



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: Annual Report 2019
Wardsville Wastewater Treatment Plant and Collection System

The Ontario Clean Water Agency is the Operating Authority for the Wardsville Wastewater Treatment Plant and Collection System on behalf of Municipality of Southwest Middlesex. The system is currently operated under Environmental Compliance Approval 7726-B2BNSA and 6045-9DKP2X. Please find attached the 2019 Annual Report for the Wardsville Wastewater Treatment Plant and Collection system.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Thomson'.

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

c.c. Greg Storms, Municipality of Southwest Middlesex
Dale LeBritton, OCWA's Regional Hub Manager
Sam Smith, OCWA's Senior Operations Manager
Cindy Sigurdson, OCWA's Safety, Process and Compliance Manager
Stephen Dunn, Ministry of the Environment, Conservation and Parks

MUNICIPALITY OF SOUTHWEST MIDDLESEX

**WARDSVILLE WASTEWATER TREATMENT PLANT
AND COLLECTION SYSTEM**

2019 ANNUAL REPORT
January 1 to December 31, 2019

Environmental Compliance Approval
6045-9DKP2X
7726-B2BNSA

Prepared by:



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Table of Contents

Section 1: Overview	1
Section 2: Influent Monitoring Data	2
Section 3: Effluent Monitoring Data	6
Section 4: Monitoring Schedule	13
Section 5: Operating Problems and Corrective Actions.....	13
Section 6: Maintenance	13
Section 7: Effluent Quality Assurance.....	13
Section 8: Calibration and Maintenance.....	14
Section 9: Effluent Quality	14
Section 10: Biosolids Management.....	15
Section 11: Community Complaints.....	15
Section 12: Bypasses, Overflow, Spills, and Other Situations Outside Normal Operating Conditions	15
Section 13: Modifications to Sewage Works	16
Section 15: Proposed Works Completion and Commissioning	16
Section 16: Summary	16
Appendix A: Analytical Data	
Appendix B: Monitoring Schedule	
Appendix C: Flow Meter Verification	
Appendix D: Work Order Schedule	
Appendix E: Completed Works	

Section 1: Overview

The Wastewater Treatment Plant and the Main Pumping Station was operated under ECA 7726-B2BNSA issued On October 4th, 2018. The other two pumping stations and the SBS collection system are on a separate Environmental Compliance Approval, 6045-9DKP2X issued November 29, 2013.

Collection System

The collection system consists of a Small Bore Sewer (SBS) system rather than a conventional sanitary sewer system. This system uses on-site SBS clarifiers for each individual lot, consisting of approximately 145 residential and 6 commercial/institutional properties. The SBS clarifiers overflow into the SBS sewer system to one of the two pumping stations. The pumping stations then direct the flow to the main pumping station where the forcemain pumps the influent to the Wastewater Treatment Plant.

Plant Description

Sewage enters a splitter box equipped with a manually cleaned bar screen. The splitter box is designed for a peak flow of 1100m³/day and includes two sluice gates to divide and direct the sewage into two parallel extended aeration treatment trains. Soda ash is added at the splitter box by the chemical feed system for alkalinity adjustment.

Each individual extended aeration treatment train includes the following components:

- i) A 9m × 4.5m × 4.5m extended aeration tank sized for 24 hours detention time assuming an average daily flow of 150m³/day. The tank is designed to achieve dissolved oxygen (DO) concentration of 2mg/L.
- ii) A secondary clarifier tank sized for a peak hydraulic loading of 550m³/day together with stilling well, baffles and air lift sludge pump that directs sludge into the on-site sludge management facilities.
- iii) A continuous backwash up flow granular sand filter sized for a peak hydraulic loading rate of 550m³/day. Approximately 6 to 8% of the effluent that flows through the filter is backwashed.

The effluent from each treatment train's sand filter is combined and directed into a 1m × 5.6m × 4.5m post-aeration tank designed to achieve a DO concentration of at least 5mg/L in the effluent. Following the aeration, the effluent is directed to an in-ground chamber housing a UV disinfection system designed for a peak hydraulic flow of 1100m³/day. The outfall is located less than 500m from the sewage works and discharges to the Thames River.

Phosphorus and solids removal is achieved by the addition of aluminum sulphate (alum) from two metering pumps that inject into the aeration tanks. The alum is stored in a 3400L storage tank. Carrier water was added to the alum system to help prevent blockages and freezing of the alum lines.

The sludge management system consists of an aerobic digestion tank sized to achieve a 45 day sludge age in combination with the aeration tanks. The sludge is then transferred to the aerated sludge holding tank (250m³) sized to hold six months of sludge before it is hauled to another facility for further processing. Two blowers were added to the system, dedicated to providing air to the holding tanks.

A generator was installed November 2019 at the plant.

Section 2: Influent Monitoring Data

Sampling and Testing

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

Raw sewage is sampled once per month and tested for BOD₅, total suspended solids, total phosphorus, and total Kjeldahl nitrogen. The raw samples are collected as grab samples.

Alkalinity tests are completed on the final effluent for better operational control of the soda ash dosing.

The receiving stream temperature is monitored at the Thames River.

Raw Sewage Quality

Table 1 represents the raw sewage (influent) quality compared to the values to which the plant was designed to treat. See Appendix A for more detailed analytical data. The annual averages were below the design criteria for all parameters except TKN. Despite the higher concentration of TKN the plant was able to meet compliance limits in the effluent for Total Ammonia Nitrogen with the exception of August.

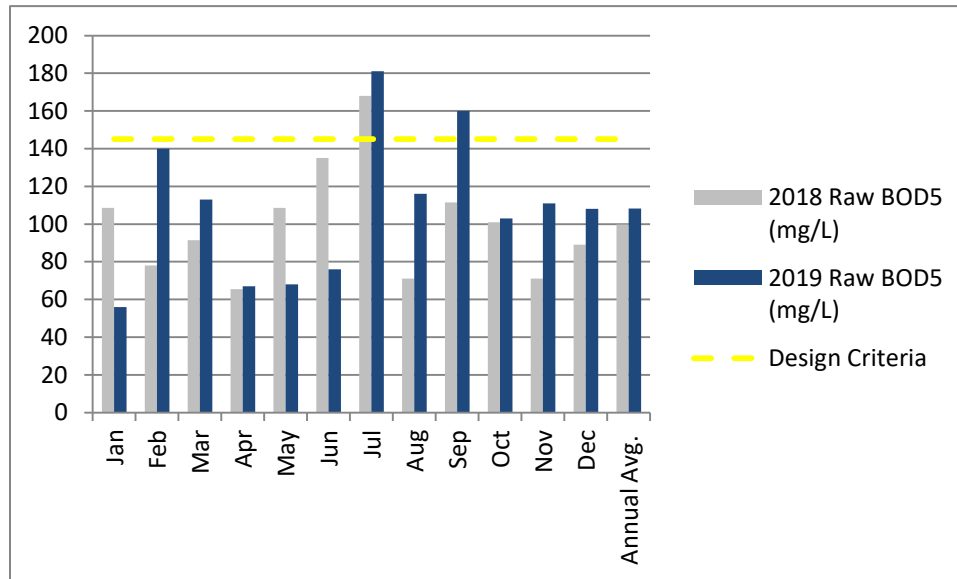
Table 1. Raw sewage annual average concentrations compared to the treatment plants design concentrations.

	BOD5 (mg/L)	TKN (mg/L)	TP (mg/L)	TSS (mg/L)
January	56.0	37	4.1	30.0
February	140	41	4.37	117
March	113	36.7	6.81	42
April	67	24.6	4.16	113
May	68	27	3.71	46
June	76	40	5.28	47
July	181	66	7.79	76
August	116	77	9.96	133
September	160	75	12.70	37
October	103	71	8.66	82
November	111	62.1	8.01	41

December	108	54.7	5.86	57
Annual Average	108.3	50.88	6.79	68.4
Design Objective	145	40	8	100
# Months Design Objective Exceeded	2/12	7/12	4/12	3/12

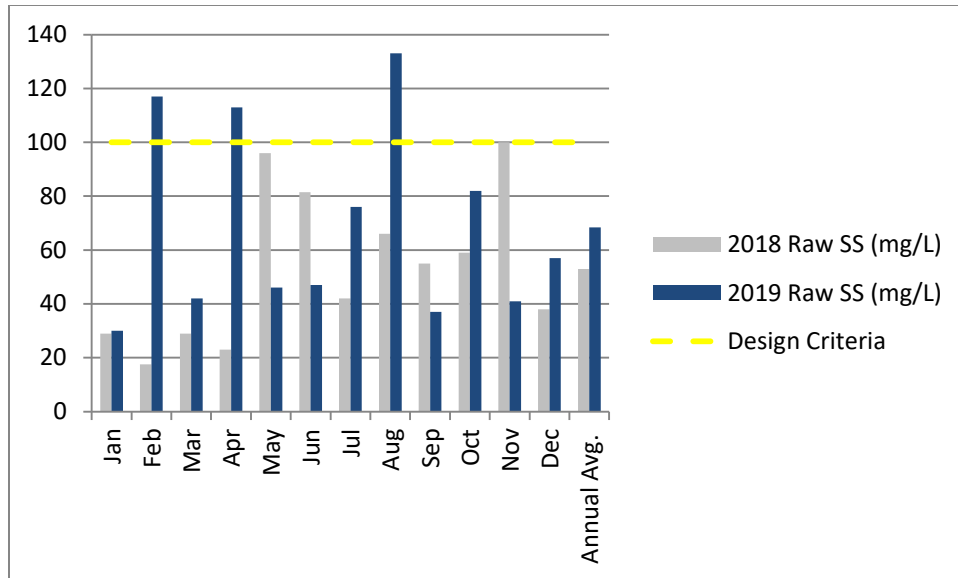
The annual average raw sewage BOD₅ concentration to the plant was 108.25mg/L with a maximum concentration of 181mg/L. The average concentration of BOD₅ has increased 8.5% from 2018, refer to Chart 1. The average BOD₅ loading to the plant was 10.6kg/d for 2019. There was two month in 2019 where the monthly average raw concentration was above the design criteria.

Chart 1. Average monthly raw sewage BOD₅ concentrations in 2019 compared to 2018 concentrations.



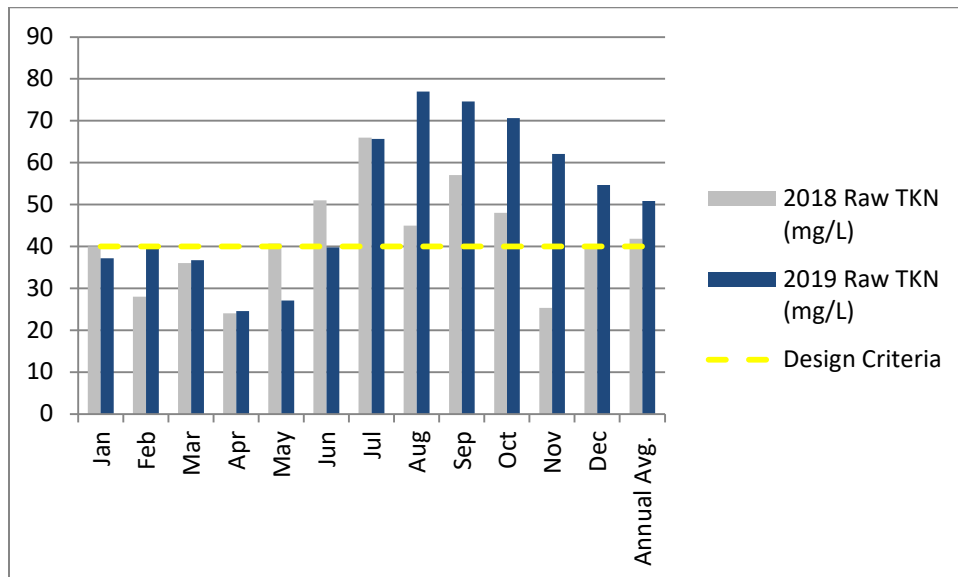
The annual average raw sewage suspended solids (TSS) concentration to the plant was 68mg/L, which is a 29% increase from 2018 (refer to Chart 2). This corresponds to an average TSS loading to the plant of 6.7kg/day in 2019. There were three months in 2019 the raw concentration of TSS was above the design concentration of 100mg/L

Chart 2. Average monthly raw sewage TSS concentrations in 2019 compared to 2018 concentrations.



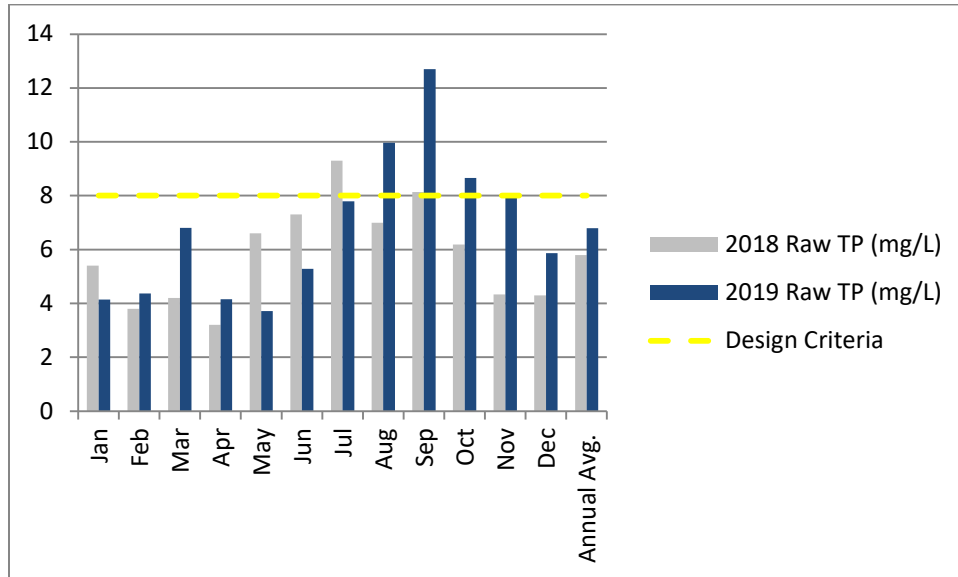
The annual average raw sewage nitrogen concentration (as represented by TKN) to the plant was 50.9mg/L with a loading of 4.96kg/d. This is an increase of 21.7% from 2018 annual average concentration, refer to Chart 3. There were seven months in 2019 the raw concentration of TKN was above the design concentration of 40mg/L, which also resulted in the annual average above the design concentration.

Chart 3. Average monthly raw sewage TKN concentrations in 2019 compared to 2018 concentrations.



The annual average raw sewage total phosphorous (TP) to the plant was 6.8mg/L with a loading of 0.66kg/day. This represents a 17% increase from 2018 annual average concentrations, refer to Chart 4. There were four months that the monthly average TP concentration was above the design criteria.

Chart 4. Average monthly raw sewage TP concentrations in 2019 compared to 2018 concentrations.

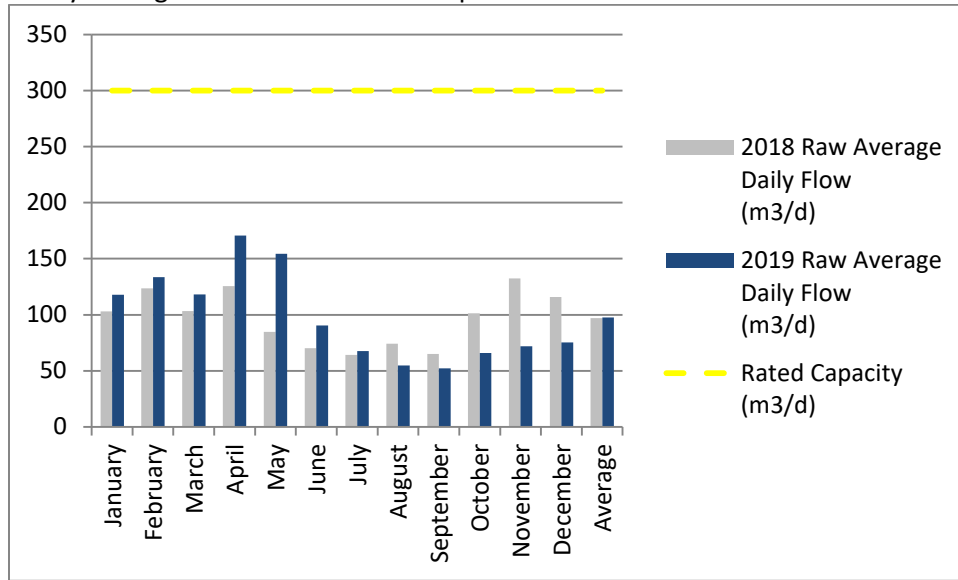


Flows

Detailed monthly flow information is summarized in Appendix A. The total flow treated in 2019 was 35,580m³, which corresponds to a 0.79% increase from 2018 raw flows. The annual average daily flow was 98m³/day, or 32.9% of the plant’s rated design capacity of 300m³/day, which is up 0.3% from 2018. Refer to Chart 5.

The design average daily flow for the plant was not exceeded in 2019; maximum daily flow was 326.5m³/d. The hydraulic peak flow of 1100m³/day for the plant was not exceeded in 2019, nor was the annual average daily flow.

Chart 5. Daily average raw flow for 2019 compared to 2018 flows.



Section 3: Effluent Monitoring Data

Final effluent is sampled weekly and tested for cBOD₅, total suspended solids, total phosphorus, and total (ammonia + ammonium) nitrogen. Samples are collected using an automatic composite sampler and collected over a twenty-four hour period. As well, a weekly grab sample for E. coli is obtained. In house grab samples are collected and tested for pH, dissolved oxygen, and temperature.

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

Effluent Limits

Detailed analytical data is provided in Appendix A. Table 2 summarizes the annual averages and maximum single sample results.

Table 2. Monthly average effluent concentration ranges, maximum single sample effluent results, monthly average loading ranges and maximum single sample loading compared to the effluent limits prescribed in the Environmental Compliance Approval.

Parameter	Monthly Average Effluent Limit (mg/L)	Single Sample Effluent Limit (mg/L)	Monthly Average Effluent Result Ranges (mg/L)	Maximum Single Sample Effluent Results (mg/L)	Monthly Loading Effluent Limit (kg/day)	Monthly Average Loading ranges (kg/d)	Maximum Single Sample Loading (kg/d)
cBOD ₅	10	15	<2 – 3.5	9	3.0	0.10 – 0.54	1.39
Suspended Solids	10	15	3 – 8.5	10	3.0	0.16 – 1.45	2.39
Total Phosphorus	0.5(a)	1.0(a)	0.14 – 0.52	1.12	0.15 (a)	0.01 – 0.09	0.12
	1.0(b)	1.5(b)	0.2 – 0.39	0.6	0.30 (b)	0.02 – 0.03	0.05
Total (Ammonia + Ammonium) Nitrogen	3.0(a)	4.5(a)	<0.1 – 2.1	7	0.9 (a)	0.01 – 0.12	0.38
	5.0(b)	7.5(b)	<0.1 – 1.33	4.9	1.5 (b)	0.01 – 0.18	0.65
E. coli (cfu/100mL)	200(a)	n/a	2 – 3.5	n/a			
	1000(b)	n/a	2 – 2.9				
pH	6-9.5 (at all times)		6.21 – 8.33	n/a			
Dissolved Oxygen (Minimum Conc.)	4 (at all times)		6.63 – 11.5	5.15			

NOTE:

(a) limit applies during the non-freezing period April 1 to October 31

(b) limit applies during the freezing period November 1 to March 31

Discussion on Monitoring Data as Compared to the Effluent Limits

The annual average effluent CBOD₅ concentration in 2019 was 2.3mg/L, which is a 6.5% increase from 2018. (refer to Chart 6). The annual average effluent loading for CBOD₅ in 2019 was 0.22kg/day. The monthly average and single sample limits were met in 2019 for cBOD₅. Refer to Table 2 for monthly average concentration, single sample concentration, and loading limits.

Chart 6. Monthly average concentrations of CBOD₅ in 2019 compared to 2018.

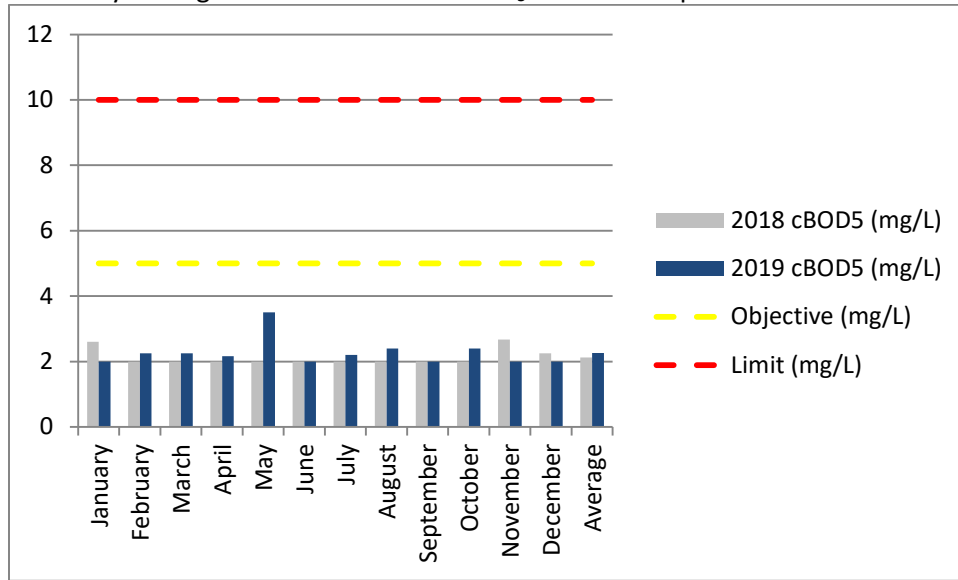
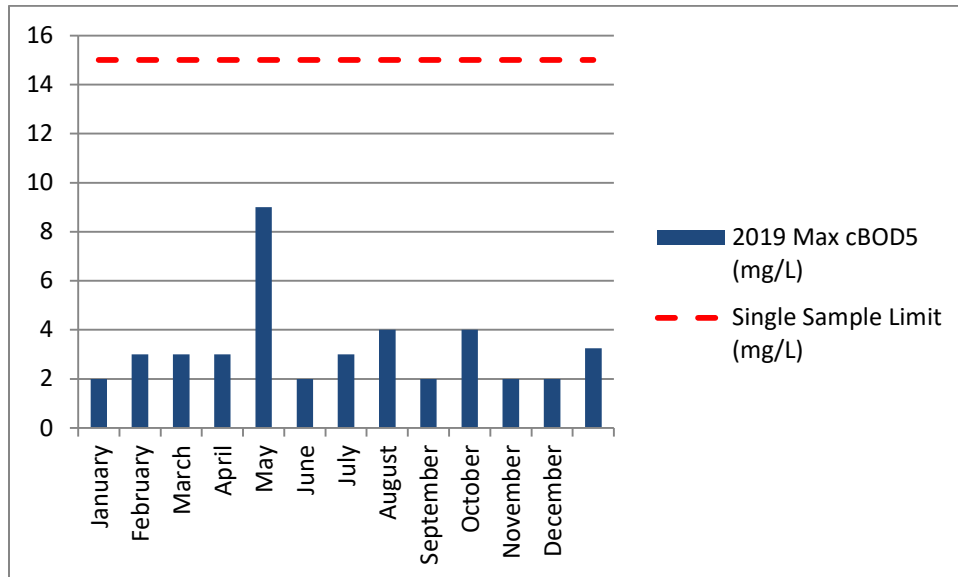


Chart 7. Maximum monthly concentrations of CBOD₅ in 2019 compared to the maximum single sample limit.



The annual average effluent Total Suspended Solids (TSS) concentration in 2019 was 4.3mg/L, which is an increased by 24% from 2018 (refer to Chart 8). The annual average effluent loading for TSS in 2019 was 0.44kg/day. The monthly average and single sample limits were met in 2019 for TSS. Refer to Table 2 for monthly average concentration, single sample concentration, and loading limits.

Chart 8. Monthly average concentrations of TSS in 2019 compared to 2018.

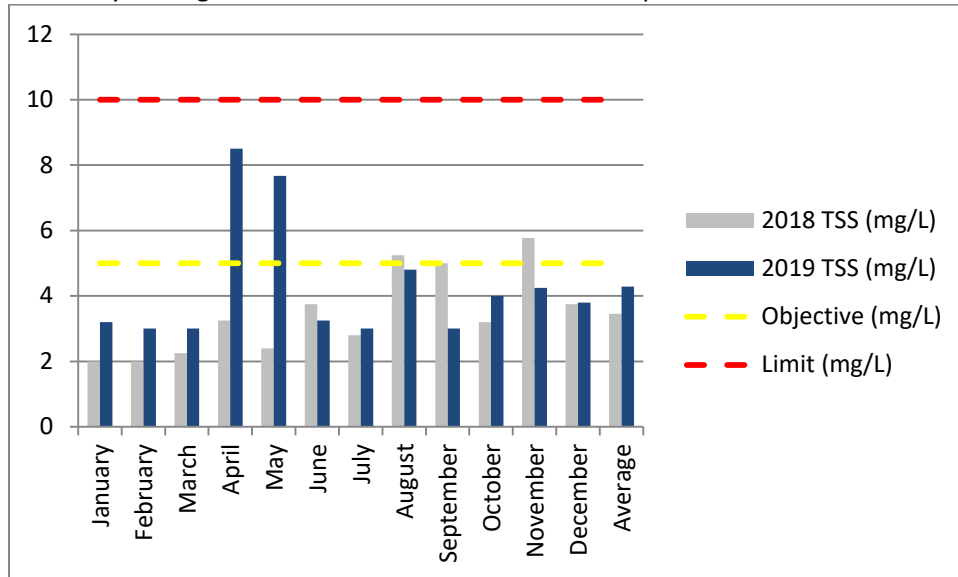
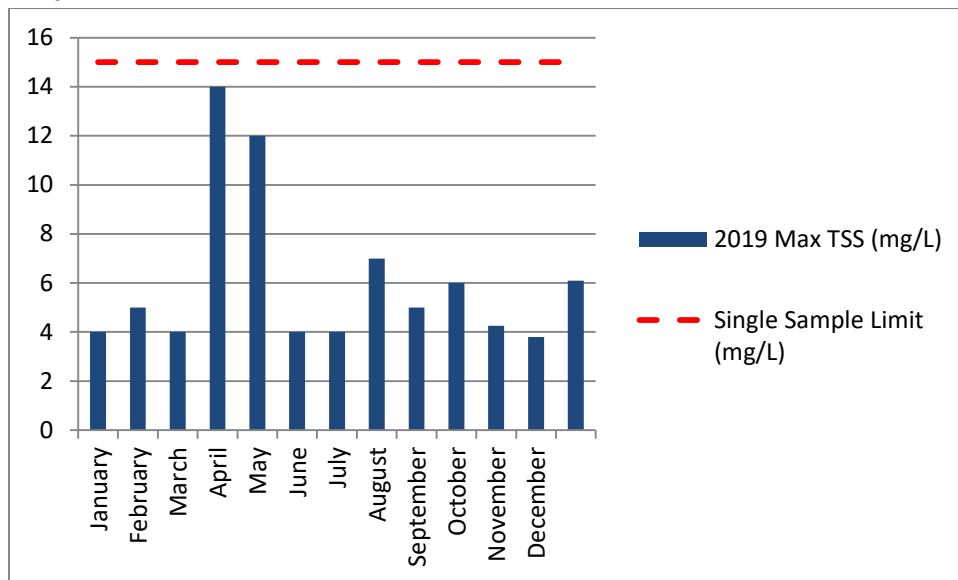


Chart 9. Maximum monthly concentrations of TSS in 2019 compared to the maximum single sample limit.



The annual average effluent Total Phosphorus (TP) concentration in 2019 was 0.35mg/L, which is an increase by 31% from 2018 (refer to Chart 10). The annual average effluent loading for TP in 2019 was 0.03kg/day. The monthly average and single sample limits were met in 2019 for TP with the exception of an average limit exceedance in April and a single limit exceedance in October. These non-compliances were reported to the MECP as per the ECA requirements. Refer to Table 2 for monthly average concentration, single sample concentration, and loading limits.

Chart 10. Monthly average concentrations of TP in 2019 compared to 2018.

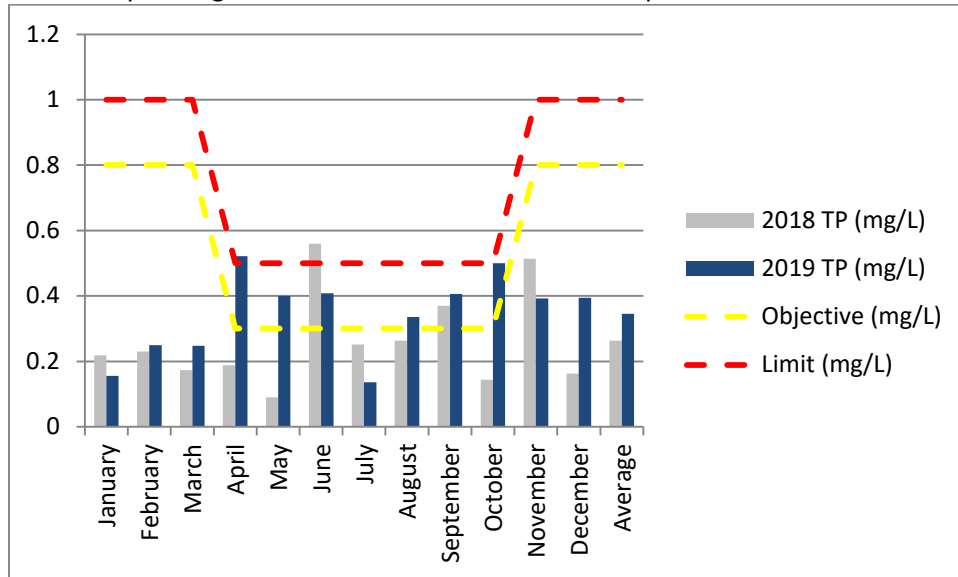
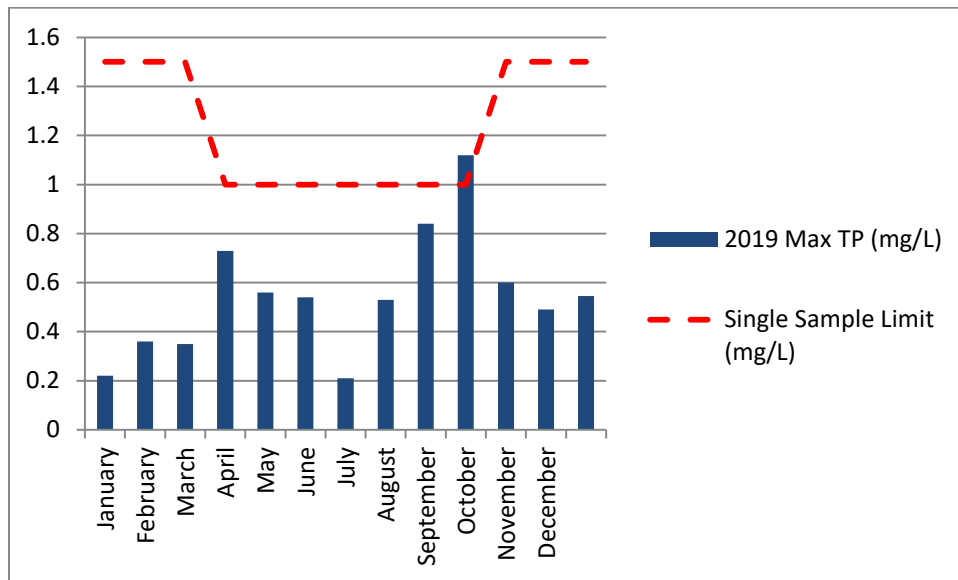


Chart 11. Maximum monthly concentrations of TP in 2019 compared to the maximum single sample limit.



The annual average effluent Total Ammonia + Ammonium Nitrogen (TAN) concentration in 2019 was 0.64mg/L, which is an decrease of 2.9% from 2018 (refer to Chart 12). The annual average effluent loading for TAN in 2019 was 0.06kg/day. The monthly average limits and single sample limits were met in 2019 for TAN with the exception of August single sample limit exceedance. Refer to Table 2 for monthly average concentration, single sample concentration, and loading limits.

Chart 12. Monthly average concentrations of TAN in 2019 compared to 2018.

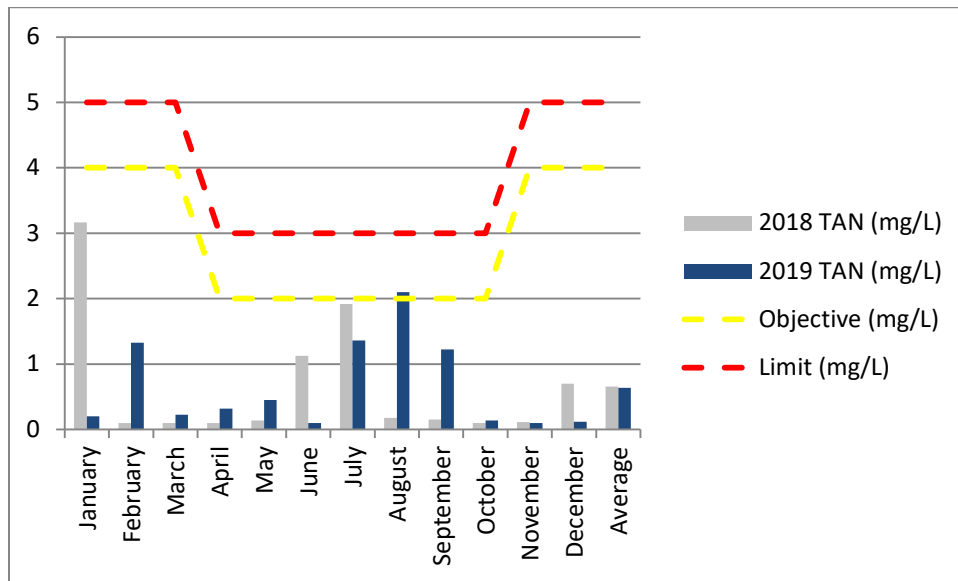
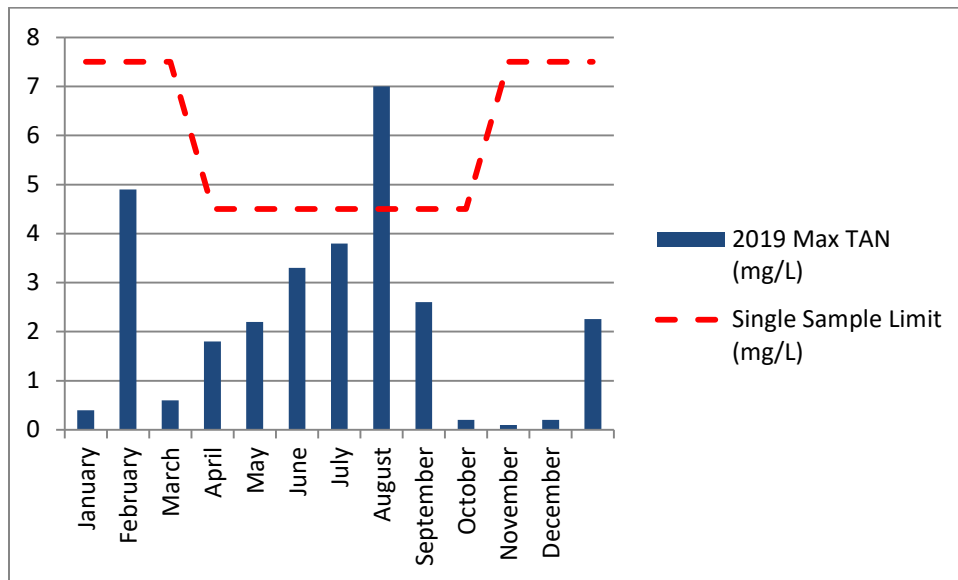


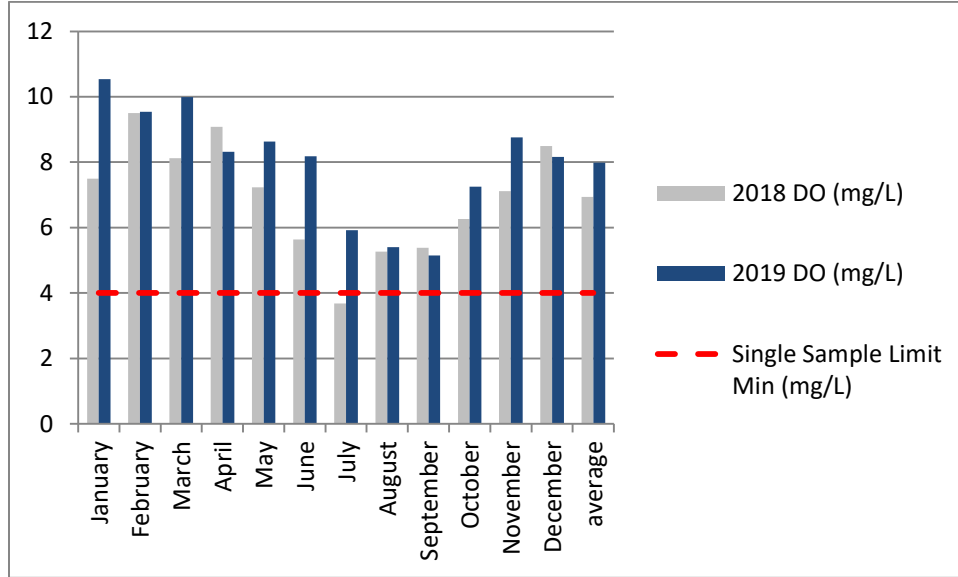
Chart 13. Maximum monthly concentrations of TAN in 2019 compared to the maximum single sample limit.



The annual average effluent pH in 2019 was 7.35, which is an increase by 2.3% from 2017. All pH readings were within the minimum and maximum limits identified in the ECA. Refer to Table 2 for pH limits. Soda ash is added at the Wardsville WWTP to control alkalinity; the addition of soda ash also increases the pH.

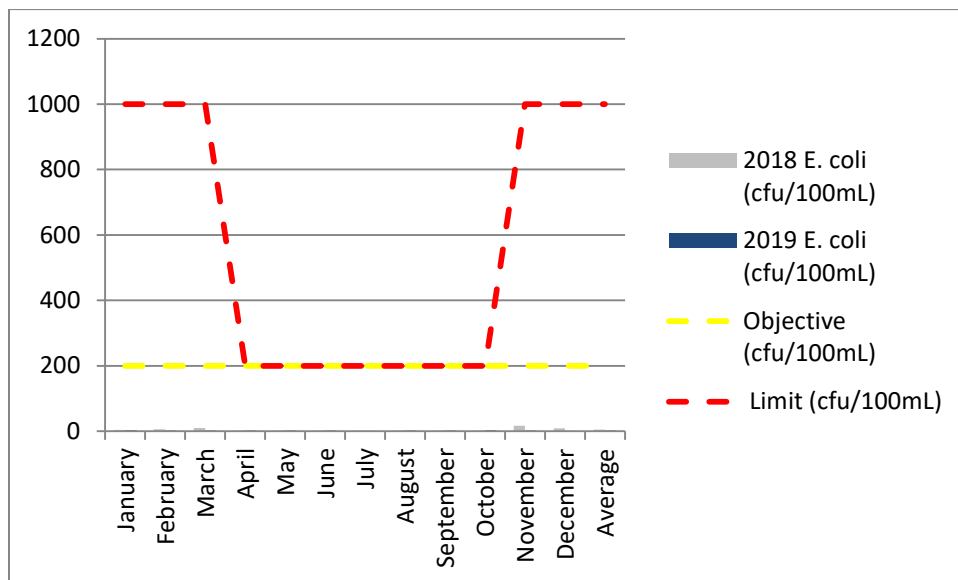
The annual average effluent Dissolved Oxygen (DO) concentration in 2019 was 8.0mg/L, which is an increase of 15% from 2018 (refer to Chart 14). DO limits were met in 2019. Refer to Table 2 for monthly minimum concentrations.

Chart 14. Monthly minimum concentrations of DO in 2019 compared to 2018. Dissolved oxygen is limit is a minimum concentration required.



The annual geometric mean effluent E. coli concentration in 2019 was 2.1cfu/100mL, which is a decrease by 58% from 2018 (refer to Chart 16). The monthly geometric mean limits were met in 2019 for E. coli with the exception of one reading of NDOGEC in August which was resampled. Refer to Table 2 for monthly geometric mean concentration limits.

Chart 16. Monthly geometric mean concentrations of E. coli in 2019 compared to 2018.



Single Sample limits were exceeded once in August for TAN due to a power bump resulting in the blowers shutting down. In April the TP average limit was exceeded and also the single limit was exceeded in October. This was caused due to improper alum dosage due to higher flows. All non-compliances were reported to the MECP.

Section 4: Monitoring Schedule

Refer to Appendix B for the monitoring schedule for 2020. All changes are documented on the sampling calendars that are signed off by the operator.

Section 5: Operating Problems and Corrective Actions

In April higher flows with inadequate alum dosages caused a total phosphorus exceedance. Alum was increased correcting the issue.

In the evening on August 12th a power failure occurred shutting down the blowers. The power failure was too brief to even trigger the power outage alarm. Therefore, when the operators arrived on site the following day they discovered the situation and found that the blowers were not reset. As a result the nitrifying bacteria were stressed causing the TAN to rise. As a result the TAN single sample limit was reached (7mg/L) and E.-coli result was outside the limits (NDOGEC). All other parameters were within limits. A second set of samples were obtained on August 16th with results within the ECA limits.

On October 28th we received a result 1.12 mg/L for Total Phosphorus exceeding the single sample limit. Samples were also taken the 29th and 31st which were within compliance limits.

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:

- New clarifier tank on Longwoods rd home
- Replaced blower
- Replaced filter reject pump
- Repaired Inlet pipe
- Installed Generator

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 DO, pH, temperature, settling tests, and Mixed Liquor

Suspended Solids (MLSS). As well, monitoring of the alum dosages, wasting volumes and Return Activated Sludge Suspended Solids is completed. Data collected from these test provide information to the operator to make the appropriate adjustments in the treatment process and corrective actions can be taken before the plant reaches its effluent limits.

Section 8: Calibration and Maintenance

Annual maintenance on the generator at the Main Pumping Station was completed by Albert’s Generator Service. Flow Metrix Technical Services Inc. performed the annual calibration on the flow meter in April.

In house meters for pH are calibrated by OCWA operators as per manufacturer’s instructions.

Section 9: Effluent Quality

Effluent Objectives

Detailed analytical data is provided in the excel spreadsheet in Appendix A. The following table summarizes the monthly average effluent concentrations for 2019.

Table 3. Monthly average effluent concentrations 2019 compared to the effluent objectives set out in the Environmental Compliance Approval.

Parameter	Effluent Objective (mg/L)	Effluent Results Ranges (mg/L)
cBOD5	5	<2 – 3.5
Suspended Solids	5	3 –8.5
Total Phosphorus	0.3(a)	0.14 – 0.52
	0.8(b)	0.2 – 0.39
Total (Ammonia + Ammonium) Nitrogen	2.0(a)	<0.1 – 2.1
	4.0(b)	<0.1 – 1.33
E. coli	200	2 – 3.5
pH	6.5-8.5	6.21 – 8.33

NOTE:

(a) limit applies during the non-freezing period April 1 to October 31

(b) limit applies during the freezing period November 1 to March 31

Discussion on Effluent Objectives

The Wardsville WWTP did not meet the all the objectives in the Environmental Compliance Approval for 2019. There were 14 objective exceedances in 2019. The TP in April lead to a non-compliance in 2019. Upon recognizing the results have exceeded the objectives; adjustments

are made to ensure that the compliance limits are not exceeded. All actions taken are documented in the facility logbook.

Table 4. Exceedances of the Effluent Objectives identified in the Environmental Compliance Approval.

Parameter	Date	Result	Comment/Cause
pH	March 1, 2019	6.44	Adjusting soda ash dosage
pH	March 26, 2019	6.26	Adjusting soda ash dosage
pH	July 16, 2019	6.36	Adjusting soda ash dosage
pH	July 23, 2019	6.21	Adjusting soda ash dosage
pH	August 7, 2019	6.45	Adjusting soda ash dosage
pH	August 20, 2019	6.39	Adjusting soda ash dosage
TP	April, 2019	0.52	High flows
TP	May, 2019	0.40	High Flows
TP	June, 2019	0.41	High Flows
TP	August, 2019	0.34	High Flows
TP	September, 2019	0.41	High Flows
TP	October, 2019	0.50	High Flows
TSS	April, 2019	8.5	High Flows
TSS	May, 2019	7.7	High Flows
TAN	August, 2019	2.1	Power issues

Section 10: Biosolids Management

Aerobically digested biosolids produced at the Wardsville WWTP are disposed of at the Glencoe Wastewater Treatment Plant. In 2019 approximately 250m³ was hauled to the Glencoe Sewage sludge holding lagoon. It is anticipated that in 2020 no sludge will be removed from the holding tank.

Section 11: Community Complaints

December 9, 2019: Homeowner at 229 William Street in Wardsville called with a sewer back up issue. Operator arrived on site and located the tank and inspected. Central Sanitation arrived on site to pump the tank out. Found that the homeowner's inlet line was plugged in between the tank and the house.

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

In 2019 there were no bypasses, spills or other situations outside normal operating conditions.

Section 13: Modifications to Sewage Works

In 2019 a new generator as per the ECA was installed. Refer to attached LOF in Appendix E.

Section 14: Bypass/Overflow Elimination

In 2019 there were no bypasses/overflows.

Section 15: Proposed Works Completion and Commissioning

See appendix E regarding the completed installation of the generator.

Section 16: Summary

The Wardsville Wastewater Treatment Plant provided effective treatment in 2019. In April a total phosphorus exceedance was reported due to high flows. In August a power failure shut down the blowers which resulted in a single sample exceedance for total ammonia nitrogen. In October a single sample exceedance was reported for total phosphorus.

APPENDIX A

Analytical Data

						January 2019 Winter		February 2019 Winter		March 2019 Winter		April 2019 Summer		May 2019 Summer		June 2019 Summer		July 2019 Summer		August 2019 Summer		September 2019 Summer		October 2019 Summer		November 2019 Winter		December 2019 Winter		Summary	Annual Loading	
		Objective Concentration (Summer)	Objective Concentration (Winter)	Limits (Summer)	Limits (winter)	Loading Limits	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	300		300			118.0		133.6		118.2		170.6		154.5		90.4		67.6		54.8		52.3		65.9		72.0		75.3		97.5	
	Max			1100			177.7		173.6		159.6		324.0		326.5		107.3		88.0		69.0		66.7		94.0		95.0		86.0		326.5	
	Min						86.2		102.6		84.0		91.0		73.0		67.0		44.0		36.0		31.0		47.0		54.0		58.0		31.0	
	Sum						3658.0		3741.4		3663.4		5118.9		4788.0		2711.0		2094.4		1698.5		1569.0		2044.0		2159.0		2334.7		35580.2	
Raw	Avg	145				56.0	6.61	140	18.71	113	13.35	67	11.43	68	10.50	76	6.87	181	12.23	116	6.36	160	8.37	103	6.79	111	7.99	108	8.13	108.3	10.55	
Raw TSS	Avg	100				30.0	3.54	117	15.63	42	4.96	113	19.28	46	7.10	47	4.25	76	5.13	133	7.29	37	1.94	82	5.41	41	2.95	57	4.29	68.4	6.67	
Raw TKN	Avg	40				37	4.39	41	5.41	36.7	4.34	24.6	4.20	27	4.19	40	3.60	66	4.44	77	4.22	75	3.90	71	4.65	62.1	4.47	54.7	4.12	50.883	4.96	
Raw TP	Avg	8				4.1	0.49	4.37	0.58	6.81	0.80	4.16	0.71	3.71	0.57	5.28	0.48	7.79	0.53	9.96	0.55	12.70	0.66	8.66	0.57	8.01	0.58	5.86	0.44	6.788	0.66	
Effluent cBOD5 (mg/L)	Avg	5		10	3	< 2.0	0.24	< 2.25	0.30	< 2.25	0.27	< 2.167	0.37	< 3.5	0.54	< 2	0.18	< 2.2	0.15	< 2.4	0.13	< 2	0.10	< 2.4	0.2	< 2	0.14	< 2	0.15	< 2.298	0.22	
	Max			15		< 2.0	0.24	3	0.40	3	0.35	3	0.51	9	1.39	2	0.18	3	0.20	4	0.22	2	0.10	4	0.26	2	0.14	2	0.15	9	0.88	
	Min					< 2.0	0.24	< 2	0.27	< 2	0.24	< 2	0.34	< 2	0.31	< 2	0.18	< 2	0.14	< 2	0.11	< 2	0.10	< 2	0.13	< 2	0.14	< 2	0.15	< 2	0.19	
Effluent TSS (mg/L)	Avg	5		10	3	3.2	0.38	3	0.40	3	0.35	8.5	1.45	7.667	1.18	3.25	0.29	3	0.20	4.80	0.26	3	0.16	4	0.26	4.25	0.31	3.8	0.29	4.509	0.44	
	Max			15		4.0	0.47	5	0.67	4	0.47	14.00	2.39	12	1.85	4.00	0.36	4	0.27	7	0.38	5	0.26	6	0.40	6	0.43	6	0.45	14	1.36	
	Min					2.0	0.24	2	0.27	2	0.24	2	0.34	4	0.62	2	0.18	2	0.14	3	0.16	2	0.10	3	0.20	3	0.22	3	0.23	2	0.19	
Effluent TP (mg/L)	Avg	0.3	0.8	0.5	1.0	0.15 (0.30)	0.2	0.02	0.25	0.03	0.248	0.03	0.52	0.09	0.40	0.06	0.41	0.04	0.136	0.01	0.336	0.02	0.406	0.02	0.5	0.03	0.392	0.03	0.394	0.03	0.355	0.03
	Max			1	1.5		0.2	0.03	0.36	0.05	0.35	0.04	0.73	0.12	0.56	0.09	0.54	0.05	0.21	0.01	0.53	0.03	0.84	0.04	1.12	0.07	0.6	0.04	0.49	0.04	1.12	0.11
	Min						0.1	0.02	0.18	0.02	0.15	0.02	0.22	0.04	0.25	0.04	0.26	0.02	0.07	0.00	0.07	0.00	0.03	0.00	0.03	0.00	0.26	0.02	0.3	0.02	0.03	0.00
Effluent TAN (mg/L)	Avg	2.0	4.0	3	5	0.9 (1.5)	< 0.2	0.02	1.325	0.18	< 0.225	0.03	< 0.317	0.05	< 0.45	0.07	< 0.1	0.01	1.36	0.09	2.1	0.12	1.225	0.06	< 0.14	0.01	< 0.1	0.01	< 0.12	0.01	< 0.659	0.06
	Max			4.5	7.5		0.40	0.05	4.9	0.65	0.6	0.07	1.2	0.20	2.2	0.34	< 0.1	0.01	3.80	0.26	7	0.38	2.6	0.14	0.2	0.01	< 0.1	0.01	0.2	0.02	7	0.68
	Min						< 0.1	0.01	< 0.1	0.01	< 0.1	0.01	< 0.1	0.02	< 0.1	0.01	< 0.1	0.01	< 0.1	0.01	0.2	0.01	< 0.2	0.01	< 0.10	< 0.1	0.01	< 0.1	0.01	< 0.1	0.01	
Effluent E. coli (cfu/100)	Geomean	200		200	1000		2.9		2		2		2		2		2		1.516		1.682		1.682		3.504		2		1.516		2.1	
	Max						12.0		2		2		2		2		2		2		2		2		66		2		2		66	
	Min						< 2.0		< 2		< 2		< 2		< 2		< 2		0		0		0		0		< 2		0		0	
Effluent DO (mg/L)	Avg						11.5		10.984		11.088		9.657		9.124		8.855		7.718		6.63		7.107		9.089		9.583		8.819		9.159	
	Max						12.5		12.65		12.1		10.59		9.55		9.66		8.94		8.4		9.11		10.15		11.07		9.32		12.65	
	Min			4	4		10.5		9.54		9.99		8.32		8.63		8.18		5.92		5.4		5.15		7.25		8.76		8.16		5.15	
Effluent pH	Avg						7.3		7.139		6.742		7.307		7.606		7.584		7.228		7.202		7.277		7.473		7.598		7.768		7.345	
	Max	8.5		9.5			7.7		7.65		6.91		7.74		7.95		8.14		8.33		7.72		8.07		7.75		7.99		8.07		8.33	
	Min	6.5		6			6.8		6.68		6.26		6.53		7.08		7.14		6.21		6.39		6.70		6.77		6.96		7.12		6.21	
Effluent Temp. (oC)	Avg						5.6		4.488		4.967		9.856		13.814		17.825		22.111		22.578		21.071		16.278		10.513		8.011		13.135	
	Max						8.5		6.3		7.8		11.9		15.9		19.9		24.8		24.3		21.9		20.1		14		9.1		24.8	
	Min						2.7		1.2		3.7		6.1		12		16.5		20.1		20.4		19.5		13.3		8.7		6.2		1.2	

APPENDIX B

Monitoring Schedule



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw, Effluent & Quarterly Samples	9	10 IH Reduced	11
12	13 IH Reduced	14	15 IH Full Effluent Samples	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full Effluent Samples	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw & Effluent Samples	6	7 IH Reduced	8
9	10 IH Reduced	11	12 IH Full Effluent Samples	13	14 IH Reduced	15
16	17 STAT	18	19 IH Full Effluent Samples	20	21 IH Reduced	22
23	24 IH Reduced	25	26 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
Rev.#: 0
Pages: 3 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

March 2020

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

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw, Effluent & Quarterly Samples	2	3 IH Reduced	4
5	6	7 IH Full Effluent Samples	8	9 IH Reduced	10 STAT	11
12	13 STAT	14	15 IH Full Effluent Samples	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full Effluent Samples	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Effluent Samples	14	15 IH Reduced	16
17	18 STAT	19	20 IH Full Effluent Samples	21	22 IH Reduced	23
24	25 IH Reduced	26	27 IH Full Effluent Samples	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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Effluent Samples	11	12 IH Reduced	13
14	15 IH Reduced	16	17 IH Full Effluent Samples	18	19 IH Reduced	20
21	22 IH Reduced	23	24 IH Full Effluent Samples	25	26 IH Reduced	27
28	29 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw, Effluent & Quarterly Samples	9	10 IH Reduced	11
12	13 IH Reduced	14	15 IH Full Effluent Samples	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full Effluent Samples	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw & Effluent Samples	6	7 IH Reduced	8
9	10 IH Reduced	11	12 IH Full Effluent Samples	13	14 IH Reduced	15
16	17 IH Reduced	18	19 IH Full Effluent Samples	20	21 IH Reduced	22
23	24 IH Reduced	25	26 IH Full 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: 8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples: Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Raw & Effluent Samples	3	4 IH Reduced	5
6	7 STAT	8	9 IH Full Effluent Samples	10	11 IH Reduced	12
13	14 IH Reduced	15	16 IH Full Effluent Samples	17	18 IH Reduced	19
20	21 IH Reduced	22	23 IH Full Effluent Samples	24	25 IH Reduced	26
27	28 IH Reduced	29	30 IH Full Effluent Samples			

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: 8 hr Composite (BOD₅, SS, TP, TKN)

Effluent Samples: 8 hr Composite (cBOD₅, SS, TP, NH₃+NH₄, TKN, NO₃, NO₂, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples: Sludge holding tank Grab (Metals, SS, TP, NH₃+NH₄, NO₃)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 & Quarterly Samples	8	9 IH Reduced	10
11	12 STAT	13	14 IH Full Effluent Samples	15	16 IH Reduced	17
18	19 IH Reduced	20	21 IH Full Effluent Samples	22	23 IH Reduced	24
25	26 IH Reduced	27	28 IH Full Effluent Samples	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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 IH Full Effluent Samples	10	11 STAT	12	13 IH Reduced	14
15	16 IH Reduced	17	18 IH Full Effluent Samples	19	20 IH Reduced	21
22	23 IH Reduced	24	25 IH Full Effluent Samples	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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson



Sample Schedule 2020 6640 Wardsville WWTP

Issued: 2019-12-17
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 Effluent Samples	10	11 IH Reduced	12
13	14 IH Reduced	15	16 IH Full Effluent Samples	17	18 IH Reduced	19
20	21	22 IH Full Effluent Samples	23	24 IH Reduced	25 STAT	26
27	28 STAT	29 IH Full 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:

8 hr Composite (BOD5, SS, TP, TKN)

Effluent Samples:

8 hr Composite (cBOD5, SS, TP, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli, DO, pH, Temp.)

Quarterly Samples:

Sludge holding tank Grab (Metals, SS, TP, NH3+NH4, NO3)

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
2019-12-17	0	Create Schedule	Terri-Lynn Thomson

APPENDIX C

Flow Meter Verification



AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL		EQUIPMENT DETAIL	
CUSTOMER	OCWA - West Elgin Middlesex	[MUT] MANUFACTURER	Krohne
CONTACT	Cindy Sigurdson Compliance Manager 9210 Graham Road, West Lorne c: 226-377-3563 e: csigurdson@ocwa.com	MODEL	IFC010D
		SERIAL NUMBER	02116607
		FUSE	On Board Plug
		PLANT ID	Wardsville WWTP
		METER ID	Influent Flow Meter
		FIT ID	N/A
		CLIENT TAG	OCWA# 123647
		OTHER	ORG# 6640
		GPS COORDINATES	N42 39.004 W081 45.537
VER. BY - FM	Paris Machuk	VERIFICATION DATE	April 26, 2019
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.		CAL. FREQUENCY	Annual
		CAL. DUE DATE	April, 2020

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	100	AS FOUND	3966658	M3
F.S. FLOW - MAG	LPS	66.4	AS LEFT	3966673	M3
F.S. RANGE - O/P	LPS	78.5	DIFFERENCE	15	M3
CAL. K-FACTOR	GKL	5.54870			
			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	
Zero Offset Flow	LPS	0.08	ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.		

FLOW TUBE SIMULATION							
		0.0	1.0	2.0	5.0	10.0	m/s
		0.1	10.1	20.1	50.1	100.1	% F.S. Flow
		0.1	8.6	17.0	42.4	84.7	% F.S. Range
REF. FLOW RATE		0.08	6.72	13.36	33.29	66.49	LPS
MUT [Reading]		0.08	6.72	13.37	33.29	66.51	LPS
MUT [Difference]		0.00	0.00	0.01	0.00	0.02	LPS
MUT [% Error]		0.00	-0.02	0.05	0.01	0.02	%
mA OUTPUT		4.000	5.369	6.722	10.781	17.546	mA
MUT [Reading]	min. 4.000 mA	3.997	5.366	6.718	10.776	17.542	mA
MUT [Difference]	max. 20.000 mA	-0.003	-0.003	-0.004	-0.005	-0.004	mA
MUT [% Error]		-0.08	-0.06	-0.06	-0.05	-0.02	%
TOTALIZER - REF. FLOW RATE						66.495	LPS
TOTALIZER [MUT]						11	M3
TEST TIME						164.45	SECONDS
CALC. TOTALIZER						10.935	M3
ERROR						0.59	%

COMMENTS	QUALITY MANAGEMENT STANDARDS INFO.			RESULTS		
	Note: mA output tested but not used	[QMS] INFORMATION	IDENT.	ID #	TEST	AVG % o.r.
	[REFERENCE] FTS	KRO	1	DISPLAY	0.02	PASS
	PROCESS METER	DMM	11	mA OUTPUT	-0.05	PASS
	ANALOG METER	AM	N/A	TOTALIZER	0.59	PASS
	STOP WATCH	SW	YES			

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: Mar 1, 2019 12:00 AM

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

Location: 6640,6640-SPP1,6640-SPP2,6640-SPP3,6640-WWWV

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

Work Order Class:

WO #	Asset ID	Asset Description	Location Description	WorkOrder		PM Schedule		Workorder Details			
				Type	Class	FEQ	Units	Work Order Description	Schedule Start	Actual Start	Actual Finsh
1519702			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	12/1/19 12:00 AM	12/31/19 07:52 AM	12/31/19 07:52 AM
1482962			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:29 AM	12/19/19 10:29 AM
1443432			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:35 AM	10/28/19 08:35 AM
1199276			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	4/1/19 12:00 AM	4/26/19 08:00 AM	4/26/19 08:00 AM
1159220			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	3/1/19 12:00 AM	4/2/19 12:32 PM	4/2/19 12:32 PM
1240035			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:13 AM	5/31/19 08:13 AM
1320701			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	7/1/19 12:00 AM	7/26/19 02:20 PM	7/26/19 02:20 PM
1279134			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	6/1/19 12:00 AM	6/28/19 03:18 PM	6/28/19 03:18 PM
1400145			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:26 AM	10/28/19 08:26 AM
1360389			6640, Wardsville WWTP	PM	Health and Safety	1	MONTHS	OHSA Inspection Wardsville (1m) - 6640	8/1/19 12:00 AM	8/30/19 03:02 PM	8/30/19 03:02 PM
1376246			Wardsville Wastewater	CORR	Compliance	0		Missed sample pick up/ delivery to lab - 6640		8/20/19 01:36 PM	8/20/19 01:36 PM
1257329			6640, Wardsville WWTP	PM	Inspection	0		Wardsville Facility Checks		5/6/19 08:26 AM	5/6/19 08:30 AM
1517978	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/19/19 10:47 AM	12/19/19 10:47 AM
1519331			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	12/1/19 12:00 AM	1/27/20 11:46 AM	1/27/20 11:46 AM
1481547			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:17 AM	12/19/19 10:17 AM
1481789	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:18 AM	12/19/19 10:18 AM
1481803	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:19 AM	12/19/19 10:19 AM
1481810	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:19 AM	12/19/19 10:19 AM
1442214	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:28 AM	10/28/19 08:28 AM
1442221	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:31 AM	10/28/19 08:31 AM
1443127			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:34 AM	10/28/19 08:34 AM

1517691			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	12/1/19 12:00 AM	12/19/19 10:27 AM	12/19/19 10:27 AM
1517957	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/19/19 10:31 AM	12/19/19 10:31 AM
1517971	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/19/19 10:32 AM	12/19/19 10:32 AM
1197770			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	4/1/19 12:00 AM	4/2/19 02:30 PM	4/2/19 02:30 PM
1198012	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/11/19 07:58 AM	4/11/19 07:58 AM
1198026	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/11/19 07:53 AM	4/11/19 07:53 AM
1198033	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/11/19 07:57 AM	4/11/19 07:57 AM
1157764	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/18/19 07:56 AM	3/18/19 07:56 AM
1482664			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:27 AM	12/19/19 10:27 AM
1198966			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	4/1/19 12:00 AM	4/26/19 08:06 AM	4/26/19 08:06 AM
1441958			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:27 AM	10/28/19 08:27 AM
1442200	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:27 AM	10/28/19 08:27 AM
1157477			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	3/1/19 12:00 AM	3/6/19 10:54 AM	3/6/19 10:54 AM
1157743	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/6/19 10:56 AM	3/6/19 10:56 AM
1157757	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/6/19 10:57 AM	3/6/19 10:57 AM
1238794	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:25 AM	5/31/19 08:25 AM
1238531			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	5/1/19 12:00 AM	5/31/19 07:52 AM	5/31/19 07:52 AM
1238773	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:19 AM	5/31/19 08:19 AM
1238787	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:22 AM	5/31/19 08:22 AM
1319512	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	7/1/19 12:00 AM	8/30/19 08:58 AM	8/30/19 08:58 AM
1319519	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	7/1/19 12:00 AM	8/30/19 08:59 AM	8/30/19 08:59 AM
1358946			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	8/1/19 12:00 AM	8/30/19 02:58 PM	8/30/19 02:58 PM
1359188	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 02:58 PM	8/30/19 02:58 PM
1359202	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 02:59 PM	8/30/19 02:59 PM
1360091			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	8/1/19 12:00 AM	8/30/19 03:02 PM	8/30/19 03:02 PM
1398509			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	9/1/19 12:00 AM	9/23/19 08:09 AM	9/23/19 08:09 AM
1398781	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:21 AM	10/28/19 08:21 AM

KENNEDY PS											
1398795	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:22 AM	10/28/19 08:22 AM
1398802	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:22 AM	10/28/19 08:22 AM
1359209	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 03:00 PM	8/30/19 03:00 PM
1319256			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	7/1/19 12:00 AM	8/30/19 08:56 AM	8/30/19 08:56 AM
1319498	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	7/1/19 12:00 AM	8/30/19 08:57 AM	8/30/19 08:57 AM
1277370			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Blower Pos Disp Insp Route (1m) - 6640	6/1/19 12:00 AM	6/28/19 01:10 PM	6/28/19 01:10 PM
1277650	0000209459	PANEL ALARM/DIALER KENNEDY PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/13/19 08:02 AM	6/13/19 08:02 AM
1277664	0000209460	PANEL ALARM/DIALER COURSE PS	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/13/19 08:06 AM	6/13/19 08:06 AM
1277671	0000209491	PANEL ALARM/DIALER	6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/28/19 01:12 PM	6/28/19 01:12 PM
1158837			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	3/1/19 12:00 AM	3/25/19 08:08 AM	3/25/19 08:08 AM
1278794			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	6/1/19 12:00 AM	6/6/19 07:55 AM	6/6/19 07:55 AM
1239725			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:17 AM	5/31/19 08:17 AM
1320403			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	7/1/19 12:00 AM	7/15/19 08:06 AM	7/15/19 08:06 AM
1399805			6640, Wardsville WWTP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:25 AM	10/28/19 08:25 AM
1244969	0000123173	FAN EXHAUST CHEMICAL BUILDING	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	YEARS	Fan Exhaust Insp/Service (1y) - 6640	5/1/19 12:00 AM	5/31/19 08:54 AM	5/31/19 08:54 AM
1244976	0000123175	FAN EXHAUST 01 BLOWERE RM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	YEARS	Fan Exhaust Insp/Service (1y) - 6640	5/1/19 12:00 AM	5/31/19 08:56 AM	5/31/19 08:56 AM
1326248	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	YEARS	Generator 01 Electric Ward Ps1 Insp/Service (1y) - 6640	7/1/19 12:00 AM	7/26/19 08:23 AM	7/26/19 08:23 AM
1278544	0000063097	GENERATOR 02 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/28/19 08:03 AM	6/28/19 08:03 AM
1278547	0000063098	GENERATOR 03 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/28/19 08:04 AM	6/28/19 08:04 AM
1399606	0000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:23 AM	10/28/19 08:23 AM
1399609	0000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:23 AM	10/28/19 08:23 AM
1399612	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:24 AM	10/28/19 08:24 AM
1399752	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	9/1/19 12:00 AM	10/28/19 08:25 AM	10/28/19 08:25 AM
1359915	0000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 09:25 AM	8/30/19 09:25 AM
1359918	0000063098	GENERATOR 03 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 09:26 AM	8/30/19 09:26 AM

					repair			6640			
1359921	0000123646	ELECTRIC PORTABLE WARD/SWM GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 09:27 AM	8/30/19 09:27 AM
1360038	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	8/1/19 12:00 AM	8/30/19 03:01 PM	8/30/19 03:01 PM
1340258			6640, Wardsville WWTP	OPER	Refurbish/Replace/Repair	0		Wardsville WWTP Grounds and		9/11/19 08:24 AM	9/11/19 08:24 AM
1340266			6640, Wardsville WWTP	OPER	Refurbish/Replace/Repair	0		Wardsville WWTP alum delivery 6640		7/22/19 07:55 AM	7/22/19 07:55 AM
1342046			6640, Wardsville WWTP	OPER	Refurbish/Replace/Repair	0		Wardsville WWTP Clarifiers (6640)		10/28/19 12:47 PM	10/28/19 12:47 PM
1365970	0000123655	COMPRESSOR AIR 01/02	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	YEARS	Compressor Air 01/02 Insp/Service (1y) - 6640	8/1/19 12:00 AM	9/23/19 08:08 AM	9/23/19 08:08 AM
1320227	0000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	7/1/19 12:00 AM	7/26/19 07:58 AM	7/26/19 07:58 AM
1320230	0000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	7/1/19 12:00 AM	7/26/19 08:14 AM	7/26/19 08:14 AM
1320233	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	7/1/19 12:00 AM	7/26/19 08:17 AM	7/26/19 08:17 AM
1320350	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	7/1/19 12:00 AM	8/30/19 09:24 AM	8/30/19 09:24 AM
1278550	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	6/1/19 12:00 AM	6/28/19 08:06 AM	6/28/19 08:06 AM
1278713	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	6/1/19 12:00 AM	6/6/19 07:57 AM	6/6/19 07:57 AM
1239549	0000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:00 AM	5/31/19 08:00 AM
1239552	0000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:06 AM	5/31/19 08:06 AM
1239555	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 08:10 AM	5/31/19 08:10 AM
1239672	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	5/1/19 12:00 AM	5/31/19 07:56 AM	5/31/19 07:56 AM
1198791	0000063098	GENERATOR 03 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/26/19 08:03 AM	4/26/19 08:03 AM
1198794	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/26/19 08:05 AM	4/26/19 08:05 AM
1198912	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	4/1/19 12:00 AM	4/23/19 08:09 AM	4/23/19 08:09 AM
1204434	0000209439	PUMP PERISTALTIC 01 ALUM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Peristaltic 01 Alum Insp/Service (1y) - 6640	4/1/19 12:00 AM	5/31/19 08:30 AM	5/31/19 08:30 AM
1158638	0000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/18/19 07:57 AM	3/18/19 07:57 AM
1158641	0000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/25/19 08:04 AM	3/25/19 08:04 AM
1158644	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	3/1/19 12:00 AM	3/18/19 07:58 AM	3/18/19 07:58 AM
1158784	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 6640	3/1/19 12:00 AM	3/25/19 08:09 AM	3/25/19 08:09 AM
1198788	0000063097	GENERATOR 02 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	4/1/19 12:00 AM	4/26/19 07:58 AM	4/26/19 07:58 AM
1482488	0000063097	GENERATOR 02 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:20 AM	12/19/19 10:20 AM

1482491	000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	11/1/19 12:00 AM	11/27/19 12:34 PM	11/27/19 12:34 PM
1482494	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:22 AM	12/19/19 10:22 AM
1482611	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	UV Light Insp (1m) - 6640	11/1/19 12:00 AM	12/19/19 10:23 AM	12/19/19 10:23 AM
1177407			Wardsville Wastewater Collection and Treatment System	CORR	Refurbish/Replace/ Repair	0		Wardsville Sewer Line Flushing		3/21/19 01:37 PM	3/21/19 01:37 PM
1421062			Wardsville Wastewater Collection and Treatment	CORR	Refurbish/Replace/ Repair	0		Soda ash system repairs		12/31/19 10:06 AM	12/31/19 10:06 AM
1421857			Wardsville Wastewater Collection and Treatment System	CORR	Refurbish/Replace/ Repair	0		Raw inlet line repair		10/28/19 11:32 AM	10/28/19 11:32 AM
1442951	000063097	GENERATOR 02 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:32 AM	10/28/19 08:32 AM
1442954	000063098	GENERATOR 03 ELECTRIC PORTABLE WARD/SWM	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:32 AM	10/28/19 08:32 AM
1442957	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:33 AM	10/28/19 08:33 AM
1443074	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	UV Light Insp (1m) - 6640	10/1/19 12:00 AM	10/28/19 08:34 AM	10/28/19 08:34 AM
1204451	0000209440	PUMP PERISTALTIC 02 ALUM	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Pump Peristaltic 02 Alum Insp/Service (1y) - 6640	4/1/19 12:00 AM	5/31/19 08:37 AM	5/31/19 08:37 AM
1204468	0000123176	BLOWER POSITIVE DISPLACEMENT A4	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Blower A4 Insp/Service (1y) - 6640	4/1/19 12:00 AM	5/31/19 08:48 AM	5/31/19 08:48 AM
1204476	0000123178	BLOWER POSITIVE DISPLACEMENT A5	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Blower A5 Insp/Service (1y) - 6640	4/1/19 12:00 AM	5/31/19 08:52 AM	5/31/19 08:52 AM
1488172	0000123654	BLOWER POSITIVE DISPLACEMENT 03	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Blower Positive Displacement 03 Insp/Service (1y) - 6640	11/1/19 12:00 AM	12/19/19 10:23 AM	12/19/19 10:23 AM
1488180	0000209486	BLOWER POSITIVE DISPLACEMENT 02	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Blower Positive Displacement 02 Insp/Service (1y) - 6640	11/1/19 12:00 AM	12/19/19 10:24 AM	12/19/19 10:24 AM
1488188	0000209487	BLOWER POSITIVE DISPLACEMENT 01	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	YEARS	Blower Positive Displacement 01 Insp/Service (1y) - 6640	11/1/19 12:00 AM	12/19/19 10:26 AM	12/19/19 10:26 AM
1518887	000063097	GENERATOR 02 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/31/19 07:47 AM	12/31/19 07:47 AM
1518890	000063098	GENERATOR 03 ELECTRIC PORTABLE	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/20/19 07:42 AM	12/20/19 07:42 AM
1518893	0000123646	GENERATOR 01 ELECTRIC WARD PS1	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	Generator Electric Test/Insp (1m) - 6640	12/1/19 12:00 AM	12/31/19 07:46 AM	12/31/19 07:46 AM
1519226	0000209481	UV LIGHT	6640, Wardsville WWTP	PM	Refurbish/Replace/ Repair	1	MONTHS	UV Light Insp (1m) - 6640	12/1/19 12:00 AM	12/31/19 07:46 AM	12/31/19 07:46 AM
1378982			6640, Wardsville WWTP	OPER	Refurbish/Replace/ Repair	0		Wardsville East Aeration Tank RAS Air Line Repair (6640)		8/13/19 03:38 PM	8/13/19 03:38 PM
1422586			6640, Wardsville WWTP	OPER	Refurbish/Replace/ Repair	0		Wardsville Sewage Treatment Plant Sludge Holding Tank Cleanout (6640)		12/4/19 12:43 PM	12/4/19 12:43 PM
1339447			6640, Wardsville WWTP	OPER	Refurbish/Replace/ Repair	0		Clean Air Inlet for Blower Room 6640		10/28/19 12:43 PM	10/28/19 12:43 PM
1378970			Wardsville Wastewater Collection and Treatment System	OPER	Refurbish/Replace/ Repair	0		Wardsville Power Surge/ Flicker (6640)		8/13/19 03:33 PM	8/13/19 03:33 PM
1257317			Wardsville Wastewater Collection and Treatment System	CORR	Refurbish/Replace/ Repair	0		191 Queen St Septic Tank Clean Out		5/6/19 08:57 AM	5/6/19 08:57 AM
1218194			Wardsville Wastewater Collection and Treatment System	CAP	Refurbish/Replace/ Repair	0		150 Davis St Tank Inspection		4/8/19 07:58 AM	4/8/19 07:58 AM

1380659	0000209451	PUMP SUBMERSIBLE 01 REJECT PLANT	6640, Wardsville WWTP	CORR	Refurbish/Replace/ Repair	0		Reject Pump Replacement	8/27/19 11:08 AM	8/27/19 11:08 AM
1420604	0000123654	BLOWER POSITIVE DISPLACEMENT 03	6640, Wardsville WWTP	CAP	Refurbish/Replace/ Repair	0		Blower replacement/PM's on all blowers- 6640	12/31/19 10:07 AM	12/31/19 10:07 AM
1204484	0000123647	METER FLOW	6640, Wardsville WWTP	PM	Calibration	1	YEARS	Meter Flow Insp/Service (1y) - 6640	4/1/19 12:00 AM	5/31/19 08:40 AM

3/31/20 09:05:41

APPENDIX E

Completed Work



Notice of Modification to Sewage Works

**Ministry of
the Environment**

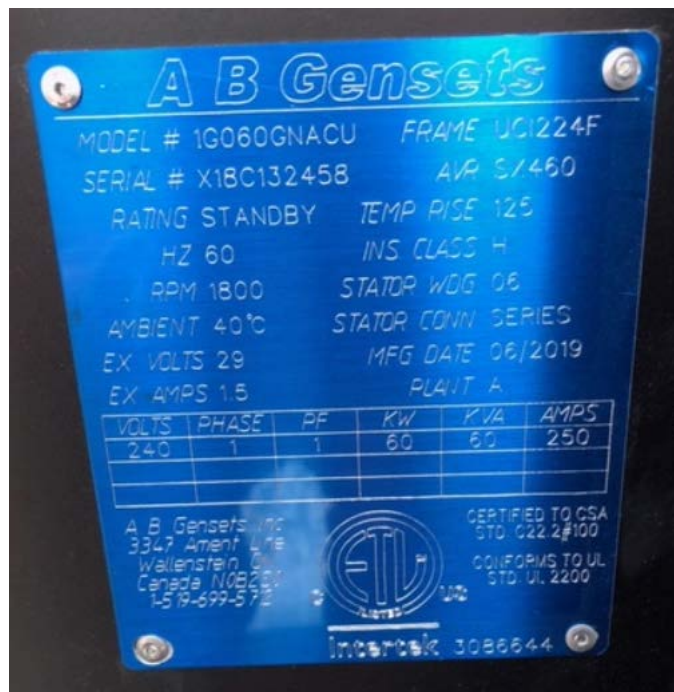
RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL PLANTS) OR DISTRICT MANAGER (FOR INDUSTRIAL PLANTS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility			
(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)			
ECA Owner The Corporation of the Municipality of Southwest Middlesex	ECA number ECA 7726-B2BNSA	Issuance Date (mm/dd/yy) October 4, 2018	Notice number 02
Part 2 – Description of the modifications as part of the Limited Operational Flexibility (Attach a detailed description of the sewage works) See detailed description below			
Description shall include: 1. A detail description above of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.) 2. An assessment of the anticipated environmental effects 3. Updated versions of, or amendments to, all relevant technical documents required by this ECA that are affected by the modifications as applicable, e.g. site plan, design brief, drawings, emergency and spill prevention plan, etc.			
Part 3 – Declaration by Professional Engineer I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design: 1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario; 2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA; 3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations. I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate			
Name (Print) Hank Andres	PEO License Number 100074097		
Signature 	Date (mm/dd/yy) December 20, 2019		
Name of Employer Ontario Clean Water Agency			
Part 4 – Declaration by Owner I hereby declare that: 1. I am authorized by the Owner to complete this Declaration; 2. The Owner consents to the modification; and 3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA. 4. The Owner has fulfilled all applicable requirements of the <i>Environmental Assessment Act</i> . I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate			
Name of Owner Representative (Print) Gregory Storms	Owner representative's title (Print) Public Works Manager		
Owner Representative's Signature	Date (mm/dd/yy) December 23, 2019		

Ministry of the Environment

Part 2 – Description of the modifications as part of the Limited Operational Flexibility (continued)

The Wardsville wastewater treatment facility located in Wardsville, Ontario. A 60 kW standby power system has been installed at the plant to run the key process equipment (i.e. aeration blower, digester blower, filter compressor, UV disinfection system etc.) during a power outage. The nameplate for the 60kW standby power system is shown below.



Description shall include:

1. A detail description above of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. An assessment of the anticipated environmental effects
3. Updated versions of, or amendments to, all relevant technical documents required by this ECA that are affected by the modifications as applicable, e.g. site plan, design brief, drawings, emergency and spill prevention plan, etc.