Ontario Clean Water Agency
Agence Ontarienne Des Eaux

March 29, 2019

Mark Smith
Ministry of the Environment, Conservations and Parks
733 Exeter Road
London, ON N6E 1L3

Attention: Mr. Smith

RE: Rodney Wastewater Treatment Plant Annual Report 2018

The Ontario Clean Water Agency is the Operating Authority for the Rodney Wastewater Treatment Plant on behalf of the Municipality of West Elgin. The system is operated under Environmental Compliance Approval 3-0871-88-949. Please find attached the 2018 Annual Report for the Rodney Wastewater Treatment Plant.

Feel free to contact me should you require any additional information regarding the report. I can be reached at 226-377-3563.

Sincerely,

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

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

MUNICIPALITY OF WEST ELGIN

RODNEY WASTEWATER TREATMENT PLANT

2018 ANNUAL REPORT
January 1 to December 31, 2018

Environmental Compliance Approval # 3-0871-88-949

Prepared by:

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Section 1: Overview

The wastewater treatment plant was operated under Environmental Compliance Approval 3-0871-88-949 dated April 12, 1994 with amendments September 24, 1998.

Collection System
The collection system contains gravity sewers that lead to the Main Pumping Station located on Furnival Road. It contains a wet well with two submersible pumps that pump to the treatment plant. Backup power is supplied by an onsite generator.

Plant Description
The Rodney Wastewater Treatment Plant is an extended aeration facility which consists of: extended aeration, settling, UV disinfection (seasonal), phosphorus removal, and filtration. 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 filtered and seasonally disinfected using ultraviolet light, then discharged to Sixteen Mile Creek. Sludge is directed to the lagoon for storage and settling. Decant liquid off the lagoon is returned to the influent of the plant.

Process Details

- Wastewater is directed into the sewage lift station from the Village of Rodney by gravity. Wastewater is pumped from the sewage lift station located near the junction of Furnival Road and King Street by force main into a reinforced concrete splitter chamber, provided with a mechanical rake bar screen.
- The secondary treatment system consists of two aeration basins, one reinforced concrete clarifier tank and two return activated sludge pumps.
- The phosphorous removal system consists of one 30,000 L fiber reinforced tank with spills containment equipped with 2 diaphragm type metering pumps (1 duty and 1 standby).
- Three mechanical aerators in each aeration tank provide oxygen at a low pressure in the aeration tanks.
- The tertiary treatment system consists of four (4) continuous back wash 2 metre deep bed, granular single media sand filtration units housed in the filter building. Hydrogen peroxide is introduced for filter cleaning when necessary.
- The disinfection system consists of a ultra-violet (UV) unit through which the effluent is discharged seasonally.
- A concrete V-notch weir flow measuring chamber is installed between the clarifier and the filter building.
- Operations are controlled by a programmable logic controller (PLC). A data logging computer system with local monitoring capability is used to monitor, trend, and record select process parameters.
- Laboratory space is also located at the WWTP to allow for basic laboratory analyses to be conducted by the plant operator.
- Process control is monitored by SCADA at the West Lorne Wastewater Treatment Facility.

Section 2: Monitoring Data

Sample Collection and Testing

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

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

Final effluent is sampled bi-weekly and tested for BOD_5, total suspended solids, total phosphorus, free ammonia nitrogen, total Kjeldahl nitrogen, nitrite, nitrate, pH and alkalinity. Samples are collected using an automatic composite sampler and collected over a twenty-four hour period. Grab samples for dissolved oxygen and temperature are 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 required.

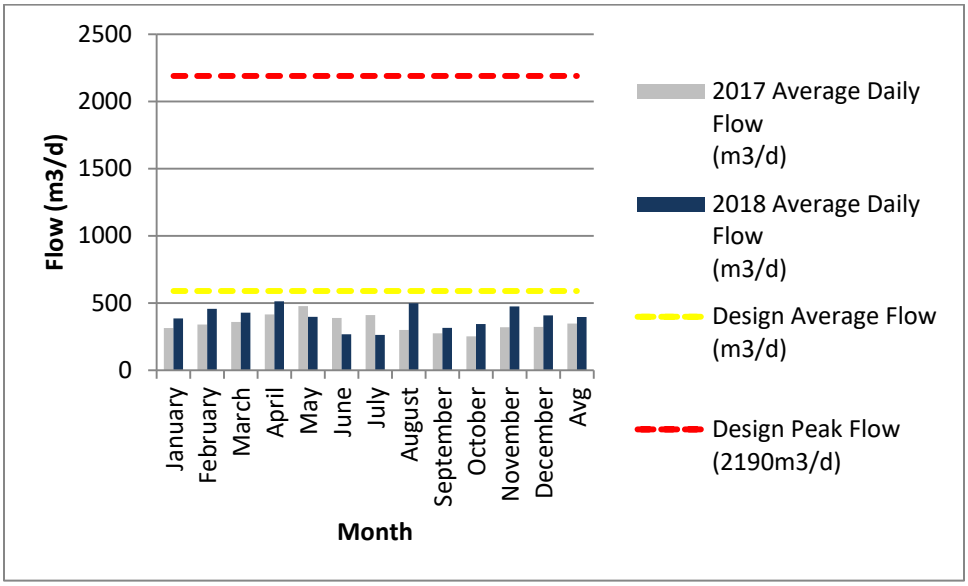
In 2018, all chemical and microbiological sample analyses were conducted by SGS Lakefield Research. Temperature, pH and dissolved oxygen were conducted by staff at the treatment plant.

The receiving stream temperature is performed at Sixteen Mile Creek.

Flows

Detailed monthly flow information is summarized in Appendix A. The total flow treated in 2018 was 144,390m^3, which corresponds to a 13.8% increase from 2017 raw flows. The annual average daily flow for the reporting period was 396.1m^3/day, or 67.1% of the plant's rated design capacity of 590m^3/day (refer to Chart 1).

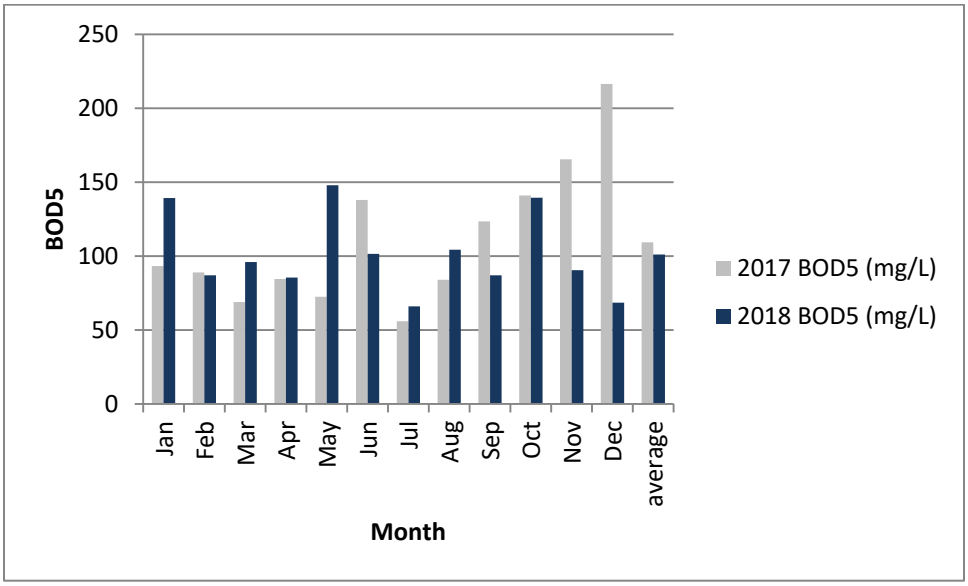
Chart 1. The average daily raw sewage flow to the plant in 2018 compared to 2017.



Raw Sewage Quality

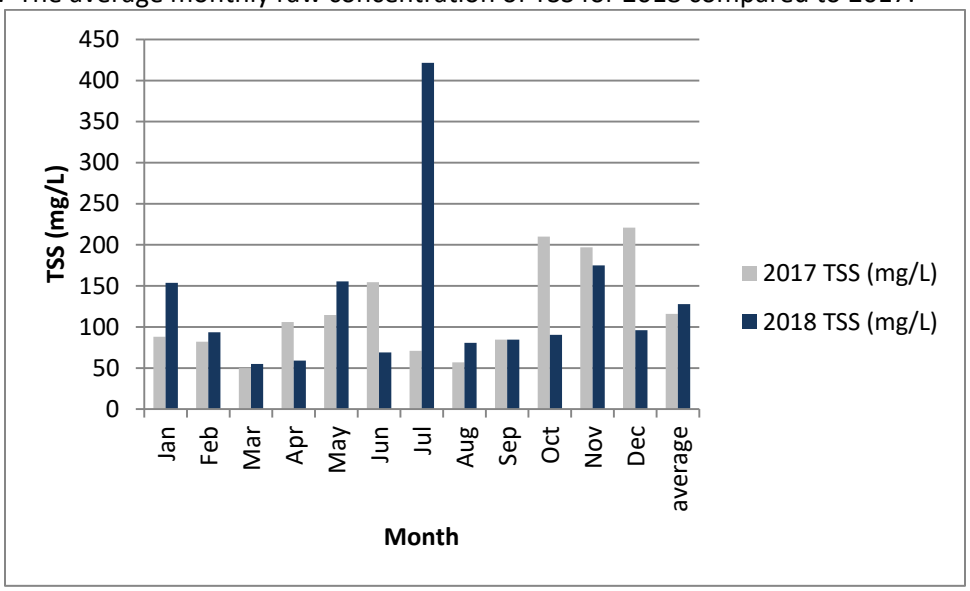
The annual average raw sewage BOD_5 concentration to the plant was 101.1mg/L with a maximum concentration of 181mg/L. The average BOD_5 loading to the plant was 40.0kg/d for 2018. The annual average concentration of BOD_5 has decreased 7.5% from 2017, refer to Chart 2.

Chart 2. Average monthly raw concentration of BOD_5 for 2018 compared to 2017.



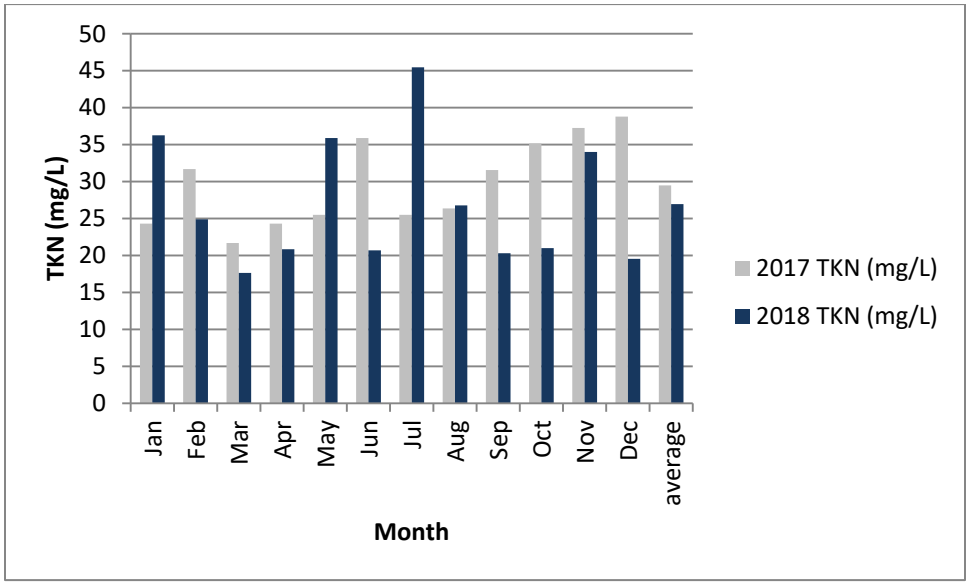
The annual average raw sewage suspended solids (TSS) concentration to the plant was 128mg/L, with a maximum of 763mg/L. This corresponds to an average TSS loading to the plant of 50.6kg/day. The average concentration of TSS has increased 10.2% from 2017, refer to Chart 3.

Chart 3. The average monthly raw concentration of TSS for 2018 compared to 2017.



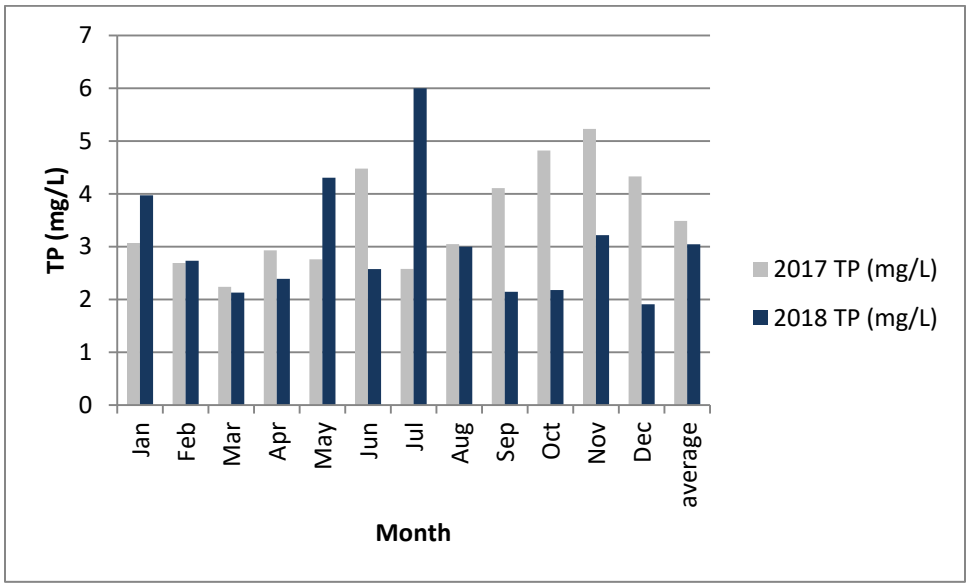
The annual average raw sewage Total Kjeldahl Nitrogen (TKN) concentration to the plant was 26.9mg/L, with a maximum of 60.6mg/L. This corresponds to an average TKN loading to the plant of 10.7kg/day. The average concentration of TKN has decreased 8.6% from 2017, refer to Chart 4.

Chart 4. The average monthly raw concentration of TKN for 2018 compared to 2017.



The annual average raw sewage Total Phosphorus (TP) concentration to the plant was 3.05mg/L, with a maximum of 8.90mg/L. This corresponds to an average TP loading to the plant of 1.21kg/day. The average concentration of TP has decreased 12.6% from 2017, refer to Chart 5.

Chart 5. The average monthly raw concentration of TP for 2018 compared to 2017.



Effluent Limits

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

Summary and Comparison of Compliance Data

Table 1. Monthly average concentration and loading ranges for 2018.

Parameter	Monthly Average Effluent Limit (mg/L)	Monthly Average Effluent Result Ranges (mg/L)	Monthly Average Loading Limit (kg/d)	Monthly Average Loading Result Ranges (kg/d)
BOD_5	10(a)	<2 – 3.5	6.9	0.5 – 1.9
	15(b)	<2 – 5		
Suspended Solids	10(a)	<2 – 6.5	6.9	0.7 – 3.9
	15(b)	2 – 9		
Total Phosphorus	0.5(a)	0.06 - 0.13	0.4	0.01 -0.10
	1.0(b)	0.09 – 0.25		
Total (Ammonia + Ammonium) Nitrogen	3.0(a)	<0.1 – <0.1	2.2	0.03 – 0.16
	5.0(b)	<0.1 – 0.35		
E. coli	200	<2 – 2		
Unionized Ammonia*	0.1	0 – 0.007		

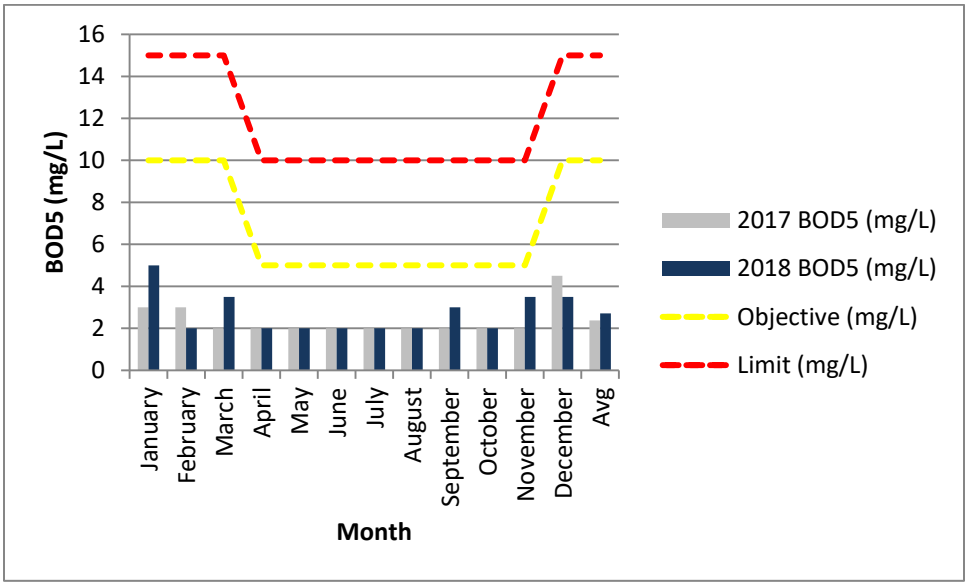
NOTE: (a) limit applies during the non-freezing period
(b) limit applies during the freezing period
*single sample results

Discussion on Monitoring Data as Compared to the Effluent Limits

There were no non-compliances with Environmental Compliance Approval limits.

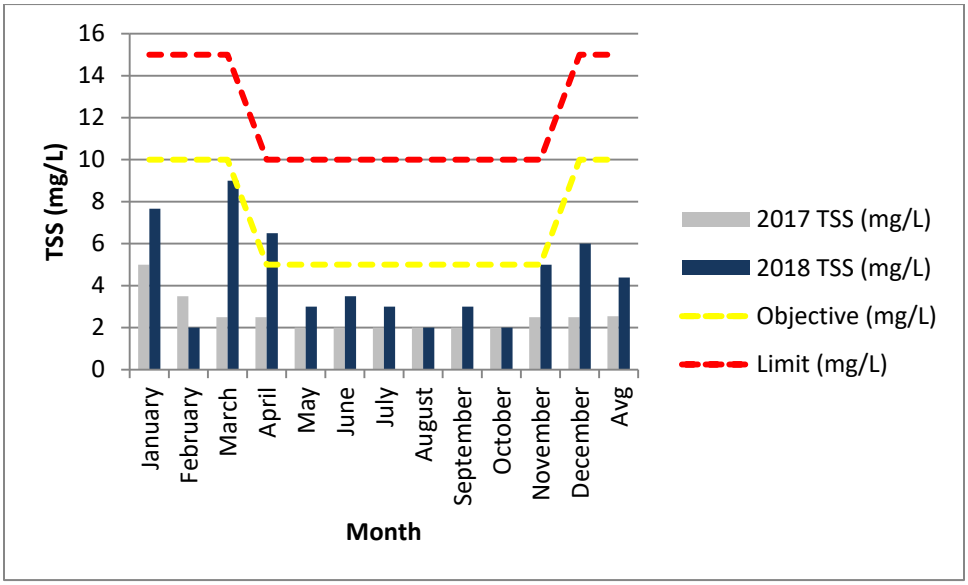
The annual average effluent BOD_5 for 2018 was 2.7mg/L, which is a 14% increase from 2017 (refer to Chart 6). The annual loading of BOD_5 at the plant in 2018 was 1.1kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 6. The effluent monthly average concentration of BOD_5 in 2018 compared to 2017 concentrations.



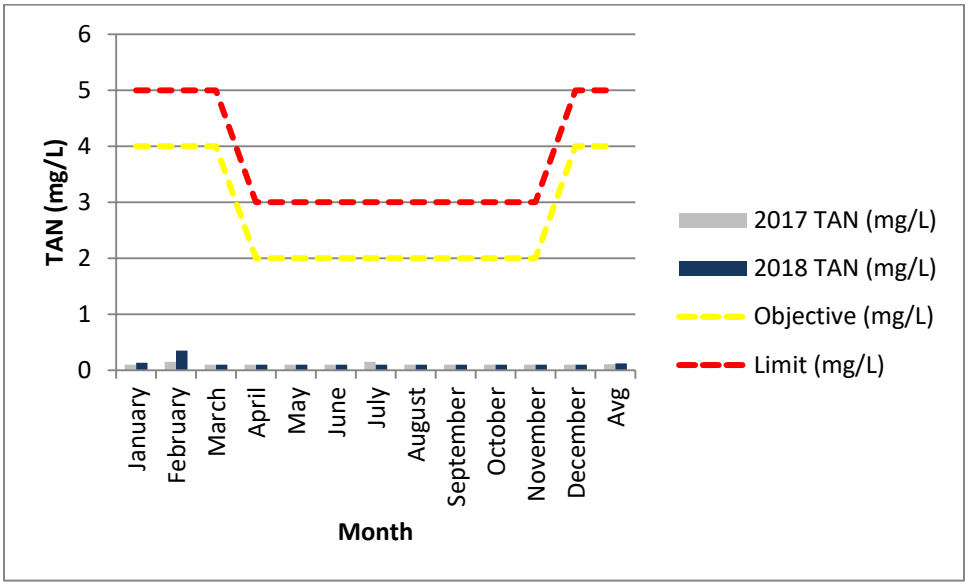
The annual average effluent Total Suspended Solids (TSS) for 2018 was 4.4mg/L, which is a increase from 2017 by 72.7% (refer to Chart 7). The annual loading of TSS at the plant in 2018 was 1.7kg/d. This large increase is attributed to poorer filter performance due to the need to replace the media. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 7. The effluent monthly average concentration of TSS in 2018 compared to 2017 concentrations.



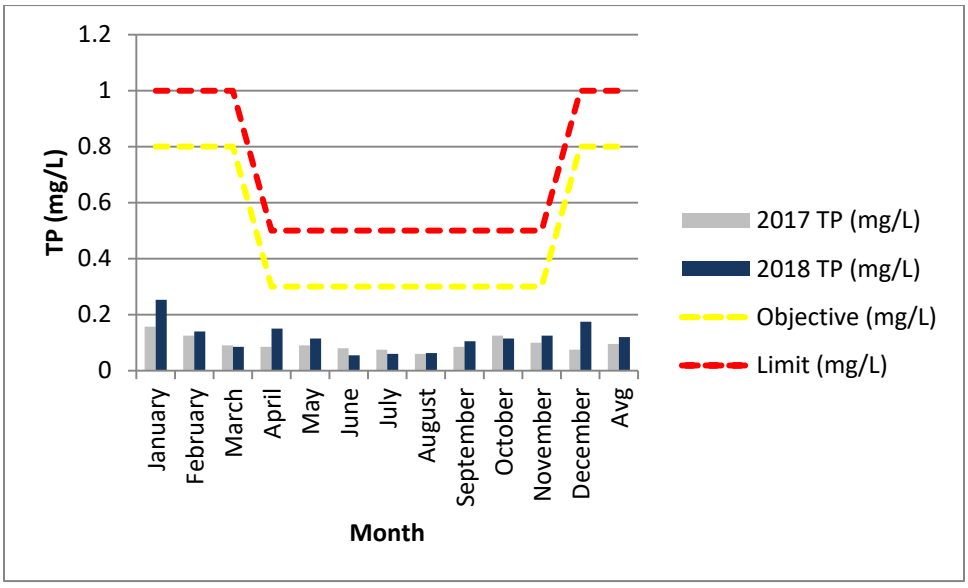
The annual average effluent Total Ammonia + Ammonium Nitrogen (TAN) for 2018 was 0.12mg/L, which is a 14% increase from 2017 (refer to Chart 8). The annual loading of TAN at the plant in 2018 was 0.05kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 8. The effluent monthly average concentration of TAN in 2018 compared to 2017 concentrations.



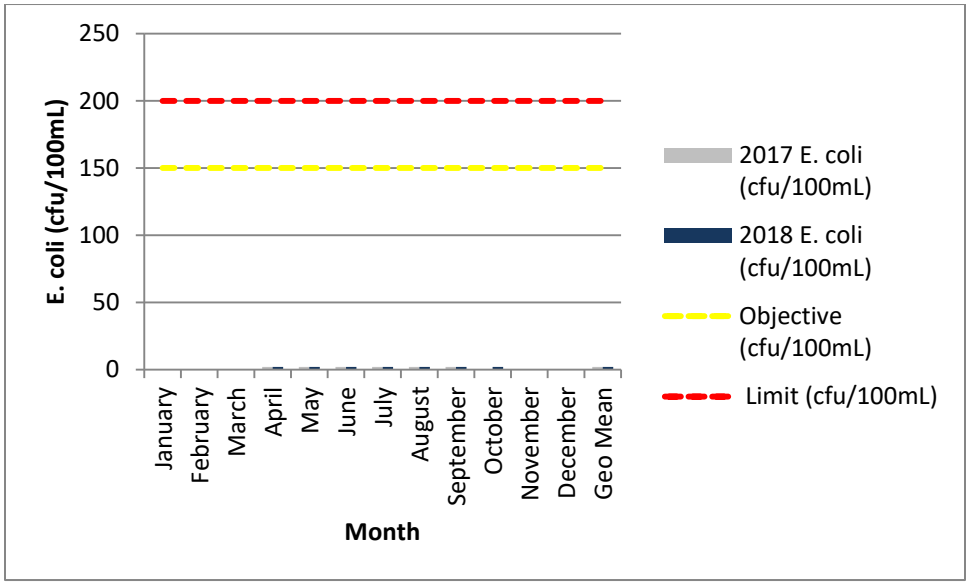
The annual average effluent Total Phosphorus (TP) for 2018 was 0.12mg/L, which is a 25.6% increase from 2017 (refer to Chart 9). The annual loading of TP at the plant in 2018 was 0.05kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 9. The effluent monthly average concentration of TP in 2018 compared to 2017 concentrations.



The annual geometric mean effluent E. coli for 2018 was 2cfu/100mL, which is equivalent to 2017 (refer to Chart 10). Refer to Table 1 for a list of monthly geometric mean effluent limits.

Chart 10. The effluent monthly geometric mean concentration of E. coli in 2018 compared to 2017 concentrations.



Section 3: Operating Problems and Corrective Actions

Ongoing SCADA issues with communications and overall use of system. This has been placed on the capital list created by OCWA to be replaced in 2019.

Cold temperatures can affect the treatment of the sewage. The mechanical surface aerators in the aeration tanks lowers the temperature of the contents further. Usually, adjustments to the mixed liquor suspended solids at the plant is enough to remain in compliance during these cold periods, however in extreme winters this is not enough. A replacement of the mechanical aerators is proposed in the future. Not only should this improve treatment but will be more energy efficient.

The collection system on Third Street has required frequent monitoring due to backing up of sewage in the area. This area is inspected and flushed routinely.

Sand filter media should be considered for replacement as they are requiring frequent maintenance.

Section 4: Maintenance

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

- Repairs to bar screen motor
- Repairs to RAS Pump #1
- Upgrades to Pump Station-generator and electrical upgrades
- Replaced UV Bulbs and sleeves
- Replaced sump pump in RAS chamber
- Replaced WAS flow meter
- Repaired clarifier arm and sludge scrapers
- Replace decant pump motor

Section 5: 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 6: Calibration and Maintenance

Annual maintenance on the generator was completed by Albert's Generator Services. Flowmetrix Technical Services Inc. performed the annual calibration on the flow meter in April. In house meters for pH and dissolved oxygen are calibrated by OCWA operators as per manufacturer's instructions.

Section 7: Effluent Quality

Effluent Objectives

The following table shows the monthly average effluent concentrations ranges and loadings to the effluent objectives outlined in the Environmental Compliance Approval.

Table 3. Monthly average effluent concentration and loadings compared to objectives.

Parameter	Average Monthly Effluent Objective (mg/L)	Average Monthly Effluent Result Ranges (mg/L)	Average Monthly Loading Objectives (kg/day)	Average Monthly Loading Result Ranges (kg/day)
BOD_5	5(a)	<2 – 3.5	3.9	0.5 – 1.9
	10(b)	<2 – 5		
Suspended Solids	5(a)	<2 – 6.5	3.9	0.7 – 3.9
	10(b)	2 – 9		
Total Phosphorus	0.3(a)	0.06 - 0.13	0.28	0.01 -0.10
	0.8(b)	0.09 – 0.25		
Total (Ammonia + Ammonium) Nitrogen	2.0(a)	<0.1 – <0.1	1.57	0.03 – 0.16
	4.0(b)	<0.1 – 0.35		
E. coli	150	<2 – 2		
Dissolved Oxygen	5 (minimum)	4.5 – 13.5		

Discussion of Effluent Objectives

The Rodney WWTP met all the monthly averaging loading objectives. The suspended solids objective was not met in April 2018. As well there was a single sample taken for dissolved oxygen in November that was below the objective. All other monthly average concentration objectives in 2018 set out in the Environmental Compliance Approval were met.

The annual average flow for 2018 was 396.1m^3/d, which is below the design flow of 590m^3/d. The design average daily flow for the plant was exceeded 30 days in 2018. The hydraulic peak flow of 2,190m^3/day for the plant was not exceeded 2018.

Section 8: Biosolids

The lagoon is used for sludge digestion and storage as per the Environmental Compliance Approval. The waste activated sludge (WAS) process transfers to the lagoon. The sludge is allowed to settle at the bottom of the lagoon and the liquid is pumped back to the head of the plant for treatment. There is sludge build up at the discharge pipe from the plant to the lagoon. In 2018, the amount of WAS transferred to the lagoon was approximately 4,500m^3. It is anticipated that a similar amount will be transferred in 2019 (4,500m^3).

Section 9: Community Complaints

There was no community complaints received in 2018.

Section 10: Bypasses, Spills, and Abnormal Discharges

There were no by-pass events for the Rodney WWTP during 2018.

The Rodney Wastewater Treatment Plant can direct raw sewage from the pump station to the lagoon when there is a power failure of long duration or is there is high flow to the plant. Flow was temporarily diverted to the lagoon periodically in July, August and September. This was to facilitate maintenance at the plant as well as to alleviate high flows.

Section 11: Alterations, Extensions or Replacement of the Works

In 2018, there was a replacement to the onsite generator at the Rodney Pumping Station. Recommended capital upgrades to the system for 2019 include filter media replacement, clarifier arm repairs and SCADA system upgrades. Also being completed in 2019 is a facility condition assessment which will provide a 20 year capital plan.

Section 12: Summary

Overall the Rodney Wastewater Treatment Plant provided effective treatment in 2018, with no non-compliances and only two objective exceedances. Capital improvements to the system will ensure continued success in the operation of the plant and to improve the effluent quality.

APPENDIX A

Analytical Data

						January 2018 Stream < 5°C		February 2018 Stream < 5°C		March 2018 Stream <5°C		April 2018 Stream >5oC		May 2018 Stream >5oC		June 2018 Stream >5oC		July 2018 Stream >5oC		August 2018 Stream >5oC		September 2018 Stream >5oC		October 2018 Stream >5oC		November 2018 Stream >5oC		December 2018 Stream <5oC		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	590		590 (ann)		385.06		456.53		428.27		512.79		397.57		267.31		263.07		499.18		315.11		344.35		475.36		408.08		396.05	
	Max			2190		608		1120		586		763.3		527		460		684		1560		1006.3		910		1220		596		1560	
	Min					240		246		192		321		210		110		1		87		0		187		268		258		0	
	Sum					11936.9		12782.9		13276.3		15383.6		12324.6		8019.4		10708.6		15474.7		9453.4		10674.8		14260.8		12650.6		144390.3	
Effluent Flow (m3/d)	Avg					385.06		456.53		428.27		512.79		397.57		267.31		345.44		499.18		315.11		344.35		475.36		408.08		396.05	
	Max					608		1120		586		763.3		527		460		2837		1560		1006.3		910		1220		596		1560	
	Min					240		246		192		321		210		110		1		87		0		187		268		258		0	
	Sum					11936.9		12782.9		13276.3		15383.6		12324.6		8019.4		10708.6		15474.7		9453.4		10674.8		14260.8		12650.6		144390.3	
Raw BOD5 (mg/L)	Avg					139.333	53.7	87	39.7	96	41.1	85.5	43.8	148	58.8	101.5	27.1	66	17.4	104.333	52.1	87	27.4	139.5	48.0	90.5	43.0	68.5	28.0	101.097	40.0
	Max					153		87		130		87		181		136		73		161		111		149		108		88		181	
	Min					115		87		62		84		115		67		59		43		63		130		73		49		43	
Raw SS (mg/L)	Avg					153.667	59.2	93.5	42.7	55	23.6	59	30.3	155.5	61.8	69	18.4	421.5	110.9	80.667	40.3	84.5	26.6	90.5	31.2	175	83.2	96	39.2	127.819	50.6
	Max					167		102		79		70		191		91		763		139		94		100		211		175		763	
	Min					130		85		31		48		120		47		80		45		75		81		139		17		17	
Raw TKN (mg/L)	Avg					36.267	14.0	24.9	11.4	17.65	7.6	20.85	10.7	35.9	14.3	20.7	5.5	45.45	12.0	26.767	13.4	20.3	6.4	21	7.2	34	16.2	19.55	8.0	26.944	10.7
	Max					40		33.3		25.1		21.9		39.2		23.2		60.6		31.6		20.8		21.3		37.7		33		60.6	
	Min					29		16.5		10.2		19.8		32.6		18.2		30.3		23.5		19.8		20.7		30.3		6.1		6.1	
Raw TP (mg/L)	Avg					3.973	1.53	2.735	1.25	2.13	0.91	2.39	1.23	4.305	1.71	2.575	0.69	6	1.58	3	1.50	2.145	0.68	2.18	0.75	3.22	1.53	1.91	0.78	3.047	1.21
	Max					4.76		3.65		2.97		2.53		5.17		2.68		8.9		3.78		2.26		2.64		3.78		3.21		8.9	
	Min					2.92		1.82		1.29		2.25		3.44		2.47		3.1		2.04		2.03		1.72		2.66		0.61		0.61	
Effluent BOD5 (mg/L)	Avg	5 (10)	3.9	10 (15)	6.9	< 5	1.9	< 2	0.9	< 3.5	1.5	< 2	1.0	< 2	0.8	< 2	0.5	< 2	0.5	< 2	1.0	< 3	0.9	< 2	0.7	< 3.5	1.7	3.5	1.4	< 2.708	1.1
	Max					9		< 2		< 4		< 2		< 2		< 2		< 2		< 2		< 4		< 2		5		4		< 9	
	Min					< 2		< 2		< 3		< 2		< 2		< 2		< 2		< 2		< 2		< 2		< 2		3		< 2	
Effluent SS (mg/L)	Avg	5 (10)	3.9	10 (15)	6.9	< 7.667	3.0	2	0.9	< 9	3.9	6.5	3.3	3	1.2	< 3.5	0.9	< 3	0.8	< 2	1.0	< 3	0.9	< 2	0.7	< 5	2.4	6	2.4	< 4.389	1.7
	Max					12		2		16		8		4		< 5		4		< 2		< 4		< 2		8		9		< 16	
	Min					< 2		2		< 2		5		2		< 2		< 2		< 2		< 2		< 2		< 2		3		< 2	
Effluent TAN (mg/L)	Avg	2 (4)	1.57	3.0 (5.0)	2.2	< 0.133	0.05	< 0.35	0.16	< 0.1	0.04	< 0.1	0.05	< 0.1	0.04	< 0.1	0.03	< 0.1	0.03	< 0.1	0.05	< 0.1	0.03	< 0.1	0.03	< 0.1	0.05	< 0.1	0.04	< 0.124	0.05
	Max					< 0.2		< 0.6		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.6	
	Min					< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1	
Effluent TKN (mg/L)	Avg					1.167	0.45	0.85	0.39	0.85	0.36	< 0.5	0.26	< 0.5	0.20	< 0.8	0.21	< 0.5	0.13	< 0.5	0.25	< 0.5	0.16	< 0.5	0.17	< 0.65	0.31	< 1	0.41	< 0.704	0.28
	Max					1.3		0.9		0.9		< 0.5		< 0.5		< 1.1		< 0.5		< 0.5		< 0.5		< 0.5		< 0.8		< 1.5		< 1.5	
	Min					0.9		0.8		0.8		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5		< 0.5	
Effluent NO2 (mg/L)	Avg					0.237	0.09	0.22	0.10	< 0.03	0.01	< 0.03	0.02	< 0.03	0.01	< 0.03	0.01	< 0.03	0.01	< 0.03	0.01	< 0.03	0.01	< 0.595	0.20	< 0.2	0.10	< 0.03	0.01	< 0.124	0.05
	Max					0.61		0.4		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		1.16		< 0.37		< 0.03		< 1.16	
	Min					0.03		0.04		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03		< 0.03	
Effluent NO3 (mg/L)	Avg					21.667	8.3	19.35	8.8	17.3	7.4	17.8	9.1	21.8	8.7	13.09	3.5	11.45	3.0	11.23	5.6	3.775	1.2	11.435	3.9	19.65	9.3	21.05	8.6	15.8	6.3
	Max					26.4		23.9		17.6		18.1		22.7		23		22.5		17.7		5.19		21.5		21.3		22.9		26.4	
	Min					16.8		14.8		17		17.5		20.9		3.18		0.4		0.39		2.36		1.37		18		19.2		0.39	
Effluent TP (mg/L)	Avg	0.3 (0.8)	0.28	0.5 (1.0)	0.4	0.253	0.10	0.14	0.06	0.085	0.04	0.15	0.08	0.115	0.05	0.055	0.01	< 0.06	0.02	< 0.063	0.03	< 0.105	0.03	0.115	0.04	0.125	0.06	0.175	0.07	< 0.12	0.05
	Max					0.3		0.2		0.09		0.16		0.16		0.08		0.09		< 0.08		0.18		0.19		0.15		0.22		< 0.3	
	Min					0.21		0.08		0.08		0.14		0.07		0.03		< 0.03		< 0.03		0.03		0.04		0.1		0.13		< 0.03	
Effluent pH	Avg					7.623		7.443		6.834		7.854		7.637		7.554		7.563		7.824		7.654		7.893		7.918		7.956		7.639	
	Max					8.24		8.07		7.95		8.03		8.08		8.02		7.74		7.99		8		8.33		7.99		8.08		8.33	
	Min					7.01		6.98		0.26		7.72		7.14		7.21		7.4		7.6		7.59		7.6		7.72		7.68		0.26	
Effluent Alkalinity (mg/L)	Avg					41.8		54.25		116.25		53.75		60		27.75		26.5		30.8		38.25		29.8		36.75		47.25		46.442	
	Max					55		85		137		60		70		41		28		38		45		35		38		88		137	
	Min					30		31		98		48		54		20		25		25		28		25		35		32		20	
Effluent E. coli (cfu/100	Geomean	150		200								2		2		2		2		2		2		2						2	
	Max											< 2		< 2		< 2		< 2		< 2		< 2		< 2						< 2	
	Min											< 2		< 2		< 2		< 2		< 2		< 2		< 2						< 2	
Effluent Temp. (oC)	Avg					5.478		3.589		5.356		7.525		13.2		15.044		17.788		19.25		17.975		17.911		12.063		6.875		11.816	
	Max					9.9		7.8		7		10		16.3		17.2		19.7		20.5		19		19.6		17.1		8.2		20.5	
	Min					0.7		0.5		4.2		5.9		9.2		13.5		15.2		17.2		16.8		16.6		5.6		4.9		0.5	
Effluent DO (mg/L)	Avg	5 (min)				9.539		10.058		11.999		9.749		8.149		7.881		7.61		7.473		8.282		8.366		7.641		10.975		8.947	
	Max					11.52		11.7		12.53		10.86		9.53		8.39		8.82		8.18		8.96		8.62		11.59		12.05		12.53	
	Min					8.1		7.87		11.37		8.77		7.59		6.42		6.42		5.82		7.79		8		4.46		10.1		4.46	
Eff Unionized Amm	Avg					0.001		0.004		0.001		0.001		0.001		0.001		0.001		0.003		0.001		0.005		0.002		0.001		0.002	
	Max	0.1		0.1		0.001		0.007		0.001		0.002		0.002		0.002		0.001		0.003		0.001		0.007		0.002		0.002		0.007	
	Min					0		0.001		0.001		0.001		0.001		0.001		0.001		0.002		0.001		0.003		0.001		0.001		0	