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Town of Latchford

LATCHFORD ANNUAL SEWAGE TREATMENT REPORT 2020

Annual Compliance Report 2020
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EXECUTIVE SUMMARY

The Latchford Water Pollution Control Plant (WPCP) was granted an Environmental Compliance Approval (ECA) #3106-7M8PWK on September 17, 1974 for the construction of an extended aeration package sewage treatment plant, the Latchford lift station and a number of sanitary sewers to serve the community of Latchford.

The Ministry of the environment issued a Provincial Officer's Order No. 5744-9YMKWN on July 22, 2015 which required the owner of the system to prepare and submit a performance report to the Ministry's District Manager on an annual basis within 90 days following the end of the period being reported upon. The 2020 Annual Performance Report was prepared by the ORO of the Latchford STP on behalf of the Town of Latchford and is based on information kept on record by the town. The report has been completed in accordance with item 5(4) of the order and contains the following information:

- A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Item 2, including an overview of the success and adequacy of the works;
- A description of any operating problems encountered and corrective actions taken;
- A summary of any effluent quality assurance or control measures undertaken in the reporting period;
- A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works;
- A summary of any effluent quality assurance or control measures undertaken in the reporting period;
- A summary of the calibration and maintenance carried out on all effluent monitoring equipment;
- A tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed.

The Latchford sewage treatment facility produced high quality effluent throughout the reporting period meeting the compliance limits specified in the ministry's Provincial Officer's Order. All requirements specified under Item 3 of the Order and any issues experienced at the facility are further explained throughout the report.

Name of Sewage Plant:	Latchford Water Pollution Control Plant
Address:	Lot 17, Concession 1, Latchford
MOE Works Number:	110001774
ECA Number:	3106-7M8PWK (issued September 17, 1974)
Provincial Officer's Order:	5744-9YMKWN (issued July 22, 2015)
Plant Capacity:	340.5 m ³ /day
Report Period:	January 1, 2020 to December 31, 2020

1.0 Facility Description

The Latchford Water Pollution Control Plant (WPCP) is A Class 2 wastewater treatment facility that is owned by the Corporation of the Town of Latchford and operated by the Ontario Clean Water Agency. The treatment facility is located on 1 McLeod Avenue approximately 50 meters west of Highway 11.

The Latchford WPCP is an extended aeration facility which is rated for treating 75,000 imperial gallons per day (IGPD) or 341 m³/day. It is equipped with twin grit channels for removing large debris, one 304,000 IGPD comminutor, a 73,000 IG aeration section, one 15,700 IG settling tank, one 2,440 IG sludge holding tank and one 1,585 IG chlorine contact tank. The treated effluent discharges into the Montreal River through a 21 inch outfall. Seasonal disinfection is set to occur May to October of each year, as per the ECA. However a directive from the MOE encourages disinfection to begin mid June in order to help protect the fish spawning season. The chlorination period is June 10th to September 30th.

A V-notch weir is in place to measure sewage effluent. Bypasses that occur are disinfected, tested, monitored and reported to the Spills Action Center (SAC). Disinfection is achieved using sodium hypochlorite.

2.0 Monitoring Program

2.1 Monitoring Program as Outlined in Provincial Officer Order No. 5744-9YMKWN

BOD₅ ≡ Five-day biochemical oxygen demand measured in an unfiltered sample
TSS ≡ Total Suspended Solids
TP ≡ Total Phosphorus
TAN (NH₃⁻ + NH₄) N ≡ Nitrogen as Ammonium and Ammonia (Total Ammonia Nitrogen)
TRC ≡ Total Residual Chlorine
E.coli ≡ Escherichia coli
pH = Potential of Hydrogen

2.1.1 Raw Sewage (Influent)

Parameter	Type of Sample	Minimum Frequency
BOD ₅	8 hour composite	monthly
TSS	8 hour composite	monthly
TP	8 hour composite	monthly

2.1.2 Final Effluent

Parameter	Type of Sample	Minimum Frequency
BOD ₅	24 hour composite	monthly
TSS	24 hour composite	bi-weekly
TP	24 hour composite	monthly
Total Ammonia Nitrogen (TAN)	24 hour composite	monthly
pH	24 hour composite	monthly
<i>E. coli</i>	24 hour composite	bi-weekly*
TCR	grab	daily**

*During the chlorination period

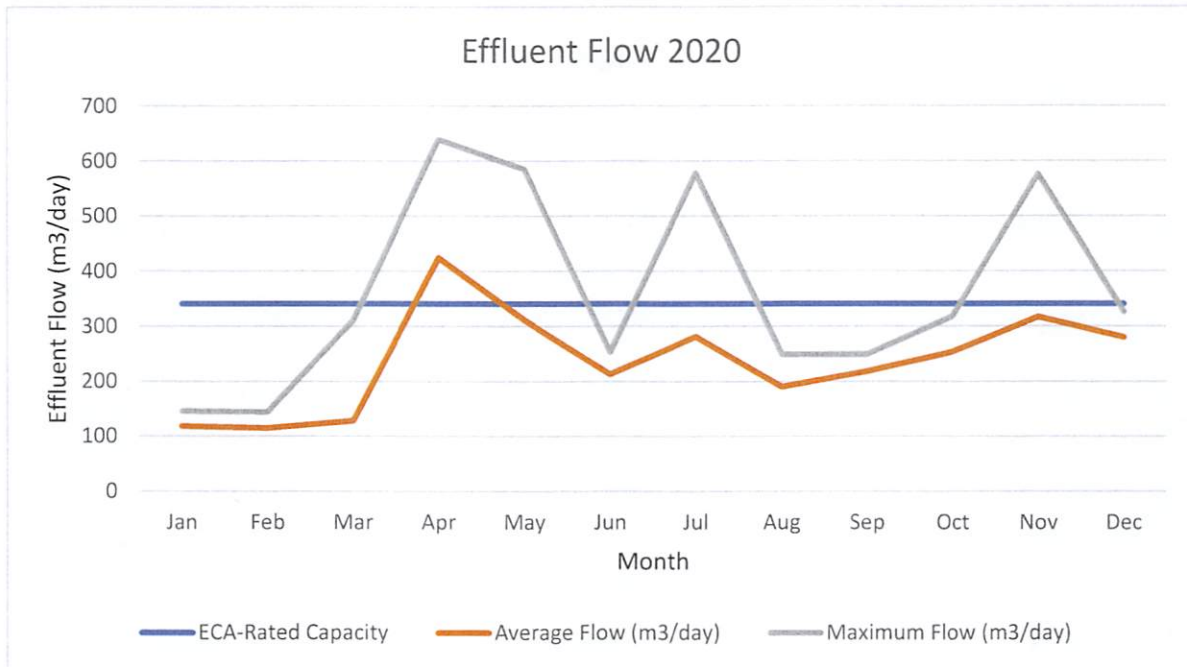
**Except weekends and statutory holidays during chlorination

2.2 Interpretation of Monitoring and Analytical Data

2.2.1 Summary of Effluent Flow

Month	Average Flow (m ³ /day)	Maximum Flow (m ³ /day)
January	118	146
February	115	144
March	128	311
April	424	639
May	311	585
June	213	253
July	281	578
August	190	249
September	218	249
October	254	318
November	317	576
December	280	326

2020 Total Flow	86,863 m ³
2020 Max Daily Flow:	639 m ³ /day
2020 Average Daily Flow:	237 m ³ /day
Design Capacity	341 m ³ /day
% of Design Capacity:	69.5 %



The Latchford Sewage Treatment System operated within its required capacity throughout 2020. Compliance is achieved when the annual average daily flow does not exceed 341 m³/day. The average daily flow for 2020 was 237 m³/day which represents 69.5% of the design capacity. The maximum flow occurred in April when heavy precipitation and snow melt contributed to a maximum flow of 639 m³/day.

2.2.2 Raw Sewage (Influent)

A summary of the annual average and maximum influent parameter concentrations are listed below. A Process Data Report is presented in Appendix A which provides a monthly summary of the 2020 influent data.

Parameter (mg/L)	Annual Minimum	Annual Maximum	Annual Average
BOD ₅	1.5	76	21.9
TSS	0.458	124	26.45
TP	0.227	4.41	1.39

2.2.3 Effluent

In 2020, the Latchford wastewater treatment system produced high quality effluent which surpassed the effluent design limits. Annual summaries of the final effluent parameter

concentrations are presented below. Refer to Appendix A for the Monthly Process Data Report which summarizes the effluent data for the reporting period.

Parameter (mg/L)	Annual Minimum	Annual Maximum	Annual Average	Compliance
BOD ₅	0.5	3	1.78	25 (annual average)
TSS	<1	10	3.67	25 (annual average)
TP	0.032	0.348	0.080	1.0 (annual average)
TAN (NH ₃ ⁻ + NH ₄) N	<0.01	3.05	0.809	N/A
pH (units)	7.09	7.84	7.55	Between 6.0 and 9.5
<i>E. coli</i> (cfu/100mL)	450	12,500	2810	N/A
TCR	0.02	0.07	0.045	N/A

"<" means values include results that were less than the laboratory's method detection limit

2.3 Sewage Treatment Program Success and Adequacy

Table 2.3.1 *Performance Summary* presents the system's efficiency through pollutant removal rates from raw sewage concentrations through to final effluent for BOD₅, suspended solids and total phosphorus.

2.3.1 Performance Summary

Parameter (mg/L)	Influent (annual average)	Effluent (annual average)	% Removal
BOD ₅	21.90	1.78	92.0%
TSS	26.45	3.67	86.1%
TP	1.39	0.80	42.5%

"<" means values include results that were less than the laboratory's method detection limit

As indicated by the effluent concentrations and performance summary, the Latchford WPCP continues to experience a high degree of removal efficiency, and as a result, is operating well within the Ministry limits.

3.0 Operating Problems and Corrective Actions

The STP Blower #2 failed again due to a bad bearing. The blower has been since repaired, and is currently operating well.

The STP Blower #1 failed once due to bad belts and shives. The blower belts and shives have been replaced with new, and the blower is currently operating well.

The STP Aeration Pipes and diffusers failing, many air leaks and plugged up pipes. Replaced defective pipes and diffusers as required. 90% completed.

The Waste pit pump failed and required replacement. We had an old pump in digester that was not being used. We installed used pump in waste pit chamber and it is currently running well.

4.0 Maintenance Performed on the Works

- Effluent flow calibration verified April 16 / 2020
- Instrumentation and electrical equipment inspected and repaired as required.
- SPS wet well cleaned, STP Digester and Sludge holding tank cleaned

5.0 Effluent Quality Assurance and Control Measures

The following activities are included in regular operator and supervisory activities to assure the quality of the sewage treatment operations including effluent quality and flow monitoring data:

- The facility is inspected by certified operators on a regular basis
- Certified operators conduct regular tests and monitor data from certain equipment at the plant and record this information on facility spreadsheets
- Certified operators monitor chemical usage and make adjustments as required
- Operation and Compliance staff review process data and laboratory reports to keep track of routine operation of the treatment plant to ensure compliance with the Ministry Guidelines.
- All laboratory results and selected operational data are logged in a process data management system, as well as on spreadsheets located at the WTP.
- All effluent quality data is reviewed by the Operations and Compliance staff to identify any changes in concentrations and/or emerging trends.
- All instrumentation is tested and maintained as per manufacturer's recommendations.
- All routine maintenance has been scheduled in Plant Workplace Maintenance System (WMS) and was completed in 2020.

Quality Control elements of the monitoring program include the following:

- Samples are collected as required and analyzed by Testmark Laboratories located in Kirkland Lake, Ontario. Analyses are conducted in accordance with the Standard Council of Canada (SCC), in cooperation with the Canadian Association for Laboratory Accreditation Inc. (CALA).
- Quality control procedures are method specific and include laboratory duplicate samples, spiked blanks and spiked duplicates.
- Any bypass or upset events that occur at the pumping stations or plant site are tested, monitored and reported to the local Health Unit and Spills Action Center (SAC).

6.0 Calibration and Maintenance of All Monitoring Equipment

Plant maintenance is conducted as per plant Preventative Maintenance Schedules. Monitoring equipment is calibrated based on the manufacturer's recommendations. All routine and preventative maintenance measures were conducted as scheduled in 2020. Refer to Table 6.1 for a summary of calibrations conducted in 2020.

6.1 Calibration Summary

Date	Instrument	% Accuracy
April 16/20	Effluent Flow Meter	98.88%

Note: The flow is metered with a V-notch weir and flow readings are confirmed at various levels at the weir plate and compared to manufacturer's standards. The % value above is an average of the accuracy at each level.

7.0 Efforts made to Meet Effluent Limits

Latchford staff use a number of best efforts to achieve the *Effluent Limits*.

Operational staff has the required certification to operate the facility and they continue to learn and gain knowledge with respect to the process and equipment. Staff also has a high level of regulatory competence.

The mechanical elements in the facility are regularly inspected, well maintained and kept in good repair. Latchford Staff use a maintenance management system which ensures maintenance of equipment is proactively performed.

Raw wastewater and effluent samples are collected as required and analyzed by Testmark Laboratories, an accredited laboratory. Latchford staff reviews these results on a regular basis to ensure compliance with regulatory limits.

In-house sampling and testing for operational parameters provide real time results which are used to enhance process and operational performance.

Operations, maintenance and emergency procedures are available to ensure facilities are operated in compliance with applicable legal instruments. Facility staff has access to a network of operational compliance and support experts at the region and corporate levels.

During this inspection period, the facility operated efficiently and met the annual effluent limits for cBOD5 (25.0 mg/L), TSS (25.0 mg/L), TP (1.0 mg/L) and pH range of 6.0 to 9.5 as outlined in Item No. 2 Provincial Officer Order No. 5744-9YMKWN.

8.0 Sludge Generation and Disposal

Sludge is hauled by Ray & Son's Industrial Services to approved sites at the Latchford Landfill. The landfill is approved to accept the sludge under Certificate of Approval number: S504LM10-01.

Date Sludge Hauled	Volume of Sludge Hauled m ³
Feb 5, 2020	30.0 m3
July 9, 2020	6.7 m3
Oct 13, 2020	23.0 m3
Total Hauled	59.7 m3

It is expected that the Latchford WPCP will haul approximately 40 to 80 m3 of sludge in 2021 now that the sludge is being hauled on a regular basis.

According to the Ministry's procedure F-10-1; sludge is required to be sampled and tested annually. For a summary of sludge sampling results please refer to Appendix B for the Monthly Process Data Report for Sludge.

9.0 Complaints

According to records maintained by Latchford staff, no complaints were received during the 2020 reporting period.

10.0 Bypass, Spill and Abnormal Discharge Events

According to records maintained by Latchford staff, no bypasses, spills or abnormal discharge events occurred in 2020.

APPENDIX A

Monthly Process Data Report 2020

Litchford Sewage Treatment Plant
2020 Monthly Process Data Report

Influent (Raw) Parameters	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
Influent / Biochemical Oxygen Demand: BOD5 - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	76	31	33	12	14	13	6.4	16	19	15	22	21			76	
Mean Lab	76	31	33	12	14	13	6.4	16	19	15	22	21		21.80000		
Min Lab	76	31	33	12	14	13	6.4	16	19	15	22	21				1.5
Influent / Total Suspended Solids: TSS - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	124	29	30	0.458	19.5	13	14	12	12	7.5	27	28			124	
Mean Lab	124	29	30	0.458	19.5	13	14	12	12	7.5	27	28		26.45433		
Min Lab	124	29	30	0.458	19.5	13	14	12	12	7.5	27	28				0.458
Influent / Total Phosphorus: TP - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	4.41	1.90	2.05	0.462	0.409	0.629	1.58	0.227	1.13	0.97	0.989	1.75			4.41	
Mean Lab	4.41	1.90	2.05	0.462	0.409	0.629	1.58	0.227	1.13	0.97	0.989	1.75		1.387187		
Min Lab	4.41	1.90	2.05	0.462	0.409	0.629	1.58	0.227	1.13	0.97	0.989	1.75				0.227
Effluent Parameters																
Effluent / Biochemical Oxygen Demand: BOD5 - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	1.5	1.5	1.5	3	1.7	3	0.7	0.8	0.5	1.8	1.4	0.8			3	
Mean Lab	1.5	1.5	1.5	3	1.7	3	0.7	0.8	0.5	1.8	1.4	0.8		1.7775		
Min Lab	1.5	1.5	1.5	3	1.7	3	0.7	0.8	0.5	1.8	1.4	0.8				0.5
Effluent / Total Suspended Solids: TSS - mg/L																
Count Lab	2	2	2	2	2	3	2	2	2	2	3	2	28			
Max Lab	1.5	2	3.5	4.5	2	3	1.5	4	6.5	10	8.5	1			10	
Mean Lab	0.75	1.5	2.75	3	1	1.5	0.75	3.5	5.25	5	2.17	0.5		3.6708		
Min Lab	<1	1	2	1.5	<1	<1	<1	3	4	<1	<1	<1				<1
Effluent / Total Phosphorus: TP - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	0.08	0.043	0.048	0.032	0.046	0.11	0.051	0.088	0.045	0.348	0.042	0.034			0.348	
Mean Lab	0.08	0.043	0.048	0.032	0.046	0.11	0.051	0.088	0.045	0.348	0.042	0.034		0.078653		
Min Lab	0.08	0.043	0.048	0.032	0.046	0.11	0.051	0.088	0.045	0.348	0.042	0.034				0.032
Effluent / Total Ammonia Nitrogen: NH3 + NH4 as N - mg/L																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	<0.01	0.01	0.08	0.55	0.62	3.05	0.02	0.01	<0.01	<0.01	<0.01	<0.01			3.05	
Mean Lab	<0.01	0.01	0.08	0.55	0.62	3.05	0.02	0.01	<0.01	<0.01	<0.01	<0.01		0.80916		
Min Lab	<0.01	0.01	0.08	0.55	0.62	3.05	0.02	0.01	<0.01	<0.01	<0.01	<0.01				<0.01
Effluent / pH----																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	7.57	7.38	7.09	7.54	7.69	7.81	7.45	7.56	7.78	7.84	7.47	7.64			7.84	
Mean Lab	7.57	7.38	7.09	7.54	7.69	7.81	7.45	7.56	7.78	7.84	7.47	7.64		7.251867		
Min Lab	7.57	7.38	7.09	7.54	7.69	7.81	7.45	7.56	7.78	7.84	7.47	7.64				7.09
Effluent / E. Coli: EC - cfu/100ml																
Count Lab	0	0	0	0	0	2	2	2	2	0	0	0	8			
Max Lab						1200	400	1100	1200						1200	
Mean Lab						647.5	285.0	1032	1083						285.0	
Min Lab						450	1300	885	885							450
Effluent / Cl Residual: Total - mg/L																
Count Lab	0	0	0	0	0	12	22	20	22	0	0	0	76			
Max Lab						0.05	0.05	0.05	0.07						0.07	
Mean Lab						0.04	0.04	0.05	0.048					0.04475		
Min Lab						0.02	0.02	0.02	0.02							0.02
Effluent / CDD																
Count Lab	1	1	1	1	1	1	1	1	1	1	1	1	12			
Max Lab	1.1	1.6	1.3	1.3	1.3	2.1	<0.5	1.2	<0.05	0.6	1	1			2.1	
Mean Lab	1.1	1.6	1.3	1.3	1.3	2.1	<0.5	1.2	<0.05	0.6	1	1		1.2483		
Min Lab	1.1	1.6	1.3	1.3	1.3	2.1	<0.5	1.2	<0.05	0.6	1	1				<0.5

Appendix B – Annual Sludge Results

Parameter	MDL	Result	Units	ReceivedDate	AnalysisDate
Ammonia (as N)	0.02	6.2	mg/L	2020-01-15	2020-01-16
Nitrate (as N)	0.5	<0.5	mg/L	2020-01-15	2020-01-20
Arsenic	10	44	ug/L	2020-01-15	2020-01-17
Cadmium	1	6	ug/L	2020-01-15	2020-01-17
Chromium	10	71	ug/L	2020-01-15	2020-01-17
Cobalt	1	15	ug/L	2020-01-15	2020-01-17
Copper	100	1790	ug/L	2020-01-15	2020-01-17
Lead	1	103	ug/L	2020-01-15	2020-01-17
Mercury	1	<1	ug/L	2020-01-15	2020-01-17
Molybdenum	10	<10	ug/L	2020-01-15	2020-01-17
Nickel	10	101	ug/L	2020-01-15	2020-01-17
Potassium	1000	79100	ug/L	2020-01-15	2020-01-17
Selenium	5	5	ug/L	2020-01-15	2020-01-17
Zinc	10	4700	ug/L	2020-01-15	2020-01-17
Total Phosphorus (as P)	4	747	mg/L	2020-01-15	2020-01-17
Total Solids	20	24200	mg/L	2020-01-15	2020-01-22
Total Solids (Dup)	20	24300	mg/L	2020-01-15	2020-01-22