

February 4<sup>th</sup>, 2022

Ministry of the Environment  
Southwestern Region  
733 Exeter Road  
London, Ontario  
N6E 1L3

**Attn.: Mr. Mark Smith**

**Re: *Listowel Wastewater Treatment Facility  
2021 Annual Report***

Please find enclosed the 2021 Annual Report for the Municipality of North Perth – Listowel Wastewater Treatment Facility. In accordance with Amended Environmental Compliance Approval # 0161-ALLQ8G, this report outlines;

1. Summary and interpretation of all monitoring data and comparison to compliance limits;
2. Description of any operating problems and corrective actions taken;
3. Summary of the maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
4. Summary of effluent quality assurance or control measures;
5. Summary of the calibration and maintenance on all effluent monitoring equipment;
6. Description of efforts made and results achieved in meeting the Design Objectives;
7. Tabulation of the volume of sludge generated and an outline of the anticipated volumes to be generated in the next reporting period and a summary of the locations of where the sludge was disposed;
8. Summary of complaints received and the steps taken to address the complaints;
9. Summary of all By-pass, spill or abnormal discharge events
10. Summary of quantity and quality of different types of imported wastewater co-treated at the Works and an overview of the success of the co-treatment;
11. Tabulation of the quantities and characteristics of the sewage from all different sources in the reporting period on a monthly basis and an outline of any changes in the anticipated quantities and characteristics of the sewage from all different sources in the next reporting period;
12. A copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report of the implementation of each modification;

13. A report summarizing all modifications completed as a result of Schedule A, Section 3; and
14. Any other information the Water Supervisor requires from time to time.

Regards,

Mark Hackett  
Manager of Environmental Services, Municipality of North Perth

## **1. MONITORING DATA AND ANALYTICAL RESULTS**

The utility monitoring reports for the year are attached in accordance with the Environmental Compliance Approval guidelines for the period January to December 2021.

The total influent flow in 2021 was 2551.619 ML. The annualized average daily flow was 6.980 MLD. The design capacity for the treatment facility is 9.03 MLD. The maximum influent daily flow for the year was 23.373 MLD, which was recorded in the month of March. The total influent flow includes the Atwood Wastewater System, which added 91.813 ML and the Septage Receiving Station, which added an additional 103.761 ML.

The total effluent flow for the year was 2433.430 ML and the annualized average effluent daily flow for the year was 6.657 MLD. The maximum effluent daily flow for the year was 12.310 MLD, which was recorded in the month of April.

The annualized influent concentrations and loadings for Carbonaceous Biochemical Oxygen Demand (CBOD<sub>5</sub>), Suspended Solids, Total Phosphorus and Total Kjeldahl Nitrogen are summarized in the table below. The concentrations and loadings were calculated using the annualized averages of the monthly averages.

<b>Influent Quality Parameter</b>	<b>Average Concentration (mg/L)</b>	<b>Average Loading (kg/d)</b>
CBOD <sub>5</sub>	681	4647.6
Suspended Solids	483	3258.7
Total Phosphorus	8.04	54.2
Total Kjeldahl Nitrogen	63.9	431.7

The annualized effluent concentrations various parameters are summarized in the table below. The concentrations were calculated using the annualized averages of the monthly averages.

Effluent Quality Parameter	Average Concentration mg/L	Concentration Criteria mg/L December 1 - March 32	Concentration Criteria mg/L April 1 – November 30	Compliance
CBOD <sub>5</sub>	4.4	< 15	< 10	Monthly
Suspended Solids	5.62	< 15	< 10	Monthly
Total Phosphorus	0.24	< 0.73	< 0.36	Monthly
Ammonia + Ammonium	1.05	< 3.62	< 2.2	Monthly
Total Kjeldahl Nitrogen	3.9			
E. Coli	11.8	200 counts/100 mL	200 counts/100 mL	Monthly
pH	7.84-8.33			
Temperature	17.6			
Dissolved Oxygen	6.2	> 5	> 5	Monthly

All of the effluent monthly concentration criteria as per the Environmental Compliance Approval were achieved for the reporting period,

The annualized effluent loadings for various parameters have been calculated based on the monthly average effluent daily flows and monthly effluent monthly concentrations. They are summarized in the table below.

Effluent Parameter	Loading Kg/day	Monthly Average Loading (kg/d) @ period B Temp.< 5	Average Monthly Loading (kg/d) @ period A Temp. >5
CBOD <sub>5</sub>	29.1	135.6	90.4
Suspended Solids	37.3	135.6	90.4
Total Phosphorus	1.5	6.56	3.28
Ammonia + Ammonium	7.4	32.8	20.0
Total Kjeldahl Nitrogen	26.0		

The table below evaluates the performance of the wastewater treatment process. The efficiency is expressed as % removal and was calculated using the annualized influent and effluent concentrations and annualized influent and effluent loadings for each parameter.

<b>Parameter</b>	<b>Concentration % Removal</b>	<b>Loading % Removal</b>
CBOD <sub>5</sub>	99.5 %	99.4%
Suspended Solids	98.8 %	98.9%
Total Phosphorus	97.0%	97.2%
Total Kjeldahl Nitrogen	93.9 %	94.0%

## **2. OPERATIONAL UPSETS**

There were no operational upsets during the reporting period.

## **3. MAINTENANCE ACTIVITIES**

- All blowers inspected including vibration analysis by contractor
- Bearings replaced on Blower #1
- Inspection, cleaning and replacement of UV lights as required
- Highway 23 Pump Station annual pump maintenance – Pump #2 refurbished
- All on-line dissolved oxygen and suspended solids sensors where inspected and calibrated by contractor
- Filter #2 had sand replaced, pumps rebuilt, chemical treatment of porous plates, and also replaced HMI controller
- Aeration tank #2 had full maintenance overhaul, including refurbishment of recirculating pump, tank cleanout, and replacement of all air diffuser membranes
- Refurbishment of other aeration recirculating pump
- Atwood forcemain maintenance
- Winston Street Pump Station replaced pumps and associated equipment
- Septage Receiving Station – tank cleaned out twice, replaced auger, replaced hydro-ejector pump, replaced grinder pack

## **4. QUALITY ASSURANCE OR CONTROL MEASURES**

A 24hr composite sampler, model American Sigma, located at the inlet head works of the treatment plant obtains the influent sample. The sample is drawn

from the screen effluent channel prior to grit removal. A 100 mL sample is taken every 30 minutes.

A 24hr composite sampler, model American Sigma, located at the effluent UV channel obtains the effluent sample. A 100 mL sample is taken every 30 minutes.

A sampler for the Septage Receiving Station was installed in 2016 to take samples automatically from loads received.

The influent and effluent samples as well as Septage Receiving Station samples are sent to ALS Labs in Waterloo for independent analysis. A portion of the same sample is analyzed in-house for suspended solids, pH, dissolved oxygen, nitrates, ammonia, phosphorus and temperature. All laboratory instruments used in-house are regularly calibrated as per manufacturer's recommendations and the methodology follows "Standard Methods for the Examination of Water and Wastewater".

#### **5. MONITORING EQUIPMENT CALIBRATION & MAINTENANCE**

The Spectrophotometer used in the WWTP lab was calibrated. All of the various flow meters in use were calibrated and a copy of their reports is attached.

#### **6. MEETING DESIGN OBJECTIVES**

Through the best efforts of the operators, the treatment plant achieved all of the effluent parameter design objectives for the reporting period. The objectives were met as follows:

- CBOD<sub>5</sub> – achieved 9 out of 12 months
- TSS – achieved 8 out of 12 months
- TP – achieved 8 out of 12 months
- Ammonia – achieved 9 out of 12 months

#### **7. SLUDGE GENERATED AND ANTICIPATED VOLUMES AND LOCATIONS**

The new aerobic digesters and sludge storage facility were utilized for the entire year.

- 131,140 m<sup>3</sup> of waste activated sludge was processed in the digesters
- 81,229 m<sup>3</sup> decanted to headworks
- 52,750 m<sup>3</sup> transferred to sludge holding cell
- 29,655 m<sup>3</sup> of digested sludge was hauled from the sludge holding cell.

In 2022, similar volumes of sludge generation are expected.

The waste activated sludge generated at the wastewater treatment plant is aerobically stabilized in the aerated digester. Supernatant is decanted to the headworks. Processed sludge is then transferred into the sludge storage cell on site until it can be removed and hauled to approved agricultural sites for land application. A copy of the sludge analysis is attached.

**2021 Sludge Haulage Summary**

<b>Date</b>	<b>Site #</b>	<b>Volume (m<sup>3</sup>)</b>
May 20, 21	24386	2,501
August 9	24719	1,841
August 11	24720	1,543
August 13	24269	3,076
August 17	24716	3,544
August 27	24720	3,008
November 8, 9	24353	2,434
November 9, 10,16, 17, 18, 19	24827	5,030
November 19, 20	24369	3,352
November 21, 22	24797	1,710
November 22, 23, 24	24270	1,616
	<b>Total</b>	<b>29,655</b>

**8. SUMMARY OF COMPLAINTS RECEIVED**

There were no odor complaints received during the reporting period in 2021.

**9. BY-PASS, SPILLS AND ABNORMAL DISCHARGE EVENTS.**

There were no by-pass, spill or abnormal discharge events during the reporting period in 2021.

**10. IMPORTED WASTEWATER SUMMARY**

The Septage Receiving Station was in operation for the entire year. The controlled pumping of the storage tank contents through the WWTF force main eliminated the effects of shock loading experienced in prior years. This enabled the plant to

successfully treat the imported waste on a consistent basis. The daily totals of imported wastewater received and its various parameters are reflected in the table below. An odor control system was installed in 2010 and is working well to eliminate odors from the Septage Receiving Station.

Imported Wastewater	Average Flow (Cubic meters/day)	Average Loading (Kilograms/day)	
		BOD <sub>5</sub>	TKN
Septage	66.0	200.0	40.8
Atwood Resources	56.0	750.8	109.5
OGI - Sheik	28.1	66.7	17.6
OGI - Cheese	5.1	22.9	3.2
OGI – All Treat	2.9	10.7	1.1
Nafziger Waste – Fieldgate	23.4	58.5	47.2
Nafziger Waste – New Process	59.3	619.0	23.7
Par Two Farms - Dare	0.5	0.05	1.1
Vish Transport	17.9	998.0	8.0

#### **11. SUMMARY OF INFLUENT QUANTITIES AND CHARACTERISTICS**

The quantities and characteristics of sewage from all sources on a monthly basis are summarized in the attached *North Perth Wastewater Treatment Plant Compliance Report 2021*. No changes are anticipated in the quantities and characteristics of sewage from the different sources in the next reporting period.

#### **12. NOTICE OF MODIFICATIONS**

There were no Notice of Modification to Sewage Works submitted to the Water Supervisor as a result of Schedule B, Section 1 in 2021.

#### **13. SUMMARY OF SCHEDULE A, SECTION 3**

There were no modifications completed in 2021 as a result of Schedule A, Section 3.

#### **14. INFORMATION PROVIDED TO WATER SUPERVISOR**

There was not any additional information required or requested to be submitted to the Water Supervisor in 2021.