



Wastewater Operations

Annual Performance Report
Lakeshore Wastewater Treatment Plant
Environmental Compliance Approval (ECA) #6075-BDSKRR

~Town of Innisfil~

Reporting Year - 2023

Introduction

Effective January 1, 2016, the Town of Innisfil (TOI) transferred ownership of its municipal sewage works to InnServices Utilities Inc. (InnServices). InnServices is a municipal service corporation, wholly owned by the Town of Innisfil, charged with the responsibility to operate, maintain, and expand the municipal sewage works that service the Town of Innisfil.

The Board of Directors are appointed by the Shareholder and represent the Owners of the System.

InnServices has prepared this Performance Report for the operations conducted during the 2023 calendar year.

This Performance Report has been prepared to meet the following commitments:

- To provide InnServices Utilities Inc., Board of Directors, as “Owners” of the sewage works, a summary of the operations and maintenance of the Lakeshore Wastewater Treatment January 1 to December 31, 2023; and
- To comply with Condition 11 of Environmental Compliance Approval (ECA)#2748-C5EJLK, issued April 11, 2022.

This Performance Report, provided to the InnServices Board of Directors, conveys information related to the performance of operations and maintenance, which aids decision making related to system expansion needs.

The Lakeshore Wastewater Treatment Plant (LS WWTP) is an extended aeration facility. It is located at 1578 St. John’s Road in Innisfil.

The collection system consists of approximately 110 km of gravity sewers, 13 km of force mains, and ten pumping stations servicing the Sandy Cove, Alcona, Belle Ewart, Friday Harbour, and Lefroy areas of Innisfil.

Environmental Compliance Approval (ECA)

For the reporting period covered in this report, InnServices Utilities Inc. was defined as the Operating Agency of Lakeshore Wastewater Treatment Plant (LS WWTP) and the associated collection system.

The Innisfil Sanitary Sewage Collection System is now subject to the conditions as set out in Environmental Compliance Approval (ECA) Number 120-W601, issued March 28, 2023. As such, there is a requirement to prepare an annual performance report which is submitted to the Director.

The treatment facility and collection system are operated under the following Certificates of Classification:

Class III Wastewater Treatment Certificate #267

Class II Wastewater Collection Certificate #2450

A Class Environmental Assessment (Class EA) was completed in 2011 that defined a two-stage increase in the capacity of the Lakeshore WWTP, to 25 MLD and ultimately to 40 MLD. The new ECA includes the Proposed Works which will bring the Plant to 25,000 m³/day (25 MLD) rated capacity.

Influent Monitoring Data

The 2023 average daily influent flow was 10,552 m³, which equates to 62% of the plant's design rated capacity of 17,000 m³ per day.

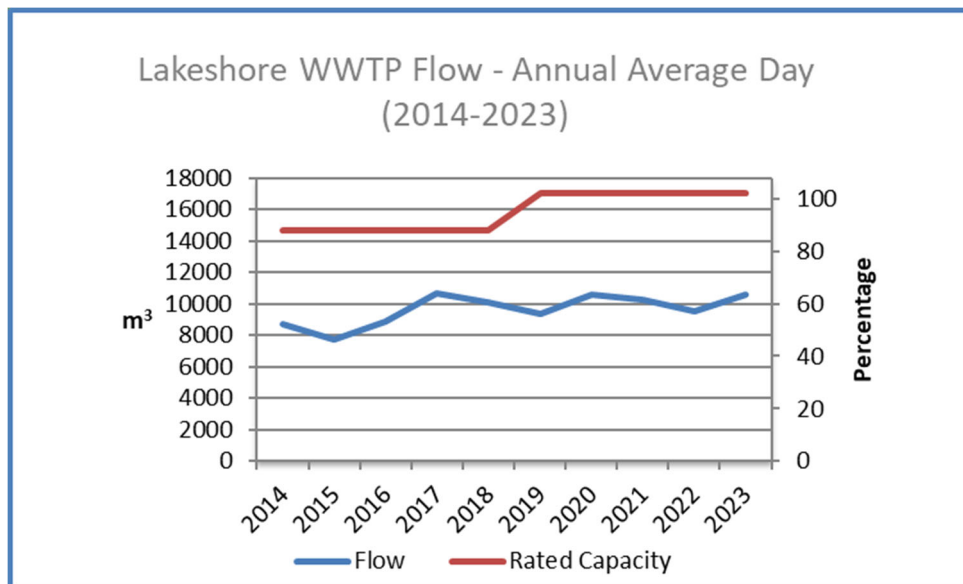
The 2023 maximum daily flow occurred on June 27, when the recorded flow was 19,365 m³, equating to 45.6% of the plant's design peak flow rate of 42,500 m³ per day.

The plant received a total raw influent flow of 3,851,302 m³ in 2023.

The overall removal efficiency is 95.58%.

Flows	Design Capacity	80% of Rated Capacity	2023 Flows	Performance
Daily Flow	17,000 m ³ / day	13,600	10,552 m ³ /day Average Daily Flow	62% of Design
Peak Flow	42,500 m ³ /day	34,000	19,365 m ³ /day (June. 27, 2023)	45.6 % of Design
Annual Total	-----	-----	3,851,302m ³	

Figure 1 below provides a visual display of the annual average day influent flow trend for the ten-year period of 2014 – 2023. (Note ADF increased from 14,700 m³ to 17,000 m³ effective July 2019)



Monitoring of influent requires weekly composite sampling. The annual averages and removal efficiencies are depicted in this table:

Parameter-Influent	Sample Type	Minimum Frequency	Monthly Average (mg/L)	Removal Efficiency
Total Suspended Solids (TSS)	24-hour composite	Weekly	167	98.08%
Total Phosphorus (TP)	24-hour composite	Weekly	2.59	96.80%
Total Kjeldahl Nitrogen (TKN)	24-hour composite	Weekly	27.01	91.85%

Hauled Wastewater Flow

During the 2023 calendar year, the Lakeshore WWTP accepted 3952.2 m³ of hauled septic waste, a 69% decrease from last year. Septic Receiving was closed for extended periods of time throughout the year. This was due to ongoing maintenance and repairs. It has been shut down in preparation for construction related to the WWTP upgrade.

Septic receiving flow is included in the influent values discussed above. Here are the totals for the past five years:

Year	Hauled Septic Waste m ³
2018	48,263
2019	24,728
2020	22,596
2021	20,571
2022	12,799
2023	3,952

Samples are collected of each load delivered to the septic receiving station. Samples are chosen at random for analysis for the development of a septage quality database. This is a summation of the annual averages for the required parameters:

Parameter-Import Sewage Receiving Station	Sample Type	Minimum Frequency	Monthly Average (mg/L)
BOD5	Grab	Weekly	3435.24
Total Suspended Solids (TSS)	Grab	Weekly	10121.9
Total Phosphorus (TP)	Grab	Weekly	131.87
Total Kjeldahl Nitrogen (TKN)	Grab	Weekly	835.67

Final Effluent Monitoring Data

The Lakeshore WWTP operated below the limits set out in the ECA Effluent parameters. Final Effluent is monitored by weekly 24-hour composite sampling.

Design Objectives were achieved more than 50% of the year, with no deterioration of the Final Effluent quality trending.

A summary of the plant's performance in 2023 relative to the amended ECA limits is reflected in these tables and on the following page.

Effluent Parameter	ECA Effluent Limit: Monthly Avg Concentration (mg/L)	Design Objective Monthly Avg. Concentration (mg/L)	2023 Treated Effluent Monthly Avg. Concentration (mg/L)
CBOD ₅	10.0	5.0	2.01
Total Suspended Solids	15.0	5.0	3.21
Total Phosphorus	0.20	0.10	0.082
Total Ammonia Nitrogen	5.0	3.0	1.44
<i>E. coli</i>	200 CFU/100mL	150 CFU/100 mL	13.4
pH	6.0 to 9.5 inclusive	6.5 – 8.5 inclusive	6.49 – 8.66

Effluent Parameter	ECA Annual Total Effluent Limit	2023 Annual Effluent Loading
Total Phosphorus*	629 kg/yr	318.53 kg/yr

*Lake Simcoe Phosphorus Reduction Strategy Effluent Limit for Total Phosphorus is 0.12 mg/L Annual Average Baseline Concentration; the Total Annual Baseline Load is 629 Kg.

Parameters for LS WWTP Final Effluent Monitoring were reviewed for 2023. There were no exceedances of Compliance Limits related to effluent quality in 2023. This can be attributed to operational process optimization, use of in-line monitoring instrumentation, and septic source restrictions.

Design Objective for *Monthly* average Total Phosphorus (0.10 mg/l) was exceeded twice, the month of February 0.11 mg/l, and June 0.12 mg/l, with a monthly average of 0.08 mg/l. This design exceedance is not reportable.

Testing for toxicity – Acute Lethality of Effluents to *Daphnia magna* and Rainbow Trout was conducted in December as required by Wastewater Systems Effluent Regulations (SOR/2012-139) under the Federal Fisheries Act and was determined to be not acutely lethal.

The table on the next page depicts the monthly averages for Final Effluent parameters.

MONTH	A.D.F. m ³	TOTAL PHOSPHORUS (629 kg/yr max.)			NH3 + NH4 as N			E. Coli.			C.B.O.D			TSS			pH
		Month Avg.	Loading kg/d	Total Monthly Load kg	Month Avg.	Loading kg/d	Geo. Mean ml	Month Avg.	Loading kg/d	Month Avg.	Loading kg/d	Month Avg.	Loading kg/d	Month Avg.	Loading kg/d		
2023																	
Compliance limit		0.20 mg/L	0.87 kg/d	kg	5.00 mg/L	72.00 kg/d	200/100 ml	10.0 mg/L	144.00 kd/d	15.0 mg/L	216.00 kd/d					6.0 – 9.5	
Design objective		0.10 mg/L			3 mg/L			5 mg/L		5 mg/L						6.5 – 8.5	
January	11147	0.07	0.80	24.88	1.70	18.95	4	2.00	22.29	4.80	53.50					7.45-8.66	
February	11643	0.11	1.31	36.67	3.20	37.26	12	2.3	26.20	3.3	37.84					8.03-8.47	
March	12025	0.09	1.02	31.69	1.25	15.06	3	2.0	24.05	4.0	48.10					7.69-8.58	
April	13271	0.08	1.09	32.85	1.00	13.27	12	2.3	29.86	4.8	63.04					7.88-8.33	
May	10459	0.10	1.05	32.42	1.44	15.06	24	2.2	23.01	3.6	37.65					6.96-7.15	
June	10715	0.12	1.23	36.97	0.38	4.02	10	0.0	0.00	3.8	40.18					7.51-7.76	
July	11375	0.09	1.05	32.62	0.10	1.14	8	2.0	22.75	2.0	22.75					7.10-7.16	
August	9056	0.09	0.85	26.39	1.10	9.96	9	2.0	18.11	3.4	30.79					7.08-7.13	
September	7943	0.06	0.46	13.70	2.15	17.08	8	2.3	17.87	2.5	19.86					6.99-7.11	
October	8584	0.06	0.55	17.03	1.78	15.28	2	2.0	17.17	2.0	17.17					6.49-7.09	
November	8864	0.06	0.53	15.96	1.58	13.96	3	2.0	17.73	2.3	19.95					6.95-7.03	
December	10667	0.05	0.56	17.36	1.35	14.40	5	2.0	21.33	2.3	24.00					6.90-7.05	
TOTAL	125748	0.99	10.51	318.53	17	175	100	23	240	39	415					6.49-8.66	
AVG.	10479	0.082	0.876	26.54	1.42	14.62	8.33	1.91	20.03	3.21	34.57					7.58	

Operational Issues and Corrective Actions Taken

In general, the accumulation of non-organic debris (i.e., wipes, and personal hygiene products) are plugging pumps and causing pump failure. Since the onset of COVID-19, the plant is also experiencing an increase of organic material such as grease. This has been compounded and continues to cause problems. A public education program through social media and community engagement continues to raise awareness. Septic Receiving was closed multiple times due to maintenance issues caused by non-organic debris.

Much of the equipment, structures mechanisms and apparatus forming the Works are aging and require frequent assessment. Repair and/or replacement is completed, when necessary, those items of larger scope are put forth as Capital Works Projects.

A written warning was issued to InnServices on April 18, 2023. InnServices was found to have failed to meet Acute Lethality testing requirements during an inspection in November 2022.

Required sampling was conducted and a schedule was developed as prescribed. There are no further consequences as long as we exercise due diligence in the future.

Maintenance Activities

The Maintenance Mechanic and Operations Staff perform a variety of scheduled, preventative, predictive and reactive maintenance on a variety of equipment throughout the year. Equipment replacement and upgrades contribute to greater process control at the Plant and increased capacity in the collection system.

Notable maintenance activities in 2023 include:

At LS WWTP

- Relocation of filter box for Storage blower to the roof for access completed.
- Leaky roof over the North Filter building replaced.
- Grit air valves were replaced.
- New automatic sampler purchased.
- Large and Small digesters cleaned out.
- New server installed.
- New sludge transfer pump installed.

Pump stations

- PS3 – new variable speed drive installed.
- Yearly wet well cleanouts completed.
- PS4 upgrades completed and are now being run by operations.
- Continue flushing of sewer mains this year was focused on the area from 6th Line north to 8th line (central Alcona).
- Continue to conduct specific flow monitoring of areas in Alcona area sewers for flow monitoring.

Effluent Quality Assurance or Control Measures Undertaken

Analytical tests to monitor required parameters are performed by SGS Environmental Services.

Annual laboratory testing for toxicity (Acute Lethality of Effluents) is performed by AquaTox Testing and Consulting.

Both labs are accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the recognized International Standard ISO/IEC 17025:2005.

Plant operation and performance is monitored by licensed operators.

Calibration & Maintenance on all Influent and Final Effluent Monitoring Equipment

Annual verifications/calibrations of flow monitoring equipment were performed in October 2023 by a third-party instrumentation and controls technician. This included influent, effluent, septic receiving and the Parshall flume monitoring equipment.

All were found to be within the tolerance of the equipment as recommended by the manufacturer.

Summary of Efforts made to achieve Design Objective

Design Objectives were achieved more than 50% of the year, with no deterioration of the Final Effluent quality trending.

The 2023 average daily influent flow was 10,552 m³, which equates to 62% of the plant's design rated capacity of 17,000 m³ per day.

Sludge Generation & Removal

The biosolids handling facility, Lystek, uses biosolids created by the system and processes into a marketable Class A (EQ) quality, fertilizer product which is hauled from the facility and injected into farm fields. Lystek is responsible for all aspects of the marketing and application of LysteGro fertilizer produced at the facility.

Lystek is running 10 hours per day, 4 days per week with minimum interruption.

The amounts hauled and applied in 2023 totaled 4434.03 cubic meters. Estimate for volume to be generated and hauled in 2024 is 4500-5000 cubic meters.

Farmer	LysteGro Volume (m³)	Acres
Bowman	4434.03	313
Total:	4434.03	313

ROHES held the contract for the removal and disposal of Non-Agricultural Source Material (NASM) from the Lakeshore WWTP. A total of 1,514.30m³ of NASM was removed from the Plant to ROHES 4 Lagoon between June 12 to June 15th. The table on the following page tabulates sites and volumes.

Period	Site #	Volume in cubic meters
June 12	ROHES 4 Lagoon	126.00
June 12	ROHES 4 Lagoon	169.20
June 12	ROHES 4 Lagoon	126.00
June 12	ROHES 4 Lagoon	126.20
June 12	ROHES 4 Lagoon	126.00
June 13	ROHES 4 Lagoon	126.90
June 13	ROHES 4 Lagoon	126.00
June 13	ROHES 4 Lagoon	42.00
June 14	ROHES 4 Lagoon	126.00
June 14	ROHES 4 Lagoon	84.00
June 14	ROHES 4 Lagoon	126.00
June 15	ROHES 4 Lagoon	126.00
	Total volume hauled	1514.30

Complaints Received & Steps taken to address Complaints

Customer Service inquiries are received and logged through the Town of Innisfil. There were 24 inquiries related to the operation of the Lakeshore WWTP and collection system in 2023. All incidents were resolved and logged.

There were 6 calls for sewer back-ups. All back-ups were found to be on homeowner's side.

The one issue was a sag on the lateral service found on the town side, which was repaired by InnServices.

The remaining inquiries involved other sewer problems, flushing concerns and an odour complaint.

In 2023, there were zero backups in the sanitary sewer mains causing surcharge.

Bypass, Overflows, Spills, and other situations outside Normal Operating Conditions

There were zero (0) incidents in 2023.

Notices of Modifications to Sewage Works

The ECA allows for certain pre-authorized modifications to be made to the facility. The Ministry is notified of these modifications via a *Notice of Modification to Sewage Works*. There were zero (0) Notices of Modification submitted to the Water Supervisor as per Paragraph 1.d of Condition 10.

A new ECA for the Lakeshore WWTP was issued April 11, 2022, which includes Proposed Works which will bring the Plant to 25,000 m³/day (25 MLD) rated capacity.

Efforts to Achieve Conformance with Procedure F-5-1 Determination of Treatment Requirements for Municipal And Private Sewage Treatment Works

InnServices Utilities Engineering and Operations have been working on several projects and initiatives to eliminate Bypass/Overflow incidents. These include, but are not limited to the following ongoing efforts:

- IUI Engineering is working with TOI Development Engineering to ensure all un-assumed sanitary maintenance holes are equipped with bulkheads. Implemented for Alcona capital, Sleeping Lion Phase 3, LSAMI P1/P3, Alcona Downs 4, Grand Sierra, Innis Village and underway for upcoming projects: LSAMI P4, Corm Street condos, LSAMI P2 Ph4, Melrose servicing planned for construction in 2024, Orbit Ph1A servicing planned for construction in 2024.
 - Regular flushing and CCTV (closed-circuit television) inspection program of sanitary mains. All sanitary mains in the central area of Alcona were flushed and inspected via CCTV in 2023 under InnServices annual capital program.
 - Annual pump station wet well clean out programs.
 - Sewer laterals inspections are done with a lateral launch and repairs made if deficiencies are discovered from the main to the property line.
 - External Maintenance Hole (MH) wrapping of horizontal joints on recent Capital projects and Development projects underway. All new development projects are still following the MH wrapping requirements.
 - Flow Monitoring of active subdivision under progress in Alcona Capital, Sleeping Lion Phase 3, Alcona Downs 4, Innis Village, LSAMI P3 and select condominium developments.
 - Condition assessment of MH at multiple locations leading to a repair/replacement plan as required.
 - Commissioning of a new pump station at 1520 St. John's Road
 - Working on a pre-qualified list of approved contractors to complete large sanitary sewer connections for site plans and developments..

Proposed Works Update

The Lakeshore Wastewater Treatment Plant (LSWWTP) expansion construction is commencing Q2/Q3-2024. Tentative commissioning by Q2-2028.

The InnServices engineering team continues to work on environmental assessment activities for several proposed sewage pump stations (SPS).

Upgrade works at Pump Station #4 (2298 Crystal Beach Road) have been completed. The Director's Notification was filed with the Ministry July 24, 2023.

Monitoring Schedule

Influent sampling is required at a minimum frequency of weekly by 24-hour composite sampling. The influent sampling point is located near the grit tanks in the preliminary treatment system building (Inlet Building).

Imported sewage received at the Septic Receiving Station is required at a minimum frequency of weekly by grab sampling (when in service). Individual samples are obtained

at the time of off-loading by the septic hauler. A single sample is randomly selected to be analyzed each week. A composite sample is taken by grab method from the storage cell.

The Final Effluent sampling is required at a minimum frequency of weekly. Sampling type is determined by the parameter and includes 24-hour composite, grab, probe or analyzer. The weekly Final Effluent composite sampler is located downstream of the disinfection channels.

Flow rates are monitored by continuous flow measuring devices for influent, effluent and imported sewage.

As per Condition 9.1.d of the ECA, effective January 2023, Tuesday was designated as the scheduled day for sampling, except for statutory holidays when this may shift to the next appropriate day. This schedule was maintained to the end of 2023. The scheduled sample day will be rotated to Wednesday (in January 2024) and is expected to be maintained for the next year.