



2023 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Mount Elgin Wastewater Treatment Plant

1. GENERAL INFORMATION

Oxford County (the County) prepares a report summarizing wastewater treatment operation and treated effluent discharge quality for every municipal wastewater treatment plant (WWTP) annually. The reports detail the latest effluent quality testing results and quantity statistics, and any non-compliance conditions that may have occurred for the previous year. They are available for review by the end of March on the County website at <http://www.oxfordcounty.ca/waterwastewater> or by contacting the Public Works Department.

All efforts have been made to ensure the information presented in this report is as accurate as possible.

If you have any questions or comments concerning the report, please contact the County at the address and phone number listed below or by email at wastewater@oxfordcounty.ca.

Wastewater Treatment Plant:	Mount Elgin WWTP
Wastewater Treatment Plant Number:	120002870
Certificate of Approval (CofA):	0611-6Q3JQL (May 25, 2006)
Reporting Period:	January 1, 2023 – December 31, 2023

Wastewater Treatment Plant Owner & Contact Information:

Oxford County Public Works Department - Wastewater Services
P.O. Box 1614
21 Reeve Street
Woodstock, ON N4S 7Y3
Telephone: 519-539-9800
Toll Free: 866-537-7778
Email: wastewater@oxfordcounty.ca

1.1 System Description

The Mount Elgin WWTP consists of a central Recirculating Sand Filter (RSF) and subsurface discharge. The wastewater collection system includes two (2) sewage pumping stations, 5.7 kilometers of sanitary gravity sewers, 0.2 kilometers of sanitary forcemain sewers and 1.3 kilometers of sanitary low pressure sewers. Within the wastewater collection system, individual properties are serviced by septic tanks where sewage is pretreated to remove solids and grease before discharge to a small diameter variable grade sewer. The small diameter collection mains direct the primary treated effluent to a sewage pumping station.

At the WWTP the primary treated effluent is pumped to the recirculation tanks. The influent is pumped to the recirculating sand filter and then collected and pumped to a splitter valve that allows 80% of the flow to recirculate and 20% to enter the dosing tank. From the dosing tank, treated effluent is pumped to the shallow buried trench drain field that provides for the subsurface discharge of the treated effluent. Effluent samples are collected from the dosing tank ahead of the drain field.

A standby generator is available to power the plant in case of a power failure.

The system is maintained by licensed wastewater system operators and licensed mechanics that operate, monitor, and maintain the treatment equipment, in accordance with the regulations, and collect samples as required by the CofA. Alarms automatically notify operators in the event of failure of critical operational requirements.

Facility	Mount Elgin WWTP
Design Capacity	190.5 m ³ /d
2023 Average Daily Flow	98 m ³ /d
2023 Maximum Daily Flow	294 m ³ /d
2023 Total Volume of Wastewater	35,789 m ³ /year

1.2 Major Expenses

In 2023, the Mount Elgin WWTP had forecasted operating and maintenance expenditures of approximately \$247,000.

In addition to regular operational and maintenance expenditures, Capital Improvement Projects for Mount Elgin were forecasted at \$355,000 for improvements to the wastewater collection system and the Mount Elgin WWTP.

Capital Improvement Projects included:

- \$339,000 for Mount Elgin WWTP Capacity Expansion
- \$16,000 for servicing projects

Capital Improvement Projects for all systems included:

- \$1,799,000 to develop Countywide SCADA Master Plan for all wastewater systems
- \$70,000 to develop Countywide Wastewater Servicing Master Plan for all wastewater systems
- \$38,000 for Development Charges Technical Study

2. SUMMARY AND INTERPRETATION OF MONITORING DATA

2.1. Effluent Quality Assurance and Control Measures

Sampling Procedure

Grab samples are collected from the influent lift station every three months. Samples are tested for Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), Total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN).

Effluent grab samples are analyzed for CBOD₅, TSS, TP, ammonia, TKN, nitrite, nitrate, pH, and E. coli every three months at a minimum.

Groundwater testing for nitrite, nitrate, chloride and pH are completed every three months at a minimum.

Laboratory and Field Testing

All samples for parameters used to evaluate compliance are analyzed by a licensed laboratory except for pH, which is tested in the field during collection. Laboratory analysis is performed by SGS Lakefield Research Ltd. Any other information generated in-house is used in process control but is not included in this report.

2.2 WWTP Performance and Effluent Quality

Influent Streams and Effluent Streams

The Mount Elgin WWTP provided effective treatment in 2023, and was 100% compliant with all its final effluent objectives.

There are no effluent limits for the system, however, the CofA requires the County to use best efforts to operate the Mount Elgin WWTP with the objective that the average annual concentrations of both CBOD₅ and Suspended Solids do not exceed 10 mg/L in the effluent ahead of the subsurface disposal system. The County is also required to

collect grab samples of raw sewage, effluent ahead of the subsurface disposal system, and groundwater in monitoring wells around the Mount Elgin WWTP.

Graphs of discharge parameters versus effluent discharge limit are included in this report in Appendix A.

Influent wastewater characteristics and groundwater sampling results are presented in the tables below.

Influent Wastewater Characteristics (annual average)		
Parameter	Concentration (mg/L)	Loading (kg/d)
CBOD ₅	94	9.2
Total Suspended Solids	78	7.6
Total Phosphorus	8.3	0.81
Total Kjeldahl Nitrogen	72	7.1

Groundwater Monitoring Well Results:

2023									
March 7	MW1	MW2	MW3	--	--	--	--	--	--
Parameter				--	--	--	--	--	--
Groundwater elevation (*m ASL)	274.15	273.83	273.39	--	--	--	--	--	--
Nitrite (mg/L N)	0.03	0.15	0.07	--	--	--	--	--	--
Nitrate (mg/L N)	0.06	1.54	15.2	--	--	--	--	--	--
Nitrate+Nitrite (mg/L N)	0.06	1.69	15.3	--	--	--	--	--	--
Chloride (mg/L)	57	250	250	--	--	--	--	--	--
pH	7.24	7.25	7.52	--	--	--	--	--	--

2023									
June 12	MW1	MW2	MW3	--	--	--	--	--	--
Parameter				--	--	--	--	--	--
Groundwater elevation (*m ASL)	273.43	273.31	273.17	--	--	--	--	--	--
Nitrite (mg/L N)	0.03	0.14	0.03	--	--	--	--	--	--
Nitrate (mg/L N)	0.06	0.73	3.45	--	--	--	--	--	--
Nitrate+Nitrite (mg/L N)	0.06	0.87	3.45	--	--	--	--	--	--
Chloride (mg/L)	69	200	180	--	--	--	--	--	--
pH	7.33	7.15	7.32	--	--	--	--	--	--
July 18	MW1	BH23-01	BH23-02	BH23-03	BH23-05	BH23-06	BH23-07	BH23-08	BH23-09
Parameter									
Groundwater elevation (*m ASL)	272.54	272.29	272.35	272.62	272.26	272.32	272.08	272.06	272.20
Nitrite (mg/L N)	0.03	0.18	0.03	1.89	0.03	0.03	0.03	0.03	0.14
Nitrate (mg/L N)	0.12	8.56	0.08	38.4	0.06	0.11	0.06	0.48	3.04
Nitrate+Nitrite (mg/L N)	0.12	8.74	0.08	40.3	0.06	0.11	0.06	0.48	3.18
Chloride (mg/L)	41	10	18	140	150	48	3	31	120
pH	7.26	7.69	7.41	7.17	7.35	7.35	7.45	7.50	7.37

2023									
August 9	MW1	BH23-01	BH23-02	BH23-03	BH23-05	BH23-06	BH23-07	BH23-08	BH23-09
Parameter									
Groundwater elevation (*m ASL)	272.66	272.18	272.30	272.71	272.21	272.30	272.09	272.12	272.10
Nitrite (mg/L N)	0.04	0.10	0.03	0.25	0.03	0.03	0.03	0.03	0.07
Nitrate (mg/L N)	0.06	6.96	0.07	49.9	0.06	0.11	0.06	1.07	0.16
Nitrate+Nitrite (mg/L N)	0.06	7.06	0.07	50.2	0.06	0.11	0.06	1.07	0.23
Chloride (mg/L)	130	6	12	200	88	55	2	43	150
pH	7.45	7.81	7.62	7.39	7.92	7.58	7.70	7.61	7.51
November 16	MW1	BH23-01	BH23-02	BH23-03	BH23-05	BH23-06	BH23-07	BH23-08	BH23-09
Parameter									
Groundwater elevation (*m ASL)	273.01	272.27	272.38	272.83	272.46	272.22	271.86	272.09	272.39
Nitrite (mg/L N)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Nitrate (mg/L N)	0.06	1.97	0.09	32.4	0.12	0.19	0.06	1.80	0.06
Nitrate+Nitrite (mg/L N)	0.06	1.97	0.09	32.4	0.12	0.19	0.06	1.80	0.06
pH	7.58	7.84	7.52	7.58	7.91	7.49	7.77	7.40	7.64

*m ASL: meters above sea level

The groundwater monitoring program was expanded in 2023 to further define and understand the effects of the facility on shallow groundwater at the site. Oxford County's Hydrogeologist has reviewed all monitoring well data, and will continue to monitor groundwater results on our behalf.

2.3 Final Effluent Design Objectives

Objectives are non-enforceable effluent quality values which the Owner is obligated to use best efforts to strive towards achieving on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively, and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the Mount Elgin WWTP CofA were met in 2023.

The following table presents the range of effluent discharge values vs. CofA Objectives and the annual average effluent concentration, ahead of the subsurface disposal system.

Effluent Parameter	Sample Frequency	Annual Average Objective Concentration mg/L	Quarterly Results Min-Max mg/L	Annual Average Effluent Concentration mg/L
CBOD ₅	quarterly	10	4.0 – 18.5	9.3
Suspended Solids	quarterly	10	4.5 – 12.5	8.1

3. OVERFLOWS, BYPASSING, UPSETS, SPILLS, AND ABNORMAL CONDITIONS

On April 1, 2023, heavy rainfall in the area resulted in high flows entering the WWTP and alerted the On-call Wastewater Operator of a high level condition at the onsite WWTP sewage pumping station wet well. The Operator arrived onsite at the WWTP and found the onsite SPS liquid level increasing, which eventually resulted in approximately 50 litres of influent seeping onto the ground surrounding the SPS from the joints in the wet well casing. Upon receiving the high level alarm, a vacuum truck was dispatched to the Mount Elgin WWTP. The vacuum truck was used to clean up the spilled liquid and removed approximately 4000 gallons of influent (being transported to a neighbouring WWTP), lowering the level within the SPS wet well, to decrease the chances of subsequent spills.

This overflow event was reported to the Spills Action Center and MECP at the time of occurrence.

The planned Phase 3 and Phase 4 capacity expansions of the Mount Elgin WWTP, in combination with the implementation of a new Inflow & Infiltration (I&I) Reduction Program, will aim to reduce future overflow events.

There were no additional overflows, bypassing, upsets, spills, or abnormal conditions for 2023.

There were no complaints in 2023.

4. MAINTENANCE OF WORKS

The operating and maintenance staff at the Ingersoll WWTP conducts regularly scheduled maintenance of the WWTP equipment. The Mount Elgin WWTP utilizes a database system known as Cartegraph to issue work orders and maintain records for regular maintenance and repair at the WWTP.

5. MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

The calibration of flow meters was conducted by JBF Controls Ltd. in accordance with the requirements of the Mount Elgin WWTP CofA. The records are kept on-site at the Mount Elgin WWTP.

All other operational monitoring equipment was calibrated by staff and records are kept on-site at the Mount Elgin WWTP.

6. INSPECTION, PILOTS, AND TRIALS

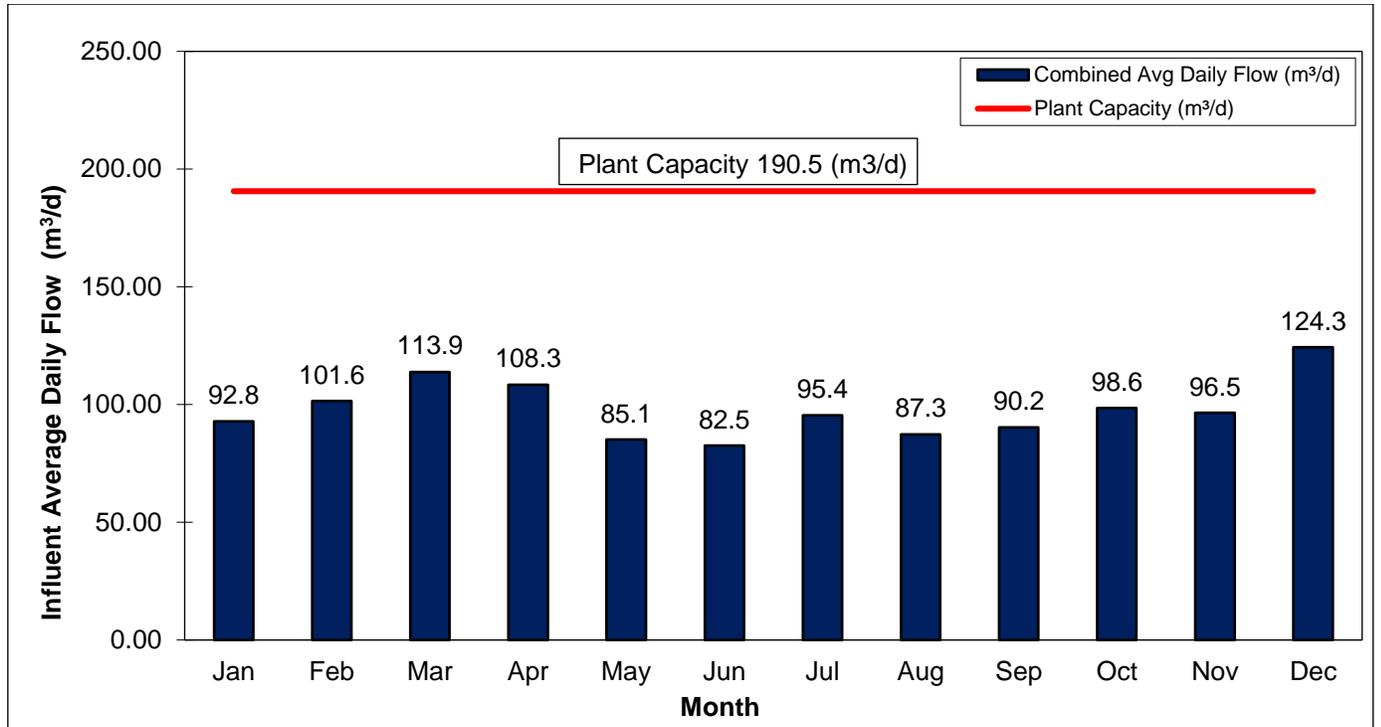
The MECP did not conduct an inspection of the Mount Elgin WWTP in 2023. MECP inspection typically occurs every three years.

WWTP Expansion

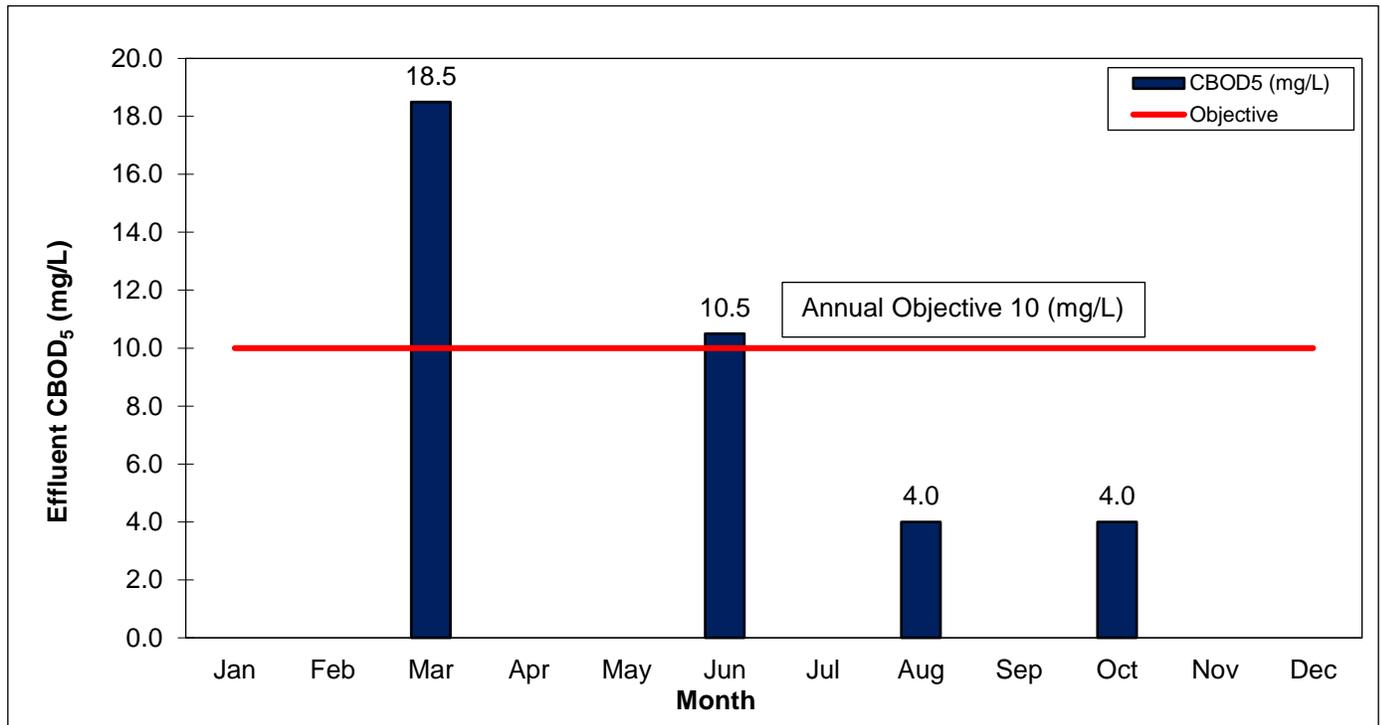
To meet the future wastewater treatment servicing needs of the community, design work continued in 2023, for the Phase 3 and 4 expansion of the Mount Elgin WWTP, to increase the rated capacity of the system from 190.5 m³/day to 381 m³/day. The project includes a flow equalization tank, additional sand filters and disposal beds as well as an electrical upgrade. Pending MECP approvals, design is to be completed this year with construction planned for 2025.

APPENDIX A: GRAPHS OF 2023 DISCHARGE PARAMETERS VS. EFFLUENT DISCHARGE LIMITS

Mount Elgin WWTP Influent Monthly Average Daily Flow in Cubic Meters per Day, 2023



Mount Elgin WWTP Effluent CBOD₅ (mg/L), 2023



Mount Elgin WWTP Effluent TSS (mg/L), 2023

