2025 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Tillsonburg 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 report details 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:	Tillsonburg WWTP
Wastewater Treatment Plant Number:	110000757
Environmental Compliance Approval (ECA):	6451-BW5LNN (February 12, 2021)
Reporting Period:	January 1, 2025 – December 31, 2025

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 Tillsonburg WWTP is a Class III facility, as defined by Ontario Regulation (O. Reg.) 129/04, which provides wastewater treatment for residential, commercial, and industrial users in the Town of Tillsonburg. The separated wastewater collection system includes three (3) sewage pumping stations (SPS), 125.3 kilometers of sanitary gravity sewers, and 1.7 kilometers of sanitary forcemain sewers. The Tillsonburg WWTP is a conventionally activated sludge plant consisting of primary and secondary treatment, with an outfall pipe to Big Otter Creek.

A standby generator is available to run the main influent pump station (John Pound Road SPS) in the event 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 ECA. Alarms automatically notify operators in the event of failure of critical operational requirements.

The WWTP plant is located in Coronation Park, Tillsonburg, Ontario. The Facility description is provided below:

Facility	Tillsonburg WWTP
Design Capacity	8,180 m^3/d
2025 Average Daily Flow	6,213 m^3/d
2025 Maximum Daily Flow	11,936 m^3/d
2025 Total Volume of Wastewater	2,226,551 $m^3/year$

1.2 Major Expenses

In 2025, the Tillsonburg WWTP had forecast operating and maintenance expenditures of approximately $3,310,000.

Planning for major wastewater system expenses is included within Oxford County's Wastewater Services Master Plan and managed according to our Asset Management and Capital Replacement Program. In addition to regular operational and maintenance expenditures, Capital Improvement Projects for the Town of Tillsonburg were forecast at approximately $4,220,000 which included improvements to the wastewater collection system and the Tillsonburg WWTP.

Notable Tillsonburg Capital Improvement Projects included:

- $480,000 for replacement of general operating equipment;
- $910,000 for Phase 1 Upgrade of the Tillsonburg WWTP;
- $660,000 for Cranberry Line sewer extension;
- $170,000 for Gravity Inlet Trunk Sewer project;
- $850,000 for Stoney Creek sanitary sewer forcemain; and
- $900,000 for Town projects.

Capital Improvement Projects for all systems included:

- $1,340,000 to develop Countywide Supervisory Control and Data Acquisition (SCADA) Master Plan for all wastewater systems.

2. SUMMARY AND INTERPRETATION OF MONITORING DATA

2.1 Effluent Quality Assurance and Control Measures

Sampling Procedure

Raw sewage samples are collected where the influent streams combine before entering the sewage works. A composite sampler collects samples over a 24-hour duration on a bi-weekly basis.

The final effluent 24-hour composite sample is collected on a weekly basis after secondary treatment and disinfection, and prior to the effluent discharge to Big Otter Creek.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, dissolved oxygen (DO), and temperature which are collected and analyzed in the field. All other in-house testing is done for process control, the results of which are not included in this report.

2.2 WWTP Performance and Effluent Quality

Final Effluent Compliance Limits

Compliance limits are defined as the maximum effluent concentrations permitted for a given parameter set by the Ministry of Environment, Conservation and Parks (MECP). Compliance limits are detailed within each WWTP ECA. The limits are determined to prevent impairment to the receiving water body quality. The Owner is legally obligated to operate and maintain the treatment system to ensure the compliance limits are achieved.

The Tillsonburg WWTP provided effective treatment in 2025 and was 100% in compliance with all its regulatory limits for all effluent discharged from the WWTP.

Influent Streams and Effluent Streams

On a bi-weekly basis, the operator measures pH of the influent stream and on a weekly basis, measures pH of the effluent stream. There was no single pH result for the effluent outside the discharge limit of 6.0 - 9.5 in 2025.

Graphs of discharge parameters versus effluent discharge limits are included in this report in Appendix ‘A’.

Influent wastewater characteristics and effluent discharge values are presented in the following tables:

Influent Wastewater Characteristics (annual average)		
Parameter	**Concentration (mg/L)**	**Loading (kg/d)**
$CBOD_5$	386	2,400
Total Suspended Solids	669	4,155
Total Phosphorus	15.8	98
Total Kjeldahl Nitrogen	87	541

Annual Average Effluent Daily Loadings	Annual Average Concentration (mg/L)	Annual Average Daily Effluent Flow (1000 m^3/d)	Result (kg/d)	Limit (kg/d)
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	5.7	6.213	36	206
Total Suspended Solids (TSS)	8.6	6.213	54	206
Total Phosphorus (TP)	0.3	6.213	2	8.2

Effluent Parameter	Sample Frequency	ECA Effluent Limit (Monthly Average) (mg/L unless otherwise indicated)	Monthly Average Result Min-Max (mg/L unless otherwise indicated)	Percentage Removal
$CBOD_5$	weekly	25.0	2.8 – 11.6	97.0 – 99.3
TSS	weekly	25.0	4.8 – 12.0	98.3 – 99.3
TP	weekly	1.0	0.14 – 0.44	97.2 – 99.1
E. coli (May 1 – October 31)	weekly	200 MPN*/100 mL (Monthly Geometric Mean Density)	3.0 – 162.2 MPN/100 mL (Monthly Geometric Mean Density)	--
pH (any single sample)	weekly	6.0 – 9.5	6.7 – 7.65	--

*MPN: Most Probable Number

2.3 Final Effluent Design Objectives

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.

There were some objectives that were not met at the Tillsonburg WWTP in 2025, namely:

- The Monthly Geometric Mean Density Concentration for E. coli of 150 MPN/100 mL for the months of October and November; and
- Several single sample objective exceedances occurred throughout 2025 (found in the table below).

The failure to meet the Monthly Geometric Mean Density Concentration for E. coli of 150 MPN/100 mL for the months of October and November was caused by excessive algae buildup on the disinfection ultraviolet light bulbs. In response, staff hosed and cleaned the bulbs several times during the months of October and November.

The following table presents the range of effluent discharge values vs. ECA Objectives:

Effluent Parameter	**Sample Frequency**	**Monthly Average Objective Concentration** (mg/L unless otherwise indicated)	**Monthly Average Result Min-Max** (mg/L unless otherwise indicated)
$CBOD_5$	weekly	15.0	2.8 – 11.6
TSS	weekly	15.0	4.8 – 12.0
TP	weekly	0.8	0.14 – 0.44
E. coli (May 1 – October 31)	weekly	150 MPN/100 mL (Monthly Geometric Mean Density)	3.0 – 162.2 MPN/100 mL (Monthly Geometric Mean Density)
pH (any single sample)	weekly	6.5 – 8.0	6.7 – 7.65

Monthly average effluent concentrations that failed to meet monthly average objective limits are provided in the following table.

Month	**Parameter**	**Monthly Average Objective Concentration** (mg/L unless otherwise indicated)	**Result** (mg/L unless otherwise indicated)
October 2025	E. coli	150 MPN/100 mL	162 MPN/100 mL
November 2025	E. coli	150 MPN/100 mL	157 MPN/100 mL

Single sample results that failed to meet effluent objectives are provided in the following table:

Date	**Parameter**	**Objective** (mg/L unless otherwise indicated)	**Result** (mg/L unless otherwise indicated)
January 2, 2025	$CBOD_5$	15.0	16.0
February 4, 2025	TSS	15.0	20.0
April 8, 2025	TSS	15.0	17.0
April 15, 2025	$CBOD_5$	15.0	17.0
April 15, 2025	TSS	15.0	17.0
June 3, 2025	TSS	15.0	20.0
July 2, 2025	TSS	15.0	16.0
July 2, 2025	E. coli	150 MPN/100 mL	248 MPN/100 mL

Date	Parameter	**Objective** (mg/L unless otherwise indicated)	**Result** (mg/L unless otherwise indicated)
July 15, 2025	TSS	15.0	16.0
August 27, 2025	E. coli	150 MPN/100 mL	199 MPN/100 mL
September 2, 2025	TSS	15.0	20.0
September 9, 2025	E. coli	150 MPN/100 mL	387 MPN/100 mL
October 7, 2025	E. coli	150 MPN/100 mL	1,203 MPN/100 mL
October 21, 2025	E. coli	150 MPN/100 mL	156 MPN/100 mL
October 28, 2025	E. coli	150 MPN/100 mL	435 MPN/100 mL
November 4, 2025	E. coli	150 MPN/100 mL	166 MPN/100 mL
November 25, 2025	E. coli	150 MPN/100 mL	687 MPN/100 mL
December 2, 2025	TSS	15.0	31.0
December 29, 2025	TSS	15.0	28.0

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

On February 27, 2025, an estimated 180 litres of wastewater leaked from the gravity inlet channel into the overflow piping just ahead of the headwork facility at the Tillsonburg WWTP. The gasket on the overflow sluice gate had a small leak. Staff operated headworks screen units to lower the channel depth, reducing the pressure on the gate. The leak was repaired and staff added additional supports to the sluice gate.

The spill was reported to the Spills Action Centre and MECP at the time of occurrence.

Between April 10 and November 25, Oxford County received fifty-six (56) complaints of odour being emitted from the Tillsonburg WWTP. The complaints began upon completion of the recent major construction upgrade and were related to air being released from HVAC systems on new treatment processes. The County responded to each complaint received, and several actions were implemented during this time and continue to be monitored:

- **Enhanced monitoring and process adjustments:** Since April, staff have conducted enhanced daily monitoring of plant processes, including dissolved oxygen and hydrogen sulfide testing, biological microscopy, weather tracking, and twice-daily community odour checks. Excess scum and grease accumulations are removed as required by vacuum truck, upstream sewers and manholes are regularly monitored and flushed, and removal of dried screenings and grit has increased from bi-weekly to weekly to reduce headworks odours.
- **Odour control systems:** In May, the digester biofilter supplier inspected the aerobic digester odour control systems and completed minor repairs; no media replacement was required at that time, though ongoing monitoring was recommended. A follow-up inspection in June identified new operational issues, and a full biofilter media replacement was completed in October.
- **Chemical optimization:** The polymer supplier reviewed the new biosolids thickening and dewatering processes. Several days of onsite testing were conducted, leading to optimized chemical usage.

- **HVAC and building odour mitigation:** In June, an engineering firm assessed odour mitigation for the new headworks, sludge thickening, and existing biosolids dewatering building. Their report recommended installing ozone equipment to oxidize odorous organic compounds. This work is ongoing, expected to be completed during the spring of 2026.
- **Comprehensive review:** The plant's expansion design engineers were brought onsite in June for a full inspection. They continue to review WWTP data and assist with optimization.

On September 24, a complaint was received about groundwater leaking from a bore hole located on the WWTP property on to the frisbee golf course located adjacent to the facility in Coronation Park. Staff responded, and both the design engineer and geotechnical contractor on the recently completed upgrade are working towards a solution to permanently seal the bore hole.

There were no additional overflows, bypasses, upsets, spills, or abnormal conditions in 2025.

There were no additional complaints in 2025.

Several projects were undertaken in 2025 to eliminate Bypass/Overflow events (in conformance with MECP Procedure F-5-1, meant to ensure all wastewater receives at minimum secondary treatment or greater, as the normal standard of treatment):

- Progress Drive: Watermain, sanitary and storm infrastructure installations;
- Rolling Meadows Storm Water Management Pond: Storm infrastructure improvements;
- Lake Lisgar Weir Repair: Storm infrastructure repairs;
- John Pound Sanitary Sewer Replacement: Sanitary and storm infrastructure improvements;
- Devonshire Culvert Replacement: Storm infrastructure improvements;
- Cranberry Road: Watermain, sanitary and storm infrastructure replacements/installations; and
- Gravity Inlet Trunk: Sanitary gravity line replacement and upsizing.

The following projects have been planned (or will continue) for 2026:

- EA study on John Pound Road SPS and forcemain;
- Gravity Inlet Trunk: Sanitary gravity line replacement and upsizing (continued); and
- Lorraine Avenue sanitary upsizing.

4. MAINTENANCE OF WORKS

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

The Limited Operational Flexibility for modifications to the Tillsonburg WWTP was used in 2025 for the replacement of the standby power system (generator/transfer switch) at the John Pound Road SPS.

5. MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

The calibration of flow meters is conducted yearly by JBF Controls Ltd. in accordance with the requirements of the ECA. The records are kept on-site at the Tillsonburg WWTP.

All other operational monitoring equipment is calibrated by staff and records are kept on-site at the Tillsonburg WWTP.

6. BIOSOLIDS PROGRAM

Biosolids are aerobically digested and dewatered at the Tillsonburg WWTP using an Alfa-Laval Centrifuge. The biosolids are then stored at the County Biosolids Centralized Storage Facility (BCSF) prior to land application. The sampling results and land application details are summarized in a separate Biosolids Annual report, available at: www.oxfordcounty.ca/services-for-you/water-wastewater/wastewater/reports-and-policies.

7. INSPECTION, PILOTS, AND TRIALS

The MECP did not perform an inspection of the Tillsonburg WWTP in 2025. The MECP inspections typically occur on a three-year schedule.

WWTP Upgrade

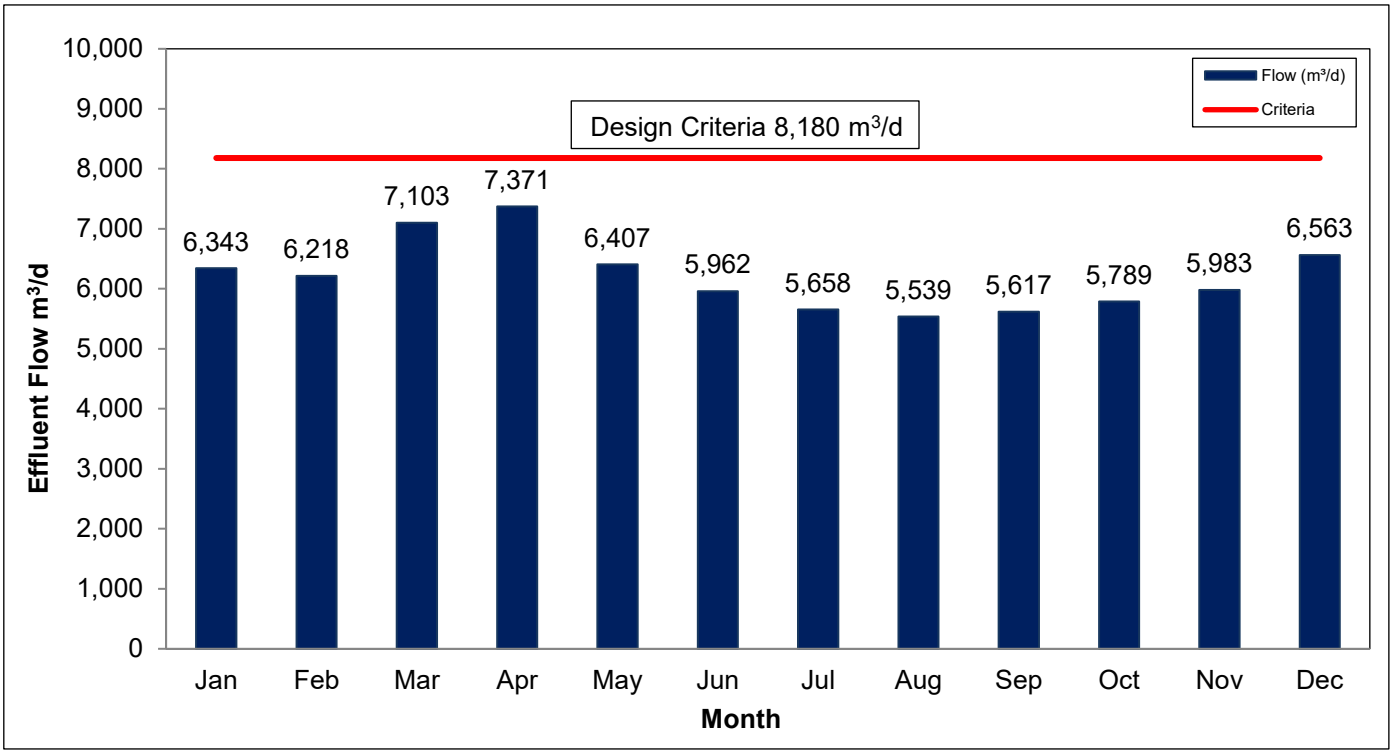
Phase 1 construction upgrades to the Tillsonburg WWTP were completed in early 2025. Upgrades to headworks, primary and secondary clarification, waste thickening, backup power generation, blower and various piping and control upgrades were implemented. The upgrades strategically address WWTP system bottlenecks to improve operational performance, plant resiliency and servicing capacity.

WWTP Odour Control Project

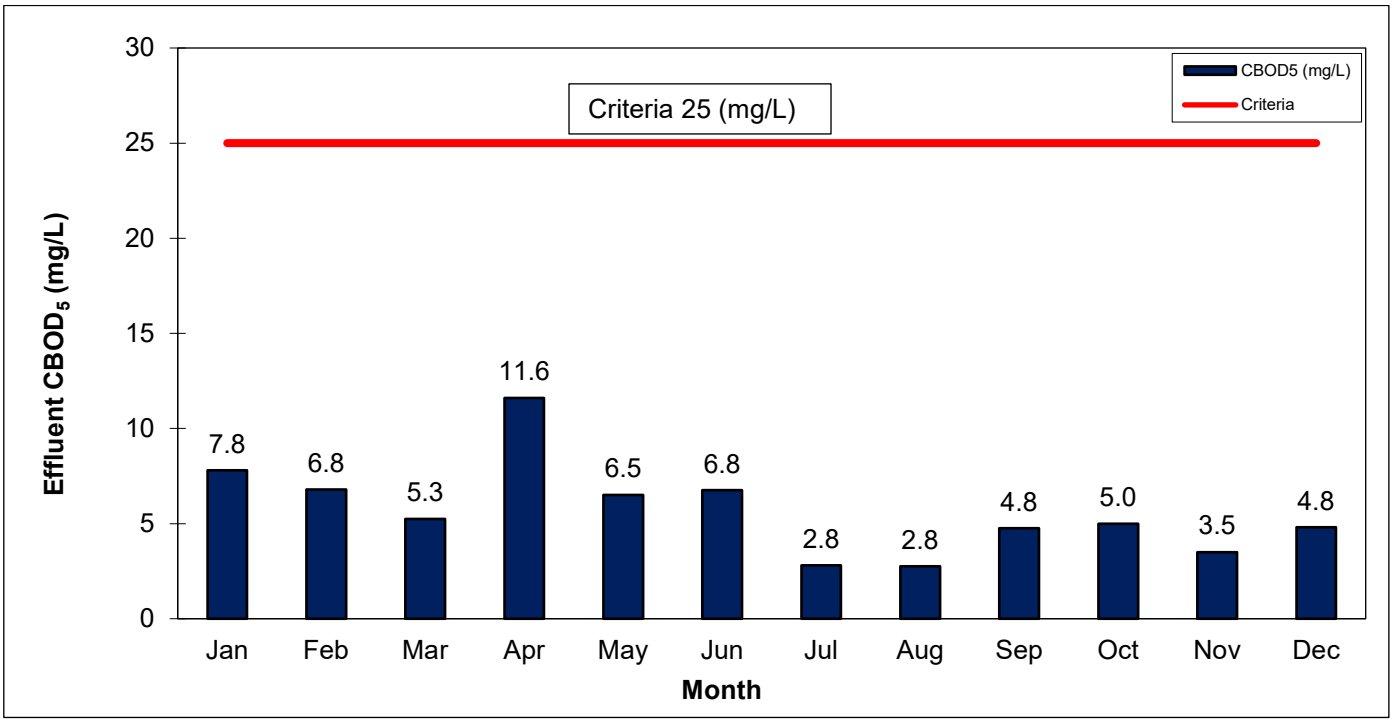
Design work and equipment fabrication for the Tillsonburg Odour Control Project was initiated in September 2025. The project includes the installation of ozone generating odour control equipment, to be integrated into the environmental systems in several buildings at the WWTP. Ozone odour removal equipment is extremely efficient and works by generating ozone (O_3), a highly reactive molecule, which then oxidizes odour-causing substances, effectively breaking them down and neutralizing the odour. The project is expected to be completed Q2 of 2026.

APPENDIX A: GRAPHS OF 2025 DISCHARGE PARAMETERS VS. EFFLUENT DISCHARGE LIMITS

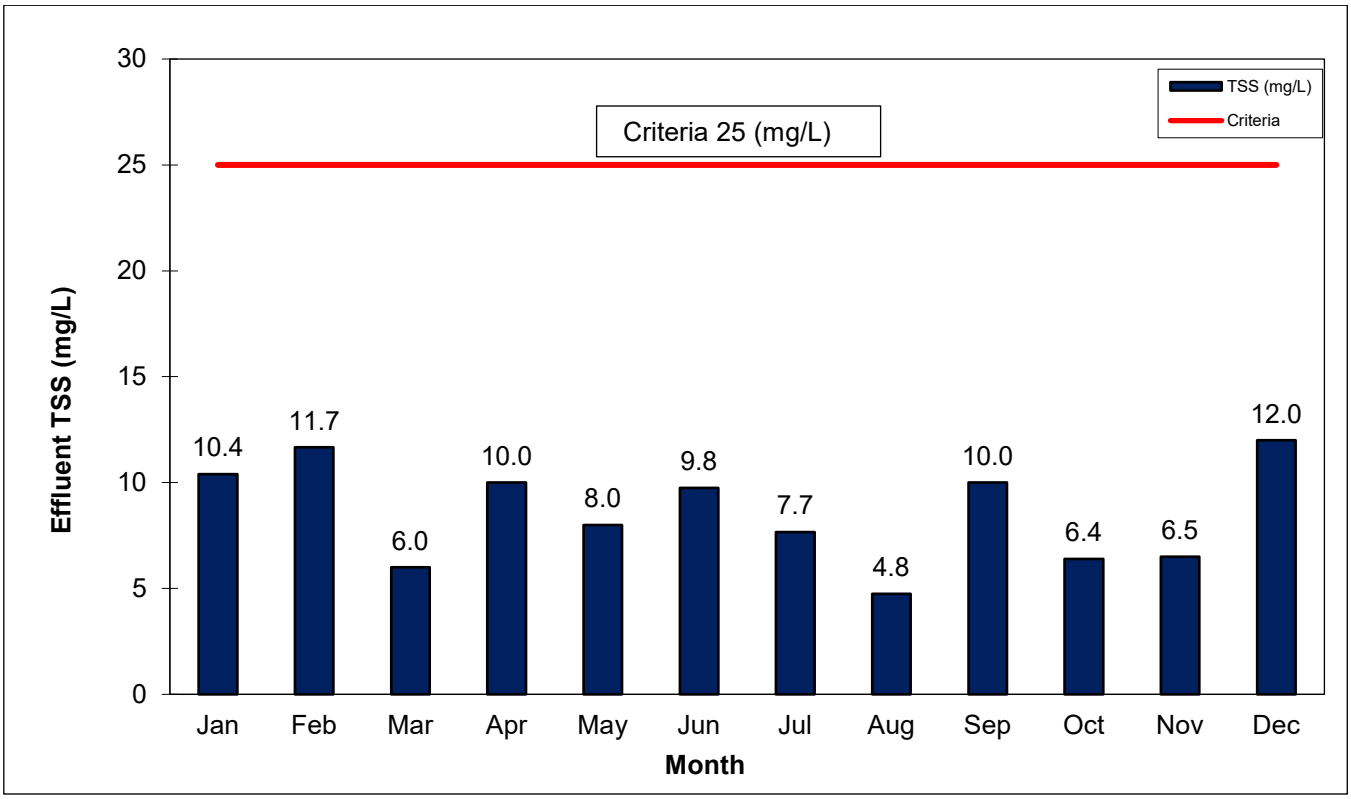
Tillsonburg WWTP Effluent, Monthly Average Daily Flow in Cubic Meters per Day, 2025



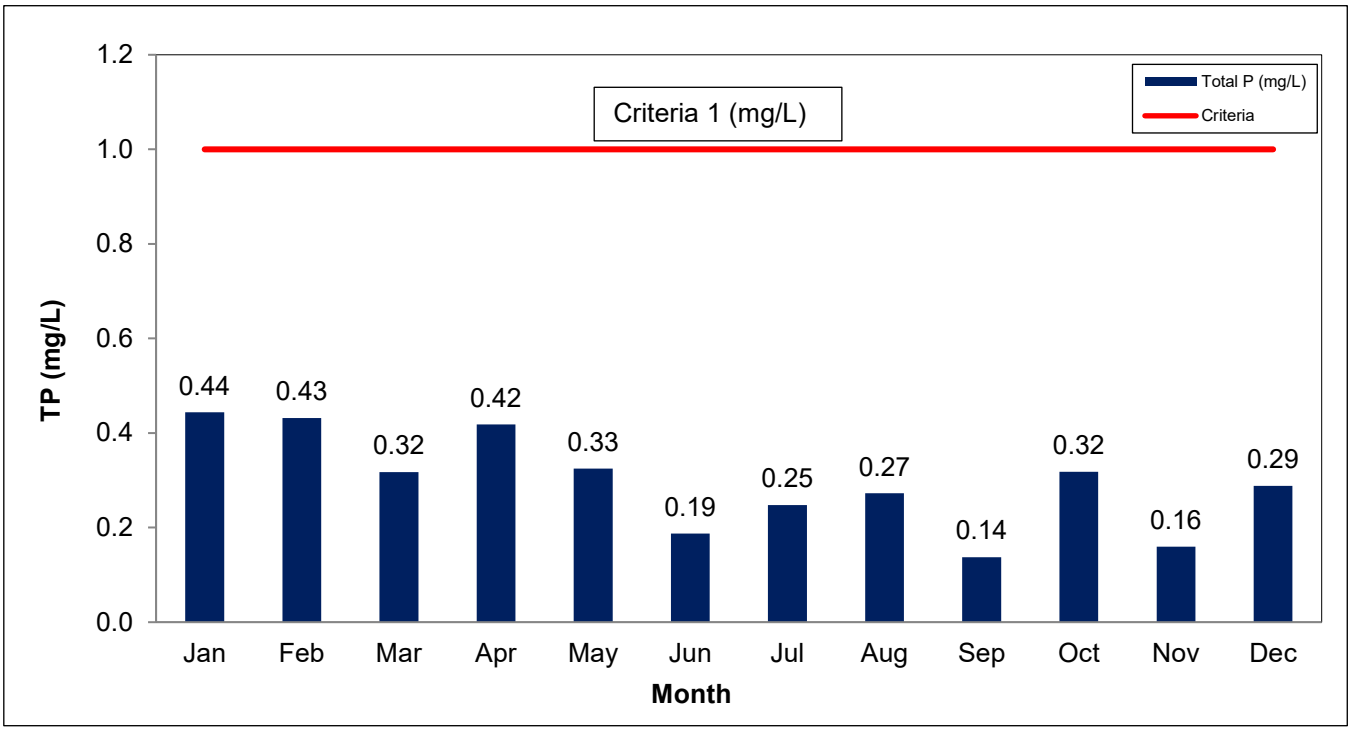
Tillsonburg WWTP Effluent, Monthly Average $CBOD_5$ (mg/L), 2025



Tillsonburg WWTP Effluent, Monthly Average TSS (mg/L), 2025



Tillsonburg WWTP Effluent, Monthly Average TP (mg/L), 2025



Tillsonburg WWTP Effluent, Monthly Geometric Mean Density E. coli (MPN/100 mL), 2025