2024 ANNUAL WASTEWATER TREATMENT SYSTEM SUMMARY REPORT

Tavistock 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:	Tavistock WWTP
Wastewater Treatment Plant Number:	110000720
Environmental Compliance Approval (ECA):	0095-CBJQUJ (March 17, 2022)
Reporting Period:	January 1, 2024 – December 31, 2024

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 Tavistock WWTP is a Class I facility, as defined by Ontario Regulation (O. Reg.) 129/04. The Tavistock WWTP is a lagoon wastewater treatment system serving the Village of Tavistock. The separate wastewater collection system includes three (3) sewage pumping stations (SPS), 23.1 kilometers of sanitary gravity sewers, 2 kilometers of sanitary forcemain sewers and 0.2 kilometers of sanitary low-pressure sewers. The Tavistock WWTP consists of three aerated lagoon cells, one polishing pond and an Intermittent Sand Filter (ISF). Cell 1 is equipped with Ares aerators, cells 2 and 3 are equipped with Mat Aerators, and there are an additional six 15 HP aspirating surface aerators in Cell 1 to provide the necessary dissolved oxygen for the lagoons.

There is also the provision for continuous aluminum sulphate addition for phosphorus removal. The wastewater is dosed with aluminum sulphate as it enters Cell 1 and as it enters Cell 2.

Effluent from Cell 1 overflows to Cell 2, then into Cell 3 and/or Cell 4 where it is pumped through the filter beds and/or stored prior to discharge.

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 is located at 381 William Street, Tavistock, Ontario. The Facility description is provided below:

Facility	Tavistock WWTP
Design Capacity	2,935 m^3/d
2024 Average Daily Flow	1,933 m^3/d
2024 Maximum Daily Flow	6,063 m^3/d
2024 Total Volume of Wastewater	707,996 m^3/year

1.2 Major Expenses

In 2024, the Tavistock WWTP had forecasted operating and maintenance expenditures of approximately $1,914,000.

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, notable Capital Improvement Projects for Village of Tavistock totaled approximately $431,000 which included improvements to the wastewater collection systems and the Tavistock WWTP.

Notable Tavistock Capital Improvement Projects included:

- $281,000 for Williams Street SPS Rehab
- $150,000 for Tavistock WWTP Class EA Study

Capital Improvement Projects for all systems included:

- $427,000 to develop Countywide 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 is sampled a minimum of once monthly for Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), pH, and temperature. Automatic composite samplers are used to collect raw sewage samples from Chamber 3 as the flow enters Cell 1. Automated composite samples are also taken at the same time from a large food processor in Tavistock. The company can discharge significant loadings to the Tavistock WWTP and is subject to a surcharge agreement with the County.

Grab samples of final effluent are taken weekly during effluent discharge and tested for Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), TSS, TP, pH, temperature, dissolved oxygen (DO), nitrate nitrogen, nitrite nitrogen, Total Ammonia Nitrogen (TAN) and un-ionized ammonia.

Laboratory and Field Testing

A licensed laboratory is used to evaluate all samples that are taken for compliance purposes with the exception of pH, temperature, and DO which are collected and analyzed in the field. SGS Lakefield Research Ltd. performs all laboratory analyses. 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 Tavistock WWTP provided effective treatment in 2024 and was 100% in compliance with all its regulatory limits for all effluent discharged from the WWTP.

Influent Streams and Effluent Streams

On a weekly basis (minimum), the operator measures the pH of the effluent stream when discharging. There was no single pH result for the effluent outside the discharge limit of 6.0 – 9.5 in 2024.

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 tables below:

Influent Wastewater Characteristics (annual average)		
Parameter	**Concentration (mg/L)**	**Loading (kg/d)**
$CBOD_5$	688	1,331
Total Suspended Solids	430	832
Total Phosphorus	16.5	32
Total Kjeldahl Nitrogen	65.5	127

Effluent Parameter	**Sample Frequency** (when discharging)	**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	15.0	3.5 – 6.7	99.0 - 99.5
TSS	weekly	15.0	2.0 – 9.5	97.8 - 99.5
TP (May-November)	weekly	0.5	0.08 – 0.15	99.1 – 99.5
TP (December-April)	weekly	0.8	0.07 – 0.23	98.6 – 99.6
Total Ammonia Nitrogen (January)	weekly	7.0	2.6	-
Total Ammonia Nitrogen (February)	weekly	10.0	4.5	-
Total Ammonia Nitrogen (March)	weekly	8.5	1.3	-
Total Ammonia Nitrogen (April)	weekly	8.0	1.9	-
Total Ammonia Nitrogen (May-November)	weekly	1.0	0.1 – 1.0	-
Total Ammonia Nitrogen (December)	weekly	3.0	0.6	-
pH any single sample	weekly	6.0 - 9.5	6.8 – 8.7	-

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 was one monthly average objective exceedance in 2024 related to effluent TAN. There were some single sample effluent objective exceedances, which are summarized in the tables below.

During the month of May, one of the four effluent sand filter beds experienced a valve failure and had to be removed from service which impacted the nitrification efficiency of the process. A new valve was purchased and installed. The sand filter bed was put back online, and the nitrification efficiency improved.

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

Effluent Parameter	**Sample Frequency** (when discharging)	**Monthly Average Objective Concentration** (mg/L)	**Monthly Average Result Min-Max** (mg/L)
$CBOD_5$	weekly	10.0	3.5 – 6.7
TSS	weekly	10.0	2.0 – 9.5
TP (May-November)	weekly	0.3	0.08 – 0.15
TP (December-April)	weekly	0.5	0.07 – 0.23
Total Ammonia Nitrogen (January)	weekly	6.0	2.6
Total Ammonia Nitrogen (February)	weekly	9.0	4.5
Total Ammonia Nitrogen (March)	weekly	7.5	1.3
Total Ammonia Nitrogen (April)	weekly	7.0	1.9
Total Ammonia Nitrogen (May-November)	weekly	0.8	0.1 – 1.0
Total Ammonia Nitrogen (December)	weekly	1.5	0.6
pH any single sample	weekly	6.5 – 9.0	6.8 – 8.7

Tavistock WWTP effluent single samples that did not meet effluent objective concentrations in 2024 include the following:

Date	**Parameter**	**Objective (mg/L)**	**Result (mg/L)**
January 17, 2024	TSS	10.0	12.0
January 24, 2024	TSS	10.0	11.0

Date	Parameter	Objective (mg/L)	Result (mg/L)
February 7, 2024	TSS	10.0	13.0
February 14, 2024	TSS	10.0	20.0
May 1, 2024	TAN	0.8	2.9
May 8, 2024	TAN	0.8	2.5
May 15, 2024	TAN	0.8	1.6
May 30, 2024	TAN	0.8	0.9
June 26, 2024	TAN	0.8	2.4
July 3, 2024	TAN	0.8	1.3
July 10, 2024	TAN	0.8	1.3
July 17, 2024	TAN	0.8	1.5

Tavistock WWTP effluent monthly average concentrations that did not meet effluent objective concentrations in 2024 include the following:

Month	Parameter	Objective (mg/L)	Monthly Average Result (mg/L)
May 2024	TAN	0.8	1.0

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

There were no overflows, bypasses, upsets, or spills from the Tavistock WWTP in 2024.

There were several complaints received in 2024.

The County received 18 complaints related to odour between July 15 and October 25. The WWTP was receiving large quantities of high strength non-residential sewage, which was exceeding the organic loading capacity of the treatment plant. In response, operation staff diverted a portion of the influent flow into cell 2 to reduce the loading demands on cell 1, additional sampling and testing was undertaken, calcium nitrate was dosed into the WWTP to prevent the formation of odorous sulphides and staff began continuously monitoring and data logging the sulfide gas concentrations at the WWTP. Oxford County initiated a Municipal Class Environmental Assessment (Class EA) Study to explore a range of possibilities for expanding the Tavistock Wastewater Treatment Plant (WWTP) in order to determine the most appropriate solution that will support the growing wastewater servicing needs within the Village of Tavistock in the Township of East Zorra-Tavistock.

The was one complaint in 2024 related to noise. In response operation staff monitored sound levels onsite and offsite. Sound levels were found to be acceptable and typical of the WWTP.

No projects were undertaken in 2024 or are forecasted to be completed 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).

4. MAINTENANCE OF WORKS

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

The Limited Operational Flexibility for modification to the Tavistock WWTP was used in 2024 for one project:

- A rotary lobe blower was replaced with an equivalent unit. The replacement blower operates at the same duty point as the existing blower (23.75 m^3/min at a pressure of 58.7 kPa). The replacement blower will operate at a higher speed, but a lower horsepower compared to the existing blower. The anticipated environmental impacts are negligible as the treatment process will remain unchanged.

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 WWTP.

All other operational monitoring equipment calibration records are kept on-site at the Tavistock WWTP.

6. INSPECTION, PILOTS, AND TRIALS

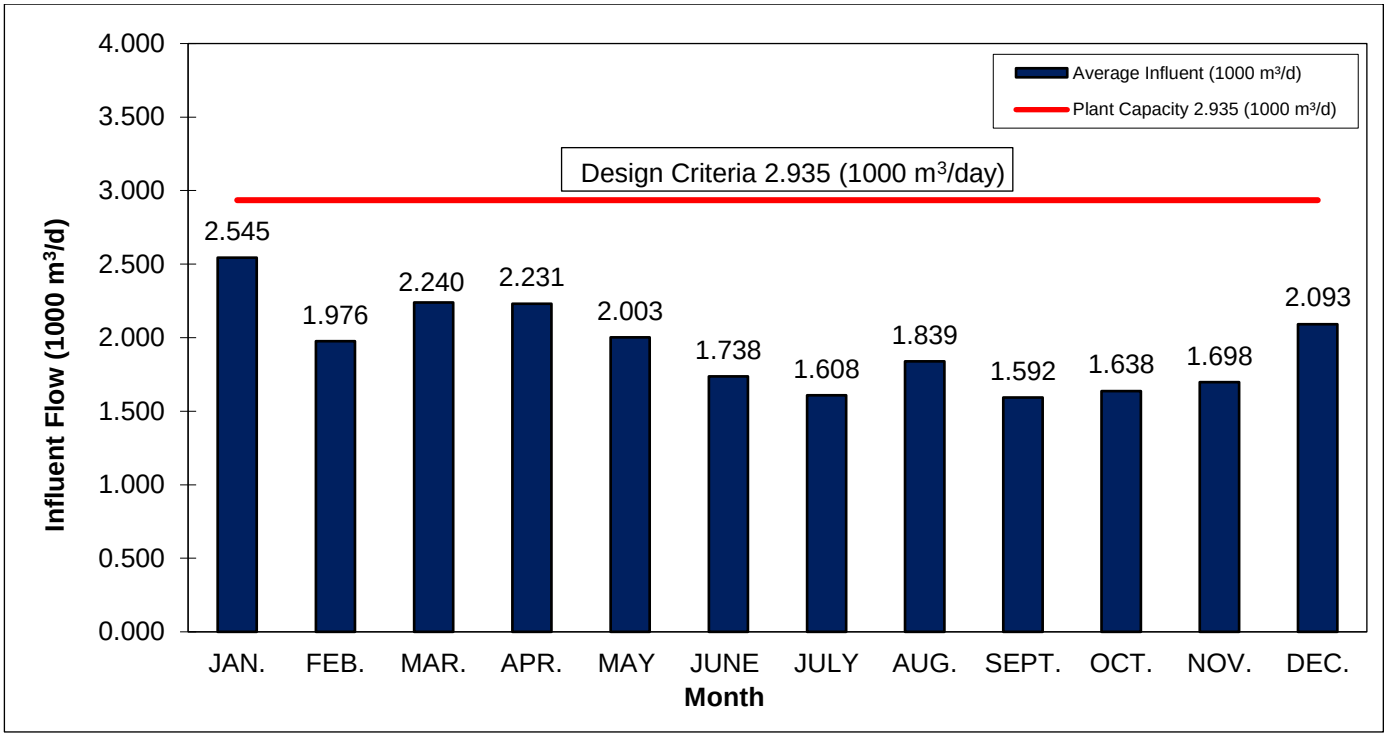
The MECP did not conduct an inspection of the Tavistock WWTP in 2024. The MECP inspections typically occur on a three-year schedule.

Municipal Class Environmental Assessment Study

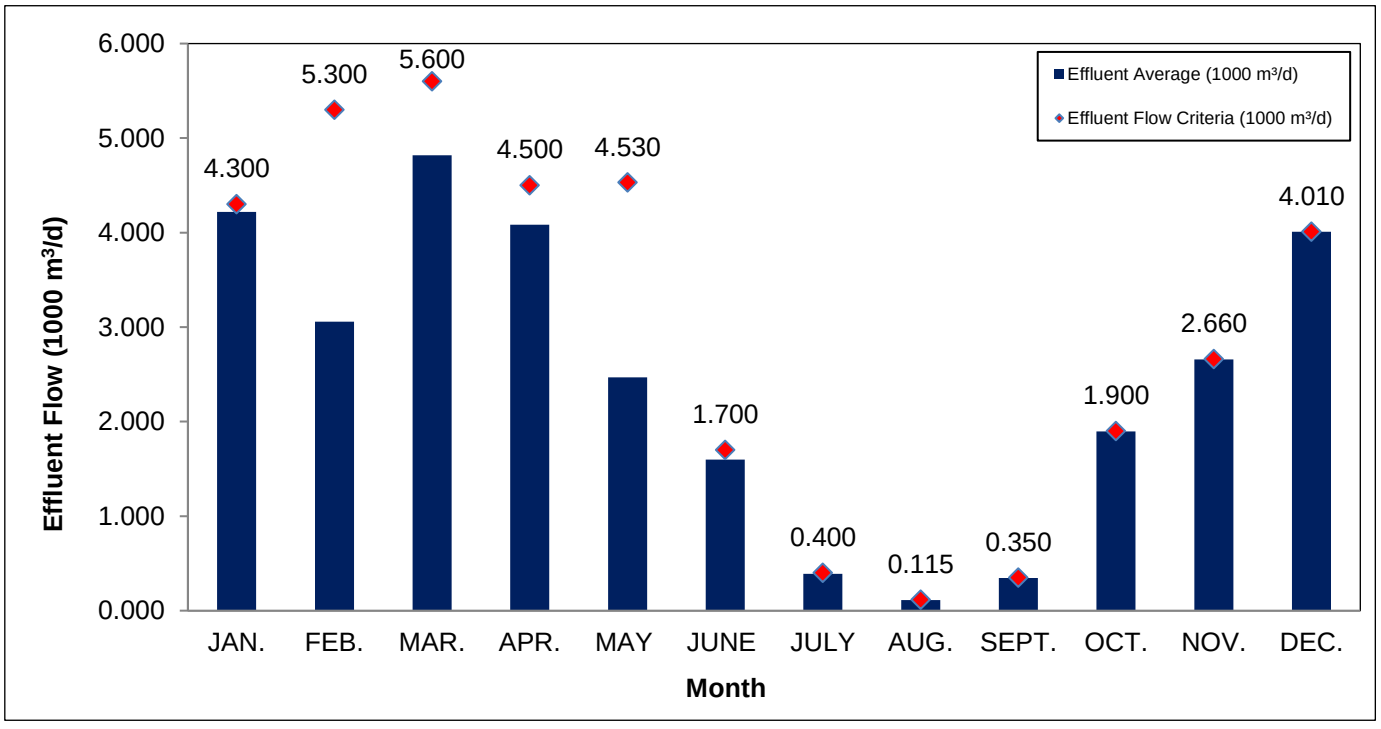
In response to future growth in the Village of Tavistock, and associated projected increases in Tavistock WWTP flow rates, the County initiated a Municipal Class EA Study for capacity expansion of the Tavistock WWTP which commenced in 2024. The study will determine the most cost-effective, environmentally sound, and sustainable approach to expand the Tavistock WWTP to meet the wastewater servicing needs of the community. The Class EA Study is underway and is expected to be completed in 2025.

APPENDIX A: GRAPHS OF 2024 DISCHARGE PARAMETERS VS. EFFLUENT DISCHARGE LIMITS

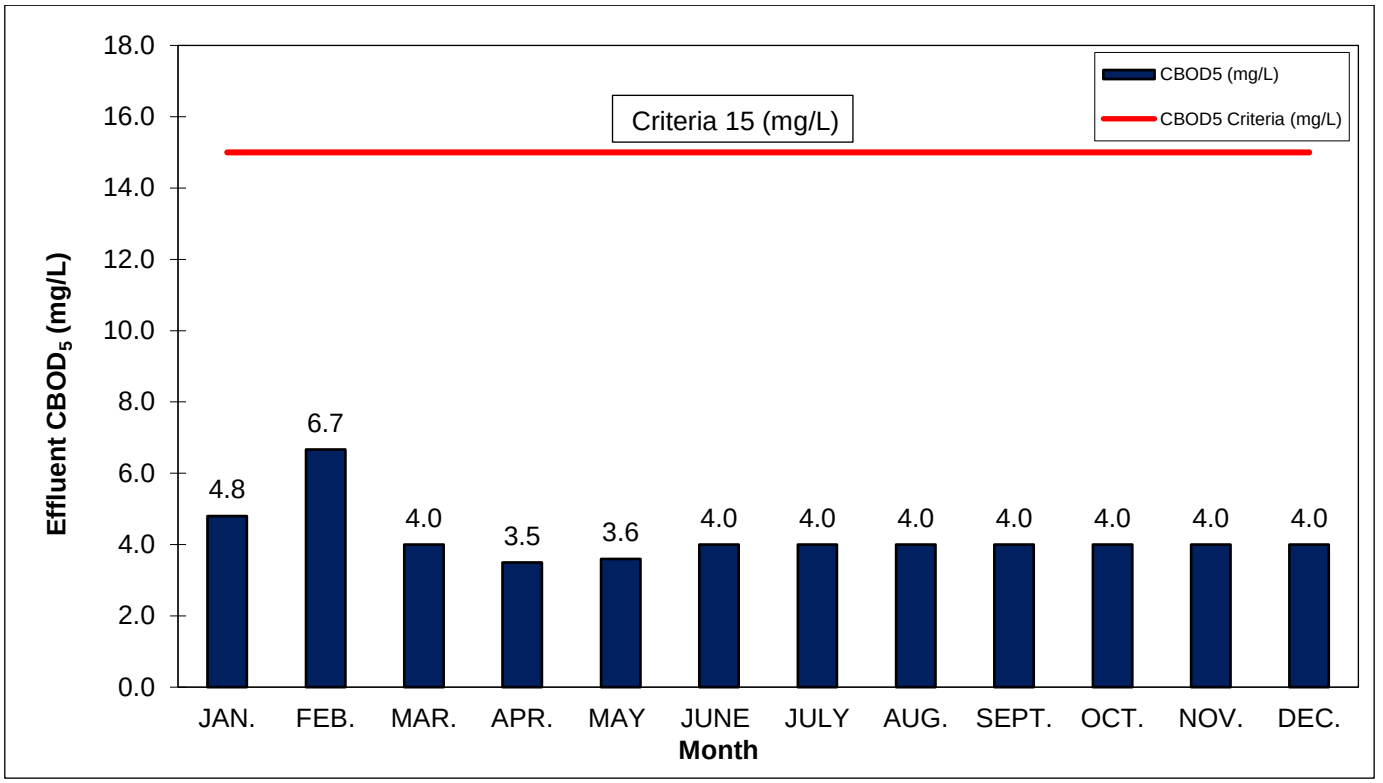
Tavistock WWTP Influent, Monthly Average Daily Flow (1000 m^3/d), 2024



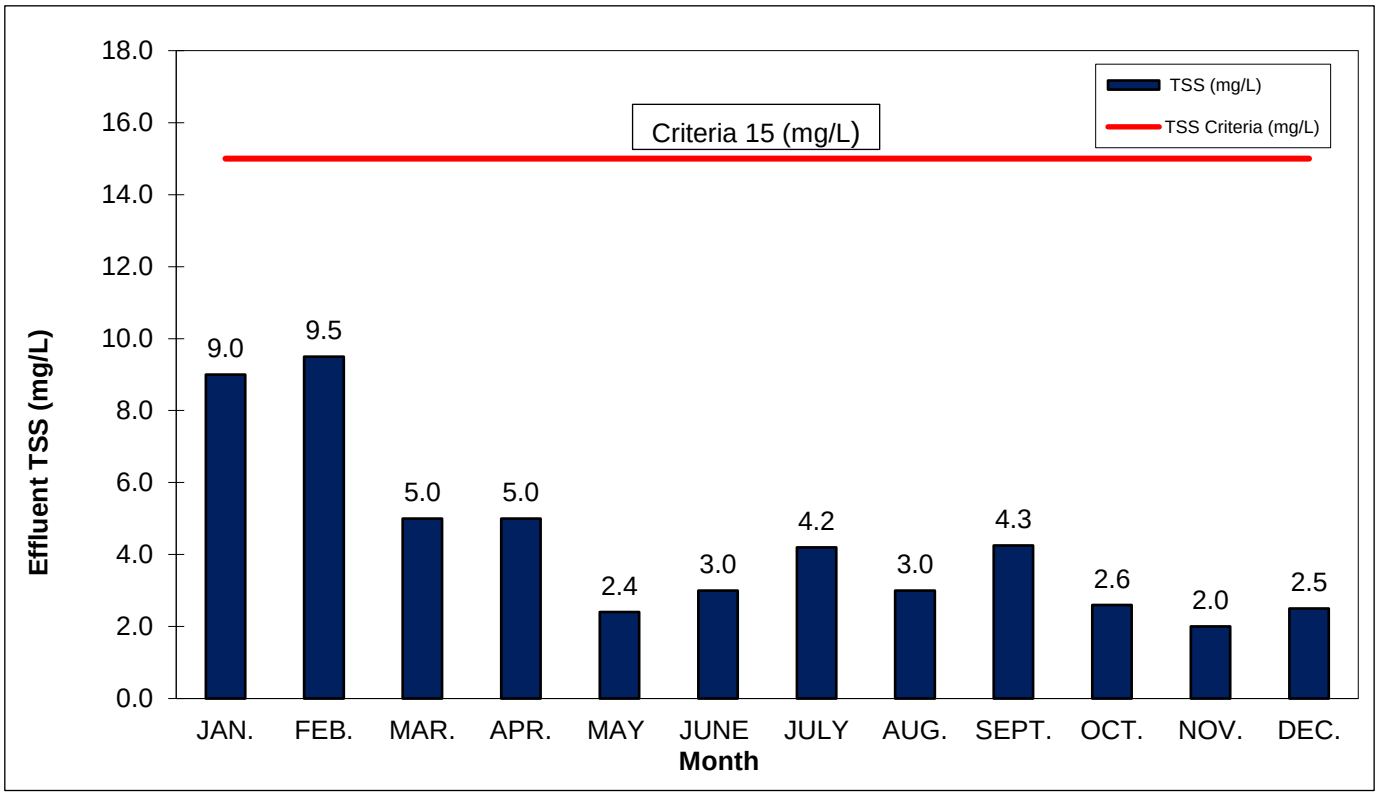
Tavistock WWTP Effluent, Monthly Average Daily Flow (1000 m^3), 2024



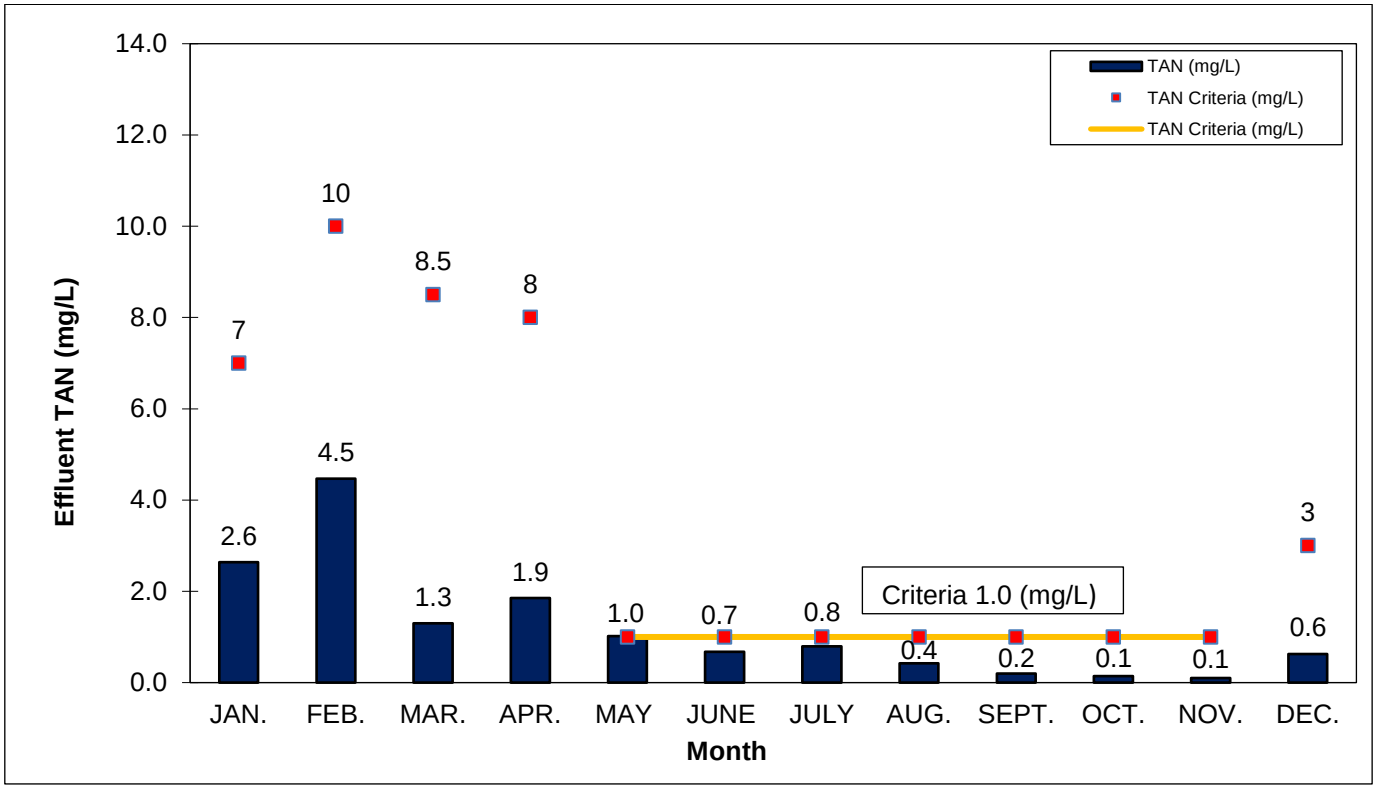
Tavistock WWTP Effluent, Monthly Average $CBOD_5$ (mg/L), 2024



Tavistock WWTP Effluent, Monthly Average TSS (mg/L), 2024



Tavistock WWTP Effluent, Monthly Average TAN (mg/L), 2024



Tavistock WWTP Effluent, Monthly Average TP (mg/L), 2024