

March 12, 2025

Municipality of West Perth
160 Wellington Street
P.O. Box 609
Mitchell, Ontario N0K 1N0

**ATTENTION: Mr. Dan Hobson
CAO**

**REFERENCE: 2024 Annual Wastewater Report
Mitchell Wastewater Treatment Plant**

Please find enclosed the 2024 Annual Wastewater Report for the Town of Mitchell Wastewater Treatment Plant and Collection System. The report is prepared in accordance with the criteria outlined in the Environmental Compliance Approval #6954-B6YMGQ for the reporting period of January 1, 2024 to December 31, 2024. The report also includes a brief nitrate monitoring summary as per the West Perth Nitrate and Reporting Plan.

On behalf of the Municipality, a copy of this report has been sent to Mr. Neville Rising of the Ministry of Environment, Conservation and Parks London District Office and the District Manager.

Yours very truly,



Environmental Services
Municipality of West Perth

Table of Contents

A. Summary and interpretation of all influent, imported sewage and processed organic waste monitoring data and a review of the historical trend of the characteristics and flow rates;.....	3
B. Summary and interpretation of final effluent monitoring data;	8
C. Summary of deviations from the 2024 monitoring schedule and reasons and a schedule for 2025;.....	13
D. Summary of operating issues encountered and corrective actions taken;.....	15
E. Summary of repairs and maintenance activities;.....	15
F. Summary of effluent quality assurance;	16
G. Summary of calibration and maintenance carried out on monitoring equipment;	17
H. Summary of efforts made to achieve the design objectives;	17
I. A tabulation of generated sludge, locations of sludge disposal and anticipated volumes for the next reporting period;.....	17
J. Summary of complaints received, and actions taken to address the complaints;.....	18
K. Summary of all bypasses, overflows, spills or abnormal discharge events;	18
L. Summary of all notice of modifications to sewage works completed including a report on status of implementation of all modification;.....	18
M. Summary of efforts made to achieve conformance with procedure F-5-1;	18
N. Changes or updates to the schedule for the completion of construction and commissioning operation of major process(es)/equipment groups in the proposed works;.....	19
O. Nitrogen monitoring summary;	20
P. Annual compliance summary for 2024;	21

A. Summary and interpretation of all Influent, Imported Sewage and Processed Organic Waste monitoring data and a review of the historical trend of the characteristics and flow rates;

The Mitchell Wastewater Treatment Plant (MWWTP) receives wastewater from residential properties, small businesses, and industrial facilities through the collection system. The two largest wastewater producers are a dairy production facility and poultry processing facility. Environmental Services measures discharge volumes of both facilities independently.

The annual average influent flow to the MWWTP was approximately 4.781 MLD, which represents approximately 66.4% of the hydraulic design capacity for the treatment facility (average day design flow of 7.2 MLD). The maximum daily flow of 15.369 MLD occurred in the month of January. Both the average and maximum daily flows for the year were lower than in 2023 (average of 0.244 MLD, maximum of 2.861 MLD).

The MWWTP was able to treat the average daily flows. Peak flows were diverted and temporarily stored in the peak overflow cell and pumped back into the treatment plant when incoming flow volumes returned to normal.

The MWWTP has an on-site receiving station that is designed to accept imported liquid waste. Accepted waste is pumped and metered to the MWWTP during periods of low loading. Imported waste was not accepted in 2024.

Table 1 shows the monthly average characteristics of waste entering the MWWTP, Table 2 shows the monthly average characteristics of the imported waste, and Table 3 shows the average monthly influent volumes in 2024.

2024 Monthly Average Influent	BOD₅ (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
January	326.00	33.80	11.04	220.40
February	267.75	27.80	9.67	159.60
March	279.25	24.50	14.26	239.08
April	258.00	17.20	15.19	244.92
May	272.50	21.00	12.90	251.65
June	372.50	27.00	15.92	379.60
July	620.00	26.20	15.31	297.68
August	475.00	24.00	17.65	272.80
September	682.00	35.80	17.25	338.18
October	670.00	40.50	21.70	354.93
November	469.75	46.00	15.75	286.30
December	357.00	23.80	7.32	263.00

Table 1: Summary of 2024 influent concentrations.

2024 Imported Waste Averages	BOD₅ (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
January	N/A	N/A	N/A	N/A
February	N/A	N/A	N/A	N/A
March	N/A	N/A	N/A	N/A
April	N/A	N/A	N/A	N/A
May	N/A	N/A	N/A	N/A
June	N/A	N/A	N/A	N/A
July	N/A	N/A	N/A	N/A
August	N/A	N/A	N/A	N/A
September	N/A	N/A	N/A	N/A
October	N/A	N/A	N/A	N/A
November	N/A	N/A	N/A	N/A
December	N/A	N/A	N/A	N/A

Table 2: Summary of 2024 imported waste influent characteristics.

2024 Influent	Average Monthly Influent (m³)
January	6496
February	4991
March	6203
April	6224
May	4544
June	3907
July	4556
August	3949
September	3694
October	3681
November	4002
December	5120

Table 3: The average monthly volume of all influent to the MWWTP in 2024.

The following graphs display the average monthly concentrations of specified parameters of influent to the MWWTP for 2023 and 2024:

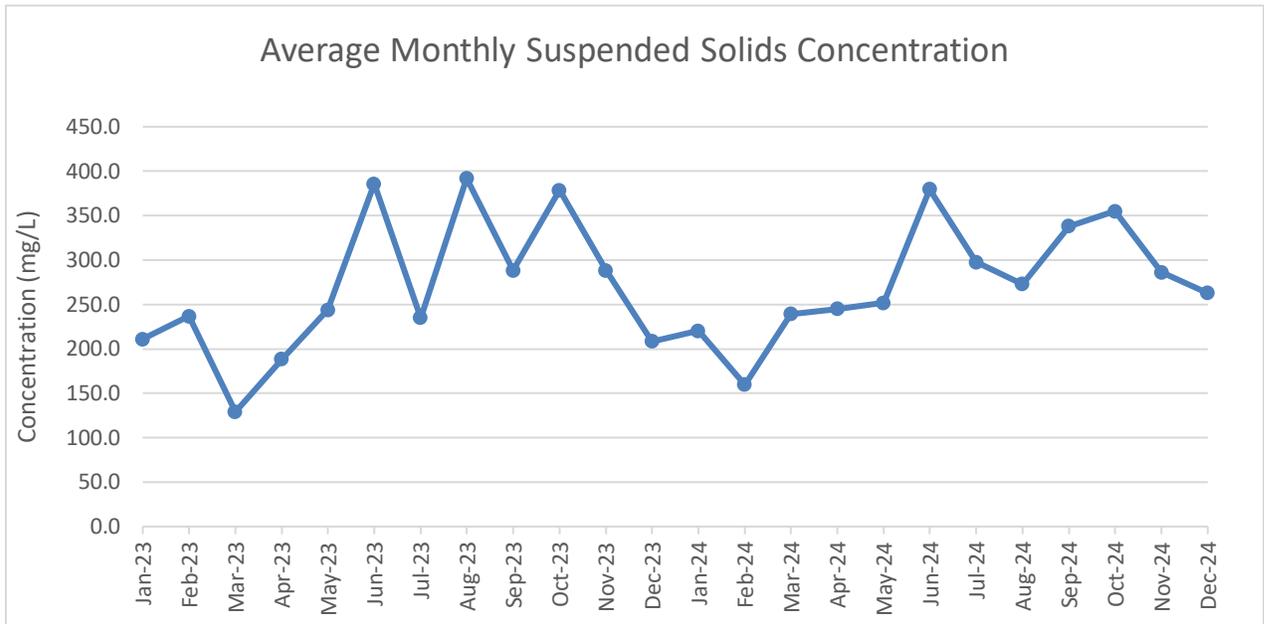


Figure 1: The historical trend of suspended solids concentration from January 2023 - December 2024.

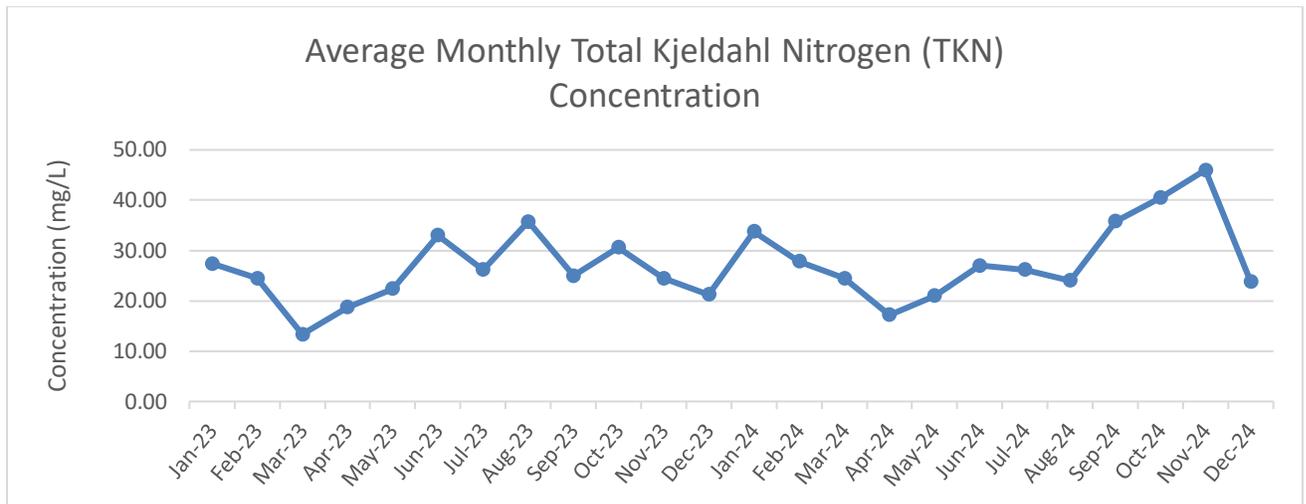


Figure 2: The historical trend of total kjeldahl nitrogen concentration from January 2023 - December 2024.

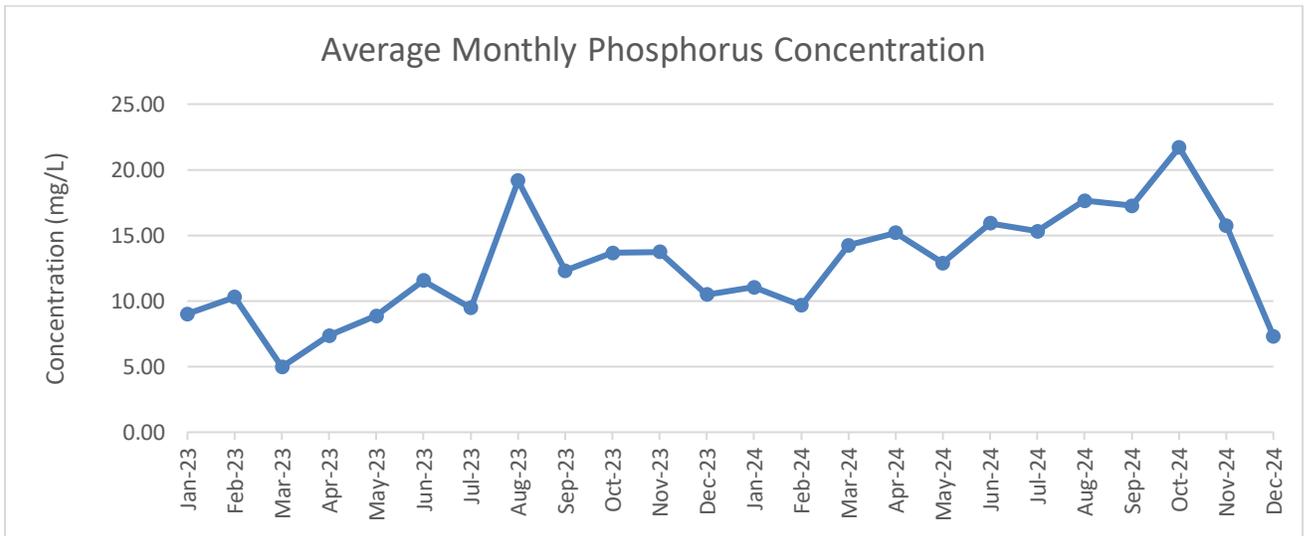


Figure 3: The historical trend of total phosphorus concentration from January 2023 - December 2024.

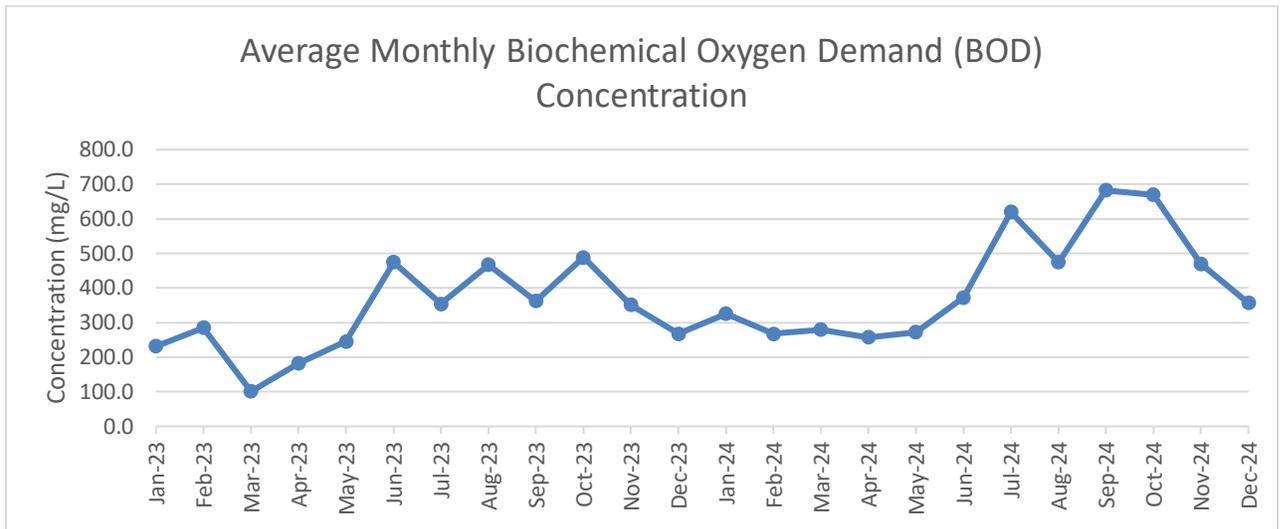


Figure 4: The historical trend of biochemical oxygen demand concentration from January 2023 - December 2024.

The following graphs show the flow rates of influent and imported waste to the MWWTP in 2023 and 2024:

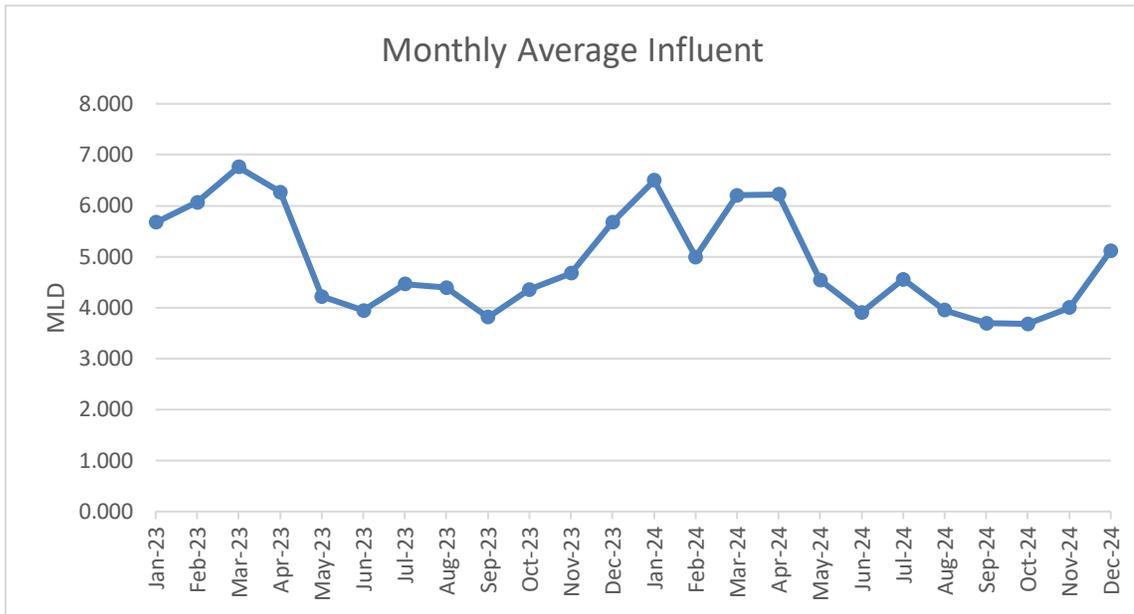


Figure 5: The historical trend of monthly average influent to the MWWTP from January 2023 – December 2024.

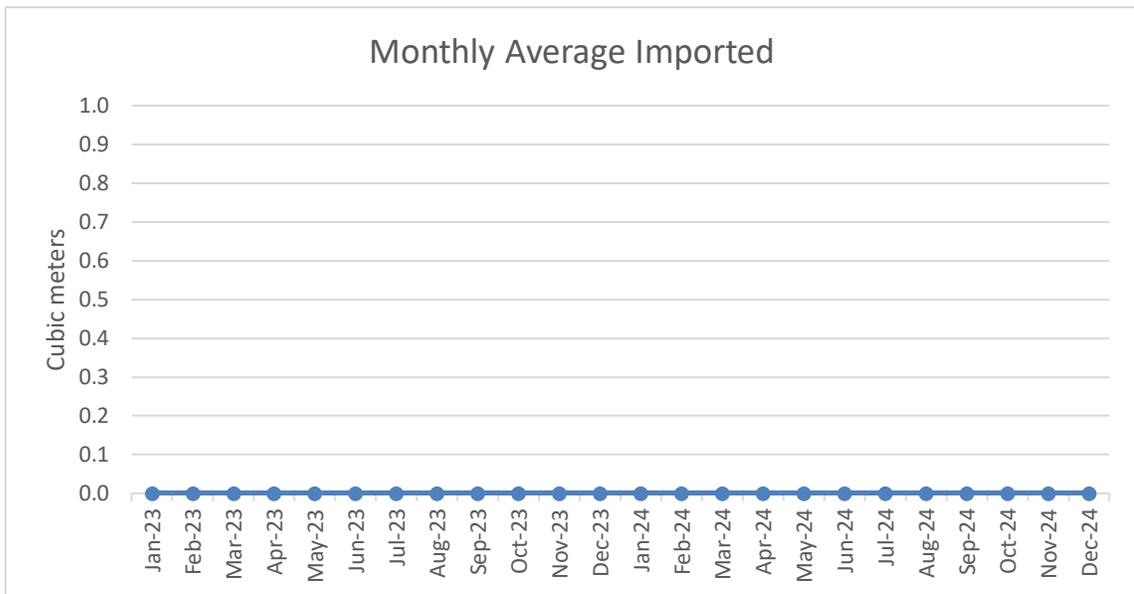


Figure 6: The historical trend of monthly average imported waste to the MWWTP from January 2023 - December 2024.

B. Summary and interpretation of final effluent monitoring data:

The following tables and graphs compare the effluent concentrations in 2024 to compliance limits and design objectives stated in the Environmental Compliance Approval (ECA):

Effluent Parameter	Annual Average Concentration	Concentration Criteria Limit	Concentration Criteria Limit
		Dec 1 – Apr 30	May 1 – Nov 30
CBOD ₅	2.41 mg/L	15.0 mg/L	10.0 mg/L
Total Suspended Solids	4.56 mg/L	15.0 mg/L	10.0 mg/L
Total Phosphorus	0.27 mg/L	1.0 mg/L	0.5 mg/L
Total Ammonia Nitrogen	0.19 mg/L	5.0 mg/L	3.0 mg/L
E. Coli	2 CFU / 100 mL	200 CFU/ 100 mL using MPN Method Mar 15 to Oct 31	
pH	7.49	Between 6.0-9.5 inclusive	
Unionized Ammonia	0.0019 mg/L	0.1 mg/L	

Table 4: 2024 annual average effluent concentrations compared to the design limits for specified periods.

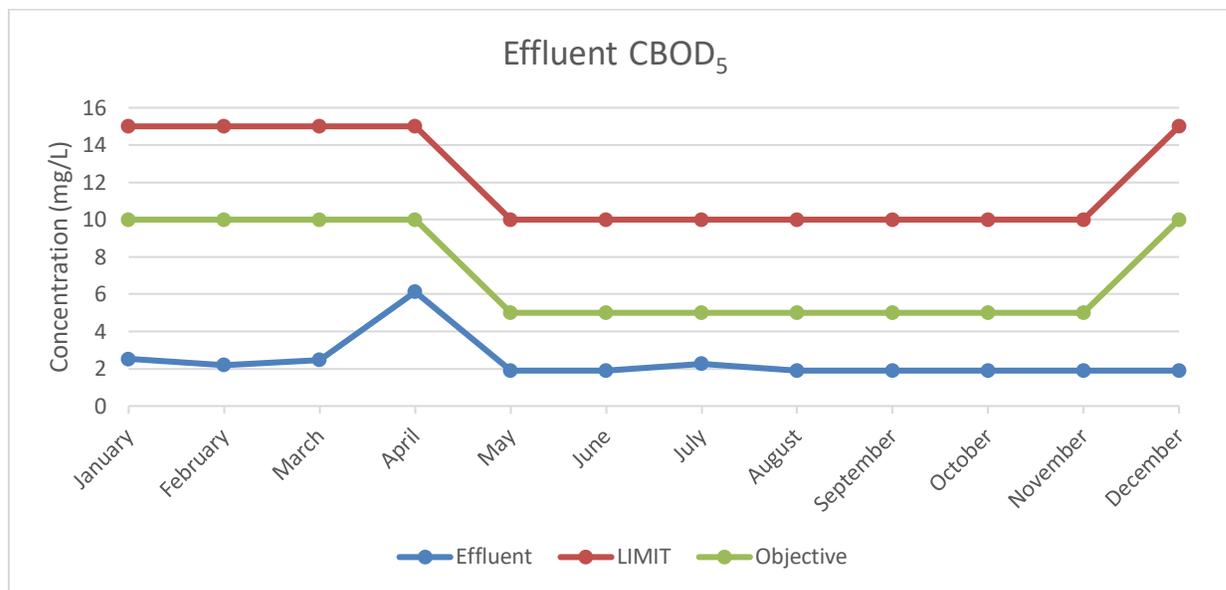


Figure 7: Comparison of the 2024 monthly average concentrations of effluent CBOD₅ to design objectives and compliance limits.

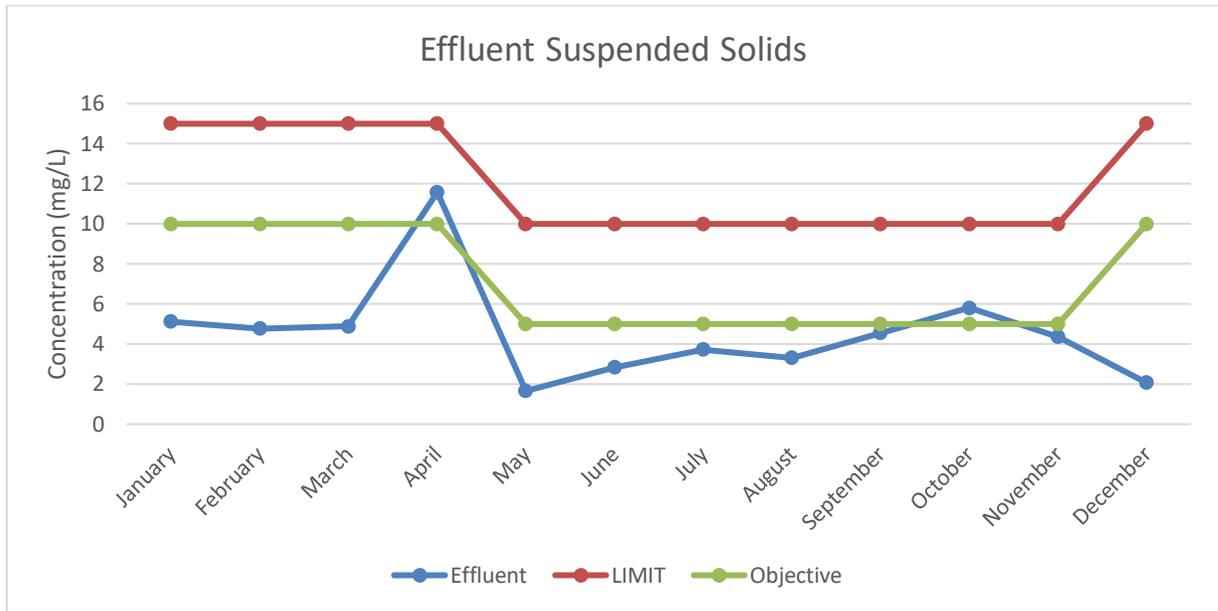


Figure 8: Comparison of the 2024 monthly average concentrations of effluent suspended solids to design objectives and compliance limits.

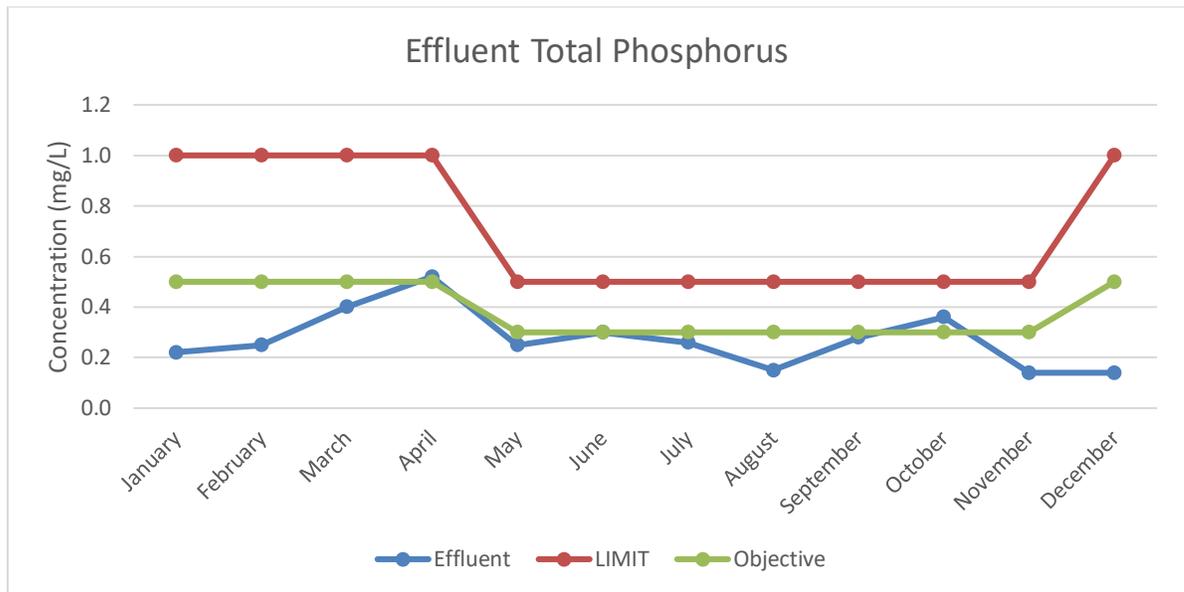


Figure 9: Comparison of the 2024 monthly average concentrations of effluent total phosphorus to design objectives and compliance limits.

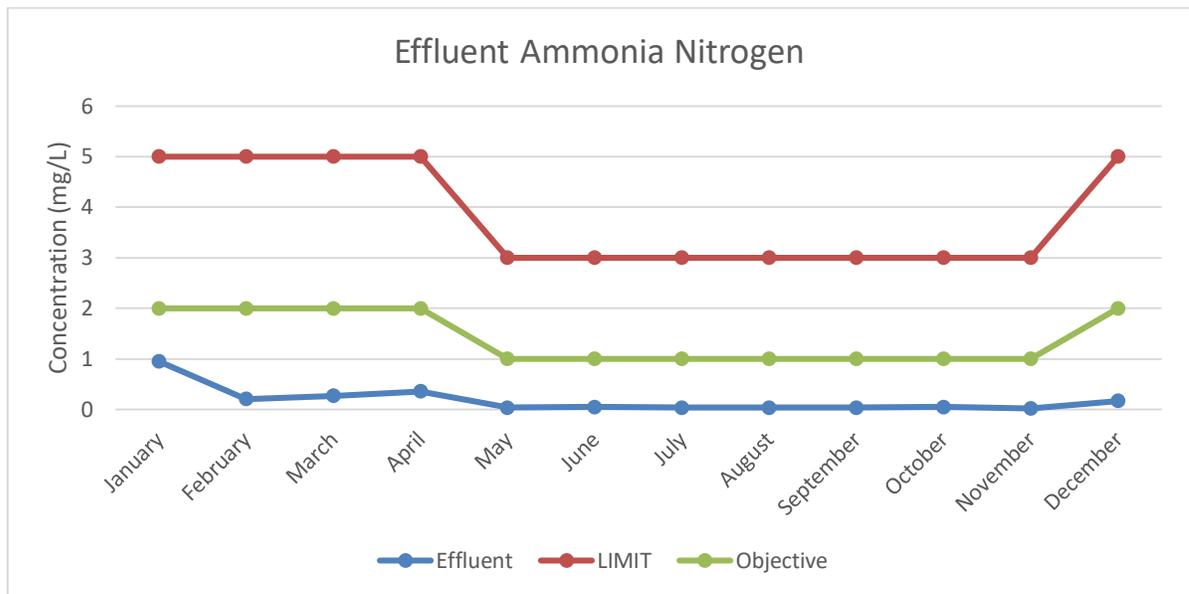


Figure 10: Comparison of the 2024 monthly average concentrations of effluent ammonia nitrogen to design objectives and compliance limits.

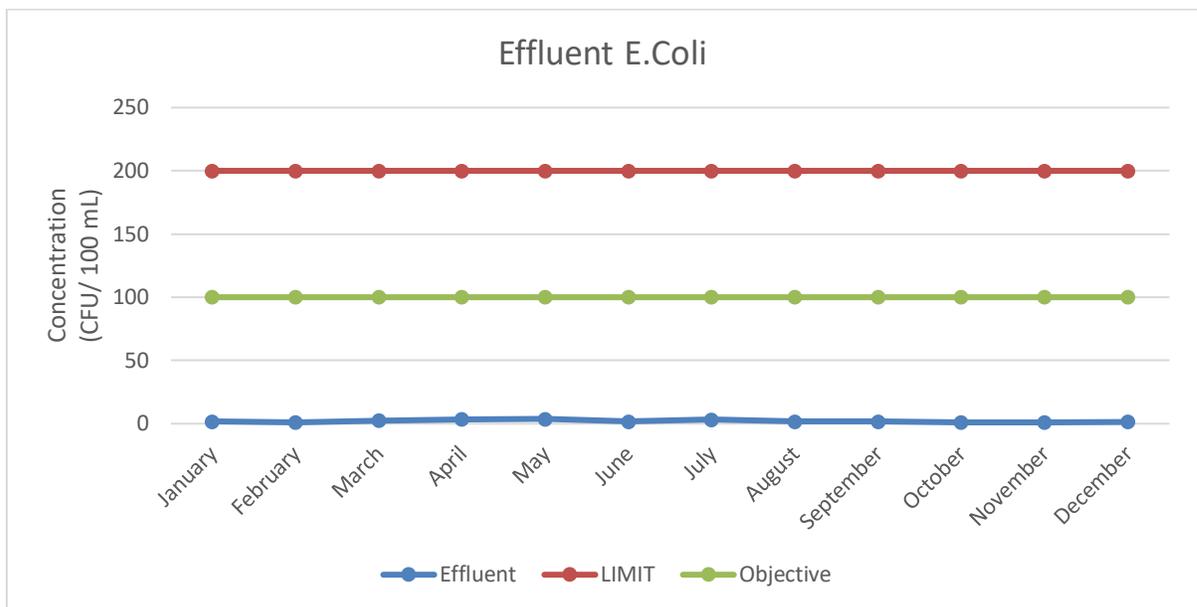


Figure 10: Comparison of the 2024 monthly average concentrations of effluent E. Coli to design objectives and compliance limits.

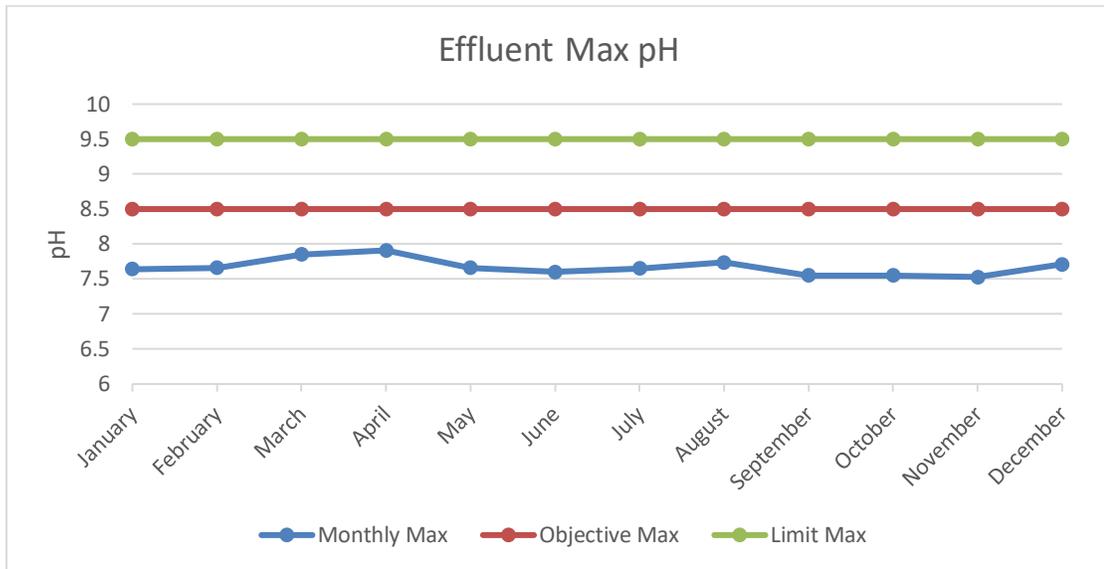


Figure 11: Comparison of the 2024 monthly maximum effluent pH to design objectives and compliance limits.

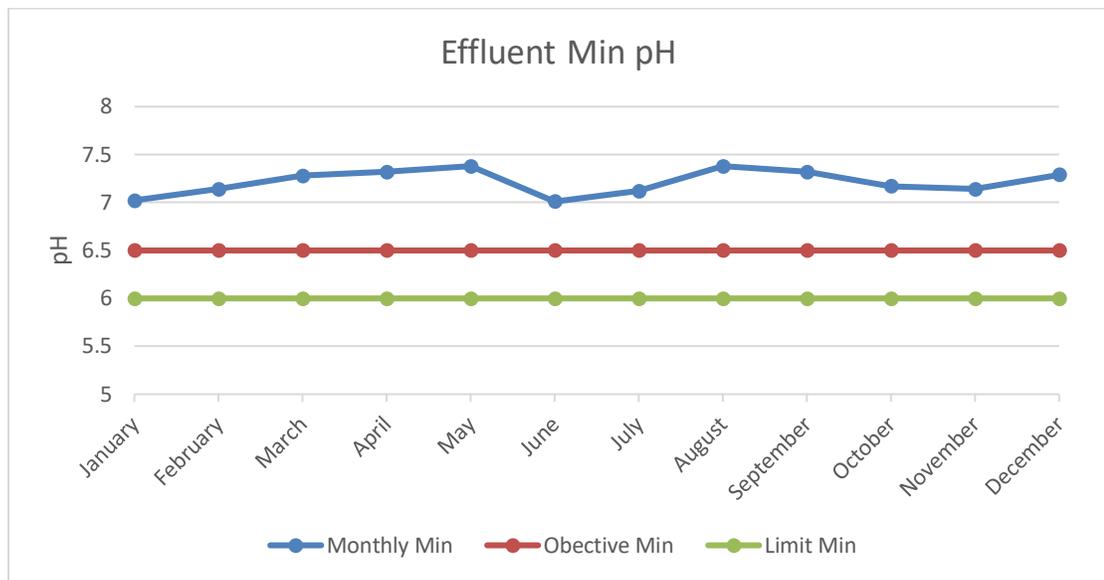


Figure 12: Comparison of the 2024 monthly minimum effluent pH to design objectives and compliance limits.

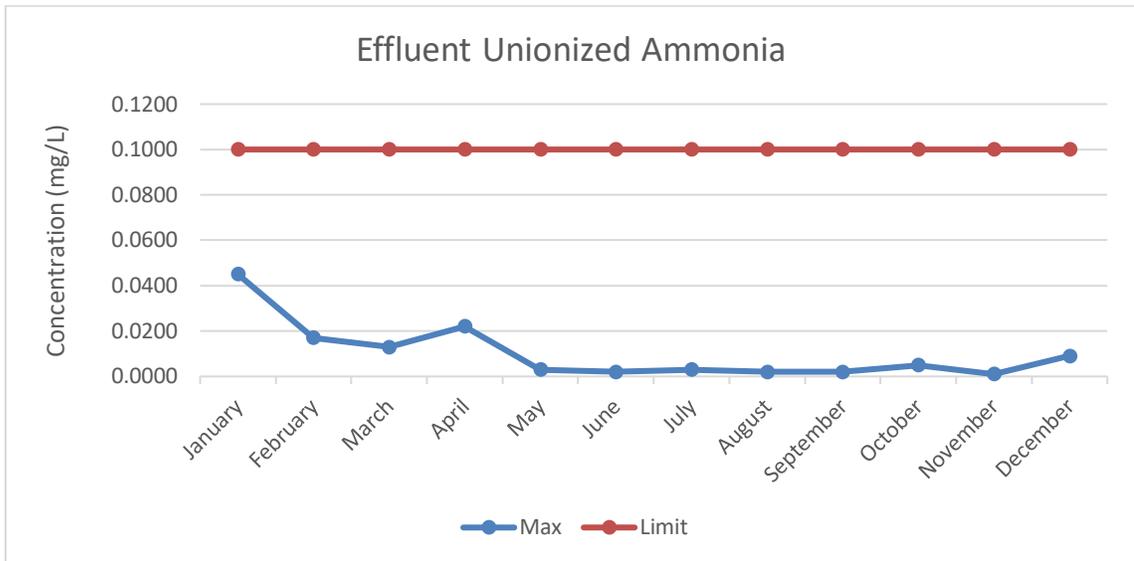


Figure 14: Comparison of the 2024 monthly max concentrations of effluent unionized ammonia to the compliance limits.

The following table shows the estimated effluent flow rates for the reporting period:

Month	Average Daily Flow (m ³)	Total Flow (m ³)
January	6238.48	193393
February	5197.72	150734
March	6135.03	190186
April	6158.53	184756
May	4623.16	143318
June	3864.77	115943
July	4381.90	135839
August	4060.74	125883
September	3565.27	106958
October	3495.74	108368
November	3788.97	113669
December	4899.52	151885

Table 5: Estimated effluent flow rates for 2024.

The following table compares the annual average daily effluent loading to the limit set out by the ECA:

Effluent Parameter	Loading (kg/day)	Loading Criteria (kg/day)	
		Dec 1 – Apr 30	May 1 – Nov 30
CBOD₅	12.17	108	72
Total Suspended Solids	22.87	108	72
Total Phosphorus	1.34	7.2	3.6
Total Ammonia Nitrogen	1.09	36	21.6

Table 6: Comparison of 2024 effluent loading to limits for specified periods.

The calculated removal efficiencies achieved at the MWWTP for the main effluent parameters are highlighted as follows:

- CBOD₅ removal efficiency was 99.43%
- Suspended solids removal efficiency was 98.35%
- Total Phosphorus removal efficiency was 98.14%

C. Summary of deviations from the 2024 monitoring schedule and reasons and a schedule for 2025;

The following deviations occurred from the 2024 schedule:

- The quarterly sludge sample scheduled for January 8, 2024, was missed. It was collected on January 15, 2024.
- The weekly river samples scheduled for January 22, 2024, were not taken due to the river being frozen.
- The poultry processing facility sample scheduled for December 2, 2024, was not collected as the facility was not operating. Sample was instead taken on December 3, 2024.

Below is the Sampling Schedule for 2025:

2025

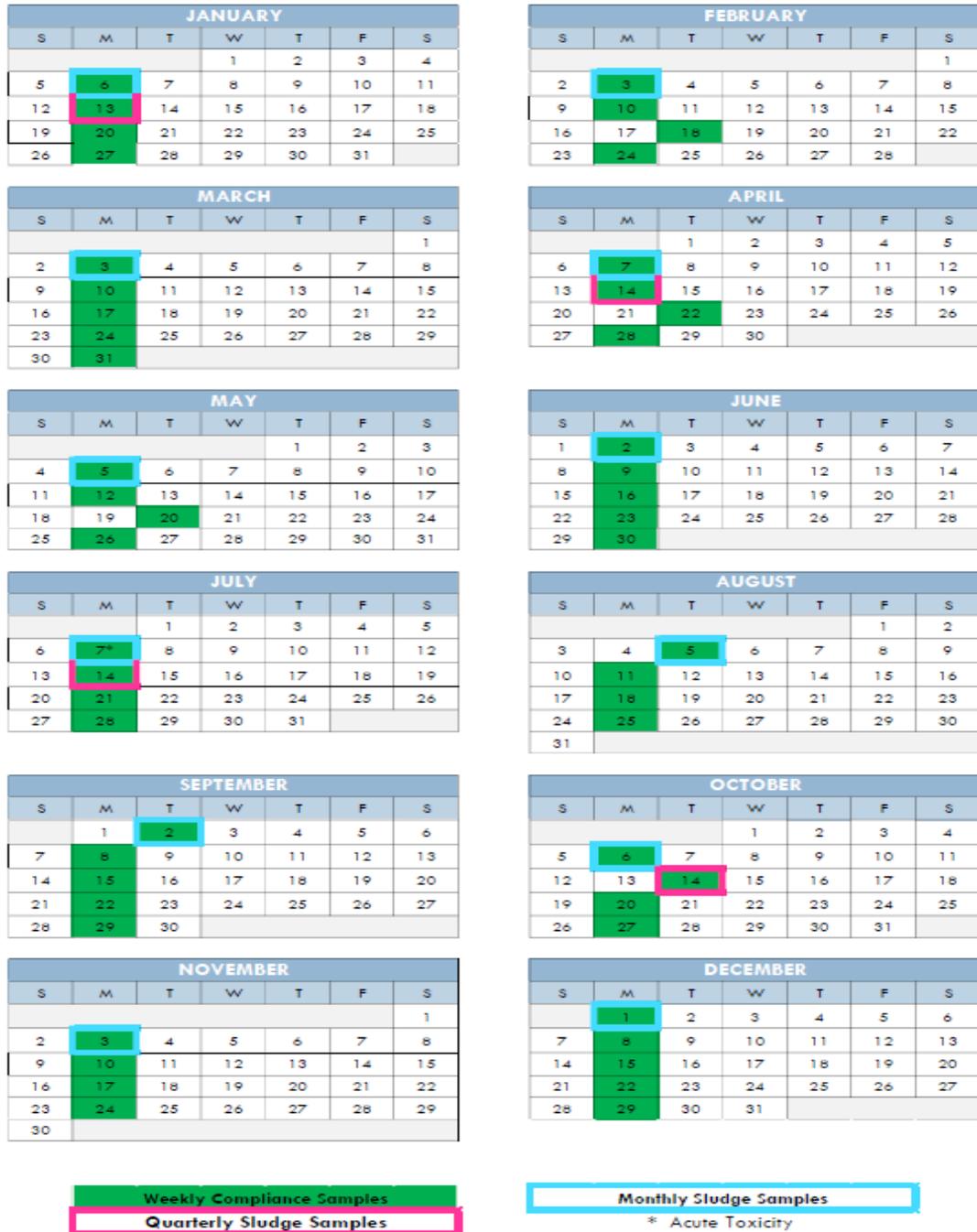


Figure 15: 2025 Sampling Schedule

D. Summary of operating issues encountered and corrective actions taken:

- Blower 2 experienced an electrical failure. The UPS, GFCI and batteries were replaced, but the issue persisted. Further investigation revealed that the GFCI was not bonded to the ground at the transformer. After bonding the neutral to the ground, the system returned to normal operation.
- High solids and poor settling in Clarifier 2 caused solids to flow over the weir, which clogged the sand filters. With water unable to flow through the filters, the filters were bypassed. SAC and HPPH were notified of the bypass. The filters were cleared by air scouring and the sludge issue was resolved.
- The Grit Vortex reducing drive at the MWWTP failed, preventing the preliminary treatment process for sediment removal. Operators reconfigured the drive to restore normal operation.
- The level transducer at the Herbert St Sewage Pumping Station (SPS) failed due to corroded connections in junction box. The connections were repaired and the station returned to normal operation.
- Herbert St SPS continues to operate with two pumps. Throughout the year, Pump 2 was sent back for repair multiple times. Pump 1 also failed but was deemed unrepairable. A new pump has been ordered. Pump 2 has been returned and is now operating normally. During the repairs, Pump 3 failed, leaving no operational pumps. Operators successfully restored Pump 3 before the wet well reached capacity, preventing a potential a bypass or spill.

E. Summary of repairs and maintenance activities:

The computerized maintenance management system is used to schedule maintenance activities at the MWWTP and SPS. The operators can generate preventive maintenance and corrective work orders; as well as document work performed and issue work order history reports.

A highlight of the major maintenance carried out for 2024 is outlined below:

- The raw sewage pumps at both Hebert and James Street SPS were inspected monthly and maintained by operators.
- The Herbert St SPS, James St SPS and MWWTP diesel generators received their annual service in early 2024. They were also inspected and ran monthly under load.
- Annual greasing and oil changes were completed on Blower 4. Vibration readings were also taken annually.
- Blowers 1,2 and 3 were inspected and maintained as per manufacturers' recommendations.

- Flowmeters were verified by a third party contractor.
- All submersible pumps were inspected.
- Aerobic Digesters 1 and 2, including the headers and piping, were cleaned, inspected, and serviced by operators in spring and fall.
- Clarifier drives and gearboxes were inspected.
- Valves at MWWTP, Herbert St SPS and James St SPS were exercised.
- The air lift piping on all the filter air lifts were pulled and inspected.
- The UV system was monitored daily by the operators. Lenses were cleaned monthly, and bulbs replaced as needed.
- Third party contractors inspected the gas detectors, chain falls, beams, and lab equipment.
- The alum dosing system was flushed and inspected.
- Compressors were serviced.
- Replaced bulbs, sleeves and O-rings for UV bank 1A.
- Replaced check valve for Pump 2 at James St SPS.
- Added sand to sand filters.
- Replaced control board on the Rotork for Waste Activated Sludge valve.
- James St Pump 2 was rebuilt.
- Drained, cleaned and inspected Clarifiers 1 and 2.
- Replaced the oxygen sensor in Grit Room.
- Replaced radio cable at Herbert St SPS.
- MCC, VFD's, PLC and floats replaced at Herbert St SPS.

F. Summary of effluent quality assurance;

A 24hr-composite sampler located downstream of the UV channel is used to collect the effluent sample. A 100 mL sample is collected every 50 minutes over a 24hr period to produce a composite sample. Staff use this sample to perform analysis twice a week along with raw and mixed liquor to ensure effluent quality. The results from the effluent analysis along with other process samples are used to adjust the various processes to achieve the highest quality effluent possible. Once a week, samples are sent to Bureau Veritas Laboratories in Mississauga, Ontario.

Samples sent to Bureau Veritas Laboratories are delivered in coolers with sufficient ice packs to maintain a cool temperature. The samples are accompanied by a Chain of Custody document, which details the following: the operator responsible for collecting the sample, the time of collection, the type of sample, and the requested analysis. This document ensures that the samples are handled exclusively by authorized personnel before undergoing analysis.

Bureau Veritas Laboratories holds accreditations from several organizations, including the Ministry of Environment, Conservation and Parks and is also accredited under ISO/IEC 17025 standards. Each laboratory report is accompanied by a Certificate of Analysis.

G. Summary of calibration and maintenance carried out on monitoring equipment:

Copies of the calibration reports for the return activated sludge, waste activated sludge, filter backwash water and influent flow meters are filed at the MWWTP. The flow meters are calibrated annually by a qualified third party contractor.

Portable dissolved oxygen probes and meters are cleaned after every use. They are calibrated annually by a qualified third party contractor.

The pH meter is calibrated once a month by operators as per manufacturer’s instructions.

H. Summary of efforts made to achieve the design objectives:

Operators consistently perform routine maintenance on equipment to ensure proper operation. Weekly in-house process control analysis are performed to ensure that the MWWTP operates efficiently and in a manner that meets design objectives. Operational changes are made as required to meet design objectives.

I. A tabulation of generated sludge, locations of sludge disposal and anticipated volumes for the next reporting period:

In 2024, approximately 69,537m³ of sludge was generated. The MWWTP produced 5267m³ more sludge than in 2023. Influent characteristics are expected to change and decrease the amount of sludge generation in 2025.

Digested sludge from the MWWTP and biosolids from the storage lagoon are removed by a licensed waste hauler.

Biosolids are land applied to sites approved by OMAFRA/MECP. The summary of the biosolids applied during 2024 are as follows:

Year	Land Application Site Number	Sludge Applied to Land (m³)
2024	Submission ID: 24728	5859
	Submission ID: 24729	2264
	Submission ID: 61598	6040
	Submission ID: 61665	3586

Table 7: Summary of 2024 biosolids.

J. Summary of complaints received, and actions taken to address the complaints:

- November 22, 2024 – A resident on Frances St called with a question regarding their drain. Staff returned the call and left a voicemail. On November 27, the same resident contacted the On-Call Operator to report a backup in their basement. Staff advised the resident to call a plumber and arranged for a contractor to flush the lateral. The plumber was able to clear the blockage.
- November 29, 2024 – A property owner on St. Andrew St reported a drain issue. Staff visited the residence and inspected the clean-out. It was determined that the property owner should contact a plumber.

K. Summary of all bypasses, Overflows, spills or abnormal discharge events:

- April 11-12, 2024 – An Emergency Bypass occurred at the MWWTP after heavy rainfall increased flow rates and exacerbated sludge bulking in the secondary clarifiers. The sludge failed to settle properly, causing solids to flow over the weir and into the filters, causing them to clog forcing a filter bypass. Sewage went through pretreatment, secondary aeration and secondary clarifiers before bypassing the tertiary sand filters. The sewage went through the UV disinfection system prior to leaving the plant via the approved effluent disposal facilities. The bypass lasted 3 hours and 44 minutes, with an estimated volume of 2413m³. Samples were taken in accordance with the ECA.
- July 4-5, 2024 – A Planned Bypass occurred at the MWWTP. Clarifier 1 was taken out of service for cleaning and inspection, which temporarily reduced the plant's capacity. The Director was notified prior to the bypass. The bypass lasted 22 hours and 7 minutes, with an estimated volume of 3483m³. Samples were taken in accordance with the ECA
- July 11-12, 2024 – A Planned Bypass occurred at the MWWTP. Clarifier 2 was taken out of service for cleaning and inspection, which temporarily reduced the plant's capacity. The Director was notified prior to the bypass. Duration 24 hours and 43 minutes, with an estimated volume 5241m³. Samples were taken in accordance with the ECA.

L. Summary of all Notice of Modifications to Sewage Works completed including a report on status of implementation of all modification:

There were no *Notice of Modifications to Sewage Works* completed in 2024.

M. Summary of efforts made to achieve conformance with Procedure F-5-1:

Operators conduct routine maintenance on equipment and conduct weekly process control analysis to ensure that the MWWTP, the SPS as well as the collection system are operating efficiently to achieve conformance with Procedure F-5-1.

The MWWTP is equipped with a Peak Sewage Overflow Storage Cell that can be used to prevent exceeding peak flow capacity of the plant.

The Municipality is committed to the improvement of the collection system to eliminate bypass and overflow events. Each year, a section of sanitary sewer is replaced to decrease inflow and infiltration into the collection system. The Municipality of West Perth allocated \$270,000.00 for capital expenditures and an additional \$55,000.00 for maintenance expenditures in 2024. The focus of this year's reconstruction project was James St. The proposed budget allocation for replacing sanitary and storm infrastructure on James St was \$300,000.00.

Older sections of the collection system, particularly where sump pumps discharge into the sanitary system, significantly contribute to potential bypass and overflow events. These connections are eliminated during construction. The Municipality plans to implement procedures for inspecting the collection systems integrity through manhole inspections and smoke testing to identify problem areas that require attention. Additionally, the Municipality will consider the implementation of a Pollution Prevention and Control Plan.

N. Changes or updates to the schedule for the completion of construction and commissioning operation of major process(es)/equipment groups in the Proposed Works

The installation of the secondary clarifier has been postponed due to the evaluation of potential upgrades at the MWWTP. Additionally, the flow meter for measuring return flow from the Peak Sewage Overflow Storage Cell has not been installed yet. The upgrades to the supplementary treatment system have been completed and are now fully commissioned.

O. Nitrogen Monitoring Summary

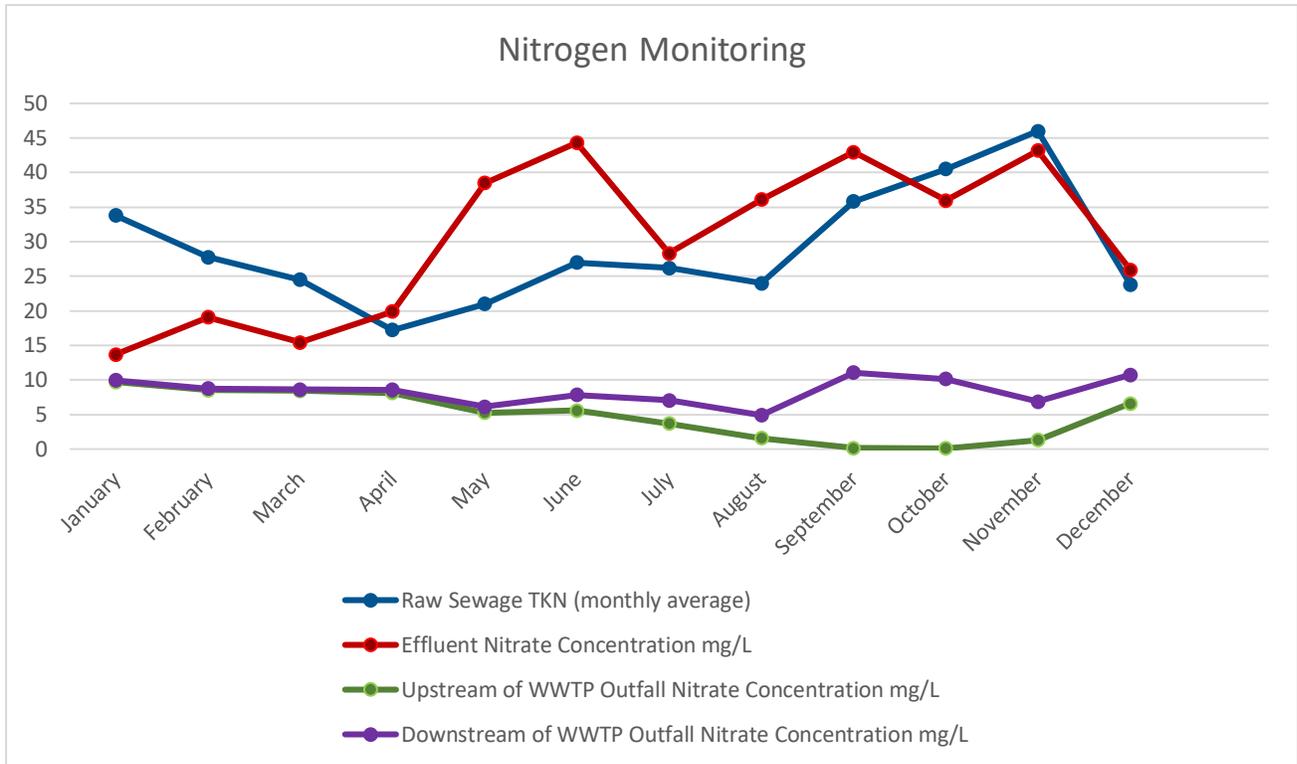


Figure 16. The historical trend of nitrate concentrations from 2024.

Based on ongoing sampling results, the most significant increase of nitrate in the North Thames River occurs during the summer when stream flow is low and minimal effluent dilution is provided. Correspondingly, background nitrate levels in the North Thames River appear to reduce in the summer which in part offsets the impact of additional nitrate loadings from the MWWTP during this time period.

The work plan developed by West Perth to date does not include a component for ecological impacts, if any, from higher nitrate values in the North Thames River.

We understand that high nitrate values may be linked to impacts on amphibians during the egg stage of amphibian life cycle (spring). Results to date would indicate a minimal nitrate increase during the springtime, due to higher dilution and to some degree, higher background nitrate levels in the North Thames River during the spring season.

For 2025, the work plan will continue with sampling at the West Perth Line 29 location. This location will be used to evaluate the net increase of nitrate levels in the North Thames River.

P. Annual Compliance Summary for 2024

2024	FLOWS			BIOCHEMICAL O2 DEMAND				SUSPENDED SOLIDS			PHOSPHORUS			AMMONIA		EFFLUENT				WASTE		
	Total Flow (ML)	Avg. Day Flow (ML)	Max Day Flow (ML)	Avg. Raw BOD (mg/L)	Avg. Load BOD (kg/day)	Avg. Eff. CBOD (mg/L)	Avg. Load CBOD (kg/day)	Avg. Raw SS (mg/L)	Avg. Eff. SS (mg/L)	Avg. Load SS (kg/day)	Avg. Raw Phos. (mg/L)	Avg. Eff. Phos. (mg/L)	Avg. Load Phos. (kg/day)	Avg. Eff. Amm (mg/L)	Avg. Load Amm (kg/day)	Effluent E. Coli (cnt/100ml)	DO (mg/L)	pH (mg/l)	Temp C	Volume m³/month	SS (mg/L)	
Jan	201.38	6.50	15.37	326.00	2117.71	2.52	16.37	220.36	5.12	33.26	11.04	0.22	1.42	0.95	6.20	1.72	6.90	7.43	14.62	5141.00	10603.60	
Feb	144.75	4.99	6.83	267.75	1336.44	2.20	10.98	159.60	4.78	23.83	9.67	0.25	1.26	0.21	1.02	1.00	6.98	7.47	15.38	4626.00	9974.50	
Mar	192.28	6.20	9.12	279.25	1732.07	2.48	15.35	239.08	4.88	30.24	14.26	0.40	2.48	0.27	1.64	2.40	6.04	7.66	16.97	5471.00	12377.50	
Apr	186.72	6.22	10.26	258.00	1605.75	6.12	38.07	244.92	11.58	72.08	15.19	0.52	3.24	0.36	2.25	3.45	6.06	7.62	19.18	7003.00	10110.80	
May	140.87	4.54	5.92	272.50	1238.33	1.90	8.63	251.65	1.66	7.55	12.90	0.25	1.15	0.04	0.18	3.81	6.65	7.52	21.05	6267.00	7425.50	
Jun	117.22	3.91	5.07	372.50	1455.46	1.90	7.42	379.60	2.84	11.09	15.92	0.30	1.18	0.05	0.20	1.57	6.25	7.39	22.68	5924.00	7761.50	
Jul	141.25	4.56	9.28	620.00	2824.90	2.27	10.33	297.68	3.73	16.99	15.31	0.26	1.17	0.04	0.20	3.32	6.40	7.47	22.73	5406.00	9513.60	
Aug	122.43	3.95	6.06	475.00	1875.88	1.90	7.50	272.80	3.31	13.08	17.65	0.15	0.58	0.04	0.15	1.57	6.57	7.58	23.13	5466.00	9760.50	
Sep	110.83	3.69	4.70	682.00	2519.51	1.90	7.02	338.18	4.56	16.83	17.25	0.28	1.03	0.04	0.13	1.78	6.63	7.43	22.29	5247.00	10896.00	
Oct	114.12	3.68	5.36	670.00	2466.55	1.90	6.99	354.93	5.80	21.35	21.70	0.36	1.32	0.05	0.20	1.00	6.76	7.42	20.40	5756.00	11016.00	
Nov	120.07	4.00	5.04	469.75	1880.02	1.90	7.60	286.30	4.36	17.46	15.75	0.14	0.54	0.02	0.09	1.00	7.03	7.39	18.68	6396.00	10021.00	
Dec	158.72	5.12	11.64	357.00	1827.83	1.90	9.73	263.00	2.08	10.65	7.32	0.14	0.69	0.17	0.85	1.52	7.68	7.49	17.36	6834.00	9620.00	
Total	1750.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69537.00	-	
Avg	145.89	4.78	7.89	420.81	1906.70	2.41	12.17	275.67	4.56	22.87	14.50	0.27	1.34	0.19	1.09	2.01	6.66	7.49	19.54	5794.75	9923.38	
Max	201.38	6.50	15.37	682.00	2824.90	6.12	38.07	379.60	11.58	72.08	21.70	0.52	3.24	0.95	6.20	3.81	7.68	7.66	23.13	7003.00	12377.50	
Criteria	T>5 C	5.8	-	-	-	< 10	72	-	< 10	72	-	< 0.5	3.6	< 3	21.6	200	-	-	-	-	-	
	T<5 C	5.8	-	-	-	< 15	108	-	< 15	108	-	< 1.0	7.2	< 5	36.0	None	-	-	-	-	-	
Meets Concentration Criteria				-	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-