STRATHROY WASTEWATER TREATMENT FACILITY

2024 ANNUAL REPORT

as per ECA # 5933-C37KWJ Section 11.(4)
Works # 12000827

STRATHROY-CARADOC
URBAN OPPORTUNITY – RURAL HOSPITALITY

1. Influent Monitoring and Compliance Summary (Certificate of Approval 11. 4. (a))

The annual influent laboratory results for carbonaceous biochemical oxygen demand, total suspended solids, total phosphorus and total kjeldahl nitrogen can be found in Appendix A.

The incoming sewage characteristics are similar to the previous year.

2. Effluent Monitoring and Compliance Summary (Certificate of Approval 11. 4. (b))

The Strathroy WWTF has a design rated capacity of 10,000 m^3/day, with a peak flow rate of 23,280 m^3/day. During 2024, the annual average daily flow was 5,196 m^3/day, which is 52% of the design rated capacity for the treatment facility. The maximum daily flow was recorded at 16,346 m^3/day, which is 70% of the peak flow rate. Average daily flow rates are similar to the previous year, the maximum daily flow rate was much higher than the previous year. The higher flows can be attributed to heavy rainfall during the period July 15-19, 2024

The summary of the annual effluent laboratory results for carbonaceous biochemical oxygen demand, total suspended solids, total phosphorus, nitrogen, DO and pH is found in Appendix A. The comparison of these results to the compliance criteria can be found in Table 1 and Table 2 below. All parameters met effluent limits in 2024.

Table 1
Strathroy WWTF – Effluent Quality Summary

Description	Range of Monthly Averages mg/L	Effluent Limits mg/L	# Months Limits Achieved/ # Months
CBOD5 (non-freezing period April - Oct)	2.0 – 2.5	10	7/7
CBOD5 (freezing period Nov-Mar)	2.0 – 2.8	15	5/5
Suspended Solids (non-freezing period April - Oct)	2.6 - 4.25	10	7/7
Suspended Solids (freezing period Nov-Mar)	2.5 - 4.0	15	5/5
Total Phosphorus (non-freezing period April - Oct)	0.15 - 0.34	0.5	7/7

Total Phosphorus (freezing period Nov-Mar)	0.15 - 0.31	1	5/5
Total Ammonia Nitrogen (non-freezing period April - Oct)	0.10 - 0.28	2	7/7
Total Ammonia Nitrogen (freezing period Nov-Mar)	0.10 - 0.18	5	5/5
E.Coli (counts/100mL)	0.1 - 7.17	200 (geometric mean)	12/12
pH	6.6 - 8.1	6.0 - 9.5	12/12
DO (min)	4.9	>4.0	12/12

Table 2
Strathroy WWTF – Effluent Loading Summary

Description	Annual Average Loading kg/d	Effluent Loading Limits kg/d	Achieved Yes/No
CBOD5	11.11	103.4	Yes
Suspended Solids	16.46	103.4	Yes
Total Phosphorus	1.11	6.1	Yes
Total Ammonia Nitrogen	0.69	27.8	Yes

3. Operating Issues and Corrective Actions (Certificate of Approval 11. 4. (c))

During the year, there were no exceedances in 2024.

The second phase of the upgrades at the Strathroy WWTF, are currently being designed and anticipated to be tendered in the 2nd quarter of 2025.

4. Maintenance Summary (Certificate of Approval 11. 4. (d))

The operators performed the routine maintenance throughout the year. In addition to the routine maintenance which includes greasing, oiling and changing air filters a detailed list is included in Appendix B.

5. Quality Assurance/Quality Control (Certificate of Approval 11. 4. (e))

On a monthly basis, the operator collected and submitted influent samples to SGS Canada Inc for total suspended solids, biochemical oxygen demand, TKN and total phosphorus analysis.

On a weekly basis, the operator collected effluent samples for analysis by SGS Canada Inc for total suspended solids, carbonaceous biochemical oxygen demand, total phosphorus, ammonia and E. Coli analyses. The operator performed analysis for pH, DO and temperature in-house.

In-house laboratory testing also included monitoring of MLSS, reactive phosphorus, total suspended solids, and ammonia in the effluent.

6. Calibration/Maintenance Summary (Certificate of Approval 11. 4. (f))

Flow meter calibrations were carried out by SCG in February 2024. The laboratory, SGS Canada Inc was used for all the required analytical chemical and biological testing of influent and effluent from the wastewater treatment facility.

7. Effluent Objectives (Certificate of Approval 11. 4. (g))

Strathroy-Caradoc attempted to meet the objectives in the Environmental Compliance Approval (ECA) through regular testing and monitoring of the treatment system. The installation of new filters in 2022 helped improve the WWTF treatment process.

In the table below, monitoring data and analytical results are compared to the Effluent Objectives as listed in the ECA.

Table 3

Strathroy WWTF – Effluent Objective Summary

Description	Range of Monthly Averages mg/L	Effluent Objectives mg/L	# Months Objectives Achieved/# Months
CBOD5 (non-freezing period April - Oct)	2.0 – 2.5	5	7/7
CBOD5 (freezing period Nov-Mar)	2.0 – 2.8	10	5/5
Suspended Solids (non-freezing period April - Oct)	2.6 - 4.25	5	7/7
Suspended Solids (freezing period Nov-Mar)	2.5 - 4.0	10	5/5

Total Phosphorus (non-freezing period April - Oct)	0.15 - 0.34	0.3	7/7
Total Phosphorus (freezing period Nov-Mar)	0.15 - 0.31	0.5	5/5
Total Ammonia Nitrogen (non-freezing period April - Oct)	0.10 - 0.28	1	7/7
Total Ammonia Nitrogen (freezing period Nov-Mar)	0.10 - 0.18	3	5/5
E.Coli (counts/100mL)	0.1 - 7.17	150 (geometric mean)	12/12
pH	6.6 - 8.1	6.5 - 8.5	12/12

7. Sludge Management (Certificate of Approval 11. 4. (h))

Supernatant from this lagoon is transferred to the aeration section of the sewage treatment plant for treatment as needed. Staff monitor the lagoon levels to ensure adequate reserve capacity is in place to accommodate waste activated sludge along with precipitation events and will implement supernatant pumping as required.

In 2024, the Municipality hired a contractor that removed 891 dry tones of sludge from the storage lagoon. The sludge production and sludge handling methods for 2024 is expected to be similar to 2025.

8. Complaints Summary (Certificate of Approval 11. 4. (i))

There were no complaints related to the Strathroy WWTP in 2024.

9. Summary of By-pass, Spill or Abnormal Events (Certificate of Approval 11. 4. (j))

There were no by-pass, spill or abnormal events to report.

10. Notice, Modifications/Summary of Alterations (Certificate of Approval 11. 4. (k & l))

There were no modifications to the Sewage Works completed under the Limited Operational Flexibility provisions in the ECA.

The following list details alterations, extensions or replacements that were implemented or in process in 2024.

- Strathroy WWTF Process Upgrades Design
- Lagoon Sludge Handling
- Sanitary Masterplan
- Completion of Pollution Control Prevention Plan

For 2025, the following have received Council approval or are continuing and will provide a benefit to the operation of the Strathroy WWTF.

- Strathroy WWTF Process Upgrades Design
- Strathroy WWTF Process Upgrades Starting Construction

11. Changes/Updates in Schedule (Certificate of Approval 11. 4. (m))

The projects are continuing to proceed as mentioned above

12. Summary of Monitoring Schedule (Certificate of Approval 11. 4. (n))

Routine weekly effluent sampling was conducted on Thursdays for 2024. The sampling will be complete on Fridays for 2025.

APPENDIX A

Strathroy WWTF

Year: 2024

		January	February	March	April	May	June	July	August	September	October	November	December	Average	Total
Flows, Average Daily Flow 10,000 m3/day															
Effluent Total	m^3	166,303	141,376	136,580	141,878	151,943	164,642	218,665	160,587	147,410	155,612	154,328	158,147	158,123	1,897,470
Effluent Average	m^3/day	5,365	4,875	4,406	4,729	4,901	5,488	7,054	5,180	5,083	5,020	5,144	5,102	5,196	
Effluent Max	m^3/day	11,221	6,041	5,490	6,754	7,318	6,664	16,346	6,221	6,730	5,762	5,681	8,424	7,721	
cBOD, Monthly Average Concentration Limits Apr 1 - Oct 31 10mg/L, Nov 1 - Mar 31 15mg/L															
Raw Average BOD	mg/L	227	193	552	185.0	434	130	436	128	193	317	714	453	330.2	
Effluent Average cBOD	mg/L	2.0	2.8	2.3	2.5	2.0	2.0	2.0	2.0	2.3	2.0	2.0	2.0	2.2	
Effluent cBOD Loading	kg/D	10.73	13.65	9.91	11.82	9.80	10.98	14.11	10.36	11.44	10.04	10.29	10.20	11.11	
Suspended Solids, Monthly Average Concentration Limits Apr 1 - Oct 31 10 mg/L, Nov 1 - Mar 31 15mg/L															
Raw Average	mg/L	71	42	716	86.0	652	73	479	43	77	166	714	442	296.8	
Effluent Average	mg/L	2.8	3.4	4.0	4.0	2.8	3.0	2.8	2.6	4.3	3.6	2.5	2.8	3.2	
SS Loading	kg/D	14.75	16.58	17.62	18.92	13.72	16.46	19.40	13.47	21.60	18.07	12.86	14.03	16.46	
Total Phosphorus, Monthly Average Concentration Limits Apr 1 - Oct 31 0.5mg/L, Nov 1 - Mar 31 1 mg/L															
Raw Average	mg/L	5.9	2.0	8.0	6.8	8.2	6.0	10.8	4.7	6.6	4.6	30.9	9.9	8.7	
Effluent Average	mg/L	0.31	0.19	0.23	0.34	0.27	0.19	0.22	0.15	0.17	0.19	0.19	0.15	0.21	
Phosphorus Loading	kg/D	1.65	0.92	1.01	1.62	1.30	1.02	1.52	0.76	0.84	0.95	0.98	0.75	1.11	
Nitrogen, Monthly Average Concentration Limits Apr 1 - Oct 31 2mg/L, Nov 1 - Mar 31 5mg/L															
Raw Average TKN	mg/L	50.20	37.30	61.20	58.3	57.10	41.80	50.00	37.00	48.00	41.00	65.00	56.00	50.2	
Effluent Average Total N	mg/L	0.18	0.10	0.10	0.28	0.14	0.18	0.13	0.10	0.10	0.10	0.10	0.10	0.13	
Nitrogen Loading	kg/D	0.94	0.49	0.44	1.3	0.69	0.96	0.88	0.52	0.51	0.50	0.51	0.51	0.69	
Effluent TKN	mg/L	0.80	1.20	1.73	1.2	0.88	0.65	0.90	0.76	0.63	0.96	0.83	0.88	0.95	
Nitrate as Nitrogen	mg/L	20.95	18.84	18.90	20.3	10.13	13.48	12.17	14.22	9.98	14.56	14.95	17.45	15.49	
Nitrite as Nitrogen	mg/L	0.44	0.24	0.17	0.2	0.16	0.12	0.07	0.05	0.05	0.05	0.04	0.09	0.14	
Unionized Ammonia Avg	mg/L	0.0010	0.0012	0.0258	0.0010	0.0010	0.0018	0.0010	0.0010	0.0010	0.0010	0.0258	0.0010	0.005	
Unionized Ammonia Min	mg/L	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.001	
Unionized Ammonia Max	mg/L	0.0010	0.0020	0.1000	0.0010	0.0010	0.0030	0.0010	0.0010	0.0010	0.0010	0.1000	0.0010	0.018	
E. Coli, Monthly Geometric Average 200 Counts/mL															
Geo Mean	CFU/ 100mL	0.53	0.38	0.14	6.43	2.00	0.95	7.17	2.00	0.01	2.76	0.30	2.00	2.06	
pH 6.0 -9.5, DO > 4.0															
pH Min	SU	6.6	6.9	6.9	7.0	7.1	6.9	6.9	6.9	6.9	6.9	7.0	6.7	6.89	
pH Max	SU	7.4	7.6	7.2	7.3	7.5	8.1	7.4	7.6	7.7	7.1	7.2	7.2	7.44	
pH Average	SU	7.1	7.2	7.1	7.2	7.3	7.4	7.2	7.1	7.2	7.0	7.1	7.0	7.15	
Temperature MIN	^oC	6.6	7.9	8.8	11.0	14.7	16.7	19.1	19.4	18.6	15.7	11.4	9.4	13.3	
Temperature MAX	^oC	11.1	11.8	12.7	15.2	18.9	22.4	22.0	22.7	22.3	20.9	17.6	12.7	17.5	
DO Min	mg/L	6.5	7.2	7.1	4.9	5.2	5.8	6.0	5.7	5.8	6.0	6.4	6.8	6.1	
Non-Freezing (N) Freezing (F)		F	F	F	N	N	N	N	N	N	N	F	F		

APPENDIX B

2024 Annual Maintenance Summary for STRATHROY WWTF

January
- Cleaned and replaced UV bulbs
- Run generators

February
- Watech repairing air lines of aeration cell
- Run generators

March
- Vibration analysis done on back-up blowers
- Repair work completed on furnance
- Run generators

April
- Sludge removal of pond 4
- Run generators

May
- Cleaned and replaced UV bulbs
- Watech investigating broken valve in splitter box
- Annual generator maintenance

June
- UV system maintenance/repairs
- Drained and cleaned both filters
- UV bulb socketd replaced
- Backwashed pump 1 on filter 2 replaced
- Supernatent pump controls repaired
- Run generators

July
- Replaced motor on valve 4 filter 1
- Watech repairing aerators in areation pond
- Run generators

August
- Replaced filter gauge on filter 1 and 2
- Replaced pressure gauges on backwash pumps
- Run generators

September
- Run generators

October
- Replaced burnt out UV bulbs
- Replaced block heater on plant generator
- Run generators

November
- Run generators

December
- Furnace replaced
- Watech completed repair to valve in distribution box
- Run generators