

2024

City of Dryden

Waste-Water Treatment Plant Annual Report

A summary of 2023 events.



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City of Dryden
1/16/2024





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Dryden Waste-Water Treatment Plant Annual Report 2023

Contents

Final Effluent Monitoring Data:.....	3
Effluent Monitoring Comparison:	4
Problems & Corrective Actions:	4
Maintenance Summary:.....	5
Effluent Quality Assurance & Control Measures:	6
Monitoring Equipment & Calibration:.....	7
Condition 6 – Effluent Objectives:.....	7
Sludge Volume Tabulation & Anticipated Volumes:	7
2022 Sludge Volumes	8
Complaint Summary & Corrective Actions:	9
Bypass, Spill or Abnormal Discharge Summary:	9
Other Information Required:.....	9



DRYDEN

Dryden Waste-Water Treatment Plant Annual Report 2023

Final Effluent Monitoring Data:

Date	PH 6.0 - 9.5 Limit	Suspended Solids 25Mg/L Limit	CBOD5 25Mg/L Limit	Total Ammonia Nitrogen 3Mg/l Limit	E. Coli 150/100MI. Limit *May 1-Oct. 31
	Lab Result	Lab Result	Lab Result	Lab Result	Lab Result
Jan. 3	6.95	0.67	1.6	1.2	400
Jan. 16	7.22	5.0	0.9	2.0	10,300
Feb. 6	6.76	4.5	0.7	2.2	29,000
Feb. 21	6.76	27.3	13	6.76	17,000
Mar. 6	6.27	11.0	1.9	1.0	515
Mar. 20	7.42	4.0	1.2	1.0	1,000
Apr. 3	6.89	4.0	1.1	3.8	12,000
Apr. 17	7.28	4.7	1.4	1.2	2.0
May 1	7.22	4.7	3.0	3.2	4.0
May 8	N/A	N/A	N/A	N/A	4.0
May 15	7.16	10.0	3.8	3.4	11.0
May 24	N/A	N/A	N/A	N/A	320.0
May 29	N/A	N/A	N/A	N/A	260.0
June 5	7.17	6.7	5.6	7.7	20.0
June 14	N/A	N/A	N/A	N/A	100.0
June 19	7.06	8.0	1.0	2.9	2.0
June 27	N/A	N/A	N/A	N/A	4.0
July 4	7.14	1.7	1.0	2.8	1.0
July 10	N/A	N/A	N/A	N/A	13.0
July 17	7.06	17.0	5.7	4.7	7,000
July 24	N/A	N/A	N/A	N/A	640.0
Aug. 1	7.44	1.0	1.7	7.4	1.0
Aug. 8	N/A	N/A	N/A	N/A	20.0
Aug. 14	7.26	5.0	1.1	2.3	38.0
Aug. 21	N/A	N/A	N/A	N/A	10.0
Aug. 28	N/A	N/A	N/A	N/A	28.0
Sept. 5	7.25	6.0	1.7	2.6	2.0
Sept. 11	N/A	N/A	N/A	N/A	14.0
Sept. 18	7.03	2.3	1.0	4.2	9.0
Sept. 25	N/A	N/A	N/A	N/A	30.0
Oct. 2	7.01	3.0	2.0	2.5	2.0
Oct. 10	N/A	N/A	N/A	N/A	6.0
Oct. 16	7.31	4.7	2.6	2.2	8.0
Oct. 23	N/A	N/A	N/A	N/A	1.0
Oct. 30	N/A	N/A	N/A	N/A	2.0
Nov. 6	7.29	1.3	0.6	1.9	0.0
Nov. 20	7.36	5.0	3.0	2.3	1.0
Dec. 4	7.19	2.7	1.3	2.0	0.0
Dec. 18	7.37	4.7	2.1	1.7	2,700

*Disinfection is required from May 1st until Oct. 31st only.

Acute Toxicity Bioassay Update	July 11, 2023	96 Hr.	Trout	LC50 Test	No Mortality / Stress Observed	Pass
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DRYDEN

Dryden Waste-Water Treatment Plant Annual Report 2023

Effluent Monitoring Comparison:

Table 1 - Effluent Objectives		2023 Effluent
Effluent Parameter	Concentration objective	Maximum Concentration Results
CBOD5	15 Mg/l	5.7 Mg/L - July 17, 2023
Total Suspended Solids	15 Mg/l	27.3 Mg/L - Feb. 21, 2023
Total Ammonia Nitrogen	3.0 Mg/l (temp. at or above 14° C)	
E. Coli	150 organisms/ 100 Ml. Monthly Geometric Mean Density May 1 st to Oct. 31 st only	7,000 Organisms/100 Ml. - July 17, 2023
Table 2 - Effluent Limits		2023 Effluent
Effluent Parameter	Average Concentration	Maximum Concentration Results
CBOD5	25 Mg/l	5.7 Mg/L - July 17, 2023
Total Suspended Solids	25 Mg/l	27.3 Mg/L - Feb. 21, 2023
Effluent Ph	6.0 to 9.5 inclusive at all times	High - 7.44 Mg/L - Aug. 1, 2023 Low - 6.27 Mg/L - Mar. 6, 2023

The Effluent monitoring data compared to the Effluent limits set out in table 2 are mostly being met consistently. The Wastewater Plant had a major breakdown of its air diffuser system in one of the Sequencing Batch Reactor (SBR) units causing an upset in one of the reactor tanks. This was the reason for the increase in suspended solids getting into the final effluent. The tank was shut-down and isolated until repairs were completed.

There was a high concentration of E-Coli on July 17, 2023, due to a combination of heavy rainfall and only one SBR unit in operation.

The overall process and operation of the Wastewater Treatment Plant is adequate to keep the concentration levels of the parameters set out in Table #2 well below the limits.

When the Wastewater Plant is operating at full capacity, the effluent objectives of Table #1 are being met. The E-Coli & Suspended Solids result from Feb. 21st and July 17th week are a result of high rainfall and the plant operating at only 50% capacity.

Problems & Corrective Actions:

- Heat Pump #5 not working. Repairs to Heat Pump #5 were not able to get it back online. Electric back-up heaters are being used until a solution is determined.
- The City of Dryden IT Dept completed IP Address changeover on computers to accommodate update to newer versions that allow better connectivity and security.



DRYDEN

Dryden Waste-Water Treatment Plant Annual Report 2023

- The flow meter on Raw Sewage Pump #4 stopped working. A new circuit board was ordered and changed out to get the flow meter back online.
- SBR #1 had a problem with its air diffuser system. The tank was drained to see what the issue was. The air diffuser system had a pipe support break loose from its floor mount. The pipe eventually broke away from the header then floated up to the surface. This resulted in large volumes of air escaping into the SBR tank right below the decant header. The large volume of air movement also stirred up large volumes of suspended solids. The unit was shut down and isolated from incoming sewage until repairs could be completed. The pipes were all repaired plus the diffuser membranes on all 1,200+ air pots were changed out with new membranes.
- The lights in the MCC room of the Sewage Plant had been gradually ceasing to operate. The lights were replaced with new LED fixtures that offer brighter illumination and longer life.
- Heat Pump #5 also provided air conditioning for the Sewage Treatment Plant. With its failure the building no longer had air conditioning. A wall mounted air conditioning unit was mounted in the MCC room to provide cooling for the electrical components.
- The UVT monitoring unit was not reading. It was determined that the pump that supplies the monitoring unit had failed. A new pump was ordered and installed.
- The air compressor that supplies air to the sludge press was malfunctioning. The compressor was over pressurizing until the relief valve was activated. Operators shut it down and investigated the problem. It was determined that the air pressure switch was faulty. A new pressure switch was ordered and installed. The compressor and sludge press were then put back in operation.

Maintenance Summary:

- Wet-Well Cleaning - Operators cleaned grease and sludge from both sides of the wet-well at the sewage pumping station. A contracted Vac. Truck was hired to facilitate the cleaning.
- Brushes on the spiral screen were changed out.
- UV Cleaning - Operators cleaned the UV units after they were removed for the season. UV units are cleaned using a soak in Citric acid with aeration.
- HVAC Filter Change - Regular filter changes on all air handling units changed semi-annually.
- Lowe Mechanical completed boiler maintenance on main building boilers and pump well building boilers Dec. 14, 2023.
- Heat Pump Maintenance - Operators flushed the heat exchange units on all 5 heat pumps.
- The contractor (Earth4U) completed maintenance on remaining operating heat pumps.



DRYDEN

Dryden Waste-Water Treatment Plant Annual Report 2023

- Generator testing and load testing - City Fleet mechanics perform monthly generator testing and maintenance. Annual load testing is contracted out. Gal Power completed load testing on Oct. 23, 2023.
- Quarterly SCADA maintenance provided by Indus Automation.
- Digital Engineering completed a maintenance inspection on all blowers on November 28, 2023. Other regular maintenance on the blowers included filter changes.
- Regular greasing and oil checks on pumps.
- All overhead crane inspections completed by Kone Cranes Dec. 4, 2023.
- Lakeside Calibrations calibrating all instruments on Sept. 19, 2023.
- Clow Darling completed inspections & repairs on all back-flow preventers.

Effluent Quality Assurance & Control Measures:

Operators conduct daily in-house laboratory tests for PH & Temperature on the influent and PH, Temperature and Dissolved Oxygen on the Effluent. Daily tests are also done to determine sludge settling and blanket thickness. Operators conduct weekly sampling for Mixed Liquor Volatile Suspended Solids and Sludge Volume Index. Monthly & Bi-Monthly samples are sent to an accredited lab to test for:

- PH
- Total Suspended solids
- Total Ammonia
- Un-ionized Ammonia
- Total Kjeldahl Nitrogen
- Total Phosphorus
- E-Coli
- Biochemical Oxygen Demand
- Carbonaceous BOD

*UV Disinfection is only used from May 1st to October 31st. Sampling for E-coli is increased to weekly for this time period.

Effluent is tested annually for un-ionized ammonia as per the Federal Wastewater Systems Effluent Regulations (WSER) using the LC-50 method. Quarterly effluent reporting as per the WSER is also completed.



DRYDEN

Dryden Waste-Water Treatment Plant Annual Report 2023

Operators control the process by monitoring UV dosages, removing sludge from digesters for dewatering and disposal, adjusting wasting from the units and physically observing any changes in mixed liquor color, odor, and foam.

Dryden continues to participate in Ontario's Wastewater Surveillance Initiative as part of Ontario's Covid-19 Preparedness Plan. Dryden is one of two communities chosen to represent NW Ontario. Weekly samples are sent to test for the presence of genetic material in wastewater effluent. Results are shared with the MECP and the North-West Health Unit.

Monitoring Equipment & Calibration:

Monitoring equipment consists of Flow Monitors to record influent flow to the plant and Effluent flow leaving the plant. Flow volume to the sludge press is also monitored. Dissolved Oxygen sensors are in the 2 SBR tanks to monitor dissolved oxygen levels in those areas. UV levels are monitored to ensure proper dosage. Monitoring equipment was calibrated by Lakeside Process Controls on Sept. 19, 2023.

Condition 6 – Effluent Objectives:

- Actual lab test results for CBOD5, Total Suspended Solids and E-Coli are usually well below the Effluent Objectives of Condition 6.
- There were no raw sewage bypasses in 2023.
- During the time that the plant was only running at 50% capacity, the Sewage Treatment Plant had trouble trying to maintain the total Ammonia Nitrogen objective for Condition 6.
- The 2023 CBOD5 results were all under the objective limit.

Sludge Volume Tabulation & Anticipated Volumes:

- Sludge continues to be hauled to Gordon Rd. land fill. All sludge was deposited in the form of a dry cake. There was 911,400 Kgs of sludge deposited to the Gordon Rd. Landfill in 2023. Sludge volumes are anticipated to remain similar in 2024.



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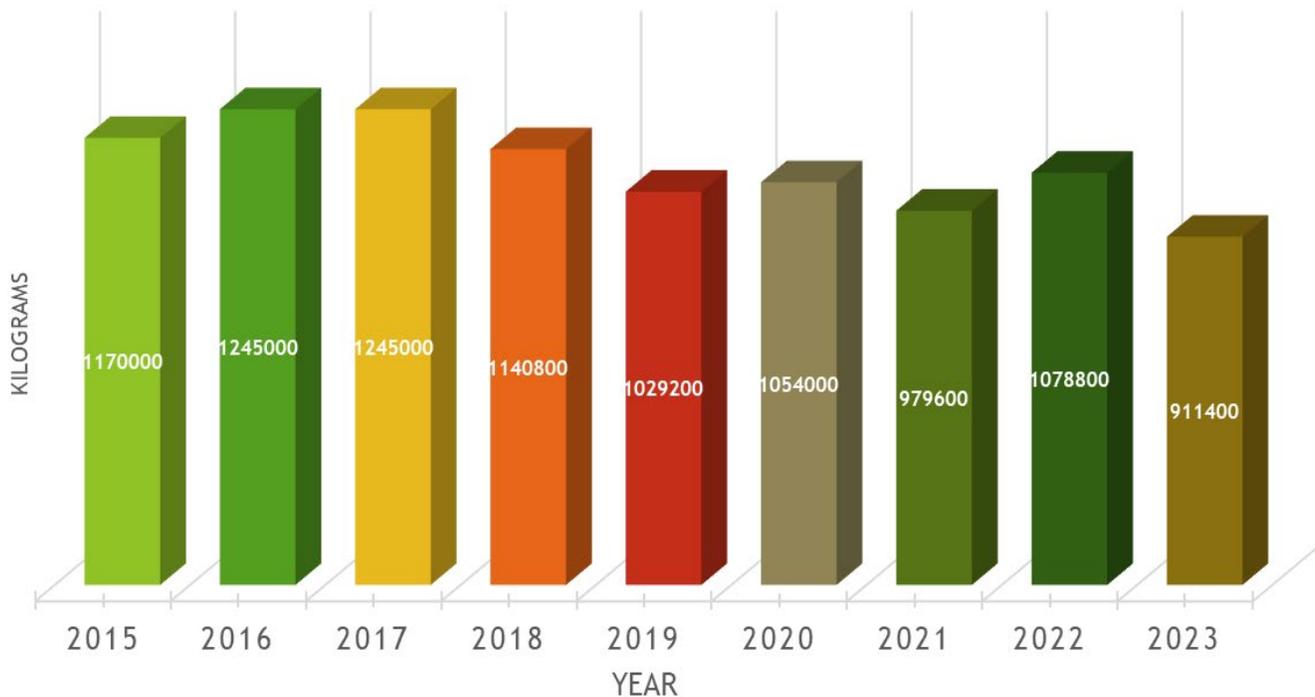
Dryden Waste-Water Treatment Plant Annual Report 2023

2023 Sludge Volumes

Month	Loads From SHT #1	Loads From SHT #2	SHT Avg. % Solids	Avg. Kg's/Load
January	7	8	1.02	6,200
February	6	6	1.19	6,200
March	8	7	1.43	6,200
April	7	8	1.34	6,200
May	6	6	1.33	6,200
June	5	5	1.43	6,200
July	5	4	1.48	6,200
August	8	9	1.43	6,200
September	5	4	1.36	6,200
October	8	7	1.29	6,200
November	4	4	1.29	6,200
December	5	5	1.29	6,200
Totals	74	73	1.32	911,400 Kg

*SHT = Sludge Holding Tank

ANNUAL SLUDGE VOLUMES





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Dryden Waste-Water Treatment Plant Annual Report 2023

Complaint Summary & Corrective Actions:

No complaints were received in 2023.

Bypass, Spill or Abnormal Discharge Summary:

There were no Sewage By-Pass events in 2023.

Other Information Required:

No other information.