



2019 Annual Performance Report

Thornbury Wastewater Treatment Plant

Prepared by: Wastewater Operations

Revised – May 21, 2020

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Executive Summary

This report has been prepared as required by Amended Environmental Compliance Approval 1640-BAFFX5, Section 11 issued to the Thornbury Wastewater Treatment Plant.

Section 11 (4) requires the Owner to prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The report shall contain, but shall not be limited to, the following information pertaining to the reporting period:

- a. Summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
- b. Summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;
- c. Summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
- d. Summary of all operating issues encountered and corrective actions taken;
- e. Summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- f. Summary of any effluent quality assurance or control measures undertaken;
- g. Summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- h. Summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
 - i. When any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
 - ii. When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- i. Estimate of the sludge volumes in the lagoon cells. Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period;
- j. Summary of any complaints received and any steps taken to address the complaints;
- k. Summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- l. Summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d of Condition 10, including a report on status of implementation of all modification
- m. Summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that

result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the following year following that for which the report is submitted;

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

All the requirements listed in Section 11 (4) have been met and will be further explored throughout the report.

Facility Information

The TWWP is a modification of the extended aeration treatment process. The original plant was a lagoon system constructed in 1975.

In 1993 the plant was extended to a mechanical facility utilizing the “Sutton Concept” for sludge disposal. The plant design included provision for phosphorus removal facilities and U.V. disinfection with continued use of existing outfall to the Beaver River on a continuous basis.

The Sutton process was developed in the early 1980’s following a research project which involved installing a package treatment facility in line with active lagoons.

The system provides nitrification and denitrification for the control of ammonia and hydrogen sulphide in waste stabilization lagoon effluents. A high nitrified effluent is obtained from an extended aeration activated sludge process which provides a high sludge and high solids level in the aeration cells (low F/Mv ratio).

The high concentration of nitrates in the secondary effluent prevents the reduction of sulphates to hydrogen sulphide in the lagoon.

The TWWP is currently rated at 3,580 m³/d operating under Amended Environmental Compliance Approval # 1640-BAFFX5.

Monitoring and Compliance

Town Staff ensure that the sewage works and related equipment and appurtenances which are installed or used to achieve compliance are properly operated and maintained.

A. Interpretation of Monitoring and Analytical Data

A comprehensive interpretation of all monitoring and analytical data collected during the reporting period, in comparison to the effluent quality and quantity criteria, is outlined below:

Capacity Assessment with Historical Trending– Table No. 1

Year	2019	2018	2017	2016	2015
Average Day Flow (m ³ /d)	2,780	2,660	2,773	2,335	1,835
Average Design Capacity (m ³ /d)	3,580	3,580	3,580	3,580	3,580
% of capacity (based on average daily flows)	78%	74%	77%	65%	51%
Five Year Rolling Average	69%	65%	64%	60%	61%
Peak Day Flow (m ³ /d)	6,696	7,656	7,617	10,580	4,546
Peak Design Capacity	7,196	7,196	7,196	7,196	7,196
Raw Sewage Total Flow (m ³)	1,013,577	951,371	1,010,180	853,670	670,000

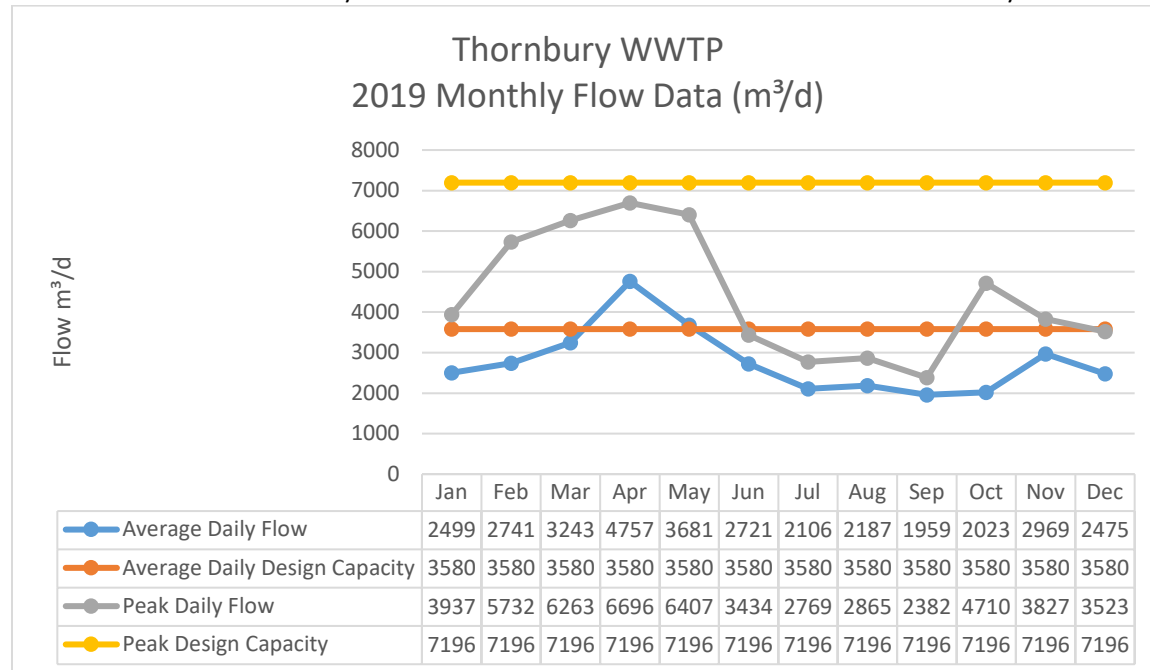
Capacity rating is based on Annual Flow Data. There was no imported sewage hauled in.

2019 Raw Sewage Loading Objectives (kg/d)

Table No. 2

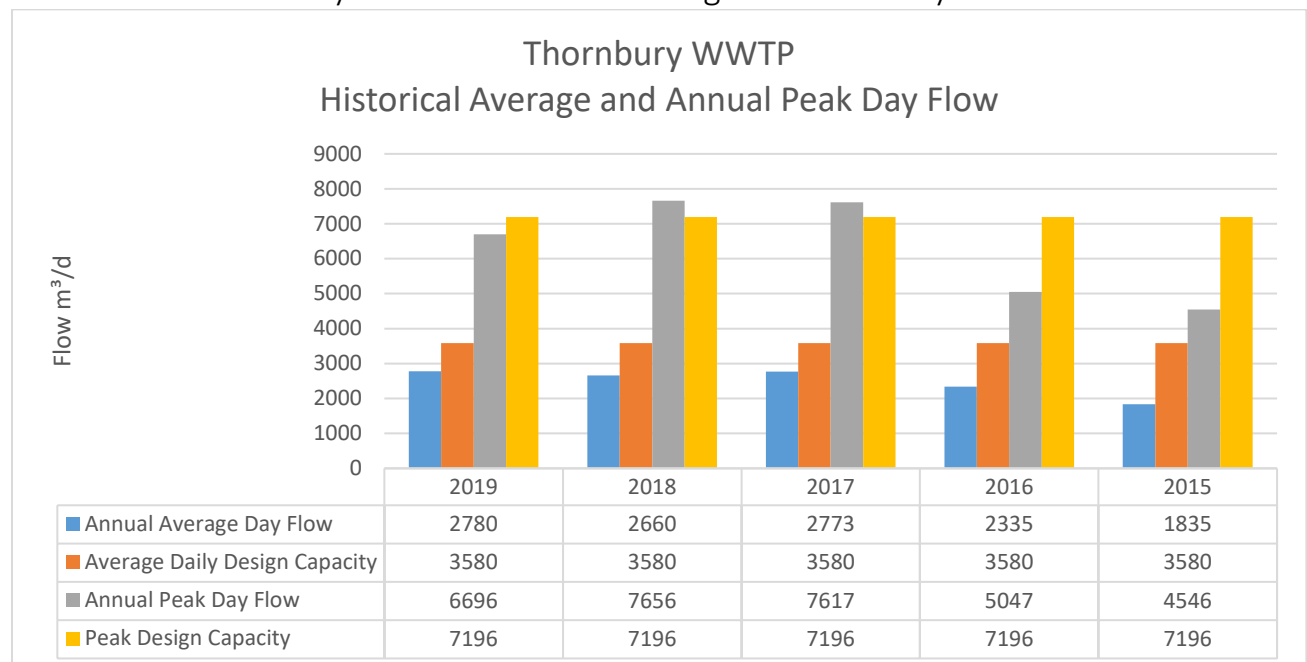
Influent Parameter	Design	Annual Average Loading	% of Design	Was Design Exceeded?
BOD	537	283	53%	No
Total Suspended Solids	651	337	52%	No
Total Phosphorus	25	4.2	17%	No
Total Kjeldahl Nitrogen	86	33	39%	No

Chart No. 1: Thornbury Wastewater Treatment Plant 2019 Monthly Flow Data



An estimated 4 million in upgrades to the headworks is proposed for 2020 to encompass new grit and rag removal and separate flow meters for incoming force mains. The upgrades will automatically divert to the lagoons once the peak day flow is reached or in the event of a power failure.

Chart No 2: Thornbury WWTP Historical Average and Peak Day Flow



The Annual Peak Day Flow is calculated using the average of the monthly Peak Day Flow events.

B. Summary and Interpretation of Final Effluent Monitoring Data

2019 Effluent Objectives

Amended Compliance Approval Number 1640-BAFFX5, issued on May 24, 2019 establishes the following effluent limits:

Table No. 3

Effluent Parameter	Concentration Objective (mg/L)	Concentration Achieved (mg/L)	Was Objective Met?
CBOD5	5.0	5.8	No
Total Suspended Solids	5.0	9.4	No
Total Phosphorus	0.25	0.18	Yes
Total Ammonia Nitrogen Freezing Period (Nov 1 to Mar 31)	3.0	3.18	No
Total Ammonia Nitrogen Non-Freezing Period (April 1 – October 31)	1.0	2.86	No
E.Coli	100	67.19 (Geometric Mean)	Yes

pH was maintained at 7.73 which is compliant with the range of 6.5 to 8.5 inclusive, at all times.

All cell discharge data has been included in Final Effluent Monitoring Data.

2020 Plant Performance

Table No. 4

Effluent Parameter Average Daily Effluent Flow 2,868	Annual Average Loading (kg/d)	Design Objective (kg/d)	Was Design Exceeded?
CBOD	19.6	18	Yes
Total Suspended Solids	27	18	Yes
Total Phosphorus	0.53	0.89	No

Effluent Parameter Average Daily Effluent Flow 2,868	Annual Average Loading (kg/d)	Design Objective (kg/d)	Was Design Exceeded?
Ammonia Freezing Period November 1 – March 31	8.14	11	No
Ammonia Non-Freezing Period April 1 – October 31	9.09	3.6	Yes

The Town met with an Industrial user who, on occasion, was exceeding BOD, pH and Total Phosphorus limits outlined in the Town's Sewer Use By-law. These exceedances decimated the MLSS and nitrifying bacteria in the aeration tanks. The Plant was re-seeded using aeration tank contents from the Craighleith Wastewater Treatment Plant and hauled by an approved hauler. A new Sewer Use By-law was approved in December 2019. The Industrial user is required to provide regular sampling data to the Town to demonstrate compliance with the limits.

2019 Final Effluent Compliance Limits

Table No. 5

Final Effluent Parameter	Month Sample Collected	Result mg/L	Maximum Monthly Concentration mg/L	Concentration Limit mg/L	Number of Exceedances	Was Objective Met?
CBOD5	January	4.30	7.0	10.0	0	Yes
	February	3.50	5.0	10.0	0	Yes
	March	5.25	8.0	10.0	0	No
	April	5.70	10.0	10.0	0	No
	May	6.85	14.0	10.0	1	No
	June	6.28	8.0	10.0	0	No
	July	2.5	4.0	10.0	0	Yes
	August	2.0	2.0	10.0	0	Yes
	September	11.5	19.0	10.0	2	No
	October	14	75.0	10.0	1	No
	November	11.7	14.0	10.0	3	No

Final Effluent Parameter	Month Sample Collected	Result mg/L	Maximum Monthly Concentration mg/L	Concentration Limit mg/L	Number of Exceedances	Was Objective Met?
	December	7.6	14.0	10.0	1	No

Final Effluent Parameter	Month Sample Collected	Result mg/L	Maximum Monthly Concentration mg/L	Concentration Limit mg/L	Number of Exceedances	Was Objective Met?
Total Suspended Solids	January	4.5	8.0	15.0	0	Yes
	February	3.16	4.0	15.0	0	Yes
	March	6.25	8.0	15.0	0	No
	April	7.80	14.0	15.0	0	No
	May	8.45	14.0	15.0	0	No
	June	10.7	30.0	15.0	1	No
	July	2.50	4.0	15.0	0	Yes
	August	4.25	8.0	15.0	0	Yes
	September	18.5	32.0	15.0	3	No
	October	17.3	85.0	15.0	1	No
	November	16.3	24.0	15.0	3	No
	December	13.3	31.0	15.0	3	No

Final Effluent Parameter	Month Sample Collection	Result	Maximum Monthly Concentration	Concentration Limit mg/L	Number of Exceedances	Was Objective Met?
	January	0.09	0.12	0.30	0	Yes

Final Effluent Parameter	Month Sample Collection	Result	Maximum Monthly Concentration	Concentration Limit mg/L	Number of Exceedances	Was Objective Met?
Total Phosphorus	February	0.09	0.25	0.30	0	Yes
	March	0.18	0.28	0.30	1	No
	April	0.15	0.35	0.30	1	No
	May	0.23	0.32	0.30	1	Yes
	June	0.18	0.23	0.30	0	Yes
	July	0.05	0.05	0.30	0	Yes
	August	0.08	0.13	0.30	0	Yes
	September	0.20	0.23	0.30	0	Yes
	October	0.40	1.54	0.30	3	No
	November	0.25	0.38	0.30	1	No
	December	0.19	0.51	0.30	1	Yes

Final Effluent Parameter	Month Sample Collection	Result	Maximum Monthly Concentration	Concentration Limit	Number of Exceedances	Was Objective Met?
Total Ammonia Nitrogen (Nov 1 to March 31)	January	1.73	4.6	5.0	0	Yes
	February	1.30	2.1	5.0	0	Yes
	March	3.2	6.5	5.0	2	No
	November	6.9	8.6	5.0	3	No
	December	8.03	17.2	5.0	5	No

Final Effluent Parameter	Date Sampled	Result	Maximum Monthly Concentration	Concentration Limit	Number of Exceedances	Was Objective Met?
Total Ammonia Nitrogen (Apr 1 to Oct 31)	April	2.38	4.4	2.0	4	No
	May	4.20	7.2	2.0	17	No
	June	3.6	6.7	2.0	6	No
	July	1.85	1.2	2.0	0	No
	August	0.775	1.2	2.0	0	Yes
	September	9.05	12.9	2.0	5	No
	October	6.3	22.2	2.0	8	No

Final Effluent Parameter	Date Sampled	Result	Concentration Limit	Number of Exceedances	Was Objective Met?
Acute Lethality to Rainbow Trout and Daphnia Magna	March	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	June	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	September	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	December	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes

Final Effluent Parameter	Date Sampled	Result	Maximum Monthly Concentration	Concentration Limit	Number of Exceedances	Was Objective Met?
E.Coli	January	11.3	220	200 CFU/100 mL	1	Yes
	February	4	16	200 CFU/100 mL	0	Yes
	March	94	1020	200 CFU/100 mL	2	Yes
	April	70	1800	200 CFU/100 mL	1	Yes
	May	358	13600	200 CFU/100 mL	4	No
	June	12.2	162	200 CFU/100 mL	0	Yes
	July	11.8	52	200 CFU/100 mL	0	Yes
	August	3.1	56	200 CFU/100 mL	0	Yes
	September	79.7	560	200 CFU/100 mL	1	Yes
	October	35	570000	200 CFU/100 mL	4	Yes
	November	62.7	130	200 CFU/100 mL	0	Yes
	December	74.3	600	200 CFU/100 mL	2	Yes

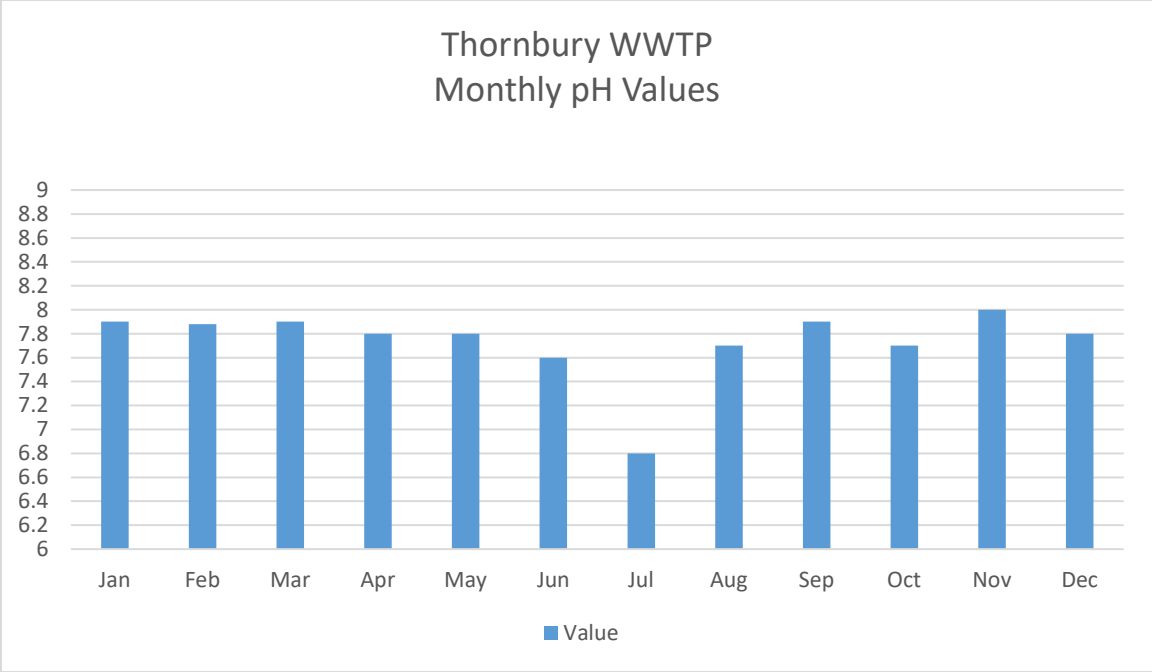


Chart No. 3 – Thornbury WWTP Monthly Average Effluent Waste Loadings

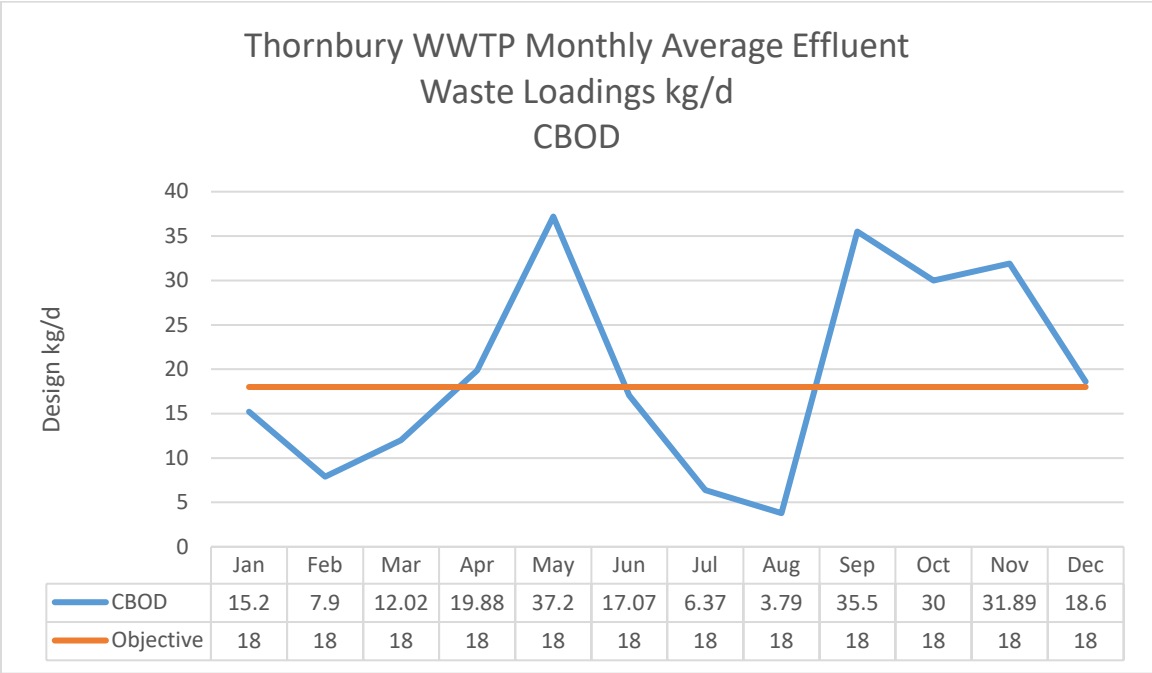
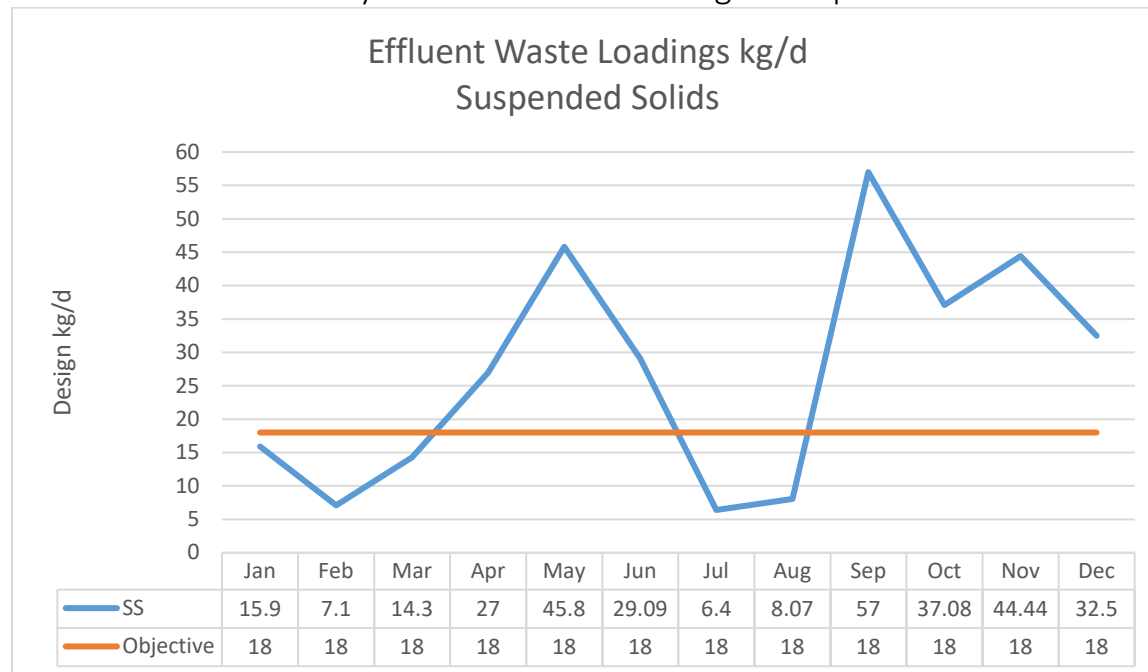


Chart No. 4 – Thornbury Effluent Waste Loadings – Suspended Solids



The future upgrades to the headworks will automatically divert to the lagoons once the peak day flow is reached or in the event of a power failure.

C. Summary of Deviation from Monitoring Schedule

Raw samples are collected twice monthly and sent to an accredited laboratory for analysis. This enables a better understanding of incoming raw sewage flow loadings. The influent and effluent samples are taken with an automated composite sampler. The composite samplers are located at the plant headworks and effluent channel after U.V.

There were no deviations from the monitoring schedule and the schedule will continue in 2020.

D. Summary of Operating Issues Encountered and Corrective Actions Taken

- Loss of nitrifying bacteria in aeration resulted in the Thornbury Wastewater Treatment Plant being reseeded using 138 cubic meters of mixed liquor from the Craighleith Wastewater Treatment Plant.
- Town Staff met with Industrial user exceeding the Town's Sewer Use by-law who in turn obtained a Consultant to develop a treatment system for process. The Town continues to work with the Industrial user to monitor and ensure compliance with the Town's Sewer Use by-law.

E. Summary of Normal and Emergency Repairs and Maintenance Activities Performed

- Two (2) Clarifiers were drained and cleaned. The sweep assemblies were rebuilt. The drives and three (3) valves were replaced.
- The aeration basins were drained and cleaned.
- Samples were collected quarterly for Acute Lethality analysis
- Eight (8) pumps at four (4) Sewage Lift Stations were serviced
- Two (2) large sewage pumps at the main Sewage Lift Station were rebuilt
- Two hundred (200) manholes were inspected
- 1,600 meters of collection system flushed
- 7,671 meters of sewer mains and 1,619 meters of laterals were assessed during the sewer main condition assessment
- Four (4) compressors serviced
- Annual inspection of all safety equipment
- Bi-annual inspection of all gas monitors

In accordance with Condition (8) of the ECA, the Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained.

The Thornbury WWTP employs a planned maintenance program that ensures that the sewage works and related equipment that are installed or used to achieve compliance are properly operated and maintained. Licensed Operators perform routine maintenance on all equipment including pumps, monitoring equipment, alarm systems, safety equipment, and other treatment components. Both routine and non-routine (emergency) maintenance activities are conducted in accordance with manufacturers' instructions.

F. Effluent Quality Assurance or Control Measures Undertaken

Effluent quality assurance is controlled by monthly effluent concentrations and waste loading calculations which are submitted to the Ministry of the Environment, Conservation and Parks (MECP) Owen Sound District Office.

The Town strives to operate within the ECA design objectives, however, on occasion due to high flow and plant upset, the Plant was unable to achieve the design objectives.

Table No. 6

Effluent Parameter	% Removal Efficiency (Annual Average)
CBOD5	93%

Effluent Parameter	% Removal Efficiency (Annual Average)
Total Suspended Solids	92%
Total Phosphorus	79%
Total Ammonia Nitrogen (Nov 1 to Mar 31)	75%
Total Ammonia Nitrogen (Apr 1 to Oct 31)	73%

G. Evaluation of Calibration and Maintenance Conducted on Monitoring Equipment

The Town is required to provide a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required by the ECA or recommended by the manufacturer.

Calibration of the monitoring equipment was completed in April 2019 and is attached for reference as Appendix A. All calibration results received met the accuracy requirement.

H. Summary of Efforts Made to Achieve Design Objectives

In cases where the facility did not meet design objectives, the MECP District Office was notified. The WWTP was reseeded on three (3) occasions and extra cell monitoring was conducted. The design objectives were achieved more than 50% of the operating year.

To assist with meeting design objectives, the final effluent line from the Clarifiers was flushed to maintain suspended solids in the final effluent within limits. In house lab work was performed once a week to monitor pH, suspended solids and total phosphorus. The UV system is monitored daily to verify operation. Ongoing dialogue is being held with Industrial dischargers.

Due to design limitations, which will be addressed in the Phase 1 expansion, the final effluent line from the clarifiers to the UV line was flushed regularly to improve suspended solids in the final effluent.

The existing TWWTP headworks (i.e. screening and grit removal) is known to be inadequate in hydraulic capacity and the equipment and other components are at the end of their intended service life and have failed.

The construction of new headworks has been scheduled for the 2020 construction season, with an anticipated completion date of December 2020. Following the completion of the headworks, staff are intending on moving ahead with the capacity expansion of the treatment plant. Construction of the new headworks is critical for the Town to achieve the TWWTP's effluent criteria and maintain compliance with Provincial Regulations.

I. Volume of Sludge generated in 2020 / Anticipated Volumes in 2019

Sludge disposal incorporates the "Sutton concept" where a high sludge age and solids level combined with an increased concentration of nitrates in the secondary effluent, prevents the reduction of sulphates to hydrogen sulphide in the lagoon. There was 9,083 cubic meters of Biosolids removed from Cell #1 in 2019 and applied to sites in accordance with Non-Agricultural Source Material (NASM) numbers 23699, 496074 and 496476. There is approximately 5,000 cubic meters left in the lagoon which is projected to be removed once the upgrades to the headworks in complete.

J. Summary of Complaints Received in 2020

One complaint was received in 2019. The complaint was investigated and determined to be the on-site sewage system that was the cause of the odor.

K. Summary of Bypasses, Overflow, or other situations outside Normal Operating Conditions

In accordance with Condition 11 of the ECA, this report must provide a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events.

A by-pass refers to the diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flow being returned to the Sewage Treatment Plant treated train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities. By-passes are prohibited except in certain situations, and may be planned (i.e. for maintenance or research purposes) or unplanned (i.e. emergency situations or high flow conditions).

To enable maintenance on the Clarifiers and three (3) valves in July, all flow from the Mill Street and Lakeshore Sewage Pumping Stations was directed to Cell #1. No partially or untreated sewage was discharged to the receiving stream. Dialogue was conducted with the local MECP Office in regard to this occurrence.

A plant overflow means a discharge to the environment from the sewage treatment facility at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling locations. Overflows are prohibited except in certain situations and special reporting, sampling, and recording requirements apply in the event of an overflow. Overflows may be

generally the result of heavy rainfall or snow melt events, such that the system becomes hydraulically overloaded.

Spills are releases of pollutants into the natural environment from or out of a structure, vehicle or other container that is abnormal in quality or quantity in light of all the circumstances of the discharge. Spills are generally the result of mechanical, electrical, automation or process failures. Abnormal discharge events include any other abnormal events not otherwise classified as a bypass, overflow, or spill.

There was one (1) overflow event at the Thornbury WWTP during the reporting period.

On April 29, 2019, Staff observed a small flow developed over the top of lagoon cell # 3 at the TWWTP. The MECP Spills Action Centre, the local MECP Inspector and Public Health Unit were notified in accordance with legislation.

The two weeks prior to the event, the average daily flow entering the TWWTP was between 6,000 – 7,000 cubic meters per day. Due to the high flows and poor effluent quality, flow from the clarifiers was directed to cell # 1. This, combined with the heavy rainfall, filled the cells prematurely. The Town received permission from the MECP to undertake an Emergency bypass to lower levels in cells # 1, 2 and 3 at the TWWTP.

Wastewater Operations Staff undertook efforts to sandbag the area. The northern berm discharge flow was stopped and contained by sandbags, in combination with the lowering of cell # 3 effluent level as granted by the MECP approved bypass. The eastern berm discharge continued which resulted in Staff contacting a contractor to build up the berm along the perimeter of cell # 3. The flow was contained and no longer discharging to the roadside ditch on Highway 26.

L. Summary of Notice of Modifications to Sewage Works Completed

There were no Notice of Modification to Sewage Works completed in 2019 for the Thornbury Wastewater Treatment Plant.

M. Summary of Efforts Made to Achieve Conformance with Procedure F-5-1

Not applicable.

N. Changes or Updates to Schedule for Completion of Construction for Proposed Works


The Town has hired J.L. Richards and Associates Limited (JLR) to provide engineering services for the preliminary and detailed design and construction administration for the construction of upgrades to the existing headworks facility at the Thornbury Wastewater Treatment Plant.

The Town currently holds Environmental Compliance Approval (ECA) No. 1640-BAFFX5 issued on May 24, 2019, for the operations of the Thornbury Wastewater Treatment Plant.

ACI Instrumentation Ltd.	Town of Blue Mountain -2019 Thornbury W.W.T.P.	14 Gormley Industrial Ave. Gormely, ON L0H 1G0 Tel: (905) 888-0063 Fax: (905) 888-6381
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Location	Thornbury WWTP	Manufacturer	Milltronics
Process	Effluent Flow	Model:	MultiRanger Plus
Calibration Date:	April 9 2019	Serial #	105-23
Technician	V.Nowik	Tag:	FIT-01

Input			Output		(Signal)	(Process)
Type:	Head (cm)		Type or EGU:	mA		CM/D
Min:	0.00		Min:	4.00		0.00
Max:	29.84		Max:	20.00		1400.00
Exponent	1.50					
Range Unit	CM/D					
Empty Distance	112.80					
			Before Calibration		After Calibration	
Cal. Input cm	Calculated Flow	Calculated O/P	Output (mA)	%Error	Output (mA)	%Error
0.00	0.00	4.00	4.05	0.31%	4.00	0.00%
12.90	397.94	8.55	8.09	-2.86%	8.09	-2.86%
19.60	745.27	12.52	11.83	-4.30%	11.83	-4.30%
26.20	1151.81	17.16	16.14	-6.40%	16.14	-6.40%
27.90	1265.72	18.47	16.83	-10.22%	16.83	-10.22%

Calibration Equipment			
Type:	Spare Sensor	DMM	Calibration performed as per manufacturers recommended procedure. Calibration Passed 
Manufacturer:	Miltronics	Fluke	
Model:	ST25	789 Processmeter	
Serial No.:	83329	25430033	
Last Cal. Date:		March 2019	


Comments: Check Zero and Span. P97 = 210=3.99 madc, P98=3623=19.93 madc.
Permissible error +/- 20% on this process

|Analog Output module inside Milltronics should be replaced, peaks out at 16.8 |

ACI Instrumentation Ltd.	Town of Blue Mountain -2019 Thornbury W.W.T.P.	14 Gormley Industrial Ave. Gormely, ON L0H 1G0 Tel: (905) 888-0063 Fax: (905) 888-6381
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Location	Thornbury WWTP	Manufacturer	Milltronics
Process	Influent Flow	Model:	MultiRanger Plus
Calibration Date:	April 9 2019	Serial #	23-Oct
Technician	V.Nowik	Tag:	FIT-02

Input			Output		(Signal)	(Process)
Type:	Head (cm)		Type or EGU:	mA		CM/D
Min:	0.00		Min:	4.00		0.00
Max:	45.40		Max:	20.00		9566.00
Exponent	1.58					
Range Unit	CM/D					
Empty Distance	81.92					
			Before Calibration		After Calibration	
Cal. Input cm	Calculated Flow	Calculated O/P	Output (mA)	%Error	Output (mA)	%Error
0.00	0.00	4.00	3.97	-0.19%	3.97	-0.19%
18.90	2395.48	8.01	7.96	-0.29%	7.96	-0.29%
21.30	2893.49	8.84	8.82	-0.12%	8.82	-0.12%
38.70	7433.02	16.43	15.89	-3.39%	15.89	-3.39%


Calibration Equipment			
Type:	Spare Sensor	DMM	Calibration performed as per manufacturers recommended procedure. Calibration Passed 
Manufacturer:	Miltronics	Fluke	
Model:	ST25	789 Processmeter	
Serial No.:	83329	25430033	
Last Cal. Date:		March 2019	

Comments: Check Zero and Span. P97 = 212=4.02 mdc, P98=3499=16.04 mdc.
Permissible error +/- 20% on this process

ACI Instrumentation Ltd.	Town of Blue Mountain -2019 Thornbury W.W.T.P.	14 Gormley Industrial Ave. Gormely, ON L0H 1G0 Tel: (905) 888-0063 Fax: (905) 888-6381
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Location	Thornbury WWTP	Manufacturer	Milltronics
Process	RAS Flow	Model:	MultiRanger Plus
Calibration Date:	April 9 2019	Serial #	133-23
Technician	V.Nowik	Tag:	FIT-03

Input			Output		(Signal)	(Process)
Type:	Head (cm)		Type or EGU:	mA		CM/D
Min:	0.00		Min:	4.00		0.00
Max:	46.99		Max:	20.00		1000.00
Exponent	1.55					
Range Unit	CM/D					
Empty Distance	101.10					
			Before Calibration		After Calibration	
Cal. Input cm	Calculated Flow	Calculated O/P	Output (mA)	%Error	Output (mA)	%Error
0.00	0.00	4.00	3.97	-0.19%	3.97	-0.19%
19.45	254.81	8.08	8.03	-0.29%	8.03	-0.29%
29.62	489.04	11.82	11.82	-0.03%	11.82	-0.03%
39.34	759.25	16.15	16.05	-0.61%	16.05	-0.61%
47.05	1001.98	20.03	19.90	-0.82%	19.90	-0.82%

Calibration Equipment			
Type:	Spare Sensor	DMM	Calibration performed as per manufacturers recommended procedure. Calibration Passed 
Manufacturer:	Milltronics	Fluke	
Model:	ST25	789 Processmeter	
Serial No.:	83329	25430033	
Last Cal. Date:		March 2019	

Comments: Check Zero and Span. P97 = 218=3.97 made, P98=3465=19.85 made.
 Permissible error +/- 20% on this process