



Mildmay Water Pollution Control Plant

#110002194

2019 Summary Report

March 19, 2020

**Prepared by Veolia Water
For the Municipality of South Bruce**

Contents

C of A (#2042-8KYJH3) Reporting Requirements

Plant Description

The Mildmay Water Pollution Control Plant is an Extended Aeration plant with a rated capacity of 966 m³. The collection system consists of approximately 14 km of gravity sewers and 3 lift stations. The main lift station is located on the North side of Clarke St. just northeast of the intersection of Clarke and Elora Road. It is equipped with two (2) centrifugal vertical pumps, each having a capacity of 45.5L/s at 23 meters TDH; bypass fittings on the forcemain and provision for emergency overflow from the pumping station wet well to Otter Creek; equipped with one (1) diesel generator 100 kilowatt back up diesel. Sewage is pumped through a 200mm diameter forcemain from the sewage pumping station to the sewage treatment plant. This forcemain has three (3) air relief valve chambers.

Sewage Treatment Plant

A circular extended aeration plant, with an overall diameter of 23.5 m, having annular process compartments;

Preliminary Treatment

- one (1) flowminutor with a *Peak Flow Rate* of 6,364 m³/d together with emergency bypass equipped with manually cleaned coarse bar screen;
- two (2) grit channels, each channel having dimensions of 7.6 m x 0.53 m;
- One (1) flowminutor with peak flow of 6,364m³/d with an emergency bypass equipped with manually cleaned coarse bar screen.
- Two (2) grit channels, each channel having dimensions of 7.6 m x 0.53m;
- A 250 millimeter diameter bypass sewer between the exit of the grit channels and the chlorine contact chamber;

Secondary Treatment

- One (1) 962 m³ Aeration tank with two compartments, having a sidewater depth (SWD) of 4.0 m and equipped with coarse bubble diffusers;
- One (1) 13.5 m diameter secondary clarifier with a SWD of 3.0 m and equipped with side feed clarifier mechanism, scum baffle, removable mechanical scum skimmer and scum air lift;
- One (1) return/waste activated sludge pump rated at 22 L/s at 2.1 m TDH;

Phosphorus Removal

- One (1) 27.3 m³ chemical storage tank with an enclosure and containment tank; addition of phosphorus removal chemicals can be done at the headworks or at the entry of the aeration tank;

Back-up Chlorination System

- One (1) 28 m³ chlorine contact chamber with bypass and V-notch measuring weir;
- One (1) 45.4 kg/d gas chlorinator for effluent disinfection and if required, pre-chlorination of raw sewage;
- One (1) ultrasonic water level monitor in the chlorine contact chamber, connected to a level/flow integrator and flow recorder;
- One (1) controller taking a signal from the final effluent level/flow integrator to control a water supply flow to the chlorinator for the preparation of chlorine solution to be added to the chlorine contact chamber for disinfection of secondary treated effluent;

Blower Room

- Three (3) air blowers, each with a rated capacity of 12.2 m³ /min. at 55.2 kPa. One (1) of the three blowers is equipped with a Variable Frequency Drive that allows Operators to adjust blower speeds based on Dissolved Oxygen levels for energy conservation and process improvement.

Sludge Stabilization

- One (1) two-stage aerobic digester having a volume of 97 m³ in the first stage and 48 m³ in the second stage. The digester is equipped with a coarse bubble diffuser system and a decanting facility;
- One (1) blower with a capacity of 20.1 m³/min. at 60 kPa provides aeration and mixing of the digester. This blower is equipped with a Variable Frequency Drive that allows Operators to adjust blower speeds based on tank level for energy conservation and process improvement.

Sludge Storage

- a 466 m³ sludge holding tank equipped with one (1) submersible mixer, a diffused aeration system and decanting device;
- one (1) submersible sludge loading pump rated at 23 L/s at 15.4 m TDH;

Standby Power

- one (1) 100 kW diesel generator set and one (1) 908 L fuel tank;

Scum Well

- a scum well equipped with one (1) submersible pump rated at 3 L/s at a 5.2 m TDH;

Brewery Waste Holding Tank

- a brewery waste holding tank equipped with one (1) submersible pump rated at 3 L/s at a 5.2 m

Outfall

- one (1) 279 millimeter outside diameter polyethylene outfall sewer complete with outfall headwall, discharging to Otter Creek;

Miscellaneous


- all other controls, electrical equipment, instrumentation, piping, pumps, valves, heating and ventilation systems and appurtenances essential for the proper operation of the aforementioned *Works* ; all in accordance with the following submitted supporting documents:

Chlorination System

- Existing chlorination system has been retained for pre-chlorination of raw sewage, if required,

UV Disinfection System

- a 300 mm diameter pipe from the existing outlet box in the chlorine contact chamber to the outdoor UV disinfection channel;
- an outdoor 5.31 m x 0.6 m x 0.9 m depth concrete channel equipped with a UV disinfection unit with a *Peak Flow Rate* of 49.1 L/s, complete with level control weir;
- a 300 mm diameter outlet pipe from the UV disinfection channel to the existing outfall chamber.

	Mildmay Wastewater Compliance Report 2019										Facility Classification: Class 2 Waste Water Treatment		Total Design Capacity: 966 m3/day		Receiving Waters: Otter Creek	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average	Maximum	Limit
Flow																
Influent Total Flow (m3/mth)	14,931	14,420	18,250	20,432	17,550	18,208	14,367	11,013	10,506	10,898	12,611	13,307	176,493	14,708		
Influent Average Day Flow (m3/d)	482	515	589	681	566	607	463	355	350	352	420	429		484		966
Influent Max Day Flow (m3/d)	844	1,178	1,369	1,261	898	733	720	401	434	561	627	620			1,369	
Biochemical O2 Demand																
Influent Average Raw CBOD (mg/L)	108	115	135	116	108	108	119	144	212	191	137	168		138	212	
Effluent Average CBOD (mg/L)	2	2	2	2	2	2	2	2	2	2	2	3		2	4	25
Eff. CBOD Loading (kg/d)	1.00	0.94	1.09	1.31	0.95	1.28	1.07	0.68	0.79	0.66	0.82	1.16		1.0		
Percent Removal	98.1	98.3	98.5	98.3	98.1	98.1	98.3	98.6	99.1	99.0	98.5	98.4		98.4 %		
Suspended Solids																
Influent Average TSS (mg/L)	165	156	212	180	134	187	190	184	338	268	260	233		209	338	
Effluent Average TSS (mg/L)	3	2	2	2	2	2	2	2	2	3	3	2		2	4	25
Eff. SS Loading (kg/d)	1.27	0.68	1.09	1.31	0.95	1.01	1.07	0.68	0.58	0.83	1.02	0.87		0.9		
Percent Removal	98.4	99.0	99.1	98.9	98.5	99.2	98.9	98.9	99.6	99.1	99.0	99.1		99.0 %		
Phosphorus																
Influent Average TP (mg/L)	3.23	4.29	5.13	3.93	3.60	4.45	4.33	5.35	6.47	7.03	4.75	5.46		4.84	7.03	
Effluent Average TP (mg/L)	0.21	0.19	0.22	0.22	0.29	0.40	0.45	0.49	0.45	0.37	0.27	0.18		0.31	0.53	1
Eff. Phosphorus Loading (kg/d)	0.10	0.09	0.12	0.14	0.14	0.25	0.24	0.17	0.18	0.12	0.11	0.08		0.1		
Percent Removal	93.4	95.6	95.7	94.5	91.9	91.0	89.5	90.8	93.0	94.7	94.4	96.6		93.4 %		
Nitrogen Series																
Influent Average TKN (mg/L)	26.40	32.20	34.90	29.60	30.40	28.00	29.20	39.70	47.50	44.50	35.90	41.20		34.96		
Effluent Average NH3+NH4 (mg/L)	0.03	0.04	0.06	0.06	0.08	0.06	0.09	0.07	0.06	0.07	0.05	0.07		0.06	0.13	8
Effluent Average Nitrate (mg/L)	13.00	10.90	11.05	9.20	11.95	11.20	18.23	22.45	22.15	20.95	20.55	21.00		16.20	24.5	
Effluent Average Nitrite (mg/L)	0.02	0.01	0.02	0.02	0.04	0.03	0.06	0.08	0.06	0.05	0.03	0.03		0.04	0.09	
pH																
Effluent Average pH	7.60	7.61	7.73	7.74	7.71	7.71	7.75	7.79	7.80	7.91	7.96	7.97		7.77	8.40	
UV Disinfection																
Average UV Intensity	3.50	3.35	3.52	4.07	4.75	5.76	6.78	7.08	6.85	6.44	7.40	6.89		5.5	8.8	
Disinfection																
E.Coli Geo.Mean per 100mL	1	2	1	1	1	1	1	4	1	1	1	1		1	4	200

Note: Acute Lethality Sample was collected July 23rd. The results came back non lethal.



By-Passes

There were no by-passes in 2019.

Table 2 BYPASS AND OVERFLOW SUMMARY FOR 2019

MONTH	Primary Bypass			Secondary Bypass			Plant Overflows			Collection System Overflows		
	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (m3)
January	0			0			0			0		
February	0			0			0			0		
March	0			0			0			0		
April	0			0			0			0		
May	0			0			0			0		
June	0			0			0			0		
July	0			0			0			0		
August	0			0			0			0		
September	0			0			0			0		
October	0			0			0			0		
November	0			0			0			0		
December	0			0			0			0		
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

Note: An 'Event' means an occurrence or occurrences of a bypass or overflow separated by a period of more than 12 hours between the occurrence(s) or the event(s) and the previous event, at each location.



Operating Problems

- During 2019 there were no operational issues that significantly impacted the quality of effluent. However, some minor difficulties were encountered in the wastewater plant processes.
- There are significant differences between “dry period” flows and “wet period” flows. This is not unusual for older collection systems.

Major Maintenance

While there were some minor breakdowns of the equipment at the Mildmay STP in 2019, none significantly impacted the effluent quality. Additional maintenance other than routine maintenance included:

April 25 - Completed installation and began running new Digester Air Blower.

September 16 - Sommers Generators and RKS Electric were on site to Commission the new Generator at the Elora Lift Station

September 23 - WSP and RKS Electric were on site to work on SCADA upgrades at the Sewage Pumping Station.

November 15-19 - Annual Sewer flushing was completed.

QA/QC Measures

All required regulatory and C of A analyses were performed by E3 Lab Services. In addition, routine in house laboratory sampling was undertaken to ensure compliance and included, but was not limited to: 30 minute Settling, Suspended Solids, Final Effluent Total Phosphorus, pH, and temperature.

Effluent Monitoring Equipment

The following is a list of the monitoring equipment at the Water Pollution Control Plant for the final effluent:

- Hach Pocket Colorimeter 2 Phosphate – Total Phosphorus
- Hach HQ 40d– pH, Dissolved Oxygen
- Endress Hauser- Dissolved Oxygen, pH, Temperature
- Hach Pocket colorimeter 2 – Total Cl₂ residual (for back-up in event of UV malfunction)
- Digital Scale for MLSS

Calibration and Service of Equipment

- April 4, 2019 – Annual inspection of all safety equipment.
- May 3, 2019 – Calibration of gas detectors by Hetek
- July 8, 2019 - Calibration of flow monitoring equipment by ICS – Effluent
- October 28, 2019 - Calibration of gas detectors by Hetek

Effluent Objectives

1. Dissolved Phosphorus tests were used to indicate the required Alum dosage.
2. pH measurements were taken to ensure levels were between 6.0 and 9.0 and water quality.
3. Dissolved oxygen was measured to ensure that adequate aeration is being carried out.
4. Mixed liquor suspended solids and 30 minute settling tests are used to determine adequate microbiological populations and to set the sludge wasting rates.

Bio Solids Volume

Bio-Solids hauled in 2019 was approximately 735 m³. The volume of Biosolids hauled was up by 14 m³ compared to 2018 volume.

Bio-Solids quantities are expected to be similar in 2020.

From July 10-16, 2019, 735 m³ of biosolids were hauled to the Mike Neisen farm (NASM #22417)



Customer Complaints

No complaints were known to have been received.

By-Passes

No by-passes occurred in 2019.

Information for the District Manager

No additional information was known to have been requested from the District Manager.

Recommendations

1. Consider adding standby power to Vincent St. Lift Station.
2. Replacement of Effluent Water Pump
3. Long term replacement of Aeration tank Blowers