

DWCo. LTD

Dufferin Water Co. LTD
13 Rose Ridge Lane
Mono On
L9W 5Y3
Phone 519 942 5695 Fax 519 940 3956

Maple Leaf Acres Members' Association Sewage Works

Annual Performance Report March 31, 2019 Revision #1

For the Period:

January 01, 2018 to December 31, 2018

**Prepared for the Maple Leaf Acres Members' Association
By Dufferin Water Co. Ltd – March 2019**

Introduction

Dufferin Water Co. Ltd was retained to operate the sewage works starting on July 27, 2006. Prior to this period the facility was operated by the Envirosearch Operation Inc. of Rockwood Ontario.

The purpose of this report is as follows:

- To summarize all monitoring data including an overview of the success and adequacy of the sewage treatment program.
- To provide a tabulation of all monitoring and analytical results obtained during the reporting period.
- To provide a record of the operation of the spray irrigation system.
- To provide an account of any environmental and operating problems that occurred during the reporting period.

Process Description

The sewage works are comprised of 5 main components as follows:

Main Sewage Pumping Station

One 2.4m diameter sewage pumping station, equipped with two submersible pumps each rated at 20.2 L/s at 7.1m total dynamic head. The station receives septic tank effluent from all three phases and discharges to a facultative sewage lagoon located on the south end of the property via a 700m long, 150mm diameter forcemain, complete with two valves allowing either or both cells of the lagoon to be filled.

Metering Chamber

One in-ground concrete metering chamber with magnetic flow meters installed on the forcemain from the main sewage pumping station and the effluent forcemain to the spray irrigation system. Both meters are connected to a datalogger that is downloaded remotely approximately once per month.

Facultative Lagoon

Two cell waste stabilization pond, interconnected by a pipe, each cell having a surface area of 1.05ha at mid operating depth, with 1.67m operating water depth, plus 0.93m freeboard, and 0.3m sludge storage depth, providing a nominal operating volume of 36,300 cubic metres and a total storage volume of 67,000 cubic metres approximately, 3m wide berm top formed with 4:1 (h:v) inside berm slope and 3:1 (h:v) outside berm slope, complete with two inlet structures, an outlet pipe with an intake collar, connecting to an irrigation pumping station.

Irrigation Pumping Station

One 1.8m diameter by 6.2m deep, below grade, sewage pumping station located on the berm of the facultative lagoon near the outlet pipe, equipped with two submersible pumps each rated at 24.9 L/s at 63.6m total dynamic head, discharging to a spray irrigation area via a 150mm forcemain complete with a flow meter (out of service), level controls, an air purge system, safety platform, vent pipe and associated appurtenances

Effluent Spray Irrigation

An effluent spray irrigation system consisting of three spray areas 2ha, 3.4ha, and 3.4ha totaling 8.8ha, located on the north side of the facultative lagoon, complete with an effluent discharge network consisting of approximately 150

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spray nozzles including low trajectory nozzles, spray irrigation control system and associated apputenances.

Facility Facts

Data for the facility is summarized below:

Peak Flow Capacity	1745 m3 per day
Average Day Design Flow	135 m3 per day
Average Daily Flow (2018)	135 m3 per day
Service Population (sites - design)	523 sites (Permitted), 520 Actual
ECA#	2708-ATBLTQ

Effluent Objectives

- CBOD5 25 mg/L
- Suspended Solids 25 mg/L
- Total Phosphorus 3 mg/L
- TKN 7 mg/L

Non-Compliance Concentrations

- CBOD5 40 mg/L
- Suspended Solids 40 mg/L
- Total Phosphorus 3.5 mg/L
- TKN 7.5 mg/L

Sampling requirements for raw sewage are monthly for the following parameters:

- CBOD5
- Suspended Solids
- Total Phosphorus
- TKN

Sampling requirements for the final effluent are monthly from April to October for the following parameters:

- CBOD5
- Suspended Solids
- Total Phosphorus
- TKN
- Ammonia and Ammonium Nitrogen
- E. Coli
- Chloride

Sampling requirements for groundwater at various locations in the spray area are before the spray season, in the middle of the spray season, and at the end of the spray season for the following parameters:

- Total Phosphorus
- Nitrates
- Nitrites
- Chloride
- Conductivity
- pH
- Temperature

Sampling requirements for surface water are upstream and downstream samples before the spray season, in the middle of the spray season, and at the end of the spray season for the following parameters:

- CBOD5
- Suspended Solids
- Total Phosphorus
- TKN
- Ammonia and Ammonium Nitrogen
- Nitrates
- Nitrites
- pH
- Temperature
- Chloride

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Compliance Facts

During 2018 the sewage works were operated by the following licensed operators:

- **Joe Miedema, WWT1, License # 16442, Expires April 30, 2020**

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Repairs and Process Upsets

During the year 2018 there were no treatment bypasses that discharged untreated or partially treated wastewater to the natural environment.

Monitoring Data and Analytical Results

The results of all analytical testing are summarized in Tables 1 to 5.

Table 1 – Raw Sewage

Date	Sample ID	CBOD5	TSS	Total P	TKN
		mg/L	mg/L	mg/L	mg/L
Jan 31/18	Raw	47	29	2.5	27
Feb 28/18	Raw	48	64	2.7	21
Mar 29/18	Raw	51	28	2.4	21
Apr 27/18	Raw	13	29	1.8	16
May 30/18	Raw	110	57	4.8	45
June 28/18	Raw	160	83	5.5	48
July 30/18	Raw	180	63	6.8	50
Aug 31/18	Raw	190	71	6.6	52
Sep 26/18	Raw	30	82	4.9	20
Oct 31/18	Raw	37	92	3.1	13
Nov 30/18	Raw	30	30	1.2	12
Dec 24/18	Raw	19	28	1.2	12

Note - ND = parameter not detected

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Table 2 – Lagoon Effluent

Date	Sample ID	CBOD 5 mg/L	TSS mg/L	Total P mg/L	Ammonia – N mg/L	TKN Mg/L	NO3 mg/L	NO2 mg/L	Chloride Mg/L
May 09/18	Lagoon	ND	16	0.59	0.052	0.72	0.42	ND	190
May 30/18	Lagoon	ND	ND	1.0	1.5	2	ND	0.07	25
Jun 28/18	Lagoon	8	ND	0.98	ND	0.58	0.34	ND	85
July 30/18	Lagoon	ND	ND	0.34	ND	1.4	ND	ND	410
Aug 31/18	Lagoon	9	ND	0.59	0.5	1.7	ND	ND	63
Sep 26/18	Lagoon	ND	ND	2.0	0.056	1.6	0.22	ND	270
Oct 31/18	Lagoon	ND	10	0.44	ND	1.2	ND	0.37	380

Note - ND = parameter not detected

Table 3 – Surface Water

Date	ID	CBOD5 mg/L	TSS mg/L	Tot. P Mg/L	Am m -N mg/ L	NO3 mg/L	NO2 mg/L	pH	Temp C	Chlori de Mg/L	TKN mg/L
Apr 27, 2018	Down	ND	ND	0.033	ND	0.27	ND	7.84	15	58	0.22
Apr 27, 2018	UP	ND	ND	0.021	ND	0.32	ND	7.98	15	66	0.42
July 30/18	Down	ND	ND	0.026	ND	ND	ND	8.31	24	81	0.22
July 30/18	Up	ND	ND	0.028	ND	ND	ND	8.29	24	79	0.35
Sep 26/18	Down	ND	ND	0.045	0.08	ND	ND	8.24	18	80	0.43
Sep 26/18	Up	ND	10	0.037	0.07	0.10	0.01	8.27	18	79	0.43
Oct 31/18	Down	ND	10	0.052	ND	ND	ND	8.15	9	79	0.55
Oct 31/18	Up	4	ND	0.052	ND	ND	ND	8.13	9	80	0.64

Note - ND = parameter not detected

Table 4 - Summary of Microbiological Data

Date	E. Coli Result - CFU/100ml
May 09/18	<10
June 28/18	<10
July 30/18	<10
Aug 31/18	<10
Sep 26/18	<10
Oct 31/18	<10

Note - ND = parameter not detected

Table 5 - Groundwater

Date	ID	Cond	pH	Total P mg/L	Chloride mg/L	Nitrite mg/L	Nitrate mg/L	Temp C
May 4	PW-01	1340	6.92	0.043	100	ND	5.8	8.2
May 4	PW-02	561	7.31	0.008	2	ND	0.22	7.6
May 4	PW-03	495	7.53	0.181	4	ND	0.11	5.7
May 4	PW-04	942	7.28	0.008	40	ND	ND	7.4
May 4	PW-05	899	7.12	0.014	44	ND	ND	5.8
May 4	PW-06	966	7.14	0.008	30	ND	ND	6.3
May 4	PW-07	870	7.43	0.007	43	0.03	0.41	6.9
May 4	PW-08	704	7.06	<0.003	10	ND	ND	6.7
May 4	PW-09	790	6.97	0.033	35	ND	ND	7.7
May 4	PW-10	678	7.16	0.016	7	ND	ND	7.5
May 4	PW-11	682	7.05	0.044	9	ND	0.21	7.8
Jul 30	PW-02	634	7.62	0.1	3	ND	0.38	16.6
Jul 30	PW-04	926	7.63	0.13	41	ND	0.08	13.7
Jul 30	PW-05	936	7.41	0.098	37	ND	ND	12.2
Jul 30	PW-08	734	7.46	0.282	12	ND	ND	14.1
Jul 30	PW-09	1030	7.01	0.612	52	ND	ND	17.3
Jul 30	PW-10	821	7.69	0.968	14	ND	ND	20.3
Nov 5	PW-02	670	7.25	0.023	7	ND	12.8	11
Nov 5	PW-04	982	7.23	0.017	43	ND	ND	10.7
Nov 5	PW-05	1100	7.24	0.031	55	ND	ND	11
Nov 5	PW-08	529	7.51	0.173	6	ND	ND	9.7
Nov 5	PW-09	1040	7.19	0.142	67	ND	ND	9.1
Nov 5	PW-10	613	7.31	0.051	6	ND	ND	9.5

Note - ND = parameter not detected

Spray Irrigation System Operation and Flow Summary

The spray irrigation system typically operates from mid April until the end of October. The effluent is sprayed onto the spray areas automatically. The system is equipped with sensors that prevent the system from irrigating during wet and/or windy weather.

Based on the magnetic flow meters at the lagoon it is estimated that **49,350,000** litres entered the lagoon and **49,200,000** litres of effluent were disposed of using the spray irrigation system. This represents an average annual daily flow of about **135,000** litres per day.

The spraying season commenced on May 09, 2018 and finished on October 29, 2018. During the 2018 spray season the spraying schedule was as follows:

- April - no spraying conducted.
- May 09 to end of September - 7 days per week from 0830 to 1830 weather and conditions permitting. All zones utilized.
- October - 5 days per week from 0900 to 1800 weather and conditions permitting. All zones utilized.
- Application rates of the spray effluent averaged 16 L/s during spray operation with minor variations depending on the number of spray heads in a given zone.

Table 6 on the following page provides the dates and corresponding volumes of effluent applied on days that spraying was conducted.