Crysler Wastewater System

Sewage Works #110002960

Annual Report

Prepared for: Township of North Stormont

Reporting Period of January 1st – December 31st 2018

Issued: March 25, 2019

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

This report has been prepared to meet the requirements of ECA #9170-9PXLXZ

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Operations and Compliance Reliability Indices

Compliance Event	# of Events
Ministry of Environment Inspections	0
Ministry of Labour Inspections	0
Non-Compliance	0
Spills	0
Sewer Main Blockages	0

System Process Description

Crysler's wastewater system consists of a gravity fed sanitary sewage collection system, one pumping station and a wastewater treatment lagoon. The system also receives municipal wastewater from the Village of Finch. Finch has three small sewage pumping stations and one main pumping station (SPS #1) where ferric chloride is injected before the wastewater is pumped to Crysler. The sewage from Finch takes up about 45% of Crysler's sewer and pump station capacity. Upgrades to Crysler's SPS were completed in 2014 to increase the pumping capacity of the station from 35 l/s to 46 l/s.

The combined sewage from Crysler and Finch is pumped over a distance of 2.7 kilometers from Crysler's SPS to the sewage lagoon located on the north bank of the South Nation River. A chemical injection building is located on site housing a 20,000 litre alum storage tank and two chemical feed pumps (one duty and one standby). Aluminum sulphate is injected for phosphorus control as wastewater is pumped to the lagoon. The total capacity of the lagoon system is 297,600 m^3. The west facultative cell (Cell #1) has an operating volume of 61,700 m^3, and the east facultative cell (Cell #2) has an operating volume of 87,900 m^3. The center cell (Cell #3) is equipped with aeration and has an operating volume of 148,000 m^3. Effluent is discharged from the center cell through a 675 mm outfall to the South Nation River.

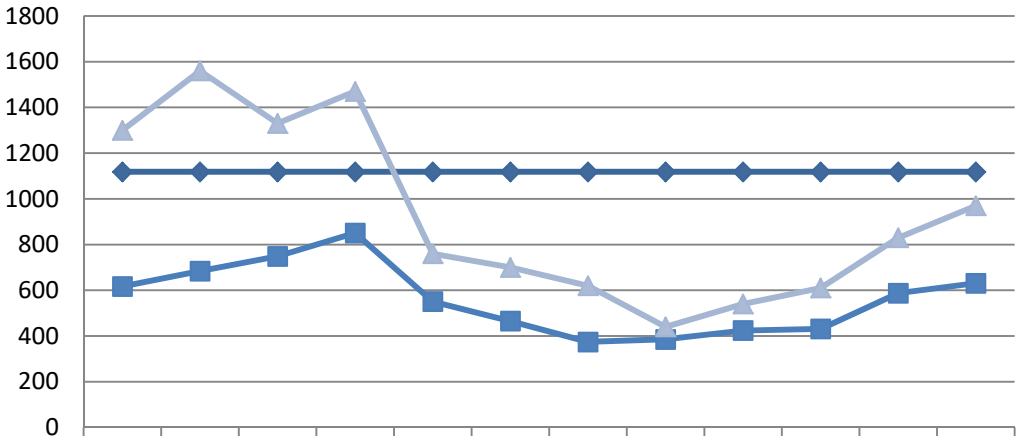
The lagoon can be operated on a semi-annual discharge basis in accordance with the ECA which allows effluent to be discharged in the spring and in the fall. Currently, only the spring discharge window is utilized.

Wastewater System Flows

The hydraulic flows reaching the sewage lagoons in 2018 averaged 562 m^3/day which represents 50% of the 1,118 m^3/day design capacity

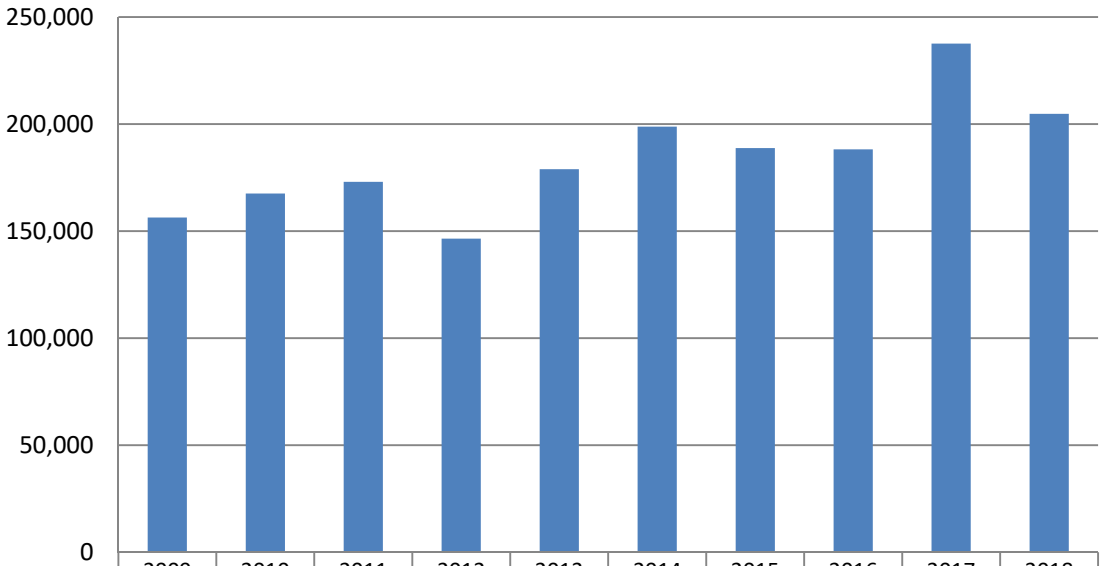
Raw Flows

2018 Raw Flows:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Design Capacity (m3/d)	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118
Avg Flow (m3/d)	617	684	748	851	551	465	374	385	424	431	587	631
Max Flow (m3/d)	1300	1560	1330	1470	760	700	620	440	540	610	830	970

Annual Raw Flow Comparison:



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Annual Flow (m3)	156,334	167,565	173,050	146,505	178,900	198,791	188,790	188,170	237,560	204,800

Effluent Flow

A total of 285,033 m^3 was discharged from Crysler's sewage lagoons in the spring of 2018.

Effluent Quality Assurance or Control Measures

Effluent control measures include pre-discharge sampling and testing of lagoon cell contents prior to discharge. The samples are collected by the Ontario Clean Water Agency's competent and licensed staff using approved methods and protocols for sampling including those specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

All effluent samples collected during the reporting period were submitted to Eurofins laboratory in Ottawa for analysis, with the exception of pH and temperature. Eurofins is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, OCWA is ensuring appropriate control measures are undertaken during sample analysis.

The pH and temperature were analyzed in the field at the time of sample collection by certified operators to ensure accuracy and precision of the results obtained.

Effluent Quality

The total volume of the spring discharge was 285,033 m^3. There were no exceedances of the seasonal average concentration objectives or limits outlined in the ECA during the 2018 discharge period. Correspondingly, none of the seasonal waste loadings were exceeded.

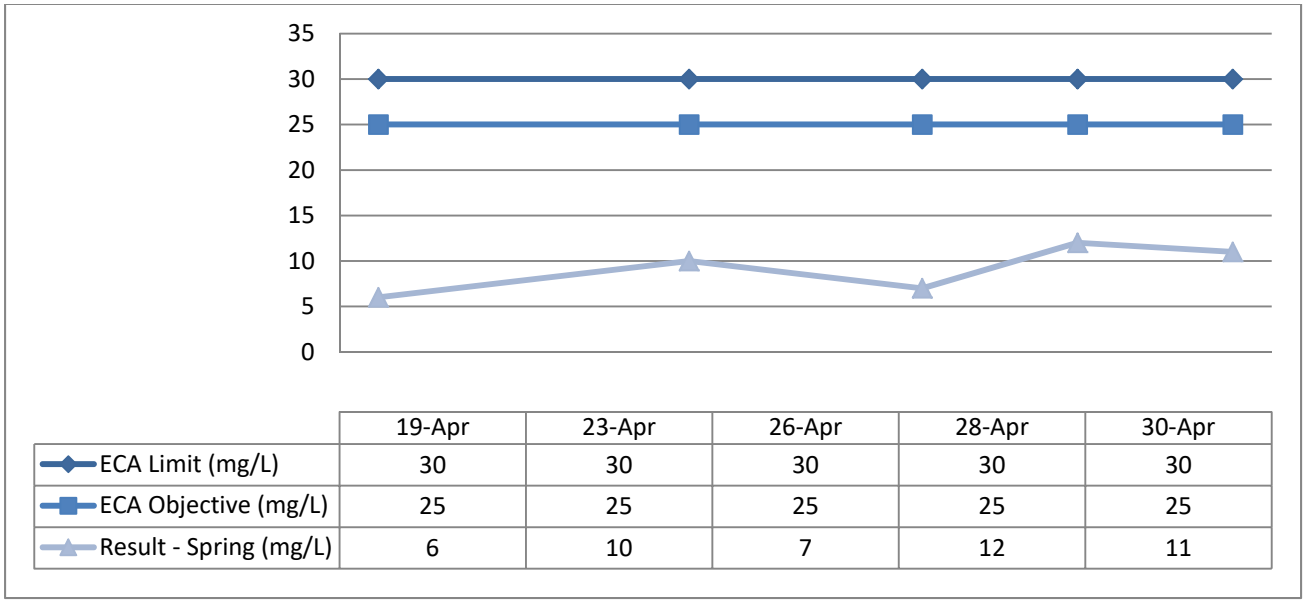
It should be noted that the average total suspended solids (TSS) concentration calculated for the spring discharge was equal to the objective concentration of 25 mg/L, with single samples collected on April 23rd and April 28th exceeding the objective. The sample collected on April 28th with a result of 36 mg/L also exceeded the limit of 30 mg/L; however, ECA compliance is not based on single sample results.

The results from the spring discharge are tabulated below. Please refer to the Performance Assessment Reports in Appendix A for details.

Carbonaceous Biochemical Oxygen Demand (5-Day)

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	9.2	30	25	No

Effluent $CBOD_5$ Results:

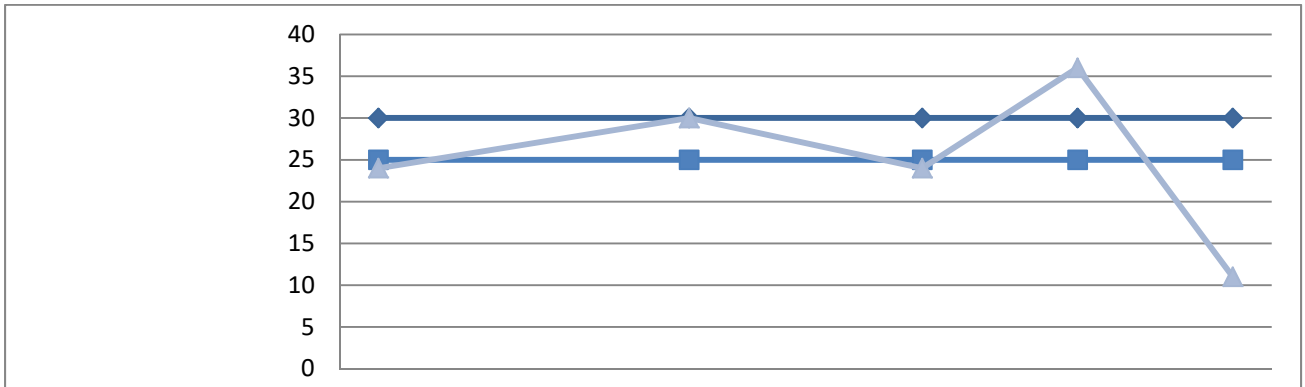


	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
ECA Limit (mg/L)	30	30	30	30	30
ECA Objective (mg/L)	25	25	25	25	25
Result - Spring (mg/L)	6	10	7	12	11

Total Suspended Solids

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	25.0	30	25	No

Effluent TSS Results:

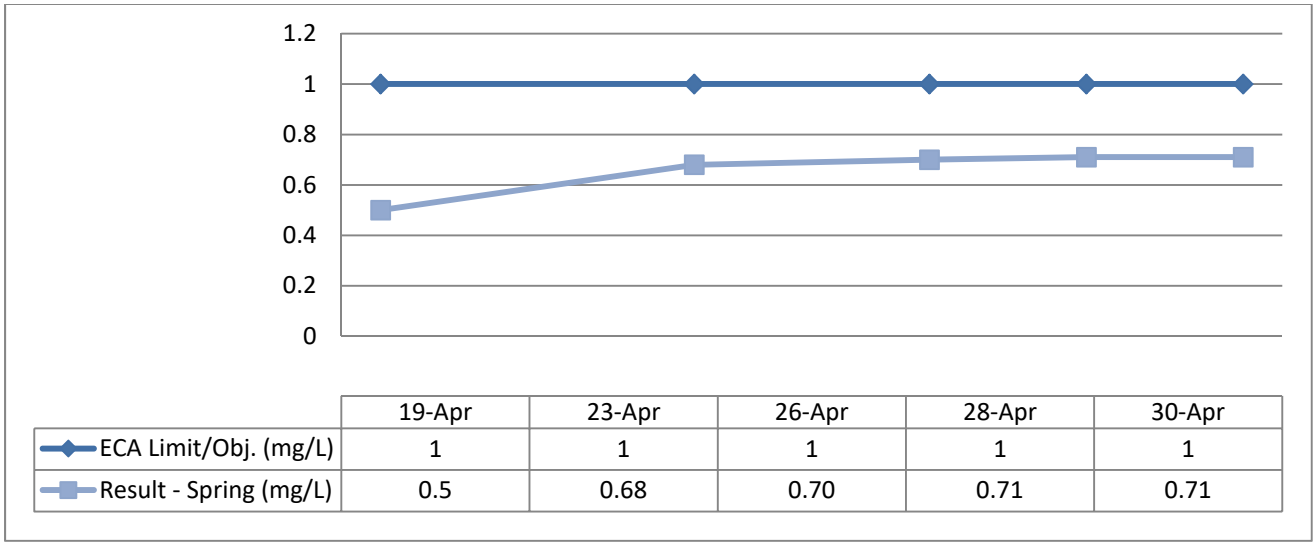


	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
ECA Limit (mg/L)	30	30	30	30	30
ECA Objective (mg/L)	25	25	25	25	25
Result - Spring (mg/L)	24	30	24	36	11

Total Phosphorus

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	0.70	1.0	1.0	No

Effluent TP Results:

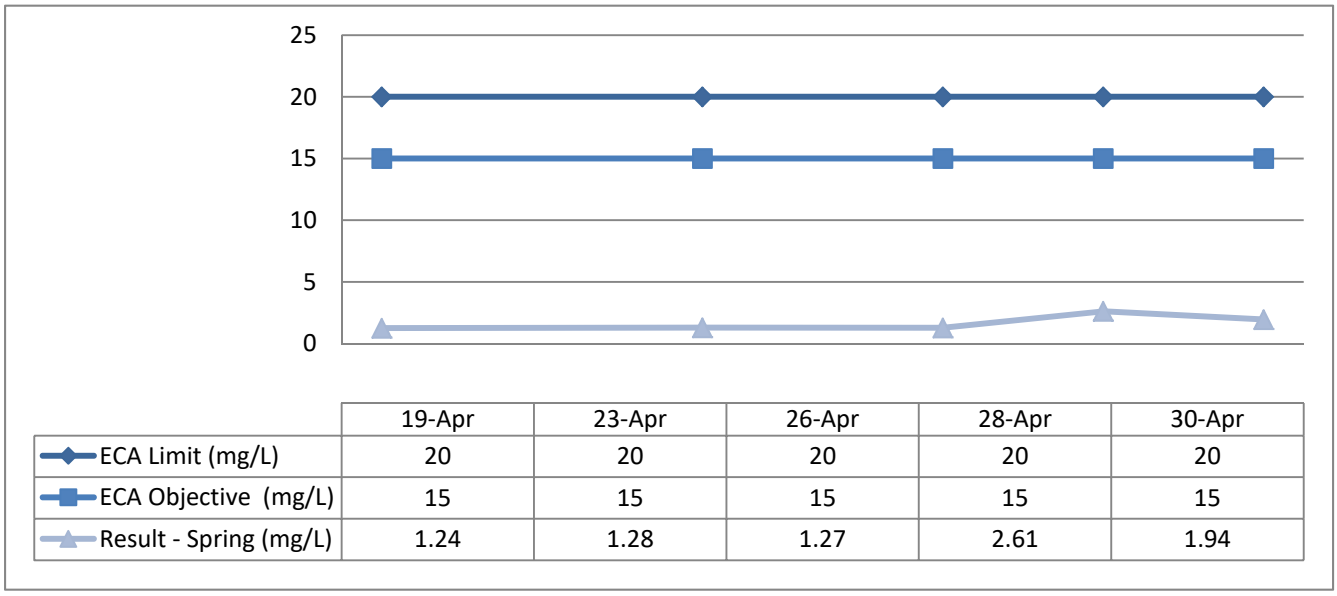


	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
ECA Limit/Obj. (mg/L)	1	1	1	1	1
Result - Spring (mg/L)	0.5	0.68	0.70	0.71	0.71

Total Ammonia Nitrogen

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	3.9	20	15	No

Effluent TAN Results:

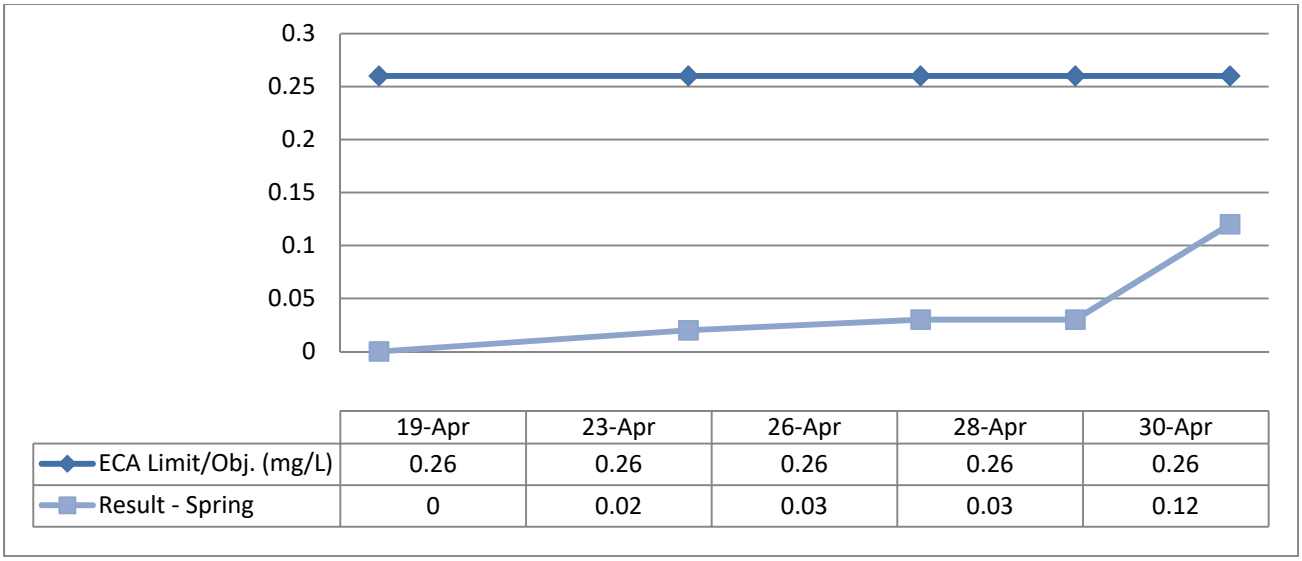


	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
ECA Limit (mg/L)	20	20	20	20	20
ECA Objective (mg/L)	15	15	15	15	15
Result - Spring (mg/L)	1.24	1.28	1.27	2.61	1.94

Hydrogen Sulphide

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	0.042	0.26	0.26	No

Effluent Undissociated H_2S Results:

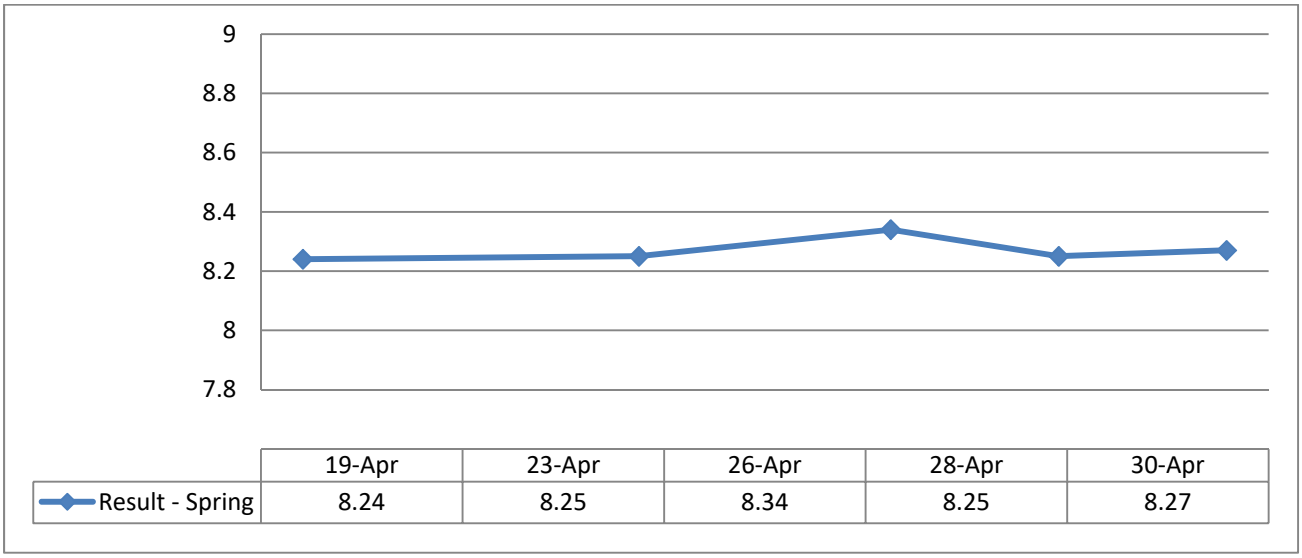


	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
ECA Limit/Obj. (mg/L)	0.26	0.26	0.26	0.26	0.26
Result - Spring	0	0.02	0.03	0.03	0.12

pH

Discharge Period	Seasonal Average	ECA Limit	ECA Objective	Exceedance
Spring	8.3	n/a	n/a	n/a

Effluent pH Results:



	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr
Result - Spring	8.24	8.25	8.34	8.25	8.27

There are no ECA limits or objectives for pH.

Operating Issues

There were no operating issues to report for 2018.

Maintenance

Flow Meter Calibration and Maintenance

A copy of the flow meter calibration certificate for 2018 is attached in Appendix B.

Maintenance Summary

Description
- performed routine sewer flushing and wet well cleaning - performed routine camera inspection of sewer mains - repaired/upgraded manholes in collection system - performed pest control at lagoon - repaired alum process piping - purchased new gates to replace damaged gates at lagoon

Notice of Modifications

Date	Process	Modification	Status
None to report.			

Sludge Generation

Sludge depth is monitored periodically, and plans for sludge removal are made as required for optimal operation of the lagoon system.

Summary of Complaints

There were no complaints documented during the reporting period.

Summary of Abnormal Discharge Events

Bypass/Overflow

No bypasses or overflows occurred during the reporting period.

Spills

No spills occurred during the reporting period.

Appendix A

Performance Assessment Reports

ONTARIO CLEAN WATER AGENCY
PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF NORTH STORMONT
PROJECT: CRYSLER/FINCH LAGOON SYSTEM
PROJECT NUM.: 6053
WORKS NUM.: 110002960
DESCRIPTION: A SINGLE SEWAGE PUMPING STATION EQUIPPED WITH A STANDBY POWER DIESEL GENERATOR SET AND TWO FACULTATIVE LAGOONS HAVING A TOTAL OPERATING VOLUME OF 149,600 m^3 AND A POST AERATION CELL HAVING AN OPERATING CAPACITY OF 148,000 m^3

YEAR: 2018
WATER COURSE: SOUTH NATION RIVER
DESIGN CAPACITY: 1.118 x 1000 m^3/d

MONTH	FLOWS			ALUM	EFFLUENT		BIOCHEMICAL O_2 DEMAND			SUSPENDED SOLIDS			PHOSPHORUS			TKN
	TOTAL FLOW (m^3)	AVG DAY FLOW (m^3)	MAX DAY FLOW (m^3)	AVG DOSE (mg/L)	EFFLUENT FLOW (m^3)	DISCHARGE DURATION (days)	AVG RAW BOD (mg/L)	AVG EFF CBOD (mg/L)	PERCENT REMOVAL (%)	AVG RAW SS (mg/L)	AVG EFF SS (mg/L)	PERCENT REMOVAL (%)	AVG RAW PHOS. (mg/L)	AVG EFF PHOS. (mg/L)	PERCENT REMOVAL (%)	AVG RAW TKN (mg/L)
JAN	19,120	617	1,300	59.6			161			188			6.63			60.4
FEB	19,150	684	1,560	60.5			177			286			5.48			45.6
MAR	23,200	748	1,330	86.5			131			226			3.73			35.3
APR	25,520	851	1,470	62.5	285,033	12	33	9.2		178	25.0		2.76	0.70		29.9
MAY	17,070	551	760	63.7			107			109			2.87			51.0
JUN	13,960	465	700	121.1			151			281			4.64			42.5
JUL	11,590	374	620	81.0			304			1600			11.5			65.3
AUG	11,940	385	440	46.6			301			889			6.09			56.2
SEPT	12,720	424	540	32.0			211			2590			4.47			33.7
OCT	13,360	431	610	15.1			234			130			3.11			50.7
NOV	17,620	587	830	11.9			117			118			4.33			38.7
DEC	19,550	631	970	11.8			170			149			2.02			36.6
TOTAL	204,800		SPRING		285,033	12										
TOTAL			FALL		0	0										
AVG		562		54.3			175	9.2	94.7	562	25.0	95.6	4.80	0.70	85.4	45.5
MAX			1,560							2590			11.5			
CRITERIA		**1,118**	SPRING		**295,650**			**30**			**30**			**1**		
CRITERIA			FALL		**112,420**			**15**			**25**			**0.5**		
COMPLIANCE		YES	SPRING		YES			YES			YES			YES		
COMPLIANCE			FALL		N/A			N/A			N/A			N/A		

	SPRING			FALL		
	Actual	Criteria	Compliance	Actual	Criteria	Compliance
START DATE	Apr. 19	Mar. 15	YES	N/A	Nov. 4	N/A
END DATE	Apr. 30	Apr. 30	YES	N/A	Dec.17	N/A

COMMENTS: PERCENT REMOVAL BASED ON 12 MONTHS OF RAW SEWAGE GRAB SAMPLES

ONTARIO CLEAN WATER AGENCY
LAGOON PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF NORTH STORMONT
PROJECT: CRYSLER/FINCH LAGOON SYSTEM
PROJECT NUM.: 6053
DESCRIPTION: TWO FACULTATIVE LAGOON CELLS HAVING A TOTAL OPERATING VOLUME OF 149,600 m^3 AND POST AERATION HAVING AN OPERATING CAPACITY OF 148,000 m3

YEAR: 2018
WATER COURSE: SOUTH NATION RIVER
DESIGN CAPACITY: 1.118 x 1000 m^3/d

	SAMPLE RESULTS	SPRING						285,033 m^3	
	Date	19-Apr	23-Apr	26-Apr	28-Apr	30-Apr	Average	ECA Objective	ECA LIMIT
Samples Collected at Start, 25%, 50%, 75% and End of the Discharge Period	CBOD (mg/L)	6	10	7	12	11	9.2	**25**	**30**
	SS (mg/L)	24	30	24	36	11	25.0	**25**	**30**
	TP (mg/L)	0.5	0.68	0.70	0.71	0.71	0.7	**1.0**	**1.0**
	NH_3 (mg/L)	2.5	4.96	4.01	5.12	2.93	3.9	**15**	**20**
	S2- (mg/L)	<0.02	0.02	0.03	0.03	0.12	0.042	**<0.26**	**0.26**
	TKN (mg/L)	7	11.3	9.30	10.10	8.80			
	NO_2 (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10			
	NO_3 (mg/L)	0.14	0.21	0.13	0.11	0.52			
	pH (on site)	8.24	8.25	8.34	8.25	8.27			
	Temp (on site)	6.9	5.95	8.00	9.00	9.50			
	E.coli (cfu/100mL)	30	2730	1040	100	130			

* Pre-discharge sample results, not included in average/stream loading calculations

	TOTAL LOADING	C OF A LIMIT
BOD (kg)	2622	**8870**
SS (kg)	7126	**8870**
TP (kg)	188	**296**
NH_3 (kg)	1113	**5930**
H_2S (kg)	12	**77**

Effluent Flow	DATE	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr
	Flow (m^3/d)	13,459	13,459	13,459	19,738	19,738	20,755
	DATE	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr
	Flow (m^3/d)	19,836	19,625	18,880	42,028	42,028	42,028

Appendix B

Flow Meter Calibration Certificate

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Work Order #	699559	Meter Flow Verification (1y) 6053	**Status**	COMP
Job Plan #	METFLO01-A	METER FLOW ANNUAL GENERIC		
Project	NORSTM6053S-000			
Type	PM		**Scheduled Start Date**	03-Mar-18
Criticality	3			
Class	CALIBRATION			

Location	6053, Crysler Wastewater Treatment Lagoon

Reported By	MAXADMIN
Lead	
Crew Work Group	1225 Meter Flow Verification Team 2 Chesterville

Sequence	Asset		Location		Inspected
1	0000101150	METER FLOW RAW SEWAGE SPS	6053-WLCR-P-PC	6053, Crysler Wastewater Treatment Lagoon, Process, Process Control & Monitoring	☑
2	0000170829	METER FLOW EFFLUENT	6053-WLCR-P-PC	6053, Crysler Wastewater Treatment Lagoon, Process, Process Control & Monitoring	☑

Safety Message

This Work Order (and accompanying Maintenance Procedure) have been developed to aid field personnel in the care and maintenance of the specified equipment. However, maintenance personnel are expected to look for and correct any defects which are not anticipated in the procedure. This document may not provide all the technical information that may be required, and it may be necessary to refer to the manufacturer's manual for further details.

The "As Found" and "As Left" readings, as well as any abnormalities found and any repairs carried out, are to be recorded in the Maximo WMS System.

Isolate and de-energize equipment in accordance with the lock-out procedure.

Take time to identify hazards and plan how each hazard will be eliminated or controlled. Work practices must be in accordance with the Occupational Health & Safety Act and the Ontario Clean Water Agency safety manual.

Ensure direct supervisor or their designate have been notified of entry into the site. This notification should provide approximate time and duration. On completion of duties notification is to be given that site has been vacated and secured.

Task	Description
10	**RUNNING CHECKS** 1) Verify calibration parameters and programming parameters where applicable. 2) Ensure proper connections and grounding. 3) Check display for any alarm or error codes.
20	**HAVE QUALIFIED TECHNICIAN CALIBRATE UNIT** 1. Have a qualified technician calibrate the unit, using actual flow method or flow simulator. 2. Calibration records must be kept for a period of five years. 3. Records shall include the level of accuracy of the equipment as found and as left. 4. Calibration test equipment shall be certified annually and certification dates recorded on the calibration record. Some test equipment may not require calibration
30	**RECORD ADJUSTMENTS AND VERIFY OUTPUTS** 1. Record any adjustments, modifications or replacements made to the equipment during the calibration. 2. Verify accuracy of electronic outputs to the end device as required based on theoretical versus actual values .{Chart recorders, SCADA, Outpost 5}. 3. Ensure all nameplate data is recorded and entered in WMS.
40	**COMPLETE A VERIFICATION SHEET FOR EACH FLOW METER, POST IT AND ATTACH TO WORK ORDER** Note: Calibration sheet must be signed and original kept on site in the SOP binder.

For Field-Use Only - Completion Elements:

Work Log:	Annual Inspection & Calibration of Flow Meters Completed

Labour

Date	Reg/Prem.	Hours	Memo

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Completed By			
Please Print Name	Stephane Barbarie		
Signature	Stephane Barbarie	Date	May 24, 2018