



2019 Annual Wastewater Report



July 29, 2020 Version 1.1

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Reviewed by:



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Date

Approved by:



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30 July 2020

Date

Introduction to the Annual Wastewater Report

Under Environmental Compliance Approval (ECA) agreements issued by the Ministry of Environment, Conservation & Parks (MECP), the City is required to report annually on the values/parameters indicated in the ECA and must make this report publicly available within 90 days of January 1st for the year preceding the current year. Specifically the annual report is to include:

- a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in conditions described in the Approval, including an overview of the success and adequacy of the Works;
- b) a description of any operating problems encountered and corrective actions taken;
- c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
- d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;
- e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment;
- f) a description of efforts made and results achieved in meeting the Effluent Objectives of the Approval;
- g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;
- h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;
- i) a summary of all by-pass, plant overflow, overflow, spill or abnormal discharge events;
- j) any other information the Water Supervisor requires from time to time; and
- k) a copy of all Notices of Modification submitted to the Water Supervisor.

To address these requirements, this report contains the following sections;

- 1. **Operating Issues & Corrective Actions;** Measured values resulting in a non-compliance with respect to a parameter listed within an ECA and the corrective actions taken to resolve the issue.
- 2. **Maintenance & Capital Improvements;** All major maintenance, modifications and capital works completed at the facility within the reporting period.
- 3. **Calibrations & Maintenance:** Details on the calibration and maintenance carried out on all effluent monitoring equipment.
- 4. **Sludge Disposal;** The volume of sludge received and treated at the Sudbury Biosolids facility from the Sudbury WWTP, other wastewater treatment facilities and licensed septage haulers.
- 5. **Customer Complaints (ACR);** Any complaints received regarding Wastewater Treatment facilities through the City of greater Sudbury 311 (ACR) system during the reporting period and any steps taken to address the complaints.
- 6. **Plant Bypasses and Overflows;** A listing of all bypasses, spills and overflows at the facility during the reporting period.
- 7. **Effluent Quality & Control Measures;** A summary and interpretation of all monitoring data collected and a comparison to the parameters and limits given in the ECA for each facility.
- 8. **Individual Plant Annual Data Reports;** Tables showing all required reporting values and parameters for each wastewater treatment plant of which the City of Greater Sudbury is the owner, including a graphical representation of flows through the plant.

Definitions

- *Alkalinity*: a measurement of the ability of water to neutralize acid by absorbing hydrogen ions;
- *Average Concentration*: the mean of all Single Sample Results of the concentration of a contaminant in a given stream (influent/effluent) measured during a specified time period;
- *Average Flow*: the cumulative total influent or effluent flow measured during a defined time period (annual, monthly, etc.) divided by the number of days during that specified period;
- *Average Loading*: the value obtained by multiplying the Average Concentration of a contaminant in a given stream (influent/effluent) by the Average Flow for that stream;
- *BOD₅*: the five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;
- *Bypass*: the diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities;
- *CBOD₅*: the five day carbonaceous biochemical oxygen demand of biological organisms in the material, without the impact of oxygen depletion by nitrogenous bacteria;
- *E. coli*: coliform bacteria that possess the enzyme beta-glucuronidase and are capable of cleaving a fluorogenic or chromogenic substrate with the corresponding release of a fluorogen or chromogen, that produces fluorescence under long wavelength (366 nm) UV light, or color development, respectively. Data are reported as colony forming units (CFU) per 100 mL;
- *Event*: an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of Bypass or Overflow in the 12-hour period following the start of the event;
- *Final Effluent*: effluent that is discharged to the environment through the approved effluent disposal facilities, including all Bypasses, that are required to meet the compliance limits stipulated in the Approval for the Sewage Treatment Plant at the Final Effluent sampling point(s);
- *Influent*: flows to the Sewage Treatment Plant from the collection system. Flows can fluctuate according to weather conditions and high flows are commonly due to Inflow and Infiltration, a condition that allows rain and/or snow melt to enter the sanitary sewer.;
- *Monthly Geometric Mean Density*: the mean of all Single Sample Results of E. coli measurement in the samples taken during a calendar month, calculated and reported as per the methodology specified by the MECP;
- *Nitrite*: the amount of nitrogen present in the effluent as the NO₂⁻ anion;
- *Nitrate*: the amount of nitrogen present in the effluent as the NO₃⁻ anion;
- *Overflow*: a discharge to the environment at location(s) other than the approved effluent discharge;
- *pH*: the potential of hydrogen measured on a 14 point scale where 0 represents highly acidic material, 14 represents highly basic material and 7 represents neutral material (such as water);
- *Rated Capacity*: the Annual Average Daily Influent Flow for which the facility is designed to process;
- *T Amm*: the total ammonia measured in the final effluent;
- *TKN*: Total Kjeldahl Nitrogen; the total concentration of organic nitrogen & ammonia in the effluent;
- *TP*: Total Phosphorous; the total amount of phosphorous measured in the final effluent;
- *TSS*: Total Suspended Solids; the total amount of residual solid matter in the final effluent;
- *Un-ionized Amm*: the calculated amount of un-ionized ammonia in the final effluent;
- *Sludge*: the residual material produced through the wastewater treatment process.

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Revision History

Date	Description	Revision	Author
24-Mar-2020	Initial issue	1.0	Michael Loken
29-Jul-2020	Revised data for Falconbridge WWTP	1.1	Michael Loken

1. Operating Issues & Corrective Actions

Date	Facility	Parameter	Probable Cause	Corrective Actions Taken
01-Feb-19	Dowling WWTP	BOD5	Error in 3rd party lab results; BOD in plant influent lower than in effluent	Additional sampling to prove plant is within ECA limits
29-Mar-19	Azilda WWTP	Total Suspended Solids (TSS)	Testing of new pumps at Laurier Lift Station caused abnormal flows to plant.	Testing completed
02-Apr-19	Lively WWTP	Total Suspended Solids (TSS)	Baffles separating aeration tank from effluent channel leaking	Baffles repaired
18-Apr-19	Chelmsford WPCP	Total Suspended Solids (TSS)	Project work at facility causing process disruptions	Work completed
23-Apr-19	Chelmsford WPCP	Ammonia - Seasonal Discharge 1-Jan-2018 to 30-Apr-2018 & 31-Oct-2018 to 31-Dec-2018	Project work at facility causing process disruptions	Upgrade work completed
23-Apr-19	Chelmsford WPCP	Ammonia - Seasonal Discharge 1May-2018 to 31-Oct-2018	Project work at facility causing process disruptions	Upgrade work completed
29-Apr-19	Azilda WWTP	Total Suspended Solids (TSS)	Spring run-off causing high flows	Spring run-off completed
30-Apr-19	Lively WWTP	E.coli	Spring run-off causing high flows	Increased chlorine residual
02-May-19	Azilda WWTP	E.coli	Spring run-off causing high flows	Increased chlorine residual
21-May-19	Azilda WWTP	Chlorine Residual	Plugged chlorine pump resulted in no Cl in effluent	Cleaned chlorine pump
10-Jun-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
21-Jul-19	Azilda WWTP	Chlorine Residual	Plugged chlorine pump resulted in no Cl in effluent	Cleaned chlorine pump
16-Aug-19	Azilda WWTP	pH	Liquid lime system plugged	Cleaned liquid lime system
01-Oct-19	Chelmsford WPCP	Total Phosphorus (TP)	Chemical feed pump not working	Pump repaired
07-Oct-19	Azilda WWTP	Ammonia	Mechanical equipment failure	Equipment repaired
07-Oct-19	Azilda WWTP	E.coli	Mechanical equipment failure	Equipment repaired
07-Oct-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
05-Nov-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
03-Dec-19	Chelmsford WPCP	Ammonia	High seasonal flows and plant maintenance	Additional planning for plant switchovers
30-Nov-19	Lively WWTP	E.coli	Return activated sludge pumping system failure	Equipment repaired
01-Dec-19	Lively WWTP	Total Phosphorus (TP)	Mechanical equipment failure	Diverted flow to Walden WWTP for repairs
01-Dec-19	Lively WWTP	E.coli	Mechanical equipment failure	Diverted flow to Walden WWTP for repairs
31-Dec-19	Coniston WPCP	E.coli - Annual Geomean Value	Various maintenance issues in 2019	Various repairs completed

2. Maintenance & Capital Improvements

Facility	Maintenance Completed	Capital Improvements Completed
Azilda WWTP	- Electrical infrastructure repaired (fire damage) - Clarifier gearbox repaired - Damaged blowers replaced/repared	- Deflector plate installed on plant influent
Chelmsford WPCP	- UV disinfection system repaired	- Modifications made to chemical dosing systems
Capreol Lagoons	- No major maintenance required	- No capital work completed
Coniston WWTP	- Aeration air lines repaired	- No capital work completed
Dowling WWTP	- No major maintenance required	- No capital work completed
Falconbridge WWTP	- No major maintenance required	- No capital work completed
Levack WWTP	- No major maintenance required	- No capital work completed
Lively WWTP	- Tank baffles repaired - Return Activated Sludge pumping system repaired - Clarifier gearbox repaired	- No capital work completed
Sudbury WWTP	- Aeration tanks and chlorine contact chamber cleaned - Aeration system piping and membranes repaired - Effluent pumps repaired - #2 Clarifier gearbox repaired - Activated charcoal and UV blubs replaced in odour control units	- No capital work completed
Valley East WWTP	- Clarifier chain repaired - Raw and effluent pumps repaired/replaced as required - Concrete repairs completed on primary clarifier	- Supervisory Control and Data Acquisition (SCADA) system connected to network; can now be controlled from Sudbury plant
Wahnapitae Lagoons	- No major maintenance required	- No capital work completed
Walden WWTP	- Aeration tanks cleaned - Aeration piping and diffusers repaired - Blowers rebuilt and reinstalled	- Clarifier treated with internal coating to prolong operating life

3. Calibrations & Maintenance

All analyzers at all plants are calibrated as per manufacturer's recommendations, a minimum of once per year. Calibration Certificates are submitted and retained electronically for each unit.

All major plant equipment is maintained as per manufacturer's recommendations, with regular preventive maintenance checks completed as per established schedules.

4. Sludge Disposal

Sludge produced and removed from all Wastewater Treatment Plants in the City of Greater Sudbury, along with hauled liquid waste from other sources, is processed at the Sudbury Biosolids facility. Hauled liquid waste is any domestic sewage collected & transported by licensed haulers that is suitable for treatment, including:

- Waste removed from cesspools, septic tanks, privy pits, chemical toilets, portable toilets or sewage holding tanks and grey water from residential activities;
- Sewage from on-board holding tanks (e.g. RVs, tour buses, boats, etc.), and;
- Sludge from wastewater treatment facilities in neighbouring municipalities (for example, Espanola).

This Biosolids facility, operated under a Public Private Partnership by Walker Industries and located on the grounds of the Sudbury Wastewater Treatment Plant, produces a soil amendment by mixing dewatered septage & sludge with cement kiln dust and/or quicklime, to attain pathogen pasteurization. The product is a granular material, which is applied to agricultural soils for nutrient and pH enhancement.

In 2019, the Sudbury Biosolids facility treated a total of 128,098 m³ of material, containing approximately 3,727 tonnes of solids. Of this total, approximately 17,910 m³ was from septic tanks, 38,888 m³ was sludge from other CGS facilities and 4,035 m³ was sludge received from the Espanola Wastewater Treatment Plant.

5. Customer Complaints (ACR)

Date	Case ID	Location	Issue	Resolution
01/03/19	851159	Walford East Lift Station	Snowbank at lift station causing line of sight issues	Snow bank removed.
01/11/19	853203	Walford East Lift Station	Snow being plowed on to resident's property	Snow bank removed.
02/04/19	857147	Walford East Lift Station	Snow being plowed on to resident's property	Snow bank removed.
03/12/19	867933	Capreol Lagoons	Hydro meter at lift station required replacement	Issue resolved by Hydro One
05/01/19	880778	Helene Lift Station	Debris left over from snow removal	Debris removed.
05/23/19	886271	Wahnapiatae Lagoons	Driving concern	Issue discussed with employee, and coaching provided on proper driving techniques and habits.
05/29/19	887454	Nickel Lift Station	House vibrating due to lift station operation	Root cause of issue identified as debris in #2 pump. Pump taken offline and cleaned.

Date	Case ID	Location	Issue	Resolution
06/28/19	895692	Helene Lift Station	Debris left over from snow removal	Area cleaned up.
06/28/19	895743	Fourth Ave. Lift Station	Noise coming from lift station	Exhaust fan blades striking fan housing. Fan turned off until repairs could be completed.
07/12/19	899053	Laurier Lift Station	Lift station fence falling over	Fence repaired and other issues identified resolved.
07/12/19	899052	Laurier Lift Station	Lift station fence falling over	Concerns addressed in ACR 899053
07/24/19	901329	Brenda Lift Station	Lift station driveway not cleaned up	Debris removed.
08/06/19	903948	Nickel Lift Station	Light Flashing At Lift Station	Instrumentation issue causing false alarm. Level sensor repaired.
08/07/19	904417	Charette Lift Station	Water lift station - fence not closed	Gate closed by on call operator
08/14/19	906165	Falconbridge WWTP	Traffic constantly going into and out of plant property	Discussed concerns with resident. Fencing and additional security to be installed as part of capital project.
08/19/19	907268	Laurier Lift Station	Lift station odour	Issue resolved by modifying venting to lift station after verifying with design engineer.
08/23/19	908829	Sudbury WWTP	Driving concern	Issue discussed with employee, and coaching provided on proper driving techniques and habits.
08/28/19	910812	Lively WWTP	Treatment plant odour	Doors to inlet chamber at the facility were open. Operator closed doors to resolve issue.
09/05/19	913362	O'Neil Lift Station	Lift station odour	Odour due to some minor maintenance issues. Vacuum truck and Wastewater Operators resolved the following day.
09/19/19	918222	Fourth Ave. Lift Station	Noise coming from lift station	Maintenance performed on generator to resolve noise issue.
09/19/19	918296	Fourth Ave. Lift Station	Noise coming from lift station	High speed fan at lift station causing noise issue shut off until it can be serviced.
09/26/19	922122	Main St. Lift Station	Fence damage at lift station	Fencing repaired.
09/26/19	922506	Brenda Lift Station	Generator running at lift station	Generator did not shut off after power outage due to communications issue. Issue resolved by operators.
10/17/19	930565	Azilda WWTP	Drainage issues on residential lot	Issue not caused by Azilda WWTP. Issue forwarded to City Drainage Engineer.
11/07/19	937518	Vermillion Lift Station	Lift station electrical panel left open	Panel closed and locked.

6. Plant Bypasses and Overflows

Date	Time (24 H Clock)	Duration	Location	Type of Occurrence
16-Oct-10	7:00	19.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
06-Feb-19	15:05	0.01 hrs.	Chelmsford WWTP	Plant overflow
19-Feb-19	13:44	31.0 hrs.	Azilda WWTP	Plant bypass
24-Feb-19	15:29	8.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	20:25	28.1 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	22:45	7.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	21:20	23.0 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
15-Mar-19	3:30	20.0 hrs.	Sudbury WWTP	Plant bypass
16-Mar-19	0:00	24.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
16-Mar-19	0:00	24.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
17-Mar-19	0:00	96.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
20-Mar-19	17:17	25.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
23-Mar-19	0:00	2472 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
27-Mar-19	15:00	4.05 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	16:15	22.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	18:55	4.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	18:30	13.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	17:40	4.25 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
02-Apr-19	14:00	696 hrs.	Wahnapitae Lagoon	Plant bypass: flow exceeds design capacity
05-Apr-19	17:41	535 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
07-Apr-19	18:10	422 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
07-Apr-19	17:30	6.7 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
08-Apr-19	8:00	57.0 hrs.	Coniston WWTP	Plant bypass
08-Apr-19	8:15	48.4 hrs.	Lively WWTP	Plant bypass
08-Apr-19	0:10	80.0 hrs.	Sudbury WWTP	Plant bypass
08-Apr-19	6:45	11.0 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
09-Apr-19	5:50	18.0 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
12-Apr-19	15:35	226.5 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	7:15	3.35 hrs.	Anderson LS	Collection system overflow
18-Apr-19	4:30	30.0 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	6:00	25.5 hrs.	Coniston WWTP	Plant bypass
18-Apr-19	3:39	3.4 hrs.	Levack WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	5:00	29.5 hrs.	Lively WWTP	Plant bypass
18-Apr-19	5:00	21.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	8:30	8.0 hrs.	Main St LS	Collection system overflow
18-Apr-19	7:18	50.5 hrs.	Sudbury WWTP	Plant bypass
18-Apr-19	7:30	8.0 hrs.	Valley East WWTP	Plant overflow
18-Apr-19	7:30	8.0 hrs.	Valley East WWTP	Plant bypass

Date	Time (24 H Clock)	Duration	Location	Type of Occurrence
18-Apr-19	6:00	2.0 hrs.	Walden WWTP	Plant bypass
18-Apr-19	3:00	15.4 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
21-Apr-19	12:00	44.0 hrs.	Dowling WWTP	Plant bypass: flow exceeds design capacity
09-May-19	16:05	16 hrs.	Coniston WWTP	Plant bypass
09-May-19	11:05	8 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
09-May-19	14:45	18 hrs.	Lively WWTP	Plant bypass
09-May-19	20:30	12 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
09-May-19	14:30	1.5 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
13-May-19	17:55	17 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
19-May-19	20:15	92.5hrs	Coniston WWTP	Plant bypass: flow exceeds design capacity
20-May-19	18:00	2 hrs.	Other	Collection system overflow
27-May-19	9:15	22 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
10-Jun-19	13:45	59 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
13-Jun-19	19:15	1.75 hrs.	Coniston WWTP	Plant bypass
13-Jun-19	19:30	3.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
14-Jun-19	22:30	5.0 hrs.	Sudbury WWTP	Plant bypass
29-Jun-19	18:34	3.9 hrs.	Valley East WWTP	Plant overflow
29-Jun-19	18:34	3.9 hrs.	Valley East WWTP	Plant overflow
11-Jul-19	12:15	4.5 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
24-Jul-19	0:00	168.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
03-Sep-19	21:06	3.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
17-Sep-19	7:00	0.25 hrs.	Sudbury WWTP	Collection system overflow
22-Sep-19	20:00	5.6 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
22-Sep-19	19:30	15.5 hrs.	Sudbury WWTP	Collection system overflow
16-Oct-19	9:08	175.4 hrs.	Chelmsford WWTP	Plant bypass
16-Oct-19	9:15	9.8 hrs.	Coniston WWTP	Plant bypass
16-Oct-19	3:00	15.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
16-Oct-19	18:00	48.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
17-Oct-19	13:25	19.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	12:15	4.5 hrs.	Coniston WWTP	Plant bypass
27-Oct-19	17:50	7.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	11:20	4.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	1:20	12.2 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	11:30	12.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
28-Oct-19	0:01	816 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
04-Nov-19	16:25	22.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
04-Nov-19	23:15	4.5 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity

7. Effluent Quality & Control Measures

Data for each treatment facility within the City of Greater Sudbury is shown below. Values for average loading and material removed were calculated using laboratory results and plant influent flow data.

Azilda Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	3,300 m ³ /day	
		Average Daily Flow:	2,238 m ³ /day	

CBOD ₅		Value		ECA Limit
Annual Average Daily Loading	Influent	207.4	kg/day	< 33 kg/day < 10 mg/L
	Effluent	6.86	kg/day	
Monthly Effluent Concentration	Average	7.84	mg/L	
	Minimum	1.40	mg/L	
	Maximum	8.20	mg/L	
Plant Removal		200.5	kg/day	
		96.99	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	202.1	kg/day	< 33 kg/day < 10 mg/L
	Effluent	19.51	kg/day	
Monthly Effluent Concentration	Average	7.84	mg/L	
	Minimum	4.50	mg/L	
	Maximum	13.00	mg/L	
Plant Removal		182.6	kg/day	
		90.30	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	6.32	kg/day	< 2.0 kg/day < 0.6 mg/L
	Effluent	0.68	kg/day	
Monthly Effluent Concentration	Average	0.31	mg/L	
	Minimum	0.19	mg/L	
	Maximum	0.50	mg/L	
Plant Removal		5.65	kg/day	
		90.13	%	

Total Ammonia (as Nitrogen)		Value		ECA Limit
Annual Average Daily Loading	Influent	34.84	kg/day	< 16.5 kg/day < 5 mg/L
	Effluent	3.27	kg/day	
Monthly Effluent Concentration	Average	1.74	mg/L	
	Minimum	0.05	mg/L	
	Maximum	10.01	mg/L	
Plant Removal		31.58	kg/day	
		89.93	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.59		6.0 to 9.5 at all times
Effluent Measurements	Average	6.83		
	Minimum	6.50		
	Maximum	7.10		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	56	CFU/100mL	< 200 CFU/100mL
	Minimum	6	CFU/100mL	< 200 CFU/100mL
	Maximum	234	CFU/100mL	< 200 CFU/100mL

Capreol Lagoon

Influent Flow	
Design Capacity:	5,500 m ³ /day
Average Daily Flow:	2,332 m ³ /day

BOD ₅		Value	ECA Limit
Annual Average Daily Loading	Influent	164.5 kg/day	< 30 mg/L
	Effluent	31.13 kg/day	
Monthly Effluent Concentration	Average	16.10 mg/L	
	Minimum	0.50 mg/L	
	Maximum	31.10 mg/L	
Plant Removal		133.4 kg/day	
		79.27 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	204.9 kg/day	< 40 mg/L
	Effluent	44.92 kg/day	
Monthly Effluent Concentration	Average	20.14 mg/L	
	Minimum	25.30 mg/L	
	Maximum	9.67 mg/L	
Plant Removal		160.0 kg/day	
		69.60 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	5.41 kg/day	< 1.38 mg/L
	Effluent	3.48 kg/day	
Monthly Effluent Concentration	Average	1.62 mg/L	
	Minimum	0.50 mg/L	
	Maximum	2.57 mg/L	
Plant Removal		1.94 kg/day	
		23.06 %	

Chelmsford Water Pollution Control Plant

The ECA for the Chelmsford WPCP details different effluent limits based on two seasonal discharge periods; one from April 30th to November 1st and the other from May 1st to October 31st.

Disinfection of the final effluent and reporting of sample results for E. Coli is only required in the summer discharge period from May 1st to October 31st. The ECA limits for effluent pH are the same in both discharge periods.

Influent Flow	
Design Capacity:	7,100 m ³ /day
Average Daily Flow:	5,030 m ³ /day

CBOD₅				
Seasonal Discharge – November 1 to April 30		Value		ECA Limit
Annual Average Daily Loading	Influent	478.5	kg/day	< 106.5 kg/day < 15 mg/L
	Effluent	19.03	kg/day	
Monthly Effluent Concentration	Average	3.93	mg/L	
	Minimum	2.10	mg/L	
	Maximum	5.90	mg/L	
Plant Removal		459.5	kg/day	
		96.02	%	
Seasonal Discharge – May 1 to October 31		Value		ECA Limit
Annual Average Daily Loading	Influent	545.9	kg/day	< 49.7 kg/day < 7 mg/L
	Effluent	15.22	kg/day	
Monthly Effluent Concentration	Average	3.08	mg/L	
	Minimum	1.10	mg/L	
	Maximum	4.80	mg/L	
Plant Removal		439.7	kg/day	
		96.65	%	

TSS – Total Suspended Solids				
Seasonal Discharge – November 1 to April 30		Value		ECA Limit
Annual Average Daily Loading	Influent	593.5	kg/day	< 106.5 kg/day < 15 mg/L
	Effluent	42.84	kg/day	
Monthly Effluent Concentration	Average	7.78	mg/L	
	Minimum	6.10	mg/L	
	Maximum	10.40	mg/L	
Plant Removal		550.6	kg/day	
		92.78	%	
Seasonal Discharge – May 1 to October 31		Value		ECA Limit
Annual Average Daily Loading	Influent	676.6	kg/day	< 49.7 kg/day < 7 mg/L
	Effluent	32.78	kg/day	
Monthly Effluent Concentration	Average	7.33	mg/L	
	Minimum	5.80	mg/L	
	Maximum	10.50	mg/L	
Plant Removal		643.8	kg/day	
		95.16	%	

TP – Total Phosphorous				
Seasonal Discharge – November 1 to April 30			Value	ECA Limit
Annual Average Daily Loading	Influent	13.11	kg/day	< 3.55 kg/day < 0.5 mg/L
	Effluent	1.49	kg/day	
Monthly Effluent Concentration	Average	0.28	mg/L	
	Minimum	0.15	mg/L	
	Maximum	0.41	mg/L	
Plant Removal		11.62	kg/day	
		88.64	%	
Seasonal Discharge – May 1 to October 31			Value	ECA Limit
Annual Average Daily Loading	Influent	14.41	kg/day	< 2.13 kg/day < 0.3 mg/L
	Effluent	0.98	kg/day	
Monthly Effluent Concentration	Average	0.22	mg/L	
	Minimum	0.11	mg/L	
	Maximum	0.41	mg/L	
Plant Removal		13.43	kg/day	
		93.21	%	

Total Ammonia (as Nitrogen)				
Seasonal Discharge – November 1 to April 30			Value	ECA Limit
Annual Average Daily Loading	Influent	70.85	kg/day	< 28.4 kg/day < 4 mg/L
	Effluent	19.75	kg/day	
Monthly Effluent Concentration	Average	4.48	mg/L	
	Minimum	0.59	mg/L	
	Maximum	7.85	mg/L	
Plant Removal		51.10	kg/day	
		72.13	%	
Seasonal Discharge – November 1 to April 30			Value	ECA Limit
Annual Average Daily Loading	Influent	105.1	kg/day	< 14.2 kg/day < 2 mg/L
	Effluent	12.25	kg/day	
Monthly Effluent Concentration	Average	2.09	mg/L	
	Minimum	0.12	mg/L	
	Maximum	5.23	mg/L	
Plant Removal		92.87	kg/day	
		88.34	%	

pH				
Both Seasonal Discharge Periods			Value	ECA Limit
Influent Measurements	Average	7.58		6.0 to 9.5 at all times
Effluent Measurements	Average	6.87		
	Minimum	7.70		
	Maximum	3.50		

E. Coli				
Summer Discharge Period Only – May 1 to October 31			Value	ECA Limit
Monthly Geometric Mean Density	Average	205	CFU/100mL	< 200 CFU/100mL
	Minimum	26	CFU/100mL	< 200 CFU/100mL
	Maximum	516	CFU/100mL	< 200 CFU/100mL

Coniston Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	3,000 m ³ /day	
		Average Daily Flow:	1,730 m ³ /day	

BOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	167.1	kg/day	< 35 kg/day < 20 mg/L
	Effluent	14.96	kg/day	
Monthly Effluent Concentration	Average	9.45	mg/L	
	Minimum	3.00	mg/L	
	Maximum	18.00	mg/L	
Plant Removal		152.2	kg/day	
		91.05	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	208.0	kg/day	< 35 kg/day < 20 mg/L
	Effluent	29.29	kg/day	
Monthly Effluent Concentration	Average	15.73	mg/L	
	Minimum	5.20	mg/L	
	Maximum	27.47	mg/L	
Plant Removal		178.7	kg/day	
		85.92	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.28		6.0 to 9.5 at all times
Effluent Measurements	Average	6.54		
	Minimum	2.26		
	Maximum	7.20		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	248	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	33000	CFU/100mL	< 200 CFU/100mL

Dowling Wastewater Treatment Plant

Influent Flow	
Design Capacity: 3,200 m ³ /day	
Average Daily Flow: 2,069 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	86.07	kg/day	< 80 kg/day
	Effluent	15.23	kg/day	
Monthly Effluent Concentration	Average	8.93	mg/L	< 25 mg/L
	Minimum	3.70	mg/L	
	Maximum	50.60	mg/L	
Plant Removal		70.85	kg/day	
		82.31	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	81.16	kg/day	< 80 kg/day
	Effluent	14.57	kg/day	
Monthly Effluent Concentration	Average	6.84	mg/L	< 25 mg/L
	Minimum	3.80	mg/L	
	Maximum	9.90	mg/L	
Plant Removal		66.59	kg/day	
		82.70	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	2.69	kg/day	< 3.2 kg/day
	Effluent	1.05	kg/day	
Monthly Effluent Concentration	Average	0.54	mg/L	< 1.0 mg/L
	Minimum	0.38	mg/L	
	Maximum	0.65	mg/L	
Plant Removal		1.67	kg/day	
		60.83	%	

pH		Value		ECA Limit
Influent Measurements	Average	6.88		6.0 to 9.5 at all times
Effluent Measurements	Average	6.73		
	Minimum	6.50		
	Maximum	6.90		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	52	CFU/100mL	< 200 CFU/100mL
	Minimum	11	CFU/100mL	< 200 CFU/100mL
	Maximum	127	CFU/100mL	< 200 CFU/100mL

Falconbridge Wastewater Treatment Plant

Influent Flow	
Design Capacity: 909 m ³ /day	
Average Daily Flow: 250 m ³ /day	

BOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	47.49	kg/day	< 46 kg/day
	Effluent	0.76	kg/day	
Monthly Effluent Concentration	Average	0.76	mg/L	< 15 mg/L
	Minimum	3.28	mg/L	
	Maximum	20.00	mg/L	
Plant Removal		46.73	kg/day	
		98.40	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	5.37	kg/day	< 46 kg/day
	Effluent	0.90	kg/day	
Monthly Effluent Concentration	Average	3.56	mg/L	< 15 mg/L
	Minimum	2.48	mg/L	
	Maximum	4.80	mg/L	
Plant Removal		4.47	kg/day	
		83.20	%	

Levack Wastewater Treatment Plant

Influent Flow	
Design Capacity: 2,270 m ³ /day	
Average Daily Flow: 865 m ³ /day	

CBOD₅		Value	ECA Limit
Annual Average Daily Loading	Influent	120.6 kg/day	< 56.75 kg/day
	Effluent	2.34 kg/day	
Monthly Effluent Concentration	Average	2.88 mg/L	< 25 mg/L
	Minimum	0.80 mg/L	
	Maximum	4.40 mg/L	
Plant Removal		118.3 kg/day	
		98.06 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	166.5 kg/day	< 56.75 kg/day
	Effluent	5.08 kg/day	
Monthly Effluent Concentration	Average	6.15 mg/L	< 25 mg/L
	Minimum	3.40 mg/L	
	Maximum	10.10 mg/L	
Plant Removal		161.5 kg/day	
		96.95 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	3.12 kg/day	< 3.1 kg/day
	Effluent	0.38 kg/day	
Monthly Effluent Concentration	Average	0.45 mg/L	< 1.0 mg/L
	Minimum	0.36 mg/L	
	Maximum	0.67 mg/L	
Plant Removal		2.74 kg/day	
		87.89 %	

pH		Value	ECA Limit
Influent Measurements	Average	7.15	6.0 to 9.5 at all times
Effluent Measurements	Average	6.74	
	Minimum	6.50	
	Maximum	7.10	

E. Coli		Value	ECA Limit
Monthly Geometric Mean Density	Average	6 CFU/100mL	< 200 CFU/100mL
	Minimum	0 CFU/100mL	< 200 CFU/100mL
	Maximum	23 CFU/100mL	< 200 CFU/100mL

Lively Wastewater Treatment Plant

Influent Flow	
Design Capacity: 1,600 m ³ /day	
Average Daily Flow: 1,146 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	133.1	kg/day	< 40 kg/day
	Effluent	5.74	kg/day	
Monthly Effluent Concentration	Average	4.66	mg/L	< 25 mg/L
	Minimum	0.50	mg/L	
	Maximum	8.50	mg/L	
Plant Removal		127.4	kg/day	
		92.39	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	385.6	kg/day	< 40 kg/day
	Effluent	15.62	kg/day	
Monthly Effluent Concentration	Average	12.21	mg/L	< 25 mg/L
	Minimum	2.38	mg/L	
	Maximum	32.40	mg/L	
Plant Removal		369.9	kg/day	
		95.04	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	9.36	kg/day	< 1.6 kg/day
	Effluent	0.58	kg/day	
Monthly Effluent Concentration	Average	0.51	mg/L	< 1.0 mg/L
	Minimum	0.10	mg/L	
	Maximum	1.52	mg/L	
Plant Removal		8.77	kg/day	
		90.82	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.10		6.0 to 9.5 at all times
Effluent Measurements	Average	6.86		
	Minimum	6.60		
	Maximum	7.10		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	115	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	433	CFU/100mL	< 200 CFU/100mL

Sudbury Wastewater Treatment Plant

The Sudbury WWTP is subject to seasonal discharge limits for Total Phosphorous and is required to completely de-chlorinate the effluent discharged into the receiving stream, Junction Creek.

Influent Flow				
		Design Capacity:	79,625 m ³ /day	
		Average Daily Flow:	60,629 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	6637	kg/day	< 1990.6 kg/day
	Effluent	351.8	kg/day	
Monthly Effluent Concentration	Average	3.04	mg/L	< 25 mg/L
	Minimum	3.70	mg/L	
	Maximum	15.40	mg/L	
Plant Removal		6285	kg/day	
		94.70	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	10294	kg/day	< 1990.6 kg/day
	Effluent	730.5	kg/day	
Monthly Effluent Concentration	Average	11.75	mg/L	< 25 mg/L
	Minimum	8.35	mg/L	
	Maximum	16.50	mg/L	
Plant Removal		9564	kg/day	
		92.76	%	

TP – Total Phosphorous				
Seasonal Discharge – October 1 to May 31		Value		ECA Limit
Annual Average Daily Loading	Influent	173.5	kg/day	< 79.6 kg/day
	Effluent	32.48	kg/day	
Monthly Effluent Concentration	Average	0.50	mg/L	< 1.0 mg/L
	Minimum	0.35	mg/L	
	Maximum	0.59	mg/L	
Plant Removal		141.0	kg/day	
		81.27	%	
Seasonal Discharge – June 1 to September 30		Value		ECA Limit
Annual Average Daily Loading	Influent	159.8	kg/day	< 49.7 kg/day
	Effluent	14.58	kg/day	
Monthly Effluent Concentration	Average	0.29	mg/L	< 0.5 mg/L
	Minimum	0.25	mg/L	
	Maximum	0.39	mg/L	
Plant Removal		145.2	kg/day	
		90.9%		

pH		Value		ECA Limit
Influent Measurements	Average	7.18		6.0 to 9.5 at all times
Effluent Measurements	Average	6.98		
	Minimum	6.70		
	Maximum	7.20		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	27	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	186	CFU/100mL	< 200 CFU/100mL

Chlorine Residual		Value		ECA Limit
Annual Average Daily Loading	Effluent	0.0	kg/day	0 kg/day
Monthly Effluent Concentration	Average	0.0	mg/L	0 mg/L

Valley East Wastewater Treatment Plant

Influent Flow				
		Design Capacity: 11,365 m ³ /day		
		Average Daily Flow: 6,566 m ³ /day		

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	742	kg/day	< 284 kg/day < 25 mg/L
	Effluent	45.65	kg/day	
Monthly Effluent Concentration	Average	6.53	mg/L	
	Minimum	3.60	mg/L	
	Maximum	11.60	mg/L	
Plant Removal		696.3	kg/day	
		93.80	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	969.1	kg/day	< 284 kg/day < 25 mg/L
	Effluent	61.46	kg/day	
Monthly Effluent Concentration	Average	7.97	mg/L	
	Minimum	4.50	mg/L	
	Maximum	18.90	mg/L	
Plant Removal		907.6	kg/day	
		94.35	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	28.57	kg/day	< 11.4 kg/day < 1.0 mg/L
	Effluent	4.33	kg/day	
Monthly Effluent Concentration	Average	0.66	mg/L	
	Minimum	0.39	mg/L	
	Maximum	1.03	mg/L	
Plant Removal		24.24	kg/day	
		78.88	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.38		6.0 to 9.5 at all times
Effluent Measurements	Average	7.05		
	Minimum	6.80		
	Maximum	7.20		

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	43	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	188	CFU/100mL	< 200 CFU/100mL

Wahnapiatae Lagoons

The Wahnapiatae Lagoons are subject to seasonal discharge requirements. The Fall discharge period is defined as any discharge with a minimum duration of 14 days starting not before November 1st and not after December 15th. The Spring discharge period is defined as any discharge with a minimum duration of 14 days starting not before March 15th and not after April 30th.

Due to the limited sampling performed at the Wahnapiatae Lagoons, plant removal values are calculated using the previous available raw (influent) sample when one is not present in the same month as an effluent sample.

Influent Flow			
		Design Capacity:	1,246 m ³ /day
		Average Daily Flow:	1,169 m ³ /day

CBOD ₅			
Seasonal Discharge – Fall		Value	ECA Limit
Annual Average Daily Loading	Influent	119.1 kg/day	< 30 mg/L
	Effluent	1.65 kg/day	
Monthly Effluent Concentration	Average	1.81 mg/L	
	Minimum	3.60 mg/L	
	Maximum	13.90 mg/L	
Plant Removal		117.5 kg/day 90.95 %	
Seasonal Discharge – Spring		Value	ECA Limit
Annual Average Daily Loading	Influent	71.41 kg/day	< 30 mg/L
	Effluent	13.27 kg/day	
Monthly Effluent Concentration	Average	9.23 mg/L	
	Minimum	1.02 mg/L	
	Maximum	2.60 mg/L	
Plant Removal		58.15 kg/day 90.93 %	

TSS – Total Suspended Solids			
Seasonal Discharge – Fall		Value	ECA Limit
Annual Average Daily Loading	Influent	155.3 kg/day	< 40 mg/L
	Effluent	4.25 kg/day	
Monthly Effluent Concentration	Average	2.96 mg/L	
	Minimum	4.30 mg/L	
	Maximum	33.15 mg/L	
Plant Removal		151.1 kg/day 85.65 %	
Seasonal Discharge – Spring		Value	ECA Limit
Annual Average Daily Loading	Influent	151.7 kg/day	< 40 mg/L
	Effluent	16.70 kg/day	
Monthly Effluent Concentration	Average	18.75 mg/L	
	Minimum	4.30 mg/L	
	Maximum	33.15 mg/L	
Plant Removal		135.0 kg/day 85.46 %	

pH		Value	ECA Limit
Effluent Measurements	Average	7.34	6.0 to 9.5 at all times
	Minimum	6.90	
	Maximum	7.70	

Walden Wastewater Treatment Plant

Influent Flow	
Design Capacity: 4,500 m ³ /day	
Average Daily Flow: 2,801 m ³ /day	

CBOD₅		Value	ECA Limit
Annual Average Daily Loading	Influent	325.8 kg/day	< 112.5 kg/day < 25 mg/L
	Effluent	7.34 kg/day	
Monthly Effluent Concentration	Average	2.68 mg/L	
	Minimum	0.50 mg/L	
	Maximum	13.60 mg/L	
Plant Removal		317.9 kg/day	
		97.54 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	353.0 kg/day	< 112.5 kg/day < 25 mg/L
	Effluent	21.31 kg/day	
Monthly Effluent Concentration	Average	7.50 mg/L	
	Minimum	4.70 mg/L	
	Maximum	11.30 mg/L	
Plant Removal		331.7 kg/day	
		93.56 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	8.44 kg/day	< 4.5 kg/day < 1.0 mg/L
	Effluent	1.07 kg/day	
Monthly Effluent Concentration	Average	0.38 mg/L	
	Minimum	0.19 mg/L	
	Maximum	0.56 mg/L	
Plant Removal		7.37 kg/day	
		87.63 %	

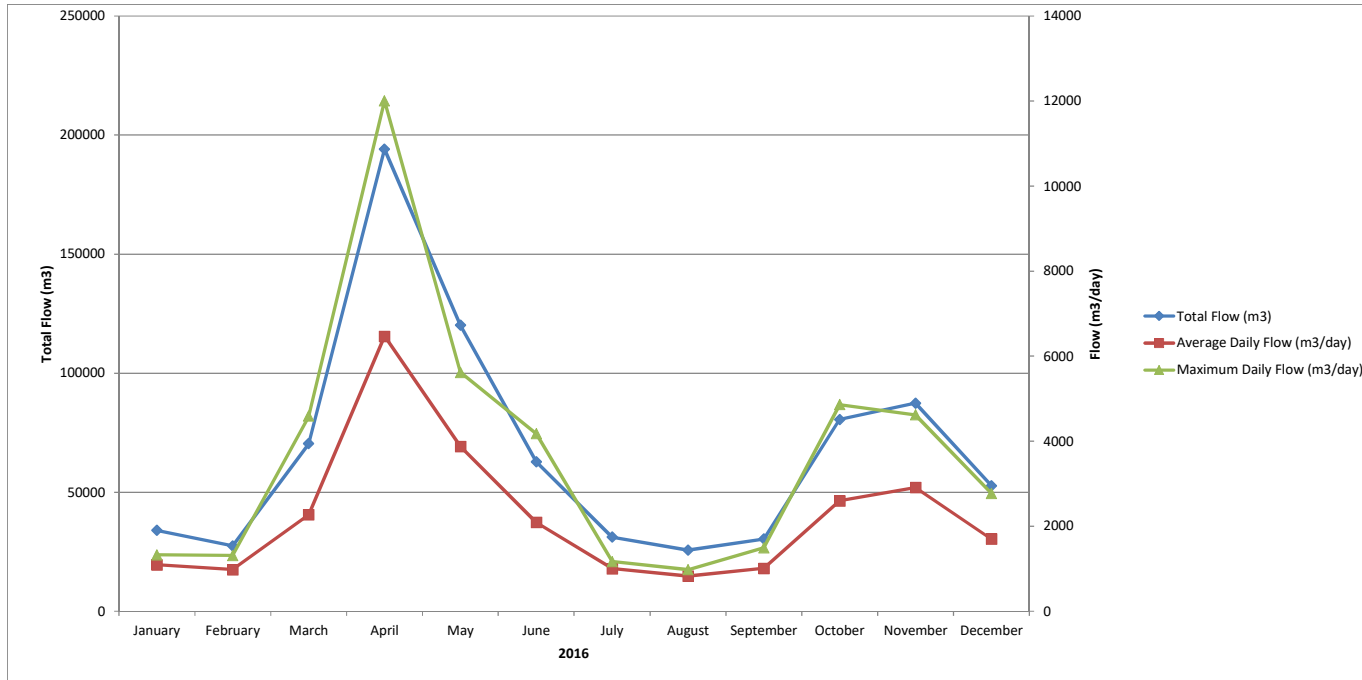
pH		Value	ECA Limit
Influent Measurements	Average	7.27	6.0 to 9.5 at all times
Effluent Measurements	Average	6.79	
	Minimum	6.50	
	Maximum	7.10	

E. Coli		Value	ECA Limit
Monthly Geometric Mean Density	Average	39 CFU/100mL	< 200 CFU/100mL
	Minimum	5 CFU/100mL	< 200 CFU/100mL
	Maximum	114 CFU/100mL	< 200 CFU/100mL

8. Individual Plant Annual Data Reports

2019 Azilda Wastewater Treatment Plant Performance

Month	Flows			BOD ₅				CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized		TKN		Nitrite		Nitrate		pH		Alkalinity		Sludge				Chlorine		E.Coli
	Total	Avg Day	Max Day	Raw	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Ammonia	Raw	Effluent	Effluent	Effluent	Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Total	Residual				
	m ³	m ³ /d	m ³ /d	mg/L	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Hauled	%	m ³	Kg	mg/L		
January	33974	1096	1328	155	135	3.0	3.29	97.8%	130	8.0	8.77	92.7%	4.7	0.26	0.28	94.5%	32.05	0.27	0.30	99.2%	0.30	32.9	0.53	0.38	34.8	6.9	6.6	340	78	195	2.7	5.3	184.8	0.89	6							
February	27465	981	1313	214	228	2.7	2.65	98.8%	299	6.7	6.57	97.8%	6.1	0.39	0.38	93.6%	28.63	1.25	1.23	95.6%	0.86	32.3	0.98	0.23	35.3	7.3	6.7	330	110	120	3.9	4.7	100.5	0.79	44							
March	70394	2271	4592	108	82	2.9	6.59	96.5%	47	11.8	26.80	74.9%	2.8	0.50	1.14	82.1%	18.63	0.17	0.39	99.1%	0.16	22.7	1.15	0.50	23.5	7.5	6.9	297	151	240	4.2	10.1	176.6	0.58	15							
April	194113	6470	12005	63	61	3.9	25.23	93.6%	43	13.0	84.12	69.8%	1.5	0.34	2.20	77.3%	4.06	0.72	4.66	82.3%	1.94	6.4	2.40	0.28	5.5	7.7	7.1	273	225	120	4.9	5.9	287.9	0.67	217							
May	120134	3875	5616	92	69	2.5	9.69	96.4%	67	7.5	29.06	88.8%	1.7	0.21	0.81	87.6%	8.14	3.63	14.07	55.4%	7.94	10.4	4.40	0.32	3.0	7.7	7.1	296	253	120	1.5	1.8	187.1	0.83	26							
June	62785	2093	4178	97	69	2.5	5.23	96.4%	99	4.8	10.05	95.2%	2.7	0.32	0.67	88.1%	14.91	2.17	4.54	85.4%	4.31	18.2	2.38	0.35	10.2	7.5	6.9	271	189	169	3.7	6.3	163.2	0.76	10							
July	31158	1005	1171	253	141	1.4	1.41	99.0%	137	4.5	4.52	96.7%	4.4	0.19	0.19	95.7%	32.32	0.07	0.07	99.8%	0.05	34.8	0.20	0.14	30.9	7.4	6.5	287	34	280	2.1	5.9	182.9	0.90	6							
August	25704	829	978	210	168	2.1	1.74	98.8%	132	6.3	5.22	95.2%	5.1	0.26	0.22	94.9%	40.45	0.92	0.76	97.7%	1.29	47.7	0.33	0.94	34.5	7.9	6.6	336	36	200	2.3	4.6	204.6	0.65	19							
September	30383	1013	1492	174	156	8.2	8.30	94.7%	124	10.2	10.33	91.8%	5.5	0.41	0.42	92.5%	36.93	10.01	10.14	72.9%	49.16	39.7	10.23	7.56	17.7	7.8	6.6	323	128	360	1.3	4.7	334.2	0.41	234							
October	80550	2598	4862	114	94	1.6	4.16	98.3%	93	5.5	14.29	94.1%	3.1	0.23	0.60	92.6%	16.94	0.06	0.16	99.6%	0.15	19.20	0.20	0.05	15.8	7.9	6.9	294	159	200	2.1	4.2	247.6	0.80	21							
November	87401	2913	4622	99	76	2.5	7.28	96.7%	102	6.3	18.35	93.8%	2.8	0.22	0.64	92.1%	13.70	0.05	0.15	99.6%	0.29	17.0	0.53	0.05	12.7	7.8	7.1	303	173	160	4.5	7.2	257.4	0.62	53							
December	52752	1702	2775	140	129	4.0	6.81	96.9%	133	9.4	16.05	92.9%	3.5	0.34	0.58	90.3%	21.29	1.61	2.74	92.4%	1.78	22.3	2.52	1.77	16.95	7.7	7.0	277	121	120	2.2	2.6	220.6	0.70	18							
Total	816813							96.7%				90.3%				89.3%				90.6%																						
Average		2238		143	117	3.11	6.86	97.0%	117	7.84	19.51	90.3%	3.66	0.31	0.68	90.1%	22.34	1.74	3.3	89.9%	5.7	25.30	2.15	1.05	20.06	7.59	6.83	302	138		2.95					0.72	56					



Plant Type: Extended Aeration

Design Capacity: 3300 m³/day

Population Served: 4,105

Compliance Parameters:

	Concentration	Loading
CBOD	10 mg/L	33 kg/day
TSS	10 mg/L	33 kg/day
Total Phosphorus	0.6 mg/L	2.0 kg/day
Total Ammonia (as N)	5 mg/L	16.5 kg/day
pH	6.0 to 9.5 inclusive, at all times	
E.Coli	200 col/100 mL	

} *Monthly Avg
 (Concentration)
 } *Annual Avg
 (Loading)

Monthly Geometric Mean

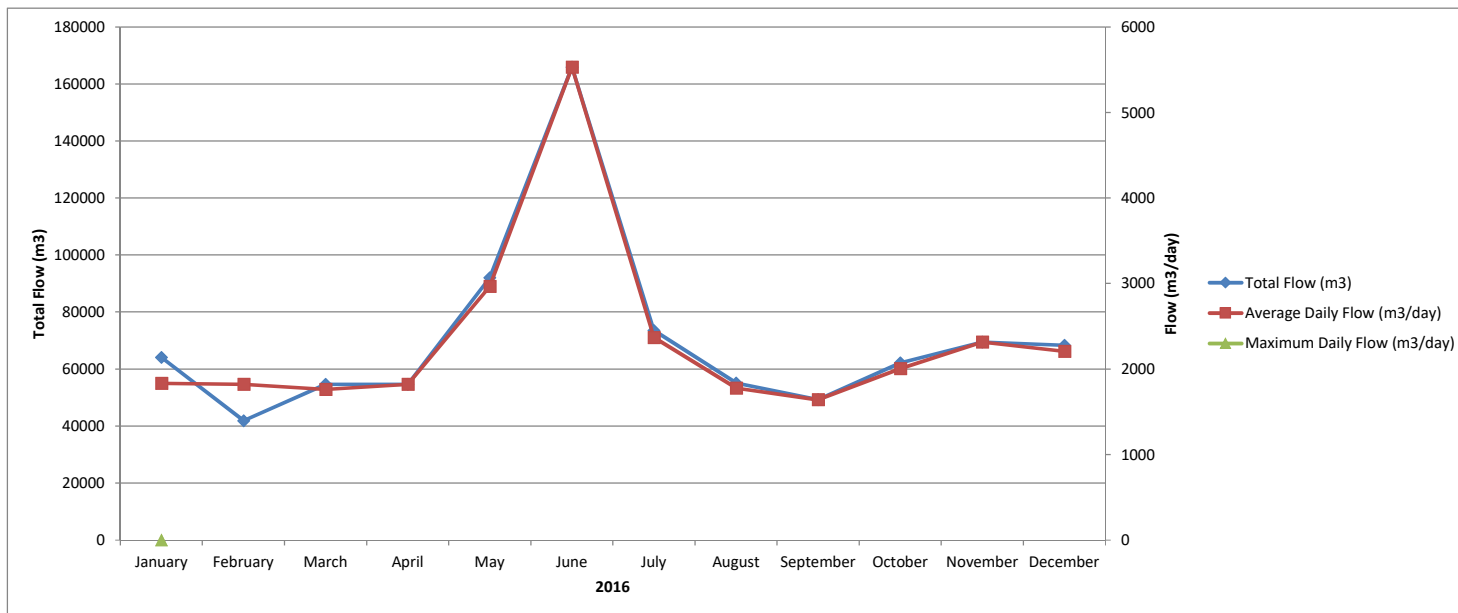


2019 Azilda Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	540	221	305	193	145	303	126	31.5	8.9	11.4	110	35.5	169.19
Nitrate (as N)	0.008	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.43
Nitrite (as N)	0.02	0.08	3.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.66
Potassium	59	98	115	127	65	115	54	56	53	33	99	21	74.58
TKN	1950	2260	2200	2250	413	2330	1510	818	385	422	2300	137	1415
Total Phosphorus	864	855	825	707	359	883	463	184	415	202	1110	33.1	575
Total Solids	36700	30200	38500	41800	22600	41600	31400	26500	14300	8160	40900	2480	27928
Arsenic	0.27	0.34	0.16	0.30	0.12	0.30	0.12	0.14	0.08	0.04	0.01	0.01	0.1575
Cadmium	0.035	0.072	0.038	0.031	0.011	0.033	0.023	0.024	0.012	0.008	0.000	0.0009	0.0240
Chromium	0.83	0.95	0.41	0.82	0.25	0.70	0.35	0.45	0.28	0.13	0.01	0.02	0.4333
Cobalt	0.846	0.694	0.344	0.686	0.121	0.257	0.203	0.430	0.178	0.082	0.001	0.013	0.3213
Copper	20	21.6	12.5	14.3	4.3	12.9	9.5	11.2	7	2.3	0.1	0.58	9.69
Lead	0.440	0.489	0.275	0.349	0.100	0.267	0.204	0.268	0.170	0.088	0.001	0.011	0.2218
Mercury	0.017	0.015	0.001	0.004	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.0039
Molybdenum	0.32	0.36	0.14	0.15	0.03	0.18	0.07	0.10	0.06	0.03	0.01	0.01	0.1217
Nickel	2.80	2.00	1.08	3.90	1.17	2.50	1.18	1.26	0.78	0.40	0.10	0.08	1.438
Selenium	0.186	0.293	0.102	0.131	0.053	0.112	0.075	0.098	0.005	0.025	0.005	0.005	0.0908
Zinc	16.40	16.20	10	12.40	4.35	12.00	7.49	9.20	8.10	4.30	24.20	0.01	10.39
Sample Date	Jan.9/19	Feb.6/19	Mar.6/19	Apr.11/19	May.23/19	Jun.6/19	Jul./10/19	Aug.14/19	Sep.25/19	Oct./9/19	Nov.6/19	Dec.18/19	#DIV/0!

2019 Capreol Wastewater Treatment Lagoon Performance

Month	Flows		BOD5							Total Suspended Solids							Total Phosphorus							Total Ammonia							Un-ionized	TKN	
	Total	Avg Day	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Ammonia	Raw	Effluent				
	m ³	m ³ /d	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	µg/L	mg/L	mg/L				
January	64112	1832	130	31.1	56.97	238	181	76.1%	84	18.7	34.25	154	120	92.7%	3.2	2.15	3.94	5.81	1.87	32.2%	15.80	15.10	27.66	28.94	1.28	4.4%	28.70	15.1	26.1				
February	41910	1822	85	39.0	71.06	155	84	54.1%	73.3	22.7	41.36	134	92	69.0%	2.6	2.54	4.63	4.66	0.04	0.8%	12.90	15.70	28.61	23.51	-5.10	-21.7%	35.32	14.4	16.1				
March	54659	1763	82.5	0.5	0.88	145	145	99.4%	88.5	22.0	38.79	156	117	75.1%	2.6	2.57	4.53	4.58	0.05	1.2%	13.40	17.40	30.68	23.63	-7.05	-29.9%	40.10	15.4	17.7				
April	54684	1823	79.2	37.6	68.54	144	76	52.5%	86.7	16.7	30.44	158	128	80.7%	1.4	1.98	3.61	2.59	-1.02	-39.4%	4.43	14.70	26.80	8.08	-18.72	-231.8%	16.33	9.1	13.3				
May	91998	2968	84.6	11.7	34.72	251	216	86.2%	21	12.3	36.50	62	26	41.4%	0.5	0.50	1.48	1.37	-0.12	-8.7%	3.01	2.68	7.95	8.93	0.98	11.0%	NA	3.8	4.1				
June	165905	5530	33.2	14.7	81.29	184	102	55.7%	27.3	9.7	53.48	151	97	64.6%	1.3	0.73	4.04	7.13	3.10	43.4%	7.77	2.70	14.93	42.97	28.04	65.3%	6.27	9.7	5.1				
July	73475	2370	55.7	3.4	8.06	132	124	93.9%	70	25.3	59.97	166	106	63.9%	1.6	0.76	1.80	3.70	1.90	51.3%	9.15	1.37	3.25	21.69	18.44	85.0%	NA	11.8	7.3				
August	55151	1779			0.00	0	0		38	19.3	34.34	68	33	49.2%	1.5	1.31	2.33	2.67	0.34	12.7%	8.70	3.02	5.37	15.48	10.11	65.3%	NA	10.9	6.5				
September	49226	1641			0.00	0	0		85	23.7	47.54	171	123	72.1%	4.0	1.41	2.83	8.02	5.20	64.8%	26.30	4.30	8.63	52.76	44.13	83.7%	NA	27.9	9.7				
October	62187	2006	150	4.3	9.95	347	337	97.1%	392	23.3	53.93	907	853	94.1%	5.2	1.48	3.43	12.06	8.63	71.6%	12.20	9.27	21.45	28.24	6.78	24.0%	10.48	21.2	9.6				
November	69433	2314	82	8.0	18.52	190	171	90.2%	58	23.3	53.93	134	80	59.8%	2.3	2.24	5.18	5.32	0.14	2.6%	11.80	9.64	22.31	27.31	5.00	18.3%	NA	14.4	9.3				
December	68395	2206	85	10.7	23.61	188	164	87.4%	90	24.7	54.50	199	144	72.6%	3.2	1.78	3.93	7.06	3.13	44.4%	13.00	11.00	24.27	28.68	4.41	15.4%	0.02	20.5	12.1				
Total	851135					1974	1600	81.1%				2459	1920	78.1%				65	23	35.8%													
Average		2332	87	16.10	31.13	165	133	79.3%	93	20.14	44.92	205	160	69.6%	2.44	1.62	3.48	5.41	1.94	23.1%	11.54	8.91	18.49	25.85	7.36	7.4%	19.60	14.5	11.4				



Lagoon Type: Exfiltration
Design Capacity: 5000 m³/day
Population Served: 3,408

Compliance Parameters:

	Concentration	
BOD ₅	30 mg/L	Annual Avg
TSS	40 mg/L	Annual Avg
Total Phosphorus	1.38 mg/L	Annual Avg

Note: Effluent = North to South Cell Effluent
 Annual Average of T.P. measured at the overflow culvert located between the north and south cell.

2019 Capreol Lagoon Groundwater Monitoring Wells

Parameter (mg/L)	OW #2		OW #3		OW #5		OW #8		OW #12a		OW #15		OW #16		Average
	May/July	Nov	May/July	Nov	May/July	Nov	May/July	Nov	May/July	Nov	May/July	Nov	May/July	Nov	
E.Coli (CFU/100 mL)															
Alkalinity	57	113	166	132	15	17	52	84	34	55	19	33	12	18	58
Ammonia (as N)	2.46	4.12	18.50	16.50	0.01	0.01	2.21	1.09	0.01	0.04	0.01	0.01	0.01	0.01	3.21
Nitrate (as N)	0.18	0.05	0.16	0.39	0.05	0.05	0.48	0.05	0.05	0.30	0.05	0.05	0.05	0.05	0.140
Nitrite (as N)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.050
BOD ₅	1	1.6	41.7	1.7	0.5	1.5	3.8	3.6	1.0	2.3	0.5	1.5	0.5	1.2	4.5
D.O.C.	4.2	6.1	5.5	4.0	1.4	1.7	2.6	6.0	2.4	3.2	2.7	3.2	1.1	1.1	3.2
Hardness (as CaCO ₃)	68.1	78.4	79.3	76.8	6.2	8.2	99.3	59.9	71.9	89.1	18.1	31.5	7.3	12.4	50.5
Aluminum	0.007	0.038	0.004	0.008	0.910	0.152	0.003	0.040	0.033	0.064	0.019	0.054	0.055	0.0480	0.1025
Antimony	0.0005	0.0005	0.0005	0.0070	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0010
Arsenic	0.003	0.005	0.007	0.005	0.001	0.001	0.002	0.003	0.002	0.001	0.001	0.001	0.001	0.0010	0.0024
Barium	0.055	0.071	0.100	0.097	0.001	0.010	0.017	0.027	0.049	0.062	0.009	0.019	0.006	0.0080	0.0379
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cadmium	0.0001	0.0004	0.0002	0.0004	0.0001	0.0004	0.0001	0.0003	0.0001	0.0003	0.0001	0.0005	0.0001	0.0002	0.0002
Calcium	18.80	22.40	21.70	21.30	1.62	2.15	27.60	17.30	20.50	25.70	4.81	8.14	1.99	3.31	14.09
Chromium	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0010	0.0010
Cobalt	0.0026	0.0022	0.0086	0.0095	0.0001	0.0028	0.0017	0.0133	0.0008	0.0027	0.0001	0.0004	0.0003	0.0004	0.0033
Copper	0.004	0.002	0.003	0.002	0.004	0.007	0.006	0.024	0.000	0.009	0.000	0.006	0.000	0.002	0.005
Iron	4.10	6.60	9.50	14.30	0.14	0.31	0.21	0.67	0.90	4.10	0.07	0.15	0.10	0.06	2.94
Lead	0.0001	0.0025	0.0015	0.0038	0.0003	0.0012	0.0001	0.0005	0.0002	0.0005	0.0001	0.0013	0.0003	0.0004	0.001
Magnesium	5.140	5.840	6.100	5.740	0.513	0.679	7.380	4.050	5.020	6.050	1.470	2.710	0.561	0.998	3.732
Manganese	0.450	0.470	1.080	0.900	0.003	0.050	0.177	0.720	0.121	0.650	0.003	0.023	0.006	0.008	0.333
Mercury	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0010	0.0010
Nickel	0.003	0.004	0.006	0.005	0.001	0.004	0.004	0.010	0.002	0.004	0.001	0.003	0.001	0.0010	0.0035
Potassium	3.20	5.30	4.70	5.50	0.40	0.50	2.40	4.10	2.90	3.50	0.50	1.10	0.40	0.70	2.51
Selenium	0.0010	0.0005	0.0005	0.0005	0.0007	0.0005	0.0005	0.0005	0.0005	0.0005	0.0008	0.0005	0.0005	0.0005	0.001
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Sodium	38.0	62.0	40.0	49.0	4.1	5.8	27.9	67.0	26.2	36.0	1.8	3.5	2.6	3.9	26.271
Tellurium	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0010	0.0010
Tin	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0010	0.0010
Zinc	0.002	0.003	0.004	0.013	0.004	0.018	0.002	0.007	0.001	0.006	0.003	0.020	0.004	0.0060	0.0066
pH	6.80	7.70	7.13	7.08	6.89	7.04	6.99	7.15	6.90	7.11	6.69	7.08	6.73	7.02	7.02
T.K.N.	2.7	4.5	16.6	15.6	1.2	0.2	2.7	1.6	0.2	0.2	0.2	0.2	0.2	0.2	3.31
Total Phosphorus	0.322	0.770	0.268	0.176	0.014	0.019	0.219	1.350	0.077	0.044	0.014	0.020	0.017	0.006	0.237

2019 Vermillion River Sampling

Parameter (mg/L)	Jun.18/19		Nov.7/19		Annual Average		Monthly Phosphorus Sampling		
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Sample Date	Upstream	Downstream
Alkalinity	15	14	15	13	15.0	13.5	May.15/19	0.0060	0.0050
Ammonia (as N)	0.01	0.02	0.01	0.01	0.01	0.0	Jun.12/19	0.0100	0.0110
Chloride	1.0	0.7	0.9	0.9	1.0	0.8	Jun.18/19	0.0120	0.0120
Sulphate	4.9	4.9	4.6	5.2	4.8	5.1	Jul.3/19	0.0030	0.0070
BOD ₅	0.5	0.5	1.8	2.3	1.2	1.40	Aug.8/19	0.0100	0.0100
Aluminum	0.041	0.050	0.061	0.062	0.051	0.1	Sep.5/19	0.0050	0.0060
Antimony	0.0005	0.0005	0.0005	0.0005	0.0005	0.0	Oct.22/19	0.0130	0.0090
Arsenic	0.001	0.001	0.001	0.001	0.001	0.0	Nov.7/19	0.0020	0.0040
Barium	0.009	0.010	0.009	0.009	0.009	0.010			
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005			
Cadmium	0.0001	0.0001	0.0001	0.0001	0.0001	0.000			
Calcium	3.20	3.78	4.58	4.63	3.89	4.205			
Chromium	0.001	0.001	0.001	0.001	0.001	0.0010			
Cobalt	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Copper	0.002	0.002	0.002	0.002	0.002	0.00	Annual Average	0.0076	0.0080
Iron	0.15	0.22	0.25	0.26	0.20	0.240	Compliance Parameters: Downstream Total Phosphorus, 0.03 mg/L Annual average. Annual average of CBOD5 and TKN can not exceed 15% of the Upstream annual average value.		
Lead	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002			
Magnesium	0.778	0.908	1.220	1.230	0.999	1.069			
Manganese	0.020	0.024	0.024	0.024	0.022	0.02			
Mercury	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001			
Nickel	0.002	0.003	0.003	0.003	0.003	0.003			
Potassium	0.300	0.400	0.600	0.600	0.450	0.5000			
Selenium	0.0060	0.0005	0.0005	0.0005	0.0033	0.001			
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.000			
Sodium	0.90	1.00	1.20	1.30	1.05	1.150			
Tellurium	0.001	0.001	0.001	0.001	0.001	0.0010			
Tin	0.001	0.001	0.001	0.001	0.001	0.0010			
Zinc	0.002	0.002	0.004	0.003	0.003	0.00			
pH	7.17	7.24	6.96	7.11	7.07	7.175			
T.D.S.	50	40	40	90	45	65.000			
T.K.N.	0.2	0.2	0.2	0.2	0.2	0.200			
Total Phosphorus	0.012	0.012	0.002	0.004	0.007	0.01			

2019 Capreol Lagoon Ground/Surface Water Levels

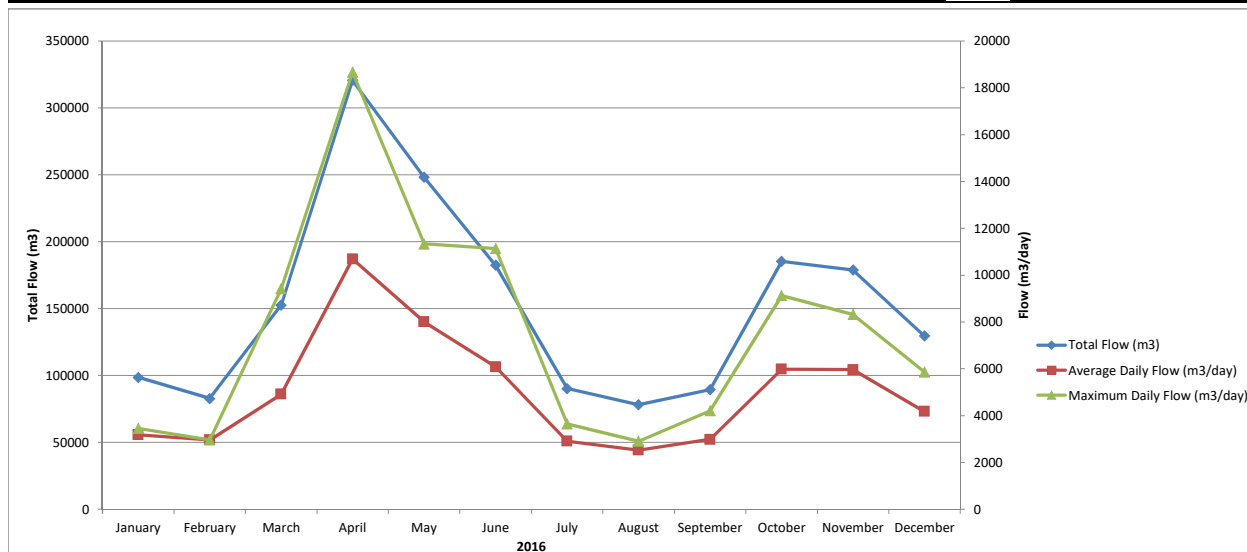
* Depth in metres from top of casing to water

Well I.D.	Water Level (m)*	Measure Date	Water Level (m)*	Measure Date
OW#1	2.92	Jun.6/19	3.00	Nov.7/19
OW#2	3.42	Jun.5/19	3.10	Nov.7/19
OW#3	3.21	Jun.5/19	3.50	Nov.7/19
OW#5	6.95	Jun.5/19	7.10	Nov.7/19
OW#7	Lower Than Measuring Device	Jun.6/19	Deeper than Measuring Device	Nov.7/19
OW#8	3.00	Jun.5/19	5.30	Nov.7/19
OW#10a	5.80	Jun.6/19	6.70	Nov.7/19
OW#10b	5.75	Jun.6/19	6.1/Cap Broken Off	Nov.7/19
OW#11	4.95	Jun.6/19	5.40	Nov.7/19
OW#12	Non Existant	Jun.5/19	n/a	Nov.7/19
OW#12a	1.95	Jun.5/19	3.40	Nov.7/19
OW#13a	6.15	Jun.6/19	5.70	Nov.7/19
OW#13b	6.15	Jun.6/19	5.70	Nov.7/19
OW#14	2.21	Jun.6/19	3.00	Nov.7/19
OW#15	8.61	Jun.5/19	7.60	Nov.7/19
OW#16	6.50	Jun.5/19	8.40	Nov.7/19
OW#21	4.52	Jun.6/19	5.20	Nov.7/19
OW#22	4.62	Jun.6/19	5.10	Nov.7/19
OW#23	6.22	Jun.6/19	6.20	Nov.7/19
OW#24	5.75	Jun.6/19	4.70	Nov.7/19
OW#25	6.32	Jun.6/19	Dry	Nov.7/19
OW#26	5.10	Jun.6/19	6.80	Nov.7/19
OW#28	2.31	Jun.6/19	3.70	Nov.7/19
OW#30	2.12	Jun.6/19	2.20	Nov.7/19
River @ Bridge	0.50	Jun.6/19	1.00	Nov.7/19



2019 Chelmsford Wastewater Treatment Plant Performance

Month	Flows			BOD ₅	CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized Ammonia	TKN		Nitrite	Nitrate	pH		Alkalinity		Sludge			E.Coli	
	Total	Avg Day	Max Day		Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant		Raw	Effluent			Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total		
	m ³	m ³ /d	m ³ /d		mg/L	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d		Efficiency	µg/L			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		Hauled
January	98529	3178	3450	150	140	3.3	10.49	97.6%	158	10.4	33.05	93.4%	3.6	0.26	0.83	92.8%	14.80	2.88	9.15	80.5%	2.98	14.40	3.97	0.71	13.2	7.3	6.8	267	120	600	2.2	13.2	11578	
February	82754	2956	2956	180	160	4.1	12.12	97.4%	150	6.1	18.03	95.9%	3.6	0.26	0.77	92.8%	33.70	7.85	23.20	76.7%	10.41	34.80	7.55	0.98	13.0	7.5	7.0	253	117	840	1.7	14.3	20203	
March	152397	4916	9410	151	163	4.2	20.65	97.4%	133	8.0	39.13	94.0%	2.8	0.15	0.74	94.6%	26.20	6.00	29.50	77.1%	25.22	28.60	8.30	0.79	7.3	7.8	7.3	283	180	960	2.2	21.1	18565	
April	320625	10688	18670	76.8	64.9	2.1	22.44	96.8%	65	9.6	102.60	85.2%	1.6	0.29	3.10	81.9%	7.80	2.04	21.80	73.8%	7.98	9.30	3.50	0.28	1.0	7.7	7.7	233	203	960	2.0	19.2	7081	
May	248071	8002	11330	86.7	60.3	3.2	25.61	94.7%	79	6.2	49.61	92.2%	2.4	0.19	1.52	92.1%	16.80	2.22	17.77	86.8%	24.06	16.90	3.10	0.35	2.1	7.7	7.5	237	199	960	0.7	6.7	242	
June	182385	6080	11130	113	81.3	3.3	20.06	95.9%	157	6.1	37.08	96.1%	3.0	0.17	1.03	94.3%	23.90	5.23	31.80	78.1%	23.98	27.30	6.35	0.05	3.8	7.6	3.5	269	202	1080		0.0	99	
July	90128	2907	3640	212	139	1.1	3.20	99.2%	252	5.8	16.86	97.7%	4.8	0.11	0.32	97.7%	31.90	0.12	0.35	99.6%	0.36	36.50	0.60	0.15	18.0	7.4	6.9	295	75	1200	1.4	16.8	26	
August	78155	2521	2900		170	2.4	6.05	98.6%	198	8.7	21.81	95.6%	4.0	0.23	0.58	94.2%	27.80	0.28	0.71	99.0%	0.42	33.90	0.47	0.72	18.9	7.2	6.7	254	41	1060	1.5	15.9	34	
September	89326	2978	4200	170	178.5	4.8	14.29	97.3%	182	10.5	31.26	94.2%	4.2	0.41	1.22	90.2%	36.70	1.69	5.03	95.4%	3.94	44.50	3.15	8.27	9.9	7.5	6.8	237	60	840	1.6	13.4	312	
October	185233	5975	9120	76	65	3.7	22.11	94.3%	117	6.7	40.03	94.3%	2.1	0.20	1.20	90.5%	13.20	2.99	17.87	77.3%	34.38	14.25	5.10	5.29	4.4	7.7	7.4	249	136	800	1.3	10.4	516	
November	178744	5958	8320	95	30	4.0	23.83	86.7%	125	6.5	38.73	94.8%	1.9	0.30	1.79	84.3%	5.10	0.59	3.52	88.4%	4.55	155.30	1.05	0.05	9.1	7.9	7.5	281	194	760		0.0	100	
December	129442	4176	5860	82	67	5.9	24.64	91.2%	125	6.1	25.47	95.1%	3.4	0.41	1.71	88.0%	8.60	7.50	31.32	12.8%	10.03	12.50	8.83	0.53	5.8	7.6	7.3	296	202	880	2.2	19.4	4938	
Total	1835789							96.3%				94.0%				91.0%				81.8%											10940		150.4	
Average		5030			110	3.51	17.12	95.6%	145	7.55	37.81	94.1%	3.12	0.25	1.23	91.1%	20.54	3.28	16.0	78.8%	12.4	35.69	4.33	1.51	8.87	7.58	6.87	263	144		1.68		5308	
Summer						3.08	15.22	96.7%			7.33	32.78	95.2%		0.22	0.98	93.2%	25.05	2.09	12.25	88.3%													
Winter						3.93	19.03	96.0%			7.78	42.84	92.8%		0.28	1.49	88.6%	16.03	4.48	19.75	72.1%													



Plant Type: Extended Aeration w/modified activated sludge for denitrification

Design Capacity: 7100 m³/day

Population Served: 7,147 (Plant & Lagoon)

Compliance Parameters:

Summer - May 1 to October 31

	Conc.	Loading	
CBOD	7.0 mg/L	49.7 kg/day	Seasonal Average
TSS	7.0 mg/L	49.7 kg/day	Seasonal Average
Total Phosphorus	0.3 mg/L	2.13 kg/day	Monthly Average
Total Ammonia as N	2.0 mg/L	14.2 kg/day	Seasonal Average
E.Coli	200 col/100 mL		Monthly Geometric Mean
UV Disinfection turned on.			

Winter - November 1 to April 30

	Conc.	Loading	
CBOD	15.0 mg/L	106.5 kg/day	Seasonal Average
TSS	15.0 mg/L	106.5 kg/day	Seasonal Average
Total Phosphorus	0.5 mg/L	3.55 kg/day	Monthly Average
Total Ammonia as N	4.0 mg/L	28.4 kg/day	Seasonal Average
UV Disinfection turned off.			



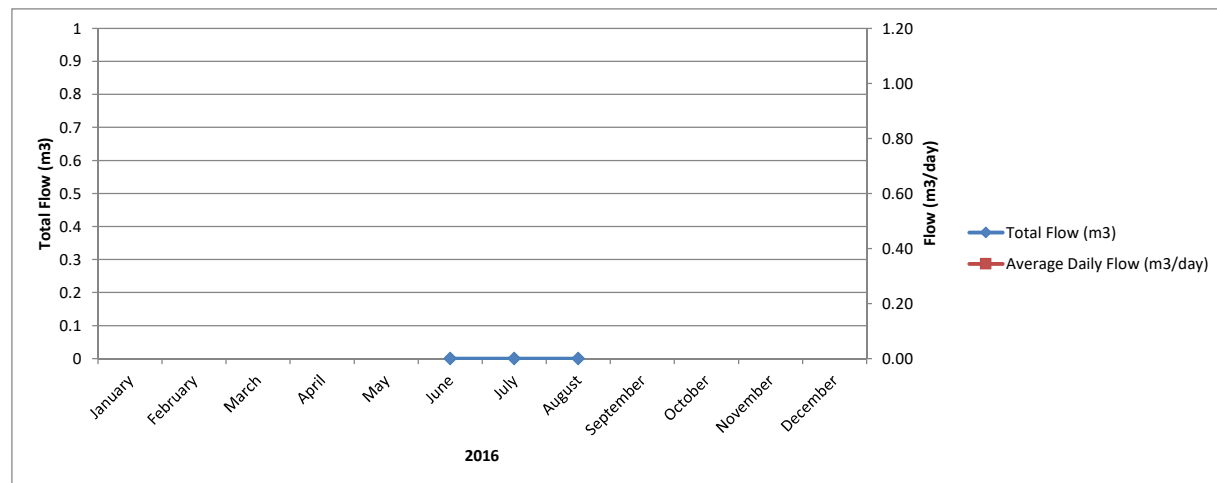
2019 Chelmsford Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	176.0	43.5	26.5	4.5	17.8	70.6	50.9	35.8	12.3	8.6	1.7	46.8	41.2
Nitrate (as N)	1.22	0.20	0.50	0.50	0.50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5350
Nitrite (as N)	0.02	1.40	0.50	0.50	0.50	0.50	0.5	0.50	3.60	10.90	0.50	0.50	1.66
Potassium	96.0	105.0	79.0	10.0	24.0	52.0	47	54.0	26.0	59.0	28.0	107.0	57.3
TKN	2050	270	883	53	287	831	293	347	263	692	102	1750	652
Total Phosphorus	390	343	312	17	101	210	227	262	77	240	25	378	215
Total Solids	22900	18800	15100	2070	7810	13400	17900	22900	4480	15000	8490	27640	14708
Arsenic	0.13	0.17	0.07	0.01	0.04	0.06	0.07	0.07	0.02	0.09	0.04	0.09	0.0717
Cadmium	0.0111	0.0250	0.0100	0.0007	0.0040	0.0077	0.0080	0.0130	0.0016	0.0144	0.0035	0.0120	0.0093
Chromium	0.31	0.44	0.20	0.03	0.14	0.17	0.19	0.21	0.05	0.24	0.10	0.37	0.2042
Cobalt	0.242	0.278	0.131	0.019	0.082	0.052	0.147	0.157	0.020	0.094	0.103	0.170	0.1246
Copper	8.50	11.60	5.00	0.57	1.90	3.80	5.5	5.61	1.300	5.90	2.30	7.70	4.97
Lead	0.233	0.328	0.137	0.017	0.061	0.097	0.117	0.159	0.037	0.166	0.053	0.198	0.1336
Mercury	0.008	0.007	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.007	0.001	0.007	0.0032
Molybdenum	0.09	0.13	0.04	0.01	0.01	0.02	0.06	0.05	0.01	0.05	0.02	0.05	0.0450
Nickel	1.07	1.20	0.55	0.31	1.07	0.87	0.83	0.58	0.13	0.93	0.72	1.40	0.81
Selenium	0.045	0.063	0.028	0.007	0.015	0.029	0.036	0.036	0.005	0.031	0.011	0.073	0.0316
Zinc	7.42	8.60	3.77	0.49	2.14	3.37	4.29	4.83	1.03	5.67	1.70	6.86	4.18
Sample Date	Jan.9/19	Feb.6/19	Mar.6/19	Apr.10/19	May.8/19	Jun.26/19	Jul.8/19	Aug.7/19	Sep.11/19	Oct.16/19	Nov.6/19	Dec.11/19	#DIV/0!



2019 Chelmsford Wastewater Treatment Lagoon Performance

Month	Flows		CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia		TKN	
	Total	Avg Day	Raw	Effluent	Loading	Raw	Effluent	Loading	Raw	Effluent	Loading	Effluent	Loading	Raw	Effluent
	m ³	m ³ /d	mg/L	mg/L	kg/d	mg/L	mg/L	kg/d	mg/L	mg/L	kg/d	mg/L	kg/d	mg/L	mg/L
January					0.00			0.00			0.00		0.00		
February					0.00			0.00			0.00		0.00		
March			115		0.00	164		0.00	4.12		0.00		0.00	n/a	n/a
April			39.6		0.00	9.33		0.00	0.68		0.00		0.00	n/a	n/a
May			4		0.00	3.67		0.00	0.52		0.00		0.00	n/a	n/a
June	no results - in shutdown				0.00			0.00			0.00		0.00		
July	no results - in shutdown				0.00			0.00			0.00		0.00		
August	no results - in shutdown				0.00			0.00			0.00		0.00		
September			200		0.00	2630		0.00	7.30		0.00		0.00		
October			45		0.00	36		0.00	0.89		0.00		0.00		
November			59		0.00	26		0.00	1.24		0.00		0.00		
December			77		0.00	46		0.00	2.49		0.00		0.00		
Total	0														
Average		0	77	#DIV/0!	0.00	416	#DIV/0!	0.00	2.46	#DIV/0!	0.00	#DIV/0!	0.00	#DIV/0!	#DIV/0!



Lagoon Type: Seasonal Retentional

Design Capacity: 824 m³/day

Population Served: Delivery to Chelmsford WWTP

Compliance Parameters:

	Concentration	
BOD ₅	30 mg/L	Annual Average
TSS	40 mg/L	Annual Average

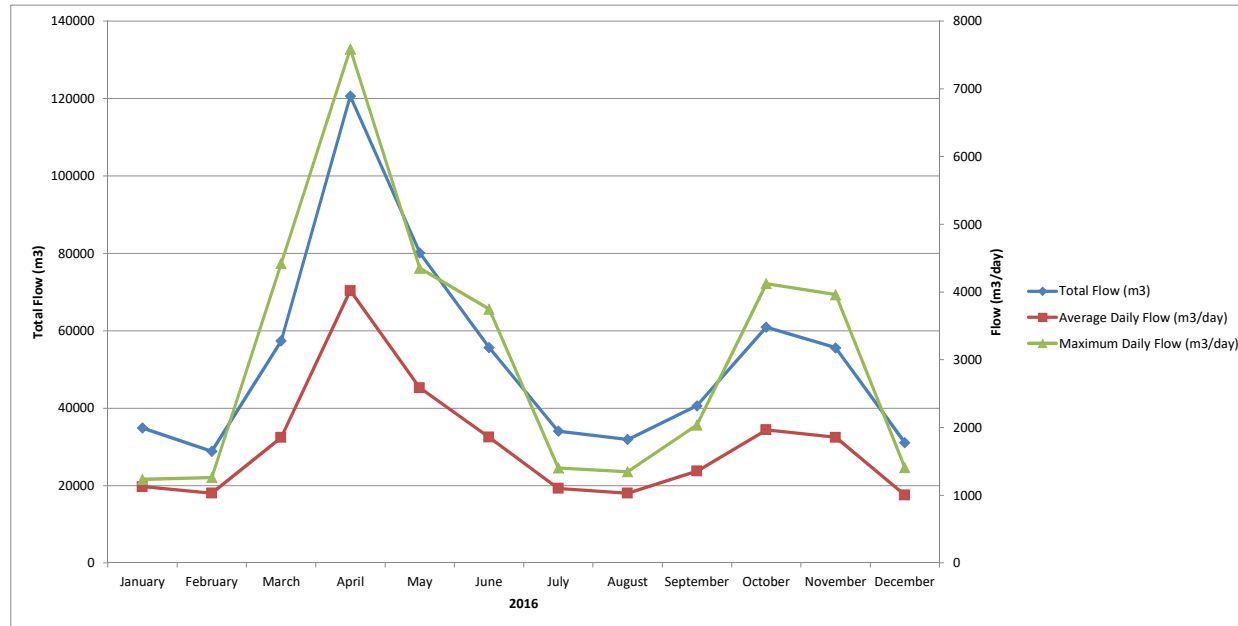
Note: Lagoon in Service from March 11, 2013 to March 18, 2013.

Raw sewage sampled March 11, 2013.



2019 Coniston Wastewater Treatment Plant Performance

Month	Flows			BOD ₅				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized Ammonia µg/L	TKN mg/L	Nitrite mg/L	Nitrate mg/L	pH		Alkalinity		Sludge			Chlorine		E.Coli # Col./100ml	
	Total	Avg Day	Max Day	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant					Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Total	Residual		
	m ³	m ³ /d	m ³ /d	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Hauled	%	m ³		Kg
January	34864	1125	1234	130	18.0	20.24	86.2%	116	9.0	10.14	92.2%	3.8	1.79	2.01	52.9%	24.20	2.95	3.32	87.8%	5.7	4.30	7.87	3.51	7.1	7.0	178	122	120	1.6	1.9	37.9	0.89	6	
February	28828	1030	1258	220	15.6	16.06	92.9%	152	27.5	28.28	81.9%	7.2	2.63	2.71	63.5%	30.40	17.80	18.33	41.4%	15.8	18.45	1.33	0.30	7.0	6.9	183	135	40	1.3	0.5	34.0	0.75	1120	
March	57323	1849	4421	118	7.3	13.41	93.9%	155	19.7	36.48	87.3%	4.7	2.26	4.18	51.9%	23.80	16.50	30.51	30.7%	16.5	15.15	0.50	0.50	7.3	2.3	172	151	0	2.3	0.0	69.3	0.96	2	
April	120640	4021	7587	20	9.3	37.40	53.5%	67	20.5	82.44	69.4%	1.6	1.15	4.62	28.1%	5.30	4.55	18.30	14.2%	72.2	8.20	0.50	0.50	7.3	7.1	120	126	0	0.0	0.0	124.3	0.68	2390	
May	80121	2585	4351	71	5.8	14.99	91.8%	106	27.0	69.78	74.5%	2.0	1.31	3.39	34.5%	9.80	6.88	17.78	29.8%	14.0	8.90	0.50	1.09	7.1	6.9	182	168	0	0.0	0.0	136.3	0.73	8220	
June	55656	1855	3747	89	7.3	13.54	91.8%	109	22.0	40.81	79.8%	4.4	2.08	3.86	52.7%	24.40	12.10	22.45	50.4%	0.03	13.30	0.05	0.38	7.4	7.0	196	174	80	0.0	0.0	79.7	0.86	5000	
July	34015	1097	1402	69	6.8	7.46	90.1%	115	7.8	8.56	93.2%	5.1	1.89	2.07	62.9%	16.00	9.70	10.64	39.4%	41.3	10.90	0.85	2.79	7.5	6.8	160	96	160	0.4	0.6	75.0	0.65	2	
August	31900	1029	1346	130	9.9	10.19	92.4%	153	7.9	8.13	94.8%	4.3	2.30	2.37	46.5%	18.50	0.28	0.29	98.5%	0.66	2.40	0.05	8.16	7.4	6.7	148	69	240	0.8	1.9	113.6	0.74	40	
September	40605	1354	2034	130	7.8	10.56	94.0%	162	10.0	13.54	93.8%	3.8	2.16	2.92	42.6%	25.00	1.28	1.73	94.9%	3.08	3.40	8.09	2.28	7.5	6.7	154	58	200	1.1	2.2	85.1	0.70	30	
October	60885	1964	4122	92	3.0	5.89	96.7%	94	5.2	10.21	94.5%	4.1	1.14	2.24	72.2%	17.70	0.19	0.37	98.9%	0.4	0.70	0.38	6.96	7.1	6.9	161	85	80	1.2	1.0	110.0	0.70	52	
November	55574	1852	3959	140	8.2	15.19	94.1%	182	12.8	23.71	93.0%	3.2	1.06	1.96	66.9%	10.90	0.52	0.96	95.2%	1.7	1.90	0.05	0.59	7.4	7.2	175	131	120	1.2	1.4	64.2	0.80	33000	
December	31068	1002	1405	160	14.5	14.53	90.9%	152	19.3	19.37	87.3%	3.6	2.38	2.39	33.5%	11.70	12.30	12.33	-5.1%	27.7	13.50	0.05	0.37	7.3	7.0	180	169	40		0.0	50.1	0.70	10000	
Total	631479																										9.9		979.5					
Average		1730		114	9.45	14.96	91.1%	130	15.73	29.29	85.9%	3.98	1.85	2.89	52.3%	18.14	7.09	11.42	0.56	16.59	8.43	1.69	2.29	7.28	6.54	167	124		0.80			0.76	248	



Plant Type: Extended Aeration

Design Capacity: 3000 m³/day

Population Served: 2,090

Compliance Parameters:

	Conc.	Loading	
BOD ₅	20 mg/L	35 kg/day	*
TSS	20 mg/L	35 kg/day	*
E.Coli	200 col/100 mL		Annual Geometric Mean

* Average of any 12 consecutive month period.



2019 Coniston Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	123	43.3	107	n/a	n/a	n/a	16.2	0.48	8.5	12.9	15.7	13.4	37.8
Nitrate (as N)	0.08	0.2	5	n/a	n/a	n/a	0.7	3.4	0.5	0.05	0.5	0.05	1.16
Nitrite (as N)	0.2	0.08	5	n/a	n/a	n/a	3.3	0.5	3.7	0.05	0.5	0.05	1.49
Potassium	56	42	67	n/a	n/a	n/a	24	34	37	46	55	9	41.1
TKN	28	448	1560	n/a	n/a	n/a	270	483	606	480	536	95	501
Total Phosphorus	231	153	271	n/a	n/a	n/a	86	127	138	164	138	22.1	147.8
Total Solids	14900	13500	27300	n/a	n/a	n/a	5910	8990	11100	13000	13500	1790	12221
Arsenic	0.02	0.02	0.04	n/a	n/a	n/a	0.03	0.03	0.04	0.06	0.07	0.01	0.0356
Cadmium	0.0066	0.0080	0.0190	n/a	n/a	n/a	0.0130	0.0150	0.0200	0.0170	0.0180	0.0022	0.0132
Chromium	0.11	0.10	0.27	n/a	n/a	n/a	0.13	0.17	0.20	0.25	0.23	0.03	0.1656
Cobalt	0.242	0.116	0.109	n/a	n/a	n/a	0.124	0.162	0.200	0.240	0.360	0.025	0.1753
Copper	2.2	3.3	8.5	n/a	n/a	n/a	4.2	6.5	8.6	9.9	8.1	1	5.811
Lead	0.167	0.120	0.299	n/a	n/a	n/a	0.153	0.252	0.330	0.347	0.261	0.028	0.2174
Mercury	0.001	0.001	0.001	n/a	n/a	n/a	0.001	0.001	0.001	0.001	0.001	0.001	0.0010
Molybdenum	0.02	0.02	0.04	n/a	n/a	n/a	0.02	0.03	0.04	0.05	0.04	0.01	0.0300
Nickel	2.30	1.60	2.50	n/a	n/a	n/a	2.00	2.50	2.40	4.30	5.80	0.73	2.68
Selenium	0.015	0.020	0.050	n/a	n/a	n/a	0.026	0.042	0.047	0.021	0.056	0.006	0.0314
Zinc	4.96	3.78	7.70	n/a	n/a	n/a	3.71	5.42	6.60	6.77	5.86	0.75	5.06
Sample Date	Jan.8/19	Feb.14/19	Mar.7/19				Jul.16/19	Aug.6/19	Sep.4/19	Oct./1/19	Nov.6/19	Dec.3/19	

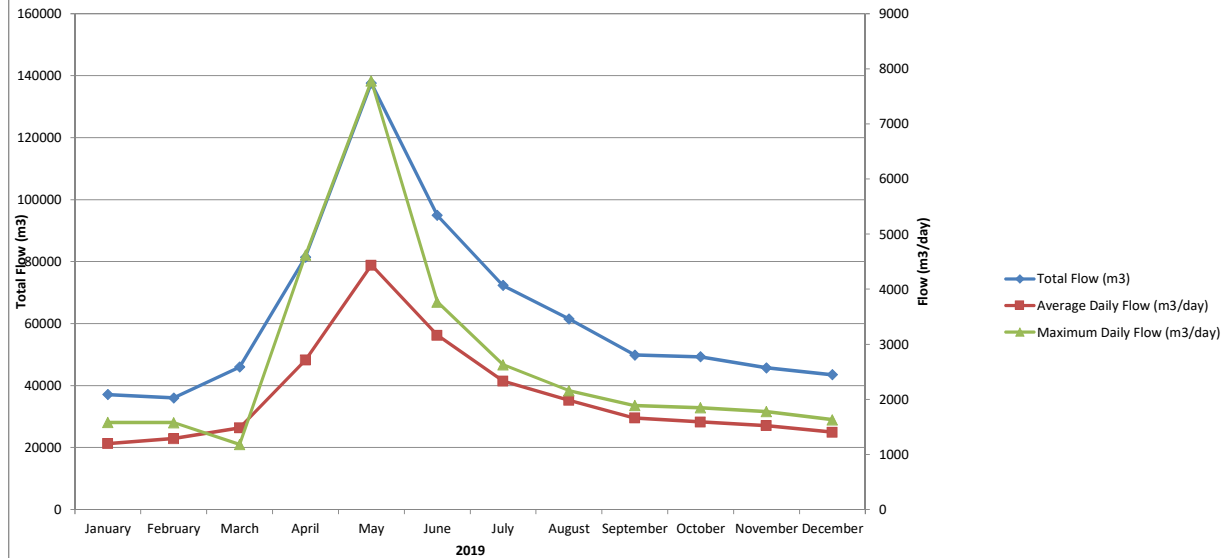
April no results - WO368797 has WS/AE scratched out - email to Richard - confirmed Operator did not take any results

Jun 6/19 - per Richard no Sludge April/May therefore no metals results



2019 Dowling Wastewater Treatment Plant Performance

Month	Flows			BOD ₅				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized	TKN	Nitrite	Nitrate	pH		Alkalinity		Sludge			Chlorine		E.Coli
	Total	Avg Day	Max Day	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Ammonia	Effluent	Effluent	Effluent	Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Total	Residual	Geomean
	m ³	m ³ /d	m ³ /d	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	µg/L	mg/L	mg/L	mg/L	Raw	Effluent	mg/L	mg/L	Hauled	%	m ³	Kg	mg/L	# Col./100ml
January	37125	1198	1583	51	50.6	60.60	0.8%	42	6.1	7.31	85.5%	2.0	0.65	0.78	67.5%	3.70	0.27	0.32	92.7%	0.2	1.90	0.20	6.16	6.7	6.5	120	60	120	1.7	2.0	135.1	0.57	20
February	36032	1287	1580	62	4.4	5.66	92.9%	35	3.8	4.89	89.1%	1.2	0.62	0.80	48.3%	7.10	0.21	0.27	97.0%	0.1	1.10	0.23	5.84	6.7	6.6	120	57	40	2.5	1.0	116.4	0.51	23
March	45963	1483	1181	20	3.8	5.63	81.0%	32	6.3	9.34	80.3%	1.8	0.65	0.96	63.9%	2.00	0.18	0.27	91.0%	0.2	1.30	0.05	5.37	6.9	6.6	127	55	80	2.8	2.2	134.8	0.59	14
April	81463	2715	4620	84	7.9	21.45	90.6%	41	8.7	23.62	78.8%	1.5	0.55	1.49	63.3%	3.00	1.63	4.43	45.7%	1.2	2.20	0.05	3.06	6.8	6.7	97	73	80	3.0	2.4	135.5	0.55	32
May	137570	4438	7780	20	3.7	16.42	81.5%	29	8.1	35.95	72.1%	1.3	0.38	1.69	70.8%	1.30	0.54	2.40	58.5%	0.5	1.70	1.06	1.48	6.9	6.7	68	56	120	2.2	2.6	140.0	1.00	127
June	94915	3164	3770	61	6.2	19.62	89.8%	42	6.8	21.51	83.7%	0.8	0.44	1.39	45.0%	1.90	0.74	2.34	61.1%	0.9	2.20	0.38	2.76	6.9	6.8	84	64	80	1.2	1.0	127.7	0.64	14
July	72325	2333	2630	21	5.0	11.67	76.2%	41	5.4	12.60	86.7%	1.9	0.45	1.05	76.3%	2.40	0.89	2.08	62.9%	1.7	2.80	0.52	3.60	7.1	6.8	86	66	120	1.3	1.6	125.5	0.72	11
August	61536	1985	2160	42	5.0	9.93	88.1%	39	6.1	12.11	84.4%	1.2	0.57	1.13	52.5%	3.90	2.25	4.47	42.3%	3.6	3.20	1.37	1.97	6.9	6.8	98	78	120	2.5	3.0	93.1	0.56	52
September	49870	1662	1890	54	5.8	9.64	89.3%	54	6.8	11.30	87.4%	1.2	0.58	0.96	51.7%	3.50	0.81	1.35	76.9%	1.3	1.60	2.21	4.91	7.0	6.8	94	65	80	1.5	1.2	92.6	0.40	68
October	49276	1590	1850	26	4.5	7.15	82.7%	47.8	7.2	11.44	84.9%	1.2	0.59	0.94	50.8%	3.20	0.20	0.32	93.8%	0.1	1.30	0.50	5.34	6.7	6.8	95	60	80	1.9	1.5	137.6	0.50	32
November	45733	1524	1780	40	5.2	7.93	87.0%	44.9	9.9	15.09	78.0%	0.8	0.48	0.73	40.0%	2.80	0.47	0.72	83.2%	0.7	1.20	0.05	5.09	7.0	6.8	93	61	80	2.2	1.8	104.8	0.50	124
December	43495	1403	1630	20	5.0	7.02	75.0%	37.3	6.9	9.68	81.5%	0.9	0.50	0.70	46.8%	2.67	0.75	1.05	71.9%	1.3	3.10	0.05	4.27	7.0	6.9	97	58	80		0.0	117.3	0.40	103
Total	755303						82.3%				82.0%				60.8%				70.9%								22.8		1460				
Average		2069		42	8.93	15.23	82.3%	40	6.84	14.57	82.7%	1.32	0.54	1.05	60.8%	3.12	0.75	1.67	0.73	0.98	1.97	0.56	4.15	6.88	6.73	98	63		1.69			0.58	52



Plant Type: Extended Aeration

Design Capacity: 3200 m³/day

Population Served: 1,857

Compliance Parameters:

	Conc.	Loading	
BOD ₅	25 mg/L	80 kg/day	Annual Average
TSS	25 mg/L	80 kg/day	Annual Average
Total Phosphorus	1.0 mg/L	3.2 kg/day	Annual Average
E.Coli	200 col/100 mL		Monthly Geometric Mean



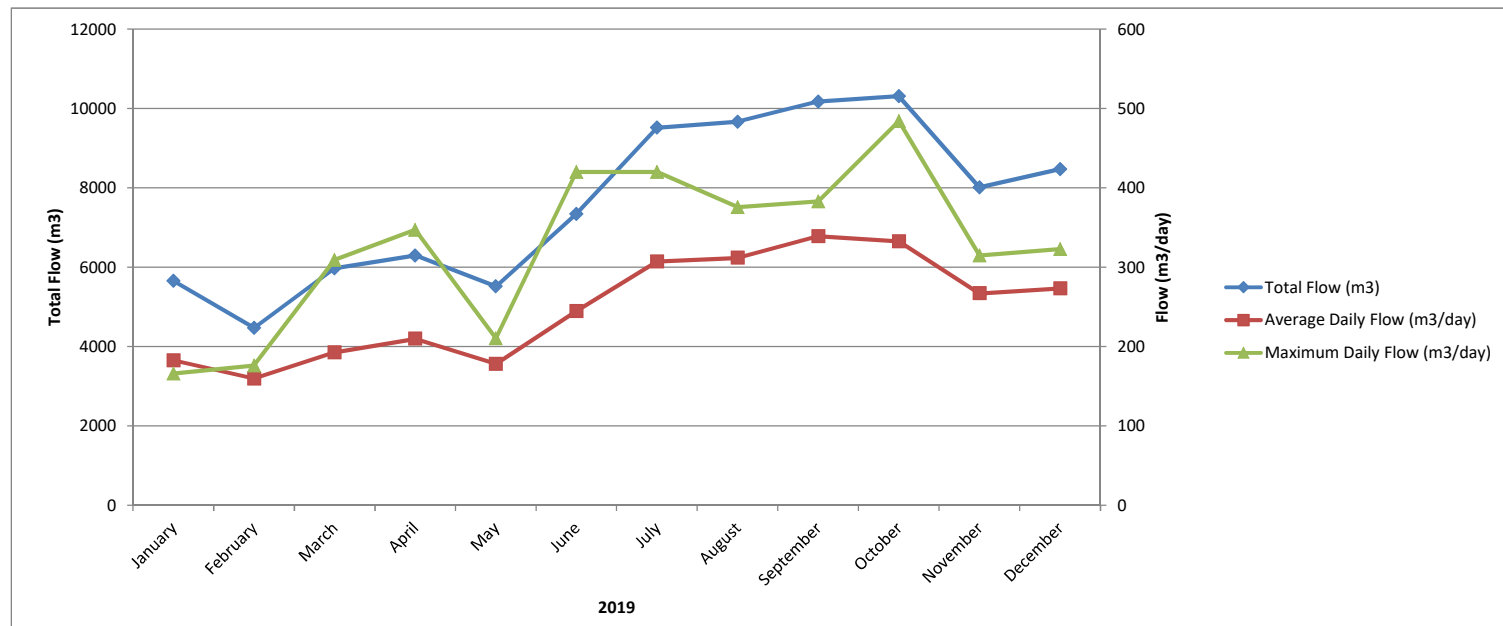
2019 Dowling Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	0.98	1.82	1.30	1.65	2.33	0.95	2.10	2.66	3.50	2.00	7.28	2	2.4
Nitrate (as N)	0.322	0.58	0.5	1.31	0.35	0.5	0.18	1.45	0.6	2.17	0.05	0.43	0.70
Nitrite (as N)	0.85	0.31	0.5	0.05	0.05	0.5	0.15	0.39	2.07	0.05	0.78	0.05	0.48
Potassium	15	11	12	7	9	11	45	6	10	10	10	11	13.08
TKN	22	124	137	25.9	67.8	46	77.2	58.4	118	100	45.9	113	77.93
Total Phosphorus	25.5	23.2	38.1	15.7	12.4	23.1	24.5	11.0	21.3	19.0	13.3	28.2	21.28
Total Solids	2510	1480	2040	1360	1120	1890	1780	1220	2120	2260	820	1790	1699
Arsenic	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	0.0009	0.0002	0.0009	0.0005	0.0005	0.0009	0.0070	0.0010	0.0010	0.0007	0.0050	0.0007	0.00
Chromium	0.04	0.03	0.03	0.02	0.01	0.03	0.22	0.02	0.02	0.02	0.01	0.05	0.04
Cobalt	0.003	0.003	0.003	0.003	0.002	0.003	0.024	0.002	0.002	0.003	0.002	0.003	0.00
Copper	1.6	1.3	1.4	0.76	0.55	1.02	9.2	0.81	1.4	1.22	0.48	1.3	1.75
Lead	0.025	0.016	0.021	0.015	0.012	0.030	0.174	0.022	0.023	0.020	0.007	0.019	0.03
Mercury	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.00
Molybdenum	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	0.20	0.04	0.06	0.04	0.03	0.05	0.45	0.05	0.06	0.04	0.02	0.06	0.09
Selenium	0.005	0.005	0.008	0.008	0.001	0.006	0.046	0.006	0.005	0.005	0.005	0.005	0.01
Zinc	0.60	0.37	0.47	0.29	0.24	0.44	3.29	0.31	0.54	0.35	0.15	0.38	0.62
Sample Date	Jan.2/19	Feb.6/19	Mar.6/19	Apr.3/19	May.1/19	Jun.5/19	Jul.3/19	Aug.7/19	Sep.4/19	Oct./9/19	Nov.6/19	Dec.4/19	



2019 Falconbridge Wastewater Treatment Plant Performance

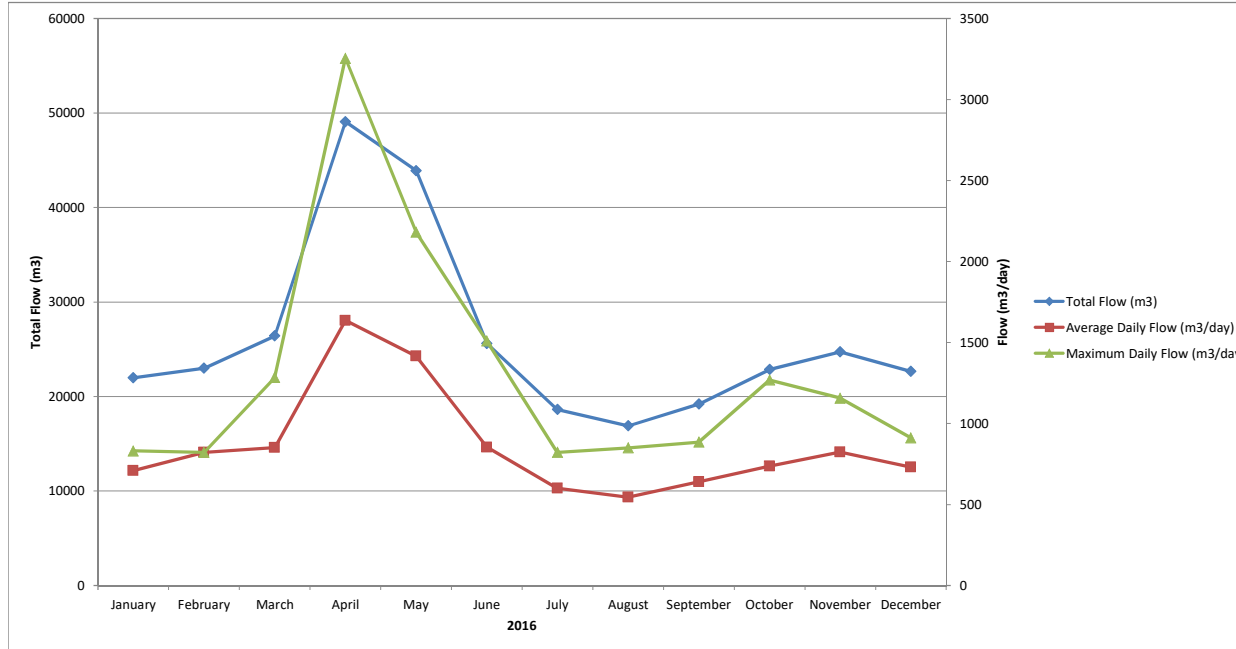
Month	Flows			BOD ₅				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized	TKN	Nitrite	Nitrate	pH		E.Coli
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Ammonia µg/L	Effluent mg/L	Effluent mg/L	Effluent mg/L	Raw	Effluent	Average # Col./100mL
January	5656	182	166	230	1.3	0.24	99.4%	99	3.4	0.62	85.0%	9.8	0.03	0.01	99.7%	48.40	0.04	0.01	99.9%	0.003	0.30	0.01	0.54	7.3	7.0	5
February	4470	160	176	160	1.9	0.30	98.8%	138	2.8	0.45	87.2%	7.5	0.04	0.01	99.5%	37.90	0.17	0.03	99.6%	0.22	0.50	0.08	0.20	7.2	7.0	38
March	5972	193	309	176	1.4	0.27	99.2%	116	4.3	0.83	78.8%	7.0	0.03	0.01	99.6%	35.60	0.15	0.03	99.6%	0.16	0.70	0.50	0.50	8.7	7.0	204
April	6293	210	347	20	20.0	4.20	0.0%	117	4.5	0.94	#DIV/0!	4.0	0.04	0.01	99.0%	5.59	0.62	0.13	88.9%	2.50	0.40	0.50	0.50	7.8	7.1	400
May	5517	178	210	220	1.6	0.28	99.3%	115	3.0	0.53	88.1%	8.7	0.03	0.01	99.7%	46.30	0.10	0.02	99.8%	0.27	2.50	0.50	0.50	7.5	6.9	350
June	7341	245	420	173	1.8	0.44	99.0%	102	3.3	0.81	81.1%	6.2	0.03	0.01	99.5%	37.80	0.07	0.02	99.8%	0.24	0.90	0.50	0.50	7.2	6.9	260
July	9516	307	420	195	1.3	0.40	99.3%	156	3.4	1.04	88.7%	6.4	0.02	0.01	99.7%	38.80	0.04	0.01	99.9%	0.29	0.09	0.05	0.05	7.1	6.9	184
August	9663	312	376	200	1.9	0.59	FALSE	163	2.8	0.87	91.3%	5.5	2.89	0.90	47.5%	30.50	0.11	0.03	99.6%	0.57	0.20	0.50	0.50	7.2	6.8	16
September	10170	339	383	190	1.7	0.58	99.1%	149	4.8	1.63	82.9%	5.8	0.02	0.01	99.7%	37.90	0.15	0.05	99.6%	0.28	0.40	5.14	0.05	7.0	6.8	112
October	10310	333	484	240	1.5	0.50	99.4%	91	4.7	1.56	78.3%	7.1	0.03	0.01	99.6%	36.30	0.07	0.02	99.8%	0.14	0.60	0.50	0.50	7.1	6.9	122
November	8009	267	315	190	1.7	0.45	99.1%	70	3.3	0.88	75.0%	6.3	0.02	0.00	99.7%	41.40	0.21	0.06	99.5%	0.47	0.30	0.05	0.33	7.4	7.2	354
December	8470	273	323	240	3.2	0.87	98.7%	71	2.4	0.66	85.7%	6.0	0.05	0.01	99.2%	37.60	0.36	0.10	99.0%	0.38	1.70	0.05	0.19	7.3	7	1140
Total	91388.1						98.4%				83.2%				95.0%				99.5%							
Average		250		186	3.28	0.76	98.4%	116	3.56	0.90	83.2%	6.68	0.27	0.08	95.0%	36.17	0.17	0.04	98.8%	0.46	0.72	0.70	0.36	7.40	6.96	265





2019 Levack Wastewater Treatment Plant Performance

Month	Flows			CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized	TKN		Nitrite	Nitrate	pH		Alkalinity		Sludge			Chlorine		E.Coli
	Total	Avg Day	Max Day	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Ammonia	Raw	Effluent	Effluent	Effluent	Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Residual	Geomean	
	m ³	m ³ /d	m ³ /d	mg/L	mg/L	kg/d		mg/L	mg/L	kg/d		mg/L	mg/L	kg/d		mg/L	mg/L	kg/d		µg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	Hauled	%	m ³	Kg	mg/L	±Col
January	21968	709	830	180	3.4	2.41	98.1%	161	5.5	3.90	96.6%	3.3	0.36	0.26	89.1%	30.70	1.77	1.25	94.2%	1.42	29.1	1.80	0.67	22.10	7.1	6.7	188	58	200	1.2	2.4	28.9	1.30	0
February	22987	821	821	150	3.1	2.54	97.9%	191	6.9	5.66	96.4%	4.0	0.47	0.39	88.3%	25.20	12.20	10.02	51.6%	25.19	32.3	13.20	0.08	10.70	7.3	7.1	193	143	160	2.0	3.2	17.1	0.77	5
March	26399	852	1283	157	4.1	3.49	97.4%	213	5.4	4.60	97.5%	5.5	0.46	0.39	91.6%	26.30	17.30	14.73	34.2%	21.82	26.9	17.40	0.05	5.85	7.4	7.0	167	131	160	1.3	2.1	15.2	0.61	2
April	49076	1636	3254	191	0.8	1.31	99.6%	182	3.4	5.56	98.1%	3.5	0.41	0.67	88.3%	22.50	8.87	14.51	60.6%	13.95	21.2	10.20	0.05	5.26	7.1	6.8	123	104	200	1.4	2.8	39.2	0.55	4
May	43891	1416	2180	82	2.7	3.82	96.7%	103	5.3	7.50	94.9%	2.6	0.41	0.58	84.2%	11.30	0.15	0.21	98.7%	0.07	14.7	0.20	0.05	12.30	7.0	6.7	99	53	160	1.8	2.9	48.3	0.67	10
June	25610	854	1508	80	2.5	2.13	96.9%	223	4.7	4.01	97.9%	2.5	0.38	0.32	84.8%	15.30	11.00	9.39	28.1%	25.33	19.4	10.40	0.05	5.10	7.0	6.9	100	65	160	1.9	3.0	28.7	0.58	23
July	18617	601	822	172	1.8	1.08	99.0%	233	5.5	3.30	97.6%	3.9	0.67	0.40	82.8%	21.10	0.09	0.05	99.6%	0.09	28.0	0.20	0.05	21.00	7.1	6.5	148	43	200	1.9	3.8	52.2	0.51	16
August	16880	545	849	140	2.9	1.58	97.9%	231	5.3	2.89	97.7%	3.7	0.46	0.25	87.6%	28.50	0.13	0.07	99.5%	0.26	39.5	0.20	0.05	19.80	7.1	6.5	158	55	160	2.3	3.7	59.2	0.71	3
September	19185	640	885	160	3.7	2.37	97.7%	231	7.4	4.73	96.8%	3.3	0.39	0.25	88.2%	22.20	0.20	0.13	99.1%	0.29	31.3	0.20	4.73	24.10	7.2	6.6	157	51	160	0.4	0.6	52.0	0.52	3
October	22846	737	1268	180	2.1	1.55	98.8%	221	6.1	4.50	97.2%	3.7	0.37	0.27	90.0%	34.60	0.09	0.07	99.7%	0.18	36.8	0.20	0.05	22.00	7.0	6.6	160	45	200	1.6	3.2	64.4	0.63	4
November	24715	824	1156	140	3.1	2.55	97.8%	249	10.1	8.32	95.9%	4.7	0.55	0.45	88.3%	19.00	0.40	0.33	97.9%	0.57	23.6	0.20	0.05	18.20	7.4	6.7	156	55	120	1.8	2.2	39.8	0.70	2
December	22644	730	911	50	4.4	3.21	91.2%	179	8.2	5.99	95.4%	3.5	0.41	0.30	88.2%	21.40	10.20	7.45	52.3%	14.49	22.2	8.80	0.05	10.40	7.1	6.8	149	58	200	2.7	5.4	26.9	0.70	5
Total	314817.81						98.1%				96.9%				87.9%				74.7%										2080		35.3			
Average		863		140	2.88	2.34	98.1%	201	6.15	5.08	96.9%	3.68	0.45	0.38	87.9%	23.18	5.20	4.85	74.7%	8.64	27.08	5.25	0.49	14.73	7.15	6.74	150	72		1.69		0.69	6	



Plant Type: Extended Aeration

Design Capacity: 2270 m³/day

Population Served: 2,320

Compliance Parameters:

	Conc.	Loading	
CBOD	25 mg/L	56.75 kg/day	Annual Average
TSS	25 mg/L	56.75 kg/day	Annual Average
Total Phosphorus	1.0 mg/L	3.1 kg/day	Monthly Average
pH	6.0 to 9.5 inclusive, at all times		
E.Coli	200 col/100 mL		Monthly Geometric Mean



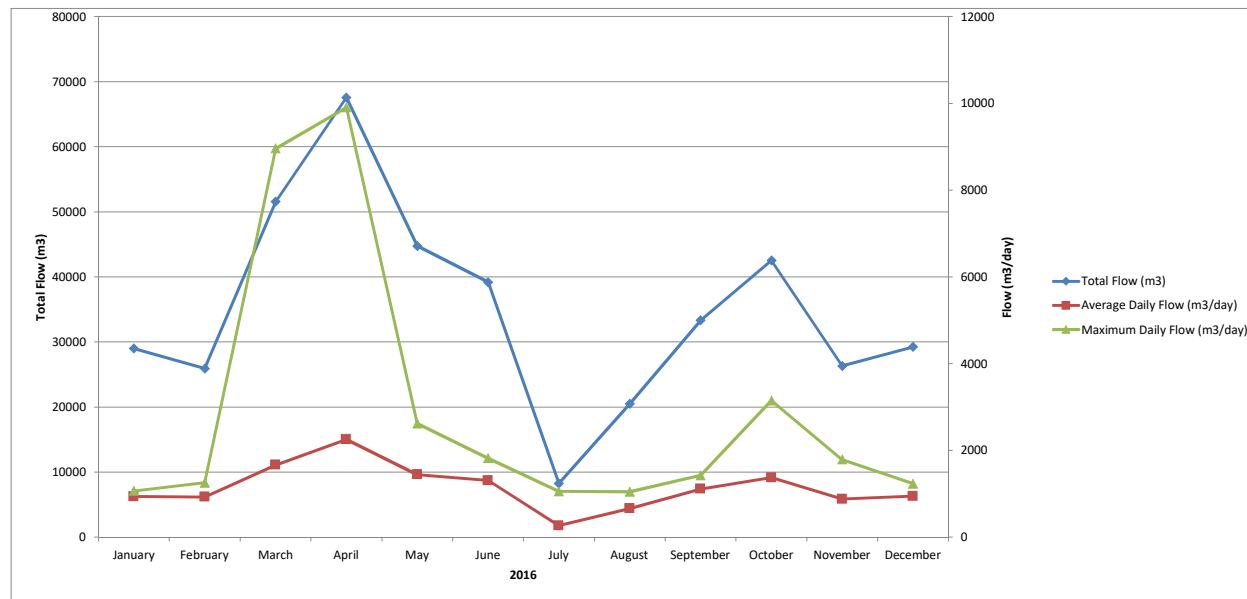
2019 Levack Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	32.2	94.9	19.1	135	40.2	3.29	20.1	27.3	4.9	0.22	0.31	5.4	31.9
Nitrate (as N)	0.02	0.20	4.99	0.50	0.50	0.50	0.50	7.80	0.15	20.50	19.30	1.08	4.67
Nitrite (as N)	0.735	0.08	0.97	0.5	0.5	0.5	2.7	0.5	5.05	0.05	0.05	0.05	0.97
Potassium	92	98	11	61	54	13	44	31	21	16	11	19	39.3
TKN	1240	1190	20	773	874	84.9	1070	1130	147	61.6	11.3	139	561.7
Total Phosphorus	383	362	1.9	306	284	187	335	195	52.4	28.2	4.43	271	200.8
Total Solids	16800	15700	580	17200	12200	3200	15700	14500	3130	1540	690	3480	8727
Arsenic	0.02	0.03	0.01	0.03	0.03	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.0192
Cadmium	0.0125	0.0206	0.0002	0.0087	0.0145	0.0260	0.0165	0.0180	0.0030	0.0009	0.0005	0.0002	0.0101
Chromium	0.19	0.25	0.01	0.25	0.22	0.15	0.20	0.25	0.04	0.02	0.01	0.01	0.1333
Cobalt	0.075	0.105	0.002	0.113	0.157	0.251	0.106	0.139	0.032	0.012	0.005	0.001	0.0832
Copper	6.8	10.2	0.08	5.5	7.4	5.3	8.4	8.9	1.9	0.54	0.19	0.01	4.60
Lead	0.371	0.561	0.005	0.325	0.392	0.579	0.480	0.556	0.106	0.027	0.007	0.001	0.2842
Mercury	0.008	0.015	0.001	0.001	0.004	0.005	0.009	0.008	0.001	0.001	0.001	0.001	0.0046
Molybdenum	0.04	0.05	0.01	0.02	0.03	0.01	0.04	0.05	0.01	0.01	0.01	0.01	0.0242
Nickel	1.60	2.40	0.07	1.50	2.70	2.90	2.10	2.30	0.48	0.16	0.10	0.01	1.36
Selenium	0.022	0.033	0.005	0.022	0.028	0.014	0.033	0.039	0.005	0.005	0.005	0.005	0.0180
Zinc	5.09	7.80	0.07	4.39	4.91	10.50	6.24	7.11	1.60	0.40	0.11	0.01	4.02
Sample Date	Jan.2/19	Feb.6/19	Mar.6/19	Apr.3/19	May.1/19	Jun.5/19	Jul.3/19	Aug.7/19	Sep.4/19	Oct.9/19	Nov.6/19	Dec.4/19	



2019 Lively Wastewater Treatment Plant Performance

Month	Flows				BOD ₅				CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized	TKN		Nitrite	Nitrate	pH		Alkalinity		Sludge		Chlorine		E.Coli	
	Total	Avg Day	Max Day	Diverted	Raw	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Ammonia	Raw	Effluent		Effluent	Effluent			Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Residual		
	m ³	m ³ /d	m ³ /d	m ³	mg/L	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	µg/L	mg/L	mg/L	mg/L	mg/L	Raw	Effluent	Raw	Effluent	Total m ³	Conc.	Total	Residual					
January	29000	935	1066	1427	170	170	4.4	4.12	97.4%	179	7.9	7.39	96.1%	5.4	0.43	0.40	93.0%	40.10	18.70	17.49	59.1%	31.36	39.1	15.50	0.37	3.09	7.2	7.0	195	95	200	2.0	4.0	53.4	1.80	17			
February	25912	925	1254	3346	170	130	4.3	3.98	96.7%	175	8.0	7.40	96.6%	4.1	0.45	0.42	91.9%	48.40	26.40	24.43	59.7%	18.58	49.8	26.90	0.01	0.14	7.1	6.9	234	120	120	1.8	2.2	38.6	0.71	48			
March	51560	1663	8960	3979	281	151	5.3	8.82	96.5%	149	32.4	53.89	96.0%	3.9	0.71	1.18	96.6%	32.60	27.70	46.07	84.2%	133.00	38.2	27.10	0.05	0.05	7.1	7.1	193	99	200	1.9	3.8	75.8	0.58	73			
April	67573	2252	9907	13514	200	191	4.9	11.04	97.4%	125	12.0	27.03	97.8%	2.7	0.39	0.88	96.7%	14.10	11.10	25.00	82.1%	14.01	25.2	11.20	0.05	1.81	7.0	6.9	89	66	40	1.0	0.4	104.3	0.97	262.5			
May	44751	1444	2619	14707	107	87	7.4	10.68	91.5%	148	18.9	27.28	93.0%	2.3	0.40	0.58	90.4%	13.00	11.90	17.18	49.5%	20.29	16.8	11.90	0.05	1.11	7.1	6.9	95	80	120	1.4	1.7	73.8	1.02	45			
June	39205	1307	1820	5737	129	36.9	3.6	4.70	90.2%	97	4.3	5.62	96.8%	2.5	0.23	0.30	93.4%	10.90	11.90	15.55	21.6%	18.56	16.5	10.90	1.07	6.28	6.9	6.7	118	50	80		0.0	93.8	0.69	5			
July	8269	267	1055	17913	75.6	55.4	0.9	0.24	98.4%	60	2.4	0.63	99.0%	2.6	0.10	0.03	99.0%	16.80	0.20	0.05	99.7%	0.002	21.2	0.20	0.50	13.70	7.0	6.9	142	45	40	4.6	1.8	20.1	1.03	2			
August	20492	661	1046	5848	170	120	0.5	0.33	99.6%	137	9.7	6.41	95.5%	4.3	0.48	0.32	92.9%	21.20	2.14	1.41	93.6%	5.97	32.1	1.90	0.41	20.00	7.1	6.6	167	45	80	2.9	2.3	74.5	0.57	12			
September	33308	1110	1423	566	100	62	3.9	4.33	93.7%	123	6.1	6.77	96.1%	3.5	0.32	0.36	92.9%	17.30	1.12	1.24	94.9%	0.87	19.1	0.50	3.14	18.70	7.1	6.6	144	48	40		0.0	148.5	0.57	82			
October	42519	1372	3150	2440	160	140	4.0	5.49	97.1%	130	9.0	12.34	97.0%	2.9	0.35	0.48	94.7%	16.80	0.38	0.52	99.0%	0.31	39.2	0.20	0.05	16.20	7.1	6.6	166	55	0		0.0	230.0	0.55	78			
November	26302	877	1790	11268	90	20	8.2	7.19	59.0%	94	18.0	15.79	90.6%	1.8	0.73	0.64	80.1%	8.00	8.60	7.54	47.3%	27.36	10.2	11.00	0.46	2.38	7.3	7.0	153	120	0		0.0	67.2	0.63	433			
December	29236	943	1231	1943	110	96	8.5	8.02	91.1%	97	17.9	16.87	85.9%	3.7	1.52	1.43	68.1%	21.10	20.40	19.24	25.9%	47.72	24.1	19.30	0.05	0.46	7.2	7.1	126	146	0		0.0	39.3	0.63	324			
Total	418127								95.7%				95.9%				93.8%				76.5%													969		15.6			
Average		1146			147	105	4.66	5.74	92.4%	126	12.21	15.62	95.0%	3.31	0.51	0.58	90.8%	21.69	11.71	14.6	68.1%	26.50	27.63	11.38	0.52	6.99	7.10	6.86	152	81		76.67			0.81	115			



Plant Type: Extended Aeration
Design Capacity: 1600 m³/day
Population Served: 2,761

Compliance Parameters:

	Conc.	Loading	
BOD ₅	25 mg/L	40 kg/day	*
TSS	25 mg/L	40 kg/day	*
Total Phosphorus	1.0 mg/L	1.6 kg/day	Monthly Average
E.Coli	200 col/100 mL		Monthly Geometric Mean

* Annual average of any consecutive 12 month period.



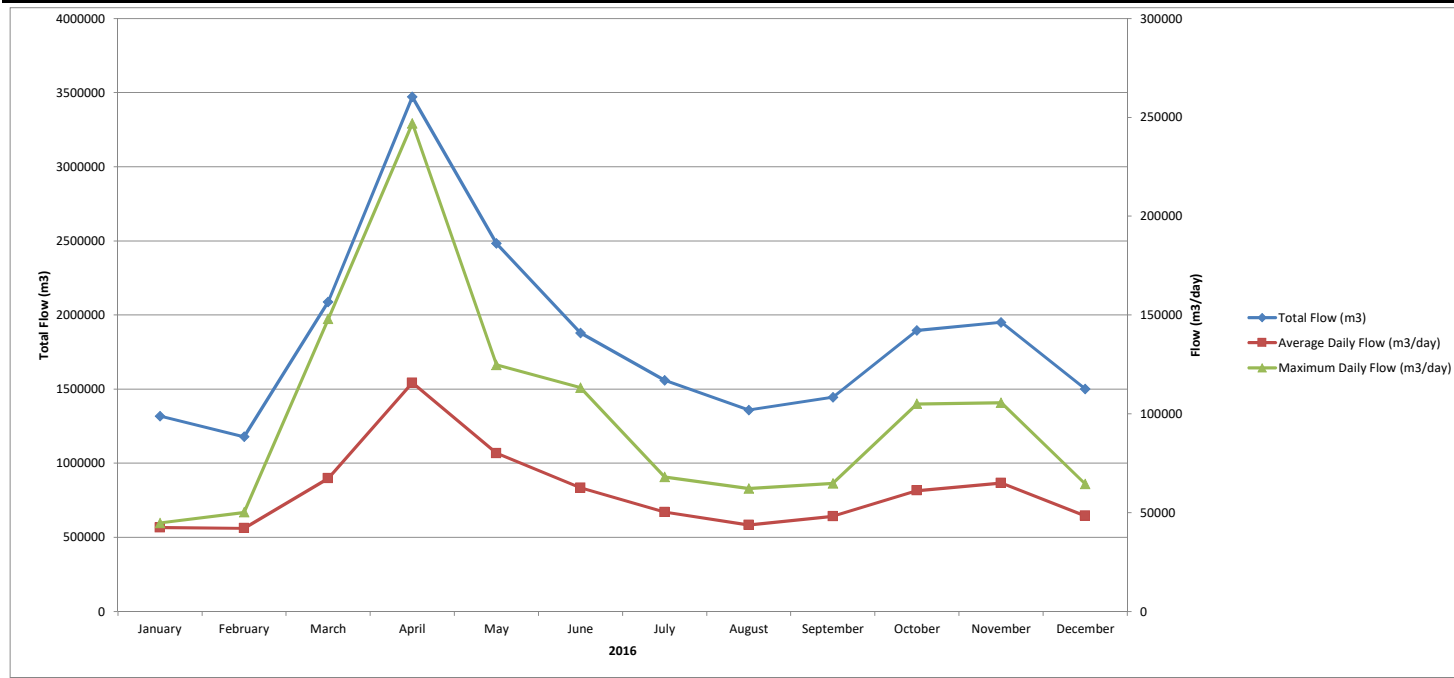
2019 Lively Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	140	32.9	27.2	33	14.2	12.8	40.7	10.8	4.6	57.2	n/a	n/a	37.3
Nitrate (as N)	0.02	0.2	0.5	0.5	0.5	0.5	0.5	1.8	0.5	22.7	n/a	n/a	2.77
Nitrite (as N)	0.925	0.08	0.5	0.5	0.5	0.5	0.5	0.5	2.8	5.3	n/a	n/a	1.21
Potassium	73	84	50	19	26	47	26	72	119	87	n/a	n/a	60.3
TKN	1570	1300	986	173	325	55.9	148	844	1390	2330	n/a	n/a	912.2
Total Phosphorus	564	547	325	59.8	396	361	141	522	23.2	589	n/a	n/a	352.8
Total Solids	24100	23400	14100	5520	15400	21300	15600	23800	23000	24100	n/a	n/a	19032
Arsenic	0.08	0.02	0.03	0.02	0.1	0.11	0.14	0.15	0.12	0.15	n/a	n/a	0.0920
Cadmium	0.245	0.000	0.013	0.006	0.033	0.042	0.048	0.060	0.033	0.052	n/a	n/a	0.0532
Chromium	0.26	0.03	0.13	0.07	0.33	0.33	0.47	0.57	0.43	0.54	n/a	n/a	0.3160
Cobalt	0.103	0.021	0.041	0.032	0.174	0.208	0.241	0.242	0.211	0.281	n/a	n/a	0.1554
Copper	10.6	0.01	4.7	2.3	8.9	9.3	15.1	20.2	14.1	18.4	n/a	n/a	10.36
Lead	0.452	0.005	0.154	0.078	0.310	0.353	0.543	0.853	0.562	0.783	n/a	n/a	0.4093
Mercury	0.009	0.001	0.001	0.001	0.004	0.004	0.014	0.028	0.008	0.021	n/a	n/a	0.0091
Molybdenum	0.06	0.01	0.02	0.01	0.03	0.03	0.01	0.09	0.07	0.09	n/a	n/a	0.0417
Nickel	1.90	0.21	0.73	0.63	3.70	3.20	3.70	3.90	2.60	4.30	n/a	n/a	2.49
Selenium	0.058	0.006	0.029	0.033	0.044	0.061	0.085	0.115	0.092	0.117	n/a	n/a	0.0640
Zinc	9.50	0.05	4.11	1.92	7.27	6.90	10.10	12.30	10.00	14.60	n/a	n/a	7.68
Sample Date	Jan.19/19	Feb.20/19	Mar.6/19	Apr.10/19	May.15/19	Jun.5/19	Jul.3/19	Aug.22/19	Sep.12/19	Oct.16/19			

November - no sludge/metals results
 plant shut down per Richard
 December - no sludge results per Richard

2019 Sudbury Wastewater Treatment Plant Performance

Month	Flows			BOD ₅ Raw mg/L	CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized Ammonia µg/L	TKN		Nitrite Effluent mg/L	Nitrate Effluent mg/L	pH		Alkalinity		Sludge		Chlorine		Dechlorination		E.Coli # col./100mL
	Total	Avg Day	Max Day		Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant		Raw	Effluent			Raw	Effluent	Raw	Effluent	Total	Conc.	Total	Residual	Total	Loading	
	m ³	m ³ /d	m ³ /d		mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency		mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L	m ³	%	Kg	mg/L	mg/L	
January	1317400	42497	44800	170	153	7.8	331.5	94.9%	223	16.2	688.4	92.7%	3.7	0.50	21.2	86.5%	20.70	17.22	731.8	16.8%	17.82	24.7	20.3	0.29	0.53	6.7	6.7	152	124		2.82	1805	1.40	0.00	0.00	15
February	1178400	42086	50200	153	142	15.4	648.1	89.2%	229	14.4	606.0	93.7%	3.3	0.57	24.0	82.7%	34.40	20.65	869.1	40.0%	35.51	22.8	18.4	0.31	0.45	7.0	6.9	146	122		2.74	1721	0.61	0.000	0.00	45
March	2088300	67365	148000	214	168	10.2	687.1	93.9%	204	16.5	1111.5	91.9%	3.1	0.59	39.7	81.0%	22.20	16.07	1082.5	27.6%	37.18	34.8	16.4	0.21	0.77	7.3	7.0	149	155			3052	0.68	0.000	0.00	13
April	3471800	115727	247000	158	113	4.8	555.5	95.8%	84	16.3	1886.3	80.6%	1.7	0.52	60.2	69.4%	7.10	6.49	751.1	8.6%	17.43	12.4	7.4	0.32	0.94	7.4	7.1	125	133	0	3.86	5097	0.69	0.000	0.00	12
May	2482500	80081	124800	97	63	4.7	376.4	92.5%	115	9.8	784.8	91.5%	2.0	0.35	28.0	82.5%	10.70	6.70	536.5	37.4%	20.61	12.5	7.0	0.16	1.43	7.6	7.1	131	147	0	3.41	2986	0.78	0.000	0.00	10
June	1878700	62623	113300	87	65	4.1	256.8	93.7%	158	10.3	645.0	93.5%	2.7	0.25	15.7	90.7%	11.40	11.10	695.1	2.6%	38.12	16.4	11.6	2.69	0.84	7.4	7.1	139	142		3.24	2691	0.85	0.000	0.00	3
July	1560100	50326	68100	121	107	3.8	191.2	96.4%	300	8.4	420.2	97.2%	3.3	0.25	12.6	92.4%	13.70	11.17	562.1	18.5%	61.78	19.3	11.6	3.15	1.51	7.4	7.2	137	142		2.60	1997	0.69	0.000	0.00	8
August	1359100	43842	62300	135	103	3.8	166.6	96.3%	186	10.9	477.9	94.1%	3.3	0.39	17.1	88.2%	17.00	14.35	629.1	15.6%	55.94	26.8	14.3	2.73	0.70	7.3	7.1	153	152		2.00	2083	0.85	0.000	0.00	9
September	1444700	48157	64800	135	130	3.7	178.2	97.2%	185	8.8	423.8	95.2%	3.3	0.27	13.0	91.8%	16.55	14.70	707.9	11.2%	35.90	42.6	15.4	2.41	1.01	7.0	6.9	142	143			1996	0.65	0.000	0.00	3
October	1896700	61184	105100	145	93	4.8	293.7	94.8%	172	9.1	556.8	94.7%	2.9	0.42	25.7	85.5%	8.10	10.21	624.7	-26.0%	35.26	18.8	10.1	1.70	1.24	7.1	6.9	139	159	0	5.34	2574	0.84	0.000	0.00	7
November	1950515	65017	105700	120	90	4.9	318.6	94.6%	154	11.0	715.2	92.9%	2.9	0.58	37.7	80.0%	13.50	11.59	753.5	14.1%	29.33	15.8	9.8	1.65	1.36	6.9	6.9	152	148	0		2732	0.77	0.000	0.00	14
December	1501212	48426	64500	140	123	4.5	217.9	96.3%	189	9.3	450.4	95.1%	3.3	0.48	23.2	85.5%	16.90	15.80	765.1	6.5%	38.46	20.4	16.0	0.63	0.43	7.1	6.9	185	151		3.27	2329	0.76	0.000	0.00	186
Total	22129427							94.7%				92.9%				84.3%				18.1%																
Average	60629				113	6.04	351.79	94.7%	183	11.75	730.53	92.8%	2.96	0.43	26.51	84.3%	16.02	13.00	725.72	0.14	35.28	22.27	13.18	1.35	0.93	7	7		143.13		3.25	2589	0.80	0.00	0.00	27



Plant Type: High Rate
Design Capacity: 79625 m³/day
Population Served: 84609

Compliance Parameters:

	Conc.	Loading	
CBOD	25 mg/L	1990.6 kg/day	Annual Avg
TSS	25 mg/L	1990.6 kg/day	Annual Avg
Total P	1.0 mg/L	79.6 kg/day	Monthly Avg (Oct.-May)
Total P	0.5 mg/L	39.8 kg/day	Monthly Avg (June-Sept.)
E.Coli	200 col/100 mL		Monthly Geometric Mean
pH	6.0 to 9.5 inclusive, at all times		
Dechlorination total chlorine residual	0.02 mg/L, 1.6 kg/L, Monthly Avera		



2019 Sudbury Wastewater Treatment Plant Waste Sludge Analysis

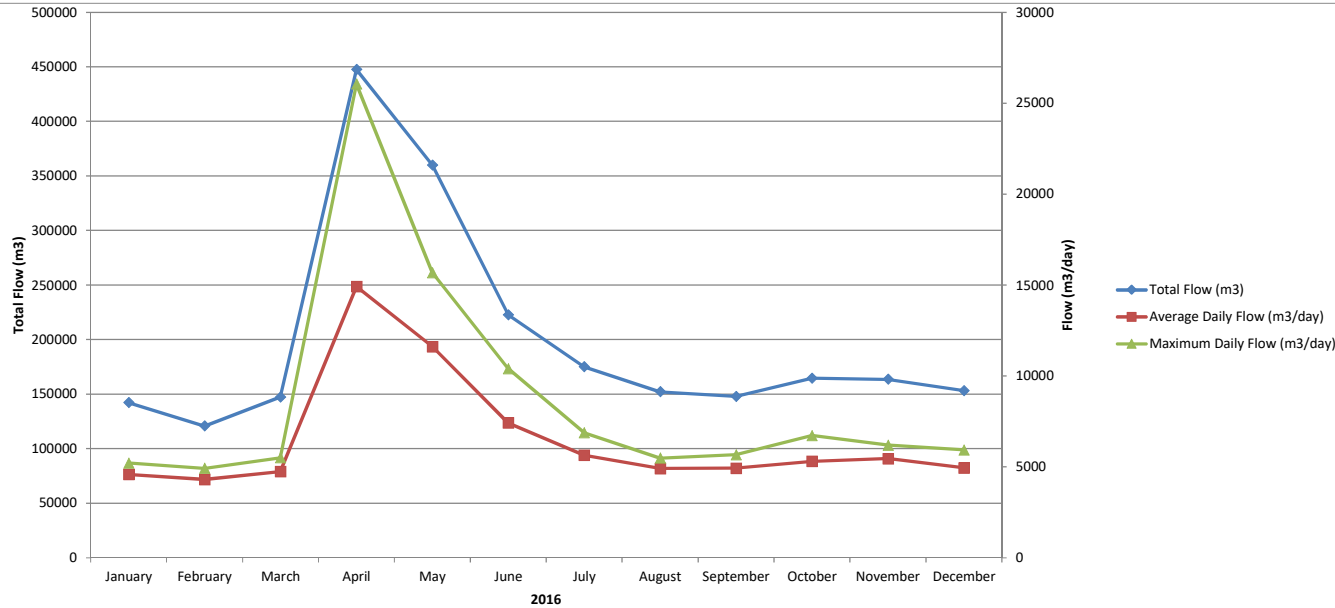
Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	290	220	350	23.8	314	549	406	469	369	217	591	323	343.5
Nitrate (as N)	0.2	0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.43
Nitrite (as N)	0.08	1.9	10.7	0.5	0.5	0.5	0.5	0.5	0.5	15.5	17.5	0.5	4.10
Potassium	102	104	151	94	100	101	78	84	77	118	126	68	100.3
TKN	1990	1670	2190	1430	2020	2290	835	2130	2160	2150	2350	2120	1945
Total Phosphorus	513	418	610	451	471	564	191	629	548	465	0.002	574	453
Total Solids	25500	21800	34200	27000	29700	30600	13500	28200	30800	27500	32700	31100	27717
Arsenic	0.11	0.13	0.14	0.22	0.27	0.24	0.07	0.11	0.20	0.33	0.28	0.17	0.1892
Cadmium	0.0305	0.0328	0.0308	0.0431	0.0441	0.0418	0.0106	0.0140	0.0400	0.03830	0.0407	0.0354	0.0335
Chromium	0.33	0.33	0.34	0.58	0.54	0.45	0.14	0.17	0.46	0.67	0.51	0.41	0.4108
Cobalt	0.3140	0.2250	0.2510	0.3510	0.3690	0.2740	0.0980	0.1690	0.3340	0.4910	0.4030	0.2430	0.2935
Copper	13	12.5	16.1	16	22.9	15.5	4.2	6.6	15.2	23.6	17.4	13.9	14.74
Lead	0.443	0.544	0.473	0.510	0.559	0.523	0.151	0.278	0.615	0.769	0.693	0.568	0.5105
Mercury	0.0070	0.0120	0.0010	0.0060	0.0060	0.0030	0.0020	0.0010	0.0060	0.0058	0.0090	0.0050	0.0053
Molybdenum	0.070	0.100	0.050	0.090	0.060	0.060	0.030	0.040	0.130	0.118	0.110	0.100	0.0798
Nickel	6.20	4.70	6.50	8.20	10.20	6.50	2.00	4.10	5.00	14.80	7.50	4.80	6.71
Selenium	0.061	0.074	0.058	0.062	0.075	0.088	0.032	0.045	0.076	0.124	0.106	0.087	0.0740
Zinc	8.70	8.80	11.50	10.30	10.20	8.80	3.37	5.05	13.30	17.70	13.00	10.40	10.09
Sample Date	Jan.2/19	Feb.4/19	Mar.4/19	Apr.1/19	May.6/19	Jun.3/19	Jul.2/19	Aug 6/19	Sep.3/19	Oct.7/19	Nov.4/19	Dec.2/19	

2019 Sudbury Wastewater Treatment Plant - Raw & Effluent Metals Analysis

Parameter (mg/L)	Location	January	February	March	April	May	June	July	August	September	October	November	December	Average
Arsenic	Raw	0.0100	0.0010	0.0100	0.0010	0.0020	0.0030	0.0010	0.0020	0.0010	0.0030	0.0010	0.0010	0.0030
	Effluent	0.0100	0.0010	0.0100	0.0010	0.0020	0.0020	0.0020	0.0010	0.0010	0.0020	0.0010	0.0010	0.0028
Cadmium	Raw	0.0010	0.0001	0.0010	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0003
	Effluent	0.0010	0.0001	0.0010	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003
Chromium	Raw	0.0100	0.0020	0.0100	0.0010	0.0020	0.0030	0.0010	0.0010	0.0010	0.0020	0.0010	0.0030	0.0031
	Effluent	0.0100	0.0010	0.0100	0.0010	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010	0.0010	0.0030	0.0028
Cobalt	Raw	0.0030	0.0028	0.0040	0.0051	0.0049	0.0042	0.0019	0.0032	0.0016	0.0031	0.0029	0.0025	0.0033
	Effluent	0.0020	0.0034	0.0040	0.0050	0.0042	0.0067	0.0029	0.0030	0.0011	0.0031	0.0025	0.0027	0.0034
Copper	Raw	0.0200	0.0250	0.0300	0.0320	0.0740	0.0710	0.0140	0.0550	0.0100	0.0940	0.0350	0.0200	0.0400
	Effluent	0.0100	0.0100	0.0100	0.0130	0.0140	0.0150	0.0310	0.0030	0.0050	0.0070	0.0160	0.0080	0.0118
Lead	Raw	0.0010	0.0016	0.0030	0.0006	0.0022	0.0018	0.0005	0.0017	0.0007	0.0032	0.0007	0.0002	0.0014
	Effluent	0.0010	0.0007	0.0010	0.0002	0.0002	0.0014	0.0001	0.0002	0.0001	0.0002	0.0002	0.0001	0.0005
Mercury	Raw	0.0010	0.0001	0.0010	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003
	Effluent	0.0010	0.0001	0.0010	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003
Molybdenum	Raw	0.0100	0.0010	0.0100	0.0020	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0026
	Effluent	0.0100	0.0020	0.0100	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0026
Nickel	Raw	0.0700	0.0850	0.1100	0.1300	0.1400	0.1280	0.0700	0.1050	0.0480	0.0960	0.0890	0.0860	0.0964
	Effluent	0.0700	0.0780	0.0800	0.1270	0.1150	0.1110	0.0100	0.0960	0.0450	0.0790	0.0800	0.0850	0.0813
Selenium	Raw	0.0050	0.0009	0.0050	0.0014	0.0011	0.0013	0.0012	0.0009	0.0008	0.0010	0.0011	0.0011	0.0017
	Effluent	0.0050	0.0005	0.0050	0.0013	0.0011	0.0010	0.0005	0.0009	0.0008	0.0011	0.0007	0.0011	0.0016
Zinc	Raw	0.0100	0.0600	0.1100	0.0310	0.0770	0.0666	0.0160	0.0580	0.0150	0.1250	0.0260	0.0130	0.0506
	Effluent	0.0200	0.0310	0.0300	0.0240	0.0270	0.0280	0.0010	0.0180	0.0100	0.0200	0.0170	0.0200	0.0205

2019 Valley East Wastewater Treatment Plant Performance

Month	Flows			BOD ₅		CBOD					Total Suspended Solids					Total Phosphorus					Total Ammonia					Un-ionized	TKN		Nitrite	Nitrate	pH		Alkalinity		Sludge			Chlorine		E.Coli
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Raw	Effluent	Loading	Plant	Ammonia µg/L	Raw	Effluent	Effluent	Effluent	Raw	Effluent	Raw	Effluent	Total m ³ Hauled	Conc. %	Total m ³	Total Kg	Residual mg/L	Geomean # Col./100mL		
				mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	kg/d	Efficiency	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
January	142178	4586	5209	130	140	7.3	33.48	94.8%	137	6.6	30.27	95.2%	2.4	0.61	2.80	74.6%	39.40	26.90	123.37	31.7%	86.4	32.3	26.4	1.10	5.60	7.4	7.2	227	148	0	2.1	0.0	211.9	1.50	12					
February	120743	4312	4917	230	180	7.5	32.34	95.8%	213	6.6	28.46	96.9%	1.9	0.66	2.85	65.3%	34.60	27.70	119.45	19.9%	85.5	38.7	28.1	0.83	1.83	7.4	7.2	180	214	0	0.0	0.0	126.0	0.64	15					
March	147200	4748	5500	142	96	11.6	55.08	87.9%	151	6.7	31.81	95.6%	2.3	0.62	2.94	73.0%	27.10	25.90	122.98	4.4%	51.4	27.6	25.1	1.50	2.70	7.3	7.0	220	180	0	1.3	0.0	147.2	0.66	14					
April	447527	14918	26060	105	95	8.8	131.27	90.7%	125	18.9	281.94	84.9%	4.3	0.70	10.44	83.7%	7.94	9.14	136.35	-15.1%	18.1	10.3	9.4	0.60	2.60	7.4	6.9	129	129	0	0.0	0.0	537.5	0.63	188					
May	359983	11612	15682	73	68	9.5	110.32	86.0%	83	8.4	97.54	89.9%	9.6	0.50	5.81	94.8%	14.40	10.66	123.79	26.0%	19.8	15.1	10.4	0.10	3.00	7.0	7.0	172	130	0	3.3	0.0	429.2	0.91	12					
June	222628	7421	10401	76	57	5.2	38.59	90.9%	102	7.7	57.14	92.5%	2.6	1.03	7.64	60.4%	18.40	12.91	95.80	29.8%	27.4	20.1	12.4	0.37	2.28	7.4	7.0	170	109	0	0.0	0.0	267.0	0.78	13					
July	174946	5643	6873	134	104	3.6	20.32	96.5%	246	6.4	36.12	97.4%	2.6	0.40	2.26	84.7%	20.90	17.30	97.63	17.2%	62.7	24.2	18.1	1.10	3.00	7.4	7.1	154	131	0	0.0	0.0	156.6	0.74	10					
August	152132	4907	5484	na	160	6.4	31.41	96.0%	160	9.0	44.17	94.4%	3.8	0.39	1.91	89.7%	27.20	15.10	74.10	44.5%	65.1	34.4	15.0	1.95	7.27	7.4	7.1	218	117	0	0.0	0.0	151.8	0.53	109					
September	147774	4926	5673	na	200	5.2	25.61	97.4%	206	8.0	39.41	96.1%	6.3	0.57	2.81	91.0%	30.00	7.44	36.65	75.2%	20.7	35.6	6.2	2.10	16.70	7.4	6.8	196	71	1160	2.7	31.3	248.1	0.60	123					
October	164594	5309	6724	160	160	4.2	22.30	97.4%	157	7.3	38.76	95.4%	3.4	0.82	4.35	76.0%	16.20	12.08	64.14	25.4%	44.8	31.0	11.8	0.49	8.24	7.5	7.0	184	119	1240	3.1	38.4	289.9	0.82	7					
November	163577	5453	6192	130	110	4.1	22.36	96.3%	161	4.5	24.54	97.2%	2.9	0.68	3.71	76.6%	17.30	19.88	108.40	-14.9%	59.0	19.0	18.0	1.81	2.67	7.4	7.1	182	162	840	3.4	28.6	249.6	0.83	3					
December	153211	4942	5934	150	120	5.0	24.71	95.8%	178	5.5	27.38	96.9%	4.0	0.91	4.50	77.0%	22.70	24.60	121.58	-8.4%	99.1	26.2	23.3	1.90	2.10	7.5	7.2	193	174	680	3.7	25.2	227.1	0.76	8					
Total	2396493							93.8%				93.7%				84.8%				22.1%											3920		123.5							
Average		6566			124	6.53	45.65	93.8%	160	7.97	61.46	94.3%	3.84	0.66	4.33	78.9%	23.01	17.47	102.0	0.2	53.33	26.21	17.01	1.15	4.83	7.38	7.05	185	140		2.45		253.49	0.78	43					



Plant Type: Extended Aeration
Design Capacity: 11,400 m³/day
Population Served: 17,365

Compliance Parameters:

	Conc.	Loading	
CBOD	25 mg/L	284 kg/day	Annual Average
TSS	25 mg/L	284 kg/day	Annual Average
Total Phosphorus	1.0 mg/L	11.4 kg/day	Monthly Average
pH	6.0 to 9.5 inclusive, at all times		Monthly Geometric Mean
E.Coli	200 col/100 mL		Monthly Geometric Mean

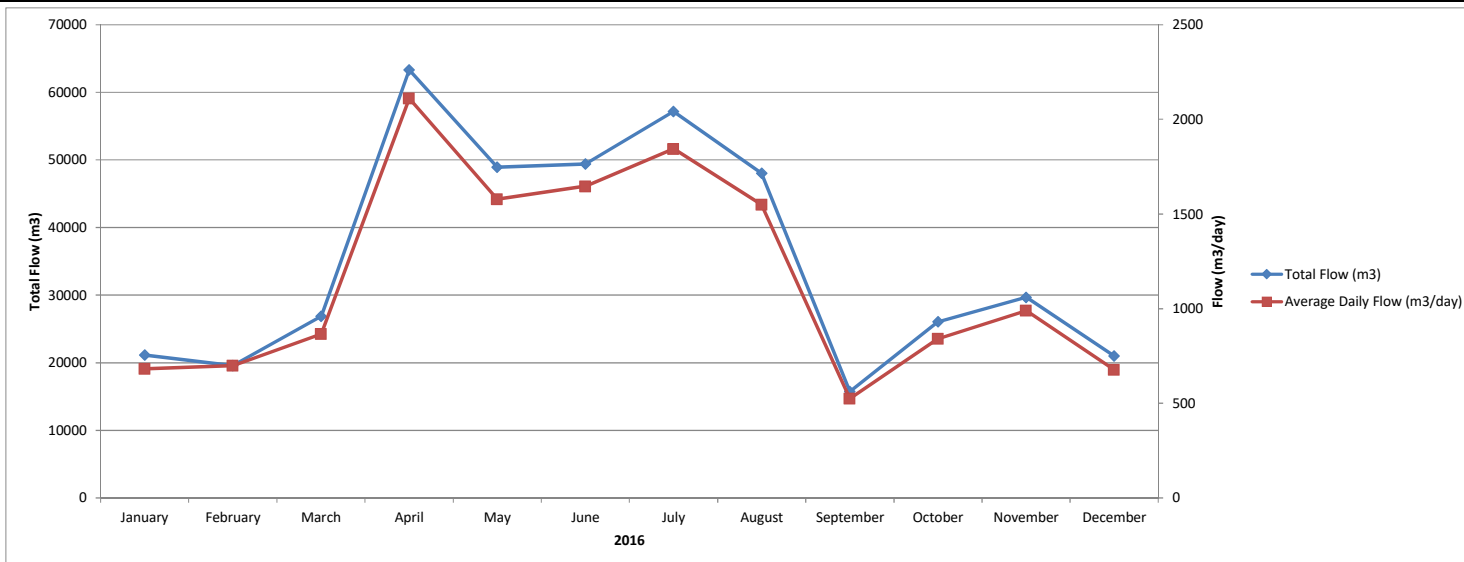


2019 Valley East Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	246	269	82.8	481	273	23.6	729	35.7	26.1	32.3	127	269	216.2
Nitrate (as N)	0.02	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.44
Nitrite (as N)	0.008	0.08	0.5	0.5	22.5	0.5	0.5	0.5	0.5	12.6	0.5	0.5	3.27
Potassium	67	51	63	54	93	96	42	62	63	71	84	91	69.8
TKN	1290	1510	445	2340	1770	2160	3140	1230	1410	1720	1960	1880	1737.9
Total Phosphorus	578	581	292	445	601	554	111	529	497	542	497	472	474.9
Total Solids	30100	21500	29100	12900	53400	64100	64100	31000	28700	30200	35600	39300	36667
Arsenic	0.08	0.11	0.02	0.19	0.13	0.13	0.11	0.1	0.09	0.11	0.11	0.09	0.1058
Cadmium	0.0122	0.0220	0.0090	0.0290	0.0270	0.0320	0.0250	0.0240	0.0190	0.0269	0.0235	0.0210	0.0226
Chromium	0.31	0.35	0.19	0.97	0.58	0.47	0.53	0.37	0.35	0.41	0.44	0.3700	0.4450
Cobalt	0.073	0.107	0.068	0.253	0.205	0.148	0.181	0.145	0.096	0.140	0.14	0.1360	0.1410
Copper	9.3	11.3	3.4	16.7	13	13.4	12.4	10.7	10.0	8.0	12.3	11.6	11.01
Lead	0.283	0.300	0.148	0.399	0.350	0.387	0.470	0.260	0.253	0.326	0.285	0.329	0.3158
Mercury	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.003	0.001	0.0018
Molybdenum	0.07	0.07	0.01	0.07	0.07	0.07	0.07	0.07	0.07	0.09	0.07	0.07	0.0667
Nickel	0.590	0.64	0.41	1.30	1.30	1.06	1.40	1.03	0.70	0.93	1.09	0.73	0.93
Selenium	0.04	0.06	0.01	0.09	0.05	0.04	0.05	0.05	0.02	0.06	0.055	0.047	0.0477
Zinc	10.60	12.20	6.95	15.60	13.00	12.90	15.60	10.30	10.90	8.30	13.20	10.8	11.70
Sample Date	Jan.9/19	Feb.6/19	Mar.20/19	Apr.10/19	May.15/19	Jun.12/19	Jul.3/19	Aug.21/19	Sep.4/19	Oct.9/19	Nov.6/19	Dec.23/19	

2019 Wahnapiatae Wastewater Treatment Lagoon Performance

Month	Flows		BOD ₅	CBOD						Total Suspended Solids						Total Phosphorus						Total Ammonia						Un-ionized	TKN	pH	H ₂ S	E.Coli
	Total	Avg Day	Raw	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Ammonia	Raw	Effluent	Pre-Discharge	Geomean
	m ³	m ³ /d	mg/L	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	µg/L	mg/L	mg/L	mg/L	# Col./100ml
January	21131	682	36	28						100						1.1			0.75										9.4			
February	19548	698																														
March	26846	866																														
April	63313	2110	81	51	13.9	29.34	108	78	72.7%	158	4.3	9.07	333	324	97.3%	4.2	0.06	0.13	8.86	8.80	99.3%	0.95	7.89	16.65	2.00	0.00	0.0%	11.06	4.3	6.9		596
May	48907	1578	81	51	2.6	4.10	80	76	94.9%	158	4.8	7.57	249	242	97.0%	4.2	0.04	0.06	7	7	99.4%	0.95	4.22	6.66	1.50	0.00	0.0%	28.72		7.4		14
June	49392	1646																														
July	57170	1844	156	121		0.00	223	223	100.0%	1900						39.3			72.48				28.70						33.6			
August	48023	1549																														
September	15722	524																														
October	26060	841	76	64	1.0	0.86	54	53	98.4%	73	1.1	0.93	61	60	98.5%	1.6	0.04	0.03	1.35	1.31	97.0%	25.70	0.18	0.15	21.60	21.42	99.2%		24.9	7.7		
November	29677	989	76	64	3.6	3.56	63	60	94.4%	73	18.8	18.60	72	54	74.2%	1.6	0.08	0.08	2	2	95.1%	25.70	0.40	0.40	25.42	25.02	98.4%	1.29		7.6		38
December	20973	677	76	64	10.2	6.90	43	36	84.1%	73	33.2	22.43	49	27	54.6%	1.6	0.21	0.14	1	1	80.6%	25.70	9.32	6.31	17.39	8.07	46.4%	8.87		7.1		129
Total	426762						572	527	92.2%				766	707	92.3%				93	19	20.6%				68	55	80.3%					
Average		1169	83		6.26	7.46	95	88	90.7%	362	12.43	11.72	153	141	84.3%	7.66	0.09	0.09	13.25	3.81	94.3%	17.95	4.40	6.03	13.58	10.90	0.49	12.49	18.1	7.34		194
Fall	245274	1330	104.3	78.67	1.81	1.65	119.1	117.5	90.95%	710.3	2.96	4.25	155.3	151.1	85.65%	15.03	0.04	0.05	26.82	26.77	99.8%	18.45	2.20	3.40	11.55	8.15	70.53%	28.72	29.25	7.55		14
Spring	181488	1004	67.25	51.75	9.23	13.27	71.41	58.15	90.93%	101.00	18.75	16.70	151.7	135.0	85.46%	2.13	0.12	0.11	3.07	2.95	96.3%	17.45	5.87	7.78	14.94	7.15	47.89%	7.07	6.85	7.20		254



Lagoon Type: Seasonal Retention
Design Capacity: 1,246 m³/day
Population Served: 1,136

Compliance Parameters:
Concentration
 CBOD Seasonal Average
 TSS Seasonal Average
 pH

Spring Discharge:
 Cell 2 & 3 - Pre discharge Apr 10, 2019
 Cell #3 Pre-Discharge sampled May 8/15.
 Cell #2 & 3 Discharge sampled Apr 17-24, 2019
 Total amount discharged approximately 181,488 m³.

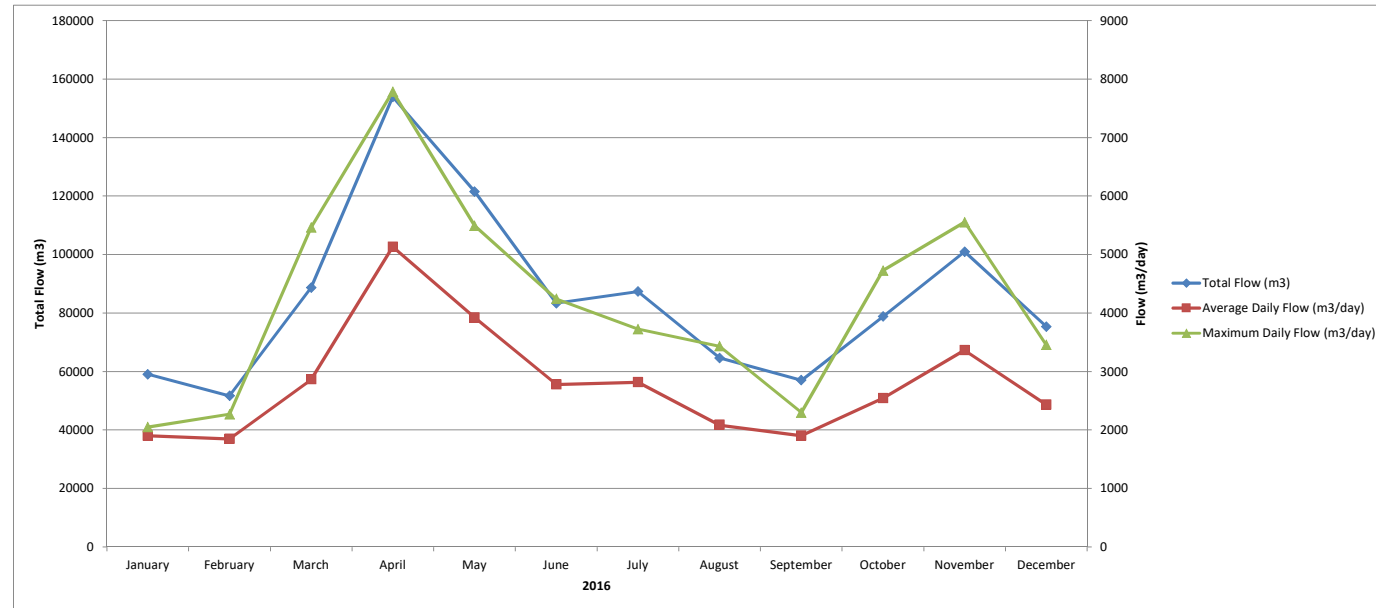
Fall Discharge:
 Cell 1 Pre-Discharge sampled November 22, 2019
 Cell #1 -Discharge sampled November 29, 2019
 Cell #2 & 3 - Discharge Nov 8-15, 2019
 Total amount discharged approximately 245,274 m³.

****Values used from previous raw samples to calculate plant performance for months when discharges occurred.**



2019 Walden Wastewater Treatment Plant Performance

Month	Flows			BOD ₅		CBOD						Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized	TKN		Nitrite	Nitrate	pH		Alkalinity		Sludge			Chlorine		E.Coli
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Raw mg/L	Effluent mg/L	Loading kg/d	Raw Loading kg/day	Removed kg/day	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Ammonia µg/L	Raw mg/L	Effluent mg/L	Effluent mg/L	Effluent mg/L	Raw	Effluent	Raw mg/L	Effluent mg/L	Total m ³ Hauled	Conc. %	Total m ³	Total Kg	Residual mg/L	Geomean # Col./100mL	
January	59024	1904	2051	100	71	2.3	4.38	135	131	96.8%	158	11.1	21.13	93.0%	2.4	0.19	0.36	92.1%	23.70	9.10	17.33	61.6%	5.76	22.10	7.80	0.45	9.19	7.2	6.7	161	72	360	2.2	7.9	86.1	1.50	114	
February	51672	1845	2270	200	150	1.7	3.14	277	274	98.9%	218	8.3	15.32	96.2%	3.6	0.20	0.37	94.4%	26.50	7.91	14.60	70.2%	12.17	32.40	5.60	0.08	11.80	7.0	6.8	193	53	0	1.9	0.0	71.0	0.54	86	
March	88744	2863	5463	284	138	13.6	38.93	395	356	90.1%	162	11.3	32.35	93.0%	2.9	0.28	0.80	90.3%	26.60	3.70	10.59	86.1%	3.89	28.60	5.00	0.50	14.70	7.1	6.6	115	67	80	8.6	6.9	95.5	0.62	12	
April	153930	5131	7784	24	30	0.5	2.57	154	151	98.3%	75	10.2	52.34	86.4%	1.8	0.34	1.74	81.1%	9.84	7.12	36.53	27.6%	28.58	10.80	6.90	0.50	0.50	7.2	6.9	118	88	240	3.6	8.6	194.9	0.65	39	
May	121568	3922	5493	165	110	2.1	8.24	431	423	98.1%	158	5.2	20.39	96.7%	3.1	0.28	1.10	91.0%	15.30	10.80	42.35	29.4%	20.23	18.90	9.10	0.05	2.46	7.3	7.1	121	106	280	2.2	6.2	125.3	0.67	10	
June	83325	2778	4241	133	130	0.8	2.22	361	359	99.4%	139	4.9	13.61	96.5%	3.0	0.35	0.97	88.3%	19.00	12.30	34.16	35.3%	36.49	26.00	11.60	0.84	3.74	7.5	7.1	141	131	200	2.7	5.4	97.7	0.64	5	
July	87353	2818	3726	175	153	2.4	6.76	431	424	98.4%	110	8.4	23.67	92.4%	3.6	0.53	1.49	85.2%	17.90	4.43	12.48	75.3%	26.11	26.60	6.10	3.33	6.64	7.5	7.1	180	142	400	1.4	5.6	107.3	0.61	63	
August	64666	2086	3432	230		0.5	1.04	0	-1	#DIV/0!	82	5.9	12.31	92.8%	3.7	0.49	1.02	86.8%	24.60	2.51	5.24	89.8%	5.13	31.60	3.60	0.05	1.38	7.4	6.5	216	87	640		0.0	139.8	0.63	37	
September	57048	1902	2298	77	70	2.2	4.18	133	129	96.9%	54	4.7	8.94	91.3%	3.2	0.33	0.63	89.7%	24.20	2.02	3.84	91.7%	3.05	23.70	1.00	3.88	13.40	7.5	6.9	197	108	280	2.3	6.4	142.7	0.64	18	
October	78813	2542	4724	190	190	2.7	6.86	483	476	98.6%	161	8.3	21.10	94.8%	3.0	0.46	1.17	84.7%	28.20	0.14	0.36	99.5%	0.18	32.70	0.20	0.50	16.80	7.7	6.7	198	89	200		0.0	197.3	0.60	21	
November	100939	3365	5552	86	110	1.6	5.38	370	365	98.5%	94	6.6	22.21	93.0%	2.7	0.56	1.88	79.3%	12.50	0.12	0.40	99.0%	0.01	16.05	1.05	0.05	11.35	7.0	6.5	172	66	120		0.0	233.0	0.64	50	
December	75397	2432	3454	180	170	1.8	4.38	413	409	98.9%	152	5.1	12.40	96.6%	4.7	0.53	1.29	88.7%	24.00	0.17	0.41	99.3%	0.12	30.10	1.70	0.05	13.10	6.8	6.6	179	71	160		0.0	132	0.64	13	
Total	1022479							3584	3496	97.5%				94.0%				87.3%				72.7%										2960		47.0				
Average		2801				2.68	7.34	299	291	#DIV/0!	130	7.50	21.31	93.6%	3.14	0.38	1.07	87.6%	21.03	5.03	14.9	72.1%	11.81	24.96	4.97	0.86	8.76	7.27	6.79	166	90		3.11			0.70	39	



Plant Type: Extended Aeration

Design Capacity: 4500 m³/day

Population Served: 3,313

Compliance Parameters:

	Conc.	Loading	
CBOD	25 mg/L	112.5 kg/day	Annual Average
TSS	25 mg/L	112.5 kg/day	Annual Average
Total Phosphorus	1.0 mg/L	4.5 kg/day	Monthly Average
E.Coli	200 col/100 mL		Monthly Geometric Mean



2019 Walden Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	12.1	41.9	15.5	28.5	22.1	35.2	27.1	8	22.5	11.8	n/a	13.2	21.6
Nitrate (as N)	0.55	0.2	0.5	5.4	0.5	4.3	3.7	2.9	0.5	12.1	n/a	0.05	2.79
Nitrite (as N)	0.36	0.08	4	6.5	6.2	23.8	6.1	6.1	2.5	13.7	n/a	0.05	6.31
Potassium	0.55	43	35	121	95	91	76	81	77	46	n/a	51	65.1
TKN	12	307	336	2130	1200	1690	1730	1260	1830	706	n/a	1130	1121.0
Total Phosphorus	10.3	184	111	403	323	437	386	413	399	258	n/a	312	294.2
Total Solids	1160	14400	8580	35300	23200	28600	24600	23100	21300	11700	n/a	15300	18840
Arsenic	0.01	0.05	0.04	0.22	0.18	0.14	0.14	0.12	0.13	0.08	n/a	0.08	0.1082
Cadmium	0.0002	0.0200	0.0150	0.0700	0.0678	0.0566	0.0530	0.0470	0.0383	0.0211	n/a	0.0200	0.0372
Chromium	0.01	0.18	0.14	0.82	0.62	0.54	0.51	0.47	0.45	0.21	n/a	0.25	0.3818
Cobalt	0.053	0.187	0.152	0.711	0.702	0.511	0.526	0.517	0.765	0.595	n/a	0.5940	0.4830
Copper	0.23	2.8	3.4	17.1	13.6	12.3	13.7	12.5	8.3	4.9	n/a	6.5	8.67
Lead	0.020	0.195	0.165	0.754	0.506	0.413	0.391	0.491	0.410	0.198	n/a	0.224	0.3425
Mercury	0.001	0.001	0.001	0.006	0.001	0.001	0.006	0.001	0.001	0.001	n/a	0.001	0.0019
Molybdenum	0.01	0.05	0.04	0.20	0.12	0.11	0.12	0.08	0.13	0.07	n/a	0.07	0.0909
Nickel	0.32	1.20	1.30	9.80	7.10	5.40	5.70	4.80	3.70	2.40	n/a	2.60	4.03
Selenium	0.005	0.048	0.038	0.179	0.147	0.120	0.119	0.115	0.122	0.062	n/a	0.071	0.0933
Zinc	0.39	3.69	2.82	14.40	9.60	8.90	12.20	12.20	9.50	6.19	n/a	5.93	7.80
Sample Date	Jan.9/19	Feb.11/19	Mar.6/19	Apr.2/19	May.13/19	Jun.6/19	Jul.3/19	Aug.8/19	Sep.23/19	Oct.16/19		Dec.6/19	

n/a per Richard - no samples taken