

2018 Annual Report

North Bay Wastewater Treatment System

Description of the Works

Wastewater Treatment Plant:

The original sewage plant was built in 1961-62 providing secondary treatment for 18,160 cubic meters/day. The plant was expanded in 1973 to a capacity of 36,320 cubic meters/day, and in 1984 the plant was expanded again to its present capacity of 54,500 cubic meters/day. Phosphorus removal was included in the 1984 expansion/upgrade. In order to protect spawning grounds, the plant operates a discontinuous chlorination program (period of operation is May 15th to October 15th).

The North Bay Wastewater Treatment Plant is a conventional activated sludge facility, using biological oxidation, anaerobic sludge digestion than centrifugation for sludge dewatering. The plant treats urban wastewater and discharges the processed effluent water into Lake Nipissing. The solid sludge material produced through primary settlement and the biological secondary treatment process "activated sludge process", is stabilized through anaerobic digestion which reduces its organic content and renders it non-putrescible. The anaerobically digested sludge is thickened by centrifugation with a polymer addition. Dewatered sludge with an approximate solids concentration of 19-24% is hauled from the Wastewater Treatment Plant and utilized at the Merrick Landfill Site as sections are closed and again used as a topping material.

The works consist of:

- A raw sewage pumping station with two (2) debris grinders and four variable speed raw sewage pumps, two(2) rated at 72,640 m³/d against 10.4 m TDH. Two (2) upgraded variable speed raw sewage pumps each rated at 95,904 m³/d against 10.9m TDH
- Two (2) vortex grit removal tanks with a total peak flow capacity of flow of 108,960 m³/d.
- Two (2) mechanically cleaned screen racks.
- Four (4) primary clarifiers each with surface area of 250.25 m² providing a total surface area of 1001 m² and two (2) large primary clarifiers each with a surface area of 613.7 m² providing a total surface area of 1227 m²; and
- Two (2) waste sludge pumps, one (1) with rated capacity of 18.9 L/s and one (1) with rated capacity of 22.5 L/s.

- Three (3) aeration tanks providing a total volume of 10,150 m³ with each tank equipped with fine bubble diffused aeration system, and Six (6) positive displacement lobe type blowers, each rated at 500 c.f.m. at a maximum of 14 p.s.i.;
- Four secondary clarifiers (#1-4) each with volume of 3,383m³ providing a total surface area of 1,340 m² and two (2) rectangular clarifiers (#5-6) each with surface area of 739 m² providing a total surface area of 1,478 m².
- One (1) constant speed waste activated sludge (WAS) pump for secondary clarifiers #1-4 having a rated capacity of 27.6 L/s at 24.7 m TDH.
- Two (2) return activated sludge (RAS) pumps with Variable frequency drives for secondary clarifier's #1-4, each having a rated capacity of 415 L/s.
- Five (5) RAS/WAS sludge pumps for secondary clarifiers #5-6, each having a rated capacity of 76 L/s at 9.1 m TDH.
- Two (2) chemical metering pumps for chemical addition for phosphorus removal, each having a rated capacity of 0 - 32 L/hr.
- A chlorine disinfection system consisting of two chlorine contact tanks, one providing a volume of 764 m³ and a second chlorine contact tank providing a total volume of 784 m³.
- A sludge digestion and storage system consisting of: one (1) anaerobic digester (primary digester) providing a digestion volume of 3,434 m³ and two (2) anaerobic digesters (secondary digesters), each having the volume of 2,060 m³ to provide a total digestion volume of 7,580 m³; and one (1) digested sludge holding tank having a volume of approximately 1,500 m³.
- One Bird Model 3700 dewatering centrifuge and one Andritz Model sludge dewatering centrifuge capable of dewatering sludge up to 680 kg/h of dry solids.
- Two industrial effluent wash water pumps (one duty and one standby) each rated at 3.5 L/s at 59.8 m TDH.
- One 500 kW diesel driven power generator set c/w one (1) 2,270 L double walled fuel tank provides partial emergency power to the raw sewage pumps and critical plant processes during power outages.
- Approximately 322 m of 1500 mm diameter discharge/outfall pipe discharging from an overflow chamber into Lake Nipissing.
- A dechlorinating system consisting of two chemical metering pumps each rated at 12.3 liters per hour, and three oxidation reduction potential (ORP) probes to monitor chlorine residuals.
- All other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works.

Registration of the Wastewater Works:

Municipal Location	City of North Bay
Works Number	110000533
Facility Classification	WWC Level II, Certificate #1447
	issued 21 September, 1990
	WWTP Level IV, Certificate #154
	issued 17 January, revised 2012
	upgraded to a class 4
Certificate of Approval	Certificate of Approval #7304-9KPKKK
Population Served	54,000 people

Wastewater Collection System Pumping Station Descriptions:

The Barber (Coreen/Wickstead) sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 125 KVA standby diesel gen set to provide emergency power. A small building on site houses the pump controls and the standby gen set.

The Booth Road sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 20 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 62.5 KVA standby gen set to provide emergency power. A small building on site houses the pump controls and the standby gen set.

The Chapais Street sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 3.5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 50 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Foran sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set must be used to provide emergency power when required. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Gertrude Road sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 15 HP, 240 Volt, 3 Phase, Flygt pumps. It is also equipped with a 32.5 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade dry well.

The Judge Street sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 20 HP, 575 Volt, 3 Phase, Flygt pumps. It is also equipped with a 75 KVA standby gen set to provide emergency power. A small building at this site houses the pump controls and the standby gen set.

The Lakeside pumping station Is a dry well/wet well type station without an overflow. It has two (2) 3.5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. This pumping station does not have a permanently installed standby gen set to provide emergency power. A mobile 32.5 KVA standby gen set stored at the Public works must be transported to the site and used to provide emergency power to this station when required. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade dry well.

The Lake Heights sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 29 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 62 KVA standby gen set to provide emergency power. A small building at this site houses the pump controls and the standby gen set.

The Marsh Drive sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, and Gorman Rupp above ground pumps. This pumping station is located at the Marsh Landfill site and collects the leachate and pumps it into the municipal sewage system. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set must be transported to the site and used to provide emergency power when required. A small building at this site houses the above ground pumps with suction piping extending into the wet well and pump controls.

The Marshall Sewage lift pumping station is a wet well type station without an overflow. It has (1) 75 HP, 575 Volt, 3 Phase, Crane Deming dry pit pump and (1) 85 Hp Flygt with capacity of 288L/s drywell submersible pump. It is also equipped with a 180 KVA standby gen set to provide emergency power. A building of significant size at this site houses the pump controls and the standby gen set in the above ground level of the building and also the dry well pumps in a below ground (basement) level. Access is provided via a

separate external door to a staircase which leads down to a screening unit for wastewater entering the stations wet well.

The Merlin Street sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 3.5 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 35 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Northgate sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 9.4 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 75 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Premier Road sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 2 HP, 575 Volt, 3 Phase, Allis Chalmers/Smith & Lovelace pumps. It is also equipped with a 35 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Tenth Street pumping station Is a wet well type station with an overflow. It has two (2) 5 HP, 600 Volt, 3 Phase, and Flygt submersible pump. (This station is operational in the summer months only) This station does not have a permanently installed standby gen set to provide emergency power. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Timmins/Gorman sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 7.5 HP, 230 Volt, 3 Phase, Flygt submersible pumps. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set/thawing stored by the city must be transported to the site and used to provide emergency power when required. A very small building at this site houses the pump controls for the pumps which are located in a sub grade dry well/wet well.

The Wallace Road sewage lift pumping station Is a factory built dry well/wet well station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, Allis Chalmers pumps. It is also equipped with a 41.25 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade dry well.

The Waterfront Storm Water pumping station located at Community Waterfront Friends Waterfront Park in the City of North Bay, designed for peak flow of 113L/s, consisting of a 3.81m x 3.81m precast concrete structure wet well equipped with two (2) 20HP, 600 Volt, 3 Phase, Flygt Model 3153.181 LT submersible pumps, one for duty and one for standby, each pump has a rated capacity of 110 L/s at a total dynamic head of 8.2m, complete with electrical and electronic control systems, float control systems, discharge piping, valves, and all other appurtenances necessary to have a complete and operable pumping station, discharging to the proposed 1200mm diameter storm sewer via the proposed 300mm diameter storm water force main.

Summary & Interpretation of Sampling and Monitoring Data:

The Certificate of Approval (C of A) #5207304-9KPXXX issued for the North Bay Wastewater Treatment Plant on July 31, 2014 requires the Owner to prepare and submit a performance report annually within (90) days following the period reported on.

The City of North Bay acts as the operating authority and operated the North Bay Wastewater Treatment Facility and the Wastewater Collection System in 2018. This Annual Wastewater System Report covers the period from 01 Jan 2018 to 31 December 2018.

Summary of Raw Sewage Sampling Data and Annual Flow Data

The sewage treatment plant has the *Rated Capacity* of 54,480 m³/day with a secondary treatment Peak Flow Rate of 108,960 m³/day. In 2018 the average daily raw sewage flow was 31,248 m³/day. Therefore the annual average day flow was within the design capacity, with the average day flow running at 57% of the wastewater systems rated design capacity.

The annual minimum daily raw sewage flow was 21,548 m³/day and occurred in August 2018. The maximum daily raw sewage flow was 86,560 m³/day and occurred in April 2018.

The total raw sewage flow for the year was 11,405,491 m³.

Raw Sewage Sampling Summary:

The operator collects a composite sample of raw sewage on a monthly basis sending it to Near North Laboratories in North Bay for analysis for BOD₅, Total Suspended Solids, TKN and Total Phosphorus as required by the ECA. The reported analysis results are forwarded to City of North Bay staff.

The average raw sewage BOD₅ concentration was 80.38 mg/L.

The average raw sewage Total Suspended Solids (TSS) concentration was 60.80 mg/L.

The average raw sewage Total Phosphorus (TP) concentration was 2.67 mg/L

The average raw sewage Total Kjeldahl Nitrogen (TKN) concentration was 27.95 mg/L.

See the accompanying North Bay WWTP 2018 Monthly Data Summary for complete raw wastewater flow and analyses data.

Treated Sewage Sampling Summary

The annual average treated sewage effluent CBOD₅ was 4.85 mg/L.

The annual average treated sewage effluent Total Suspended Solids (TSS) was 6.61mg/L.

The annual average treated sewage effluent Total Phosphorus (TP) was 0.43mg/L.

The annual average treated sewage effluent E. coli during the period of chlorination was 67.10 CFU/100 mL.

The Ann. Avg. treated sewage effluent Total Chlorine residual during the period of chlorination was 0.54 mg/L.

The annual average treated sewage effluent pH was 6.81

The annual average sewage effluent temperature was 14.0 degrees C

Effluent Chlorination and E Coli Levels:

The sewage treatment plant effluent is chlorinated using chlorine gas during the disinfection period of May 15 to October 15. In 2018 a total of 6673.51 kg of chlorine was used. The average dosage of Cl₂ applied in 2018 was 2.02 mg/L. The average chlorine residual in the effluent was 0.54 mg/L. The minimum and maximum E Coli levels measured in the effluent during the

period of chlorination were respectively 5 CFU/100ml and 650 CFU/100ml. The monthly geometric mean average for E Coli level in the effluent for 2018 was 39.22 CFU/100ml. The Monthly Geometric Mean Density Objectives of 150 counts/100 mL for E.coli *Effluent Limits* set in the ECA was achieved for all chlorination season of 2018.

Effluent Total Phosphorus Levels:

After primary treatment is completed the sewage ferric sulfate (iron salts) is added at the beginning of the secondary treatment process to reduce the Total Phosphorus level. The monthly averages for Total Phosphorus in the effluent ranged from 0.28 mg/L to 0.77 mg/L. The annual average Total Phosphorus level measured of the effluent was 0.43mg/L. Therefore the *Annual Average Effluent Objective of 0.8 mg/L*_set in the ECA was achieved in 2018.

See the accompanying North Bay 2018 Summary of Sewage Effluent Sampling Data and Annual Flow Data for complete wastewater effluent flow and analyses data.

ECA Effluent Compliance Limits and Operational Objectives

Please see table below which shows the ECA effluent compliance limits, operational objectives and North Bay Wastewater Treatment Plant Effluent results for 2018.

Effluent Parameter	Annual Average	Concentration	
	(mg/L unless otherwise indicated)		
	Compliance	Operational	2018
	Limit	Objective	Results
CBOD ₅	25	15	4.85
Total Suspended Solids (TSS)	25	15	6.61
Total Phosphorus (TP)	1	0.8	0.43
Total Ammonia Nitrogen	N/A	N/A	10.81
E. Coli * ¹	200 counts/100ml	150 counts/100ml	39.22
	(monthly Geometric	(Monthly Geometric	
	Mean Density)	Mean Density)	
Total Chlorine Residual* ¹	N/A	N/A	0.54
pH	6.0-9.5	6.5-8.5	6.81
Temperature	N/A	N/A	14

*¹ During the disinfection period between May 15 to October 15, every year.

Weekly samples are taken immediately to Near North Laboratories in North Bay for analysis. Should the samples not be processed for analysis immediately, they are refrigerated at 4° C until analysed in the laboratory.

The ECA Annual Average Concentration Effluent Limits of 25.0 mg/L for CBOD₅, 25.0 mg/L for Suspended Solids, 1.0 mg/L for Total Phosphorus were all met. Therefore, the plant was in compliance with the ECA. The pH of the effluent ranged between pH 5.87 to pH 8.18 and averaged pH 6.81. This met the ECA effluent limits except for one incident reading 5.87, pH was maintained between pH 6.0 to 9.5, inclusive at all times otherwise.

The ECA Effluent Objective concentrations of 15.0 mg/L for CBOD₅, 0.8 mg/L for Total Phosphorus, 15.0 mg/L for Suspended and were achieved. The pH Objective of maintaining between 6.5 – 8.5 was achieved most of the time through the year with exception of a small percentage of days.

The Monthly Geometric Mean Density of 150 counts/100 mL for E.coli Effluent Objective set in the ECA was achieved all chlorination months of 2018. The average monthly geometric mean for the sewage effluent E. Coli during the period of chlorination was 39.22 CFU/100 mL.

Summary of Effluent Quality Assurance or Control Measures Taken:

In 2018 as ongoing efforts to ensure optimal operation or the treatment process and best possible effluent quality the following measures were followed:

- Routine data reviews to identify trends or developing process problems
- In-house sampling in addition to regulatory sampling required by the ECA
- Routine maintenance on all equipment
- Process changes to optimize treatment effectiveness
- On-going training of operators
- Upgrading equipment where needed to increase effectiveness of plant

Operational Problems and Corrective Actions

- Occasional issues with our pH being below the objective of 6.5, we had old sludge some of these times which can cause a drop in pH. We had one adverse condition on July 24, 2018 with a pH of 5.87 due to failed equipment in secondary clarifier causing septic sludge conditions. Shut unit down and removed sludge, repaired and put back on line with no more problems.
- Acute lethality sample had failed in February 14 sample due to suspected high ammonia levels. Increase return rates and wasting to increase nitrification. Another acute lethality sample had failed June 13, 2018 due to sampling error, sample was taken from weir after chlorination before dechlorination. In both events followed up with mandatory 3 samples taken 2 weeks apart and all passed.

Tabulation of the Volume of Sludge Generated

Sludge that settles to the bottom of the primary clarifier tanks, referred to as primary sludge is drawn from the tanks and pumped to the primary digester for reduction through the primary and secondary sludge digestion processes. The digested sludge is then processed through centrifugation to thicken the sludge to reduce water content. Thickened sludge (19 to 23% solids) is then hauled away from the wastewater facility. The sludge is hauled to Merrick Landfill site and is then mixed with sand and used as a topping material to cover closed out sections of the landfill. The sludge blended with the sand is nutrient rich and promotes vegetative growth to cover the closed out sections of the landfills

In 2018 the volume of primary sludge produced was 75,461 m³. The total volume of digested sludge that was processed through dewatering after the digestion process was 35,583 m³. The total weight of dewatered sludge that was hauled away from the WWTP was 3,102,730 Kg which was taken to the Merrick Landfill site to be blended with sand and used for top cover which stimulates rapid vegetation growth.

Sludge was removed on a regular basis for the sewage effluent CBOD₅, Suspended Solids and total phosphorus to meet compliance criteria.

The total treated sewage effluent flow for the year 2018 was 11,405,491 m³ minus 3,102,730 Kg of sludge with an approximate 23 - 26 % solids concentration which was hauled away from the facility for disposal.

See the accompanying North Bay 2018 Summary of Sewage Sludge Volumes and Disposal Data for complete wastewater effluent flow and analyses data.

Summary of Plant Sewage By-passes or Abnormal Discharge Events

There were two secondary bypasses that occurred from the North Bay Wastewater Treatment Plant during the 2018 reporting period. The secondary by-passes were initiated by operations staff to avoid losing the biomass due to solids being flushed out of the aeration tanks and secondary clarifiers during high flow conditions. The events were reported to the Ministry of the Environment as required and samples were collected for analysis thorough out the events.

On April 25/26,2018 a secondary by-pass of the plant process occurred twice, once from 10:20 – 13:20 hrs on April 25th. It is estimated that 5,185 m³ of

primary treated sewage was released. Second occurrence took place between 14:20 on April 25th and 02:00 on April 26th, it is estimated 17,439m³ of primary treated sewage was released due to rain and snowmelt. The by-pass sewage was chlorinated before release, samples were collected during the event and sent to lab as required. MOE Spill Action Centre was notified with reference number #902182.

A secondary by-pass of the plant process occurred May 4/5th, 2018 between 16:25hrs May 4th and 03:05hrs May 5th. It is estimated that 5,813m³ of sewage was released due to heavy rain event. The by-pass sewage was chlorinated before release, samples were collected during the event and sent to the lab. MOE Spill Action Centre was notified with reference number #902223

There was two spills at the lift station and no bypasses in 2018:

1. On May 6th, 2018 there was a sewage over flow at Marsh Dr. Lift Station due to a blockage in the line, approximately 1.5 m³ of wastewater was released. Pumps were shut off to stop overflow, blockage cleared and pumps were put back on-line MOE SAC reference MOE SAC reference # 0174-AYMPEL
2. On September 4th, 2018 there was a sewage overflow at the Patton St. Lift Station releasing approximately 2.0m³ of sewage due to a blockage in the line, Used CL2 pucks to disinfect spill and called flusher truck to clear blockage. MOE SAC reference #4445-B4AHV7

Flow Measurement & Annual Calibration

The annual calibrations of the raw sewage flow meters were completed in November 2018. In addition other flow meters throughout the sewage treatment plant were calibrated at the same time.

Documentation and Reporting

An emergency SOP manual with procedures to deal with emergencies and complaints is kept updated and is stored for easy reference at the North Bay Wastewater Treatment Plant; along with SDS data sheets for the treatment chemicals. The Certificate of approval ECA for the facility is posted at the facility along with copies of the Facility Classification certificate. A copy of the wastewater treatment plant manual with process descriptions, procedures, checklists, treatment calculations and pertinent information for the operation of the facility is readily available for reference for the operators.

Plant logbooks, daily and monthly data record sheets are completed and retained as required by the ECA. Process treatment records and lab analysis

report data are entered into a spreadsheet. The annual report will be filed with the Ministry of the Environment as required by the ECA

Facility Maintenance

Certified electricians, SCADA technician, mechanics and operators, who operate the treatment facility and conduct maintenance of the appurtenances of the wastewater treatment system.

Summary of 2018 Major Maintenance Activities , Capital Upgrades or Equipment Replacement at the Facility:

- Chain replaced on Primary Clarifier #4 along with replacement of needed wear shoes on longitudinal flights.
- Mutple flights and shoes replaced on all Primary Clarifiers
- Ongoing air-sparge replacement in sewage channels
- MCC Upgrade and replacement engineering in Centrifuge building
- Installation of new gate valves on old chlorine contact tanks
- Chlorination equipments all serviced and lines replaced
- Replacement of VFD and Raw sewage pump #3 in head end
- Concrete repairs on old primary clarifiers and in tunnels
- P2 Building upgrade with new brick and filling of old grit channel
- One blower rebuilt for aeration process
- On- going work to Waste Gas burner and methane system to meet TSSA standards
- Replacement of 300m of 250mm sanitary main on Johnston Rd. to Ski- Club Rd.
- Installed 420m of 250mm sanitary forcemain on Gertrude St.
- Replacement of 6 air relief valves on the Marshall Forcemain
- Rebuilt both pumps at the Marshall Liftstation
- 1071m of 300mm diameter sanaitary sewer installed on College Dr. up through Laroque Rd.
- Replaced 207m of 250mm sanitary sewer on John St. between Second Ave. and Worthington St.
- Replaced 13m of 250mm sanitary sewer on Worthington St. from John St. north.
- Replaced 12m 250mm sanitary sewer on First Ave. from John St. north

Summary of Complaints Received and Steps Taken to Address Them:

There was three complaints in regards to the wastewater facility for the same incident which had taken place on April 23, 2018 due to a broken Primary Clarifier. The smell of the sludge was taken by the wind towards town generating these complaints. Incident was reported to MOE as required by the ECA and a crew had worked into overtime to clean and repair this tank, in which solved the odour problem.

Report prepared by

Jonathan Dewey, C-tech.

Operations Supervisor Water & Wastewater Facilities

6 March 2019

MONTHLY PROCESS DATA

Facility:	North Bay Waste Water Treatment Plant	Period:	January 1, 2018 to December 31, 2018
Classification:	Class 4 Treatment, Class 2 Wastewater Collection	Population:	54,000
Water Receiver:	Lake Nipissing	Total Design Capacity (m3/d):	54,540

	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Summary
Raw Sewage													
Volume (m3/d)													
Avg	29872.0	27762.3	29811.0	43671.0	41426.0	27795.0	23753.0	24890.0	30290.0	33877.0	33567.0	28256.6	31,248.00
Max	46619.0	38929.0	38895.0	86560.0	73444.0	37068.0	25755.0	34082.0	42669.0	41479.0	43790.0	34004.0	86,560.00
Min	25010.0	23439.0	26441.0	33705.0	31865.0	24297.0	21842.0	21548.0	25427.0	29091.0	28328.0	25375.0	21,548.00
Sum	926031.0	777344.0	924151.0	1310137.0	1284202.0	833838.0	736344.0	771588.0	908700.0	1050194.0	100708.0	875954.0	11,405,491.00
Peak Flow (m3/d)													
Max	111549.0	117499.0	112250.0	118112.0	109124.0	134957.0	71162.0	94287.0	105025.0	106287.0	105100.0	139724.0	139,724.00
BOD5													
Avg	97.4	81.3	94.1	67	38.6	61.4	96.1	71.8	179.3	67	48.8	61.7	80.38
Total Phosphorus (mg/L)													
Avg	3.2	1.74	1.77	1.97	1.81	2.47	4.12	2.42	6.98	2.16	1.5	1.92	2.67
TKN (mg/L0													
Avg	25.4	22.5	23.1	28	24.6	26.1	37	33.3	40.9	25.1	18.8	30.6	27.95
Suspended Solids (mg/L)													
Avg	63	46.4	60.5	425.7	25	29	54	48.8	213	31.3	57.9	58	60.8

MONTHLY PROCESS DATA													
Period: January 1, 2018 to December 31, 2018													
Facility: North Bay Waste Water Treatment Plant					Population Served: 54,000								
Classification: Class 4 Treatment, Class 2 Wastewater Collection					Total Design Capacity (m3/d): 54,540								
Water Receiver: Lake Nipissing													
	18-Jan	18-Feb	18-Mar	18-Apr	18-May	18-Jun	18-Jul	18-Aug	18-Sep	18-Oct	18-Nov	18-Dec	Summary
Sludge/Biosolids Handling													
Volume to Primary Digester (m3)													
Sum	7,091.00	6,813.00	5,221.00	8,031.00	9,999.00	9,379.00	6,637.00	5,712.00	3,294.00	4,219.00	3,864.00	5,201.00	75,461.00
Sludge (Liquid) Volume Processed (m3)													
Sum	3018	2641	3,038	2,671	3,351	3,147	3,642	4,042	3,365	3,580	1,768	1,320	35,583.00
Sludge (Thickened) Volume Hauled x 1,000 Kg													
Sum	281.09	184.79	300.92	289.41	246.17	240.2	185.77	291.27	219.47	491.66	231.09	140.89	3102.73
loads	19.00	16.00	20.00	14.00	18.00	16.00	17.00	24.00	15.00	29.00	16.00	11.00	

MONTHLY PROCESS DATA													
Facility: North Bay Waste Water Treatment Plant							Period: January 1, 2018 to December 31, 2018						
Classification: Class 4 Treatment, Class 2 Wastewater Collection							Population Served: 54,000						
Water Receiver: Lake Nipissing							Total Design Capacity (m3/d):			54,540			
	18-Jan	18-Feb	18-Mar	18-Apr	18-May	18-Jun	18-Jul	18-Aug	18-Sep	18-Oct	18-Nov	18-Dec	Summary
Final Effluent													
Temp Grab (oC)													
<i>Avg</i>	9.7	9.3	9.6	10.2	12.7	15.9	18.7	19.4	19.4	17.3	14.7	12.8	14
<i>Max</i>	11.3	11.2	10.9	12.6	15.2	18	20	21.1	21.5	19.4	16	15.4	21.5
<i>Min</i>	8.2	7.2	8.6	8.3	10.6	13.7	17.5	16.8	17.7	15.2	12.7	9.8	7.2
NH3: Ammonia as N (mg/L)													
<i>Avg</i>	15.8	19.85	22.75	15.8	13.2	16.63	4.18	4.11	3.92	3.23	7.27	5.38	10.81
CBOD5 (mg/L)													
<i>Avg</i>	5.06	3.8	3.03	3.3	2.9	4.8	4.3	4.82	5.65	5.08	9.38	4.83	4.85
PH													
<i>Avg</i>	6.83	6.87	6.75	6.81	6.77	6.62	6.79	6.9	6.82	6.95	6.8	6.83	6.81
<i>Max</i>	7.03	7.14	7.11	6.98	7.19	6.81	8.18	7.66	7.66	7.75	7.35	7.38	8.18
<i>Min</i>	6.62	6.46	6.19	6.52	6.18	6.51	5.87	6.37	6.54	6.63	6.56	6.56	5.87
Total Phosphorus (mg/L)													
<i>Avg</i>	0.45	0.45	0.36	0.32	0.28	0.29	0.65	0.48	0.78	0.42	0.29	0.43	0.43
TKN (mg/L)													
<i>Avg</i>	18.4	21.01	17.55	18.42	15.58	15.73	4.85	6.88	5.1	3.94	7.68	5.53	11.74
Suspended Solids (mg/L)													
<i>Avg</i>	10.36	6.13	5.25	4.38	5.9	3.43	3.2	5.7	12.3	9.02	7.28	5.65	6.61
E-coli (cfu/100 mL)													
<i>Geo Mean</i>					138.21	53.84	7.07	7.92	69.06	126.49			39.22
<i>Max</i>					220	600	10	50	650	320			650
<i>Min</i>					60	5	5	5	5	50			5
Chlorine used (kg)													
<i>Sum</i>					476.36	1004.37	1293.95	1385.12	1779.82	733.89			6673.51
Chlorine Dosage (mg/L)													
<i>Avg</i>					0.92	1.2	2.1	1.78	1.99	1.38			2.02
Total Chlorine Res. (mg/L)													
<i>Avg</i>					0.6	0.73	0.38	0.64	0.5	0.32			0.54