TORONTO Water

ASHBRIDGES BAY WASTEWATER TREATMENT PLANT

2019 Annual Report

March 31, 2020

EXECUTIVE SUMMARY

The Ashbridges Bay Treatment Plant (ABTP) is one of four wastewater treatment facilities operated by the City of Toronto. This facility, located at 9 Leslie Street, has a rated capacity of 818,000 m^3/day, or 818 ML/day, and serves an equivalent population of approximately 1,603,700. The Ashbridges Bay Treatment Plant discharges into Lake Ontario. In 2019, the plant operated under two Environmental Compliance Approval (ECA): ECA No. 1496-B2UHDE, which was issued on September 26, 2018; and ECA No. 1336-B6GM3S, issued on June 26, 2019.

The average daily flow rate in 2019 was 651.3 ML/day. Influent concentrations of Biochemical Oxygen Demand (BOD_5), Total Phosphorus (TP) and Total Suspended Solids (TSS) averaged 153.8 mg/L, 4.9 mg/L, and 207.8 mg/L, respectively.

Ashbridges Bay Treatment Plant achieved the following effluent quality and loading rates in 2019 in comparison to ECA limits:

Parameter	ECA[1]	2019 Final Effluent
Total Suspended Solids (TSS), mg/L	25	14.7
Carbonaceous Biological Oxygen Demand ($CBOD_5$), mg/L	25	7.3
Total Phosphorus (TP), mg/L	1.0	0.8
Escherichia Coli (E. Coli)[2], CFU/100mL	200	32
pH	6.0-9.5	7.1
TSS Loading Rate[1], kg/day	20,450	9336
$CBOD_5$ Loading Rate[1], kg/day	20,450	4668
TP Loading Rate[1], kg/day	818	487

[1] Referenced from ECA Sewage No. 1336-B6GM3S Schedule B and C.

[2] Arithmetic mean of monthly geometric mean data.

During 2019, the biosolids generated at Ashbridges Bay were managed through agricultural land application, soil amendment use, pelletization, and mine reclamation. The total amount of biosolids generated at the plant in 2019 was 154,656 wet tonnes at an average of 27.73 % total solids (TS). The biosolids generated met all the metal and *E. coli* concentration requirements set out in O.Reg 267/03.

Ferrous chloride consumption for phosphorus removal totalled 1,766 tonnes as Fe. Polymer consumption in 2019 for waste activated sludge (WAS) thickening and sludge dewatering totalled 212 and 639 tonnes, respectively. Total sodium hypochlorite (12% w/v) consumption for disinfection totalled 4,642 m^3.

There were 22 secondary treatment system bypass occurrences in 2019 where portions of the flow did not receive secondary treatment, but still received preliminary treatment, primary treatment, and nutrient removal before being disinfected and discharged into Lake Ontario. Total bypassed flows were estimated to be 4131 ML.

The plant continued with numerous capital projects. Notable projects included: construction of a new ultraviolet (UV) disinfection facility; design of a new influent pumping station; design of a new WAS thickening facility; design of a new plant outfall; construction of a new phosphorous removal facility; design of a dewatering polymer system; construction of P Building headworks upgrades; and construction of Digesters 9-12 upgrade. A variety of scheduled, preventative, predictive and reactive maintenance was performed, including annual calibration of effluent monitoring equipment.

Total annual consumption for potable water, hydro, and natural gas was 383,478m^3, 132 GWh, and 7.5 M scm, respectively. The plant direct operating costs for 2019 totalled $59.90 M. In 2019, the Ashbridges Bay Treatment Plant had a staffing compliment of 170 full time equivalent (FTE) employees. As of February 24, 2019, there were 23 health and safety incidents and 67.5 lost time days due to work related injuries in 2019.

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GLOSSARY OF ABREVIATIONS

AAC	Annual Average Concentration
BOD5	Five-Day Biochemical Oxygen Demand
CBOD5	Five-Day Carbonaceous Biochemical Oxygen Demand
CEU	Continuing Education Units
CFU	Colony Forming Units
DAF	Dissolved Air Flotation
E. coli	*Escherichia coli*
ECA	Environmental Compliance Approval
Fe	Iron
HTP	Humber Treatment Plant
HP	Horsepower
HRT	Hydraulic Retention Time
kg	Kilogram
kWh	Kilowatt-hour
MAC	Monthly Average Concentration
MGMD	Monthly Geometric Mean Concentration
MWh	Megawatt-hour
m3	Cubic metre
m3 /day	Cubic metre per day
mA	Milliamps
mg/L	Milligrams per litre
mL	Millilitre
ML	Million litres
MECP	Ministry of the Environment, Conservation and Parks
Q	Flow Rate
RAS	Return Activated Sludge
SBS	Sodium Bisulphite
SBS (P)	Sodium Bisulphite Presence
scm	Standard cubic metre
SS	Suspended Solids
TCR	Total Residual Chlorine
TP	Total Phosphorus
TS	Total Solids
TSS	Total Suspended Solids
TVS	Total Volatile Solids
TWAS	Thickened Waste Activated Sludge
µg/L	Micrograms per litre
WAS	Waste Activated Sludge

Definitions

Bypass: Means diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant 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.

Overflow: An overflow is defined as a discharge to the environment from the plant at a location other than the plant outfall downstream of the final effluent sampling station.

Spill: A spill is defined within the meaning of Part X of the Environmental Protection Act. "Spill", when used in reference to a pollutant, means a discharge,

a) into the natural environment,
b) from or out of a structure, vehicle or other container, and
c) that is abnormal in quality or quantity in light of the discharge.

Abnormal Discharge: A discharge of a pollutant designated by the regulations at a location designated by the regulations shall be deemed to be in a quantity or with a quality abnormal at the location. R.S.O. 1990, c. E.19, s. 91 (2).

$$Loading\ \left(\frac{kg}{day}\right) = Concentration\ \left(\frac{mg}{L}\right) \times Flow\ \left(\frac{ML}{day}\right)$$

$$Percent\ Removal\ (\%) = 1 - \frac{Concentration\ (Final)}{Concentration\ (Initial)}$$

$$Aeration\ Loading = \left(\frac{kg\ cBOD}{m^3\ aeration\ capacity}\right) = \frac{(Q_{Primary\ Effluent} + Q_{RAS}) \times [cBOD_{5_{primary\ effluent}}]}{V_{aeration\ Tanks}}$$

$$Solids\ Capture\ (\%) = \frac{Centrifuge\ Feed\ TS - Centrate\ TSS}{Centrifuge\ Feed\ TS} \times 100$$

1 INTRODUCTION

The Ashbridges Bay Treatment Plant (ABTP) is one of four wastewater treatment facilities operated by the City of Toronto under the responsibility of the Wastewater Treatment section of Toronto Water. The facility is located at 9 Leslie Street, in Toronto's east end and also includes two raw sewage pump stations located north of Lake Shore Boulevard at 1091 Eastern Avenue. The Ashbridges Bay Treatment Plant services a sewershed of approximately 25,000 ha and an estimated connected population of 1,603,700; bounded by Steeles Avenue on the north, the Humber sewershed on the west, the Highland Creek sewershed on the east, and the lakeshore on the south. The plant also provides production of biosolids for beneficial use, including the biosolids that are generated and transferred from the Humber and North Toronto Treatment Plants. The Ashbridges Bay Treatment Plant has a rated capacity of 818,000 m3/day, or 818 ML/day.

Major liquid treatment processes include screening and grit removal, primary treatment, secondary treatment, nutrient removal, and effluent disinfection. Treated effluent is discharged to Lake Ontario. Solids handling processes include waste activated sludge thickening, sludge stabilization by anaerobic digestion, dewatering using high speed centrifuges and biosolids management. Numerous auxiliary systems are required for proper operation of plant processes and include: potable water, process water (i.e. "plant water"), heating, ventilation and air conditioning (HVAC), SCADA, odour control, electrical power distribution, natural gas, chemicals, and instrument air.

The Ministry of the Environment, Conservation and Parks (MECP) has classified the Ashbridges Bay Treatment Plant as a Class IV wastewater treatment facility under Regulation 129/04. In 2019, the plant operated under two Environmental Compliance Approval (ECA): ECA No. 1496-B2UHDE, which was issued on September 26, 2018; and ECA No. 1336-B6GM3S, issued on June 26, 2019. This annual report complies with the reporting requirements stipulated in ECA Sewage No. 1336-B6GM3S.

This report is a summary of plant operations and performance in 2019. Highlights of the report include a discussion of effluent quality and summaries of process operations, maintenance, chemical and utility consumption, capital projects, operational costs and human resources.

2 PLANT PROCESS OVERVIEW

A description of the plant process is included below. A plant process flow diagram is available in Appendix A. Additional information on the plant's process can be found on the City of Toronto website[1].

2.1 Influent

The Ashbridges Bay Treatment Plant treats wastewater flows from the Mid-Toronto, High Level, Low Level, and Lakefront Interceptor Sewers, as well as the Queen Street and Coxwell Avenue Trunk Sewers. The Mid-Toronto Interceptor flows are pumped to the plant via the Pumping Station known as "T Building". The High Level and Low Level Interceptor Sewers, and the Queen Street Trunk Sewer flows are pumped to the plant via the Pumping Station known as '"M Building". The Lakefront Interceptor Sewer flows are pumped to the plant via the M Building or the T Building. The Coxwell Avenue Trunk Sewer flows come to the plant by gravity. Once wastewater enters the plant, it flows by gravity through the plant's processes.

Influent to the Ashbridges Bay Treatment Plant also includes sludge flows received from the Humber Treatment Plant and the North Toronto Treatment Plant via the Mid-Toronto Interceptor and Coxwell Sanitary Trunk Sewer, respectively.

2.2 Preliminary Treatment

Raw wastewater enters the Headworks (known as "P" and "D" Buildings) for grit and screenings removal. The P Building has six aerated grit channels and six mechanical screens. D Building has five mechanical screens and four aerated grit channels. The removed grit and screenings from P and D Buildings are hauled to a sanitary landfill site. Ferrous chloride is applied for nutrient removal (i.e. phosphorous removal) to the distribution conduits upstream of the aerated grit channels.

Throughout 2019, construction for the P Building Preliminary Treatment Upgrades continued, six new mechanical screens and three renovated aerated grit channels were handed over to plant staff and have been in operation since January 2019.

[1] https://www.toronto.ca/services-payments/water-environment/managing-sewage-in-toronto/wastewater-treatment-plants-and-reports/

2.3 Primary Treatment

Primary Treatment occurs in the Primary Clarification Tanks, where the flow velocity of the wastewater is reduced to allow heavier solids to settle to the bottom. There are 12 Primary Clarification Tanks. Sludge collectors in the tanks sweep the settled sludge, called primary or raw sludge, into sludge hoppers. Floating solids, called scum, are collected from the top of the water and swept into scum hoppers. The primary sludge and scum are then pumped out for further treatment and the wastewater, called primary effluent, continues onto secondary treatment.

2.4 Secondary Treatment

The primary effluent receives secondary treatment through a conventional, suspended biomass activated sludge process in the Aeration Tanks. The mixed liquor consists of primary effluent mixed with return activated sludge (RAS), which is removed from the Final Clarification Tanks and contains micro-organisms that naturally occur in wastewater and facilitate its degradation. In the presence of oxygen, these micro-organisms break down organic material in the wastewater. Air is supplied to the Aeration Tanks through 10 electrically driven blowers. There are a total of 11 Aeration Tanks that employ a step feed aeration process with four passes per tank. Aeration Tank No.1 and 3 – 9 are equipped with plastic disc coarse air bubble diffusers; Aeration Tank No. 10 and 11 are equipped with stainless steel coarse bubble diffusers; and Aeration Tank No. 2 is equipped with a mix of ceramic and membrane fine bubble diffusers.

The mixed liquor from the Aeration Tanks flows to 11 large Final Clarification Tanks, where the activated sludge is allowed to settle. A controlled quantity of this sludge is returned to the Aeration Tanks as RAS in order to maintain a sufficient biomass concentration. The excess is removed as waste activated sludge (WAS).

The plant has 10 Dissolved Air Flotation (DAF) Tanks to thicken WAS with the use of air and a thickening polymer, which is used as a coagulant. The plant also has the capacity to co-settle WAS from the Final Clarification Tanks in the Primary Clarification Tanks. At the DAF facility, incoming WAS first enters an inlet splitter box, dividing the inlet flow between the DAF tanks in operations. This splitter box also contains an overflow pipe which allows the excess WAS flow to return to the Aeration Tanks.

2.5 Final Effluent

Through operating and maintaining preliminary, primary, and secondary treatment processes, final effluent is treated to meet Schedule B of the ECA (No. 1336-B6GM3S). Sodium Hypochlorite is used to disinfect and kill pathogens in the final effluent.

The final effluent is discharged to Lake Ontario through an outfall pipe equipped with diffusers and extending approximately 1000 m into the lake from the shore. During periods of wet weather flows, the plant also has the capability of discharging final effluent through the seawall gates to prevent flooding.

2.6 Solids Handling

All primary sludge, thickened WAS (TWAS), co-settled WAS from the Primary Clarification Tanks, and scum from the Primary and Secondary Clarification Tanks, collectively called "sludge", is treated, handled and disposed of in a similar manner, consisting of anaerobic digestion, dewatering and then hauled or pelletized.

Anaerobic digestion is the biological degradation (stabilization) of organic materials in the absence of oxygen – it reduces volume of solids, destroys pathogens and mitigates sludge odour. The process produces digester gas, made up predominantly of methane. This gas is used as a supplementary fuel for plant needs, including process and space heating, thereby reducing the plant's operating costs and carbon footprint. The digesters are operated in the mesophilic temperature range (34 – 38^{o}C). The Digestion process at Ashbridges Bay Treatment Plant consists of 20 primary digesters.

The resulting anaerobically digested sludge, called "biosolids", is subsequently conditioned with a polymer and dewatered by centrifugation. Twelve solid bowl dewatering centrifuges are used to dewater the biosolids. The resulting biosolids "cake" is pumped either to the plant's Truck Loading Facility, or to the onsite pelletizer facility.

2.7 Solids Management

The dewatered biosolids are managed in a number of ways, including agricultural land application, third party process stabilization, pelletization, landfilling, and mine reclamation.

3 PROCESS SUMMARY

3.1 Process Parameters

In 2019, the Ashbridges Bay Treatment Plant continued to produce a high quality effluent. A summary of key secondary treatment effluent and final effluent parameters against the ECA objectives and limits are shown in Table 1. Influent and effluent performance charts are available in Appendix B. Historical performance data is included in Appendix C.

Table 1: Secondary Treatment and Final Effluent Parameters

Parameter	$cBOD_5$ [1] ,mg/L	TSS, mg/L	TP, mg/L	Total Residual Chlorine, mg/L	E-Coli, count/100mL	pH[2]	
						Min	Max
Secondary Effluent							
January	5.4	9.2	0.8	0.53	76	6.4	7.4
February	5.2	8.6	0.7	0.54	29	6.8	7.3
March	6.8	11.0	0.7	0.53	23	7.0	7.6
April	6.4	11.5	0.6	0.53	17	6.9	7.4
May	7.3	12.5	0.7	0.53	20	6.8	7.2
June	9.9	25.5	0.9	0.52	76	6.9	7.3
July	7.4	17.1	0.8	0.53	49	6.9	7.3
August	7.7	12.8	0.7	0.54	10	7.0	7.3
September	7.8	12.7	0.7	0.54	29	6.9	7.2
October	8.9	24.1	1.0	0.57	24	7.0	7.4
November	6.6	10.4	0.6	0.55	18	6.9	7.3
December	8.5	20.4	0.8	0.55	7	6.8	7.0
Annual Average Effluent Concentration	**7.3**	**14.7**	**0.8**	**0.54**	**32**	**7.1**	
Loading[3], kg/d	4668	9336	487	N/A	N/A	N/A	N/A
Removal Efficiency ,%	94%	93%	84%	N/A	N/A	N/A	N/A

[1] cBOD = 0.8 * BOD assumed for removal efficiency calculatons.

[2] Effluent pH in 2019 was within the required limit

[3] Loading is calculated based on the flow rates as provided in Table 2.

Table 1: Secondary Treatment and Final Effluent Parameters (continued)

ECA Requirements [4,5]						
Final Effluent Objective	AAC: 25.0 mg/L	AAC: 25.0 mg/L	MAC: 1.0 mg/L	N/A	N/A	6.5-8.5
Secondary Treatment Effluent Objective	AAC: 15.0 mg/L	AAC: 15.0 mg/L	MAC: 0.9 mg/L	N/A	MGMD: 200 CFU/100 mL	6.5-8.5
Secondary Treatment Effluent Limit	AAC: 25.0 mg/L	AAC: 25.0 mg/L	MAC: 1.0 mg/L	N/A	N/A	6.0-9.5
Average Waste Loading Limit[3]	AAL: 20,450 kg/d	AAL: 20,450 kg/d	AAL: 818 kg/d	N/A	N/A	N/A

[3] Loading is calculated based on the flow rates as provided in Table 2.
[4] Referenced from ECA Sewage 8047-ABZNY9 and Schedule B and C from ECA Sewage 1496-B2UHDE, issued on September 26, 2018.
[5] AAC refers to Annual Average Concentration, MAC refers to Monthly Average Concentration, MGMD refers to Monthly Geometric Mean Density, and AAL refers to Annual Average Daily Loading

Influent and Final effluent concentrations of eleven select heavy metals have been included in Appendix E. Any discharge into City sewers must meet the sewer use By-law limits. Final effluent concentrations are presented to assess the treatment plant's removal capacity.

A summary of the annual average of process parameters over the past three years is shown in *Table 2*.

Table 2: Process Parameters

Parameter	Units	2019	2018	2017
Influent Parameters				
Flow[1]	ML/day	651.3	563.7	659.8
Total Annual Flow[1]	ML	237,723	205,750	240,817
Total Suspended Solids (TSS)	mg/L	207.8	303.7	279.5
Biological Oxygen Demand (BOD5)	mg/L	153.8	207.9	201.9
Total Phosphorus (TP)	mg/L	4.9	6.3	6.4
Transfer from Humber TP: liquid biosolids	Dry tonnes/day	64.6	72.9	80.0
Transfer from Humber TP: WAS	Dry tonnes/day	2.7	4.9	4.9
Transfer from North Toronto TP: sludge (primary sludge, WAS, and scum)	ML/day	0.49	0.46	0.40
Preliminary Treatment				
Grit and Screenings	Tonnes/day	4.6	4.9	5.5
Primary Treatment				
TSS	mg/l	176.9	169.4	142.9
cBOD5	mg/L	99.8	89.3	68.7

Parameter	Units	2019	2018	2017
Secondary Treatment				
Aeration Loading	kg CBOD5/m3.day	0.35	0.27	0.2
Mixed Liquor Suspended Solids	mg/L	3,008	2,711	2,372
Flow through Seawall Gates	ML	3,834	3,278	3,187
Solids Handling				
Primary Sludge Treated	m3/day	5,429	5,978	5,635
Primary Sludge TS	%	2.3	2.3	2.5
Primary Sludge TVS	%	71.6	73.9	73.0
WAS to Primary Treatment and Excess Was to Aeration	m3/day	1795	911	1264
WAS to Thickening	m3/day	7,910	6,944	7,375
WAS TS	mg/L	0.91	0.84	0.74
TWAS Treated	m3/day	2,119	1,952	1,440
TWAS TS	%	3.5	3.6	3.7
TWAS TVS	%	73.8	73.9	73.2
Volume to Digestion	m3/day	7,548	7,930	7,075
Digesters Hydraulic Retention Time	days	20.0	19.3	20.2
Organic Loading to Digesters	TVS per m3 of digester capacity per day	1.0	1.0	0.9
Digester Gas Volume	m3/day	65,698	61,856	61,638
Dewatering Centrifuge Feed TS	%	1.71	1.6	1.7
Dewatered Biosolids TS	%	27.73	27.9	27.9
Centrate Quality	mg/L	626.5	428	298.5
Solids Capture Rate	%	96.5	97.4	98.2
Centrifuge Run-time	hours	51,226	52,790	52,400

In general, the plant experienced higher flow in 2019 in comparison to the previous year even though the total precipitations for both years are quite comparable. The annual average flow in 2019 is 15.5% higher than that of 2018. The increase in plant flow is attributed to the high lake levels observed in the same year. This occurrence is very similar to what happened in 2017, when lake water infiltrated into the Low Level Interceptor through the CSO points scattered throughout the lateral sewers. The infiltration of lake water into the sewer diluted the sewage, resulting in lower concentrations in the influent constituents such as BOD_5, TSS and TP. It is

expected that this increase in flow also contributed to the higher effluent TSS result seen in the month of June.

In 2019, the Ashbridges Bay Treatment Plant encountered no chronic operating problems, and continued to produce a high quality effluent which surpassed requirements of the effluent objectives as described in Condition 6 of the plant's ECA. This was achieved through continuous improvement in operations and maintenance of treatment processes, and infrastructure delivery. Ashbridges Bay Treatment Plant's effluent was essentially free of floating and settleable solids and did not contain any oil or other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters, as per Condition 6(1)(b) of the ECA.

In 2019, there was one deviation from the monitoring schedule for *E. Coli*. The weekly sampling day for *E. Coli* was every Tuesday. A scheduled sample for Tuesday, October 29, 2019 was collected on Wednesday, October 30, 2019. *E. Coli* sampling has been moved to Wednesdays of every week in 2020. All other parameters listed in the Schedule D Monitoring Program in the ECA comply with the sampling frequency requirements described in Condition 9(1)(b).

3.2 Biosolids Management

The flow projections for 2020 do not exceed the plant rated capacity of 818 ML/day and are expected to generate a sludge volume that will be +/- 5% of the volume generated in 2019.

Biosolids analysis are included in Appendix F and compared against *Ontario Regulation 267/03* under the *Nutrient Management Act*, which governs the maximum acceptable metal concentration in biosolids that are applied to land. The average metal and *E. coli* concentrations met all criteria as designated in O. Reg 267/03.

Biosolids management from the Ashbridges Bay Treatment Plant in 2019 totalled 154,656 wet tonnes and was managed as follows.

3.2.1 Agricultural Land Application

A total of 28,461 wet tonnes of biosolids were sent to approved agricultural land application sites in Ontario. During the 2019 land application season, the City contracted an independent field inspector to monitor the practices of the City's land appliers. The independent field inspector observed the application of biosolids on numerous agricultural land sites in Ontario. The inspector was responsible for ensuring the Nutrient Management Act and accompanying

Regulations were adhered to, site specific requirements were followed, and monitoring and recording of odour measurements were taken before, during and after application.

3.2.2 Third Party Process Stabilization (Soil Amendment)

In 2019, a total of 34,494 wet tonnes of biosolids were further processed off-site by licensed external service providers and beneficially used as Class A biosolids and soil amendments.

3.2.3 Pelletization

The operation and maintenance of the Ashbridges Bay Treatment Plant Pelletizer facility and marketing of pellets is managed by an outside contractor. In 2019, 83,970 wet tonnes of biosolids were processed by the on-site pelletizer. Pellet quality in 2019 met the standards set out by the Canadian Fertilizers Act.

3.2.4 Landfill Management of Biosolids

No biosolids were transported to landfill sites in 2019.

3.2.5 Mine Reclamation

A total of 7,731 wet tonnes of biosolids was utilized at mine reclamation sites. *Table 3* below summarizes the biosolids management methods utilized and the total amount of biosolids sent to each management option.

Table 3: Biosolids Management Methods

Biosolids Management Method	Wet Tonnes		
	2019	2018	2017
Agricultural Land Application	28,461	27,835	32,653
Alkaline Stabilization	34,494	37,666	35,745
Pelletization	83,970	82,702	82,938
Landfill	0	0	0
Mine Reclamation	7,731	7,553	7,952
TOTAL	**154,656**	**155,756**	**159,288**

3.3 Chemical Usage

Several chemicals are used during the treatment process at the plant. *Table 4* outlines the chemical consumption for the current and previous year. Costs listed exclude applicable taxes.

Table 4: Chemical Usage Summary

Process	Chemical	Parameters	2019	2018	2017
Phosphorus Removal	Ferrous Chloride as Fe	Dosage (mg/L)	7.60	8.05	7.04
		Consumption (tonnes)	1,766	1,638	1,662
		Cost ($)	$1,437,272	$1,201,482	$1,196,811
Disinfection[1]	Sodium Hypochlorite (12% w/v)	Dosage (mg/L)	2.38	2.43	-
		Consumption (m3)	4,642	4,167	1,133
		Cost ($)	$804,689	$701,262	$149,991
WAS Thickening	Polymer	Dosage (kg/DT)	8.04	7.54	7.33
		Consumption (tonnes)	212	160.50	145.50
		Cost ($)	$612,191	$641,538	$605,280
Biosolids Dewaterering	Polymer	Dosage (kg/DT)	14.37	12.50	11.86
		Consumption (tonnes)	639	557	536
		Cost ($)	$1,663,838	$1,853,005	$1,657,013

[1]Disinfection practice utilized chlorine gas in 2017 so dosage could not be accurately reported

3.4 Bypasses, Overflows, Spills, and Abnormal Discharge Events

3.4.1 Bypasses

There were 22 bypass events in 2019; all were secondary treatment bypasses. The total volume of bypass flow was 4131 ML, or 2% of the annual flow. High lake levels contributed to the number of bypass events in 2019. Table 5 summarizes the bypass events that occurred in 2019.

Bypass flows do not receive secondary treatment (i.e. the Aeration Tanks) but receive preliminary, primary treatment, nutrient removal, as well as disinfection before the final effluent sampling point. Secondary bypasses result from high wet weather flows that exceed the plant's secondary treatment capacity. Each instance was reported to the MECP Spills Action Center and recorded in the plant's Monthly report. Total precipitation in the Toronto area[2] was 908 mm in 2019, a 1.5% decrease compared to 2018.

[2] *Adapted from http://climate.weather.gc.ca/historical_data/search_historic_data_e.html, Toronto City Station*

Table 5: Bypass Summary

No.	Date	Start of Event	End of Event	Duration (hrs)	Volume (m^3)	Average Chlorine Dose (mg/L)
1	February 4, 2019	8:44PM	4:16AM	7.54	165,840	11.1
2	February 24, 2019	2:01:38 PM	7:19:00 PM	5.30	50,843	10.2
3	March 10, 2019	8:44:00 AM	6:55:00 PM	7.79	96,750	10.1
4	March 14, 2019	11:13:01 PM	1:46:00 AM	2.55	40,120	11.6
5	April 14, 2019	10:19:58 PM	2:15:00 AM	3.93	215,650	9.9
6	April 23, 2019	2:43:53 PM	5:42:00 PM	2.98	58,330	9.7
7	April 26, 2019	8:26:36 AM	1:40:00 PM	5.23	255,330	10.0
8	May 25, 2019	12:30:11 PM	3:25:00 PM	2.93	54,980	9.9
9	June 13, 2019	11:50:10 AM	9:36:00 PM	7.83	163,010	10.0
10	June 20, 2019	8:41:33 PM	2:11:00 AM	5.30	189,830	9.7
11	June 25, 2019	3:36:02 AM	5:59:00 AM	2.39	70,860	9.0
12	June 29, 2019	2:19:43 AM	4:35:00 AM	2.27	99,220	9.9
13	July 13, 2019	5:23:15 PM	7:40:00 PM	2.29	94,020	9.9
14	July 17, 2019	10:08:29 AM	8:19:00 PM	10.19	342,850	10.0
15	July 30, 2019	8:40:47 AM	1:49:00 PM	5.14	219,230	9.9
16	August 17, 2019	11:32:11 AM	2:43:00 PM	3.20	51,300	9.5
17	August 27, 2019	4:11:10 PM	4:35:00 PM	0.41	23,160	9.7
18	October 16, 2019	9:13:06 AM	3:13:00 PM	6.01	221,400	9.4
19	October 27, 2019	3:34:54 AM	12:37:00 PM	9.05	342,380	10.0
20	October 30, 2019	9:09:19 PM	4:02:00 AM	16.75	592,510	10.0
21	December 9, 2019	12:39:00 PM	7:48:00 PM	7.15	256,720	10.0
22	December 14, 2019	10:04:55 AM	8:06:24 PM	10.02	526,270	9.5

3.4.2 Overflows

There were no overflow events at the Ashbridges Bay Treatment Plant in 2019. An overflow is defined as a discharge to the environment from the plant at a location other than the plant outfall downstream of the final effluent sampling station.

3.4.3 Spills

There were 15 spills reported to the MECP in 2019; they are summarized below.

Table 6: Spill Summary

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
January 10, 2019	NA	0.1	Digested sludge	Approximately 50-100 L of digested sludge went onto frozen ground. The spilled material was vacuumed back to the digester. The affected area was cleaned and water flushed immediately.
February 24, 2019	NA	3	Raw sewage	The spill was caused by the screens being blocked off by some material in the wastewater from the influent conduit during excessive flow received during the wet weather event on Feb. 24th, 2019. The spilled material and contaminated soil were vacuumed and transported off-site for proper disposal.
March 7, 2019	0.5-1	0.1	Close loop hot water	The spill was caused by a failure of a unit heater due to corrosion. The affected area was washed by using fresh hot water and vacuumed on March 7th. The vacuumed material was transported off-site for proper disposal.
March 15, 2019	NA	Minimal	Plant water (chlorinated final effluent)	The spill was caused by un-clear communication of procedures for this unloading bay with contractors. The plant has installed signage on plant water usage at this area to prevent a reoccurrence.
April 26, 2019	2.75	25	Primary effluent and raw sewage	The spill was due to extremely high flow into the plant. Upon identifying the source of the release, the spilled material was vacuumed back to the wastewater treatment process, and the impacted grass area was disinfected.
April 30, 2019	NA	Minimal	Plant water (chlorinated final effluent)and primary sludge	The spilled material went into a catch basin in the vicinity during cleaning operation. The interim preventative solution was to cover the catch basins in the vicinity during cleaning and put the cleaning and disinfection water back to treatment process before removing the covers from catch basins. Long term preventative action is to make an engineered containment with appropriate slope and curb to direct all cleaning water back to treatment process.

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
May 14, 2019	Less than 5 minutes	30	Plant water (chlorinated final effluent)	The spill was due to a broken elbow coupling. The spilled plant water was vacuumed from the affected area and pumped back to the treatment process.
July 4, 2019	0.3	250	Digester gas	A digester relief lid had failed and was leaking digester gas. In order to repair seal, a controlled 20-minute venting of digester gas was required. The seal repair was completed and the digester was returned to service.
August 1, 2019	NA	2	Primary effluent	The spill was caused by a valve which was not closed properly. The spill was stopped immediately by shutting off the valve. There was zero runoff onto the street, storm sewer or catch basins. The contaminated soil in the excavation area was cleaned up and disposed properly.
August 23, 2019	NA	38	Plant water (chlorinated final effluent)	It was noticed that plant water was used by contractor to assist with gravel compaction of new road. The plant water was immediately stopped by closing the valve. As a preventative action the contractor was made aware that only city water can be used at this location.
September 30, 2019	NA	0.2	Plant water (chlorinated final effluent)	The spill was discovered during underground work and it was stopped immediately by closing the valve of the pipe in question.
October 18, 2019	0.4	5	Plant water (chlorinated final effluent)	It was noticed that plant water was leaking from closed isolation valves on a return cooling water line that was being worked on and rerouted at the time. The work on the piping was completed shortly after the spill occurred and the line was put back into service on the same day.
November 25, 2019	NA	1	Storm sewer sludge	Storm sewer sludge was taken out from a storm sewer and put on the soil. It was covered on the top with a tarp and will be disposed of appropriately.

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
November 28, 2019	10 minutes	200	Digester Gas	An emergency maintenance work for a digester flare arrester was required due to safety reason and approximate 10-minute venting of digester gas was required in order to perform this work.
December 28, 2019	NA	0.01	Primary effluent and grit	About 10 L of primary effluent and grit went onto the grass area outside of the auto sampler station due to blockage in the sampler containment. The sampler containment was cleaned up to prevent the reoccurrence. And the contaminated grass area was disinfected and spilled material was collected and disposed of appropriately on the same day.

3.4.4 Abnormal Discharge Events

There were no abnormal discharge events at the Ashbridges Bay Treatment Plant in 2019. An abnormal discharge event is defined within the meaning of Part X of the Environmental Protection Act.

3.5 MECP Procedures F-5-1 and F-5-5

Condition 11 (4)(m) of the ECA describes requirements to summarize efforts to achieve conformance with MECP Procedure F-5-1 – Determination of Treatment Requirements for Municipal and Private Sewage Works and MECP Procedure F-5-5 – Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems. Toronto Water is committed to efforts to control the frequency and volume of CSO discharges and bypass events. The City is currently implementing a 25 year plan related to its Wet Weather Flow Master Plan (WWFMP), which aims to reduce and eliminate the adverse impacts of storm water runoff and CSO discharges associated with wet weather events. It is expected that the on-going implementation of capital projects related to the City's WWFMP will eliminate CSO discharges and ultimately improve plant effluent. The plant utilizes the activated sludge treatment process to meet secondary or equivalent treatment and consistently achieves effluent quality at or beyond the objectives outlined in the ECA. A description of Effluent Quality Assurance and Control Measures is located in section 3.7.

3.6 Complaints

The Ashbridges Bay Treatment Plant received 11 complaints related to odour and one complaint related to noise. All complaints were recorded, investigated by Toronto Water staff, reported to MECP, and when possible, followed up with the complainant. Of the 11 odour complaints, only three complaints were found to be related to plant operation. These plant related complaints were temporary due to maintenance shutdowns. For additional information, please refer to Section 7.6 – MECP/MOL Correspondence.

3.7 Effluent Quality Assurance and Control Measures

Analytical tests to monitor required parameters are performed by the Toronto Water Laboratory which is accredited to ISO/IEC 17025 by Canadian Association for Laboratory Accreditation Inc. Plant operation and performance is monitored by licensed operators as well as by the facility management team. Standard Operation Procedures, emergency plans, equipment preventative and predictive maintenance, and a network of support staff, help ensure a rapid and effective response to issues, and maintain the high quality of the effluent and biosolids. A hybrid Quality and Environmental Management System is also in development and will be reported on in future annual reports.

3.8 Odour Reduction Plan

As per Section 22 of the ABTP Amended ECA – Air No. 2815-9PWTWV issued January 15, 2015, a review of the Odour Reduction Plan summarizing the work progress in 2019, including odour and total sulphur reduction activities undertaken with associated reduction levels achieved, can be found in Appendix G.

4 CAPITAL PROJECTS

Under Toronto Water's capital program, the Ashbridges Bay Treatment Plant commenced or continued with the capital works projects and studies listed in Table 7 in 2019.

Table 7: Capital Projects

Project Name	Project Description	Project Stage (Dec 31, 2019)	Estimated Completion (yyyy)
Digester 9-12, II	Complete upgrade of Digester 9-12 cluster, including replacement of the mixing system and sludge recirculation pumps and sludge transfer pumps.	Construction	2021
D Building Phase 2 Upgrade	Upgrades to existing systems including screening handling and ferrous chloride dosing. Includes chemically enhanced primary treatment and upgrades to enhance maintainability of equipment.	Design	2023
D Building Solar Roof	Installation of solar energy cells on the roof of D Building.	Design	2021
Effluent Disinfection	New UV disinfection facility. Also includes new secondary west bypass conduits, plant water station upgrades, seawall substation upgrades, and seawall gate refurbishment.	Construction	2022
Integrated Pumping Station (IPS) Contract 1	Site preparation for future IPS contract.	Complete	2019
IPS Contract 2	Preliminary civil work for the future IPS	Construction	2022
IPS Contract 3	Replacement of M&T pumping station with new Integrated sewage/wet weather flow pumping station located South of Lakeshore.	Design	2030
Outfall	New plant outfall that includes a new effluent drop shaft, new outfall pipe with diffusers.	Construction	2023

Project Name	Project Description	Project Stage (Dec 31, 2019)	Estimated Completion (yyyy)
P-Building Upgrade	Preliminary treatment upgrades in P Building, including screenings, grit removal, odour control, bypass and gallery. Also includes Chemically Enhanced Primary Treatment and replacement of Gallery 7, 8, and 9 primary sludge pumping equipment.	Construction	2020
Phosphorous Removal Upgrade	Replacement of existing ferrous chemical storage with new ferrous chemical facility that includes storage tanks, chemical transfer pumps and dosing pumps.	Construction	2020
Project Management Office	Renovation of the old administration building to include a new project management office.	Design	2021
Polymer Upgrades	Replacement of dewatering polymer system, dewatering centrifuges, upgrades to sludge feed system, centrate storage, as well as the WAS polymer system.	Design	2024
Rugby Field	Relocation of Rugby Field.	Complete	2019
WAS Thickening and South Station Upgrades	New WAS thickening facility using centrifuges and overhaul of South Substation.	Design	2024
Truck Loading Biofilter Upgrades	Replacement of biofilter for the Truck Loading Facility (TLF). Also include minor upgrades for the TLF, replacement of up blast fans for the pelletizer facility, and conversion of scrubber building into workshop and admin space.	Construction	2020
Waste Gas Burners (WGB)	Replacement of existing three WGB with five new WGB	Construction	2020
Air Header Painting	Recoating of above ground aeration air header.	Complete	2019
Blower Building Upgrades	Upgrades to blower building admin space and stores	Construction	2022
Digester 13 & 16 Cleaning	Cleaning program for Digesters 13 and 16. Additional digester clusters to follow.	Construction	2021

Project Name	Project Description	Project Stage (Dec 31, 2019)	Estimated Completion (yyyy)
M&T Building Pumping Station Critical Repairs	General upgrades to M&T building to extend the life of the pumping station until the IPS is built.	Construction	2020
Remote Processing Units (RPU) Upgrade	Upgrade of all RPUs at the plant to conform to new standard.	Construction	2022
Electrical Condition Assessment (ECAP) 03 & 05	Electrical upgrades in blower building and aeration gallery.	Complete	2019
ECAP 04	Electrical upgrades in North Substation.	Complete	2019
Z-Building Heat Conversion	Conversion of all steam loads in Z Building to hot water.	Complete	2019
Facility Condition Assessment (FCAP)	Assess life and condition of facilities onsite.	Complete	2019
Process Road Map	Process planning for the future of Ashbridges Bay Treatment Plant.	Complete	2019
Digester 9-12, II	Complete upgrade of Digester 9-12 cluster.	Complete	2019
Pelletizer Upgrade	Upgrades to various system to extend life of facility.	Design	2022
Aeration Study	A study to look at the addition of 2 new aeration tanks and upgrades to the existing tanks and supporting equipment.	Complete	2019
Space Road Map	A study to look at space required to house management, support, operations and maintenance staff.	Complete	2019
D Building Disposal Station	Construction of a vacuum truck unloading station.	Complete	2019

5 MAINTENANCE

Staff from the Ashbridges Bay Treatment Plant performed a variety of scheduled, preventative, predictive and reactive maintenance activities on a diverse spectrum of equipment. Equipment availability and reliability ensures operational objectives are achieved.

The annual calibration and maintenance records of flow meters and on-line analysers was completed in 2019, and found to be within acceptable limits. A summary of effluent monitoring equipment calibration and maintenance performed in 2019 is included in Table 8.

Table 8: Summary of Regulated Monitoring Equipment Calibration and Maintenance

Calibration and/or Maintenance Record	Completion Date
Online Chlorine Analyzer (CL 17) North Calibration	16-Apr-19
Online Chlorine Analyzer (CL 17) South Calibration	16-Apr-19
pH Analyzer: TAB-DIS-AIT-3006 Calibration	17-May-19
pH Analyzer: TAB-DIS-AIT-3003 Calibration	17-May-19
pH Analyzer: TAB-DIS-AIT-3009 Calibration	17-May-19
pH Analyzer: TAB-DIS-METR-3018 Calibration	17-May-19
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	04-Oct-19
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	18-Jul-19
Online Chlorine Analyzer (CL 17) - North - Calibration	10-Jun-19
Online Chlorine Analyzer (CL 17) - South - Calibration	10-Jun-19
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3011 Calibration	10-Jun-19
Autosampler - West Bypass - TAB-STR-SP-4001 - Verification	02-Dec-19
Autosampler - East Bypass - TAB-STR-SP-3001 - Verification	24-Jul-19
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Calibration	06-Feb-19
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Verification	04-Jan-19
Final Effluent - Autosampler - South - TAB-STR-SP-3334 Calibration	08-Nov-19
Final Effluent - Autosampler - South - TAB-STR-SP-3334 Calibration	09-May-19
Pocket Colorimeter II Chlorine System - Calibration	10-Jun-19
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3016 Calibration	10-Jun-19
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3012 Calibration	10-Jun-19
Online Chlorine Analyzer (CL 17) - North Replacement	13-Sep-19
pH Analyzer: TAB-DIS-AIT-3009 Calibration	17-Sep-19
pH Analyzer: TAB-DIS-AIT-3006 Calibration	12-Nov-19
pH Analyzer: TAB-DIS-AIT-3003 Calibration	12-Nov-19
pH Analyzer: TAB-DIS-METR-3018 Calibration	12-Nov-19
Influent Flow Meter - D Building - Channel 11 Verification	18-Dec-19
Influent Flow Meter - D Building - Channel 10 Verification	16-Jan-20

Calibration and/or Maintenance Record	Completion Date
Influent Flow Meter - D Building - Channel 09 Verification	30-Jan-20
Influent Flow Meter - D Building - Channel 08 - TAB-PLT-FIT-0803 Verification	20-Feb-20
Influent Flow Meter - P Building - Grit Diversion- TAB-PLT-FIT-0033	19-Dec-20
Influent Flow Meter - P Building – Screening Diversion - TAB-PLT-FIT-0031	Routine Inspection and Cleaning
Effluent Flow Meter - South Conduit - TAB-STR-FIT-8003 Sensor Replacement	19-Jun-19
Effluent Flow Meter - North Conduit - TAB-STR-FIT-8004 - Sensor Replacement	19-Jun-19
Effluent Flow Meter - South Conduit - TAB-STR-FIT-8004 Repair, Verification	12-Dec-19
Bypass Flow Meter - West - TAB-STR-PIT-0004X Calibration	27-Dec-19
Bypass Flow Meter - East - TAB-STR-PIT-0003X Calibration	27-Dec-19
Influent Autosampler - P Building - TAB-PLT-SP-0101	Routine Inspection and Cleaning
P Building - Grit Tank Flow Meter - Tank 4 - TAB-PLT-FIT-0401*	N/A
P Building - Grit Tank Flow Meter - Tank 5 - TAB-PLT-FIT-0501*	N/A
P Building - Grit Tank Flow Meter - Tank 6 - TAB-PLT-FIT-0601 *	N/A

*Calibration/maintenance not completed due to contractor warranty issue

In 2019, there were a total of 28,031 work orders completed on routine maintenance and emergency repairs; refer to Appendix H for a summary of major maintenance activities as per Condition 11(4) of the ECA.

One of the maintenance activities undertaken at the plant fell under Limited Operational Flexibility. A summary of the Notice of Modifications is shown in Section 7.6 MECP/MOL Correspondence.

6 UTILITIES

A summary of monthly utility consumption for the previous three years at Ashbridges Bay Treatment Plant is provided in Figure 1. Table 9 below summarizes the total cost and average unit cost for water, hydro, and natural gas. Total annual consumption for potable water, hydro, and natural gas was 383,478 m^3, 132 GWh, and 7.5 Mscm , respectively.

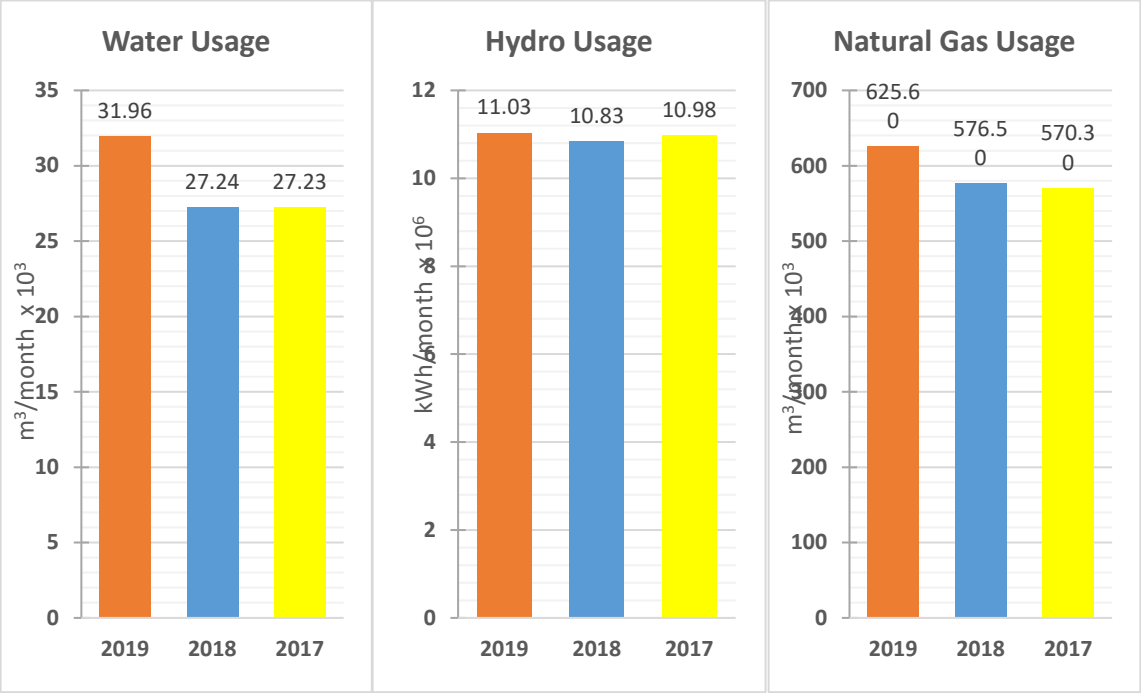


Figure 1: Annual Utility Consumption (Water, Hydro, Gas)

Table 9: Average Unit and Total Utility Cost

Utility	2019	2018	2017
Water Unit Cost ($/$m^3$)	$4.11	$4.00	$3.81
Water Total Cost ($M/year)	$1.58	$1.31	$1.24
Hydro Unit Cost ($/kWh)	$0.10	$0.10	$0.10
Hydro Total Cost ($M/year)	$12.87	$12.96	$12.88
Natural Gas Unit Cost ($/$m^3$)	$0.21	$0.23	$0.24
Natural Gas Total Cost ($M/year)	$1.54	$1.58	$1.63

7 ADMINISTRATION

7.1 Operations and Maintenance Costs

The 2019 plant direct operational costs are broken down into five categories: Salaries and Benefits, Materials and Supplies, New Equipment, Services and Rents, and Inter-Divisional Charges. Materials and Supplies is further segregated into Utilities, Machine & Equipment Parts, Chemicals and Other Materials and Supplies. A breakdown of annual operations and maintenance costs for the past three years is illustrated in Figure 2. Overall, operational costs increased by 0.2% from 2018.

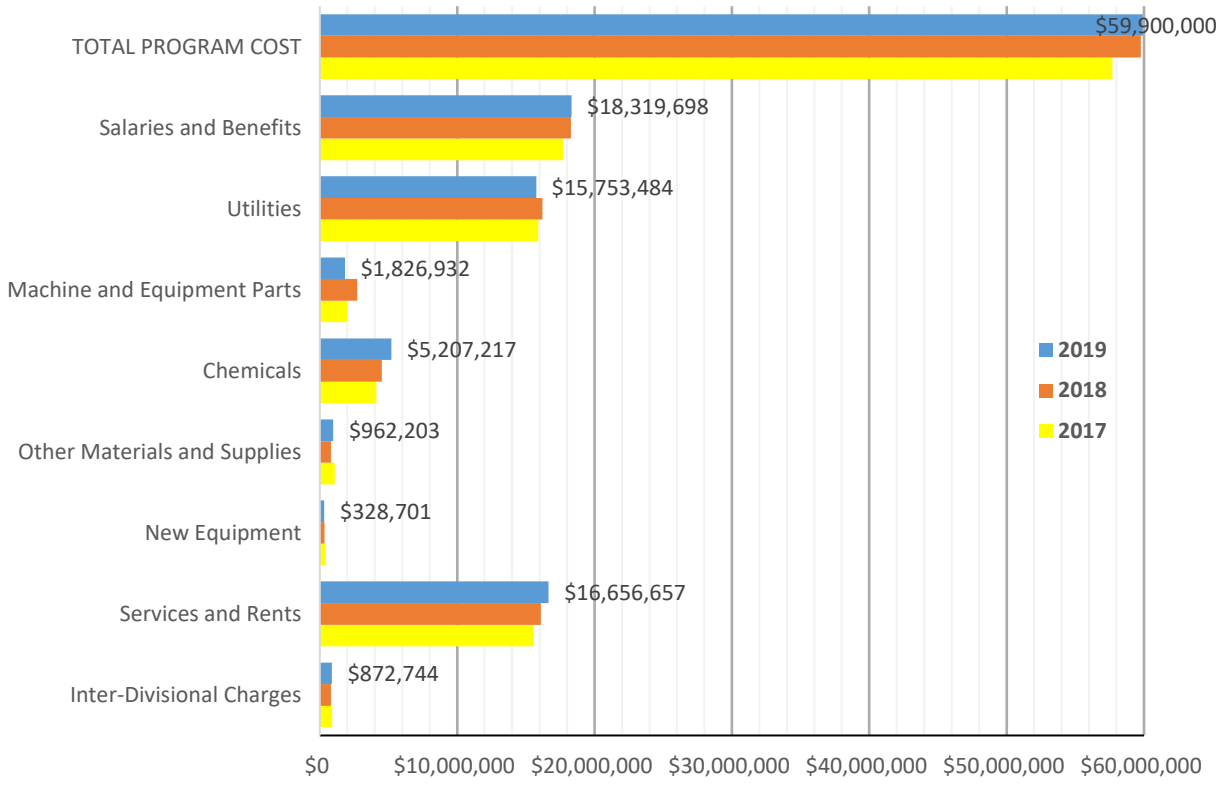


Figure 2: Operations and Maintenance Cost Breakdown

7.2 Human Resources

Plant Staffing at the Ashbridges Bay Treatment Plant in 2019 is shown in Table 10.

Table 10: Plant Staffing

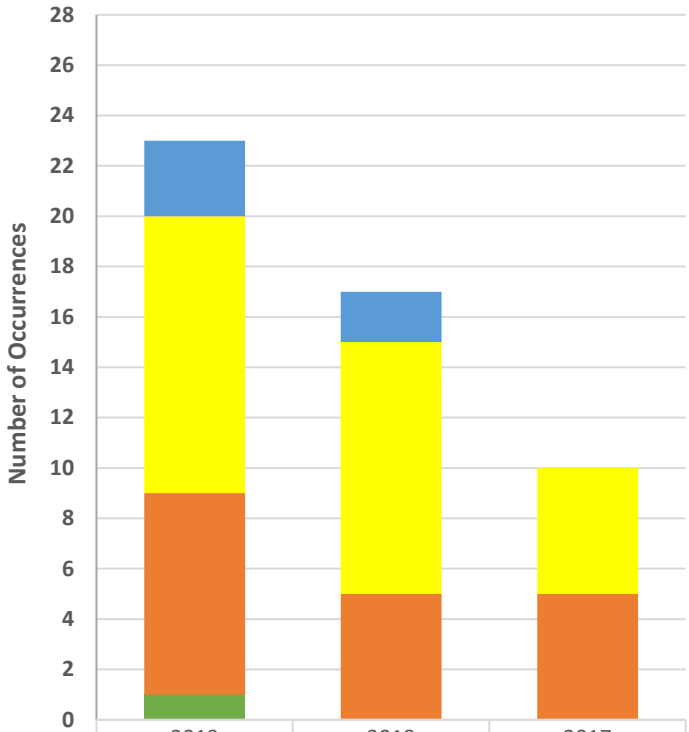
Positon	Number of FTE[1]
Sr. Plant Manager	1
Manager, Engineering Services	2
Superintendent, Plant Process and Operations	2
Senior Engineer	2
Engineer	2
Area Supervisor Plant Operations and Maintenance	9
Supervisor, Operational Support	1
Supervisor, Operating Engineers A/R-C	1
Stationary Engineer Operator	8
Electrical Instrumentation Specialist	2
Engineering Technologist Technician	1
Plant Technician/Wastewater	44
Plant Maintenance Operator	1
Developmental Plant Technician	4
Industrial Millwrights	50
EICT	22
Support Assistant	2
Systems Integrator 1	0
Materials Management Assistant	1
Materials Management Clerk	1
Wastewater Plant Worker	8
Administration Trainee	1
Technical Trainee	1
Labourer 2	4
Total FTE Positions	**170**

[1] FTE refers to Full Time Equivalent staff. Seasonal staff are considered 0.5 FTE staff.

7.3 Occupational Health & Safety

Continuous efforts are made to ensure a safe working environment at the Ashbridges Bay Treatment Plant. The Joint Health and Safety Committee (JHSC) assists management in resolving issues through regular meetings and monthly workplace inspections. Plant Health and Safety statistics for the Ashbridges Bay Treatment Plant are included in Figure 3[3].

As of **February 24, 2020,** there were 23 health and safety incidents, and a total of 67.5 lost time days due to work related injuries.



	2019	2018	2017
Lost Time	3	2	0
Medical Aid	11	10	5
Non Reportable Injuries	8	5	5
Recurrence	1	0	0

Figure 3: Ashbridges Bay Treatment Plant Health & Safety Injury Summary

[3] The previously reported values for 2018 and 2017 have been changed to reflect the status of those WSIB claims as of December 31st 2019

7.4 Staff Training and Development

The Strategic Planning and Workforce Development unit of Toronto Water facilitates a comprehensive training program for all staff.

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2019 includes the list of courses shown in Appendix I. Some of these courses were eligible for Continuing Education Units (CEU's) from the Ontario Environmental Training Consortium (OETC). Additional training related to the start-up and commissioning of new equipment/systems installed as part of the capital program was provided as required.

7.5 Utility Operator Certification

Toronto Water trains and provides the required resources to ensure all operators achieve and maintain Class IV certifications. In addition, all skilled trade positions are required to achieve and maintain a Class I operator's license. As part of this initiative, general operational/process training was delivered in order to prepare staff for any certification examination that they need to write. Table 11 summarizes the status of operator certification at the Ashbridges Bay Treatment Plant in 2019.

Table 11: Wastewater Treatment Certificates

Class Level	Licensed
Class I	41
Class II	11
Class III	8
Class IV	43
OIT	38
Total	**141**

7.6 MECP/MOL Correspondence

There were no orders issued by the Ministry of the Environment, Conservation and Parks (MECP). There was no orders from the Ministry of Labour (MOL).

Reports were submitted to the MECP for the 11 odour complaints received at the plant in 2019, 15 spill events, one consent event, one notification on commissioning and one notification on construction schedule. Table 12 summarizes the correspondence submitted to the MECP and

MOL for the Ashbridges Bay Treatment Plant. Correspondence related to spills and bypasses can be referenced in Section 3.4.

Table 12: Correspondence submitted to the MECP and MOL

Event Date	Type	Description	Resolution	Resolution Date
Complaints				
April 22, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
April 24, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
May 5, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
May 9, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
May 21, 2019	Odour complaint	An odour complaint with investigation that it was due to high blanket level in one primary tank.	The plant pumped down this Primary Tank blanket level.	May 22, 2019
July 23, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
August 11, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
September 26, 2019	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
September 27, 2019	Noise complaint	A noise complaint with investigation revealed that it was an alarm triggered by a faulty sensor in M Building.	The audio feature of the alarm was disabled and kept the visual feature of the alarm in M Building.	September 27, 2019

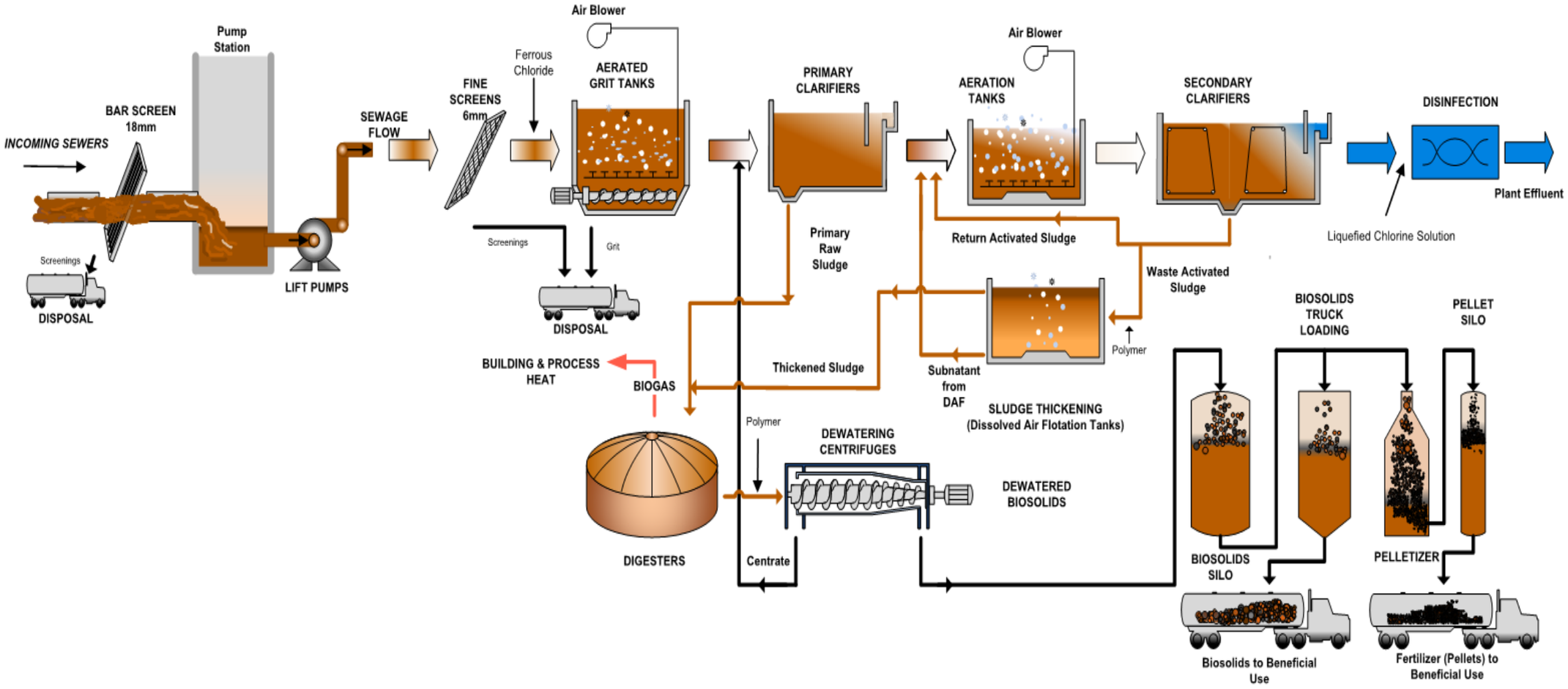
Event Date	Type	Description	Resolution	Resolution Date
October 24, 2019	Odour complaint	An odour complaint with investigation that it was due to the west side of P building primary distribution channel was out of service for cleaning.	The odour would diminish once the cleaning was completed.	October 25, 2019
October 25, 2019	Odour complaint	An odour complaint with investigation that it was due to the west side of P building primary distribution channel and one primary tank were out of service for cleaning.	The odour would diminish once the cleaning was completed.	October 25, 2019
October 26, 2019	Odour complaint	An odour complaint with investigation that it was due to lower level at raw sewage pumping station as the plant was preparing for upcoming rain event which was necessary to prevent flooding due to hydro feeds issue.	Not required.	NA
Consent Letters				
December 3, 2019	Director Consent Letter	Request for Consent – Shutdown of the Aeration Odour Control System for the winter.	Consent was granted.	January 2, 2020
Notice of Modification to Sewage Works				
August 14, 2019	Notice of Modification as Part of the Limited Operational Flexibility	Replacement of Progressive Cavity PD pump with Rotary Lobe	N/A	N/A
Notification on Commissioning				
N/A	Notification on Commissioning of Proposed Works	N/A	NA	NA
Notification on Construction Schedule				

Event Date	Type	Description	Resolution	Resolution Date
August 22, 2019	Notification on Construction Schedule of Proposed Works	Notification on Construction Schedule for Ashbridges Bay Treatment Outfall.	NA	NA
MECP Inspection				
January 16, 2019	MECP Communal Sewage Inspection	This MECP inspection is to confirm the compliance with MECP legislation as well as evaluating conformance with the Ministry's policies and guidelines during inspection period. No non-compliance with regulatory requirements raised.	NA	NA
Correspondence submitted to MECP				
January 22, 2019	15 Day Report as per Amended ECA	Written report regarding release of digested sludge on January 10, 2019.	The spilled sludge was pumped back into the digester using the vacuum trucks and the affected area was cleaned up.	January 10, 2019
March 8, 2019	15 Day Report as per Amended ECA	Written report regarding release of raw sewage on February 24, 2019.	The spilled material and contaminated soil were vacuumed and transported off-site for appropriate disposal.	February 24, 2019
March 19, 2019	15 Day Report as per Amended ECA	Written report regarding release of close loop hot water on March 7, 2019.	The affected area was washed by using fresh hot water and vacuumed.	March 7, 2019
March 27, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) on March 14, 2019.	A signage has installed on plant water usage at this area to prevent a reoccurrence.	March 29, 2019
May 2, 2019	15 Day Report as per Amended ECA	Written report regarding release of primary effluent and raw sewage on April 26, 2019.	The spilled material was vacuumed back to the wastewater treatment process, and the impacted grass area was disinfected.	April 26, 2019

Event Date	Type	Description	Resolution	Resolution Date
May 8, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) and primary sludge on April 30, 2019.	The affected area was cleaned and disinfected.	April 30, 2019.
May 24, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) on May 14, 2019.	The spilled plant water was vacuumed from the affected area and pumped back to the treatment process.	May 14, 2019
July 11, 2019	15 Day Report as per Amended ECA	Written report regarding release of digester gas on July 4, 2019.	The failed part was repaired and put back to service.	July 4, 2019.
August 27, 2019	15 Day Report as per Amended ECA	Written report regarding release of primary effluent on August 1, 2019.	The contaminated soil in the excavation area was cleaned up and disposed properly.	August 2, 2019
August 27, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) on August 23, 2019.	Contractor was made aware that only city water can be used at this location.	August 23, 2019
October 1, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) on September 30, 2019.	The spill was stopped by closing the valve.	September 30, 2019
October 30, 2019	15 Day Report as per Amended ECA	Written report regarding release of plant water (chlorinated final effluent) on October 18, 2019.	The spill happened during a cooling water line rerouting and spill stopped when the work was completed. No further action was required.	October 18, 2019
December 4, 2019	15 Day Report as per Amended ECA	Written report regarding release of digester gas on November 28, 2019.	This spill was required due to emergency repair and it stopped when the repair was completed. No further action was required.	November 28, 2019
December 6, 2019	15 Day Report as per Amended ECA	Written report regarding release of storm sewer sludge on November 25, 2019.	The storm sewer sludge was cover by tarp on site and will be disposed appropriately.	NA
December 30, 2019	15 Day Report as per Amended ECA	Written report regarding release of primary effluent and grit on December 28, 2019.	The contaminated grass area was disinfected and spilled material was collected and disposed of appropriately.	December 28, 2019

APPENDIX A – Plant Schematic

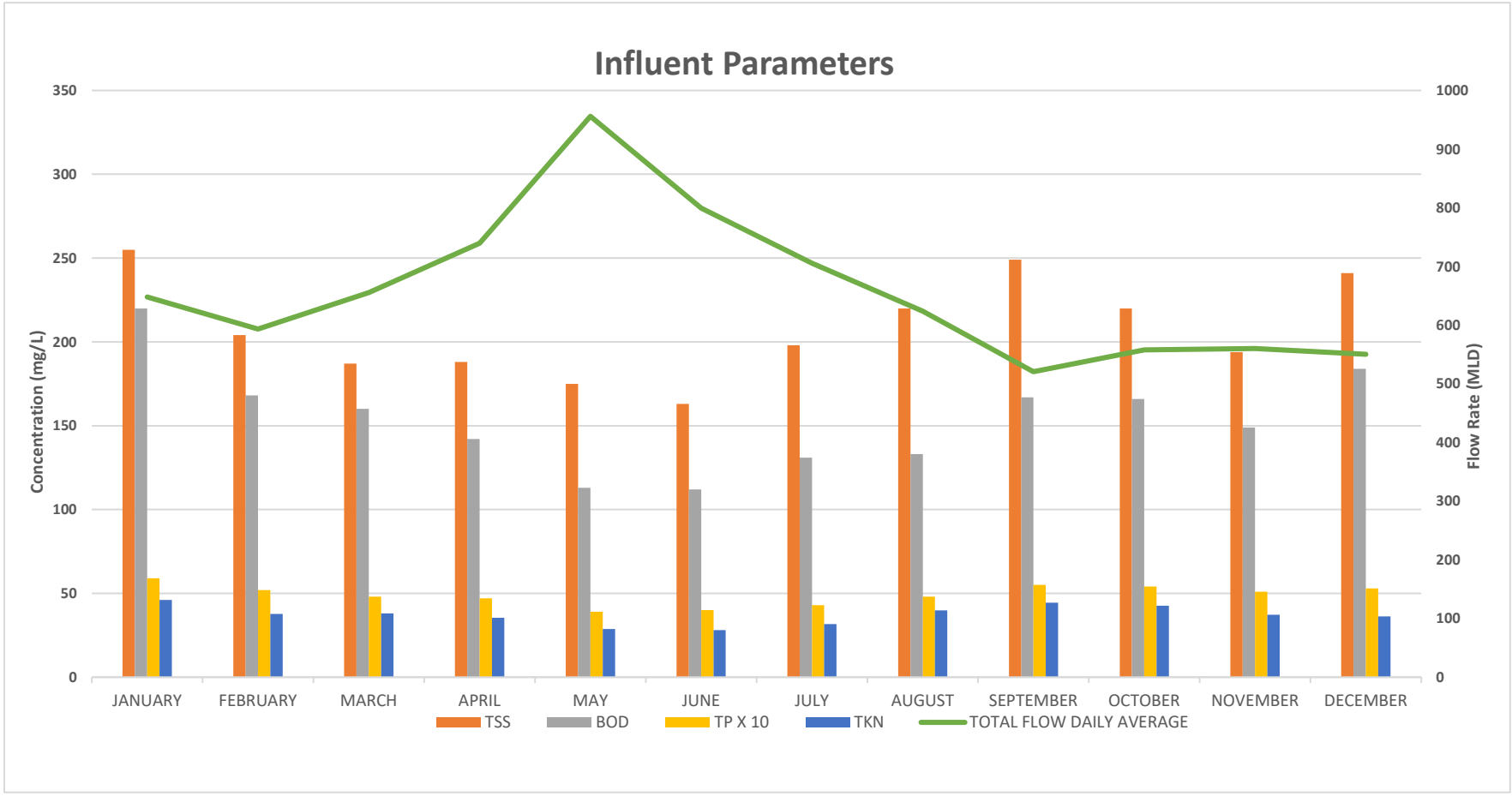
APPENDIX A: PLANT SCHEMATIC



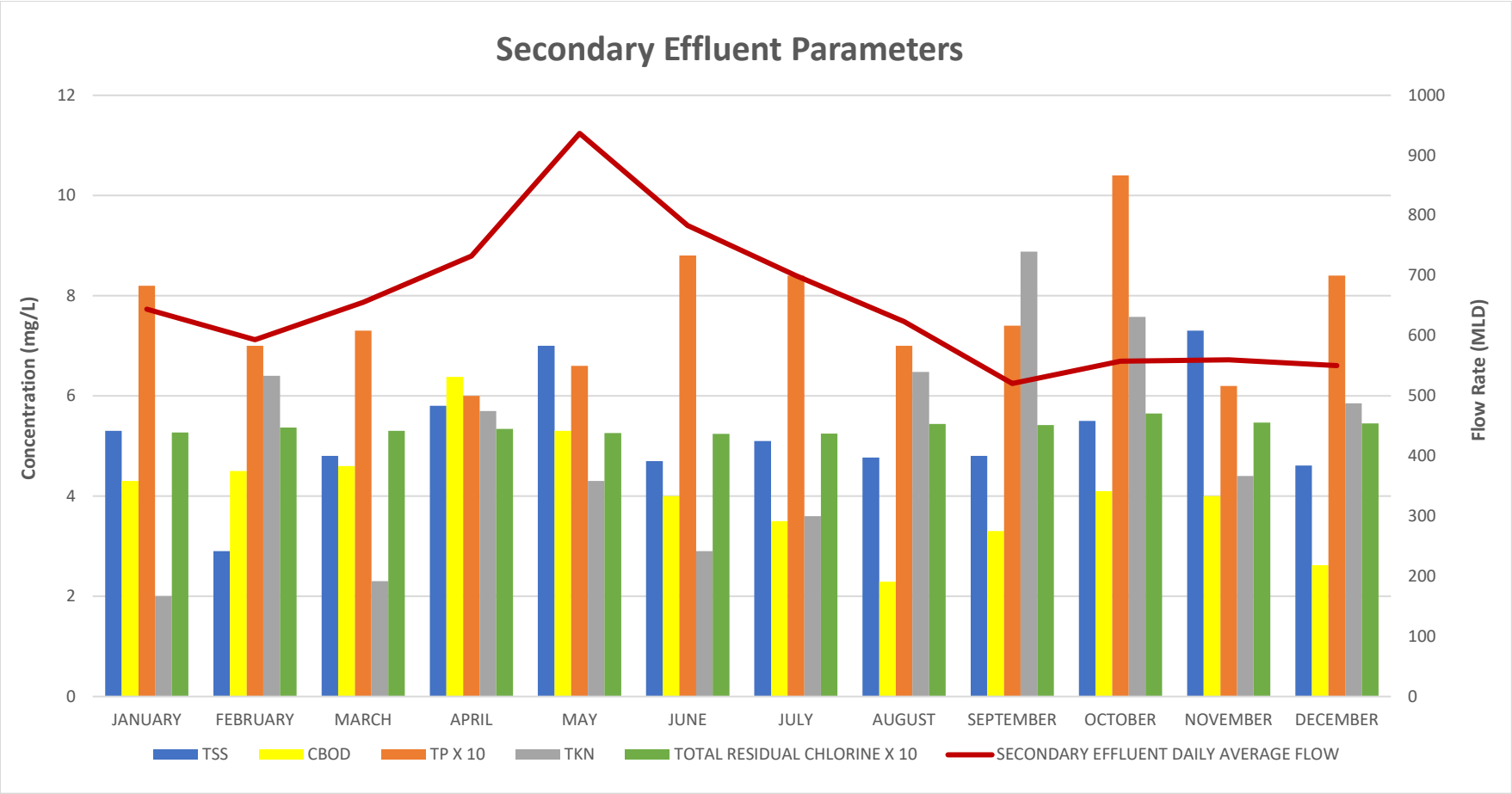
Process Flow Diagram for Ashbridges Bay Treatment Plant

APPENDIX B – Influent and Effluent 2019 Performance Charts

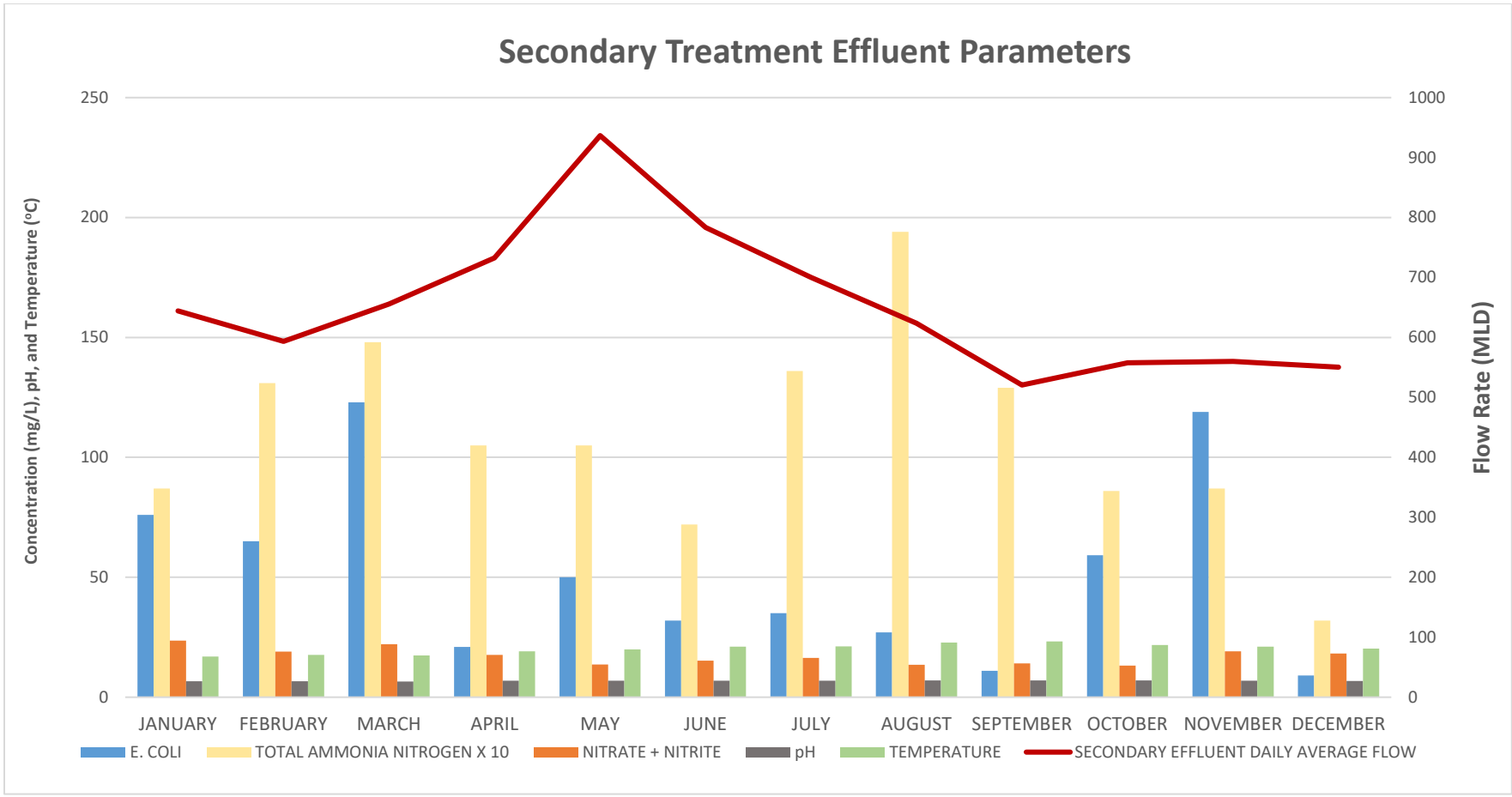
APPENDIX B – Influent and Effluent 2019 Performance Charts



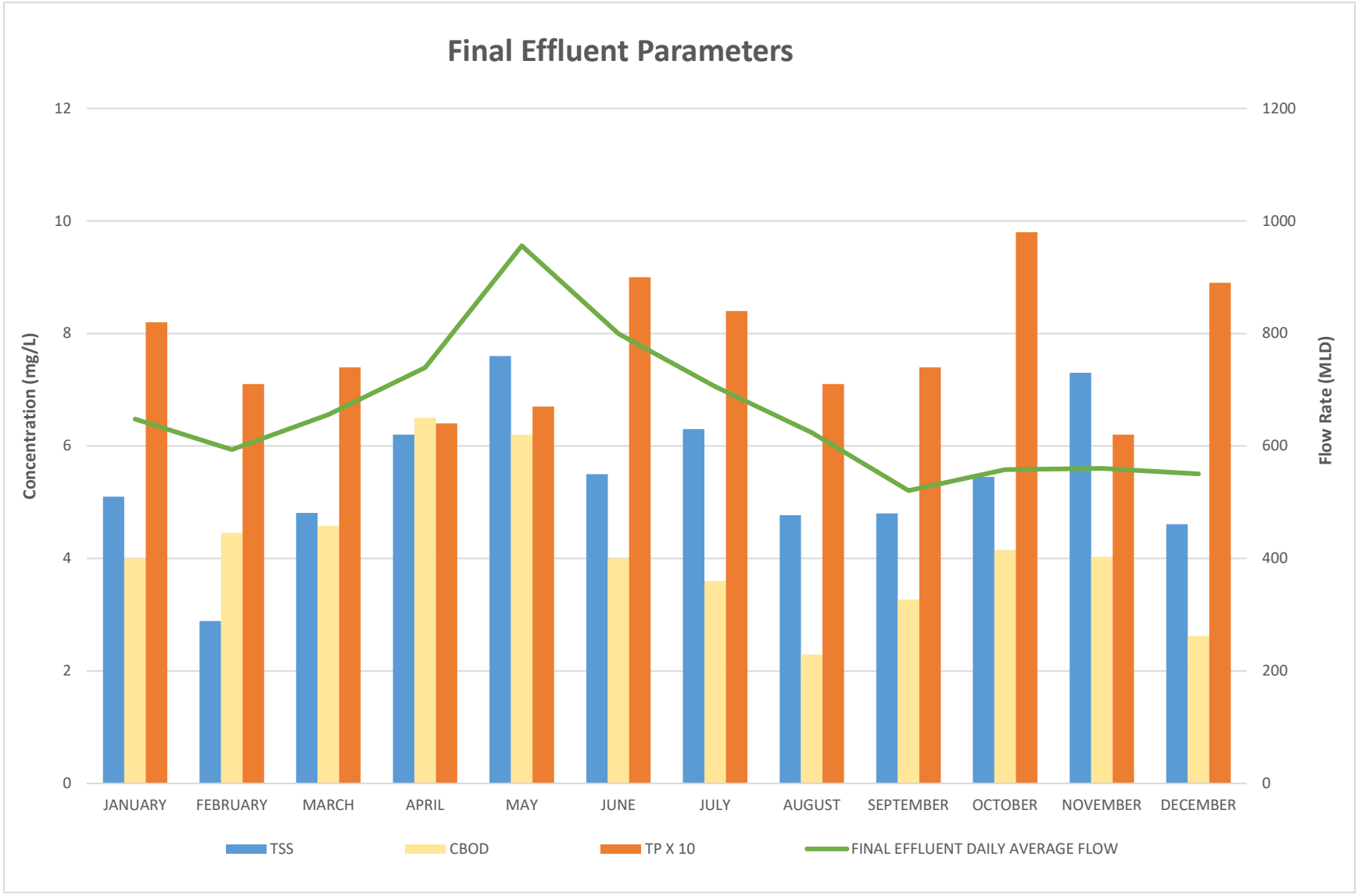
APPENDIX B – Influent and Effluent 2019 Performance Charts



APPENDIX B – Influent and Effluent 2019 Performance Charts



APPENDIX B – Influent and Effluent 2019 Performance Charts



APPENDIX C – Historical Performance Data

APPENDIX C – Historical Performance Data

Parameters	Units	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Influent												
Flow	ML/day	651.5	563.9	659.8	549.8	585.2	638.4	631.6	576.1	622.4	596.3	697.6
Total Annual Flow	ML	237,723	205,750	240,817	201,229	212,831	232,932	230,456	210,834	227,355	217,641	254,609
Total Suspended Solids (TSS)	mg/L	207.8	303.7	279.5	318.6	334.6	328.5	271.2	275.2	274.0	260	255.5
Biochemical Oxygen Demand (BOD_5)	mg/L	153.8	207.9	201.9	244.6	274.9	258.3	174.9	178.2	142.4	137	121.1
Total Phosphorus (TP)	mg/L	4.9	6.3	6.4	7.5	7.5	6.6	5.9	6.2	6.4	5.9	6.2
Total Kjeldahl Nitrogen (TKN)	mg/L	37	43	40.26	45.4	43.7	44.7	46.6	47.7	44.1	54.4	37.9
Preliminary Treatment												
Grit and Screenings	tonnes/day	4.6	4.9	5.5	5.7	5.6	11	13	9.2	8.97	11.85	9.67
Primary Treatment												
TSS	mg/L	99.8	89.3	142.9	123.9	233.3	205.9	162.7	216.1	339.9	550.5	319.1
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	mg/L	99.8	89.3	68.7	84.3	98.9	92.9	90.3	113.3	138.2	272.5	113.5
Secondary Treatment												
Aeration Loading	kg $CBOD_5$/ m^3.day	0.35	0.27	0.25	0.25	0.32	0.32	0.32	0.53	0.7	1.46	0.65
Mixed Liquor Suspended Solids	mg/L	3285	3389	2,372	2,643	2,969	2,696	1,830	1,467	2,309	2,002	2,215
Flow through Seawall Gates	ML	0	3278	3,187	2,004	2,908	4,751	5,227.9	-	-	-	-
Secondary Treatment Effluent												
Secondary Effluent Daily Average Flow	ML/day	637.3	559.6	654.9	548.7	576.9	632.4	625.7	571.2	614.7	627.7	692.0
TSS	mg/L	14.7	8.0	5.2	6.4	10.1	8.2	8.0	8.4	11.1	7.8	8.7
TSS Loading Rate	kg/day	9336	4453	3,415	3,489	5,021	5,021	4,981	4,810	7,009	4,614	6,041
cBOD5	mg/L	7.3	4.7	4.1	4.3	5	4.6	8.5	6.9	7.0	5.3	4.7
cBOD5 Loading Rate	kg/day	4668	2627	2,668	2,381	2,838	2,837	5,262	3,926	4,298	3,131	3,239
TP	mg/L	0.8	0.7	0.7	0.7	0.8	0.8	0.6	0.6	0.6	0.7	0.7

APPENDIX C – Historical Performance Data

Parameters	Units	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
TP Loading Rate	kg/day	487	376	458	365	495	495	330	330	389	407	482
Escherichia Coli (E. Coli)	CFU/100 mL	32.0	25.6	53	36.8	66.5	7.4	90.0	31.3	35.9	3.0	1.9
pH	-	7.1	7.0	6.8	6.8	7.0	7.0	7.2	7.2	7.3	7.0	7.0
Total Residual Chlorine	mg/L	0.5	0.6	0.6	0.6	0.5	0.8	1	0.6	0.64	0.9	0.9
Total Kjeldahl Nitrogen (TKN)	mg/L	10.4	6.2	5.0	3.8	6.7	7.3	14.5	14.4	15.8	18.4	19.1
Total Ammonia Nitrogen	mg/L	10.9	6.0	4.6	3.3	5.3	5.9	11.2	13.8	13.7	16.9	17.2
Nitrate + Nitrite	mg/L	14.4	17.4	17.1	18.5	17.0	16.3	13.1	17.1	15.6	13.2	9.9
Temperature	degrees Celsius	19.7	21.0	20.2	20.9	20.1	19.5	20.2	19.7	19.3	20.6	20.5
Final Effluent												
TSS	mg/L	15.0	8.1	5.4	6.5	10.4	9.2	-	-	-	-	-
cBOD5	mg/L	7.9	4.7	4.1	4.4	5.2	5.0	-	-	-	-	-
TP	mg/L	0.8	0.7	0.7	0.7	0.8	0.8	-	-	-	-	-
Solids Handling												
Primary Sludge Treated	m^3/day	5429	5978	5,640	6,420	4,440	4,292	5,067	5,546	6,900	6,590	5,767
Primary Sludge Total Solids (TS)	%	2.3	2.3	2.5	2.6	3	3.05	2.9	2.72	2.60	3.18	2.68
Primary Sludge Total Volatile Solids (TVS)	%	71.6	73.9	73	73.8	73.5	72.9	62.9	74.9	73.4	92.4	70.4
Waste Activated Sludge (WAS) co-settled in Primary Clarification Tanks or excess WAS to Aeration	m^3/day	1795	911	1,260	2,130	1,240	2,405	8,800	14,523	35,288	20,809	18,092
WAS to Thickening	m^3/day	7910	6944	7,380	7,360	8,470	8,163	10,469	9,665	8,992	11,279	12,308
WAS TS	mg/L	0.9	0.8	0.7	0.7	0.8	0.82	0.54	0.49	0.69	1.03	0.72
Thickened WAS (TWAS) Treated	m^3/day	2119	1952	1,440	1,600	2,090	2,366	876	677	980	1,064	1,851
TWAS TS	%	3.5	3.6	3.7	3.4	3.3	3.4	4.8	4.6	4.8	4.3	4.5
TWAS TVS	%	73.8	73.9	73.2	71.6	71	72.9	69.1	72.0	71.9	71.7	71.2
Volume to Digestion	m^3/day	7548	7930	7,080	8,020	6,530	6,658	5,933	6,222	5,900	7,634	7,617
Digesters Hydraulic Retention Time	days	20.0	19.3	20.2	18.1	23.3	23.1	21.8	21.1	19.1	16.6	16.2

APPENDIX C – Historical Performance Data

Parameters	Units	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Organic Loading to Digesters	TVS per m3 of digester capacity per day	1.0	1.0	0.9	1.1	1.0	1.0	2.1	1.3	-	-	-
Digester Gas Volume	m^3/day	65698	61856	61,640	62,330	64,560	65,921	77,781	115,174	60,782	63,100	71,483
Dewatering Centrifuge Feed TS	%	1.7	1.6	1.7	1.8	1.8	1.8	1.8	1.7	2.0	1.8	2.2
Dewatered Biosolids TS	%	27.7	27.9	27.9	28.1	27.7	26.5	27.8	28.3	28.3	28.0	28.0
Centrate Quality	mg/L	626	428	299	319	665.32	2091	1959	1196	5921	5066	5614
Solids Capture Rate	%	96	97	98	98	96.44	88	77	96	70	70	75
Centrifuge Run Time	hours	51226	52790	52,400	52,329	48,049	43,507	51,451	102,922	77,844	57,995	56,760
Biosolids Management	wet tonnes/year	154656	155756	159,288	149,733	145,321	143,190	142,908	139,562	129,213	134,185	136,629

APPENDIX D – Secondary Treatment Effluent Parameters (Leachate Related)

APPENDIX D: Secondary Treatment Effluent Parameters (Leachate Related)

Quarterly Average	Boron	Cobalt	Magnesium	Manganese	Potassium	Strontium	Bis(2-ethlhexyl) Phthalate
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
Q1	0.103	*0.002*	14.9	0.0544	13.3	0.223	*0.25*
Q2	0.108	*0.002*	15	0.0465	10.7	0.291	*0.25*
Q3	0.129	*0.002*	13.3	0.0803	10.8	0.253	
Q4	0.116	*0.002*	15	0.0489	13.4	0.242	*0.25*

Data in red italics is half the MDL.

APPENDIX E - Influent and Effluent Metal Concentrations

APPENDIX E – Influent and Effluent Metal Concentrations

Influent (Daily Composite tested once/month for metals)

Parameters	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
January	*0.005*	*0.002*	0.00517	*0.002*	0.128	2.89	*0.0025*	0.0603	*0.00005*	0.005	0.124
February	*0.005*	*0.002*	0.00435	*0.002*	0.0934	2.16	*0.0025*	0.0553	*0.00005*	*0.0025*	0.1
March	*0.005*	*0.002*	0.00415	*0.002*	0.0866	2.27	0.00786	0.0652	*0.00005*	*0.0025*	0.103
April	*0.005*	*0.002*	0.00534	*0.002*	0.0849	2.11	0.00566	0.0561	*0.00005*	*0.0025*	0.0969
May	*0.005*	*0.002*	0.00497	*0.002*	0.0714	1.78	0.00672	0.0523	*0.00005*	*0.0025*	0.0808
June	*0.005*	*0.002*	0.00412	*0.002*	0.0648	1.63	0.0025	0.0549	*0.00005*	*0.0025*	0.0829
July	*0.005*	*0.002*	0.00469	*0.002*	0.0832	2.15	0.0025	0.0613	*0.00005*	*0.0025*	0.098
August	*0.005*	*0.002*	0.00408	*0.002*	0.0965	2.27	0.0025	0.0602	0.00021	0.00512	0.113
September	*0.005*	*0.002*	0.00431	*0.002*	0.104	2.28	0.00603	0.0599	0.00016	*0.0025*	0.119
October	*0.005*	*0.002*	0.0166	*0.002*	0.136	2.9	0.00592	0.073	0.00005	0.0115	0.647
November	*0.005*	*0.002*	0.0054	0.00407	0.0154	5.85	0.00782	0.248	0.00026	*0.0025*	0.268
December	*0.005*	*0.002*	0.00778	*0.002*	0.0952	4.34	0.00515	0.0612	0.00005	*0.0025*	0.1
Annual Average	***0.005***	***0.002***	**0.0059**	**0.0022**	**0.0883**	**2.7192**	**0.0048**	**0.0756**	**0.0001**	**0.0037**	**0.1611**

Data in red italics is half the MDL

APPENDIX E – Influent and Effluent Metal Concentrations

Final Effluent (Daily Composite tested once/month for metals)

Parameters	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Strontium	Zinc
Units	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	0.005		0.002	0.002	0.002	0.0209	0.465	0.0025	0.0575	0.00005	0.0025		0.0279
February	0.005	0.106	0.002	0.002	0.002	0.0105	0.471	0.0025	0.0544	0.00005	0.0025	0.223	0.027
March	0.005		0.002	0.002	0.002	0.00939	0.582	0.0025	0.0576	0.00005	0.0025		0.0241
April	0.005		0.002	0.002	0.002	0.00888	0.58	0.0025	0.0504	0.00005	0.0025		0.0238
May	0.005	0.108	0.002	0.00552	0.002	0.0091	0.627	0.0025	0.0465	0.00005	0.0025	0.291	0.0238
June	0.005		0.002	0.002	0.002	0.0121	1.35	0.0025	0.0512	0.00005	0.0025		0.0262
July	0.005		0.002	0.002	0.002	0.00761	0.931	0.0025	0.0488	0.00005	0.0025		0.01
August	0.005	0.129	0.002	0.002	0.002	0.00726	0.82	0.0025	0.0803	0.00005	0.0025	0.253	0.01
September	0.005		0.002	0.002	0.002	0.00919	0.945	0.0025	0.0861	0.00005	0.0025		0.0368
October	0.005		0.002	0.002	0.002	0.0127	1.34	0.0025	0.0622	0.00005	0.0025		0.0366
November	0.005	0.116	0.002	0.002	0.002	0.00762	0.599	0.0025	0.0489	0.00005	0.0025	0.242	0.0279
December	0.005		0.002	0.002	0.002	0.0138	1.02	0.0025	0.0506	0.00005	0.0025		0.0294
Annual Average	**0.005**	**0.1148**	**0.002**	**0.0023**	**0.002**	**0.0108**	**0.8108**	**0.0025**	**0.0579**	**0.0001**	**0.0025**	**0.2523**	**0.0253**

Data in red italics is half the MDL

APPENDIX F – Biosolids Analysis

APPENDIX F – Biosolids Analysis

Ashbridges Bay Treatment Plant - Summary of Dewatered Biosolids Analysis for 2019

Dewatered Cake	January	February	March	April	May	June	July	August	September	October	November	December	Max Allowable Dry Wt Conc mg/Kg [1]	Annual Average
TKN	52,550	51,750	49,150	48,850	46,600	46,750	49600	48,450	49,050	53,750	56,000	52,600		50,425
Ammonia(N)	7,400	8,765	7,100	7,095	8,115	7,465	6,215	5,925	5,630	6,935	6,165	6,515		6,944
Nitrate as N	3.45	19.60	11.55	11.75	5.60	2.45	4.40	7.05	14.70	0.70	0.15	1.84		6.94
Nitrite as N	1.70	4.55	3.60	6.25	6.00	7.45	11.85	9.65	9.15	1.02	2.29	1.68		5.43
As	2.055	2.685	2.425	0.833	3.005	1.35	1.265	2.55	2.295	2.765	2.43	2.69	**170**	2.20
B**	16.05	17.8	15.35	12.6	13.65	10.8	11.75	11.4	11.6	16.15	20.95	22.35		15.0
Cd	0.91	1.09	1.08	0.80	0.84	0.79	0.65	0.73	0.76	0.72	0.72	0.81	**34**	0.83
Cr	63.1	59.5	62.0	61.3	67.1	75.7	65.4	76.7	77.6	69.2	113.0	97.65	**2,800**	74.0
Co	3.26	3.81	4.08	3.83	3.54	3.65	3.70	5.82	4.24	3.55	3.98	4.19	**340**	3.97
Cu	717	674	649	651	634	635	652	687	677	682	662	674	**1,700**	666
Pb	33.4	33.7	39.1	37.6	44.6	38.6	36.5	37.0	35.3	32.0	35.7	40.7	**1,100**	37.0
Mn	253	266	287	300	295	309	297	248	251	237	252	282		273
Hg	0.41	0.45	0.48	0.38	0.49	0.42	0.40	0.40	0.39	0.41	0.42	0.50	**11**	0.427
Mo	8.79	8.46	7.92	7.47	7.43	8.14	9.18	9.57	9.17	9.20	9.84	9.5	**94**	8.72
Ni	24.8	21.9	23.3	24.0	25.6	28.7	24.7	34.8	38.9	28.8	43.7	30.8	**420**	29.1
Total P	32,750	30,900	32,100	30,900	29,950	29,500	28,950	27,550	28,350	30,950	27,550	31,900		30,113
K	1160	1235	1140	1120	1155	1100	1050	1090	1080	1105	1145	1185		1130
Se	3.22	3.33	3.33	3.60	3.07	3.25	3.47	3.16	2.99	3.36	2.97	3.03	**34**	3.23
Zn	616	626	583	566	560	584	606	655	663	622	602	597	**4,200**	606
TS%	26.9	26.7	27.3	27.5	28.5	28.8	27.8	27.5	29.4	28.1	27.3	26.5		27.7
VS%	67.9	66.8	65.5	64.7	61.8	61.6	63.0	63.6	62.5	63.4	63.4	63.6		64.0
E. Coli	552,510	274,424	213,772	506,663	559,369	712,584	723,080	1,627,609	734,675	934,693	482,619	673,084	**2,000,000**	666,257

APPENDIX G – Odour Reduction Plan

ODOUR REDUCTION PLAN – Status as of December 31, 2019

1. Program Summary

The details of the Odour Reduction Plan status including odour reduction activities, scheduled completion, and estimated emissions reductions of odour are summarized in the following sections. The plan provides details for Phases I and II, as required under Environmental Compliance Approval (ECA) (Air) number 2815-9PWTWV, dated January 15, 2015. The facility currently operates under this ECA (Air).

The goal of the Odour Reduction Program is to reduce the plant-wide odour and Total Reduced Sulphur (TRS) impact beyond the plant property. The program achieves this with a combination of air capture and ventilation, improved dispersion, process changes, and treatment. Of these, only process changes and treatment have the potential to reduce odour emissions. For all new odour sources, odour and TRS emissions were estimated on a conservative basis and are not necessarily reduced at each implementation step. However, the overall odour and TRS impact is always reduced, thus meeting the objectives of the odour reduction program.

Following each project, phase emission sampling will be performed and impact assessment will be calculated as required by the ECA (Air).

2. Phase I Scope by Building

The building-by-building details of the odour reduction activities for Phase I are presented in this section for the Ministry's information. The current status of the activities and estimated completion dates have been updated to reflect the current project status.

2.1 T Building

The scope for the T Building includes:

- New air collection and ventilation system
- Re-use of existing activated carbon scrubber
- 3 new roof stacks, all 4m above roof (wet well, dry Well, and scrubber)
- Monument Building – new activated carbon scrubber

	Odour (impact)	TRS (emission)
Previous	0.34 OU	3.43E-03 g/s
Current	0.34 OU	3.43E-03 g/s
Project Status	In Operation	
Completion Date	Completed 2012	

2.2 M Building

The scope for the M Building includes:

- New ventilation system
- Installation of new activated carbon scrubber
- One new exhaust stack

	Odour (impact)	TRS (emission)
Previous	0.32 OU	5.49E-03 g/s
Current	0.32 OU	5.49E-03 g/s
Project Status	In Operation	
Completion Date	Completed 2012	

2.3 Aeration Tanks

The scope for the Aeration Tanks includes:

- Process aeration air capture and exhausted to incinerator stack

	Odour (impact)	TRS (emission)
Previous	306 OU	2.23E-01 g/s
Current	1.8 OU	2.23E-01 g/s
Project Status	In Operation	
Completion Date	All construction completed in 2014. Process air capture and exhaust completed in 2013.	

2.4 D Building

The scope for the D Building includes:

- New enclosed loading bay
- New ventilation systems
- Odour segregation and treatment including collection of air from channels, weirs, grit tanks and screens for biological odour treatment
- New biofilter with 35 m stack
- New 40 m stack for dispersion of air from primary clarifiers building

	Odour (impact)	TRS (emission)
Previous	12.5 OU	2.55E-02 g/s
Current	3.5 OU	2.55E-04 g/s
Project Status	In Operation	
Completion Date	Completed 2014	

3. Phase II Scope by Building

3.1 Truck Loading Facility Biofilter

The scope for the Truck Loading Biofilter includes:

- Replacement of the existing biofilters
- Future conveyance of odourous air from WAS thickening to biofilter
- A new dedicated 20m stack for dispersion of treated air

	Odour (impact)	TRS (emission)
Current	9.6 OU	2.67E-02 g/s
Future	0.62 OU	2.67E-02 g/s
Project Status	Under Construction	
Completion Date	Completed 2018	

3.2 P Building

The proposed upgrade of P Building is part of the City's overall strategy to rehabilitate and modernize aging infrastructure, enhance treatment processes, as well as to reduce odours emitted from the facility. In general, this upgrade comprises of the following:

- Selective odour collection of the primary clarifiers 7 to 9
- Odour segregation / treatment and a new odour collection system for the head works
- A new biofilter and stack

	Odour (impact)	TRS (emission)
Current	243 OU	1.32E-01 g/s
Future	106 OU [1]	1.22E-02 g/s
Project Status	Under Construction	
Estimated Completion Date	December 2020	

[1]The odour impact assessment of the P building has increased from 17.3 OU to 106 OU due to the primary clarifier 7 to 9 design scope change. After the completion of this project and the other Phase I and Phase II Odour projects, the City will reassess the odours at the facility to determine next steps.

4. Operational Initiatives

Plant staff implemented a number of operational changes to reduce odour. Below is a list of what's been done so far and what is on-going:

Odour initiative	Timing	Benefit
Regular replacement of activated carbon scrubber media for various locations.	On-going	Ensures existing odour control equipment operate at maximum efficiency.
Biosolids inventory management	On-going	Keeping in-plant biosolids inventory as low as possible reduces likelihood of septic conditions in certain open tanks.
Good housekeeping	On-going	Includes ensuring tanks taken out of service for maintenance are quickly washed down.
Odour Facility Re-Assessment	2021	The Facility's odour performance will be reassessed after all Phase I and Phase II Odour Projects are complete

APPENDIX H – Maintenance Activities

Preliminary and Primary Treatment (Work Area 1)

Work Area 1 includes two raw sewage pumping stations (M and T Buildings), preliminary treatment areas (P and D Buildings), and three primary treatment areas (Primary Clarification Tanks No. 1 to 6, Tanks No. 7 to 9, and Tanks No. 10 to 12). The following maintenance was completed in 2019 for Work Area 1.

- Repair P Building leaking screenings washer compactor No.3
- Replace conveyor screws in D Building screenings washer compactors
- Overhaul and replace screw conveyor in grit tank No. 13
- Replace screws in D Building dewatered grit conveyors
- Repair D Building Screen Diversion Gate
- Repair D Grit Tanks Diversion Gate
- Repair Grit Tank No. 16 Effluent Gate
- Overhaul and replace D Building screenings grinder
- Rebuild D Building Screenings Transfer Pump
- Replace pump and line
- Repair/overhaul D Building Screen No. 4
- Repair D Building biofilter irrigation system
- Replace gearbox in Primary Tank No.7 scum cross collector
- Repair Primary Tank No. 9 misaligned bridge (PS#9)
- Repair primary sludge pump for Primary Tank No.3/4
- Repair motor in primary sludge pump for Primary Tank No.9
- Install density meter on OPS primary sludge line No. 2
- Troubleshoot OPS Gallery sump pump
- Repair broken pipe hopper no.1 in Primary Tank No. 11
- Repair leaking pipe in D Building scum hopper
- Install piping system and install level sensor to convert standby tank into ferrous chloride storage tank in D Building
- Overhaul M Building Pump Station Bosker Screens
- Clean plugged Screen in M Building

Secondary Treatment (Work Area 2)

Work Area 2 includes eleven Aeration Tanks, eleven Final Clarification Tanks, and the Plant Water System. The following maintenance was completed in 2019 for Work Area 2.

- New flow meter installation on the plant water line to aeration blowers oil cooling system (heat exchanger)
- Replacement of the old gland water header pipe with new stainless steel pipe in aeration gallery
- Repair leakage in aeration piping

- Lubrication and adjustment of inlet guide vane for blower 4011
- Repair and refurbish RAS Pump 3622
- Repair and replace motor bearing of RAS Pump 3322
- Replace Heat Exchangers for Blower No.7
- Replace Heat Exchanger for Blower No. 5
- Repair Sluice Gates on North and South Effluent Conduit
- Sludge collector repairs and major maintenance of Secondary Clarifier No.8
- Cleaning and repair Secondary Clarifier No. 11
- Cleaning and rotation testing of Blower No. 2 and No.1
- Repair of Ferrous Chloride Transfer Pump
- Troubleshoot and repair aeration tank odour control fan
- Repair air leakage in air header to Tank no.1
- Repair insulation on aeration header

Dewatering (Work Area 3)

Work Area 3 includes the Centrifuges, Schwing Silo Pumps, Polymer/Sludge Feed Pumps and all electrical control equipment for dewatering operations. The following maintenance was completed in 2019 for Work Area 3.

- Overhauled glycol pump on Dewatering HVAC system
- Install total solids analyzer on centrate line
- Replace level transmitters in Equalization Tank No.1 and Sludge Holding Tank No.2
- Replace VFD drive and replace bearings and housing for Centrifuge No. 3
- Troubleshoot and repair leaking issues in Centrifuge No.4
- Overhaul Centrifuges No. 4, No.5 and No. 10
- Troubleshoot and repair vibration issues on Centrifuge No. 11
- Troubleshoot and repair vibration issues on Centrifuge No. 12
- Replace broken bearing in cake conveyor No. 2
- Repair broken screw conveyor in Dewatered Cake Pump No.3
- Trouble shoot and repair back drive motor on Centrifuge No.9
- Repair leaking Dewatered Cake Pump No.1
- Replace screw conveyor, replacement of hydraulic system and replace rams in Dewatered Cake Pump No.2
- Overhaul of Dewatered Cake Pump No.3 and Dewatered Cake Pump No.4
- Complete overhaul of Polymer Feed Pumps No.2.4.6 and 10
- Replace hydraulic cylinder for Dewatered Cake Pump No.4
- Repair hydraulic system for Dewatered Cake Silo No.2 sliding frame
- Overhaul centrifuge sludge feed grinders No.4 and No.10
- Overhaul centrifuge sludge feed pumps No.4 and No.10

- Cleaning of Equalization Tanks No.1 and No.2
- HYDROFLOW struvite trial
- Plant effluent water strainers filter replacement
- Modify mechanical seal cooling water line on centrifuge feed pumps No.1 to 12. Polymer trial for procurement contract

Solids Handling (Work Area 4):

Work Area 4 includes Disinfection, the Biosolids Storage Silos, Sludge Cake Transfer Pumps, Truck Loading Facility and Biofilters, Odour Control Building, and maintenance for the Lab Building. The following maintenance was completed in 2019 for Work Area 4.

- Silo's transition hopper replacement for Schwing pump #2
- Schwing #2 screw feeder & casing replacement
- Schwing #2 & #3 HPP's hydraulic hoses replacement
- Screw feeder main gear box overhaul and installation
- Differential cylinder replacement on Schwing pump #3
- Sliding frame's hydraulic cylinder replacement on Silo #3
- Oil cooler repair and maintenance for six hydraulic power packs
- Schwing pump #2 top & bottom differential cylinder alignment
- Fabrication completion of replacement oil tank for hydraulic power pack
- Schwing pump #1 hydraulic pump replacement on small & big power pack
- Sliding frame's wear bar inspection in Silo #3
- Silo #2 gate valve (#6070) replacement
- Transition hopper relieve valves added on to prevent high back-pressure build-up
- Hopper gate valves 353 and 359 replacement
- New generator added to Hypo system
- Hypo tank emptied and inspected. Reinforcement arms were installed.
- Protection timer installed on the transfer-pump panel to reduce the chances of the overfill spill.
- LED hopper level displays installed at the entrance of loading bays.
- New communication feature on SCADA for TLF RPU-1207/1208 added to prevent the overflow at the loading bay head boxes.

Digestion, Air Flotation, and Bio-Gas (Work Area 5)

Work Area 5 includes twenty Anaerobic Digesters, ten DAF tanks and three Waste Gas Burners. The following maintenance where completed in 2019 for Work Area 5.

- Replace Digester Gas Compressor No.5 with new.
- Repair noisy Digester Gas Compressor No.6

- Troubleshoot vibration issue and eventual replacement of Gas Compressor No. 4
- Clean plugged Digester No.4 Sludge Recirculation Pump
- Overhaul Digester No.21 Sludge Recirculation Pump
- Major repair on Digester No. 2 Sludge Transfer Pump
- Clean flame arresters and thermal valves on Digester No.13 gas trains.
- Clean plugged primary sludge line to digesters.
- Clean flame arresters and thermal valves on Digester No.15 gas trains.
- Rebuild Floatation Tank No.4
- Repair skimmer on Floatation Tank No.5
- Replace shafts, bearings and axle on Floatation Tank No.7

Boilers, Air Compressors, and HVAC (Work Area 6)

Work Area 6 includes the plant-wide hot water system, heating, ventilation, and air conditioning (HVAC), and instrument air compressors (Auxiliary Building). The following maintenance was completed in 2019 for Work Area 6.

- Repair leaking air handling unit in Floatation Building
- Replace heating coils in T Building
- Repair leaking heat exchangers in D Building
- Install convection heaters in Dewatering Building
- Repair leaking feed water pump for Boiler No.1
- Replace leaking mechanical seals on feed water pump for Boiler No.3
- Install new motor on hot water circulating pump in Z Building
- Repair leaking hot water/glycol recirculating pump in D Building
- Repair glycol circulating pump in Dewatering Building
- Repair hot water circulating pump in Digester 13-16 Complex
- Repair expansion joint in primary hot water heating loop
- Replace Victaulic gaskets on secondary hot water heating loop in Biosolids Building
- Repair leaks in plant wide compressed air loop
- Replace and modify roof dampers in Boiler Room to meet TSSA compliance.
- Overhaul gas compressor No.3
- Replace Pressure Relief Valves on Digester Gas train

Consumables, Mechanical and Welding, Grounds Keeping and Licensed Vehicles (Work Area 7)

Work Area 7 includes consumables, mechanical and welding, grounds keeping, licensed vehicles, and maintenance for the Training Centre. The following maintenance was completed in 2019 for Work Area 7.

Machine Shop

- Fabricated pump casing rings and sleeves, collector mechanism parts for floatation, pump shafts and gate nuts;
- Rebuild blower pump at N T plant
- Fabricated circulation pump parts
- Fabricate parts in welding shop for various work areas.

Fire Protection and Safety

- Replaced obsolete fire panels with modern and efficient panels in dewatering building.
- Replaced corroded sprinkler line in 13/16 digester for improvement area safety.
- Relocated fire pump in Z building to avoid freezing of fire line during winter months.
- Installed 8 new fire extinguishers cabinets to improve durability in Ferric Gallery of Aeration.
- Installed new fire hose cabinets and fire extinguishers in new P building.
- Installed new fire extinguishers in MCC room outside of M& T building, Compressor room, and gas control building.
- Bumpers installed on the roads throughout the plant to reduce speed in critical crossing areas.

City Water Backflow Preventers (BFP)

- Attending all service calls and repairing done on priority basis.
- Relocated and twin BFP"s installation which improved capacity and efficiencies
- Replaced 957 RPDA BFP with more stable and efficient 909 RP model with same capacity in polymer room
- Replace existing single BFPs with parallel units in Blower building basement

Elevators

- Coordinate with the Auxiliary building elevator drive replacement and car top modifications with upgrade version.
- Coordinate with the upgrading of the door seal on the large incinerator elevator.
- Upgraded elevator in Administration Building to eliminate down time.

Electrical Department (Work Area 8)

WA8 Electrical and Instrumentation department provides support to process and non- process activities across the facility at the ABTP and NTTP. Below is a number of maintenance activities that was completed in ABTP for the year 2019.

- Installed emergency LED lights throughout Z- building and replace all lighting fixtures in non-process areas within Z Building with LEDs.
- Installed new cables in the administration kitchen areas to accommodate the new kitchen upgrades.
- Built up floodlight pole, electrical circuit, control system, floodlights in the area of east and west by pass sampler.
- Mogen maintenance repairs and inspection.
- T-building feeder repairs.
- Repaired north gate, replaced manual key switch and hydraulic cylinder.
- Fabricated plate with support and installed solar lighting plant wide.
- Installed and tested D Building flow meter.
- Investigated, diagnosed and repaired DC power supply, flowmeter display and connected control signals to RPU in M Building.
- Investigated, diagnosed, repaired and tested sump pump control system wiring in Digester No.5-8 Complex.
- Rebuilt two auto sampler due to faulty bearing, rpm sensor position offset, faulty wire connection.
- Troubleshoot auto sampler for primary North effluent conduit due to loss of sample collection.
- Installed a new 30amps 600V breaker in City of Toronto trailer for City employees.
- Installation of Bridgeport insulated split rubber bushings in all the portable generators plant wide to ensure that the power cables would not be damaged.
- Replaced Gas Monitor Detector in generator for Digester 13-16 Complex.
- Replaced safety switch breakers in selected areas.
- Repairs and maintains the PA system across the facility, including Guna's office, laboratory and construction trailers.
- Replaced 18 UPS systems as an upgrade to the plant wide PA system.
- Replaced the VFD and ECM components in Generator No. 2.
- Designed and developed an assimilated electrical and instrument testing panel that is being used for the practical testing for the EICT candidates.

APPENDIX I – Staff Training Courses

APPENDIX I –Staff Training Courses

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2019 includes the list of courses below.

Capital Projects Training

- ABTP - NEW WASTE GAS BURNER PHASE 2
- ABTP - OTJ M & T BLDGS
- ABTP - POLYMER TRIALS DEWATERING
- ABTP - PRU BUILDING AUTOMATION SYSTEM (BAS)
- ABTP - PRU CHEMICAL DOSING SYSTEM
- ABTP - PRU CHEMICAL TRANSFER SYSTEM
- ABTP - PRU CONDUCTIVITY ANALYZERS
- ABTP - PRU EMERGENCY PLUMBING FIXTURES- EYE WASH STATION
- ABTP - PRU FYBROC CHEMICAL CONTAINMENT PUMPS
- ABTP - PRU GLYCOL HEATING PUMPS
- ABTP - PRU HAAKON CUSTOM AIR HANDLING UNITS (AHUS)
- ABTP - PRU HAYWARD GORDEN CHEMICAL STRAINING SYSTEMS
- ABTP - PRU HVAC FANS AND ACCESSORIES
- ABTP - PRU MAGNETIC FLOW METERS
- ABTP - PRU PHOSPHORUS REMOVAL UPGRADES
- ABTP - PRU SCADA SYSTEM

Health and Safety Training

- ABTP - SIGNIFICANT INCIDENTS OR EVENTS NOTIFICATION
- ABTP - TAILGATE DESIGNATED SUBSTANCES
- ABTP - TAILGATE DISTRACTED DRIVING
- ABTP - TAILGATE EQUIPMENT SAFETY INSPECT IT BEFORE YOU USE IT
- ABTP - TAILGATE EYEWASH STATION AND EMERGENCY SHOWERS
- ABTP - TAILGATE HEAD PROTECTION HARD HATS
- ABTP - TAILGATE HEAT STRESS
- ABTP - TAILGATE MSD AWARENESS
- ABTP - TAILGATE PREVENTING BACK INJURIES
- ABTP - TAILGATE SAFE LIFTING
- ABTP - TAILGATE SLIPS TRIPS FALLS
- ABTP - TAILGATE STACK INTENSITY STROBE LIGHTING
- ABTP - TAILGATE TICK BITE SAFETY & PREVENTION
- ABTP - TAILGATE WINTER DRIVING
- ABTP - TAILGATE WORKING ALONE
- AIR PURIFYING RESPIRATORS (2017)
- ANTI-OPPRESSION IN THE WORKPLACE
- AODA - IASR GENERAL REQUIREMENTS
- AODA - OHRC
- ARC FLASH FOR NON-QUALIFIED PERSONS (2017) ASBESTOS AWARENESS
- BASIC SPILL RESPONSE

APPENDIX I –Staff Training Courses

- CHAINSAW SAFETY AWARENESS (2019-2022)
- CHLORINE SAFETY / "B" KIT (2019-2021)
- CONFINED SPACE AWARENESS
- CONFINED SPACE AWARENESS ½ DAY (2019-2021)
- CONFINED SPACE RESCUE – 2 DAY
- CONFINED SPACE RESCUE UPGRADE
- DESIGNATED SUBSTANCES (2019-2022)
- ELECTRICAL SAFETY FOR DISTRICT OPERATIONS AND MAINTENANCE OPERATORS (2019-2021)
- ELECTRICAL SAFETY FOR MAINTENANCE STAFF (2019-2021)
- ELECTRICAL SAFETY IN THE WORKPLACE (CSA Z462-18)
- EMERGENCY FIRST AID LEVEL 'A' CPR (2019-2021)
- FALL PROTECTION AWARENESS
- FALL PROTECTION IN AN INDUSTRIAL WORK SETTING
- FIRE EXTINGUISHER TRAINING
- FIRE HYDRANT & VALVE – OPERATION, INSPECTION, MAINTENANCE AND INSTALLATION
- HEALTH AND SAFETY ASPECTS OF CONTRACTS FOR SERVICES
- HEALTH AND SAFETY COMPETENCY FOR FRONT-LINE SUPERVISORS
- HEALTH AND SAFETY COMPETENCY FOR FRONT-LINE SUPERVISORS: ONE-DAY REFRESHER
- HOT WORK PERMIT SYSTEM AWARENESS (2019-2021)
- INCIDENT REPORTING (2017)
- IN-SERVICE HEALTH AND SAFETY ORIENTATION
- JOINT HEALTH AND SAFETY COMMITTEE (JHSC) CERTIFICATION TRAINING – CERTIFICATION REFRESHER
- JOINT HEALTH AND SAFETY COMMITTEES - (JHSC) CERTIFICATION TRAINING PART I - BASIC
- JOINT HEALTH AND SAFETY COMMITTEES - (JHSC) CERTIFICATION TRAINING PART II - WORKPLACE SPECIFIC HAZARD TRAINING
- LOCK OUT, TAG OUT AND TEST AWARENESS (2019-2021)
- MMR – SELF-CONTAINED BREATHING APPARATUS (2018-2020)
- MOULD AWARENESS (2019-2022)
- POWERLINE SAFETY AWARENESS
- SAFETY IN A HIGH VOLTAGE ENVIRONMENT (2019-2021)
- SCAFFOLD SAFETY (2019-2021)
- SLIPS, TRIPS AND FALL PREVENTION
- STANDARD FIRST AID – LEVEL "C" CPR & AED – 2 DAY (2019-2021)
- TRENCHING AND EXCAVATION AWARENESS (2019-2021)
- WHMIS 2015 ELEARNING MODULE
- WORKER HEALTH AND SAFETY AWARENESS IN 4 STEPS
- WORKING AT HEIGHTS (2019-2021)
- WORKING AT HEIGHTS REFRESHER
- WORKPLACE VIOLENCE LEGISLATION & POLICY REVIEW

Site Specific Training

- ABTP - BINDER VALVE
- ABTP - ERIS GENERAL TRAINING
- ABTP - FLEX HOURS CANCELLATION

APPENDIX I –Staff Training Courses

- ABTP - LEAN SEMINAR SERIES DAY 1
- ABTP - MANAGING ASBESTOS AND OTHER DESIGNATED SUBSTANCES IN CONSTRUCTION AND INDUSTRIAL WORK
- ABTP - MIXING PUMP MECHANICAL SEAL
- ABTP - MOBILE ELEVATING WORK PLATFORM

Mandatory Tailgate

- INJURY REPORTING (February 2019 Tailgate)
- SEWAGE WORKS & SURFACE WATER SPILL RESPONSE AWARENESS (May 2019 Tailgate)
- PSYCHOSOCIAL PROGRAM AND RISK ASSESSMENTS (August Tailgate)
- CORPORATE SECURITY: SURVIVING AN ACTIVE SHOOTER (November 2019 Tailgate)

Technical Training

- ABTP - SCHWING BIOSET KSP SERVICE TRAINING
- ABTP - VEGA LEVEL TRANSMITTER
- ACTIVATED SLUDGE
- BACKFLOW PREVENTION AWARENESS (2019-2021)
- BASIC VIBRATION ANALYSIS
- CENTRIFUGAL AND POSITIVE DISPLACEMENT PUMP OPERATION
- CHLORAMINATION, NITRIFICATION AND CYANOTOXINS IN WATER TREATMENT AND DISTRIBUTION SYSTEM
- CRITICAL PUMP MAINTENANCE, PACKING & MECHANICAL SEALS
- DIGESTOR'S AND THE SLUDGE DIGESTION PROCESS
- DISINFECTION OF POTABLE WATER PIPING (2016)
- DRINKING WATER QUALITY MANAGEMENT STANDARD
- ELECTRICAL AWARENESS
- GIS BASICS
- INDUSTRIAL MAINTENANCE TECHNICIAN- MECHANICAL & ELECTRICAL (IMT-M & E)
- MATHEMATICS FOR OPERATORS: MODULE 1 (2019-2021)
- MATHEMATICS FOR OPERATORS: MODULE 2 (2019-2021)
- PLANT AND DISTRIBUTION VALVE OPERATION AND MAINTENANCE
- SAMPLING & TESTING IN THE DISTRIBUTION SYSTEM (2019-2021)
- SOURCE WATER PROTECTION (2019-2021)
- VALVE ACTUATOR (2019-2021)
- WACHS™ VALVE OPERATORS
- WATER LEAK DETECTION LISTENING COURSE
- WATER SYSTEM REPAIRS: INTRODUCTION TO OXY-ACETYLENE CUTTING AND STICK WELDING (SMAW)
- WINTERWISE: THE COLD HARD FACTS ABOUT DISTRIBUTION SYSTEMS

Other Training

- ACCEPTABLE USE OF INFORMATION TECHNOLOGY ASSETS POLICY
- ACCESS TO INFORMATION AND PROTECTION OF PRIVACY
- ACCOUNTABLE CUSTOMER SERVICE

APPENDIX I –Staff Training Courses

- ACHIEVING GOALS - CREATING RESULTS!
- ADVANCED FORMATTING IN WORD 2013
- ADVANCED FORMULAS AND FUNCTIONS IN EXCEL 2013
- AN INTRODUCTION TO IBMS
- ATTENDANCE MANAGEMENT
- AUTOMATIC HYDRAULIC CONTROL VALVES
- BASICS OF STAFFING FOR HIRING MANAGERS/SUPERVISORS
- BECOME A GREAT LISTENER
- BUILDING INNOVATION CULTURES AND LEADERS
- BUILDING RESILIENCE WHILE FACING ADVERSITY IN WORK AND LIFE
- CAREER PLANNING IN TIMES OF CHANGE
- CISCO JABBER VOICE & INSTANT MESSAGING
- CLASSROOM REVIEW OF COMMON WEAR ITEMS FOR PLANT MACHINERY (2019-2021)
- COACHING FOR EFFECTIVENESS, IMPROVEMENT AND GROWTH
- COMPETENCY ASSESSMENT TUTORIAL FOR NON-UNION EMPLOYEES
- CONDUCTORS (2019-2021)
- CONFIDENTIALITY AGREEMENT
- CONFLICT RESOLUTION & NEGOTIATION SKILLS
- CONTENT SERVER - EDOCS
- CONTROLLING CONFLICT, STRESS, AND TIME IN A CUSTOMER SERVICE ENVIRONMENT
- COPING WITH SHIFT WORK (2019-2021)
- CREATING PRESENTATIONS IN POWERPOINT 2013 V2.0
- CUSTOMER CARE CENTRE INFORMATION, MUSCULO-SKELETAL DISORDER OVERVIEW, CONSTRUCTION CONTRACTOR SAFETY MANAGEMENT PROGRAM, AND GENERAL EMERGENCY RESPONSE PLAN TRAINING FOR WWT PLANT TECHS
- CUSTOMER SERVICE: HANDLING CHALLENGING CLIENTS
- DE-ESCALATION SKILLS FOR CONFLICT INTERVENTION
- DE-ESCALATION TECHNIQUES
- DELIVERING FEEDBACK
- DIFFICULT PEOPLE: STRATEGIES TO KEEP EVERYONE WORKING TOGETHER
- DIFFICULT PEOPLE: WHY THEY ACT THAT WAY AND HOW TO DEAL WITH THEM
- DOMESTIC/INTIMATE PARTNER VIOLENCE FOR SUPERVISORS
- EMOTIONAL INTELLIGENCE: BUILDING SELF-MANAGEMENT SKILLS
- EMOTIONAL INTELLIGENCE: OWNING YOUR EMOTIONS
- ESSENTIAL FINANCIAL PLANNING FOR RETIREMENT
- EXTERNAL TRAINING APPROVAL FOR MANAGERS
- EXTERNAL TRAINING FOR END-USERS
- FACING CHALLENGES AS A FIRST-TIME MANAGER
- HOW CULTURE IMPACTS COMMUNICATION
- HUMAN RIGHTS 101
- HUMAN RIGHTS IN THE WORKPLACE
- INCLUSIVE CUSTOMER SERVICE
- INTERCULTURAL COMMUNICATION
- INTERVIEW PROCESS AT THE CITY FOR HIRING MANAGERS/SUPERVISORS

APPENDIX I –Staff Training Courses

- INTRODUCTION TO CYBER SECURITY AWARENESS
- INTRODUCTION TO YOUR ROLE
- LEADERSHIP SKILLS FOR NON-MANAGERS
- LEADING THROUGH POSITIVE INFLUENCE
- LEADING YOUR TEAM THROUGH CHANGE
- LESSONS IN LEADERSHIP
- LOGBOOK ENTRY (2017-2019)
- MAKING AND CARRYING OUT TOUGH DECISIONS
- MAKING FEEDBACK A REGULAR OCCURRENCE
- MALWARE
- MANAGEMENT SUMMIT: ENGAGING EMPLOYEES AND BUILDING A POSITIVE WORKPLACE CULTURE
- MANAGING EMPLOYEES WITH HEALTH ISSUES: INFORMATION, TOOLS AND RESOURCES
- MANAGING HUMAN RIGHTS AND RESPONDING TO COMPLAINTS
- MANAGING LABOUR RELATIONS: AN INTRODUCTION
- MANAGING MULTIGENERATIONAL EMPLOYEES
- MANAGING THROUGH A LABOUR DISRUPTION
- MASTERING ACTIVE LISTENING IN THE WORKPLACE
- MOTIVATING YOUR EMPLOYEES
- ONENOTE 2013 FUNDAMENTALS
- OUTLOOK 2013 - INCREASE YOUR PRODUCTIVITY WITH OUTLOOK
- PASSWORD SECURITY
- PAYROLL, PENSIONS & EMPLOYEE BENEFITS DURING A LABOUR DISRUPTION
- PERFORMING BASIC TASKS IN WORD 2013 V2.0
- PFR - PK - PARKS RETURNING EMPLOYEE ORIENTATION 2019 (REO)
- PHISHING
- PHYSICAL SECURITY
- PLANNING AN EFFECTIVE PRESENTATION
- POSITIVE ATMOSPHERE: ESTABLISHING A POSITIVE WORK ENVIRONMENT
- POSITIVE ATMOSPHERE: ESTABLISHING AN ENGAGED WORKFORCE
- POSITIVE SPACE TORONTO - MODULE 1
- PRACTICE RESILIENCE WHILE WORKING WITH CHALLENGING CUSTOMERS
- PREPARING TO MOVE INTO SUPERVISION
- PREVENTING UNHEALTHY WORKPLACE CONFLICT
- PROJECT MANAGEMENT: AN INTRODUCTION
- PROJECT MANAGEMENT: CONCEPTS
- PROTECTING PRIVACY ON THE JOB
- PTP – CREATING AND MANAGING CAPITAL WORKS PROGRAM PROJECTS
- QUATROSAFETY INCIDENT REPORTING
- RECEIVING FEEDBACK
- REMOVABLE MEDIA (I.E. CDS, DVDS AND USBS)
- RESPECT IN OUR WORKPLACE
- RESPONDING TO WORKPLACE HARASSMENT: WHAT YOU NEED TO KNOW
- RIGGING SAFETY AWARENESS (2019-2021)
- ROADBLOCKS TO EXCELLENT LISTENING

APPENDIX I –Staff Training Courses

- SHARING KNOWLEDGE FOR SUCCESS
- SOCIAL ENGINEERING
- SPEAKING CLEARLY AND CONFIDENTLY
- STAYING BALANCED IN A SHIFTING WORLD
- SUCCESSFACTORS – MANAGERS WITH DIRECT REPORTS
- SUPERVISOR HEALTH AND SAFETY AWARENESS IN 5 STEPS
- THE ART AND SCIENCE OF COMMUNICATION
- THE REALITY OF BEING A FIRST-TIME MANAGER
- THE TORONTO PUBLIC SERVICE BY-LAW ELEARNING
- TORONTO WATER ORIENTATION
- TPS NEW EMPLOYEE ORIENTATION (NEO)
- TRAFFIC CONTROL & TRAFFIC CONTROL PERSON (2019-2021)
- TRAFFIC CONTROL AWARENESS
- TRAFFIC CONTROL ROADWAY WORK (2019-2021)
- TRANSPORTATION OF DANGEROUS GOODS (2019-2021)
- TRUST BUILDING THROUGH EFFECTIVE COMMUNICATION
- TW MANAGER & SUPERVISOR EMPLOYEE ENGAGEMENT INITIATIVES WORKSHOP
- USING PIVOTTABLES AND PIVOTCHARTS IN EXCEL 2013 V2.0
- USING TALENTFLOW EFFECTIVELY ONLINE MODULE
- VIOLENCE IN THE WORKPLACE
- VIRTUAL TEAMS
- WEBTRENDS INFINITY - INTRODUCTION
- WMS AVANTIS WORKSHOP
- WORKING THROUGH A LABOUR DISRUPTION