

Water Quality!

Pick up trash
by the water.



Protect our
fresh Water now!

Do we need to Pollute the water?

fresh water
is amazing!



Dirty Water
will absolutely
make you sick!





The Regional Municipality of Durham

Corbett Creek Water Pollution Control Plant 2025 Annual Performance Report

Environmental Compliance Approval (ECA): 7560-9PPRJC

Dated November 12, 2014

Environmental Compliance Approval (Air): 1581-9URJFE

Dated May 13, 2015

The Corbett Creek Water Pollution Control Plant (WPCP) 2025 Annual Performance Report provides staff, stakeholders, and customers a performance overview of the plant for the 2025 calendar year. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP). This report demonstrates the commitment to ensuring that the WPCP delivers wastewater services to our customers in an environmentally responsible manner.

Water Pollution Control Plant Process Description

General

The Corbett Creek WPCP is located in the Town of Whitby and is owned and operated by the Regional Municipality of Durham (Region). The plant is operated in accordance with the terms and conditions of the ECA's noted above. Corbett Creek WPCP treats wastewater from the Whitby, Brooklin and Oshawa service areas. The plant services approximately 172,279 residents.

The Corbett Creek WPCP is designed to treat wastewater at an average daily flow rate of 84,350 cubic metres per day (m³/d). The plant is an MECP Class 4 conventional activated sludge treatment plant that utilizes the following processes to treat wastewater:

- Raw influent pumping
- Preliminary treatment
- Primary treatment
- Phosphorus removal
- Secondary treatment
- Disinfection (chlorination/dechlorination) and
- Solids management.

Raw Influent Pumping

Wastewater is collected from Whitby, Brooklin and Oshawa through approximately 582 kilometres of sanitary sewers. It is conveyed to the plant by gravity and several sanitary sewage pumping stations located throughout the collection system.

Preliminary Treatment

Screening: Two mechanically cleaned screens and one manually cleaned screen remove rags and large debris that could harm pumps and process equipment. Screenings are compacted for disposal to landfill.



Grit Removal: Heavy suspended material such as sand and small stones (grit) are removed in the two aerated grit tanks. The velocity of the wastewater rolling in the tanks is controlled by the quantity of air added to produce conditions that allow heavy grit material to settle, while keeping the lighter organic material in suspension to proceed to the next process tank. The grit removed in this process is dewatered and transported to landfill.

Primary Treatment

The four primary clarifiers utilize the physical process of sedimentation which allows suspended material to settle to the bottom of the tank as sludge. This raw sludge, along with excess activated sludge from the secondary treatment process is collected by a sweep mechanism which pushes the sludge into hoppers. The sludge is then pumped to the anaerobic digesters for further treatment. Any material floating on the surface of the clarifier is also removed to the digesters.

Phosphorus Removal

The phosphorus removal system lowers the total phosphorus level in the final effluent by adding a chemical coagulant, ferrous chloride, into the primary effluent.

Secondary Treatment

Aeration: The seven aeration tanks are where fine bubbled air is diffused into the wastewater to assist bacteria in removing dissolved and suspended organics, and nutrients from the wastewater.

Secondary Clarifier: The effluent from the aeration tanks is directed to the seven secondary clarifiers where the solids settle quickly to the bottom as activated sludge, leaving clear supernatant. A portion of the activated sludge collected on the bottom of the clarifier is pumped back to the head of the aeration tanks and the excess activated sludge is wasted to the primary clarifiers.

Disinfection (chlorination/dechlorination)

Chlorine in the form of liquid sodium hypochlorite is metered into the effluent stream for pathogen control. Adequate contact time is provided by the three chlorine contact chambers. Disinfected effluent is dechlorinated with a sodium bisulphite solution before being discharged to Lake Ontario through the 1,800-millimetre diameter outfall that extends 773 metres into Lake Ontario.

Solids Management

Anaerobic Digestion: The raw sludge that is collected from the primary clarifiers is pumped into the anaerobic digesters where anaerobic bacteria reduce the volume of sludge. As a result of digestion, the plant produces biosolids, water, carbon dioxide, methane, and hydrogen sulfide. The supernatant is returned to the head of the plant for further treatment.



Corbett Creek Water Pollution Control Plant 2025 Annual Performance Report

Sludge Management: All digested sludge is pumped to the biosolids holding facility. From there the treated biosolids can be utilized on approved agricultural fields or are hauled to Duffin Creek Water Pollution Control Plant (WPCP) for incineration.

Environmental Compliance Approval (ECA)

Under Condition 10. (6) of ECA 7560-9PPRJ the Region must produce an annual performance report that contains the following information:

a) Summary and interpretation of all monitoring data and a comparison to the effluent limits

The raw wastewater flowing into the plant is analyzed for its chemical and physical composition. Monitoring the raw wastewater is performed in accordance with the conditions in the ECA. Table 2 summarizes the raw wastewater characteristics during the reporting period. The plant operated at an average of 61% of its annual average rated flow capacity and received a maximum daily flow of 125,883 cubic metres per day on April 3, 2025.

- The total suspended solids (TSS) average concentration limit of 25.0 mg/L was exceeded in 3 of 12 months (25%).

b) Description of any operating problems encountered and corrective actions taken

The following operating problems were encountered in 2025:

- Waste Activated Sludge pump 7 failure leading to increased solids being held
- Clearing blockages from wasting lines and valves by freezing the lines with nitrogen
- Blowers faulting/not providing enough air. Blower 1 awaiting repairs, new diffuser heads improved oxygen transfer, professional from Turblex balanced air distribution in plant 4 among aeration tanks

c) Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works

Major maintenance items in 2025 included:

- Replaced diffuser heads in aeration tanks No. 5, 6, 8, and 9
 - Cleaned out secondary clarifiers No. 5 and 6
 - Repaired weir scum system for secondary clarifier No. 5 and 6
 - Repaired the bridge of primary clarifier No. 5
 - Cleaned and pressure tested digester No. 2
 - Replaced metal skimmer troughs for primary clarifiers No. 1 and 2
 - Repaired blower header including installation of isolation valves, pressure relief valves, and safety links
 - Replaced gear boxes for screen No. 1 and 2
 - Rebuilt 3 Return Activated Sludge pumps
-



Corbett Creek Water Pollution Control Plant 2025 Annual Performance Report

- Replaced multiple seized wasting valves throughout plant
- Replaced Waste Activated Sludge pumps for train No. 7 and 10
- Rebuilt various raw sludge pumps
- Replaced 6 chemical pumps

d) Summary of any effluent quality assurance or control measures

In-house lab test results are compared to the results of the Regional Environmental Laboratory on comparable samples to determine the in-house accuracy.

On-line instrumentation is verified by water pollution control plant (WPCP) operators using various field and/or laboratory testing equipment.

e) Summary of the calibration and maintenance carried out on all effluent monitoring equipment

Calibration of the flow meters was conducted on June 6, 2025.

Calibration of in-house laboratory equipment was conducted on June 9, 2025.

Calibration of the in-house lab pH meter was conducted regularly.

f) Description of efforts made and results achieved in meeting the effluent objectives

The Region of Durham strives to achieve the best effluent quality and produce results below the Environmental Compliance Approval (ECA) limits.

- The annual average daily flow did not exceed the rated capacity of 84,350 cubic metres per day (m^3/d).
- The carbonaceous biochemical oxygen demand (cBOD) objective of 15mg/L was exceeded in 3 of 253 samples (1.2%).
- The total suspended solids (TSS) objective of 15.0 mg/L was exceeded in 211 of 379 samples (55.7%).
- The total phosphorus objective of 0.8 mg/L was exceeded in 70 of 229 samples (30.6%).
- The total chlorine residual objective of “non-detect” was exceeded in 16 of 364 samples (4.4%). The ECA states an objective concentration of “non-detect”, however, the instrumentation has a minimum detection limit of 0.005 mg/L. Sodium bisulphite dosing is monitored to ensure low total chlorine residuals.
- The E.coli objective of 150CFU/100mL was exceeded in 1 of 12 months (8.3%). Chlorine residuals are monitored daily, and adjustments are made to the process as required.

Best efforts will continue to be applied to maintain results below the objectives.

g) Tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed

The volume of sludge removed from Corbett Creek Water Pollution Control Plant (WPCP) in 2025 was 130,057 cubic meters (m^3).



Corbett Creek Water Pollution Control Plant 2025 Annual Performance Report

Sludge production in 2025 exceeded projections due to elevated solids concentrations. As a result, sludge hauling to Duffin Creek for incineration was increased to manage the additional volumes. System maintenance was completed in 2025, and sludge production in 2026 is anticipated to return to typical operating levels.

The sludge produced at this facility was applied on agricultural fields or transferred to Duffin Creek WPCP for incineration.

Receiving facilities included:

Agricultural Fields – 46,169 m³ or 35.5%

Duffin Creek WPCP – 83,888 m³ or 64.5%

h) Summary of complaints and steps taken to address the complaint

A summary of complaints received from the public is administered through a central database. No complaints were received in 2025.

i) Summary of all Bypass, spill or abnormal discharge

- On April 3, 2025, approximately 64,800 cubic meters (m³) of wastewater bypassed the aerated grit tank during a 24-hour event resulting from heavy precipitation. During the same event approximately 812 m³ bypassed primary clarifiers 3 and 4 for 28 hours. Ministry of the Environment, Conservation and Parks (MECP) Incident Report #1-N7G8I0.

j) Notice of Modifications submitted to Water Supervisor and status report of Limited Operational Flexibility

No modifications under “Limited Operational Flexibility” were conducted.

k) Modifications arising under section 3 of Schedule A

No modifications under section 3 of Schedule A were conducted.

l) Information required by Ministry of the Environment, Conservation and Parks Water Supervisor

No additional information was requested.

Ministry of the Environment, Conservation and Parks (MECP) Inspection

This plant was last inspected by the MECP on November 15, 2017. The inspection report dated April 4, 2018, recommended to continue to use best practices to meet effluent objectives.



**Corbett Creek Water Pollution Control Plant
2025 Annual Performance Report**

Table 1 Raw Influent Flows

Month	Total Plant Flow* cubic metre (m ³)	Average Daily Flow cubic metre per day (m ³ /d)	Maximum Daily Flow m ³ /d
January	1,527,296	49,268	54,667
February	1,325,194	47,328	52,195
March	1,847,063	59,583	85,028
April	1,854,992	61,833	125,883
May	1,743,553	56,244	81,179
June	1,547,034	51,568	59,699
July	1,459,706	47,087	53,797
August	1,426,334	46,011	51,950
September	1,410,432	47,014	58,255
October	1,487,047	47,969	55,398
November	1,452,129	48,404	53,000
December	1,606,313	51,817	82,636
Total	18,687,093		
Average	1,557,258	51,198**	
Maximum	1,854,992		125,883
ECA Limit		84,350	
Met Compliance		Yes	

*Metered at the Raw Influent

**Annual Average Daily Flow



**Corbett Creek Water Pollution Control Plant
2025 Annual Performance Report**

Table 2 Raw Influent Analyses

Month	Biochemical Oxygen Demand average (avg.) concentration (conc.) milligram per litre (mg/L)	Total Suspended Solids (TSS) avg. conc. mg/L	Total Phosphorus (TP) avg. conc. mg/L	Total Kjeldahl Nitrogen (TKN) avg. conc. mg/L
January	265	264	6.0	50.10
February	256	259	6.1	51.75
March	196	223	5.6	41.62
April	246	266	5.9	50.65
May	208	223	6.4	40.63
June	206	243	6.3	42.16
July	170	217	5.7	41.44
August	173	206	5.4	48.78
September	165	185	6.1	51.68
October	161	253	5.6	45.48
November	187	248	6.1	49.00
December	181	283	6.1	49.46
Average	201	239	5.9	46.90
Minimum	161	185	5.4	40.63
Maximum	265	283	6.4	51.75
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes



Table 3 Final Effluent Analyses

Month	Carbonaceous Biochemical Oxygen Demand (CBOD ₅) average (avg.) concentration (conc.) milligram per litre (mg/L)	CBOD ₅ loading kilogram per day (kg/d)	Total Suspended Solids (TSS) avg. conc. mg/L	TSS loading kg/d
January	6.8	333	36.1	1,777
February	5.0	239	27.1	1,282
March	7.0	418	29.1	1,732
April	6.0	373	22.1	1,368
May	5.1	285	20.8	1,172
June	5.6	290	16.8	866
July	4.5	213	12.8	602
August	2.1	97	8.4	384
September	3.4	162	10.5	495
October	4.5	218	11.6	559
November	5.9	285	16.7	807
December	5.8	302	16.3	843
Average	5.2	264	19.0	974
Minimum	2.1	97	8.4	384
Maximum	7.0	418	36.1	1,777
ECA Limit	25.0	2,108	25.0	2,108
ECA Objective	15.0		15.0	
Within Compliance	Yes	Yes	No	Yes
Sampling Frequency Requirement Met	Yes		Yes	



**Corbett Creek Water Pollution Control Plant
2025 Annual Performance Report**

Table 3 Final Effluent Analyses continued

Month	Total Phosphorus (TP) average (avg.) concentration (conc.) milligram per litre (mg/L)	TP loading kilogram per day (kg/d)	Unionized Ammonia mg/L	Total Ammonia Nitrogen (TAN) avg. conc. mg/L Winter	TAN avg. conc. (mg/L) Summer	TAN Loading kg/day Winter	TAN Loading kg/day Summer
January	0.99	49	0.0	0.73		36	
February	0.79	37	0.0	2.73		129	
March	0.82	49	0.0	9.00		536	
April	0.59	36	0.0	5.09		315	
May	0.79	44	0.0		1.49		84
June	0.76	39	0.0		0.32		17
July	0.56	26	0.0		0.42		20
August	0.42	19	0.0		0.78		36
September	0.44	21	0.0		0.79		37
October	0.66	32	0.0		2.22		107
November	0.63	30	0.0	4.64		225	
December	0.42	22	0.0	2.53		131	
Average	0.66	34	0.0	4.12	1.00	229	50
Minimum	0.42	19	0.0	0.73	0.32	36	17
Maximum	0.99	49	0.0	9.00	2.22	536	107
ECA Limit	1.0	84		24.0	16.0	2,024	1,350
ECA Objective	0.8			18.0	8.0		
Within Compliance	Yes	Yes		Yes	Yes	Yes	Yes
Sampling Frequency Requirement Met	Yes		Yes	Yes	Yes		



Table 3 Final Effluent Analyses continued

Month	Total Chlorine Residual average (avg.) concentration milligrams per litre	pH minimum	pH maximum	Temperature avg. Degree Celsius
January	0.00	7.0	7.6	17.0
February	0.00	6.9	7.4	16.0
March	0.00	7.1	7.5	15.0
April	0.00	7.1	7.6	15.9
May	0.00	7.0	7.3	18.6
June	0.00	7.0	7.3	20.7
July	0.00	6.8	7.2	22.6
August	0.00	6.9	7.3	24.0
September	0.00	7.0	7.4	24.2
October	0.00	7.0	7.5	22.9
November	0.00	7.0	7.5	20.1
December	0.00	7.1	7.6	17.4
Average	0.00			19.5
Minimum	0.00	6.8		15.0
Maximum	0.00		7.6	24.2
ECA Limit	0.02	6.0	9.5	
ECA Objective	Non-detect	6.5	8.5	
Within Compliance	Yes	Yes	Yes	
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes



Table 4 *Escherichia coli* Sampling

Month	Number of Samples	Monthly Geometric Mean Density
January	9	34
February	7	13
March	8	65
April	10	128
May	9	34
June	8	104
July	10	104
August	8	145
September	9	173
October	9	66
November	8	42
December	8	38
ECA Limit		200
ECA Objective		150
Within Compliance		Yes
Sampling Frequency Requirement Met	Yes	



Table 5 Energy and Chemical Usage

Month	Ferrous Chloride Litres (L)	Sodium Hypochlorite kilograms as chlorine	Sodium Bisulphite (L)	Hydro Kilowatt hour	Natural Gas cubic metres
January	231,150	9,289	10,804	896,072.05	27223
February	214,100	7,365	9,304	746,651.44	28152
March	194,100	7,751	16,849	770,889.50	22195
April	177,970	6,923	12,689	742,717.89	19138
May	193,440	8,584	9,751	751,485.96	11215
June	177,000	8,724	8,983	699,033.39	6204
July	187,210	8,964	10,116	693,347.58	4495
August	178,980	9,181	9,358	726,179.83	3533
September	180,090	7,837	8,109	715,146.93	3578
October	167,910	9,274	9,230	723,135.96	3955
November	182,790	9,453	8,620	660,497.27	9515
December	198,640	6,884	9,355	771,334.34	13173
Total	2,283,380	100,229	123,168	8,896,492.14	152376