## Duffin Creek Water Pollution Control Plant

# 2019 Annual Performance Report

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**Environmental Compliance Approval (ECA)**: 5531-9FJJT5 Dated March 3, 2014
**Environmental Compliance Approval (Air)**: 1110-9AJP5C Dated September 13, 2013
**Environmental Compliance Approval (Air)**: 1110-9AJP5C Notice 1 Dated July 23, 2018
**International Organization for Standardization (ISO) 14001 Certification**: CA05/3563/E

The Duffin Creek Water Pollution Control Plant (WPCP) Annual Performance Report provides staff, stakeholders and customers an overview of the performance of the Duffin Creek WPCP in 2019. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP). This report demonstrates the commitment of ensuring that the WPCP continues to deliver wastewater services to our customers in an environmentally responsible manner.

## Water Pollution Control Plant Process Description

### General

The Duffin Creek WPCP is jointly owned by the Regional Municipality of Durham and the Regional Municipality of York and operated in accordance with the terms and conditions of the ECAs noted above. The plant is located in the City of Pickering and operated by the Regional Municipality of Durham. This MECP Class 4 conventional activated sludge treatment plant is designed to treat wastewater at an average daily flow rate of 630,000 cubic metres per day ($m^3$/d) with a limit of 520,000 $m^3$/d as noted in the ECA for outfall capacity limitations. The Duffin Creek WPCP is ISO 14001 certified.

The Duffin Creek WPCP treats wastewater for approximately 222,202 residents in the Town of Ajax and the City of Pickering in the Regional Municipality of Durham as well as 1,015,300 residents in the in the Regional Municipality of York: Vaughan, King, Newmarket, Whitchurch-Stouffville, Aurora, East Gwillimbury, Richmond Hill, and Markham. The total population served by Duffin Creek WPCP is approximately 1,237,502.

The Duffin Creek WPCP utilizes the following processes to treat wastewater;

- raw influent pumping,
- preliminary treatment,
- primary treatment,
- phosphorous removal,
- secondary treatment,
- disinfection (chlorination/dechlorination),
- solids management, and
- incineration.

### Raw Influent Pumping

Wastewater collected through approximately 676 km of sanitary sewers in Ajax and Pickering is conveyed to the treatment plant by gravity and by the following sanitary sewage pumping stations located in the collection system: Bayly St., Jodrel Rd., Toy Ave., Finch Av. and Liverpool Rd. Wastewater collected from the Regional Municipality of York is conveyed to the WPCP via the Primary Trunk Sewer and the twin South East Collectors which are part of the York Durham Sewage System (YDSS). The sanitary sewage from York Region accounted for an estimated 81.9% of the wastewater treated in 2019. The remaining 18.1% (estimated) was generated by the Town of Ajax and the City of Pickering in Durham Region. The combined flows enter a diversion chamber, which then splits the flow between Stages 1, 2 and 3 at the Duffin Creek WPCP. There are two Influent Pumping Stations (IPS) each with eight submersible pumps that direct the wastewater to the preliminary treatment process. From the IPS, the wastewater flows by gravity through the rest of the treatment processes.

### Preliminary Treatment

**Screening**: Eight mechanically cleaned screens remove rags and large debris that could harm pumps and process equipment. Screenings are compacted for disposal to landfill.
**Grit Removal**: There are eight grit tanks equipped with coarse bubble diffusers to provide aeration in the grit removal process. Heavy suspended material such as sand and small stones (grit) is settled to the bottom of the tanks while lighter organic particles are kept in suspension and passed through the tanks for further treatment. The grit removed is dewatered for landfill disposal.

### Primary Treatment

Fourteen primary clarifiers each equipped with a travelling bridge system utilize the physical process of sedimentation, which causes heavy particles to settle to the bottom of the tank as raw sludge and lighter particles to float to the surface as scum. The sludge, along with waste activated sludge from the secondary treatment process is collected by scraper blades, which push the sludge into hoppers. The sludge is then pumped to anaerobic digestion and/or dewatering holding tanks. The scum is collected by the travelling bridge and sent to the digesters.

### Phosphorous Removal

Iron salts are added throughout the treatment process to aid in phosphorous and suspended solids removal. Chemical addition can be supplemented by polymer at various locations throughout the plant for enhanced treatment.

### Secondary Treatment

**Aeration Tank**: There are fourteen aeration tanks each containing anoxic and aerobic zones. In the first part of the tank no oxygen is introduced (anoxic), this is for denitrification. The second part of the tank is where fine bubbled air is diffused into the wastewater (aerobic) to remove dissolved and

suspended organics and nutrients from the wastewater. Biological activity is controlled to assimilate the organic material.

**Secondary Clarifier**: Twenty-two secondary clarifiers receive effluent from the aeration tanks where solids settle quickly as activated sludge leaving a clear effluent. A portion of the activated sludge collected on the bottom of the clarifier is pumped back to the front of the aeration tanks and any excess activated sludge is 'wasted' to the primary clarifier to co-settle.

### 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 chlorine contact chambers. Disinfected effluent is dechlorinated with a sodium bisulphite solution before being discharged to Lake Ontario through a 3.05 m diameter outfall pipe, approximately 1,100 m long with a 183 m long diffuser pipe.

### Solids Management

**Anaerobic Digestion:** Some of the raw sludges that are collected from the primary clarifiers are pumped into one of the four primary digesters, which overflow into two secondary digesters for thickening. Digested sludge is pumped to dewatering storage tanks, where it is blended with additional raw sludge from the primary clarifiers before being dewatered. All solids produced are dewatered and incinerated on site.

**Imported Sludge:** Durham's Regional Biosolids Management Program imports sludges from facilities within the Regional of Municipality of York and the Regional Municipality of Durham.

**Dewatering:** Duffin Creek WPCP utilizes eight dewatering solid bowl centrifuges in order to separate the heavier material and the liquid supernatant (centrate). All dewatered solids (sludge cake) is sent to incineration. The centrate is pumped to the head of the plant where it combines with the influent to undergo treatment.

### Incineration

There are four fluidized bed process trains, which through the combustion process burns the organic substances contained in the sludge cake and converts the cake into ash and flue gas. Steam boilers are utilized for waste heat recovery. All solids at Duffin Creek WPCP were incinerated during the reporting period.

The ash from the incineration process is sent to St. Mary's Cement in Bowmanville, Ontario for reuse. No land application or landfill of biosolids occurred in 2019.

### Environmental Compliance Approval

Under Condition 10.(6) of ECA # 5531-9FJJT5 the Region of Durham 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 Duffin Creek WPCP effluent was determined to be compliant with the ECA approval limits during the reporting period.
- The plant operated at 65.77% of its approved capacity for this reporting period. The plant received a maximum daily flow of 574,245 $m^3$ on April 20, 2019.

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

The following challenges were successfully overcome though planning and communication.

- Durham Region's energy conservation initiative – Duffin Creek WPCP curtails electrical loads throughout the plant as feasible during provincial peak electrical demand events.
- The plant transitioned to ferric chloride in the early summer from ferric sulfate resulting in slightly elevated Total Phosphorous results during this transition.
- Stage 1, 2 Substation maintenance conducted in September on transformer station 102, which required that all flow be directed to Stage 3.
- Train 12 taken out of service for planned maintenance including cleaning, primary bridge and cross collector repairs, aeration diffuser repair and chain and flight preventative maintenance.
- Each digestion stage was isolated for planned construction upgrades to methane gas system in October through November.
- Replaced gas valve stage 2 digester complex in April.
- Standby Generator 5501 – TS 201 – failed, repair scheduled for 2020. Load testing completed to determine the capabilities of remaining 2 generators.
- Ferric Chloride dosing line break to primary/aeration tanks #7/8. The line was excavated, contaminated soil was removed and the break was repaired.
- Total residual chlorine analyzers installed on contact chambers 5 and 6 for improved sodium hypochlorite dosing control.
- Aeration tank 8 unwatered for multiple diffuser repairs in May.
- Blower 8 required electrical repair and was out of service October through December.
- Screenings handling equipment problems, including jam ups, compactor failures, grinder and conveyance issues. Ongoing investigations into remedies to mitigate jam ups and failures continue into 2020.

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

**Operations**

- rebuild chain and flight system on Secondary Tank 20,
- rechained Primary Tanks 10 and 12 scum collectors,
- Stage 1&2 and Stage 3 IPS pump inspections,

- rebuilt 2 pumps on Stage 3 IPS,
- rebuilt aeration tank motors on blowers 1-6 and
- Stage 1 and 2 substation maintenance.

**Dewatering**

- No major maintenance for the reporting year.

**Incineration**

- removed and replaced piping for two flash tanks,
- refurbished induced draft fan for both Reactor #3 and #4,
- repairs to Scrubber, Effluent Water, Pump Skid and Piping,
- sludge gun and sand replacement for Reactor #1,
- repaired ash thickener #3 load cell,
- repaired and installed check valve on diaphragm pump,
- installation of preheat burner automatic shut off valves for Reactor #3 and #4,
- replaced Auxiliary Boiler thermocouple and
- repaired hot water boiler oxygen sensor.

**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. All results were found to be within an acceptable range.
- On-line instrumentation is verified by WPCP operators using various field or laboratory test equipment.
- Analytical balances are calibrated by Fisher Scientific Company Ltd.
- In-house lab equipment is calibrated by operations staff and various manufacturers.

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

- Plant flows are measured at the influent of this plant.
- All influent flow meters were calibrated on January 29, and February 8.
- All monitoring and laboratory equipment is calibrated and maintained according to manufacturer's specifications.

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

The final effluent objective for pH was exceeded on February 6, resampling and recalibration produced results within compliance.

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

Refer to Table 7.

There is no increase of sludge volume expected in the next reporting period.

All sludge generated at Duffin Creek WPCP is incinerated.

**h) Summary of any complaints received during the reporting period and any steps taken to address the complaints;**

A summary of complaints received from the public is administered through a central database. No complaints were received in 2019.

**i) Summary of all By-passes, Spill or Abnormal Discharge events;**

There is no mechanism for by-passing untreated wastewater at this facility. There are no anticipated by-passes planned for the next reporting period.

**Spill or abnormal discharge event:** There were no spills or abnormal discharge events in 2019.

**j) Notice of modifications and any implementation of Limited Operational Flexibility;**

No notice of modifications were submitted in 2019.

**k) Additional information required by Ministry of the Environment, Conservation and Parks Water Supervisor;**

The fixed bed carbon adsorption units in the incineration complex were not usable due to safety reasons. The MECP was notified and investigations continued in 2019 in order to determine better operating conditions for the units. Regional Staff are working to resolve this operating condition. To maintain operation of this essential process, the MECP issued Provincial Order Number 0328-AVYR75 which allows Duffin Creek WPCP to temporarily operate incinerators 3 and 4 without the carbon absorption units. Replacement Sorbent Polymer Composite (SPC) units are planned to be installed and operational by mid year 2021.

The Duffin Creek WPCP continues to participate in the Independent Electricity System Operator's (IESO) Industrial Conservation Initiative (ICI) by curtailing plant electricity demand during the highest periods of provincial electricity demand. In addition to ICI participation, the facility continues to participate in the Embedded Energy Manager (EEM) program to meet and exceed the targeted objective of 2,000 MWh of avoided energy use per year.

**Proposed Alterations, Extensions or Replacements**

- Sludge blend tank restoration (Durham Contract D2018-029)**.** Construction 75% complete as of Dec. 31, 2019. Facility commissioning and start-up planned for completion June 1, 2020.
- Digestion mixing and motor control center improvements. Detailed engineering assignments awarded December 2019. Construction estimated to commence in the spring of 2021.
- Replacement of incineration unit #1 and #2. Detailed design continued through 2019. Design completion target is the 3rd quarter of 2020 with issuance of first of multiple construction contracts by the 3rd quarter of 2021.

- Enhanced phosphorous and outfall upgrades detailed design to begin March 2020 with target completion of December 31, 2020.
- Incineration Unit 3 and 4 enhanced mercury removal replacement and retrofit works. 80% completion of detailed design as of December 31, 2019. Targeting design completion by May 2020 with construction commencement September 2020 and completion mid year 2021.
- Stage 3 rehabilitation and retrofit work request for proposal for engineering services to be issued July 2020.
- Stage 1 and 2 blower building control system hardware replacement.
- Septage receiving station automated card reading system modifications.

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

This plant was last inspected by the MECP on February 12, 2015. No compliance items were identified in the report.

**Table 1 Raw Influent Flows**

| Month | York Region Plant Flow cubic metre ($m^3$) | Durham Region Plant Flow $m^3$ | Total Flow to Plant metered at the raw influent $m^3$ | Average Daily Flow cubic metre per day ($m^3/d$) | Maximum Daily Flow $m^3/d$ |
|---|---|---|---|---|---|
| January | 8,613,930 | 1,903,689 | 10,517,619 | 339,278 | 414,840 |
| February | 7,488,856 | 1,655,046 | 9,143,903 | 326,568 | 426,747 |
| March | 8,979,678 | 1,984,520 | 10,964,198 | 353,684 | 540,363 |
| April | 10,035,240 | 2,217,800 | 12,253,040 | 408,435 | 574,245 |
| May | 9,753,341 | 2,155,500 | 11,908,841 | 384,156 | 507,351 |
| June | 8,662,487 | 1,914,420 | 10,576,907 | 352,564 | 406,790 |
| July | 8,103,616 | 1,790,909 | 9,894,525 | 319,178 | 345,246 |
| August | 7,584,702 | 1,676,228 | 9,260,930 | 298,740 | 322,188 |
| September | 7,557,112 | 1,670,131 | 9,227,243 | 307,575 | 362,781 |
| October | 8,167,991 | 1,805,136 | 9,973,127 | 321,714 | 508,556 |
| November | 8,326,439 | 1,840,153 | 10,166,592 | 338,886 | 453,950 |
| December | 8,976,389 | 1,983,793 | 10,960,182 | 353,554 | 476,439 |
| Total (%) * | 102,249,781 (81.9%) | 22,597,327 (18.1%) | 124,847,108 (100%) | | |
| Average * | 8,520,815 | 1,883,111 | 10,403,926 | 342,027 | |
| Minimum | 7,488,856 | 1,655,046 | 9,143,903 | | |
| Maximum | 10,035,240 | 2,217,800 | 12,253,040 | | 574,245 |
| ECA Limit | | | | 520,000 | |
| ECA Objective | | | | | |
| Compliance Met | | | | Yes | |

*Note – total and average reflect rounding of decimal places

**Table 2 Raw Influent Analyses**

| Month | Biochemical Oxygen Demand average concentration (conc.) milligram per litre (mg/L) | Total Suspended Solids average conc. mg/L | Total Phosphorous (TP) average conc. mg/L | TP average loading kilogram per day | Total Kjeldahl Nitrogen average conc. mg/L | Total Ammonia Nitrogen average conc. mg/L | pH Minimum (Min) | pH Maximum (Max) | Temperature Degree Celcius |
|---|---|---|---|---|---|---|---|---|---|
| January | 180 | 310 | 5.7 | 1,934 | 45.10 | 26.5 | 6.7 | 7.6 | 10.5 |
| February | 194 | 324 | 5.6 | 1,829 | 44.13 | 25.7 | 6.9 | 7.4 | 10.4 |
| March | 177 | 282 | 5.3 | 1,875 | 42.58 | 25.1 | 7.0 | 7.5 | 10.3 |
| April | 151 | 258 | 4.5 | 1,838 | 36.49 | 20.0 | 7.1 | 7.6 | 11.9 |
| May | 154 | 259 | 4.9 | 1,882 | 38.30 | 23.6 | 6.4 | 7.6 | 14.7 |
| June | 195 | 307 | 5.6 | 1,974 | 42.84 | 24.8 | 6.8 | 7.6 | 17.1 |
| July | 217 | 348 | 6.0 | 1,915 | 50.13 | 28.7 | 7.2 | 7.7 | 19.5 |
| August | 225 | 363 | 6.3 | 1,882 | 49.46 | 28.6 | 7.1 | 7.7 | 20.0 |
| September | 207 | 333 | 6.1 | 1,876 | 50.99 | 29.3 | 7.2 | 7.7 | 19.6 |
| October | 213 | 320 | 6.0 | 1,930 | 48.79 | 28.7 | 7.2 | 7.9 | 17.6 |
| November | 180 | 293 | 5.7 | 1,932 | 45.41 | 27.6 | 7.3 | 7.7 | 14.2 |
| December | 180 | 289 | 5.3 | 1,874 | 40.60 | 26.2 | 7.4 | 7.9 | 12.0 |
| Average | 189 | 307 | 5.6 | 1,895 | 44.57 | 26.2 | | | 14.8 |
| Minimum | 151 | 258 | 4.5 | 1,829 | 36.49 | 20.0 | 6.4 | | |
| Maximum | 225 | 363 | 6.3 | 1,974 | 50.99 | 29.3 | | 7.9 | |
| Sampling Frequency Requirement Met | Yes | Yes | Yes | | Yes | | | | |

**Table 3 Final Effluent Analyses**

| Month | Carbonaceous Biochemical Oxygen Demand average concentration (conc.) milligram per litre (mg/L) | Total Suspended Solids average conc. mg/L | Total Phosphorous average conc. mg/L | Total Phosphorous average loading kilogram per day | Total Ammonia Nitrogen average conc. mg/L summer | Total Ammonia Nitrogen average conc. mg/L winter |
|---|---|---|---|---|---|---|
| January | 2.8 | 8.1 | 0.33 | 112 | | 0.15 |
| February | 2.4 | 6.9 | 0.31 | 101 | | 0.34 |
| March | 1.5 | 4.9 | 0.23 | 81 | | 0.31 |
| April | 1.1 | 4.7 | 0.17 | 69 | | 0.34 |
| May | 1.5 | 4.9 | 0.26 | 100 | 0.14 | |
| June | 1.2 | 5.6 | 0.41 | 145 | 0.14 | |
| July | 1.2 | 4.7 | 0.34 | 109 | 0.39 | |
| August | 1.2 | 5.3 | 0.36 | 108 | 0.19 | |
| September | 1.1 | 4.7 | 0.32 | 98 | 0.41 | |
| October | 1.4 | 4.6 | 0.33 | 106 | | 0.22 |
| November | 1.1 | 4.9 | 0.28 | 95 | | 0.19 |
| December | 1.2 | 4.9 | 0.25 | 88 | | 0.19 |
| Average | 1.5 | 5.4 | 0.30 | 101 | 0.25 | 0.25 |
| Minimum | 1.1 | 4.6 | 0.17 | 69 | 0.14 | 0.15 |
| Maximum | 2.8 | 8.1 | 0.41 | 145 | 0.41 | 0.34 |
| ECA Limit | 25.0 | 25.0 | 0.8 | 311 | 6.0 | 10.0 |
| ECA Objective | 15.0 | 15.0 | 0.6 | | 5.0 | 5.0 |
| Within Compliance | Yes | Yes | Yes | Yes | Yes | Yes |
| Sampling Requirement Frequency Met | Yes | Yes | Yes | | Yes | Yes |

**Table 3 Final Effluent Analyses continued**

| Month | Unionized Ammonia Nitrogen average concentration (conc.) milligram per litre (mg/L) | Total Kjeldahl Nitrogen average conc. mg/L | Total Chlorine Residual average conc. mg/L | pH minimum | pH maximum | Temperature Degree Celcius |
|---|---|---|---|---|---|---|
| January | 0.0 | 1.45 | 0.00 | 6.5 | 7.2 | 13.3 |
| February | 0.0 | 1.59 | 0.00 | 6.3 | 7.3 | 13.1 |
| March | 0.0 | 1.43 | 0.00 | 6.7 | 7.3 | 13.5 |
| April | 0.0 | 1.31 | 0.00 | 6.5 | 7.3 | 16.0 |
| May | 0.0 | 1.28 | 0.00 | 6.7 | 7.6 | 17.2 |
| June | 0.0 | 1.31 | 0.00 | 6.8 | 8.0 | 19.2 |
| July | 0.0 | 1.52 | 0.00 | 6.8 | 7.1 | 21.4 |
| August | 0.0 | 1.29 | 0.00 | 6.6 | 7.4 | 21.1 |
| September | 0.0 | 1.50 | 0.00 | 6.6 | 7.2 | 20.5 |
| October | 0.0 | 1.30 | 0.00 | 6.7 | 7.4 | 19.1 |
| November | 0.0 | 1.29 | 0.00 | 6.8 | 7.4 | 16.5 |
| December | 0.0 | 1.26 | 0.00 | 6.6 | 7.3 | 15.0 |
| Average | 0.0 | 1.38 | 0.00 | | | 17.2 |
| Minimum | 0.0 | 1.26 | 0.00 | 6.3 | | |
| Maximum | 0.0 | 1.59 | 0.00 | | 8.0 | |
| ECA Limit | 0.2 | | 0.02 | 6.0 | 9.5 | |
| ECA Objective | 0.1 | | Non-detectable | 6.5 | 8.5 | |
| Within Compliance | Yes | | Yes | Yes | Yes | |
| Sampling Frequency Requirement Met | Yes | | Yes | Yes | Yes | Yes |

**Table 4 Escherichia Coliform Sampling**

| Month | Monthly Geometric Mean Density | Number of Samples |
|---|---|---|
| January | 97 | 22 |
| February | 67 | 19 |
| March | 43 | 21 |
| April | 94 | 20 |
| May | 75 | 23 |
| June | 30 | 20 |
| July | 37 | 27 |
| August | 40 | 21 |
| September | 14 | 20 |
| October | 21 | 22 |
| November | 22 | 20 |
| December | 63 | 20 |
| ECA Limit | 200 | 52 |
| ECA Objective | 100 | |
| Within Compliance | Yes | |
| Sampling Frequency Requirement Met | | Yes |

**Table 5 Imported Wastewater Analyses and Septage Amounts**

| Month | Biochemical Oxygen Demand average concentration (conc.) milligram per litre (mg/L) | Total Suspended Solids average conc. mg/L | Total Kjeldahl Nitrogen average conc mg/L | Total Phosphorous average conc. mg/L | York Septage Solids dry tonnes | Durham Septage Solids dry tonnes | Total Septage Solids dry tonnes |
|---|---|---|---|---|---|---|---|
| January | 2,400 | 5,647 | 598.80 | 106.6 | 5.2 | 5.0 | 10.2 |
| February | 494 | 4,807 | 744.85 | 127.4 | 2.5 | 4.7 | 7.2 |
| March | 3,707 | 10,474 | 1,624.00 | 184.0 | 43.8 | 13.8 | 57.6 |
| April | 4,386 | 15,230 | 992.00 | 173.0 | 125.3 | 24.3 | 149.6 |
| May | 3,868 | 5,980 | 1,158.00 | 145.0 | 0.5 | 13.3 | 13.7 |
| June | 2,077 | 6,163 | 555.00 | 124.0 | 5.4 | 9.9 | 15.3 |
| July | 1,476 | 3,260 | 697.02 | 106.2 | 3.1 | 5.2 | 8.3 |
| August | 2,991 | 3,234 | 1,305.38 | 134.7 | 1.0 | 5.8 | 6.8 |
| September | 4,831 | 7,593 | 1,253.04 | 194.1 | 4.2 | 11.6 | 15.8 |
| October | 3,378 | 7,083 | 562.67 | 155.6 | 4.3 | 11.1 | 15.5 |
| November | 690 | 4,207 | 822.40 | 62.2 | 1.8 | 5.7 | 7.5 |
| December | 2,029 | 3,051 | 1,367.50 | 72.4 | 1.0 | 3.5 | 4.5 |
| Total | | | | | 198.1 | 113.8 | 311.9 |
| Average | 2,694 | 6,394 | 973.39 | 132.1 | | | |
| Sampling Requirement Frequency Met | Yes | Yes | Yes | Yes | | | |

*Note – total and average reflect rounding of decimal places

**Table 6 Energy and Chemical Usage**

| Month | Iron Salt Litre (L) | Sodium Hypochlorite L | Sodium Bisulphite L | Anionic Polymer kilogram* | Hydro kilowatt hour | Natural Gas cubic metre |
|---|---|---|---|---|---|---|
| January | 642,873 | 187,568 | 23,200 | 6,000 | 5,180,353 | 448,649 |
| February | 555,397 | 165,574 | 19,578 | | 4,819,253 | 414,508 |
| March | 612,533 | 192,595 | 24,008 | | 5,129,094 | 428,765 |
| April | 612,994 | 223,103 | 27,932 | | 5,307,823 | 260,507 |
| May | 509,528 | 257,787 | 32,085 | | 5,415,935 | 283,836 |
| June | 612,335 | 219,125 | 28,079 | 6,000 | 5,243,876 | 174,819 |
| July | 612,593 | 190,973 | 24,507 | | 5,585,415 | 188,019 |
| August | 675,533 | 189,477 | 24,304 | | 5,151,353 | 126,935 |
| September | 685,847 | 163,715 | 23,300 | 6,000 | 5,009,977 | 133,230 |
| October | 666,572 | 159,659 | 20,216 | | 5,178,693 | 234,263 |
| November | 655,647 | 155,088 | 19,098 | 6,000 | 5,002,812 | 322,362 |
| December | 682,239 | 158,782 | 19,458 | | 5,302,351 | 184,039 |
| Total | 7,524,090 | 2,263,445 | 285,764 | 24,000 | 62,326,935 | 3,199,932 |

*based on amount purchased

**Table 7 Summary of Sludge Produced and Imported**

| Month | Sludge produced from York Influent Solids dry tonnes | Sludge produced from Durham Influent Solids dry tonnes | Total Sludge produced from all Influent Solids dry tonnes | York Imported Solids dry tonnes | Durham Imported Solids dry tonnes | Total Imported Solids dry tonnes |
|---|---|---|---|---|---|---|
| January | 2,670 | 590 | 3,260 | 98 | 485 | 583 |
| February | 2,426 | 536 | 2,963 | 78 | 333 | 410 |
| March | 2,532 | 560 | 3,092 | 86 | 438 | 524 |
| April | 2,589 | 572 | 3,161 | 99 | 614 | 712 |
| May | 2,526 | 558 | 3,084 | 42 | 339 | 381 |
| June | 2,659 | 588 | 3,247 | 97 | 381 | 478 |
| July | 2,820 | 623 | 3,443 | 89 | 239 | 327 |
| August | 2,753 | 608 | 3,362 | 85 | 81 | 166 |
| September | 2,517 | 556 | 3,073 | 79 | 87 | 166 |
| October | 2,614 | 578 | 3,191 | 81 | 238 | 319 |
| November | 2,440 | 539 | 2,979 | 136 | 297 | 433 |
| December | 2,594 | 573 | 3,167 | 74 | 531 | 604 |
| Total | 31,141 | 6,882 | 38,023 | 1,042 | 4,062 | 5,104 |

*Note – total and average reflect rounding of decimal places

**Table 8 Dewatering and Incineration Summary**

| Month | Average Feed Solids percent (%) Total Solids (TS) | Average Sludge Cake % TS | Average Polymer Dosage kilogram per tonne | Total Sludge Output dry tonnes | Dewatered Sludge Incinerated dry tonnes | Ash Produced by Incineration tonnes |
|---|---|---|---|---|---|---|
| January | 3.1 | 24.9 | 7.4 | 2,717 | 2,645 | 853 |
| February | 2.8 | 24.9 | 7.7 | 3,191 | 3,129 | 917 |
| March | 3.5 | 26.0 | 7.7 | 2,503 | 2,324 | 781 |
| April | 2.6 | 26.8 | 7.6 | 3,771 | 3,263 | 1,149 |
| May | 2.6 | 25.6 | 7.5 | 3,273 | 2,789 | 953 |
| June | 3.0 | 26.1 | 7.6 | 2,741 | 2,303 | 705 |
| July | 2.5 | 26.0 | 7.8 | 3,517 | 2,880 | 1,061 |
| August | 2.7 | 25.4 | 7.3 | 2,259 | 1,907 | 609 |
| September | 2.5 | 26.4 | 7.5 | 2,789 | 2,364 | 815 |
| October | 2.6 | 24.9 | 7.4 | 2,766 | 2,262 | 821 |
| November | 2.7 | 24.6 | 7.5 | 2,372 | 1,850 | 752 |
| December | 2.6 | 24.6 | 7.4 | 3,356 | 2,785 | 1,002 |
| Average | 2.8 | 25.5 | 7.5 | 2,938 | 2,542 | 868 |
| Total | | | | 35,254 | 30,500 | 10,418 |

*Note – total and average reflect rounding of decimal places