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2016

Durham York Energy Centre ECA Annual Report

2016

ECA No. 7306-8FDKNX

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1. Introduction

The Regional Municipality of Durham, the Regional Municipality of York (collectively referred to as "the Regions"), and Covanta Durham York Renewable Energy Limited Partnership ("Covanta") respectfully submit the 2016 Durham York Energy Centre ("DYEC") Annual Report, covering operations during the 2016 calendar year.

This report is being submitted in accordance with Condition 15(1) of the Environmental Compliance Approval ("ECA") 7306-8FDKNX, which states the following:

> ***By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year.***

The reporting requirements in Condition 15(1) of the ECA are listed in **Table 1: ECA 7306-8FDKNX Condition 15(1) Reporting Requirements – Annual Report** together with references to the sections of this report where those reporting requirements are addressed.

The DYEC is a thermal treatment facility used for the receipt of solid non-hazardous post-diversion municipal waste ("Waste"), temporary storage and thermal treatment of the Waste, abatement of the emissions from the processes and activities undertaken at the Site, handling, screening, sorting and/or conditioning of the residual wastes, and management of the wastewater and the non-contact stormwater generated at the Site. The Facility's maximum Waste thermal treatment rate is 140,000 tonnes per year. The nominal electricity generation rate is 17.5 Megawatts and the nominal steam generation rate is approximately 67,200 kilograms per hour of steam.

The facility was built to operate on a continuous basis, 24 hours/day, seven days/week, except during periods of regularly scheduled maintenance. Waste may be delivered Monday through Saturday between 7:00 am to 7:00 pm. This operating schedule may be adjusted depending on demand and facility needs within the established protocol indicated in the ECA. The ECA was originally issued on June 28th, 2011 and amended on August 12th, 2014, October 24th, 2014, February 24th, 2015, December 23rd, 2015 and March 14th, 2016.

Table 1: ECA 7306-8FDKNX Condition 15(1) Reporting Requirements – Annual Report

ECA Condition 15		Section
(1)	By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:	NA
(a)	a summary of the quality and the quantity of the Wastes accepted at the Site, including the maximum amount of the Waste received annually and daily and the sources of the Waste;	2.1, 2.2, 2.3 Appendix 2, 3
(b)	a summary of the quality and the quantity of the Residual Waste shipped from the Site, including the analytical data required to characterize the Residual Waste, the off-Site destinations for the Residual Waste and its subsequent use, if known;	3.1, 3.2, 3.3
(c)	estimated material balance for each month documenting the maximum amount of wastes stored at the Site;	3.3
(d)	annual water usage;	4.1
(e)	annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;	4.2
(f)	summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;	NA
14.(3)	**Daily Activities** The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:	NA
14.(3)(a)	date of record and the name and signature of the person completing the report;	Onsite records
14.(3)(b)	quantity and source of the incoming Waste received at the Site;	2.2, 2.3
14.(3)(c)	records of the estimated quantity of Waste thermally treated in the Boilers;	2.3
14.(3)(d)	quantity of the Unacceptable Waste received at the Site by the end of the approved Waste receipt period and the type(s) of the Unacceptable Waste received;	2.4
14.(3)(e)	quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;	3.3

ECA Condition 15		Section
14.(3)(f)	destination and/or receiving site(s) for the Residual Waste shipped from the Site;	3.1, 3.2
14.(3)(g)	quantity and type of any Rejected Waste accepted at the Site;	2.4
14.(3)(h)	destination and/or receiving site(s) for the Rejected Waste shipped from the Site;	2.4
14.(3)(i)	housekeeping activities, including litter collection and washing/cleaning activities, etc.	10.4
14.(3)(j)	amount of electricity produced	4.2
14.(3)(k)	amount of excess electricity exported to the electrical grid	4.2
14.(4)	**Monitoring and Testing Records** The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:	NA
14.(4)(a)	day and time of the activity;	Onsite records
14.(4)(b)	all original records produced by the recording devices associated with the CEM Systems;	Onsite records
14.(4)(c)	a summary of daily records of readings of the CEM Systems, including: (i) the daily minimum and maximum 4-hour average readings for carbon monoxide; (ii) the daily minimum and maximum one hour average readings for oxygen; (iii) the daily minimum and maximum 10-minute average readings for organic matter; (iv) the daily minimum and maximum 24-hour average readings for sulphur dioxide; (v) the daily minimum and maximum 24-hour average readings for nitrogen oxides; (vi) the daily minimum and maximum 24-hour average readings for hydrogen chloride; (vii) the daily minimum and maximum 6-minute average and 2-hour average opacity readings; and (viii) the daily minimum and maximum one-hour	5.1

ECA Condition 15		Section
	average readings for temperature measurements.	
14.(4)(d)	records of all excursions from the applicable Performance Requirements as measured by the CEM Systems, duration of the excursions, reasons for the excursions and corrective measures taken to eliminate the excursions;	5.3, 5.4
14.(4)(e)	all records produced during any Acoustic Audit;	7
14.(4)(f)	all records produced during any Source Testing;	5.5
14.(4)(g)	all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;	5.6
14.(4)(h)	all records produced during the Residual Waste compliance testing;	3.1
14.(4)(i)	all records produced during the Soil Testing;	8
14.(4)(j)	all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;	9
14.(4)(k)	all records produced during the Ambient Air Monitoring required by this Certificate;	6
14.(4)(l)	all records associated with radiation monitoring of the incoming Waste, including but not limited to: (i) transaction number; (ii) hauler; (iii) vehicle ID; (iv) alarm level; (v) maximum CPS; (vi) uSv/hr; (vii) comment; (viii) background CPS; (ix) driver time in and out; and (x) name of the Trainer Personnel that carried out the monitoring.	2.4
14.(4)(m)	results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;	10.1
14.(4)(n)	results the negative pressure in the Tipping Building carried out, as required.	10.2
14.(5)	**Inspections/Maintenance/Repairs** The Owner shall maintain an on-Site written or	10

ECA Condition 15		Section
	digital record of inspections and maintenance as required by this Certificate. As a minimum, the record shall include the following: (a) the name and signature of the Trained Personnel that conducted the inspection; (b) the date and time of the inspection; (c) the list of any deficiencies discovered, including the need for a maintenance or repair activity; (d) the recommendations for remedial action; (e) the date, time and description of actions (repair or maintenance) undertaken; (f) the name and signature of the Trained Personnel who undertook the remedial action; and (g) an estimate of the quantity of any materials removed during cleaning of the Works.	
14.(6)	**Emergency Situations** The Owner shall maintain an on-Site written or digital record of the emergency situations. As a minimum, the record shall include the following: (a) the type of an emergency situation; (b) description of how the emergency situation was handled; (c) the type and amount of material spilled, if applicable; (d) a description of how the material was cleaned up and stored, if generated; and (e) the location and time of final disposal, if applicable; and (f) description of the preventative and control measures undertaken to minimize the potential for re-occurrence of the emergency situation in the future.	12
14.(7)	**Complaints Response Records** The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.	13
14.(8)	Training	15

ECA Condition 15	Section
The Owner shall maintain an on-Site written or digital record of training as required by this Certificate. As a minimum, the record shall include the following: (a) date of training; (b) name and signature of person who has been trained; and (c) description of the training provided	
Condition 15 (1) (g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;	Appendix 4, 5 and 6
(h) a summary of dates, duration and reasons for any environmental and operational problems, Boilers downtime, APC Equipment and CEM System malfunctions that may have negatively impacted the quality of the environment or any incidents triggered by the Emergency Response and Contingency Plan and corrective measures taken to eliminate the environmental impacts of the incidents;	11
(i) a summary of the dates, duration and reasons for all excursions from the applicable Performance Requirements as measured by the CEM Systems or as reported by the annual Source Testing, reasons for the excursions and corrective measures taken to eliminate the excursions;	5.3, 5.4
(j) results of the evaluation of the performance of the long-term sampling system in determining the Dioxins and Furans emission trends and/or fluctuations for the year reported on as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers;	5.4
(k) dates of all environmental complaints relating to the Site together with cause of the Complaints and actions taken to prevent future Complaints and/or events that could lead to future Complaints;	13
(l) any environmental and operational problems that could have negatively impacted the environment, discovered as a result of daily inspections or otherwise and any mitigative actions taken;	10.4
(m) a summary of any emergency situations that have occurred at the Site and how they were handled;	12
(n) the results and an interpretive analysis of the results of the groundwater and surface water, including an assessment of the need to amend the monitoring programs;	9

ECA Condition 15	Section
(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;	14
(p) any recommendations to improve the environmental and process performance of the Site in the future;	17
(q) statement of compliance with this Certificate, including compliance with the O. Reg. 419/05 and all air emission limits based on the results of source testing, continuous monitoring and engineering calculations, as may be appropriate; and	1.1, 5.5
(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.	16

For a summary of the EA/ECA reports submitted to the Ministry of the Environment and Climate Change (MOECC) for the 2016 reporting year, refer to Appendix 1: MOECC 2016 EA/ECA Report Submittal Table.

1.1 Statement of Compliance

During the 2016 calendar year, the DYEC operated in full compliance with the ECA, with the exception of the following.

- Between May 2nd and May 11th, 2016 Covanta carried out a voluntary source testing ("VST") program. This program was completed by independent contractors pre-approved by the Regions. The results of the VST identified an exceedance of the ECA in-stack dioxin limit from Unit #1. Results related to all other parameters from Unit #1 and all parameters from Unit #2 were deemed to be in compliance with the ECA. The in stack exceedance of the ECA limit on Unit #1 did not cause an exceedance of the related O.Reg. 419/05 limit at the point of impingement. However, after consultation with the Regions and the MOECC, Covanta developed an abatement plan that was subsequently fully executed. The results of the abatement plan investigations identified specific recommendations that have resulted in preventing any re-occurrence of emission exceedances. All subsequent testing conducted during the fall of 2016 confirmed the DYEC was operating in compliance with the ECA. Refer to Section 5.5.1 Voluntary Source Test.

- There were two occasions, April 1st and August 5th, 2016, where the O_2 concentration at the economizer outlet was <6%. According to Condition 6(2)(b), the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, as measured and recorded by the CEM System, the one hour average shall not be less than 6 percent by volume on a dry basis. Refer to Section 5.4 Excursions from Performance Requirements (Condition 6).

2. Municipal Solid Waste

2.1. Waste Quality

The high quality of waste received at the facility is achieved by implementing the following procedures:

- robust regional promotion and education programs to inform the public on how to source separate at the household level and the provision of multiple receptacles to each household to facilitate this;
- regionally enforced By-Laws that restrict generators from placing recyclable or hazardous materials in the waste stream;
- regional waste contractors are required under contract to inspect and reject unacceptable waste if necessary at the curbside;
- waste collected at the curbside is inspected at transfer stations before being repacked into highway haulers for delivery to DYEC; and
- during each hour of operation at DYEC, a truck, if present, is unloaded onto the Tipping Hall floor for a visual inspection before being pushed into the pit.

The design heat content of the waste is 13 MJ/kg. Due to the variability of waste, the actual estimated heat content varied throughout the year between 12.7 MJ/kg and 14.4 MJ/kg with an average of 13.0 MJ/kg. The observed variability is within the acceptable range. The waste received is consistent and relatively homogenous with low moisture content regardless of weather conditions. Refuse HHV (higher heating value or gross calorific/energy value energy) is monitored using a specific steam correlation equation that was developed during the acceptance tests completed in October 2015. In general, the refuse is considered to be well sorted, homogenous and has good combustion qualities.

2.2. Waste Source

Waste is collected and inspected at the following four transfer stations prior to reloading and transport to DYEC.

- Pebblestone Transfer Station – Durham
- Pickering Transfer Station – Durham
- York Region Waste Management Centre – York
- Earl Turcott Waste Management Centre – York

2.3. Waste Quantity

The facility's maximum waste thermal treatment rate is 140,000 tonnes per year of waste. In 2016, DYEC received 128,507.71 tonnes of waste. Refer to **Table 2: MSW Material Balance (Tonnes).**

Table 2: MSW Material Balance (Tonnes)

	Durham	York	Est. Max Daily Onsite Storage	Total MSW Received	Rejected / Unacceptable	Net MSW Received
Jan	8,766.91	2,602.35	1,911	11,369.26	0.99	11,368.27
Feb	7,064.71	2,369.77	1,419	9,434.48	0.00	9,434.48
Mar	6,892.62	2,089.28	2,962	8,981.90	0.00	8,981.90
Apr	8,984.58	2,659.11	2,363	11,643.69	0.05	11,643.64
May	9,559.73	2,937.55	2,613	12,497.68	0.42	12,496.86
Jun	4,420.49	1,006.17	2,891	5,426.66	0.00	5,426.45
Jul	5,048.31	1,245.81	1,953	6,294.12	0.67	6,293.45
Aug	8,875.57	2,485.33	1,932	11,360.90	0.00	11,360.90
Sep	9,541.03	3,213.42	1,893	12,754.45	1.04	12,753.41
Oct	9,046.19	3,296.73	2,358	12,342.92	0.00	12,342.92
Nov	9,527.17	4,104.07	2,341	13,633.29	0.00	13,633.29
Dec	8,530.27	4,241.86	1,458	12,772.74	0.81	12,771.93
Total	**96,257.58**	**32,251.45**	**-**	**128,511.69**	**3.98**	**128,507.71**

The estimated quantity of waste thermally treated in the Boilers is: 128,894 tonnes.

Condition 2(4) of the ECA limits the amount of waste that can be accepted at the facility to 1,520 tonnes per day. The maximum amount of waste received in one day was 902.52 tonnes on October 20th, 2016.

Condition 2(5)(a) limits the maximum amount of waste that can be stored in the Waste pit to 7,350 cubic metres. The maximum amount of waste stored in the Waste pit was approximately 2,962 tonnes (approximately 7,138 m^3) on March 21st, 2016

2.4. Rejected Waste

Rejected waste refers to either municipal waste that cannot be processed at the facility or waste that the site is not approved to accept. Rejected waste includes, but is not limited to, Bulky Unprocessable Items and Unacceptable Waste.

The DYEC truck scale is equipped with a LFM-3 Radiation Detection System. It is a multipurpose, modular system with two remote radiation detector assemblies. The detector assemblies oppose each other so that incoming vehicles can pass between

them. Radiation detected includes low, medium and high energy gammas and X-rays. (>20keV). A handheld alarming Personal Radiation Detector (PRD) is also available for use when the mounted detectors are being serviced/calibrated and to precisely locate any radioactive material within the truck. All records associated with the radiation monitoring of incoming waste are stored at and available at the DYEC.

On December 13th, 2016 there was one load rejected from the facility due to radiation. An MSW truck triggered the radiation detection system on the incoming truck scale. The truck was requested to back up and enter the scales again to ensure it was not a false alarm. The radiation detected was at low levels typically associated with nuclear medicine treatments. After setting off the alarm for a second time, the truck was rejected and diverted back to the transfer station of origin.

Unacceptable Waste

Unacceptable Waste refers to incoming waste which does not meet the incoming waste quality criteria, is of hazardous nature and requires caution when handling. Daily waste screening by the Equipment Operator effectively segregates these infrequent Unacceptable Wastes and subsequently stores them in a secure bermed area which ensures no adverse effects from their storage. Condition 4(3)(a)(iv) requires the removal of Unacceptable Waste from the facility within 4 days of its receipt or as acceptable to the District Manager. A letter from the MOECC District Manager dated January 9th, 2015, allows the DYEC to extend this storage to 90 days as per *Regulation 347 General – Waste Management, made under the Environmental Protection Act, R.S.O. 1990*. During 2016, six (6) shipments of Unacceptable Waste were removed from the facility within 90 days of generation. These shipments included items such as compressed gas tanks (i.e., propane and helium) and car batteries. Refer to **Table 3: Unacceptable Waste** for tonnage and shipment dates for 2016.

Table 3: Unacceptable Waste

Date	Tonnes	Licensed Hauler	Manifest Reference No.	Licensed Receiver
15-Jan	0.99	Photech (A841604)	GT44067-1	Photech (A650233)
8-Apr	0.05	Photech (A841604)	GT41008-8	Photech (A650233)
13-May	0.42	Photech (A841604)	N/A (waste metal tanks)	Photech (A650233)
6-Jul	0.67	Detox (A840849)	SK69604-4	Detox (A390323)
23-Sep	1.04	Photech (A841604)	CD70545-9	Photech (A650233)
2-Dec	0.81	Photech (A841604)	CD73307-1	Photech (A650233)
TOTAL	**3.98**			

Photech Environmental Solutions Inc.

Detox Environmental Ltd.

3. Residual Waste

Residual waste refers to waste resulting from the waste processing activities at the Site and is limited to the recovered ferrous metals, the recovered non-ferrous metals, the bottom ash (consisting of the ash fines and grizzly overs) and the fly ash (untreated and following conditioning). All residual waste is temporarily stored in an enclosed building prior to being removed from the facility.

3.1. Ash

In accordance with ECA Condition 7(7)(d), the MOECC approved the *Ash Sampling and Testing Protocol* dated June 2014 (the "Protocol"), was implemented on the Commencement Date of Operation, February 9th, 2015. The objectives of the sampling plans within the Protocol are listed below.

1. To confirm that the bottom ash generated by DYEC contains by weight less than 10% of combustible materials following ASTM D 5468 Standard Test Method for Gross Calorific and Ash Value of Waste Materials.

2. To confirm that the fly ash sent for disposal is not leachate toxic after conditioning using the Toxicity Characteristic Leaching Procedure (TCLP), as defined in Regulation 347 and the EPA Method 1311.

Bottom ash and conditioned fly ash are transported to either the South Landfill owned and operated by Walker Industries located in Niagara Falls, Ontario or to the Walker Environmental Group Atlas Landfill located in Thorold, Ontario. Both bottom and conditioned fly ash are mixed with soil and used as daily/interim cover at landfills.

3.1.1. Bottom Ash

During post commissioning operations, the Comprehensive Ash Sampling Test Program ("CASTP") consists of sampling for five days (2 shifts per day), yielding 4 daily composite samples for a total of 20 samples for submission to the laboratory for analysis. This process is repeated on an annual basis, until the compliance testing results indicate that the bottom ash meets the "incinerator ash" definition from Regulation 347 for three (3) consecutive years, following which a triennial test program event may be carried out. The scope of the triennial test program will be consistent with the annual test program.

In addition, to ensure consistent bottom ash quality between the conduct of the subsequent CASTPs, on a quarterly basis, a one day sample program was performed. Refer to Table 4: Bottom Ash Sampling Dates.

Table 4: Bottom Ash Sampling Dates

Dates	Annual	Quarterly
October 15th to October 19th, 2015 (CASTP)	X	
February 20th, 2016		X
May 15th, 2016		X
August 22nd, 2016		X
November 26th to November 30th, 2016 (CASTP)	X	

The results in 2016 demonstrate that the bottom ash meets the Regulation 347 definition of incinerator ash and that it should be managed as a non-hazardous solid waste. A review of these analyses by the receiving landfill concurred with this conclusion and it was released for disposal as a nonhazardous solid waste. Refer to Appendix 2 for bottom ash sampling results, statistical summaries and plant operating conditions.

3.1.2. Fly Ash

Fly ash is treated onsite with Pozzolan, cement and water as part of the conditioning process before being shipped off site. All reported weights for this material are inclusive of these reagents.

During post commissioning operations, the CASTP consists of sampling for five days (2 shifts per day), yielding 4 daily composite samples for a total of 20 samples for submission to the laboratory for analysis on a quarterly basis. Following the completion of three (3) quarterly CASTP's, the test frequency for fly ash may be annual instead of quarterly unless the receiving landfill establishes a more stringent frequency. Refer to **Table 5: Fly Ash Sampling Dates**

Table 5: Fly Ash Sampling Dates

Dates	Annual	Quarterly
February 16th to February 20th, 2016		**X**
May 15th to May 19th,2016		**X**
August 20th to August 24th, 2016		**X**
November 19th to November 23rd, 2016	**X**	

A statistical analysis of the data was used to determine if the fly ash exhibits Leachate Toxicity Criteria. The characterizations successfully confirmed that none of the fly ash shipped from the DYEC was leachate toxic. A review of these analyses by the receiving landfill concurred with this conclusion. Refer to Appendix 4 for fly ash sampling results, statistical summaries and plant operating conditions.

There was no untreated fly ash shipped from the site during 2016. Refer to Appendix 3 for fly ash sampling results, statistical summaries and plant operating conditions.

3.2. Metals

Ferrous and non-ferrous metals are sent to the Gerdau Ameristeel foundry located in Whitby, Ontario where the metals are recycled. There are no analytical requirements for the ferrous and non-ferrous metal streams leaving the DYEC. Ferrous and non-ferrous tonnages are summarized in **Table 6: Residual Waste Shipments (**Tonnes)

3.3. Residual Waste – Material Balance

Condition 2(5) (c to f) describes maximum storage restrictions for residual wastes. Amended by Notice 5 dated March 14th, 2016, the maximum storage durations were removed. The maximum storage limit for bottom ash is 630 tonnes, for fly ash is 700 tonnes, for ferrous metal is 77 tonnes and for non-ferrous metal is 120 tonnes.

A material balance was prepared showing the amount of residual wastes shipped per month and daily maximum amount of waste stored on site per month. Refer to **Table 6: Residual Waste Shipments (Tonnes)** and **Table 7: Residual Waste Daily Maximum Storage (Tonnes).**

Table 6: Residual Waste Shipments (Tonnes)

	BOTTOM ASH	FLY ASH	FERROUS	NON-FERROUS
Jan	2426.41	1100.38	302.49	45.44
Feb	1752.81	1048.20	225.98	22.06
Mar	1611.10	877.47	177.49	27.30
Apr	2203.86	1225.10	304.94	45.96
May	2514.72	1297.64	289.77	15.34
Jun	1357.17	808.82	193.89	0.00
Jul	1154.93	562.41	129.56	53.82
Aug	2124.83	1273.49	308.21	35.53
Sep	2419.18	1595.05	330.51	39.17
Oct	2186.29	1316.32	281.31	54.21
Nov	2671.15	1462.13	322.50	37.42
Dec	2472.18	1049.94	310.88	40.60
TOTAL	**24,894.63**	**13,616.95**	**3,177.53**	**416.85**

Table 7: Residual Waste Daily Maximum Storage (Tonnes)

	BOTTOM ASH	FLY ASH	FERROUS	NON-FERROUS
LIMIT	630	700	77	120
Jan	225.31	149.12	43.84	12.05
Feb	195.64	147.50	42.40	9.42
Mar	157.94	114.04	24.28	12.40
Apr	213.49	143.69	45.08	34.19
May	216.85	177.68	50.70	15.34
Jun	136.82	102.27	24.72	15.10
Jul	145.93	71.53	22.66	33.23
Aug	312.36	174.03	37.89	18.27
Sep	227.63	140.00	38.87	22.74
Oct	223.83	145.76	42.77	19.19
Nov	230.22	107.58	42.49	19.36
Dec	262.86	103.50	51.07	26.12

4. Utilities

4.1. Water

The DYEC is a zero process water discharge facility, and as such, no water from the process is sent to the sanitary sewer system or discharged into the environment. Under normal operations, the DYEC operates at a water deficit and requires a water supply from the Region of Durham's municipal water system. Waste water generated by the facility (with the exception of sanitary discharges) is re-used in the process to cool flue gas and condition bottom and fly ash. Make up water is required in order to replenish these processes.

During 2016, approximately 30,236 m^3 of water was drawn from the municipal water system.

4.2. Electricity

During 2016, the turbine generated 106,667 MWh of electricity, of which 90,540 MWh was exported to the grid. The remainder was used to power the Facility.

5. Air Emissions

5.1. Continuous Emission Monitoring System (CEMS)

The CEMS installed at the DYEC meets the Installation and Performance Parameters listed in Schedule "F" of the ECA. The purpose of the CEMS is to continuously monitor flue gas to maximize boiler combustion efficiency and minimize emissions. The system is equipped to display current values, make calibration checks, generate daily reports showing minimum, maximum and average readings, and display system status and emissions alarms. Data collected from this system is available to the public via the Region of Durham's website in accordance with ECA Condition 16 – Public Access to Documentation and is also displayed on the LED display board on the front of the DYEC.

The CEMS and Data Acquisition System ("DAS") measure and record concentrations on a dry-basis for carbon monoxide (CO), carbon dioxide (CO_2), oxygen (O_2), sulphur dioxide (SO_2), nitrogen oxides (NOx), ammonia (NH_3), hydrogen chloride (HCl), hydrogen fluoride (HF), total hydrocarbons (THC) and Mass Flow. The DAS also measures and records concentrations for moisture (H_2O) and opacity. Analysis sampling points are located so that the efficiency of the air pollution control system can be closely monitored. Flue gas is analyzed prior to entering the Air Pollution Control (APC) evaporative cooler (economizer outlet) and in the APC outlet/ ID Fan inlet duct for each boiler. Records of daily minimum and maximum average readings for carbon monoxide (4-hour average); oxygen and temperature (one hour average); organic matter (10-minute average); sulphur dioxide, nitrogen oxides, and hydrogen chloride (24-hour average); and opacity (6-minute and 2-hour average) and are available at the site.

A Relative Accuracy Test Audit ("RATA") and associated system bias evaluations were completed between the dates of September 16th through to September 18th, 2016, with the MOECC present at the Site to observe. The RATA was completed under the facility's normal operating conditions of approximately 100% of the full thermal capacity. Based on the RATA and associated system bias evaluation, all parameters met the performance specifications criteria of the ECA and/or EPS 1/PG/7.

5.2. Analyzer Reliability

Schedule "F" of the ECA specifies the continuous monitoring and recording systems used to measure and record the temperature and emissions from the Boilers. The monitors for carbon monoxide, oxygen, hydrogen chloride, nitrogen oxides, sulphur dioxide, total hydrocarbons, opacity and combustion zone temperature are required to be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the valid hours for each unit for each calendar quarter in accordance with EPS 1/PG/7. For the purposes of reliability calculations, EPS 1/PG/7 defines a valid hour to be an hour during which the generating unit burned fuel and the

associated continuous emission monitoring system produced a minimum of 30 minutes of valid data.

Based on the definition above, reliability for 2016 was calculated for each unit for each calendar quarter and confirmed to be greater than 95%. Refer to **Table 8: 2016 Analyzer Reliability.**

Table 8: 2016 Analyzer Reliability

UNIT 1	O_2e	SO_2	HCl	NOx	CO	Opacity	THC	Comb Temp
Q1	99	98	98	98	98	100	98	100
Q2	98	100	99	100	100	100	99	100
Q3	98	98	98	98	98	100	98	100
Q4	100	100	100	100	100	100	99	100

UNIT 2	O_2e	SO_2	HCl	NOx	CO	Opacity	THC	Comb Temp
Q1	99	98	98	98	98	100	99	100
Q2	100	97	97	97	97	100	97	100
Q3	100	98	97	98	98	100	97	100
Q4	100	98	99	98	99	100	98	100

Note: O_2e means O_2 measured at the Economizer Outlet. Unit 1 was in outage during June and July. Q2 was calculated using the analyzer reliability for April and May. Q3 was calculated using the analyzer reliability for August and September. Opacity is functioning 100% of the time.

5.3. Excursions from Performance Requirements (Schedule C)

Condition 6(c)(i) of the ECA sets out an operational target for carbon monoxide (CO) of 40 mg/Rm^3 over a 4 hour rolling average for the period from and including the initial commissioning of the facility to twelve months following the completion of the initial source testing program. The operational target for CO became an enforceable limit on October 2nd 2016. Refer to **Table 9: CO Target Performance.**

Table 9: CO Target Performance

DATE	UNIT #	REASON
2-Jan	2	The 4 hour rolling target average during the 09:00 hour was 56 mg/Rm^3. This was due to unstable combustion conditions.
18-Jan	2	The 4 hour rolling target average during the 18:00 hour was 43 mg/Rm^3 and during the 19:00 hour was 41 mg/Rm^3. This was due to unstable combustion conditions.
5-Apr	2	The 4 hour rolling target average during the 05:00 hour was 44 mg/Rm^3. This was due to unstable combustion conditions.

Covanta instituted changes to the combustion control system which resulted in improved CO performance. In addition to this, enhanced training was delivered to the operating crews. Both of these activities ensured CO compliance well in advance of October 2nd, 2016.

5.4. Excursions from Performance Requirements (Condition 6)

According to Condition 6(2)(b), the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, as measured and recorded by the CEM System, shall not be less than 6 percent by volume on a dry basis.

There were two occasions during 2016 where the O_2 concentration at the economizer outlet was <6%. No other contraventions of ECA limits occurred, including the combustion parameter CO. Refer to **Table 10: Economizer Outlet O2 Performance**.

Table 10: Economizer Outlet O_2 Performance

DATE	UNIT #	REASON
1-Apr	2	The 1 hour average O_2 concentration in the undiluted gases leaving the economizer during the 07:00 hour was 5%. Insufficient combustion air was fed to the boiler to ensure >6% economizer outlet O_2.
5-Aug	2	The 1 hour average O_2 concentration in the undiluted gases leaving the economizer during the 23:00 hour was 4%. Insufficient combustion air was fed to the boiler to ensure >6% economizer outlet O_2.

Improvements to the combustion control system and enhanced operator training have ensured that this operating parameter will remain within compliance.

5.5. Source Testing

Source testing refers to monitoring, sampling and testing to measure emissions resulting from operating the facility under conditions which yield the worst case emissions within the approved operating range of the facility. The results of these programs are summarized below. Full reports are available on the DYEC website, in accordance with the ECA.

5.5.1. Voluntary Source Test (VST)

Ortech Consulting Inc. completed a VST at the DYEC between May 2nd and May 11th, 2016 to satisfy the requirement put forth by Durham Region Council to perform emission testing twice per year during the first three years of operation.

Source testing was performed on the Baghouse Outlet of Unit 1 and the Baghouse Outlet of Unit 2 for the test contaminants listed in Schedule D of the ECA.

The average results for the tests conducted along with the respective in-stack emission limits are summarized in **Table 11: Voluntary Source Test Summary.**

Table 11: Voluntary Source Test Summary

PARAMETER	LIMIT	UNIT 1	UNIT 2
Total Suspended Particulate Matter	9 mg/Rm^3	0.62	0.48
Cadmium	7 µg/Rm^3	0.04	0.04
Lead	50 µg/Rm^3	0.27	0.22
Mercury	15 µg/Rm^3	0.44	0.27
Dioxins and Furans	60 pg/Rm^3	818	12.1
Organic Matter	50 ppmdv	0.8	0.9

During the conduct of the VST program, emissions of dioxins and furans (D&F) were identified in excess of the ECA in-stack performance standard (Schedule "C"). Covanta voluntarily shut down Unit 1 on May 26th, 2016, following a discussion regarding the preliminary laboratory reporting with the Regions. An Abatement Plan was subsequently developed by Covanta, approved by the MOECC and executed. The plan identified specific recommendations to prevent a re-occurrence of additional exceedances. All subsequent testing confirmed the DYEC operates in compliance with the ECA. The Abatement Plan and all

subsequent tests are posted on the DYEC website in accordance with ECA Condition 16 – Public Access to Documentation.

Total facility emissions were modelled using the 2011 CALPUFF version 6.263 as requested by the MOECC. The calculated point of impingement (POI) concentrations for tested parameters, including D&F, were well below the allowable concentrations for all of the contaminants. The allowable POI concentrations set forth by O. Reg. 419/05 are set conservatively to be protective of human health and the environment. As such, there was no risk to either as a result of the in-stack D&F exceedance on Unit #1.

Refer to Appendix 4: Executive Summary - Voluntary Source Test Spring 2016 (including the Emission Summary Table) including Appendix 34 Dispersion Modelling Results for the May 2016 Testing Program included within Ortech Report 21698 for the 2016 Compliance Testing Program.

5.5.2. Compliance Source Test

Ortech Consulting Inc. completed an emission testing program at the DYEC between October 25th and November 3rd, 2016 to satisfy the requirements of ECA Condition 7(1) and the abatement plan.

Source testing was performed on the Baghouse Outlet of Unit #1 and the Baghouse Outlet of Unit #2 for the test contaminants listed in Schedule D of the ECA.

The average results for the tests conducted along with the respective in-stack emission limits are summarized in **Table 12: Compliance Source Test Summary.**

Table 12: Compliance Source Test Summary

PARAMETER	LIMIT (corrected to 11% O_2)	UNIT 1	UNIT 2
Total Suspended Particulate Matter	9 mg/Rm^3	0.95	1.04
Cadmium	7 µg/Rm^3	0.07	0.12
Lead	50 µg/Rm^3	0.39	0.28
Mercury	15 µg/Rm^3	0.05	0.03
Dioxins and Furans	60 pg/Rm^3	9.44	6.40
Organic Matter	50 ppmdv	4.6	4.0

These test results indicate that the DYEC demonstrated compliance with all respective in-stack ECA limits. Total facility emissions were modelled using

CALPUFF. The calculated impingement concentrations were well below the allowable impingement concentrations for all of the contaminants.

Refer to Appendix 5: Executive Summary Compliance Source Test Fall 2016 (including the Emission Summary Table) including Appendix 33 Dispersion Modelling Results for the October/November 2016 Testing Program included within Ortech Report 21698 for the 2016 Compliance Testing Program.

5.6. Long Term Dioxin and Furan Sampling System (LTSS)

The long term D&F sampling system, referred to as the AMESA (Adsorption Method for the Sampling of Dioxins and Furans) sampler, has been installed as required by Condition 7(3)(a) of the ECA. The initial testing protocol was prepared in accordance with the Air Emission Monitoring Plan and the ECA. This testing protocol is based upon collecting paired coincident sets of AMESA and reference method source test results. To date, AMESA results have been compared to source test methods during each of four (4) source testing programs, with valid data collected during the October 28th, 2015, May 2nd, 2016 and October 25th, 2016 source testing programs. The AMESA sampler continues to be operated to collect data for both short term sampling periods of 4 to 6 hours during source testing programs noted above as well as collecting long term sampling periods (28 day periods as DYEC operations allows) in order to complete the performance evaluation of the LTSS. Once the AMESA sampler generates more consistent data, long term data will be used to assess the ongoing performance of the air pollution control system. All measurements obtained from the AMESA sampler, whether short term or long term sampling periods, are not meant to be used for the purpose of verifying compliance with the regulatory limits for D&F.

In conformance with the AMESA work plan submitted to the MOECC in April 2016, subsequent source testing programs utilized a longer six (6) hour sampling period for direct comparison to the AMESA results. Also, a combination of enhanced solvent cleaning procedures of the sample assembly between sampling events as well as replacement of the inner stainless sampling tube with a glass tube and a sample blow back system have been implemented in 2016. The combination of the these strategies, and improved DYEC operations have resulted in 2016 AMESA data that appears to more closely match reference test method data in comparison to the results in 2015. A summary of this AMESA evaluation data for Unit #1 and Unit #2 is provided on **Table 13: Unit 1 AMESA Results in Comparison to Reference Method** and **Table 14: Unit 2 AMESA Results in Comparison to Reference Method** .

Table 13: Unit 1 AMESA Results in Comparison to Reference Method

RUN #	SOURCE TESTING DATE	AMESA pgTEQ/Rm^3 @11% O_2 (a)	REFERENCE METHOD pgTEQ/Rm^3 @11% O_2 (a)
1	October 28, 2015	843	25.9
2	October 29, 2015	273	29.6
3	October 29, 2015	121	25.5
4	May 9, 2016	430	1169
5	May 10, 2016	61.3	678
6	May 11, 2016	24.3	606
7	October 27, 2016	26.2	7.62
8	October 28, 2016	15.7	5.86
9	October 31, 2016	12.9	14.8

Notes: (a) NATO/CCMS (1989) toxicity equivalency factors with full detection limit.

Table 14: Unit 2 AMESA Results in Comparison to Reference Method

RUN #	SOURCE TESTING DATE	AMESA pgTEQ/Rm^3 @11% O_2 (a)	REFERENCE METHOD pgTEQ/Rm^3 @11% O_2 (a)
1	October 28, 2015	559	19.5
2	October 29, 2015	258	23.8
3	October 29, 2015	182	23.2
4	May 9, 2016	12.4	14
5	May 10, 2016	7.5	9
6	May 11, 2016	8.9	12
7	October 27, 2016	34.1	6.75
8	October 28, 2016	31.3	6.5
9	October 31, 2016	20	5.96

Notes: (a) NATO/CCMS (1989) toxicity equivalency factors with full detection limit.

6. Ambient Air Monitoring

Ambient air monitoring is a requirement of Condition 11 of the EA and Condition 7(4) of the ECA for the DYEC. Ambient air monitoring is undertaken in accordance with the Ambient Air Monitoring Plan approved by the MOECC in May 2012. There are three ambient air monitoring stations. An upwind station located in close proximity to the southwest of the DYEC at the Courtice Water Pollution Control Plant (Courtice WPCP) collects contaminant data at a predominantly upwind location. A downwind station located northeast of the DYEC near the intersection of Baseline Road and Rundle Road, collects contaminant data in the most dominant wind direction. A property line station at the northeast corner of the DYEC collects contaminant data from fugitive site emissions from equipment operation on site. For a summary list of the ambient air monitoring stations and monitoring parameters, refer to **Table 15: Ambient Air Monitoring Program Summary.**

Table 15: Ambient Air Monitoring Program Summary

MONITORING STATION	METEOROLOGICAL DATA	CONTINUOUS PARAMETERS	NON CONTINUOUS PARAMETERS
Upwind (Courtice WPCP)	• Wind Speed & direction (@20m) • Ambient temperature • Relative humidity • Rainfall • Barometric pressure	• Sulfur dioxide (SO_2) • Nitrogen dioxide (NO_x) • Particulate Matter ($PM_{2.5}$)	• Metals • Total Particulate Matter • PAHs • Dioxins & Furans
Downwind (Baseline & Rundle Rd.)	• Wind Speed & direction (@10m) • Ambient temperature • Relative humidity • Rainfall	• Sulfur dioxide (SO_2) • Nitrogen dioxide (NO_x) • Particulate Matter ($PM_{2.5}$)	• Metals • Total Particulate Matter • PAHs • Dioxins & Furans
Property Line (Northeast corner of DYEC property)	N/A	N/A	• Metals • Total Particulate Matter

Quarterly and annual ambient air reports have been submitted to the MOECC since the start of the monitoring program in 2013 as per their respective due dates outlined in the Operations Manual for Air Quality Monitoring in Ontario (MOE, March 2008). All reports are publically available on the DYEC website in accordance with ECA condition 7(4)(c).

The 2016 Annual Ambient Air Monitoring report is due to the MOECC by May 15th, 2017 in accordance with the Operations Manual for Air Quality Monitoring in Ontario (MOE, March 2008). Refer to Table 16: 2016 Ambient Air Monitoring Quarterly Summary for the 2016 quarterly report summaries.

Table 16: 2016 Ambient Air Monitoring Quarterly Summary

2016 Ambient Air Monitoring Quarterly Summary	
Q1	All contaminants were below their applicable MOECC criteria as well as applicable HHRA health- based standards with the exception of benzo(a)pyrene on one occasion each at the upwind and downwind stations.
Q2	All contaminants were below their applicable MOECC criteria as well as applicable HHRA health- based standards with the exception of benzo(a)pyrene on three occasions each at the upwind and downwind stations.
Q3	All contaminants were below their applicable MOECC criteria as well as applicable HHRA health- based standards with the exception of benzo(a)pyrene on two occasions at the downwind station.
Q4	All contaminants were below their applicable MOECC criteria as well as applicable HHRA health- based standards with the exception of benzo(a)pyrene on one occasion each at the upwind and downwind stations.

The current Ontario 24-hour Ambient Air Quality Criterion for benzo(a)pyrene was introduced in 2011 and levels above this threshold are commonly measured throughout Ontario. However, the benzo(a)pyrene measurements noted in Table 16 are well below the MOECC Schedule 6 Upper Risk Threshold and the MOECC O.Reg. 419/05 24-hour average guideline.

7. Noise Monitoring

Valcoustics Canada Ltd. (VCL) was retained to conduct an Acoustic Audit of actual noise emissions due from the operations of the DYEC. This Acoustic Audit Report is required as per Condition 5.0 Noise Monitoring and Report Plan Methodology of the Noise Monitoring and Reporting Plan (NMRP). The NMRP was developed in accordance with Section 19 of the Environmental Assessment (EA) and Condition 7(5)(a) and (b) of the ECA. An initial Acoustic Assessment Report was completed by Golder Associates Ltd., dated March 2011 as part of the supporting documentation prepared to obtain an ECA.

Monitoring was completed from September 6th to 14th, 2016. The sound emissions from the DYEC were not audible during this post-operational measurement period and are considered to be within the sound level limits stated in the MOE publication NPC-205. The acoustic audit concluded that the facility remains in compliance with NPC-205 and NPC-300 as well as the limits set forth in the ECA. Refer to Appendix 7: Acoustic Assessment Summary Table and Area Plan with Points of Reception and Measurement Locations.

8. Soil Testing

Soil testing is required under Condition 7(10), 13(4) and 15(4) of the ECA. Soil testing is undertaken in accordance with the Soil Testing Plan approved by the MOECC in March 2013. In accordance with the approved plan, the parameters tested include metals, polycyclic aromatic hydrocarbons (PAHs), and dioxins and furans (PCDDs/PCDFs). Soil samples are evaluated against Table 1 Full Depth Background Site Condition Standards-Soil, of the Ground Water and Sediment Standards for Use Under part XV.1 of the *Environmental Protection Act*.

Soil Testing commenced in August 2013 to quantify baseline contaminant concentrations prior to DYEC operations. Soil sampling and ambient air monitoring occur at the same locations, as required by Condition 13(4)(a) of the ECA and the approved Soil Testing Plan. Soil testing is to be performed once during each of the first three years of operation, and every three years thereafter until notification is received from the MOECC Regional Director, advising that soil monitoring is no longer required.

Monitoring locations include the following.

- An upwind site at the Courtice Water Pollution Control Plant, approximately 1 kilometre from the EFW site.
- A downwind site near Baseline Road and Rundle Road in Clarington, approximately 2.5 kilometres from the EFW site and
- A third station located inside the property line of the DYEC.

The most current soil testing event was carried out on August 17th, 2016. The 2016 Soil Testing Report was submitted to the MOECC York Durham District Manager on November 3rd, 2016, within one month of the completed laboratory analysis as required by the Soil Testing Plan. Soil samples were submitted to a Canadian Accredited Laboratory for analysis.

Results from the 2016 composite soil samples tested at all three locations were below the limits specified within the Table 1 Standards for industrial property uses. Parameter concentrations did not vary significantly from the baseline (2013) sampling test results or the 2015 sampling year. Variations observed are likely attributed to natural variability within soil and are not due to the operation of the DYEC.

Results from the 2013, 2015, and 2016 soil testing events are available to the public on the DYEC website.

9. Groundwater and Surface Water Monitoring

Groundwater and surface water monitoring is a requirement of the EA Condition 20 and the ECA Condition 7(14). Monitoring is conducted in accordance with the Groundwater and Surface Water Monitoring Plan approved by the MOECC in October 2011. The monitoring program started in December 2011, prior to the commencement of facility operations to collect background water quality data.

Surface Water

In April 2016, the Regions requested a suspension of the surface water monitoring due to construction of the Courtice Road and Highway 401 interchange and the creek realignment activities undertaken by the Ministry of Transportation. This has caused significant disruption and prevents the placement of sondes in Tooley Creek. In a response letter dated May 17th, 2016, the MOECC granted the request and concurred with the interpretation of the surface water results to date. As a result, no in-situ surface water sampling occurred in the upstream or downstream locations within Tooley Creek in 2016. Monitoring requirements will be reevaluated after the completion of the 401/418 interchange construction activities. Construction of the 401/418 interchange is anticipated to be completed in 2019-2020.

Groundwater

Groundwater samples are collected annually in the spring, summer and fall through a series of dedicated on-site monitoring wells.

Preliminary data for 2016 suggests that groundwater samples analysed satisfy the Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWQS) for the tested parameters. Further, the results to date show no adverse effects, trends or anomalies to further investigate.

An interpretive analysis for the 2016 groundwater and surface water monitoring activities will be discussed in the pending groundwater and surface water annual report. This report, covering the 2016 monitoring period, will be submitted to the MOECC by April 30th, 2017, in accordance with the "Submission of Groundwater Well Development" letter dated January 28th, 2013 and the MOECC acknowledgment letter dated March 4th, 2013.

Further discussion on the assessment of the monitoring plan and the need for amendments for 2017 will be included in the annual groundwater and surface water report with supporting documentation. If any amendments are recommended, it will be discussed with the MOECC. Refer to **Table 17: Groundwater and Surface Water Monitoring Program Summary** for the groundwater well and in-situ surface water sonde locations and parameters tested.

Table 17: Groundwater and Surface Water Monitoring Program Summary

Groundwater Well ID	Groundwater Well Location
MW1	Northwest corner of site
MW2A & 2B (nested)	Northeast corner of site
MW3A & 3B (nested)	Southwest corner of site
MW4	Southeast corner of site
MW5 & 5B (nested)	Centre of site
Surface Water Sonde ID	**Sonde Location**
SW01	Upstream in Tooley Creek (Suspended in 2016)
SW02	Downstream in Tooley Creek (Suspended in 2016)
Monitoring Parameters	
Field Measurements	Water level, temperature, pH, conductivity, oxidation reduction potential
Major Anions (groundwater only)	Carbonate, bicarbonate, chloride, sulphate
Major Cations (groundwater only)	Calcium, magnesium, potassium, sodium
Metals (groundwater only)	Boron, cadmium, cobalt, lead, mercury

The 2016 groundwater and surface water monitoring activities meet the compliance requirements of the EA, the ECA and the approved Groundwater and Surface Water Monitoring Plan. Groundwater and Surface Water Monitoring results and correspondence to date are posted on the DYEC website in accordance with ECA condition 16 – Public Access to Documentation.

10. Inspections, Maintenance and Repairs

10.1. Containment Protocol Inspections

The ECA outlines requirements to confirm the effectiveness of the containment of conveyors, tanks and silos in various building on site, by conducting inspections, testing and/or engineering reviews. Initial containment testing (including negative pressure/smoke test of the Tipping Building) was conducted in 2014. The DYEC Containment Test Protocol, revised in September 2014, lists additional subsequent periodic inspections to be conducted.

All subsequent periodic inspections were conducted in accordance with the requirements as outlined in **Table 18: Containment Periodic Inspections**.

No issues were identified during the periodic inspections. Copies of all inspections are available on site.

Table 18: Containment Periodic Inspections

CONTAINMENT ENCLOSURE	PERIODIC INSPECTION
Tipping Building	Calibration of Boiler Combustion Air Flow Venturi Transmitter
	Daily Inspection for Dust/Odour Leaks
Refuse Pit	Groundwater Monitoring
Grizzly and Residue Bldgs.	Daily General Inspections
	Quarterly USEPA Method 22
Ammonia Tank	Daily General Visual Inspection
	Annual calibration of alarm systems
Cement and Pozzolan Silos	Daily General Inspections
	Quarterly USEPA Method 22
Lime and Carbon Silos	Daily General Visual Inspection
	Quarterly USEPA Method 22
Diesel Fuelling Station	Daily General Visual Inspections
Fire Pump Diesel Tanks	Daily General Visual Inspections
Exterior Bottom and Fly Ash Conveyors	Daily General Inspection
	Quarterly USEPA Method 22
Settling Basin	Daily General Visual Inspections
	Groundwater Monitoring

10.2. Combustion Air Flow – Negative Pressure

While the boilers are in operation, combustion air flow is maintained through the Tip Hall and pit area. The facility induces airflow through the Tipping Building and across the pit by combustion air fans that pull the combustion air through the intake ducts located above the cranes on the charging deck. A system of louvers is adjusted according to prevailing operating conditions, such as the number of boilers in operation and also whether or not MSW is being delivered. Louver positions for various boiler operating scenarios were developed during the 2014 containment (smoke) test. To ensure this works effectively, regular maintenance and inspection activities are performed to ensure that doors and roof vents are closed and that the building envelope remains in good condition. The doors and louvers are inspected for proper operation on a daily basis. These activities ensure that louver adjustments effectively contain odours within the Tip Hall and pit.

The continuous monitoring of the combustion airflow rate through the Tipping Building is a surrogate for confirming that an induced air flow is being maintained within the building. Temperatures, pressures and flow rates are monitored throughout the combustion air and flue gas path. Combustion airflows (Combustion Air Flow Transmitters (1/2-FIT-4202) in each of the two thermal treatment units are monitored continuously to ensure proper airflow (odour containment) in the Tipping Building is maintained. As operating conditions change (i.e., shutdowns, non-delivery times), the airflow is adjusted with the use of louvers on the north wall of the Tipping Building to maintain sufficient airflow to prevent the odours from leaving the building. An alarm indicator in the DCS will alert the control room operator of low combustion air flows requiring possible louver repositioning. Periodic inspection and annual verification of the combustion air flow transmitters is conducted in accordance with the Containment Test Protocol.

10.3. Maintenance Review

Planned maintenance and inspection activities are an important part of maintaining all plant processes and equipment. Covanta uses the PeopleSoft Asset Lifecycle Management system to track all maintenance and preventative maintenance activities at the DYEC. These activities include work identification, planning, scheduling, execution, detailing and cost-control, inventory management, preventive maintenance, purchasing, and equipment asset management. All critical equipment is systematically and repetitively inspected and tested. Critical equipment is also subjected to a systematic and detailed program of preventive maintenance repair and replacement. The system auto-generates work orders for all scheduled maintenance activities.

In 2016, scheduled preventative maintenance activities were completed on the boilers, APC equipment, CEMS and other auxiliary systems. In 2016, the Total Hydrocarbon Analyzer sampling system was relocated from the economizer outlet of each unit to the APC outlet following MOECC approval. This resulted in improved analyzer reliability.

10.4. Inspection Summaries

Records of activities are written or digital and include the date of record and the name and/or signature of the person completing the written record.

An outside environmental checklist is completed by an operator on a daily basis to fulfill the requirements of ECA Condition 5 (5) - Inspections. A weekly environmental checklist is also completed by the facility's Environmental Specialist. A facility wide housekeeping initiative is also in place. Once per month all available employees participate in a clean-up and note any environmental/operational issues.

All records are available at the site and will be retained on site for a minimum of seven years from the date of their creation, as per ECA Condition 14 (2).

No environmental or operational problems that could have negatively impacted the environment were identified during these inspections.

10.5. Sewage Works

In accordance with the ECA Condition 5, Inspections and Maintenance of the Works, (7), the Owner shall inspect the Works at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

As a result of the inspection performed in the fall of 2015, after the completion of the site construction, maintenance was performed on both the east and west ponds between February and April 2016. Both ponds were dewatered using silt control discharge bags placed on vegetated areas. The design grades were reestablished and all silt was transported to a designated area on site for draining before analysis. Approximately 560 m^3 of stockpiled silt was sampled by GHD Environmental and removed to an approved site. This level of maintenance is not expected in the future now that site construction is complete and the property is fully landscaped.

On October 7th, 2016, the annual sewage works inspection was performed. No deficiencies were found.

11. Operational Issues and Mitigation Measures

The primary operational issue in 2016 with potential to impact the environment was the exceedance of the emissions limit for dioxins in furans during the voluntary stack test in May 2016. Unit #1 was taken offline from May 26th, to August 6th, 2016. An Abatement Plan was subsequently developed by Covanta, approved by the MOECC and executed. The plan identified specific recommendations to prevent a re-occurrence of additional exceedances. All subsequent testing confirmed the DYEC operated in compliance with the ECA. With the exception of this event, there were no interruptions or problems with APC equipment that may have negatively impacted the quality of the environment. Details on this event and mitigation measures are provided in Section 5.5.1

Under normal circumstances with at least one boiler in operation, the facility maintains odour containment within the waste storage area by drawing combustion air from inside the building, which prevents odours from escaping.

In cold iron outage situations where both units were offline, odour control mitigation measures were implemented to minimize any potential offsite environmental impacts. Mitigation measures included diverting waste for disposal at alternate locations, misting micronutrients over the pit area and conducting regular on-site and off-site inspections to check for fugitive odours.

The DYEC entered into a cold iron outage (both units offline) on the following occasions during 2016.

- From March 20th to March 25th, 2016 both units were taken offline as planned and previously communicated to the Owners and the MOECC, to undertake a portion of the planned spring maintenance major outages.
- On May 21 both units were briefly off-line while a plug was removed in a fly ash collection hopper and a leaking steam drum gasket was replaced.
- On July 11 Unit #1 was off-line due to the dioxin and furan abatement plan and Unit#2 went off-line briefly due to an overheated fan bearing.
- On October 11 both units were briefly off-line during a fire in the waste storage pit (additional details in Section 12)
- On December 11 and 12, both units were off-line due an unexpected shutdown which resulted in a fire on the building roof (additional details in Section 12).
- On December 28 and 29 both units were off-line while a rupture disk was replaced.

No off-site odour concerns were noted during any of the cold-iron outages.

There were no CEM System malfunctions that may have negatively impacted the quality of the environment. Additional details on CEM System operational performance are provided in Section 5.2

12. Emergency Situations

There were no reportable spills to land or water during 2016. There were two spills reported to the MOECC Spills Action Centre regarding discharges to air in the form of smoke from fires on October 11th and December 11th, 2016. There were no environmental impacts associated with these spills.

October 11th, 2016

On October 11th, the DYEC experienced a fire in the south west corner of the waste storage pit while receiving trash. The fire started at approximately 1:40 pm and was fully extinguished by the Clarington Fire Department by 6:00 pm. The Fire Department used approximately 160,000 litres of water to extinguish the fire. This water was contained and absorbed by MSW in the pit. There was no significant damage to equipment, and the boilers both resumed operation later that evening.

After delivery of the hot load, the Regions conducted a review of transfer station operations with an emphasis on identifying and removing potential sources of ignition. This also included communication to stakeholders.

December 11, 2016

At 8:54 am, the DYEC was put into planned island mode (ceased sending power to the electricity grid) so that Hydro One could safely de-power their local distribution line and move their lines to a new pole run on the relocated South Service Road. This work had been pre-planned for several weeks. Should on-site power generation fail for any reason, during island mode, the Facility would have no choice but to shut down until the Hydro One work was completed and external power was re-established.

After successfully operating in island mode for approximately 90 minutes, the air cooled condenser (ACC) fans began to shut down and the turbine exhaust pressure began to rise until the turbine tripped and on-site power generation ceased. The boilers shut down as soon as power was lost to the combustion fans, followed by venting of the high pressure steam contained within the boiler. Normally, this venting would continue until the safety valves closed and the boilers would be taken off-line until external power was re-established. However, soon after the venting commenced, a roof fire started above Unit #2. Clarington Fire Services responded and they extinguished the fire after fighting it for approximately 3 hrs.

Covanta has implemented changes to the fan controls and operating procedures to prevent a reoccurrence of this situation. It was also determined that the roof fire started where heat from the steam vent pipe ignited the roof membrane and insulation. Combustible materials have been cleared away from the vent pipe and an improved vent design is being developed.

13. Complaints and Inquiries

The monitoring of complaints and inquiries is a requirement of Condition 6 of the EA and Condition 10 of the ECA. A Complaint and Inquiry log submission is provided to the MOECC York Durham District Office District Manager on a monthly basis in accordance with the "*Waste Complaint Protocol for Design, Construction & Operations"* approved by the MOECC in July 2011. Hard copies and digital records of complaints and the complaint investigation and responses are maintained on site. All Complaint and Inquiry logs are available on the DYEC website. A summary of the number of the 2016 complaints and inquiries is listed in **Table 19: Complaint and Inquiry Summary**

Table 19: Complaint and Inquiry Summary

2016	DURHAM	YORK	COVANTA	TOTAL
Complaints to DYEC directly	3	1	2	6
Complaints to Regional Councils	22	0	0	22
Inquiries to DYEC directly	34	3	0	37
Inquiries to Regional Councils	11	0	0	11

Of the twenty-eight (28) complaints received in 2016, four (4) complaints were related to suspected odour emissions from the DYEC. Odour complaints were received on the following dates.

- February 16, 2016
- July 26, 2016
- September 20, 2016
- November 16, 2016

For each odour complaint, an investigation was undertaken, including determining the activities being undertaken at the time of the complaint, weather conditions and a determination of whether the complaint was attributed to site activities.

All four (4) odour complaints were reported to the MOECC. None of the odour complaints were found to be a result of DYEC operations.

14. Energy from Waste Advisory Committee

The Energy from Waste Advisory Committee (EFWAC) is a requirement of Condition 8 of the EA and Condition 17 of the ECA for the Durham York Energy Centre. The committee was established in 2011 with membership outlined in EA condition 8. The meeting notices are posted on the DYEC website and the Regional Municipality of Durham calendar. EFWAC is governed by their Terms of Reference which outlines the role of the EFWAC, presents guidelines for how the committee will operate, the membership composition, and when meetings will take place. The committee is chaired by a facilitator hired by the Regions. Refer to Table 20: EFWAC Meeting Summary.

Table 20: EFWAC Meeting Summary

EFWAC MEETING #	DATE	TIME	AGENDA TOPICS
13	March 16, 2016	2:30-4:30PM	) Acceptance Testing

There are no outstanding motions from the committee. All EFWAC meeting agenda, minutes and presentations are available to the public on the DYEC website.

15. Training

The operator training program for the DYEC was developed to be a comprehensive program to ensure the facility has technically competent, safe and environmentally conscious operators. All operators are trained with respect to Condition 9 of the ECA, as per the specific job requirements of each individual operator. All written or digital records of training including date of training, name and signature of the person who was trained and a description of the training provided will be maintained on site for seven (7) years from the date of their creation as per Condition 14 (2). Training is ongoing including at commencement of employment, when procedures or equipment change and as a refresher.

As a result of the Abatement Plan, revised and/or new Standard Operating Procedures (SOP's) were developed. These training records and all SOP's are available at the site for inspection by the MOECC.

16. Comparison to Report Results from Prior Years

As noted in the 2015 Annual Report, the DYEC was being commissioned for most of the 2015 operating year, with certification testing of the CEMS equipment being completed in September 2015. As a result, the 2016 operating year is the first full year of operation. While the results to date, as shown in the required report submittals, have shown no adverse effects, anomalies, or impacts on the environment, there is not enough data at this time to assess year-over-year operational trends.

17. Recommendations for Improvement

17.1. Status of Recommendations from the 2015 Annual Report

The following 2015 recommendations were completed.

- Air cannons to enhance convection hopper fly ash flow were installed in February 2016.
- THC (organic matter) monitors were relocated to the APC outlet in March 2016.
- The ECA was revised by Notice 5, dated March 14th, 2016 to address emergency storage Waste requirements.

The 2015 recommendation to remove inconsistencies in the Ash Sampling and Testing Protocol, is in progress.

17.2. Recommendations for 2017

Below is a summary of recommendations to improve the environmental and process performance of the site for 2017:

- continue to review the results from the baghouse leak detection system and other measures implemented through the Abatement Plan to assess their effectiveness and make any further recommendations for improvement;
- continue to refine operating and evaluation procedures to improve the correlation between results obtained from the Long-Term Dioxin and Furan Sampling System and results obtained through reference source testing methods;
- continue to perform a voluntary source test in each of the next two years to assess facility performance between mandatory annual source tests; and
- revise the Noise Monitoring and Reporting Plan to carry out future annual acoustic audit measurements only when facility changes dictate or requested by the Director of the MOECC.

Appendix 1
MOECC 2016 EA/ECA Report Submittal Table

MOECC 2016 EA/ECA Report Submittal Table	
Report Type	**Submission Date**
Ambient Air Monitoring Reports as per ECA 7(4)(b), EA 11.7, Operations Manual for AQ Monitoring in Ontario	
2015 Ambient Air Q4 Report	Feb 12, 2016
2015 Ambient Air Annual Report	May 13, 2016
2016 Ambient Air Q1 Report	May 13, 2016
2016 Ambient Air Q2 Report	August 12, 2016
2016 Ambient Air Q3 Report	November 10, 2016
Annual Report as per ECA(15)(1)	
2015 Annual Report	March 31, 2016
Complaint and Inquiry Logs as per ECA 10(1), ECA 10(2), 14(7)	
January Complaint & Inquiry Log	March 24, 2016
February Complaint & Inquiry Log	March 24, 2016
March Complaint & Inquiry Log	June 17, 2016
April Complaint & Inquiry Log	June 17, 2016
May Complaint & Inquiry Log	August 24, 2016
June Complaint & Inquiry Log	August 24, 2016
July Complaint & Inquiry Log	August 24, 2016
August Complaint & Inquiry Log	February 21, 2017
September Complaint & Inquiry Log	February 21, 2017
October Complaint & Inquiry Log	February 21, 2017
November Complaint & Inquiry Log	February 21, 2017
December Complaint & Inquiry Log	February 21, 2017
Compliance Monitoring Report as per EA 5.4	
2016 Compliance Monitoring Report	November 3, 2016
Groundwater and Surface Water Monitoring Reports as per ECA 7(14)(b), EA 20.8	
2015 Annual Groundwater and Surface Water Reports	April 29, 2016
Noise Monitoring and Mitigation Reports- Acoustic Audit Reports as per Noise Monitoring Plan	
2016 Acoustic Audit	January 18, 2017
Odour Management and Mitigation Monitoring Report as per ECA 8(9)(b)	
2016 Odour Management and Mitigation Monitoring Report	December 23, 2016
Soil Testing Report as per ECA 15(4)	
2016 Soil Test Report	November 3, 2016

MOECC 2016 EA/ECA Report Submittal Table	
Report Type	**Submission Date**
Source Test as per ECA 7(1), Schedule E(1), ECA Schedule E(7) and Schedule E(8) respectively	
Source Test Pre-test Plan	August 18, 2016
Notification to MOECC 15 days prior to Source test	August 18, 2016
Source Test Report	January 5, 2017
Third Party Audit Report as per ECA 15(3), EA 16	
2016 Third Party Operations Audit	April 29, 2016
Waste Diversion Monitoring Report as per EA 10.4	
2015 Annual Waste Diversion Report	November 3, 2016

Appendix 2
Bottom Ash Sampling Results

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DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS
BOTTOM ASH
CASTP - October 2015 to August 2016

SAMPLE ID NUMBER	SAMPLE DATE	MOISTURE TOTAL (%)	LOSS ON IGNITION (Wt %)[a]	
DYEC/BA/151015/1 Run 1	10/15-16/2015	11.48	<	0.69
DYEC/BA/151015/1 Run 2	10/15-16/2015	11.45	<	0.69
DYEC/BA/151015/1 Run 3	10/15-16/2015	11.48	<	0.69
DYEC/BA/151015/2 Run 1	10/15-16/2015	11.73	<	0.69
DYEC/BA/151015/2 Run 2	10/15-16/2015	11.75	<	0.69
DYEC/BA/151015/2 Run 3	10/15-16/2015	11.73	<	0.69
DYEC/BA/151015/3 Run 1	10/15-16/2015	11.71	<	0.69
DYEC/BA/151015/3 Run 2	10/15-16/2015	11.71	<	0.69
DYEC/BA/151015/3 Run 3	10/15-16/2015	11.71	<	0.69
DYEC/BA/1510161/1 Run 1	10/16-17/2015	11.15	<	0.69
DYEC/BA/1510161/1 Run 2	10/16-17/2015	11.13	<	0.69
DYEC/BA/1510161/1 Run 3	10/16-17/2015	11.17	<	0.69
DYEC/BA/1510161/2 Run 1	10/16-17/2015	11.78	<	0.69
DYEC/BA/1510161/2 Run 2	10/16-17/2015	11.82	<	0.69
DYEC/BA/1510161/2 Run 3	10/16-17/2015	11.79	<	0.69
DYEC/BA/1510161/3 Run 1	10/16-17/2015	11.35	<	0.69
DYEC/BA/1510161/3 Run 2	10/16-17/2015	11.37	<	0.69
DYEC/BA/1510161/3 Run 3	10/16-17/2015	11.35	<	0.69
DYEC/BA/151017/1 Run 1	10/17-18/2015	13.06	<	0.69
DYEC/BA/151017/1 Run 2	10/17-18/2015	13.00	<	0.69
DYEC/BA/151017/1 Run 3	10/17-18/2015	13.05	<	0.69
DYEC/BA/151017/2 Run 1	10/17-18/2015	13.69	<	0.69
DYEC/BA/151017/2 Run 2	10/17-18/2015	13.69	<	0.69
DYEC/BA/151017/2 Run 3	10/17-18/2015	13.68	<	0.69
DYEC/BA/151017/3 Run 1	10/17-18/2015	13.59	<	0.69
DYEC/BA/151017/3 Run 2	10/17-18/2015	13.60	<	0.69
DYEC/BA/151017/3 Run 3	10/17-18/2015	13.60	<	0.69
DYEC/BA/151018/1 Run 1	10/18-19/2015	10.66	<	0.69
DYEC/BA/151018/1 Run 2	10/18-19/2015	10.65	<	0.69
DYEC/BA/151018/1 Run 3	10/18-19/2015	10.63	<	0.69
DYEC/BA/151018/2 Run 1	10/18-19/2015	11.03	<	0.69
DYEC/BA/151018/2 Run 2	10/18-19/2015	11.00	<	0.69
DYEC/BA/151018/2 Run 3	10/18-19/2015	11.02	<	0.69
DYEC/BA/151018/3 Run 1	10/18-19/2015	11.01	<	0.69
DYEC/BA/151018/3 Run 2	10/18-19/2015	11.06	<	0.69
DYEC/BA/151018/3 Run 3	10/18-19/2015	11.04	<	0.69

SAMPLE ID NUMBER	SAMPLE DATE	12.74 12.77	LOSS OF IGNITION (Wt %)[a]	
DYEC/BA/151019/1 Run 1	10/19-20/2015	12.74	<	0.69
DYEC/BA/151019/1 Run 2	10/19-20/2015	12.77	<	0.69
DYEC/BA/151019/1 Run 3	10/19-20/2015	12.81	<	0.69
DYEC/BA/151019/2 Run 1	10/19-20/2015	13.47	<	0.69
DYEC/BA/151019/2 Run 2	10/19-20/2015	13.48	<	0.69
DYEC/BA/151019/2 Run 3	10/19-20/2015	13.46	<	0.69
DYEC/BA/151019/3 Run 1	10/19-20/2015	13.02	<	0.69
DYEC/BA/151019/3 Run 2	10/19-20/2015	13.00	<	0.69
DYEC/BA/151019/3 Run 3	10/19-20/2015	13.03	<	0.69
DYEC/BA/160220/SGS Run 1	2/20/2016	14.16		1.44
DYEC/BA/160220/SGS Run 2	2/20/2016	14.19		1.52
DYEC/BA/160220/SGS Run 3	2/20/2016	14.20		1.52
DYEC/BA/160220/SGS Run 4	2/20/2016	14.22		1.14
DYEC/BA/160515/SGS Spare 1	5/15/2016	11.52	<	0.69
DYEC/BA/160515/SGS Spare 2	5/15/2016	11.55	<	0.69
DYEC/BA/160515/SGS Spare 3	5/15/2016	11.54	<	0.69
DYEC/BA/160515/SGS Spare 4	5/15/2016	11.58	<	0.69
DYEC/BA/160822/1SGS	8/23/2016	11.20	<	0.69
DYEC/BA/160822/2SGS	8/23/2016	11.31	<	0.69
DYEC/BA/160822/3SGS	8/23/2016	11.36	<	0.69
DYEC/BA/160822/4SGS	8/23/2016	12.64	<	0.69

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES		57
DEGREES OF FREEDOM		56
SAMPLE MEAN (XBAR)		0.74
SAMPLE VARIANCE (S^2)		0.04
STANDARD DEVIATION (S)		0.19
STD ERROR (S XBAR)		0.02
80% CI Upper Limit (actual)		**0.77**
MAXIMUM		1.52
MINIMUM	<	0.69
REGULATORY THRESHOLD		**10**

NOTES:

(a) Less than symbol (<) indicates laboratory result below the detection limit. The value used in this table is the detection limit provided by the laboratory.

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DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS
BOTTOM ASH: Year 2016

SAMPLE ID NUMBER	SAMPLE DATE	MOISTURE TOTAL (%)	LOSS ON IGNITION (Wt %)[a]	
DYEC/BA/160220/SGS Run 1	2/20/2016	14.16		1.44
DYEC/BA/160220/SGS Run 2	2/20/2016	14.19		1.52
DYEC/BA/160220/SGS Run 3	2/20/2016	14.20		1.52
DYEC/BA/160220/SGS Run 4	2/20/2016	14.22		1.14
DYEC/BA/160515/SGS Spare 1	5/15/2016	11.52	<	0.69
DYEC/BA/160515/SGS Spare 2	5/15/2016	11.55	<	0.69
DYEC/BA/160515/SGS Spare 3	5/15/2016	11.54	<	0.69
DYEC/BA/160515/SGS Spare 4	5/15/2016	11.58	<	0.69
DYEC/BA/160822/1SGS	8/23/2016	11.20	<	0.69
DYEC/BA/160822/2SGS	8/23/2016	11.31	<	0.69
DYEC/BA/160822/3SGS	8/23/2016	11.36	<	0.69
DYEC/BA/160822/4SGS	8/23/2016	12.64	<	0.69
DYEC/BA/161126/1SGS	11/26/2016	9.94	<	0.69
DYEC/BA/161126/2SGS	11/26/2016	9.88	<	0.69
DYEC/BA/161126/3SGS	11/26/2016	9.47	<	0.69
DYEC/BA/161126/4SGS	11/26/2016	9.40	<	0.69
DYEC/BA/161127/1SGS	11/27/2016	10.64	<	0.69
DYEC/BA/161127/2SGS	11/27/2016	10.63	<	0.69
DYEC/BA/161127/3SGS	11/27/2016	11.34	<	0.69
DYEC/BA/161127/4SGS	11/27/2016	11.32	<	0.69
DYEC/BA/161128/1SGS	11/28/2016	12.41		0.81
DYEC/BA/161128/2SGS	11/28/2016	12.43		1.25
DYEC/BA/161128/3SGS	11/28/2016	12.56	<	0.69
DYEC/BA/161128/4SGS	11/28/2016	12.54	<	0.69
DYEC/BA/161129/1SGS	11/29/2016	12.18	<	0.69
DYEC/BA/161129/2SGS	11/29/2016	12.18	<	0.69
DYEC/BA/161129/3SGS	11/29/2016	12.05	<	0.69
DYEC/BA/161129/4SGS	11/29/2016	12.04	<	0.69
DYEC/BA/161130/1SGS	11/30/2016	12.30	<	0.69
DYEC/BA/161130/2SGS	11/30/2016	12.31		0.73
DYEC/BA/161130/3SGS	11/30/2016	12.60		1.14
DYEC/BA/161130/4SGS	11/30/2016	12.59	<	0.69

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES	32
DEGREES OF FREEDOM	31
SAMPLE MEAN (XBAR)	0.82
SAMPLE VARIANCE (S^2)	0.07
STANDARD DEVIATION (S)	0.26
STD ERROR (S XBAR)	0.05
80% CI Upper Limit (actual)	**0.88**

MAXIMUM		1.52
MINIMUM	<	0.69

REGULATORY THRESHOLD	**10**

NOTES:

(a) Less than symbol (<) indicates laboratory result below the detection limit.
The value used in this table is the detection limit provided by the laboratory.

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Durham York Energy Centre
Summary of Plant Operating Conditions
Bottom Ash - 2016

Bottom Ash	Scalehouse Record of Waste Received (tonnes)	Waste Processed (tonnes)	Combustion Temperature (avg °C) [a]	Combustion O_2 Level (avg %) [a]	Carbon Monoxide Level (4 hour - mg/Rm^3 @11% O_2 avg) [a]	Opacity (avg %) [a]	Lime (kg) [b]	Carbon (kg) [b]	19% Aqueous Ammonia (L) [b]	Generated Bottom Ash (kg)
Q1 - 20-Feb-16	319.8	401.0	1,183	9	15	0	8,184	243	2,291	74.7
Q2 - 15-May-16	0.0	431.2	1,221	8	14	0	8,993	233	2,163	80.3
Q3 - 22-Aug-16	529.5	410.5	1,166	8	13	0	8,415	252	1,988	76.4
Q4 Bottom Ash										
Day 1 - 26-Nov-16	0.0	439.8	1,243	8	15	0	7,600	250	1,581	80.4
Day 2 - 27-Nov-16	0.0	463.7	1,237	8	13	0	7,575	251	1,985	82.6
Day 3 - 28-Nov-16	586.9	424.5	1,239	8	14	0	7,521	261	1,655	88.1
Day 4 - 29-Nov-16	679.0	386.5	1,242	9	18	0	6,826	254	1,503	87.2
Day 5 - 30-Nov-16	666.3	408.9	1,245	9	17	0	6,807	254	1,546	55.9

a) Daily Facility Average
b) Total Facility Consumption

Appendix 3
Fly Ash Sampling Results

DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS: Q1 (Feb 16-20, 2016) Conditioned Fly Ash Sampling

			Arsenic (As) Leachable	Barium (Ba) Leachable		Boron (B) Leachable		Cadmium (Cd) Leachable		Chromium (Cr) Leachable		Lead (Pb) Leachable		Mercury (Hg) Leachable		Selenium (Se) Leachable		Silver (Ag) Leachable		Uranium (U) Leachable
INDIVIDUAL RESULTS	**Units**		mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Sample ID	**LOR[a]**		0.050	0.50		2.5		0.0050		0.050		0.050		0.00010		0.25		0.0050		0.25
	REG 347 Limit (mg/L)		2.5	100		500		0.5		5		5		0.1		1		5		10
	Composite Date																			
DYEC/FA/160216/1	17-02-16	<	0.050	2.10	<	2.5	<	0.0050	<	0.050		0.688	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160216/2	17-02-16	<	0.050	1.94	<	2.5	<	0.0050	<	0.050		0.578	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160216/3	17-02-16	<	0.050	2.12	<	2.5	<	0.0050	<	0.050		0.562	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160216/4	17-02-16	<	0.050	2.10	<	2.5	<	0.0050	<	0.050		0.623	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160217/1	18-02-16	<	0.050	1.77	<	2.5	<	0.0050	<	0.050		0.755	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160217/2	18-02-16	<	0.050	1.80	<	2.5	<	0.0050	<	0.050		0.642	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160217/3	18-02-16	<	0.050	1.82	<	2.5	<	0.0050	<	0.050		0.578	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160217/4	18-02-16	<	0.050	1.79	<	2.5	<	0.0050	<	0.050		0.588	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160218/1	19-02-16	<	0.050	2.18	<	2.5	<	0.0050	<	0.050		1.060	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160218/2	19-02-16	<	0.050	2.07	<	2.5	<	0.0050	<	0.050		1.050	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160218/3	19-02-16	<	0.050	2.00	<	2.5	<	0.0050	<	0.050		1.320	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160218/4	19-02-16	<	0.050	2.07	<	2.5	<	0.0050	<	0.050		1.060	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160219/1	20-02-16	<	0.050	2.08	<	2.5	<	0.0050	<	0.050		0.922	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160219/2	20-02-16	<	0.050	2.09	<	2.5	<	0.0050	<	0.050		1.070	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160219/3	20-02-16	<	0.050	2.10	<	2.5	<	0.0050	<	0.050		0.958	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160219/4	20-02-16	<	0.050	2.08	<	2.5	<	0.0050	<	0.050		1.000	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160220/1	21-02-16	<	0.050	2.32	<	2.5	<	0.0050	<	0.050		0.744	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160220/2	21-02-16	<	0.050	2.30	<	2.5	<	0.0050	<	0.050		0.804	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160220/3	21-02-16	<	0.050	2.36	<	2.5	<	0.0050	<	0.050		0.841	<	0.00010	<	0.25	<	0.0050	<	0.25
DYEC/FA/160220/4	21-02-16	<	0.050	1.70	<	2.5	<	0.0050	<	0.050		0.903	<	0.00010	<	0.25	<	0.0050	<	0.25

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES	20	20	20	20	20	20	20	20	20	20
DEGREES OF FREEDOM	19	19	19	19	19	19	19	19	19	19
SAMPLE MEAN (XBAR)	0.050	2.04	2.5	0.0050	0.050	0.837	0.00010	0.25	0.0050	0.25
SAMPLE VARIANCE (S^2)	0.000	0.03	0.0	0.0000	0.000	0.046	0.00000	0.00	0.0000	0.00
STANDARD DEVIATION (S)	0.000	0.19	0.0	0.0000	0.000	0.215	0.00000	0.00	0.0000	0.00
STD ERROR (S XBAR)	0.000	0.04	0.0	0.0000	0.000	0.048	0.00000	0.00	0.0000	0.00
80% Confidence Level	**< 0.050**	**2.09**	**< 2.5**	**< 0.0050**	**< 0.050**	**0.901**	**< 0.00010**	**< 0.25**	**< 0.0050**	**< 0.25**
MAXIMUM	< 0.050	2.36	< 2.5	< 0.0050	0.050	1.320	< 0.00010	< 0.25	< 0.0050	< 0.25
MINIMUM	< 0.050	1.70	< 2.5	< 0.0050	< 0.050	0.562	< 0.00010	< 0.25	< 0.0050	< 0.25
REGULATORY THRESHOLD	**2.5**	**100**	**500**	**0.5**	**5**	**5**	**0.1**	**1**	**5**	**10**

NOTES:

[a] Limit of Reporting, Less than symbol (<) indicates laboratory result below the detection limit. The value used in this table is provided by ALS.

DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS: Q2 (May 15-19, 2016) Conditioned Fly Ash Sampling

			Arsenic (As) Leachable	Barium (Ba) Leachable		Boron (B) Leachable		Cadmium (Cd) Leachable		Chromium (Cr) Leachable		Lead (Pb) Leachable		Mercury (Hg) Leachable		Selenium (Se) Leachable		Silver (Ag) Leachable		Uranium (U) Leachable
INDIVIDUAL RESULTS	**Units**		mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Sample ID	**LOR[a]**		0.050	0.50		2.5		0.0050		0.050		0.050		0.00010		0.025		0.0050		0.25
	REG 347 Limit (mg/L)		2.5	100		500		0.5		5		5		0.1		1		5		10
	Composite Date																			
DYEC/FA/160515/1	16-May-2016	<	0.050	1.22	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160515/2	16-May-2016	<	0.050	1.25	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160515/3	16-May-2016	<	0.050	1.27	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160515/4	16-May-2016	<	0.050	1.23	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160516/1	16-May-2016	<	0.050	1.28	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160516/2	16-May-2016	<	0.050	1.31	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160516/3	16-May-2016	<	0.050	1.28	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160516/4	16-May-2016	<	0.050	1.26	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160517/1	17-May-2016	<	0.050	1.46	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160517/2	17-May-2016	<	0.050	1.56	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160517/3	17-May-2016	<	0.050	1.57	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160517/4	17-May-2016	<	0.050	1.22	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160518/1	18-May-2016	<	0.050	1.88	<	2.5	<	0.0050	<	0.050		0.089	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160518/2	18-May-2016	<	0.050	1.99	<	2.5	<	0.0050	<	0.050		0.067	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160518/3	18-May-2016	<	0.050	1.92	<	2.5	<	0.0050	<	0.050		0.064	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160518/4	18-May-2016	<	0.050	2.20	<	2.5	<	0.0050	<	0.050		0.070	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160519/1	19-May-2016	<	0.050	1.96	<	2.5		0.0085		0.050		0.058	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160519/2	19-May-2016	<	0.050	2.13	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160519/3	19-May-2016	<	0.050	1.71	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160519/4	19-May-2016	<	0.050	1.67	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES	20	20	20	20	20	20	20	20	20	20
DEGREES OF FREEDOM	19	19	19	19	19	19	19	19	19	19
SAMPLE MEAN (XBAR)	0.050	1.57	2.5	0.0052	0.050	0.055	0.00010	0.025	0.0050	0.25
SAMPLE VARIANCE (S^2)	0.000	0.11	0.0	0.0000	0.000	0.000	0.00000	0.000	0.0000	0.00
STANDARD DEVIATION (S)	0.000	0.34	0.0	0.0008	0.000	0.010	0.00000	0.000	0.0000	0.00
STD ERROR (S XBAR)	0.000	0.08	0.0	0.0002	0.000	0.002	0.00000	0.000	0.0000	0.00
80% Confidence Level	**< 0.050**	**1.67**	**< 2.5**	**< 0.0054**	**< 0.050**	**< 0.058**	**< 0.00010**	**< 0.025**	**< 0.0050**	**< 0.25**
MAXIMUM	< 0.050	2.20	< 2.5	< 0.0085	0.050	0.089	< 0.00010	< 0.025	< 0.0050	< 0.25
MINIMUM	< 0.050	1.22	< 2.5	< 0.0050	< 0.050	< 0.050	< 0.00010	< 0.025	< 0.0050	< 0.25
REGULATORY THRESHOLD	**2.5**	**100**	**500**	**0.5**	**5**	**5**	**0.1**	**1**	**5**	**10**

NOTES:

[a] Limit of Reporting, Less than symbol (<) indicates laboratory result below the detection limit. The value used in this table is provided by ALS.

DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS: Q3 (August 20-24, 2016) Conditioned Fly Ash Sampling

			Arsenic (As) Leachable	Barium (Ba) Leachable		Boron (B) Leachable		Cadmium (Cd) Leachable		Chromium (Cr) Leachable		Lead (Pb) Leachable		Mercury (Hg) Leachable		Selenium (Se) Leachable		Silver (Ag) Leachable		Uranium (U) Leachable
INDIVIDUAL RESULTS	**Units**		mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Sample ID	**LOR[a]**		0.050	0.50		2.5		0.0050		0.050		0.050		0.00010		0.025		0.0050		0.25
	REG 347 Limit (mg/L)		2.5	100		500		0.5		5		5		0.1		1		5		10
	Composite Date																			
DYEC/FA/160820/1	22-Aug-2016	<	0.050	0.96	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160820/2	22-Aug-2016	<	0.050	1.04	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160820/3	22-Aug-2016	<	0.050	0.99	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160820/4	22-Aug-2016	<	0.050	1.00	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160821/1	22-Aug-2016	<	0.050	1.16	<	2.5	<	0.0050		0.057	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160821/2	22-Aug-2016	<	0.050	1.12	<	2.5	<	0.0050		0.054	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160821/3	22-Aug-2016	<	0.050	1.06	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160821/4	22-Aug-2016	<	0.050	1.14	<	2.5	<	0.0050		0.054	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160822/1	23-Aug-2016	<	0.050	1.33	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160822/2	23-Aug-2016	<	0.050	0.99	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160822/3	23-Aug-2016	<	0.050	1.21	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/160822/4	23-Aug-2016	<	0.050	1.17	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160823/1	24-Aug-2016	<	0.050	1.07	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160823/2	24-Aug-2016	<	0.050	1.21	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160823/3	24-Aug-2016	<	0.050	1.21	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160823/4	24-Aug-2016	<	0.050	1.11	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160824/1	25-Aug-2016	<	0.050	2.12	<	2.5	<	0.0050		0.061	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160824/2	25-Aug-2016	<	0.050	1.31	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160824/3	25-Aug-2016	<	0.050	1.35	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/BA/160824/4	25-Aug-2016	<	0.050	1.25	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES	20	20	20	20	20	20	20	20	20	20
DEGREES OF FREEDOM	19	19	19	19	19	19	19	19	19	19
SAMPLE MEAN (XBAR)	0.050	1.19	2.5	0.0050	0.051	0.050	0.00010	0.025	0.0050	0.25
SAMPLE VARIANCE (S^2)	0.000	0.06	0.0	0.0000	0.000	0.000	0.00000	0.000	0.0000	0.00
STANDARD DEVIATION (S)	0.000	0.25	0.0	0.0000	0.003	0.000	0.00000	0.000	0.0000	0.00
STD ERROR (S XBAR)	0.000	0.06	0.0	0.0000	0.001	0.000	0.00000	0.000	0.0000	0.00
80% Confidence Level	**< 0.050**	**1.26**	**< 2.5**	**< 0.0050**	**< 0.052**	**< 0.050**	**< 0.00010**	**< 0.025**	**< 0.0050**	**< 0.25**
MAXIMUM	< 0.050	2.12	< 2.5	< 0.0050	0.061	0.050	< 0.00010	< 0.025	< 0.0050	< 0.25
MINIMUM	< 0.050	0.96	< 2.5	< 0.0050	< 0.050	< 0.050	< 0.00010	< 0.025	< 0.0050	< 0.25
REGULATORY THRESHOLD	**2.5**	**100**	**500**	**0.5**	**5**	**5**	**0.1**	**1**	**5**	**10**

NOTES:

[a] Limit of Reporting, Less than symbol (<) indicates laboratory result below the detection limit. The value used in this table is provided by ALS.

DURHAM YORK ENERGY CENTRE
SUMMARY OF LABORATORY RESULTS: Q4 (November 19-23, 2016) Conditioned Fly Ash Sampling

			Arsenic (As) Leachable	Barium (Ba) Leachable		Boron (B) Leachable		Cadmium (Cd) Leachable		Chromium (Cr) Leachable		Lead (Pb) Leachable		Mercury (Hg) Leachable		Selenium (Se) Leachable		Silver (Ag) Leachable		Uranium (U) Leachable
INDIVIDUAL RESULTS	**Units**		mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Sample ID	**LOR[a]**		0.050	0.50		2.5		0.0050		0.050		0.050		0.00010		0.025		0.0050		0.25
	REG 347 Limit (mg/L)		2.5	100		500		0.5		5		5		0.1		1		5		10
	Composite Date																			
DYEC/FA/161119/1	21-Nov-16	<	0.050	1.30	<	2.5	<	0.0050		0.126	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161119/2	21-Nov-16	<	0.050	1.27	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161119/3	21-Nov-16	<	0.050	1.28	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161119/4	21-Nov-16	<	0.050	1.11	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161120/1	21-Nov-16	<	0.050	1.95	<	2.5	<	0.0050	<	0.050		0.109	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161120/2	21-Nov-16	<	0.050	1.48	<	2.5	<	0.0050	<	0.050		0.120	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161120/3	21-Nov-16	<	0.050	1.35	<	2.5	<	0.0050	<	0.050		0.089	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161120/4	21-Nov-16	<	0.050	1.35	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161121/1	22-Nov-16	<	0.050	1.38	<	2.5	<	0.0050	<	0.050		0.110	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161121/2	22-Nov-16	<	0.050	1.45	<	2.5	<	0.0050	<	0.050		0.106	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161121/3	22-Nov-16	<	0.050	1.44	<	2.5	<	0.0050	<	0.050		0.104	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161121/4	22-Nov-16	<	0.050	1.31	<	2.5	<	0.0050	<	0.050		0.105	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161122/1	23-Nov-16	<	0.050	1.24	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161122/2	23-Nov-16	<	0.050	1.36	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161122/3	23-Nov-16	<	0.050	1.42	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161122/4	23-Nov-16	<	0.050	1.31	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161123/1	24-Nov-16	<	0.050	1.26	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161123/2	24-Nov-16	<	0.050	1.22	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161123/3	24-Nov-16	<	0.050	1.18	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25
DYEC/FA/161123/4	24-Nov-16	<	0.050	1.24	<	2.5	<	0.0050	<	0.050	<	0.050	<	0.00010	<	0.025	<	0.0050	<	0.25

CONSOLIDATED COMPOSITE SAMPLE STATISTICAL RESULTS

NUMBER OF SAMPLES	20	20	20	20	20	20	20	20	20	20
DEGREES OF FREEDOM	19	19	19	19	19	19	19	19	19	19
SAMPLE MEAN (XBAR)	0.050	1.35	2.5	0.0050	0.054	0.070	0.00010	0.025	0.0050	0.25
SAMPLE VARIANCE (S^2)	0.000	0.03	0.0	0.0000	0.000	0.001	0.00000	0.000	0.0000	0.00
STANDARD DEVIATION (S)	0.000	0.17	0.0	0.0000	0.017	0.028	0.00000	0.000	0.0000	0.00
STD ERROR (S XBAR)	0.000	0.04	0.0	0.0000	0.004	0.006	0.00000	0.000	0.0000	0.00
80% Confidence Level	**< 0.050**	**1.40**	**< 2.5**	**< 0.0050**	**< 0.059**	**< 0.078**	**< 0.00010**	**< 0.025**	**< 0.0050**	**< 0.25**
MAXIMUM	< 0.050	1.95	< 2.5	< 0.0050	0.126	0.120	< 0.00010	< 0.025	< 0.0050	< 0.25
MINIMUM	< 0.050	1.11	< 2.5	< 0.0050	< 0.050	< 0.050	< 0.00010	< 0.025	< 0.0050	< 0.25
REGULATORY THRESHOLD	**2.5**	**100**	**500**	**0.5**	**5**	**5**	**0.1**	**1**	**5**	**10**

NOTES:
[a] Limit of Reporting, Less than symbol (<) indicates laboratory result below the detection limit. The value used in this table is provided by ALS.

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Powering Today. Protecting Tomorrow.

Durham York Energy Centre
Summary of Plant Operating Conditions
Fly Ash Sampling 2016

Q1 Fly Ash	Scalehouse Record of Waste Received (tonnes)	Waste Processed (tonnes)	Combustion Temperature (avg °C) [a]	Combustion O_2 Level (avg %) [a]	Carbon Monoxide Level (4 hour - mg/Rm^3 @11% O_2 avg) [a]	Opacity (avg %) [a]	Lime (kg) [b]	Carbon (kg) [b]	19% Aqueous Ammonia (L) [b]	Pozzolan (kg) [b]	Cement (kg) [b]	Generated Fly Ash (tonnes)
Day 1: 16-Feb-16	502.7	184.2	1,200	8	8	0	3,596	92	744	2,954	1,927	16.8
Day 2: 17-Feb-16	511.4	211.9	1,206	8	11	0	658	101	1,044	3,399	2,217	19.3
Day 3: 18-Feb-16	445.6	438.8	1,164	9	17	0	4,173	235	3,056	7,038	4,590	39.9
Day 4: 19-Feb-16	501.4	413.8	1,176	9	16	0	8,182	232	3,047	6,638	4,329	37.7
Day 5: 20-Feb-16	319.8	401.0	1,183	9	15	0	8,184	243	2,291	6,433	4,196	36.5

Q2 Fly Ash	Scalehouse Record of Waste Received (tonnes)	Waste Processed (tonnes)	Combustion Temperature (avg °C) [a]	Combustion O_2 Level (avg %) [a]	Carbon Monoxide Level (4 hour - mg/Rm^3 @11% O_2 avg) [a]	Opacity (avg %) [a]	Lime (kg) [b]	Carbon (kg) [b]	19% Aqueous Ammonia (L) [b]	Pozzolan (kg) [b]	Cement (kg) [b]	Generated Fly Ash (tonnes)
Day 1: 15-May-16	0.0	431.2	1,221	8	14	0	8,993	233	2,163	6,917	4,511	39.2
Day 2: 16-May-16	671.8	437.3	1,217	8	14	0	9,315	233	2,094	7,708	5,027	43.7
Day 3: 17-May-16	614.2	386.5	1,230	8	14	0	9,528	223	2,021	6,200	4,044	35.2
Day 4: 18-May-16	570.8	434.2	1,222	8	14	0	8,244	246	1,824	7,654	4,992	43.4
Day 5: 19-May-16	657.9	437.4	1,232	8	17	0	9,110	238	1,722	7,017	4,576	39.8

Q3 Fly Ash	Scalehouse Record of Waste Received (tonnes)	Waste Processed (tonnes)	Combustion Temperature (avg °C) [a]	Combustion O_2 Level (avg %) [a]	Carbon Monoxide Level (4 hour - mg/Rm^3 @11% O_2 avg) [a]	Opacity (avg %) [a]	Lime (kg) [b]	Carbon (kg) [b]	19% Aqueous Ammonia (L) [b]	Pozzolan (kg) [b]	Cement (kg) [b]	Generated Fly Ash (tonnes)
Day 1: 20-Aug-16	0.0	426.0	1,174	8	18	0	8,113	252	2,129	4,412	3,456	34.6
Day 2: 21-Aug-16	0.0	392.6	1,197	7	15	0	8,152	252	2,059	4,079	4,033	35.0
Day 3:22-Aug-16	529.5	410.5	1,199	8	12	0	8,415	252	1,988	3,816	3,906	34.7
Day 4: 23-Aug-16	597.2	429.0	1,184	8	13	0	8,719	253	2,267	4,362	4,353	68.2
Day 5: 24-Aug-16	540.6	436.1	1,200	8	17	0	9,206	253	2,002	7,885	5,024	49.5

Q4 Fly Ash	Scalehouse Record of Waste Received (tonnes)	Waste Processed (tonnes)	Combustion Temperature (avg °C) [a]	Combustion O_2 Level (avg %) [a]	Carbon Monoxide Level (4 hour - mg/Rm^3 @11% O_2 avg) [a]	Opacity (avg %) [a]	Lime (kg) [b]	Carbon (kg) [b]	19% Aqueous Ammonia (L) [b]	Pozzolan (kg) [b]	Cement (kg) [b]	Generated Fly Ash (tonnes)
Day 1: 19-Nov-16	0.0	409.6	1,236	9	17	0	7,028	252	1,778	2,068	1,828	18.9
Day 2: 20-Nov-16	0.0	409.5	1,238	8	17	0	6,705	245	1,677	2,547	2,575	34.4
Day 3: 21-Nov-16	482.8	430.9	1,247	8	16	0	7,374	251	1,999	3,370	3,145	41.7
Day 4: 22-Nov-16	581.6	421.8	1,240	8	18	0	7,696	249	1,912	2,759	2,556	34.1
Day 5:23-Nov-16	547.6	441.5	1,254	9	17	0	6,810	250	1,566	2,435	2,266	33.3

a) Daily Facility Average
b) Total Facility Consumption

Appendix 4

Executive Summary - Voluntary Source Test Spring 2016 (including Emission Summary Table)

EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between May 2 and May 11, 2016. The emission testing program was performed to satisfy the agreement the facility has with the Regions of Durham and York to conduct emission testing twice per year.

Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX Section 7(1) states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter." The initial source testing program under Amended ECA No. 7306-8FDKNX was conducted in September/October 2015.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, aldehydes, acid gases, volatile organic compounds and combustion gases at the BH Outlet of each Boiler. The contaminant groups included in the emission test program and the reference test methods used are summarized below:

Test Groups	Reference Method
Particulate and Metals	US EPA Method 29
$PM_{2.5}$/PM_{10} and Condensable Particulate	US EPA Methods 201A and 202
Semi-Volatile Organic Compounds	Environment Canada Method EPS 1/RM/2
Volatile Organic Compounds	US EPA SW-846 Method 0030
Aldehydes	CARB Method 430
Halides and Ammonia	US EPA Method 26A
Combustion Gases:	
Oxygen and Carbon Dioxide	Facility CEM
Carbon Monoxide	Facility CEM
Sulphur Dioxide	Facility CEM
Nitrogen Oxides	Facility CEM
Total Hydrocarbons	ORTECH per US EPA Method 25A

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. In-stack emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter for comparison with the results from compliance source testing. In-stack emission limits are also given for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide calculated as the rolling arithmetic average of data measured by a CEMS.

Since relative accuracy and system bias testing performed in the Fall of 2015 demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the six days when isokinetic testing was performed at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. A seventh day of testing was conducted at Boiler No. 2, however only three hours of single point sampling were conducted. Concentration data measured by ORTECH between April 19 and April 20, 2016 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

Consistent with the approach commonly required by the MOECC for compliance emission testing programs, the following results are conservative in the sense that when the analytical result is reported to be below the detection limit, the full detection limit is used to calculate emission data and is shown by a "<" symbol. Also, when one or both Boiler results are reported to be below the detection limit, the detection limit was used to conservatively estimate the total emission rate for the Main Stack.

The MOECC "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provides a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. The dioxins, furans and dioxin-like PCBs toxicity equivalent emission data was also calculated using half the detection limit for those compounds not detected. The half detection limit data was only used to assess against the dispersion modelling Point of Impingement limit. The toxicity equivalent concentrations calculated using the full detection limit, for those compounds less than the reportable detection limit, was used to assess against the in-stack limit detailed in Schedule C of the ECA.

The average results for the tests conducted at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Limit	Boiler No. 1	Boiler No. 2	Combined Boilers
Power Output (MWh/day)*	-	-	-	378 (7)
Average Combustion Zone Temp. (°C)*	-	1216	1246	1231 (8)
Steam (tonnes/day)*	-	749	797	1546 (7)
MSW Combusted (tonnes/day)*	-	189	209	398 (7)
NOx Reagent Injection Rate (liters/day)*	-	644	1076	1720 (7)
Carbon Injection (kg/day)*	-	114	117	231 (7)
Lime Injection (kg/day)*	-	3801	4476	8277 (7)
Stack Temperature (°C)	-	142	140	141 (8)
Moisture Content (%)	-	16.1	15.6	15.9 (8)
Velocity (m/s)	-	16.7	17.3	-
Static Pressure (kPa)	-	-2.76	-2.47	-2.62 (8)
Absolute Pressure (kPa)	-	97.9	98.1	98.0 (8)
Actual Flowrate (m^3/s)	-	24.7	25.6	-
Dry Reference Flowrate (Rm^3/s) (1)	-	14.4	15.1	29.5 (7)
Oxygen (%)*	-	7.38	8.17	7.78 (8)
Carbon Dioxide (%)*	-	11.8	11.3	11.6 (8)
Particulate (mg/Rm^3) (2)	9	<0.62	<0.48	<0.55 (8)
Mercury ($\mu g/Rm^3$) (2)	15	0.44	0.27	0.36 (8)
Cadmium ($\mu g/Rm^3$) (2)	7	<0.043	<0.043	<0.043 (8)
Lead ($\mu g/Rm^3$) (2)	50	0.27	0.22	0.25 (8)
Dioxins and Furans (pg TEQ/Rm^3) (3)	60	<818	<12.1	<415 (8)
Hydrochloric Acid (mg/Rm^3) (4)*	9	5.6	5.4	5.5 (8)
Sulphur Dioxide (mg/Rm^3) (4)*	35	0.2	0	0.1 (8)
Nitrogen Oxides (mg/Rm^3) (4)*	121	111	111	111 (8)
Total Hydrocarbons (ppm, dry) (5)	50	0.8	0.9	0.9 (8)
Carbon Monoxide (mg/Rm^3) (6)*	40	22.5	29.8	26.2 (8)

* based on process data or CEM data provided by Covanta

(1) dry at 25°C and 1 atmosphere

(2) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(4) maximum calculated rolling arithmetic average of 24 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(5) average of six half-hour tests conducted by ORTECH between April 19 and April 20, 2016 measured at an undiluted location, reported on a dry basis expressed as equivalent methane

(6) maximum calculated rolling arithmetic average of 4 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(7) total for combined Boilers

(8) average for combined Boilers

The emission data measured at each Boiler BH Outlet during the testing program was combined and used to assess the emissions from the Main Stack against the point of impingement criteria detailed in Ontario Regulation 419/05.

The CALPUFF dispersion modelling results for the May 2016 emission testing program are provided in the following tables based on calculated ground level point of impingement concentrations for the average total Main Stack emissions. As shown in the following tables, the calculated impingement concentrations were well below the allowable impingement concentrations for all of the contaminants. The point of impingement concentration was less than 26.4% of the standard, guideline or upper risk threshold limit provided in Ontario Regulation 419/05 for each contaminant.

A scenario provided in the DYEC Emission Summary and Dispersion Modelling (ESDM) Report includes emissions from silo loading and the standby generator (Scenario H). The predominant contaminants from these sources are particulate from the silo loading and nitrogen oxides from the generator. These two contaminants were assessed and it was determined that, since the Main Stack emissions presented in this report are less than those in the ESDM Report, dispersion modelling would show a decrease in the point of impingement concentration for these two contaminants. As a result, additional dispersion modelling for Scenario H was not conducted.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Inorganic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 µg/m^3			
Base Case - 1 hour			1.00 g/s	25.1 µg/m^3			
Base Case - 1/2 hour			1.00 g/s	30.1 µg/m^3			
Base Case - 30 day			1.00 g/s	0.117 µg/m^3			
Filterable Particulate Matter	<12.1 mg/s	<9.23 mg/s	<21.3 mg/s	0.028 µg/m^3	120 µg/m^3	0.023	S
Hydrogen Chloride *	77.9 mg/s	77.5 mg/s	155 mg/s	0.20 µg/m^3	20 µg/m^3	1.00	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	0.0065 µg/m^3	0.86 µg/m^3	0.75	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	0.00059 µg/m^3	0.34 µg/m^3	0.17	S - 30 day
Ammonia	6.07 mg/s	42.8 mg/s	48.9 mg/s	0.063 µg/m^3	100 µg/m^3	0.063	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	0 µg/m^3	275 µg/m^3	<0.0001	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	0 µg/m^3	690 µg/m^3	<0.0001	S - 1 hour
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	5.42 µg/m^3	200 µg/m^3	2.71	S
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	105 µg/m^3	400 µg/m^3	26.4	S - 1 hour
Carbon Monoxide **	0.29 g/s	0.33 g/s	0.62 g/s	18.6 µg/m^3	6000 µg/m^3	0.31	S - 1/2 hour

S - Standard
G - Guideline
URT - Upper Risk Threshold
* Measured by ORTECH using the acid gases test train.
** Emission data calculated using the CEM data measured by DYEC and the volumetric flowrates measured by ORTECH between May 2-4 and May 9-11, 2016.
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Semi-Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 µg/m^3			
Base Case - 1 hour			1.00 g/s	25.1 µg/m^3			
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	14.5 ng TEQ/s	0.22 ng TEQ/s	14.7 ng TEQ/s	0.019 pg TEQ/m^3	1 pg TEQ/m^3	1.90	URT
Naphthalene	<1.25 µg/s	<1.25 µg/s	<2.50 µg/s	0.0000032 µg/m^3	22.5 µg/m^3	<0.0001	G
Biphenyl	<1.25 µg/s	<1.25 µg/s	<2.50 µg/s	0.000063 µg/m^3	60 µg/m^3	0.00010	G - 1 hour
Benzo (a) pyrene	<0.63 µg/s	<0.62 µg/s	<1.25 µg/s	0.0000016 µg/m^3	0.0011 µg/m^3	0.15	G
1,2-Dichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 µg/s	0.000031 µg/m^3	30500 µg/m^3	<0.0001	G - 1 hour
1,4-Dichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 µg/s	0.0000016 µg/m^3	95 µg/m^3	<0.0001	S
1,2,4-Trichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 µg/s	0.0000016 µg/m^3	400 µg/m^3	<0.0001	G
Pentachlorophenol	1.17 µg/s	0.84 µg/s	2.01 µg/s	0.0000026 µg/m^3	20 µg/m^3	<0.0001	G

S - Standard
G - Guideline
URT - Upper Risk Threshold

* Calculated using the WHO (O. Reg. 419/05) toxicity equivalence factors and half the detection limit for those isomers not detected in quantities greater than the reportable detection limit.
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for Metals

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 µg/m^3			
Antimony	<0.0033 mg/s	<0.0034 mg/s	<0.0067 mg/s	0.0000086 µg/m^3	25 µg/m^3	<0.0001	S
Arsenic	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	0.0000022 µg/m^3	0.3 µg/m^3	0.00072	G
Barium (as water soluble)	0.031 mg/s	0.028 mg/s	0.059 mg/s	0.000077 µg/m^3	10 µg/m^3	0.00077	G
Beryllium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	0.0000022 µg/m^3	0.01 µg/m^3	0.022	S
Cadmium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	0.0000022 µg/m^3	0.025 µg/m^3	0.0086	S
Chromium	0.063 mg/s	0.037 mg/s	0.099 mg/s	0.00013 µg/m^3	1.5 µg/m^3	0.0086	G
Cobalt	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	0.0000022 µg/m^3	0.1 µg/m^3	0.0022	G
Copper	0.030 mg/s	0.032 mg/s	0.062 mg/s	0.000080 µg/m^3	50 µg/m^3	0.00016	S
Lead	0.0052 mg/s	0.0043 mg/s	0.0094 mg/s	0.000012 µg/m^3	0.5 µg/m^3	0.0024	S
Manganese (as compounds)	0.024 mg/s	0.022 mg/s	0.045 mg/s	0.000058 µg/m^3	2.5 µg/m^3	0.0023	G
Mercury	0.0086 mg/s	0.0052 mg/s	0.014 mg/s	0.000018 µg/m^3	2 µg/m^3	0.00089	S
Molybdenum	0.15 mg/s	0.19 mg/s	0.34 mg/s	0.00044 µg/m^3	120 µg/m^3	0.00037	G
Nickel	0.067 mg/s	0.081 mg/s	0.15 mg/s	0.00019 µg/m^3	2 µg/m^3	0.0095	S
Selenium	<0.0038 mg/s	<0.0055 mg/s	<0.0093 mg/s	0.000012 µg/m^3	10 µg/m^3	0.00012	G
Silver	<0.0017 mg/s	<0.0017 mg/s	<0.0033 mg/s	0.0000043 µg/m^3	1 µg/m^3	0.00043	S
Vanadium	<0.00063 mg/s	<0.00063 mg/s	<0.0013 mg/s	0.0000016 µg/m^3	2 µg/m^3	<0.0001	S
Zinc	0.038 mg/s	0.014 mg/s	0.053 mg/s	0.000068 µg/m^3	120 µg/m^3	<0.0001	S

S - Standard
G - Guideline
URT - Upper Risk Threshold
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 µg/m^3			
Base Case - 1 hour			1.00 g/s	25.1 µg/m^3			
Acetone	0.045 mg/s	0.098 mg/s	0.14 mg/s	0.00018 µg/m^3	11880 µg/m^3	<0.0001	S
Benzene	0.026 mg/s	0.020 mg/s	0.046 mg/s	0.000059 µg/m^3	100 µg/m^3	<0.0001	URT
Bromoform	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 µg/m^3	55 µg/m^3	<0.0001	G
Bromomethane	<0.010 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 µg/m^3	1350 µg/m^3	<0.0001	G
1,3-Butadiene	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 µg/m^3	300 µg/m^3	<0.0001	URT
2-Butanone	<0.025 mg/s	<0.028 mg/s	<0.053 mg/s	0.000068 µg/m^3	1000 µg/m^3	<0.0001	S
Carbon Tetrachloride	<0.011 mg/s	<0.012 mg/s	<0.023 mg/s	0.000030 µg/m^3	2.4 µg/m^3	0.0012	S
Chloroform	0.026 mg/s	0.020 mg/s	0.046 mg/s	0.000059 µg/m^3	1 µg/m^3	0.0059	S
Cumene (Isopropylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 µg/m^3	400 µg/m^3	<0.0001	S
Dichlorodifluoromethane	<0.024 mg/s	<0.017 mg/s	<0.041 mg/s	0.000053 µg/m^3	500000 µg/m^3	<0.0001	G
trans,1,2-Dichloroethene	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	0.000019 µg/m^3	105 µg/m^3	<0.0001	G
Ethylbenzene	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 µg/m^3	1000 µg/m^3	<0.0001	S
Ethylene Dibromide	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	0.000019 µg/m^3	3 µg/m^3	0.00062	G
Mesitylene (1,3,5-Trimethylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 µg/m^3	220 µg/m^3	<0.0001	S
Methylene Chloride	<0.019 mg/s	<0.016 mg/s	<0.035 mg/s	0.000045 µg/m^3	220 µg/m^3	<0.0001	G
Styrene	<0.0082 mg/s	<0.0094 mg/s	<0.018 mg/s	0.000023 µg/m^3	400 µg/m^3	<0.0001	S
Tetrachloroethene	<0.012 mg/s	<0.020 mg/s	<0.032 mg/s	0.000041 µg/m^3	360 µg/m^3	<0.0001	S
Toluene	0.029 mg/s	0.047 mg/s	0.076 mg/s	0.000098 µg/m^3	2000 µg/m^3	<0.0001	G
1,1,1-Trichloroethane	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 µg/m^3	115000 µg/m^3	<0.0001	S
Trichloroethene	<0.0075 mg/s	<0.0084 mg/s	<0.016 mg/s	0.000021 µg/m^3	12 µg/m^3	0.00017	S
Trichlorotrifluoroethane	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 µg/m^3	800000 µg/m^3	<0.0001	S
Trichlorofluoromethane	<0.0071 mg/s	<0.0077 mg/s	<0.015 mg/s	0.000019 µg/m^3	6000 µg/m^3	<0.0001	G
Total Xylenes	<0.020 mg/s	<0.023 mg/s	<0.043 mg/s	0.000055 µg/m^3	730 µg/m^3	<0.0001	S
Vinyl Chloride	<0.0089 mg/s	<0.010 mg/s	<0.019 mg/s	0.000024 µg/m^3	1 µg/m^3	0.0024	S
Acetaldehyde	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 µg/m^3	500 µg/m^3	0.00050	S
Formaldehyde	0.81 mg/s	<0.41 mg/s	<1.22 mg/s	0.0016 µg/m^3	65 µg/m^3	0.0024	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 µg/m^3	0.4 µg/m^3	0.63	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.049 µg/m^3	4.5 µg/m^3	1.09	S - 1 hour

S - Standard
G - Guideline
URT - Upper Risk Threshold
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

In summary, the key results of the emission testing program are:

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 1623 tonnes of steam per day for the two Boilers combined, with the exception of May 5, 2016. On May 5, 2016 feed was stopped at Boiler No. 1 at 13:28 however no testing was conducted on Boiler No. 1 on May 5. The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes of steam per hour for each Boiler).

- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in the ECA with the exception of dioxins and furans measured at the Baghouse Outlet of Boiler No. 1.

- Using CALPUFF dispersion modelling techniques, the predicted maximum point of impingement concentrations, based on the average test results for both boilers, show DYEC to be operating well below the standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines, upper risk thresholds and "to be updated" guidelines.

Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 1 and Appendix 2, respectively.

APPENDIX 34

Dispersion Modelling Results
for the May 2016 Testing Program
(12 pages)

Appendix B
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [ng/s]	Maximum POI Concentration [pg/m^3]	Averaging Period [hours]	MOECC POI Limit [pg/m^3]	Limiting Effect	Regulation Schedule No.	Percentage of MOECC Limit [%]
Dioxins and Furans [TEQ][1]	N/A	Calpuff	1.47E-02	1.51E-02	24	1	—	Schedule 6	1.51%

Note:

1. Calculated using the WHO (O. Reg. 419/05) toxicity equivalence factors and half the detection limit for those isomers not detected in quantities greater than the reportable detection limit.

Appendix 5

Executive Summary - Compliance Source Test – Fall 2016 (including Emission Summary Table)

EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between October 25 and November 3, 2016. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter". This program is the third comprehensive Schedule E source testing program conducted at the facility; the initial source testing program was conducted in September/October 2015 and a voluntary test program was conducted in May 2016.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA. Although not a requirement of the ECA, at the request of Covanta and per the Pre-Test Plan submitted to and approved by the MOECC additional dioxin and furan testing was conducted at the Quench Inlet to the air pollution control (APC) system concurrently with the dioxin and furan tests performed at the Baghouse Outlet on each unit.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, acid gases, volatile organic compounds, aldehydes and combustion gases at the BH Outlet of each Boiler. Triplicate emission tests were also completed for dioxins, furans and dioxin-like PCBs at the Quench Inlet of each Boiler. The contaminant groups included in the emission test program and the reference test methods used are summarized below:

Test Groups	Reference Method
Particulate and Metals	US EPA Method 29
$PM_{2.5}$/PM_{10} and Condensable Particulate	US EPA Methods 201A and 202
Semi-Volatile Organic Compounds	Environment Canada Method EPS 1/RM/2
Volatile Organic Compounds	US EPA SW-846 Method 0030
Aldehydes	CARB Method 430 with Ashland Modification
Halides and Ammonia	US EPA Method 26A
Combustion Gases:	
Oxygen and Carbon Dioxide	Facility CEM
Carbon Monoxide	Facility CEM
Sulphur Dioxide	Facility CEM
Nitrogen Oxides	Facility CEM
Total Hydrocarbons	ORTECH per US EPA Method 25A

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. In-stack emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter for comparison with the results from compliance source testing. In-stack emission limits are also given for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide calculated as the rolling arithmetic average of data measured by a continuous emission monitoring system (CEMS).

Since relative accuracy and system bias testing performed in the Fall of 2016 demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the days when isokinetic testing was performed at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH between October 25 and October 26, 2016 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

Consistent with the approach commonly required by the MOECC for compliance emission testing programs, the following results are conservative in the sense that when the analytical result is reported to be below the detection limit, the full detection limit is used to calculate emission data and is shown by a "<" symbol. Also, when one or both Boiler results are reported to be below the detection limit, the detection limit was used to conservatively estimate the total emission rate for the Main Stack.

The MOECC "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provides a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. The dioxins, furans and dioxin-like PCBs toxicity equivalent emission data was also calculated using half the detection limit for those compounds not detected. The half detection limit data was only used to assess against the dispersion modelling Point of Impingement limit. The toxicity equivalent concentrations calculated using the full detection limit, for those compounds less than the reportable detection limit, was used to assess against the in-stack limit detailed in Schedule C of the ECA.

The average results for the tests conducted at Boiler No. 1, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	386	-
Average Combustion Zone Temp. (°C)*	-	-	-	1231	-
Steam (tonnes/day)*	-	-	-	797	-
MSW Combusted (tonnes/day)*	-	-	-	222	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	1271	-
Carbon Injection (kg/day)*	-	-	-	130	-
Lime Injection (kg/day)*	-	-	-	4772	-
Filterable Particulate (mg/Rm^3) (1)	0.97	0.78	1.09	0.95	9
PM_{10} with Condensable (mg/Rm^3) (1)	<6.16	<6.22	<6.56	<6.31	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<5.80	<5.85	<6.21	<5.95	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.13	<0.14	<0.14	<0.14	-
Ammonia (mg/Rm^3) (1)	1.36	1.44	1.24	1.35	-
Cadmium (µg/Rm^3) (1)	0.048	0.11	0.065	0.074	7
Lead (µg/Rm^3) (1)	0.53	0.40	0.25	0.39	50
Mercury (µg/Rm^3) (1)	0.067	0.038	0.047	0.051	15
Antimony (µg/Rm^3) (1)	<0.17	<0.17	<0.16	<0.17	-
Arsenic (µg/Rm^3) (1)	<0.042	<0.042	<0.041	<0.042	-
Barium (µg/Rm^3) (1)	3.31	3.05	3.95	3.44	-
Beryllium (µg/Rm^3) (1)	<0.042	<0.042	<0.041	<0.042	-
Chromium (µg/Rm^3) (1)	1.04	5.66	0.70	2.47	-
Cobalt (µg/Rm^3) (1)	0.040	0.037	0.022	0.033	-
Copper (µg/Rm^3) (1)	1.73	1.78	1.54	1.68	-
Molybdenum (µg/Rm^3) (1)	4.89	4.74	4.82	4.81	-
Nickel (µg/Rm^3) (1)	1.10	1.18	0.74	1.01	-
Selenium (µg/Rm^3) (1)	<0.11	<0.11	<0.10	<0.10	-
Silver (µg/Rm^3) (1)	<0.084	<0.085	<0.082	<0.084	-
Thallium (µg/Rm^3) (1)	<0.21	<0.21	<0.20	<0.21	-
Vanadium (µg/Rm^3) (1)	<0.032	<0.032	<0.031	<0.031	-
Zinc (µg/Rm^3) (1)	5.90	4.67	3.59	4.72	-
Dioxins and Furans (pg TEQ/Rm^3)(3)	<7.62	<5.86	<14.8	<9.44	60
Total Chlorobenzenes (ng/Rm^3)(1)	<278	<275	<280	<278	-
Total Chlorophenols (ng/Rm^3)(1)	<583	<577	<588	<583	-
Total PAHs (ng/Rm^3)(1)	<1999	<1978	<2018	<1998	-
Total VOCs (µg/Rm^3) (1)	<261	<188	<244	<231	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3)(3)	1004	804	1051	953	-
Quench Inlet Organic Matter (THC) (ppm, dry)(2)	6.7	3.5	3.5	4.6	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average results for the tests conducted at Boiler No. 2, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	385	-
Average Combustion Zone Temp. (°C)*	-	-	-	1216	-
Steam (tonnes/day)*	-	-	-	796	-
MSW Combusted (tonnes/day)*	-	-	-	218	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	1308	-
Carbon Injection (kg/day)*	-	-	-	127	-
Lime Injection (kg/day)*	-	-	-	5174	-
Filterable Particulate (mg/Rm^3) (1)	0.94	1.17	1.01	1.04	9
PM_{10} with Condensable (mg/Rm^3) (1)	<10.2	<10.1	<8.74	<9.67	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<9.91	<9.71	<8.41	<9.34	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.14	<0.14	<0.15	<0.14	-
Ammonia (mg/Rm^3) (1)	1.29	1.31	1.03	1.21	-
Cadmium (µg/Rm^3) (1)	0.20	0.060	0.10	0.12	7
Lead (µg/Rm^3) (1)	0.26	0.37	0.23	0.28	50
Mercury (µg/Rm^3) (1)	0.032	0.028	0.036	0.032	15
Antimony (µg/Rm^3) (1)	<0.17	<0.17	<0.17	<0.17	-
Arsenic (µg/Rm^3) (1)	<0.042	<0.043	<0.043	<0.042	-
Barium (µg/Rm^3) (1)	3.14	2.97	2.12	2.74	-
Beryllium (µg/Rm^3) (1)	<0.042	<0.043	<0.043	<0.042	-
Chromium (µg/Rm^3) (1)	0.68	1.58	0.67	0.98	-
Cobalt (µg/Rm^3) (1)	0.014	0.011	<0.011	<0.012	-
Copper (µg/Rm^3) (1)	1.55	1.56	3.38	2.16	-
Molybdenum (µg/Rm^3) (1)	4.96	5.00	4.79	4.92	-
Nickel (µg/Rm^3) (1)	0.67	0.99	0.57	0.75	-
Selenium (µg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Silver (µg/Rm^3) (1)	<0.084	<0.086	<0.086	<0.085	-
Thallium (µg/Rm^3) (1)	<0.21	<0.21	<0.21	<0.21	-
Vanadium (µg/Rm^3) (1)	<0.031	<0.032	<0.032	<0.032	-
Zinc (µg/Rm^3) (1)	4.29	5.19	1.13	3.54	-
Dioxins and Furans (pg TEQ/Rm^3)(3)	<6.75	<6.50	<5.96	<6.40	60
Total Chlorobenzenes (ng/Rm^3)(1)	<325	<356	<319	<333	-
Total Chlorophenols (ng/Rm^3)(1)	<818	<607	<574	<666	-
Total PAHs (ng/Rm^3)(1)	<2343	<2426	<2295	<2355	-
Total VOCs (µg/Rm^3) (1)	<219	<214	<217	<217	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3)(3)	708	886	874	822	-
Quench Inlet Organic Matter (THC) (ppm, dry)(2)	4.3	4.7	3.0	4.0	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

A summary of the minimum, average and maximum concentrations for the combustion gases measured by the DYEC CEMS with in-stack limits listed in the ECA is provided below for the two units.

Boiler No.	Parameter	Minimum	Average	Maximum	In-Stack Limit
Boiler No. 1	Carbon Monoxide (mg/Rm^3)$^{(1)}$	7.3	11.4	18.3	40
	Hydrogen Chloride (mg/Rm^3)$^{(2)}$	0.4	1.2	1.8	9
	Nitrogen Oxides (mg/Rm^3)$^{(2)}$	111	112	113	121
	Sulphur Dioxide (mg/Rm^3)$^{(2)}$	0	0.8	1.3	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3)$^{(1)}$	10.3	15.7	25.8	40
	Hydrogen Chloride (mg/Rm^3)$^{(2)}$	0.8	1.2	1.6	9
	Nitrogen Oxides (mg/Rm^3)$^{(2)}$	112	113	115	121
	Sulphur Dioxide (mg/Rm^3)$^{(2)}$	0	0.9	3.1	35

(1) 4-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume
(2) 24-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume

The emission data measured at each Boiler BH Outlet during the testing program was combined and used to assess the emissions from the Main Stack against the current point of impingement criteria detailed in Ontario Regulation 419/05.

The CALPUFF dispersion modelling (using Version 6.263 as requested by the MOECC) for the October/November 2016 emission testing program was performed by Golder Associates. A summary of the results are provided in the tables appended to this report (Appendix 33) based on calculated ground level point of impingement concentrations for the average total Main Stack emissions. As shown in the tables, the calculated impingement concentrations were well below the allowable impingement concentrations for all of the contaminants.

In summary, the key results of the emission testing program are:

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 793 tonnes of steam per day for each Boiler (approximately 98% of maximum continuous rating). The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes of steam per hour or 807.4 tonnes per day for each Boiler).

- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in Schedule C of the ECA.

- Using CALPUFF dispersion modelling techniques, the predicted maximum point of impingement concentrations, based on the average test results for both boilers, show DYEC to be operating well below all current standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines and upper risk thresholds.

Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 1 and Appendix 2, respectively. Tables for the additional testing conducted at the Boiler No. 1 Quench Inlet and Boiler No. 2 Quench Inlet are provided in Appendix 3 and Appendix 4, respectively.

APPENDIX 33

Dispersion Modelling Results
for the October/November 2016 Testing Program
(19 pages)

Appendix C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	MOECC POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOECC Limit [%]
Carbon Monoxide	630-08-0	Calpuff	5.25E-01	1.16E+01	½	6000	Health	Schedule 3	<1%
Sulphur Dioxide	7446-09-5	Calpuff	3.50E-01	3.51E-01	24	275	Health & Vegetation	Schedule 3	<1%
Sulphur Dioxide	7446-09-5	Calpuff	3.50E-01	6.46E+00	1	690	Health & Vegetation	Schedule 3	<1%
Total Particulate Matter (Condensable and Filterable)	N/A	Calpuff	3.18E-01	5.78E-01	24	120	Visibility	Schedule 3	<1%
Total Particulate Matter (Filterable only)	N/A	Calpuff	3.96E-02	2.99E-01	24	120	Visibility	Schedule 3	<1%
PM_{10}	N/A	Calpuff	3.33E-02	2.92E-01	24	50	—	Ontario AAQC	<1%
$PM_{2.5}$	N/A	Calpuff	2.00E-02	2.79E-01	24	30	—	Ontario AAQC	<1%
Lead	7439-92-1	Calpuff	1.34E-05	1.35E-05	24	0.5	Health	Schedule 3	<1%
Lead	7439-92-1	Calpuff	1.34E-05	1.51E-06	30-day	0.2	Health	Schedule 3	<1%
Cadmium	7440-43-9	Calpuff	3.83E-06	3.85E-06	24	0.025	Health	Schedule 3	<1%
Mercury	7439-97-6	Calpuff	1.65E-06	1.66E-06	24	2	Health	Schedule 3	<1%
Fluorides	7664-39-3	Calpuff	5.49E-03	5.52E-03	24	0.86	Vegetation	Schedule 3	<1%
Fluorides	7664-39-3	Calpuff	5.49E-03	6.16E-04	30-day	0.34	Vegetation	Schedule 3	<1%
Dioxins and Furans (TEQ)	N/A	Calpuff	3.33E-10	3.35E-10	24	1.00E-07	—	Guideline	<1%
Hydrogen Chloride	7647-01-0	Calpuff	1.47E-01	1.48E-01	24	20	Health	Schedule 3	<1%
Ammonia	7664-41-7	Calpuff	5.08E-02	5.10E-02	24	100	Health	Schedule 3	<1%
Nitrogen Oxides	10102-44-0	Calpuff	4.38E+00	4.40E+00	24	200	Health	Schedule 3	2.20%
Nitrogen Oxides	10102-44-0	Calpuff	4.38E+00	8.08E+01	1	400	Health	Schedule 3	20.21%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	3.33E-10	3.35E-10	24	0.15	Health	Point-of-Impingement	<1%
Antimony	7440-36-0	Calpuff	6.69E-06	6.72E-06	24	25	Health	Schedule 3	<1%
Arsenic	7440-38-2	Calpuff	1.67E-06	1.68E-06	24	0.3	Health	Guideline	<1%
Arsenic	7440-38-2	Calpuff	1.67E-06	3.71E-05	½	1	Health	Guideline	<1%
Barium	7440-39-3	Calpuff	1.23E-04	1.24E-04	24	10	Health	Guideline	<1%
Barium	7440-39-3	Calpuff	1.23E-04	2.73E-03	½	30	Health	Guideline	<1%
Beryllium	7440-41-7	Calpuff	1.67E-06	1.68E-06	24	0.01	Health	Schedule 3	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	6.84E-05	2.19E-06	Annual	0.00014	Health	Schedule 3	1.57%
Total Chromium (and compounds)	7440-47-3	Calpuff	6.84E-05	6.87E-05	24	0.5	Health	Schedule 3	<1%
Cobalt	7440-48-4	Calpuff	8.92E-07	8.96E-07	24	0.1	Health	Guideline	<1%
Cobalt	7440-48-4	Calpuff	8.92E-07	1.98E-05	½	0.3	Health	Guideline	<1%
Nickel	7440-02-0	Calpuff	3.49E-05	1.12E-06	Annual	0.04	Health	Schedule 3	<1%
Silver	7440-22-4	Calpuff	3.34E-06	3.36E-06	24	1	Health	Schedule 3	<1%
Selenium	7782-49-2	Calpuff	4.18E-06	4.20E-06	24	10	Health	Guideline	<1%
Selenium	7782-49-2	Calpuff	4.18E-06	9.27E-05	½	20	Health	Guideline	<1%
Thallium	7440-28-0	Calpuff	8.36E-06	8.40E-06	24	0.24	—	JSL	Below JSL
Vanadium	7440-62-2	Calpuff	1.25E-06	1.26E-06	24	2	Health	Schedule 3	<1%
Zinc	7440-66-6	Calpuff	1.64E-04	1.65E-04	24	120	Particulate	Schedule 3	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	1.16E-06	2.56E-05	½	37000	Health	Guideline	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	1.16E-06	2.13E-05	1	30500	Health	Point-of-Impingement	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	1.16E-06	1.16E-06	24	1	—	JSL	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.27E-06	1.28E-06	24	400	Health	Guideline	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.27E-06	2.82E-05	½	100	Particulate	Guideline	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	1.16E-06	1.16E-06	24	1.5	—	JSL	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	2.65E-06	2.66E-06	24	77	—	JSL	Below JSL
Pentachlorophenol	87-86-5	Calpuff	1.16E-06	1.16E-06	24	20	Health	Guideline	<1%
Pentachlorophenol	87-86-5	Calpuff	1.16E-06	2.56E-05	½	60	Health	Guideline	<1%
Hexachlorobenzene	118-74-1	Calpuff	1.16E-06	1.16E-06	24	0.011	—	JSL	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	1.16E-06	1.16E-06	24	3	—	JSL	Below JSL
Acenaphthylene	208-96-8	Calpuff	1.16E-06	1.16E-06	24	3.5	—	JSL	Below JSL
Acenaphthene	83-32-9	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Anthracene	120-12-7	Calpuff	1.16E-06	1.16E-06	24	0.2	—	JSL	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus

Appendix C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	MOECC POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOECC Limit [%]
Benzo(a)fluorene	238-84-6	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	1.68E-06	1.69E-06	24	0.1	—	De Minimus	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	1.78E-06	1.79E-06	24	1.2	—	JSL	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	1.16E-06	3.70E-08	Annual	0.00001	Health	Schedule 3	<1%
Benzo(e)pyrene	192-97-2	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
Biphenyl	92-51-3	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
Chrysene	218-01-9	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Fluoranthene	206-44-0	Calpuff	1.16E-06	1.16E-06	24	140	—	JSL	Below JSL
Fluorine	86-73-7	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	2.31E-06	2.32E-06	24	12	—	JSL	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	1.16E-06	1.16E-06	24	10	—	JSL	Below JSL
Naphthalene	91-20-3	Calpuff	2.31E-06	2.32E-06	24	22.5	Health	Guideline	<1%
Naphthalene	91-20-3	Calpuff	2.31E-06	5.12E-05	½	36	Odour	Guideline	<1%
Naphthalene	91-20-3	Calpuff	2.31E-06	7.04E-05	10-min	50	Odour	Guideline	<1%
Perylene	198-55-0	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
Phenanthrene	85-01-8	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Pyrene	129-00-0	Calpuff	1.16E-06	1.16E-06	24	0.2	—	JSL	Below JSL
Tetralin	119-64-2	Calpuff	2.31E-06	2.32E-06	24	1200	—	JSL	Below JSL
O-terphenyl	84-15-1	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	2.24E-03	2.25E-03	24	500	Health	Schedule 3	<1%
Acetaldehyde	75-07-0	Calpuff	2.24E-03	4.97E-02	½	500	Health	Schedule 3	<1%
Benzene	71-43-2	Calpuff	4.16E-05	1.33E-06	Annual	0.45	Health	Schedule 3	<1%
Bromodichloromethane	75-27-4	Calpuff	1.68E-05	1.69E-05	24	0.1	—	De Minimus	Below De Minimus
Bromoform	75-25-2	Calpuff	2.14E-05	2.15E-05	24	55	Health	Guideline	<1%
Bromoform	75-25-2	Calpuff	2.14E-05	4.75E-04	½	165	Health	Guideline	<1%
Bromomethane	74-83-9	Calpuff	2.76E-05	2.78E-05	24	1350	Health	Guideline	<1%
Bromomethane	74-83-9	Calpuff	2.76E-05	6.13E-04	½	4000	Health	Guideline	<1%
Carbon tetrachloride	56-23-5	Calpuff	2.45E-05	2.46E-05	24	2.4	Health	Schedule 3	<1%
Chloroform	67-66-3	Calpuff	2.33E-05	2.34E-05	24	1	Health	Schedule 3	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	3.61E-05	3.62E-05	24	500000	Health	Guideline	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	3.61E-05	8.00E-04	½	1500000	Health	Guideline	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	1.68E-05	1.69E-05	24	165	Health	Schedule 3	<1%
Dichloromethane	75-09-2	Calpuff	3.33E-05	3.35E-05	24	220	Health	Schedule 3	<1%
Ethylbenzene	100-41-4	Calpuff	2.31E-05	2.32E-05	24	1000	Health	Schedule 3	<1%
Ethylbenzene	100-41-4	Calpuff	2.31E-05	7.05E-04	10-min	1900	Odour	Guideline	<1%
Ethylene Dibromide	106-93-4	Calpuff	1.53E-05	1.54E-05	24	3	Health	Guideline	<1%
Ethylene Dibromide	106-93-4	Calpuff	1.53E-05	3.40E-04	½	9	Health	Guideline	<1%
Formaldehyde	50-00-0	Calpuff	2.82E-03	2.83E-03	24	65	Health	Schedule 3	<1%
Tetrachloroethene	127-18-4	Calpuff	3.13E-05	3.14E-05	24	360	Health	Schedule 3	<1%
Toluene	108-88-3	Calpuff	3.32E-04	3.33E-04	24	2000	Odour	Guideline	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	2.14E-05	2.15E-05	24	115000	Health	Schedule 3	<1%
Trichloroethene	86-42-0	Calpuff	1.68E-05	1.69E-05	24	12	—	Guideline	<1%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	3.13E-05	3.14E-05	24	12	Health	Schedule 3	<1%
Trichlorofluoromethane	75-69-4	Calpuff	2.23E-05	2.24E-05	24	6000	Health	Guideline	<1%
Trichlorofluoromethane	75-69-4	Calpuff	2.23E-05	4.94E-04	½	18000	Health	Guideline	<1%
Vinyl chloride	75-01-4	Calpuff	1.99E-05	2.00E-05	24	1	Health	Schedule 3	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	4.76E-05	4.78E-05	24	730	Health	Schedule 3	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	4.76E-05	1.45E-03	10-min	3000	Odour	Guideline	<1%
Copper	7440-50-8	Calpuff	7.60E-05	7.63E-05	24	50	Health	Schedule 3	<1%
Manganese	7439-96-5	Calpuff	3.37E-05	3.39E-05	24	0.4	Health	Schedule 3	2.50%
Molybdenum	7439-98-7	Calpuff	1.93E-04	1.94E-04	24	120	Particulate	Point-of-Impingement	<1%
1,3-Dichlorobenzene	541-73-1	Calpuff	1.16E-06	1.16E-06	24	360	—	JSL	Below JSL
1,4-Dichlorobenzene	106-46-7	Calpuff	1.16E-06	1.16E-06	24	95	Health	Schedule 3	<1%
1,3,5-trichlorobenzene	108-70-3	Calpuff	1.16E-06	1.16E-06	24	18	—	JSL	Below JSL
1,2,3-trichlorobenzene	87-61-6	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
1,2,3,4-tetrachlorobenzene	634-66-2	Calpuff	1.16E-06	1.16E-06	24	4	—	JSL	Below JSL
2-monochlorophenol	95-57-8	Calpuff	1.16E-06	1.16E-06	24	0.8	—	JSL	Below JSL

Appendix C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	MOECC POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOECC Limit [%]
3-monochlorophenol	108-43-0	Calpuff	1.16E-06	1.16E-06	24	0.8	—	JSL	Below JSL
4-monochlorophenol	106-48-9	Calpuff	2.73E-06	2.74E-06	24	12	—	JSL	Below JSL
2,6-dichlorophenol	87-65-0	Calpuff	1.16E-06	1.16E-06	24	8	—	JSL	Below JSL
3,5-dichlorophenol	591-35-5	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3-dichlorophenol	576-24-9	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
3,4-dichlorophenol	95-77-2	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3,6-trichlorophenol	933-75-5	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3,5-trichlorophenol	933-78-8	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,4,5-trichlorophenol	95-95-4	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3,4-trichlorophenol	15950-66-0	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
3,4,5-trichlorophenol	609-19-8	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3,5,6-tetrachlorophenol	935-95-5	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2,3,4,5-tetrachlorophenol	4901-51-3	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
2-Chloronaphthalene	91-58-7	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
Coronene	191-07-1	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
Dibenzo(a,e)pyrene	192-65-4	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
9,10-Dimethylanthracene	781-43-1	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
7,12-Dimethylbenzo(a)anthracene	57-97-6	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
2-Methylanthracene	613-12-7	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
3-Methylcholanthrene	56-49-5	Calpuff	4.62E-06	4.64E-06	24	0.1	—	De Minimus	Below De Minimus
1-Methylphenanthrene	832-69-9	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
9-Methylphenanthrene	883-20-5	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Picene	213-46-7	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
m-Terphenyl	92-06-8	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
p-Terphenyl	92-94-4	Calpuff	2.31E-06	2.32E-06	24	0.1	—	De Minimus	Below De Minimus
Triphenylene	217-59-4	Calpuff	1.16E-06	1.16E-06	24	0.1	—	De Minimus	Below De Minimus
Acetone	67-64-1	Calpuff	1.02E-04	1.02E-04	24	11880	Health	Schedule 3	<1%
1,3-Butadiene	106-99-0	Calpuff	3.83E-05	1.23E-06	Annual	2	Health	Schedule 3	<1%
2-Butanone	78-93-3	Calpuff	5.51E-05	5.54E-05	24	1000	Health	Schedule 3	<1%
Chlorobenzene	108-90-7	Calpuff	1.68E-05	3.11E-04	1	3500	Health	Point-of-Impingement	<1%
Chlorobenzene	108-90-7	Calpuff	1.68E-05	5.14E-04	10-min	4500	Odour	Guideline	<1%
Cumene (Isopropylbenzene)	98-82-8	Calpuff	1.00E-04	1.01E-04	24	400	Health	Schedule 3	<1%
Dibromochloromethane	124-48-1	Calpuff	1.38E-05	1.38E-05	24	0.2	—	JSL	Below JSL
1,2-Dichloroethane	107-06-2	Calpuff	1.07E-05	1.08E-05	24	2	Health	Schedule 3	<1%
trans,1,2-Dichloroethene	156-60-5	Calpuff	1.53E-05	1.54E-05	24	105	Health	Point-of-Impingement	<1%
1,2-Dichloropropane	78-87-5	Calpuff	1.68E-05	1.69E-05	24	2400	Odour	Point-of-Impingement	<1%
Mesitylene (1,3,5-Trimethylbenzene)	108-67-8	Calpuff	3.83E-05	3.85E-05	24	220	Health	Schedule 3	<1%
Styrene	100-42-5	Calpuff	1.99E-05	2.00E-05	24	400	Health	Schedule 3	<1%
1,1,2-Trichloroethane	79-00-5	Calpuff	2.45E-05	2.46E-05	24	0.31	—	JSL	Below JSL
Trichlorotrifluoroethane	76-13-1	Calpuff	3.83E-05	3.85E-05	24	800000	Health	Schedule 3	<1%
Acrolein	107-02-8	Calpuff	2.24E-03	2.25E-03	24	0.4	Health	Schedule 3	2.50%
Acrolein	107-02-8	Calpuff	2.24E-03	4.14E-02	1	4.5	Health	Schedule 3	<1%

Appendix 6

Acoustic Assessment Summary Table and Area Plan with Points of Reception and Measurement Locations

TABLE 3

SUMMARY OF PRE-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

Monitoring Date	M001[1]				M002a[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Thursday, November 13, 2014	52	49	–	–	49	45	–	–	60	57	–	–
Friday, November 14, 2014	55	51	52	46	52	47	50	43	59	48	58	51
Saturday, November 15, 2014	52	46	51	44	46	40	47	40	58	52	54	46
Sunday, November 16, 2014	49	41	45	37	44	33	42	33	59	49	52	46
Monday, November 17, 2014	54	42	49	37	51	38	49	32	60	49	51	43
Friday, November 21, 2014	54	45	53	47	52	39	51	46	58	45	54	46
Sunday, November 23, 2014	52	41	50	43	51	42	47	41	60	52	54	45
Average for Pre-operational Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

TABLE 4

COMPARISON OF PRE-OPERATIONAL AND POST-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

APRIL 2015

Monitoring Date	M001[1]				M002b[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Monday, April 6, 2015	52	46	–	–	54	49	–	–	59	53	–	–
Tuesday, April 7, 2015	52	46	43	48	54	48	55	51	57	53	54	45
Saturday, April 11, 2015	54	50	–	–	56	51	–	–	58	53	–	–
Sunday, April 12, 2015	51	46	49	42	54	49	53	50	57	49	55	45
Monday, April 13, 2015	55	46	53	47	58	50	55	48	61	51	58	49
Tuesday, April 14, 2015	56	49	53	45	58	50	56	52	63	48	65	52
Wednesday, April 15, 2015	58	46	58	48	59	51	61	52	58	48	51	47
Thursday, April 16, 2015	–	–	52	47	–	–	57	50	–	–	58	48
Average for Post-operational (April 2015) Monitoring Period	*54*	*47*	*53*	*46*	*56*	*50*	*56*	*51*	*59*	*51*	*57*	*48*
Average for Pre-operational (November 2014) Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

TABLE 5

COMPARISON OF PRE-OPERATIONAL AND POST-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

OCTOBER 2015

Monitoring Date	M001[1]				M002b[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Monday, October 5, 2015	49	37	–	–	54	45	–	–	50	43	–	–
Tuesday, October 6, 2015	54	46	52	44	56	50	52	43	54	48	53	48
Wednesday, October 7, 2015	54	46	55	47	59	50	57	52	54	47	56	49
Thursday, October 8, 2015	54	47	55	51	58	55	54	47	55	48	55	51
Friday, October 9, 2015	56	49	55	46	60	52	58	50	56	50	54	48
Saturday, October 10, 2015	57	40	57	51	57	50	57	49	57	42	57	51
Sunday, October 11, 2015	54	48	51	47	59	53	54	49	61	50	58	53
Monday, October 12, 2015	47	40	46	42	58	51	55	48	47	44	49	47
Tuesday, October 13, 2015	54	50	48	42	61	56	57	51	58	52	48	45
Wednesday, October 14, 2015	55	52	54	47	57	53	55	52	56	51	54	50
Thursday, October 15, 2015	52	51	52	48	61	60	61	53	54	53	53	50
Average for Post-operational (October 2015) Monitoring Period	*53*	*46*	*53*	*47*	*58*	*52*	*56*	*49*	*54*	*48*	*54*	*49*
Average for Pre-operational (November 2014) Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

TABLE 6

COMPARISON OF PRE-OPERATIONAL AND POST-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

SEPTEMBER 2016

Monitoring Date	M001[1]				M002b[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Tuesday September 6, 2016	52	47	–	–	51	45	–	–	58	53	–	–
Wednesday September 7, 2016	51	45	53	51	50	45	52	50	57	50	58	52
Thursday September 8, 2016	55	50	53	49	55	49	52	48	58	50	55	52
Friday September 9, 2016	55	47	54	51	56	47	54	52	58	49	59	54
Saturday September 10, 2016	51	43	50	48	53	45	53	48	58	54	54	52
Sunday September 11, 2016	52	48	49	48	54	51	54	52	55	49	53	50
Monday September 12, 2016	53	43	51	44	56	44	51	46	64	49	65	51
Tuesday September 13, 2016	53	48	54	46	54	50	52	46	62	58	64	55
Wednesday September 14, 2016	52	49	–	–	54	51	–	–	58	55	–	–
Average for Post-operational (September 2016) Monitoring Period	*53*	*47*	*52*	*48*	*54*	*47*	*53*	*49*	*59*	*52*	*58*	*52*
Average for Pre-operational (November 2014) Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

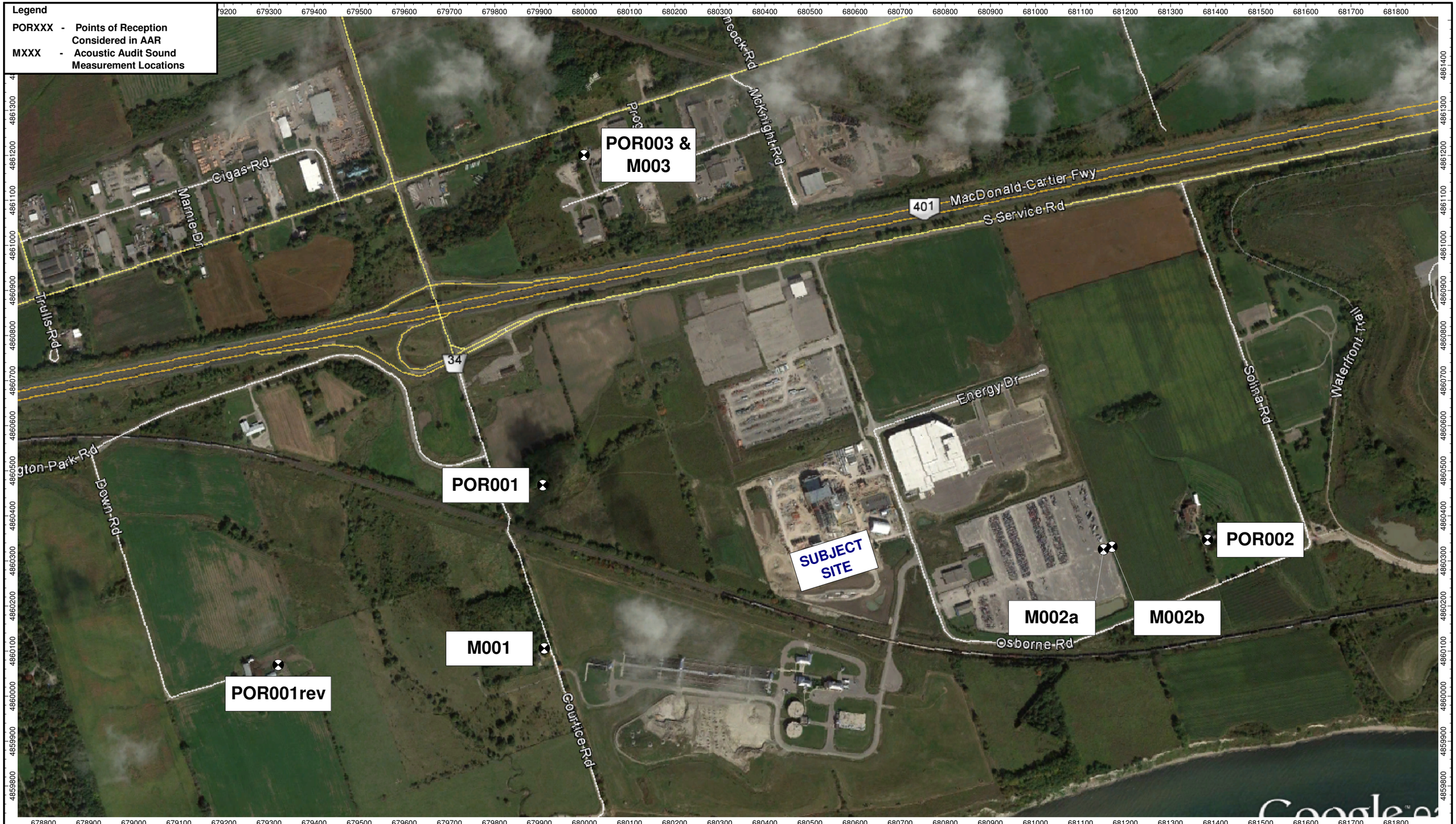
Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

Legend

PORXXX - Points of Reception Considered in AAR

MXXX - Acoustic Audit Sound Measurement Locations



VALCOUSTICS Canada Ltd. consulting acoustical engineers	Title: **Area Plan with Points of Reception and Measurement Locations**	Date: **2017-01-10**	Figure: **1**
	Project Name: **DYEC - Acoustic Audit**	Project No.: **114-318-200**	

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Date Plotted: 09.01.17