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ORTECH
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Report:

Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre
Spring 2018 Voluntary Compliance Emission Testing Program

Date: July 18, 2018





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EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed a voluntary compliance emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between May 29 and June 1, 2018. 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 Environment, Conservation and Parks (MECP) 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". This program is the sixth comprehensive Schedule E source testing program conducted at the facility; the initial source testing program was conducted in September/October 2015, a voluntary test program was conducted in May 2016, the second compliance test program was conducted in October/November 2016, a voluntary test program was conducted in May 2017, and the third compliance test program was conducted in October 2017.

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, acid gases, volatile organic compounds, aldehydes and combustion gases at the BH Outlet of each Boiler. Triplicate emission tests were also completed for total hydrocarbons 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 was conducted in the Fall of 2017, 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 (May 29 to June 1, 2018) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on May 29, 2018 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 MECP 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 MECP "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provides an updated framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. This document was replaced by "Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", with the most recent version published on April 27, 2018, however the dioxin and furan toxicity equivalent calculation methodology remains the same. 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 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, were 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)*	-	-	-	375	-
Average Combustion Zone Temp. (°C)*	-	-	-	1242	-
Steam (tonnes/day)*	-	-	-	799	-
MSW Combusted (tonnes/day)*	-	-	-	214	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	502	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4179	-
Filterable Particulate (mg/Rm^3) (1)	0.78	1.16	1.39	1.11	9
PM_{10} with Condensable (mg/Rm^3) (1)	<3.84	<3.97	<3.54	<3.79	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<3.77	<3.77	<3.47	<3.67	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	1.06	0.89	0.72	0.89	-
Cadmium (µg/Rm^3) (1)	0.13	0.14	0.14	0.14	7
Lead (µg/Rm^3) (1)	0.44	0.38	0.53	0.45	50
Mercury (µg/Rm^3) (1)	0.20	0.24	0.20	0.22	15
Antimony (µg/Rm^3) (1)	0.055	0.077	0.24	0.12	-
Arsenic (µg/Rm^3) (1)	0.051	<0.048	<0.049	<0.049	-
Barium (µg/Rm^3) (1)	2.74	2.90	2.86	2.84	-
Beryllium (µg/Rm^3) (1)	<0.046	<0.048	<0.049	<0.048	-
Chromium (µg/Rm^3) (1)	0.79	1.33	1.53	1.22	-
Cobalt (µg/Rm^3) (1)	0.12	0.13	0.16	0.14	-
Copper (µg/Rm^3) (1)	0.97	0.98	0.95	0.97	-
Molybdenum (µg/Rm^3) (1)	5.14	5.63	5.50	5.42	-
Nickel (µg/Rm^3) (1)	3.57	2.98	3.15	3.23	-
Selenium (µg/Rm^3) (1)	<0.23	<0.24	<0.24	<0.24	-
Silver (µg/Rm^3) (1)	<0.046	0.062	<0.049	<0.052	-
Thallium (µg/Rm^3) (1)	<0.046	<0.048	<0.049	<0.048	-
Vanadium (µg/Rm^3) (1)	0.048	0.10	0.060	0.069	-
Zinc (µg/Rm^3) (1)	3.85	4.40	7.49	5.25	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<11.4	<9.91	<9.84	<10.4	60
Total Chlorobenzenes (ng/Rm^3) (1)	<516	<515	<472	<501	-
Total Chlorophenols (ng/Rm^3) (1)	<334	<327	<318	<326	-
Total PAHs (ng/Rm^3) (1)	<787	<360	<316	<488	-
VOCs (µg/Rm^3) (1)	<61.7	<48.3	<76.6	<62.2	-
Aldehydes (µg/Rm^3) (1)	<493	<527	<882	<634	-
Total VOCs (µg/Rm^3) (1) (4)	<555	<575	<959	<696	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.9	0.8	0.8	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

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

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)*	-	-	-	375	-
Average Combustion Zone Temp. (°C)*	-	-	-	1318	-
Steam (tonnes/day)*	-	-	-	800	-
MSW Combusted (tonnes/day)*	-	-	-	211	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	565	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4242	-
Filterable Particulate (mg/Rm^3) (1)	1.00	1.04	0.85	0.96	9
PM_{10} with Condensable (mg/Rm^3) (1)	<6.45	<4.09	<3.63	<4.72	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<6.39	<4.02	3.56	<4.66	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.54	0.50	0.40	0.48	-
Cadmium (µg/Rm^3) (1)	0.20	0.082	0.065	0.12	7
Lead (µg/Rm^3) (1)	0.38	0.29	0.20	0.29	50
Mercury (µg/Rm^3) (1)	1.20	0.81	0.30	0.77	15
Antimony (µg/Rm^3) (1)	<0.045	0.049	<0.045	<0.047	-
Arsenic (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Barium (µg/Rm^3) (1)	2.63	2.49	2.48	2.53	-
Beryllium (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Chromium (µg/Rm^3) (1)	1.63	2.86	3.12	2.54	-
Cobalt (µg/Rm^3) (1)	0.16	0.17	0.28	0.20	-
Copper (µg/Rm^3) (1)	1.00	1.28	2.59	1.63	-
Molybdenum (µg/Rm^3) (1)	5.63	5.29	5.20	5.37	-
Nickel (µg/Rm^3) (1)	4.94	5.70	12.2	7.63	-
Selenium (µg/Rm^3) (1)	<0.23	<0.22	<0.22	<0.22	-
Silver (µg/Rm^3) (1)	0.079	0.19	<0.045	<0.10	-
Thallium (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Vanadium (µg/Rm^3) (1)	0.043	0.039	0.049	0.044	-
Zinc (µg/Rm^3) (1)	4.47	13.7	8.27	8.83	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<10.5	<10.1	<10.9	<10.5	60
Total Chlorobenzenes (ng/Rm^3) (1)	<494	<471	<481	<482	-
Total Chlorophenols (ng/Rm^3) (1)	<281	<274	<282	<279	-
Total PAHs (ng/Rm^3) (1)	<390	<275	<373	<346	-
VOCs (µg/Rm^3) (1)	<86.3	<79.2	<85.0	<83.5	-
Aldehydes (µg/Rm^3) (1)	<509	<700	<579	<596	-
Total VOCs (µg/Rm^3) (1) (4)	<595	<779	<664	<680	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.8	0.9	1.8	1.2	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

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

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)	11.3	19.7	27.8	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.8	2.0	2.2	9
	Nitrogen Oxides (mg/Rm^3) (2)	108	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.02	0.1	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.3	13.0	30.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	3.6	3.8	4.4	9
	Nitrogen Oxides (mg/Rm^3) (2)	108	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	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 MECP) for the May/June 2018 emission testing program was performed by Golder Associates. A summary of the results are provided in the tables appended to this report (Appendix 27) based on calculated ground level Point of Impingement (POI) concentrations for the average total Main Stack emissions. As shown in the tables, the calculated impingement concentrations for all of the contaminants were well below the relevant MECP standards.

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 794 tonnes of steam per day for each Boiler (approximately 98.3% 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 MECP criteria including guidelines and upper risk thresholds.

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

1. INTRODUCTION

ORTECH Consulting Inc. (ORTECH) completed a voluntary compliance emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between May 29 and June 1, 2018. 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 Environment, Conservation and Parks (MECP) 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". This program is the sixth comprehensive Schedule E source testing program conducted at the facility; the initial source testing program was conducted in September/October 2015, a voluntary test program was conducted in May 2016, the second compliance test program was conducted in October/November 2016, a voluntary test program was conducted in May 2017, and the third compliance test program was conducted in October 2017.

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 also completed for total hydrocarbons at the Quench Inlet of each Boiler.

Prior to commencing the test program, the Durham and York Regions submitted a Pre-Test Plan letter to the MECP stating that the Spring voluntary sampling program would follow the procedures detailed in ORTECH Pre-Test Plan No. 21800, "Covanta Durham York Renewable Energy Limited Partnership Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (Air) No. 7306-8FDKNX", dated July 27, 2017. Provided in Appendix 3 is a copy of the Pre-Test Plan letter sent by the Regions, dated March 2, 2018. A copy of the Amended Environmental Compliance Approval, including amendment notices, is also provided in Appendix 3.

Triplicate emission tests were completed for each of the test parameters listed in Schedule D of the ECA between May 29 and June 1, 2018.

2. PROCESS DESCRIPTION

DYEC is a thermal treatment facility with a maximum thermal treatment rate of 140,000 tonnes/year of municipal solid waste (MSW), as established by the Amended ECA. The maximum continuous rating (MCR) for the facility is defined as 218 tonnes per day, per unit, of MSW with a heat content of 13 MJ/kg per train. The steam production MCR is 33.64 tonnes per hour for each Boiler.

The facility was built to operate on a continuous basis; 24 hours/day, seven days/weeks, 365 days/year. Waste may be delivered six days per week between 7:00 am to 7:00 pm. The proposed operating schedule may be adjusted depending on demand and facility needs within the established setup indicated in the ECA (i.e., waste can only be received from Monday to Saturday – excluding statutory holidays, and between 7:00 am and 7:00 pm – ECA's Condition 4(1)(b)).

MSW arrives at the facility via covered refuse trucks and is deposited in a storage pit within the receiving building. Facility operators manage MSW by moving and mixing MSW within the storage pit with the overhead grapple cranes. The MSW is lifted from the pit by crane and fed into the fuel hopper for each thermal treatment train.

The facility consists of two thermal treatment trains, each equipped with independently operated boilers/furnaces and air pollution control equipment. The treated exhaust gases are vented to a common 87.6 m stack and released to atmosphere.

2.1 Control Equipment

Flue gasses pass through a dry recirculating type scrubber for acid control and a fabric filter for particulate control. A Selective Non-Catalytic Reduction System (SNCR) with ammonia injection is used for NO_X control. Powdered carbon is injected for mercury, and dioxin and furan control between the dry recirculating type scrubber and the fabric filter.

2.2 Continuous Emission Monitoring Systems

Continuous Emissions Monitors are installed in the vertical ductwork between the economizer and dry recirculating type scrubber (location referred to as the Quench Inlet), and in the vertical ductwork between the fabric filter and the ID fan (location referred to as the BH Outlet).

A summary of the CEMS installed at each location is provided below:

Unit	Location	Analyzer Manufacturer	Model No.	Serial No.	Parameter	Range
1	Quench Inlet	Environmental SA	MIR 9000	2684	CO (Low)	0-500 ppm
					CO (High)	0-2000 ppm
					HCl	0-1500 ppm
					O_2 (Dry)	0-25%
		Ametek	RM CEM O_2/IQ	10217710-2	O_2 (Wet)	0-25%
1	BH Outlet	Environmental SA	MIR 9000	2686	NO_X	0-500 ppm
					SO_2	0-200 ppm
					HCl	0-100 ppm
					HF	0-100 ppm
					O_2 (Dry)	0-25%
					CO_2	0-25%
		Ametek	RM CEM O_2/IQ	10217710-1	O_2 (Wet)	0-25%
		Tethys	EXM400	F130304	NH_3	0-50 ppm
		OSI	OFS-2000W	13020629	Flow	0-40 m/s
		Teledyne	Light Hawk 560	5602492	Opacity	0-100%
		Environmental SA	Graphite 52M	647	THC	0-100 ppm
		Environmental SA	Amesa	1825-269	Dioxin/Furan	0-10 ng/m^3
2	Quench Inlet	Environmental SA	MIR 9000	2685	CO (Low)	0-500 ppm
					CO (High)	0-2000 ppm
					HCl	0-1500 ppm
					O_2 (Dry)	0-25%
		Ametek	RM CEM O2/IQ	10218084-1	O_2 (Wet)	0-25%
2	BH Outlet	Environmental SA	MIR 9000	2687	NO_X	0-500 ppm
					SO_2	0-200 ppm
					HCl	0-100 ppm
					HF	0-100 ppm
					O_2 (Dry)	0-25%
					CO_2	0-25%
		Ametek	RM CEM O2/IQ	10218084-2	O_2 (Wet)	0-25%
		Tethys	EXM400	F130303	NH_3	0-50 ppm
		OSI	OFS-2000W	13020633	Flow	0-40 m/s
		Teledyne	Light Hawk 560	5602493	Opacity	0-100%
		Environmental SA	Graphite 52M	648	THC	0-100 ppm
		Environmental SA	Amesa	1825-284	Dioxin/Furan	0-10 ng/m^3

3. SAMPLING LOCATIONS

The BH Outlet sampling ports are located on the vertical circular ductwork between the baghouse outlet and the ID Fan inlet. There are two 6-inch ports, located 90 degrees apart, at the same elevation and a single 4-inch port located approximately 0.8 m upstream of the 6-inch ports. The two 6-inch sampling ports were used for isokinetic sampling and the 4-inch ports were used for all non-isokinetic sampling.

The BH Outlet duct has an inside diameter of 1.37 meters (54 inches) at the sampling ports. The two 6-inch ports are approximately 4.4 duct diameters (6.1 meters) downstream and 0.68 duct diameters (0.94 meters) upstream from the nearest flow disturbances.

The Quench Inlet sampling ports are located on the circular ductwork between the Boiler Outlet and the Recirculating Type Dry Scrubber Inlet. There are two 6-inch ports, located 90 degrees apart, at the same height. The Quench Inlet duct has a diameter of 1.37 meters (54 inches) at the sampling ports. The ports are located approximately 3.8 duct diameters (5.2 meters) downstream and 4.7 duct diameters (6.4 meters) upstream from the nearest flow disturbances.

The sampling ports are located at a "non-ideal" location as defined by the Ontario Source Testing Code. An "ideal" location is defined as being at least eight stack diameters downstream and at least two stack diameters upstream of flow disturbances.

Cyclonic flow checks were performed by ORTECH at the BH Outlet and Quench Inlet sampling locations on each Boiler on September 22, 2015. The cyclonic flow checks were performed using an S-type pitot tube and manometer following the procedures detailed in Ontario Source Testing Code Method 1. Briefly, the pitot tube was positioned at each sampling point so that the planes of the face openings were parallel to the cross-sectional axis of the duct. The pitot tube was then rotated about its longitudinal axis until the manometer reading was zero. The absolute value of the rotational angle was recorded to the nearest degree at each point. The average of the recorded angles was calculated at each location. If the average angle is less than 15°, cyclonic flow is not present and sampling may proceed as normal.

The results for the cyclonic flow checks are summarized below:

Sampling Location	Performance Specification	Average Angle (°)	Cyclonic Flow Present
Boiler No. 1 Quench Inlet	Average <15°	6.6	No
Boiler No. 2 Quench Inlet	Average <15°	8.4	No
Boiler No. 1 BH Outlet	Average <15°	8.8	No
Boiler No. 2 BH Outlet	Average <15°	8.1	No

In addition, reverse flow was not observed at any point at any of the four sample locations during the cyclonic flow checks or during any test.

4. SAMPLING PROCEDURES

4.1 General

This section outlines the sampling procedures as well as pre-test and on site internal quality assurance/quality control (QA/QC) procedures which were utilized in the testing program. The procedures described in this section ensured that representative samples were collected and that the integrity of the collected samples was maintained. The use of these sampling procedures significantly reduced the possibility of sample contamination from external sources. Sample handling and documentation requirements were key factors in this program.

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 total hydrocarbons 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

Since relative accuracy and system bias testing was performed in the Fall of 2017, 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 (May 29 to June 1, 2018) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on May 29, 2018 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

4.2 Particulate and Metals

Particulate and metals were sampled using the sampling procedures outlined in US EPA Method 29. Major components of the sampling train were as follows:

- A glass nozzle and probe liner assembly
- A quartz fiber filter with a low metal background
- The first and second impingers were initially empty to collect moisture
- The third and fourth impingers initially contained 100 mL each of 5% nitric acid/10% hydrogen peroxide solution to collect metals
- The fifth impinger was initially empty
- The sixth and seventh impingers initially contained 100 mL each of 4% potassium permanganate/10% sulphuric acid solution to collect mercury
- The eighth impinger contained silica gel

Each test for particulate matter and metals involved the collection of stack gas sampled isokinetically at twelve points centered on equal areas along each of two traverses (at 90° to each other) of the BH Outlet duct. Each of the twenty-four points was sampled for 7.5 minutes for a total actual sampling time of one hundred and eighty minutes.

At 2.5 minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

The particulate and metals field data sheets are provided in Appendix 4.

At the start and finish of sampling each traverse the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 cubic meters per minute (m^3/min) or 4% of the estimated sampling rate, whichever is less. All of the leak-checks, as detailed on the field data sheets, were acceptable.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.3 Particle Size Distribution

Particle Size Distribution (PSD) tests were performed at each of the BH Outlet sample locations in accordance with the test procedures described in US EPA Method 201A using PM_{10} and $PM_{2.5}$ combined cyclone heads and US EPA Method 202. Sampling was conducted for approximately one hundred and twenty minutes at six points across each traverse of the duct using isokinetic dwell time sampling. At approximately ten minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the PSD tests are provided in Appendix 5.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.4 Semi-Volatile Organic Compounds

Semi-volatile organic compounds (SVOC), including dioxins and furans, polychlorinated biphenyls (PCBs), chlorobenzenes (CBs), chlorophenols (CPs) and polycyclic aromatic hydrocarbons (PAHs) were sampled at the BH Outlet of each Boiler using the sampling train and sampling procedures outlined in Environment Canada Report EPS 1/RM/2. Major components of the sampling train were as follows:

- A glass nozzle and probe liner assembly
- A clean and proven glass fiber filter
- Amberlite XAD-2 sorbent resin was used in a trap to collect semi-volatile organics
- The first impinger was initially empty
- The second impinger contained 100 mL of ethylene glycol
- The third impinger was initially empty
- The fourth impinger contained silica gel

All test train and auxiliary glassware were cleaned according to the methods as outlined in Environment Canada EPS 1/RM/2 except that the methods were modified by combining proofing extracts prior to analysis for the target analytes.

Each test for semi-volatile organic compounds at the BH Outlet involved the collection of stack gas sampled isokinetically at twelve points centered on equal areas along each of two traverses (at 90° to each other) of the duct. Each of the twenty-four points was sampled for ten minutes for a total actual sampling time of two hundred and forty minutes.

At five minute time increments the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger outlet temperatures
- XAD-2 trap outlet temperature
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the SVOC tests are provided in Appendix 6.

At the start and finish of sampling each traverse, and before and after each filter change during the Quench Inlet tests, the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 m^3/min or 4% of the estimated average sampling rate, whichever is less. All of the leak-checks for the tests reported, as detailed on the field data sheets, were acceptable.

A blank train was prepared in a manner identical to the test trains for each Boiler. It was assembled, transported and left at the sampling site for a period of time equal to the test trains. The blank train was treated at the sampling site in the same manner as the test trains and a gas volume was drawn through the blank train approximately equal to the leak-check volume for the test trains.

4.5 Acid Gases

Hydrogen fluoride, hydrogen chloride and ammonia were sampled together using the sampling train and sampling procedures outlined in US EPA Method 26A. Major components of the test train were as follows:

- A glass nozzle and probe liner assembly
- The first and second impingers contained 100 ml of 0.1N H_2SO_4
- The third impinger was initially empty
- The fourth impinger contained silica gel

Each test for acid gases involved the collection of stack gas sampled isokinetically at a single point in the duct for sixty minutes.

At five minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the acid gases tests are provided in Appendix 7.

At the start and finish of each test the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 m^3/min or 4% of the estimated average sampling rate, whichever is less.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.6 Volatile Organic Compounds

Volatile Organic Compound (VOC) sampling was performed in accordance with US EPA SW-846 Method 0030. Briefly, the sampling method involved withdrawing a sample of the stack gas through a heated glass lined sampling probe containing a glass wool plug to remove particulate material. The sample was then passed through a water cooled condenser and a Tenax GC adsorbent tube, as the primary volatile organic collection device. Condensate was collected in an initial condensate trap and the sample was then drawn through a second condenser and a combined secondary Tenax GC/charcoal adsorbent tube, as the secondary volatile organic collection device. The sampled gas stream then passed through a silica gel trap to remove any remaining traces of moisture prior to the rotameter, pump and dry gas meter.

During each test, three twenty minute runs were completed at an approximate flowrate of 1 L/min. A fourth run was also conducted during each test and the tube pair was archived in case a sample was lost during desorption or analysis. Analyses from the three runs performed were combined and used to calculate test average results.

At five minute time increments throughout sampling each pair of tubes, the following information was measured and recorded:

- Elapsed sampling time
- Dry gas meter volume
- Stack gas temperature
- Probe and first condenser outlet temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

The sampling train components were cleaned using the procedures in US EPA SW-846 Method 0030, Volatile Organic Sampling Train (VOST).

Field data sheets for the VOST tests are provided in Appendix 8.

Blank tube samples analyzed for the program included three pairs of field blank tubes, a trip blank pair of tubes and one laboratory blank pair of tubes.

4.7 Aldehydes

Some of the compounds listed as VOC's (acetaldehyde, formaldehyde and acrolein) are more commonly classified as aldehydes. These compounds were captured in a separate test train in accordance with CARB Method 430 with the Ashland Modification.

Major components of the test train were as follows:

- A Teflon probe liner assembly was used.
- The first, second and third impingers contained approximately 15 ml each of 0.05% 2,4-dinitrophenylhydrazine (DNPH) in 2N HCl with 2 ml of toluene
- The fourth impinger was initially empty
- The fifth impinger contained silica gel

A single test for aldehydes involved the collection of gas sampled at a single point in the duct at a sampling flowrate of approximately 0.5 liters per minute for sixty minutes.

At five minute time increments throughout each test, the following information was measured and recorded for the train:

- Elapsed sampling time
- Dry gas meter volume
- Stack gas temperature
- Probe, oven and impinger outlet temperatures
- Dry gas meter temperature
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the aldehyde tests are provided in Appendix 9.

4.8 Combustion Gases

In Fall 2017, relative accuracy and system bias testing was conducted on the Continuous Emission Monitoring Systems (CEMS) installed at the Quench Inlet and BH Outlet of each Boiler. Covanta informed ORTECH that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA. Therefore, 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.

Combustion gases, including carbon dioxide, carbon monoxide, hydrogen chloride, nitrogen oxides, oxygen, sulphur dioxide and total hydrocarbons, were measured continuously at the BH Outlet during the emission testing program by the DYEC CEMs. Oxygen was also measured continuously by the DYEC CEMS at the Quench Inlet.

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. The data measured by the DYEC CEMS, from May 29, 2018 at 08:00 to June 1, 2018 at 18:00, was used to assess against the in-stack emission limit stated in the ECA for each Boiler.

A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the calculated 1-hour average data to compare to the in-stack emission limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data to compare to the in-stack emission limit stated in the ECA.

Total hydrocarbon concentrations were measured by ORTECH following the procedures detailed in US EPA Method 25A. Triplicate one-hour tests were conducted at the Quench Inlet and BH Outlet of each Boiler on May 29, 2018. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA.

5. SAMPLE RECOVERY AND ANALYSIS

All sample analysis was performed by ALS Canada Ltd. Copies of Sample Logs/Chain of Custody Forms for all samples submitted for chemical analysis are provided in Appendix 10.

5.1 Particulate and Metals

Before loading of the field test trains commenced, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The particulate and metals train recovery data sheets are provided in Appendix 11.

Following the conclusion of each test performed with the metals train, the probe was disconnected and all openings sealed with Teflon tape. The test trains, including the probes, were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The test trains were visually inspected to ensure that no damage occurred during transportation. The condition of the test train was noted. Filter and impinger content colors were recorded. The filter housing was disassembled and the filter carefully transferred to its pre-test petri dish with the use of Teflon coated tweezers.

All the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The front half of the sampling train was brushed and rinsed thoroughly with acetone. A nylon bristle probe brush was used to assist in dislodging particulate material which may have adhered to the inside surfaces of the nozzle and probe assembly. The front half was then rinsed in triplicate using 0.1 N nitric acid but no brushing was performed.

The contents of the first five impingers were combined. Triplicate rinses of the impingers and connecting glassware back to and including the Teflon filter support was performed with 0.1 N nitric acid and combined with the impinger solution sample.

The contents of the sixth and seventh impingers were combined. The impingers with connecting glassware were then rinsed in triplicate with approximately 100 mL of fresh potassium permanganate solution followed by a triplicate rinse with 100 mL of distilled, de-ionized water. All of the glassware rinses were added to the sample container.

Any brown residue which was present in the sixth and seventh impingers was removed by incrementally rinsing with small amounts of 8 N hydrochloric acid. These acid rinses were added to a separate sample bottle which initially contained 150 mL of distilled, de-ionized water. The impingers were then rinsed with distilled, de-ionized water into the same sample container.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were delivered to the analytical laboratory for analysis.

The test samples were prepared and analyzed for metals according to US EPA Method 29 (modified). It should be noted that the metals sampling and analysis procedures are only validated for the 17 metals listed in US EPA Method 29. However, the method was used for all metals listed in Schedule D of the ECA including Sb, As, Ba, Be, Cd, Co, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V and Zn.

The inorganic analytical reports are provided in Appendix 12.

5.2 Particle Size Distribution

Prior to loading the field test trains, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The train recovery data sheets are provided in Appendix 13.

The particle size distribution (PSD) samples were recovered in much the same way as the particulate samples from the particulate and metals trains. Following the conclusion of each test performed with the PSD trains, the probe was disconnected and all openings sealed with Teflon tape. The sample recoveries were performed in the on-site ORTECH sample recovery trailer.

The test trains were visually inspected to ensure that no damage during movement had occurred. The recovery procedure is briefly described as follows.

The condition of the test train was noted and the filter and impinger colours were recorded. The nozzle, PM_{10} cyclone walls, collection cup and outside of the exit stem was brushed and rinsed thoroughly with acetone into a glass sample container to determine particulate greater than PM_{10}. The PM_{10} cup and connecting parts were rinsed with acetone in a glass sample container to determine particulate less than PM_{10} but greater than $PM_{2.5}$. The $PM_{2.5}$ cup and connecting parts up to the back-up filter were rinsed with acetone into a glass sample container to determine particulate less than $PM_{2.5}$. The back-up filter was transferred to its original petri dish.

The impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content. The back half of the sampling train was then purged with nitrogen at 14 lpm for 1 hour as soon as possible after the completion of each test.

The back-half of the sampling train was recovered following the procedures detailed in US EPA Method 202 for condensable particulate. The contents of the first impinger were poured into a glass sample bottle and rinses of the impinger and connecting glassware were performed with water which was added to the sample. The glassware was then rinsed with acetone and the rinse was repeated in duplicate with hexane. The acetone and hexane rinses were combined into a single glass sample bottle.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were delivered to the analytical laboratory for analysis.

The particle size and condensable particulate matter results are presented with the inorganic analytical reports provided in Appendix 12.

5.3 Semi-Volatile Organic Compounds

Prior to loading the field test trains, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The train recovery data sheets are provided in Appendix 14.

Following the conclusion of each test performed with the semi-volatile organics train, the probe was disconnected and all openings sealed with Teflon tape. The test trains, including the probes, were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The condition of the test train was noted. Filter, XAD-2 trap and impinger content colours were recorded. The filter housing was disassembled and the filter carefully transferred, with the use of Teflon coated tweezers, to a piece of pre-cleaned aluminum foil. Each filter was then folded in half onto itself within the foil, the foil ends crimped, then placed in a pre-cleaned glass petri dish. Both the foil containing the filter(s) and the glass Petri dish were labeled.

All of the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The front half of the sampling train, up to but not including the trap, was brushed and rinsed thoroughly with acetone. A Teflon probe brush was used to assist in dislodging particulate material that may have adhered to the inside surfaces of the cyclone bypass and filter top assembly. This front half rinse was then repeated using hexane, with no brushing, and all rinsing was combined with the probe rinse sample.

The XAD-2 trap was drained of excess cooling water and weighed. The ends were then sealed with Teflon tape and the trap was labeled and wrapped in aluminum foil.

The contents of the first three impingers were combined in a pre-cleaned amber glass sample bottle. Triplicate rinses of the impingers and connecting glassware back to and including the trap bottom u-tube were performed first with HPLC water, which was added to the impinger solution sample, and then with acetone followed by hexane. The acetone and hexane rinses were combined in a separate sample bottle from the impinger solutions.

Due to the design of ORTECH's glassware, the filter bottom, filter bottom u-tube and trap inlet stem were not soaked for five minutes in each of acetone and hexane. Instead, these pieces of glassware were given extra rinses with each of the solvents. Also, since ORTECH uses a one piece trap and condenser, the five minute soak of this component was performed by the analytical laboratory.

Each sample container was sealed and labeled once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form then refrigerated until they were delivered to ALS for analysis.

Semi-volatile organic analyses were performed on single composite extracts for each test according to EPS 1/RM/3 and EPS 1/RM/23. These methods were modified slightly to include other semi-volatile organic compounds following the Environment Canada NITEP/Mid-Connecticut combustion test procedures. These analytical improvements have been implemented over many years and have been identified and approved through laboratory accreditation and acceptance by the MECP.

The SVOC analytical reports are provided in Appendix 15.

5.4 Acid Gases

Following the conclusion of each test performed with the acid gas train, the probe was disconnected and all openings sealed with Teflon tape. The test trains were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The test trains were visually inspected to ensure that no damage occurred during transportation. The condition of the test train was noted and the impinger content colors were recorded. All the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The contents of the first three impingers were combined. Triplicate rinses of the impingers and connecting glassware back to and including the Teflon filter support was performed with high purity water and combined with the impinger solution sample.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were transported to the laboratory for analysis.

Analysis for hydrogen fluoride, hydrogen chloride and ammonia was performed via ion chromatography.

Train recovery data sheets are provided in Appendix 16. The acid gases analytical results are presented with inorganic analytical reports in Appendix 12.

5.5 Volatile Organics Train Recovery

Following the conclusion of each tube pair run performed with the volatile organic sampling train (VOST), the tubes were removed from the train, capped and placed in appropriately labeled test tubes which were also capped. The tubes were sent to ALS for volatile organic compound (VOC) analysis.

The VOST samples were analyzed via SW846 Method 5041A/8260B. Briefly, after spiking with internal and surrogate standards, the traps were thermally desorbed through a clam shell heater then through a chilled aqueous purge to remove the bulk of the moisture onto a secondary trap. These secondary traps are further dried using a counter current flow of helium. The secondary traps are then thermally desorbed into a VOC sample concentrator and again the VOCs are thermally transferred/concentrated onto a GC column. The VOC compounds are separated via gas chromatography (GC) and analyzed via GC/MS.

The condensate collected from each tube pair run was carefully transferred to a glass bottle and combined as a single sample for each sampling location. The condensate samples were archived for future analysis if necessary.

The VOST analytical report is provided in Appendix 17.

5.6 Aldehydes

Following the conclusion of each test performed with the Aldehyde Train the probe was disconnected and all openings were sealed with Teflon tape. The test train was then recovered on site in an ORTECH sample recovery trailer separate from all other test train recoveries and solvents. The train recovery procedure is briefly described as follows.

The condition of the test train was noted. All the impingers were wiped dry and weighed. The contents of the impingers were transferred into a glass sample container. The probe and impingers were rinsed with a small amount of DNPH followed by a small amount of toluene into the same sample container.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were transported to the laboratory for analysis.

Analysis for formaldehyde, acetaldehyde and acrolein was performed via HPLC. The sample recovery data sheets are provided in Appendix 18 and the analytical results are presented in Appendix 19.

6. INTERNAL AND EXTERNAL QA/QC PROGRAM

6.1 General

As with other emission testing programs conducted by ORTECH, a comprehensive internal quality assurance/quality control (QA/QC) program was included.

Blank sampling trains were recovered and analyzed or reagent blanks were analyzed using the same procedures as the test trains to provide background concentrations of the emission test components.

6.2 Pre-Test Activities

Prior to the commencement of the emission testing program, the following activities were performed:

- Preparation, pre-cleaning and proofing of the manual stack sampling trains and sample containers.
- Preparation and quality checks of chemicals, reagents, filters and XAD-2 adsorbent resin.
- Calibration of all sampling and monitoring equipment.
- Development (and review) of data acquisition, data reduction and summary procedures.
- Development of internal QA/QC field data sheets.
- Review of equipment calibration logs.
- Review of proposed field and laboratory procedures.

All proving data for the Semi-Volatile Organics Train glassware and auxiliary equipment was deemed acceptable prior to the test program.

A proof rinse of the sampling probes was collected and archived for future analysis if necessary.

For each batch of VOST tubes, a minimum of 1 pair in 10 was analyzed to demonstrate an absence of significant background contaminants from the tubes prior to the test program.

The proof data for the semi-volatile organics glassware and VOST tubes is provided in Appendix 20.

All equipment used in the field testing program was calibrated and checked prior to the field testing program. Pertinent equipment calibration data is supplied in Appendix 21.

As part of ORTECH's internal QA/QC, data acquisition, data reduction and summary procedures were already in place and periodic spot checks of the computer programs were performed using known data sets.

6.3 Emission Testing QA/QC Results

Prior to the field testing program, preliminary data was acquired to perform the required calculations for choosing a nozzle size to permit isokinetic sampling.

The internal diameter of each duct was verified and the appropriate number of sampling points was marked on each sampling probe.

The following general QA/QC criteria were satisfied for each of the test trains where applicable:

- All sampling equipment was cleaned and proven clean (where applicable) prior to the commencement of the field testing program.
- All sampling equipment passed a visual and operational check prior to use in the field.
- Oil filled manometer gauges which had been properly leveled and zeroed were used to measure the velocity pressure.
- All sampling data was recorded in ink on preformatted data sheets at least once every 5 minutes and at least twice during sampling each traverse point.
- Any unusual occurrences were noted during each test on the appropriate data form.
- The field team leader reviewed all calibration and sampling data forms daily.
- Only tapered edge sampling nozzles and S-type pitot tubes that had been visually inspected and caliper measured, and deemed acceptable, were used for sampling.
- Each leg of the S-type pitot was leak-checked before the start of testing. The leak-checks were all acceptable (no leak detected).
- Each entire sampling train met acceptable leak-check criteria before and after each test, and during any move from one sampling traverse to another. If a test did not meet the leak-check criteria the test was voided and repeated.

- The S-type pitot tube and sampling nozzle were maintained parallel to the flow during testing and care was taken to ensure that they did not scrape the ports when being inserted and removed from the stack.
- The probe and filter components were maintained at 120°C ± 14°C during testing. If the probe or filter temperature was outside of the acceptable range the test was halted until the temperature could be brought back into the acceptable range.
- Covanta was responsible for monitoring process operations during testing and notified ORTECH when testing was to proceed.

6.4 Sample Recovery, Handling and Custody

ORTECH's sample identification scheme and system for handling and processing samples was initiated as part of ORTECH's sample tracking system for stack emission samples. All samples were identified by a unique sample number comprised of a series of numbers and letters. A master sample log/chain of custody form was maintained by the QA/QC designate and was made available to the ORTECH personnel designated to perform the sample recovery for a specific sampling train. Once a sample was collected it was labeled and checked against the sample log by the QA/QC designate.

The information contained within the sample number and the sample log enabled the sampling, recovery, data reduction and report writing personnel to easily determine the test date, test number, test type and train sample identification for a given sample. To ensure continuity, the analytical laboratory was requested to use the ORTECH number for sample identification.

The ORTECH personnel responsible for delivering samples used the master sample log/chain of custody form to document the transfer of the samples to the analytical laboratory. Appropriate care was taken when shipping the samples in order to maintain sample integrity. Once the samples and master sample log/chain of custody forms were received by the analytical laboratory, the laboratory personnel verified that all samples had been received and their integrity maintained. The laboratory personnel then signed the master log and made a photocopy which ORTECH personnel received as a record of the chain of custody for the samples.

6.5 Analytical Results

It should be noted that due to the design of ORTECH's semi-volatile organic sampling train glassware, the filter bottom, filter bottom u-tube and trap inlet stems are not soaked with each of the required solvents (acetone and hexane) during test train recovery. Instead, these components of the test train were given additional rinses with each of the required solvents. Also, because ORTECH uses a one piece condenser and XAD-2 trap, this component of the test train was Teflon sealed and wrapped with foil prior to being transported to the analytical laboratory where it was given the required five minute soaking with each of acetone and hexane. This is consistent with all SVOC test programs conducted by ORTECH and the modification was documented in the Pre-Test Plan approved by the MECP.

Analyses for the present emission testing program were performed using acceptable laboratory procedures in accordance with the specified analytical protocols. Adherence to the prescribed QA/QC procedures ensured data of consistent and measurable quality. Analytical quality control focused on the use of control standards to provide a measure of analytical accuracy. Replicate analysis (usually duplicate analysis) of the same sample was used as a means of determining precision of the various analytical procedures. Also specific acceptance criteria were defined for various analytical operations including calibrations, control standard analysis, drift checks, blanks, etc.

The following general QA/QC procedures were incorporated into the analytical effort:

- the on-site Field Supervisor reviewed all data and QA/QC data on a daily basis for completeness and acceptability
- master sample logs were maintained for all samples collected
- analytical QA/QC data was tabulated by the analytical laboratories using appropriate charts or forms
- all hard copy raw data was maintained in organized files

Specific analytical QA/QC procedures are presented in the analytical reports and are briefly summarized below.

6.5.1 Metals Sample Analysis QA/QC

The analysis of the Method 29 stack samples involved sample digestion followed by Inductively Coupled Argon Plasma Mass Spectroscopy (ICP-MS) analysis. The analysis for mercury employed cold vapour atomic absorption (CVAA). The analytical QA/QC is described as follows and the results are provided in the analytical report.

ICPMS Analysis

The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- One duplicate sample analysis was performed for the test program. The relative percent difference was less than 12.6% well within the acceptable limit of less than ±20%, for elements that are greater than 5 times the minimum detection limit.
- A blank spike (performed as a pre-digestion spike) was analyzed with the test samples. All of the recovery results were between 86-105%, except for lead and molybdenum in the back half samples (80 and 118%, respectively). The acceptable limit is 85-115% of the true value.
- A matrix spike (performed as a post digestion spike) was analyzed with the test samples. All of the recovery results were between 79-118%. The acceptable limit is 70-130% of the true value.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- An instrument calibration check standard was analyzed immediately after the calibration curve and must be within 90%-110% of the actual concentrations.
- Instrument calibration blank check sample were analyzed with every 10 samples and must be within three times the minimum detection limit.
- A continuing calibration check is run every 10 samples and must be within 85%-115% of the actual concentrations.
- Instrument (interference) check sample for ICP-MS analysis was analyzed before and after each analytical run. The value(s) found for the interference check sample must be within 80%-120% of the true value.

Antimony, molybdenum and nickel were observed by the analytical laboratory in the method blank at levels greater than three times the limit of reporting. Antimony, chromium, cobalt, lead, molybdenum, nickel and silver were also observed by the analytical laboratory in the reagent blank at levels slightly greater than the limit of reporting. The test sample data may be biased high for these compounds as a result of this potential background.

Mercury Analysis

The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- One duplicate sample analysis was performed for each fraction. The relative percent difference was less than 17.5% within the acceptable limit of less than ±20%, for fractions that are greater than 5 times the minimum detection limit.
- A blank spike (performed as a pre-digestion spike) was analyzed with the test samples. All of the recovery results were between 92-97% within the acceptable limit of 90-110% of the true value.
- A matrix spike (performed as a post digestion spike) was analyzed with the test samples. All of the recovery results were between 92-98% within the acceptable limit of 85-115% of the true value.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- A 5 point calibration was performed.
- An instrument check calibration standard was analyzed immediately after the calibration and must be within 90%-110% of the actual concentration
- One mid-range calibration standard was analyzed after 10 samples and at the end of the run and must be within 85%-115% of the actual concentration.
- Instrument calibration blank check sample is analyzed with every 10 samples and must be within three times the minimum detection limit.

6.5.2 Acid Gas Sample Analysis QA/QC

Analyses of the acid gas samples from the Method 26A sampling train was performed by Ion Chromatography (IC). The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- All of the hydrogen chloride and hydrogen fluoride analyses were conducted in duplicate. One duplicate sample analysis was also performed for ammonia. The relative percent difference was less than 3.8%, well within the acceptable limit of less than ±20% for compounds that are greater than 5 times the minimum detection limit.
- A blank spike sample was analyzed with the test samples. The recovery results for the blank spike sample were 96% for hydrogen chloride, 99% for hydrogen fluoride and 106% for ammonia, within the acceptable range of 90-110%.
- A matrix spike (spike confirmation) sample was analyzed with every 20 samples to confirm the identity of each peak. The recovery results of the matrix spike sample were 101% for hydrogen chloride, 100% for hydrogen fluoride and 101% for ammonia, within the acceptable range of 80-120%.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- A 6 point calibration bracketing the expected range.
- An instrument check calibration standard was analyzed immediately after the calibration and must be within 90%-110% of the actual concentration.
- A complete set of calibration standards were analyzed at the end of the analysis and must be within 10% of the true value.
- One mid-range calibration standard was analyzed after 10 samples and at the end of the run and must be within 90%-110% of the actual concentration.
- Instrument calibration blank check samples were analyzed with every 10 samples and must be within three times the minimum detection limit for each ion.

6.5.3 Aldehyde Sample Analysis QA/QC

Analysis for formaldehyde, acetaldehyde and acrolein was performed via Liquid Chromatography (LC). Laboratory control samples were analyzed with the test samples. A trip spike sample prepared by the analytical laboratory was submitted for analysis with the test samples, however it was discovered during analysis that the trip spike sample was prepared with the incorrect derivatization media and as a result recovery data for the sample could not be determined.

The concentrations of acetaldehyde and formaldehyde reported in the two blank samples were similar to, and in some cases slightly greater than, the concentrations reported in the test samples. The test results for acetaldehyde and formaldehyde may be elevated due to the high blank results (the reported analytical values are not blank corrected).

The test and blank samples were diluted prior to analysis for acrolein due to the presence of acetone in the samples, which elutes next to the acrolein peak during analysis. Acetone is a common laboratory solvent and is readily adsorbed by the DNPH impinger solution. The source of the acetone background was not determined, however it should be noted that ORTECH took steps during the preparation and recovery of the sampling trains to minimize exposure to acetone including using a separate recovery lab used only for the aldehyde trains. As a result the detection limits for acrolein were elevated resulting in higher emission data than previous emission testing programs. Acrolein was not detected in any of the samples in quantities greater than the reportable detection limit and the detection limit was used to calculate emission data.

6.5.4 SVOC Sample Analysis QA/QC

The combined filter, probe rinse, Amberlite XAD-2 cartridge, impinger solutions and associated rinse and soaking solutions for each of the semi-volatile organics trains were analyzed together as one sample per test.

Staff at ALS added extraction standards to all samples prior to extraction. Clean-up standards were added just prior to the clean-up process. Recoveries of the clean-up standards provide an indication on the losses that occur during the extract clean-up. The analytical report includes the lists of the field spike, extraction and clean-up standards used. The analysis of samples involved complex sample extraction and cleanup, followed by HRMS/MS analysis.

Recovery of the dioxin and furan and dioxin-like PCBs field spike standards were between 64-107% which indicates good extraction efficiency and provides a high degree of confidence in the results obtained from the dioxin and furan test trains.

The analytical laboratory report identifies responses in the chlorinated diphenylether channel that elute at a similar retention time to select hexachlorodibenzofuran isomers for some of the test results. This response may produce a positive bias on these isomers and has been identified in previous test programs conducted at the facility. This response was not seen in the blank train samples or in the laboratory blank which indicates that it is not an artifact in the solvents, glassware, XAD-2 or the instrument used for analysis. The analytical laboratory indicates that the impact of chlorinated diphenylether on the test results is minimal and does not impact data quality.

6.5.5 Volatile Organic Compound Analysis QA/QC

Prior to sampling VOST tube pairs were cleaned and conditioned under helium sweep (approximately 50 mL/min flow) through each tube in an oven at 280°C for at least 12 hours. One VOST pair was analyzed and proven clean for every 10 pairs cleaned. VOST tubes were end-capped and stored sealed in individual screw-capped vials at 4°C between conditioning and shipment to the field.

Three field blanks, a trip blank and a laboratory method blank were analyzed with the test sample tubes. VOST tubes were desorbed and analyzed, combined as pairs, according to SW846 Method 5041A/8260B.

The analytical report includes the field standards, internal standards and surrogate standards used. The surrogate recoveries for each of the surrogates should be between 50-150%. The recoveries for each sample were between 58-146%.

7. RESULTS AND DISCUSSION

Emission tests were completed for particulate matter, particle size distribution, condensable particulate matter, metals, semi-volatile organic compounds, aldehydes, acid gases and volatile organic compounds at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet.

Combustion gases, including hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide were measured during the emission testing program (May 29 to June 1, 2018) by the DYEC CEMS. Total hydrocarbon concentrations were also measured at the BH Outlet and Quench Inlet by ORTECH on May 29, 2018.

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

Detailed test schedules are provided in Table 1 and Table 2 of Appendix 1 and Appendix 2 for Boiler No. 1 and Boiler No. 2, respectively.

7.1 Stack Gas Sampling Parameters

Emission test calculations for the particulate and metals, particle size, acid gases, and SVOC tests conducted are provided in Appendix 22 to Appendix 25, respectively.

Stack gas sampling parameters for the tests conducted at each location are summarized in Table 3 (Appendix 1 and Appendix 2). These parameters include calibration data, nozzle diameter, dry gas volume sampled and average percentage of isokineticity for each test.

7.2 Stack Gas Physical Parameters

Stack gas physical parameters for tests conducted at each BH Outlet location are presented in Table 4 (Appendix 1 and Appendix 2). The average values from the isokinetic tests at each site are summarized below:

Stack Gas Parameter	Boiler No. 1 BH Outlet*	Boiler No. 2 BH Outlet*
Gas Temperature (°C)	140	142
Moisture by Volume (%)	16.5	16.4
Velocity (m/s)	16.9	16.7
Static Pressure (kPa)	-2.43	-2.26
Absolute Pressure (kPa)	97.8	98.0
Carbon Dioxide by Volume (%)**	11.0	11.2
Oxygen by Volume (%)**	8.10	7.77

* Excludes Acid Gases tests as testing was conducted at a single point in the duct
** dry basis, measured by DYEC CEMS

7.3 Volumetric Flowrate Data

Stack gas volumetric flowrates for the tests conducted at each BH Outlet location are presented in Table 5 (Appendix 1 and Appendix 2). The average flowrate values from the tests at each site are summarized below:

Volumetric Flowrate	Boiler No. 1 BH Outlet*	Boiler No. 2 BH Outlet*
Actual Flowrate (m^3/s)	25.0	24.6
Dry Reference Flowrate (Rm^3/s)**	14.6	14.3
Dry Adjusted Flowrate (Rm^3/s)***	18.9	19.0
Wet Reference Flowrate (Rm^3/s)**	17.5	17.1

* Excludes Acid Gases tests as testing was conducted at a single point in the duct
** at 25°C and 1 atmosphere
*** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

7.4 Particulate Emission Data

Filterable particulate emission data obtained from each of the particulate and metals tests conducted at the BH Outlet of each Boiler is presented in Table 6 (Appendix 1 and Appendix 2). Average filterable particulate emission data for each BH Outlet location is summarized below:

Particulate Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	0.83	0.74
Dry Reference Conc. (mg/Rm^3)*	1.42	1.29
Dry Adjusted Conc. (mg/Rm^3)**	1.11	0.96
Wet Reference Conc. (mg/Rm^3)*	1.19	1.07
Emission Rate (mg/s)	20.4	17.9

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The ECA stipulates maximum in-stack limits for the emissions of various compounds including particulate matter. The particulate dry adjusted concentration at the Boiler No. 1 BH Outlet (1.11 mg/Rm^3, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (0.96 mg/Rm^3, adjusted to 11% oxygen) were well below the maximum limit (9 mg/Rm^3, adjusted to 11% oxygen) stated in the ECA.

The amount of particulate matter detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 1 BH Outlet was 3.3 mg and <0.1 mg, respectively. The amount of particulate detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 2 BH Outlet was 3.8 mg and 0.1 mg, respectively. Although these levels are significant relative to the amount detected in the test trains, the blank analysis was not subtracted from the test sample analyses during calculation of the particulate emission data.

Particle size distribution tests were also conducted at the BH Outlet of each Boiler. PM_{10} and $PM_{2.5}$ emission data is detailed in Table 7 (Appendix 1 and Appendix 2) for each location. Average emission data for each BH Outlet location is summarized below:

PM_{10} and $PM_{2.5}$ Emission Parameter	PM_{10}		$PM_{2.5}$	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	<0.27	<0.19	<0.19	<0.13
Dry Reference Conc. (mg/Rm^3)*	<0.46	<0.31	<0.32	<0.23
Dry Adjusted Conc. (mg/Rm^3)**	<0.36	<0.24	<0.24	<0.17
Wet Reference Conc. (mg/Rm^3)*	<0.39	<0.26	<0.27	<0.19
Emission Rate (mg/s)	<6.84	<4.54	<4.71	<3.30

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Condensable particulate emission data obtained from the back-half of each of the particle size distribution tests conducted at the BH Outlet for each Boiler is presented in Table 8 (Appendix 1 and Appendix 2). Average condensable particulate emission data for each BH Outlet location is summarized below:

Condensable Particulate Emission Parameter	Inorganic Fraction		Organic Fraction	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	1.81	2.49	0.79	1.04
Dry Reference Conc. (mg/Rm^3)*	3.10	4.19	1.36	1.76
Dry Adjusted Conc. (mg/Rm^3)**	2.38	3.16	1.05	1.33
Wet Reference Conc. (mg/Rm^3)*	2.59	3.55	1.14	1.49
Emission Rate (mg/s)	45.7	60.6	20.0	25.5

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The amount of condensable particulate detected in the blank sampling train for Boiler No. 1 was 0.8 mg for the inorganic fraction and 1.3 mg for the organic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was 1.1 mg for the inorganic fraction and 1.2 mg for the organic fraction. Although these levels are significant relative to the amount detected in the test trains, the blank analysis was not subtracted from the test sample analyses during calculation of the condensable particulate emission data.

The average PM_{10} and $PM_{2.5}$ results, including condensable particulate matter, are summarized below for each Boiler:

PM_{10} and $PM_{2.5}$ + Condensable Emission Parameter	PM_{10} + Condensable		$PM_{2.5}$ + Condensable	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	<2.87	<3.72	<2.79	<3.66
Dry Reference Conc. (mg/Rm^3)*	<4.92	<6.26	<4.78	<6.18
Dry Adjusted Conc. (mg/Rm^3)**	<3.79	<4.72	<3.67	<4.66
Wet Reference Conc. (mg/Rm^3)*	<4.12	<5.30	<4.00	<5.23
Emission Rate (mg/s)	<72.5	<90.6	<70.4	<89.4

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

7.5 Acid Gases

Hydrogen chloride, hydrogen fluoride and ammonia emission data for the tests conducted at the BH Outlet of each Boiler are presented in Table 9 (Appendix 1 and Appendix 2). Hydrogen fluoride was not detected in any of the test samples in quantities greater than the detection limit. The detection limit was used to calculate hydrogen fluoride emission data. Hydrogen chloride and ammonia were detected in quantities greater than the detection limit in all of the samples collected at each location.

Average hydrogen chloride, hydrogen fluoride and ammonia emission data for the tests conducted at the BH Outlet of each Boiler is summarized below:

Acid Gases Emission Parameter	Hydrogen Chloride		Hydrogen Fluoride		Ammonia	
	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Actual Conc. (mg/m^3)	3.28	3.14	<0.079	<0.083	0.66	0.37
Dry Reference Conc. (mg/Rm^3)*	5.54	5.44	<0.13	<0.14	1.12	0.64
Dry Adjusted Conc. (mg/Rm^3)**	4.40	4.09	<0.11	<0.11	0.89	0.48
Wet Reference Conc. (mg/Rm^3)*	4.67	4.52	<0.11	<0.12	0.95	0.53
Emission Rate (mg/s)	78.5	75.7	<1.90	<2.00	15.9	8.90
Dry Adjusted Conc. (ppm)**	2.95	2.74	<0.13	<0.13	1.28	0.69

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Hydrogen chloride, hydrogen fluoride and ammonia were not detected in the blank samples in quantities greater than the detection limit. The blank analysis was not subtracted from the test sample analyses during calculation of the emission data.

7.6 Combustion Gas Emission Data

Combustion gases, including carbon dioxide, carbon monoxide, hydrogen chloride, nitrogen oxides, oxygen and sulphur dioxide, were measured continuously at the BH Outlet during the emission testing program by the DYEC CEMs. Carbon monoxide and oxygen were also measured at the Quench Inlet by the DYEC CEMS. The oxygen, carbon dioxide and carbon monoxide concentrations for each test period were used to calculate the molecular weight of the gas stream. The oxygen concentration data was also used to correct the dry reference concentration data to 11% oxygen.

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from May 29, 2018 at 08:00 to June 1, 2018 at 18:00 for each Boiler. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

The minimum, average and maximum 1-hour, 4-hour and 24-hour combustion gas data measured by the DYEC CEMS is summarized in Table 10 (Appendix 1 and Appendix 2). The maximum concentration, along with the in-stack limit stated in the ECA, is summarized in the following table for each component.

Combustion Gases Emission Parameter		In-Stack ECA Limit	Maximum Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Oxygen (%, 1-hr)	-	9.46	8.55
	Carbon Dioxide (kg/Rm^3, 1-hr)**	-	0.21	0.21
	Carbon Monoxide (mg/Rm^3, 4-hr)*	≤ 40	27.8	30.3
	Sulphur Dioxide (mg/Rm^3, 24-hr)*	≤ 35	0.1	0
	Nitrogen Oxides (mg/Rm^3, 24-hr)*	≤ 121	110	110
	Hydrogen Chloride (mg/Rm^3, 24-hr)*	≤ 9	2.2	4.4
	Total Hydrocarbons (mg/Rm^3, 1-hr)*	-	0	1
Quench Inlet	Oxygen (%, 1-hr)	≥ 6	9	9

* dry at reference conditions, adjusted to 11% oxygen
** dry at reference conditions

Total hydrocarbon concentration data was measured by ORTECH on May 29, 2018 at the Quench Inlet and BH Outlet sampling locations. The results of the total hydrocarbons tests are summarized in Table 10 (Appendix 1 and Appendix 2). The average THC concentration for each location, along with the in-stack limit stated in the ECA, is summarized in the following table.

Combustion Gases Emission Parameter		Limit	Average Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Total Hydrocarbons (1-minute)*	-	0.8	1.0
	Total Hydrocarbons (10-minute)**	-	0.7	1.0
Quench Inlet	Total Hydrocarbons (1-minute)*	-	0.8	1.2
	Total Hydrocarbons (10-minute)**	50	0.8	1.2

* ppm dry basis, expressed as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)
** ppm dry basis, expressed as equivalent methane (average of each 60 minute test calculated using the 10-minute rolling average)

The one-minute average total hydrocarbon data and the 10-minute total hydrocarbon data measured by ORTECH and expressed on a dry basis as equivalent methane is provided in Appendix 26.

7.7 Metal Emission Data

Metal analytical results for the tests performed at the BH Outlet of each Boiler are given in Tables 11, 12 and 13 (Appendix 1 and Appendix 2) for Test No. 1, Test No. 2 and Test No. 3, respectively. Metal concentrations and emission rates are shown in Tables 14, 15 and 16 for Test No. 1, Test No. 2 and Test No. 3, respectively.

Summaries of the metal actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates including the coefficients of variation for the tests performed are provided in Tables 17, 18, 19, 20 and 21, respectively. Table 22 summarizes the average metal emission data for the tests performed.

Table 23 summarizes the results from the blank metals trains. The amount of metals detected in the blank trains was significant when compared to the amounts collected in the test trains since most of the metals in the test trains were at or near the detection limit. The emission data was not corrected for the blank data.

The metals analysis of the Method 29 test trains was performed on two separate analytical fractions, the probe and filter hydrofluoric acid digest and analysis of the train impingers and associated rinses. In instances where all analyses were reported to be below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, and the remaining fraction was assigned a value of zero. In instances where any given fraction was detected that value was used to calculate emission data, and the remaining undetected fraction were assigned a value of zero.

The ECA stipulates maximum in-stack limits for the emissions of various compounds including cadmium and lead.

The average cadmium emission data is summarized below:

Cadmium Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.10	0.089
Dry Reference Conc. (µg/Rm^3)*	0.18	0.15
Dry Adjusted Conc. (µg/Rm^3)**	0.14	0.12
Wet Reference Conc. (µg/Rm^3)*	0.15	0.13
Emission Rate (mg/s)	0.0025	0.0022

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average lead emission data is summarized below:

Lead Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.34	0.22
Dry Reference Conc. (µg/Rm^3)*	0.58	0.39
Dry Adjusted Conc. (µg/Rm^3)**	0.45	0.29
Wet Reference Conc. (µg/Rm^3)*	0.49	0.32
Emission Rate (mg/s)	0.0084	0.0054

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The cadmium and lead dry adjusted concentrations were well below the maximum in-stack emission limits stated in the ECA (7 µg/Rm^3, adjusted to 11% oxygen for cadmium and 50 µg/Rm^3, adjusted to 11% oxygen for lead).

7.8 Mercury Emission Data

Mercury analysis, concentration and emission data are also summarized in the metals emission tables. Mercury was detected in samples from each test, specifically in the impinger sample analysis, and as is the case with all other analyses the mercury analytical results are not blank corrected.

The average mercury emission data is summarized below:

Mercury Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.16	0.59
Dry Reference Conc. (µg/Rm^3)*	0.28	1.03
Dry Adjusted Conc. (µg/Rm^3)**	0.22	0.77
Wet Reference Conc. (µg/Rm^3)*	0.23	0.86
Emission Rate (mg/s)	0.0039	0.014

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The mercury dry adjusted concentrations were well below the maximum in-stack emission limit stated in the ECA of 15 µg/Rm^3, adjusted to 11% oxygen.

7.9 Semi-Volatile Organic Emission Data

The combined filter and probe rinse, and combined Amberlite XAD-2 cartridge and impinger solutions for each of the semi-volatile organics trains were analyzed together (one analysis per test) for semi-volatile organic compounds including select dioxins, furans, dioxin-like polychlorinated biphenyls (PCBs), chlorobenzenes (CBs), chlorophenols (CPs) and polycyclic aromatic hydrocarbons (PAHs) at the BH Outlet of each Boiler.

7.9.1 Dioxins and Furans Emission Data

Dioxins and furans are groups of chemically related chlorinated organic compounds or congeners. There are seventy-five dioxin congeners and one hundred and thirty five furan congeners. The individual congeners all have different molecular structures and they may also have different molecular formulae. Individual congeners, which have the same molecular formula but different molecular structure, are referred to as isomers. Groups of isomers are referred to as congener groups or homologues. The basic dioxin and furan molecules have the molecular formulae $C_{12}H_8O_2$ and $C_{12}H_8O$, respectively. In chlorinated dioxin and furans, between one and eight chlorine atoms may replace an equal number of hydrogen atoms in the basic molecule.

The following table lists the chlorinated dioxin and furan congener groups, and the number of isomers present in each group:

Congener Group Abbreviation		Number of Chlorine Atoms Per Molecule	Molecular Formula	Number of Isomers Per Congener Group
Dioxins	M1CDD	1	$C_{12}H_7ClO_2$	2
	D2CDD	2	$C_{12}H_6Cl_2O_2$	10
	T3CDD	3	$C_{12}H_5Cl_3O_2$	14
	T4CDD	4	$C_{12}H_4Cl_4O_2$	22
	P5CDD	5	$C_{12}H_3Cl_5O_2$	14
	H6CDD	6	$C_{12}H_2Cl_6O_2$	10
	H7CDD	7	$C_{12}H_1Cl_7O_2$	2
	O8CDD	8	$C_{12}Cl_8O_2$	1
Furans	M1CDF	1	$C_{12}H_7ClO$	4
	D2CDF	2	$C_{12}H_6Cl_2O$	16
	T3CDF	3	$C_{12}H_5Cl_3O$	28
	T4CDF	4	$C_{12}H_4Cl_4O$	38
	P5CDF	5	$C_{12}H_3Cl_5O$	28
	H6CDF	6	$C_{12}H_2Cl_6O$	16
	H7CDF	7	$C_{12}H_1Cl_7O$	4
	O8CDF	8	$C_{12}Cl_8O$	1

In Ontario, the MECP normally requires that only the higher tetra to octa (T4CDD to O8CDD) dioxin congeners and the higher tetra to octa (T4CDF to O8CDF) furan congeners are included in air emission testing. This is because the lower mono to tri congener groups (M1CDD to T3CDD and M1CDF to T3CDF) are considered to be generally less toxic than the higher congener groups and the test procedures have not been validated for these lower groups. In addition, it is acceptable to the MECP to use only specific isomers in the higher congener groups to compare emission data with the MECP criteria for dioxin and furan emissions.

Dioxin and furan congener group analytical results and emission data for the tests performed at the BH Outlet of each Boiler are given in Table 24 to Table 32 (Appendix 1 and Appendix 2). The results are shown as congener groups from T4CDF to O8CDF and T4CDD to O8CDD, as normally required by the MECP.

The average dioxin congener group emission data for each location is summarized below:

Dioxin Congener Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	0.67	0.72
Dry Reference Conc. (ng/Rm^3)*	1.16	1.25
Dry Adjusted Conc. (ng/Rm^3)**	0.90	0.96
Wet Reference Conc. (ng/Rm^3)*	0.97	1.04
Emission Rate (ng/s)	17.1	18.1

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average furan congener group emission data for each location is summarized below:

Furan Congener Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<0.11	0.14
Dry Reference Conc. (ng/Rm^3)*	<0.19	0.24
Dry Adjusted Conc. (ng/Rm^3)**	<0.15	0.18
Wet Reference Conc. (ng/Rm^3)*	<0.16	0.20
Emission Rate (ng/s)	<2.86	3.41

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The amounts of dioxin and furan congeners detected in the blank sampling trains and in the laboratory blank were insignificant when compared to the amounts detected in the test trains. The blank sampling train analytical results are shown in Table 33. The blank analyses were not subtracted from the test sample analyses during calculation of the dioxin and furan congener emission data.

Dioxin, furan and dioxin-like PCB specific isomer analytical results and emission data for the tests performed are given in Table 34 to Table 42 (Appendix 1 and 2) for the BH Outlets. The isomers included in these tables are considered the most toxic of all the dioxin and furan isomers. They are characterized by having chlorine atoms located at the 2, 3, 7 and 8 positions of the basic dioxin and furan molecules.

The blank sampling train analytical results are shown in Table 43 for the BH Outlet. The blank analyses were not subtracted from the test sample analyses during the calculation of the dioxin and furan isomer emission data.

Several schemes have been proposed for calculating dioxin and furan toxic equivalents (TEQ's) in which different factors have been assigned to the various isomers and congener groups. Calculations in this report are based on the methods preferred by the MECP, which use WHO and NATO/CCMS (1989) toxicity equivalence factors (TEFs).

The purpose in calculating dioxin and furan emission rates as toxic equivalents is to provide a means of assessing and comparing the effects of dioxin and furan emission rates for different emission sources. In these calculations, 2,3,7,8-T4CDD, the most toxic of all the dioxin and furan isomers, is assigned an arbitrary value of 1.0 for a toxic equivalency factor.

Then, other dioxin and furan isomers are assigned toxic equivalency factors which are based on their relative toxicity compared with 2,3,7,8-T4CDD. Emission rates for each isomer are multiplied by their assigned factor and the products are summed to provide the toxic equivalency emission rate.

The MECP "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provided a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. This document was replaced by "Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", with the most recent version published on April 27, 2018, however the dioxin and furan toxicity equivalent calculation methodology remains the same.

Tables 44 to 49 show the dioxins, furans and dioxin-like PCBs toxicity equivalent emission data calculated using the full detection limit for those compounds not detected. Table 50 show the dioxins, furans and dioxin-like PCBs toxicity equivalent emission data calculated using half the detection limit for those compounds not detected.

The average dioxin, furan and dioxin-like PCBs toxicity equivalent emission data, calculated using the WHO toxicity equivalence factors and half the detection limit (Table 50 in Appendix 1 and Appendix 2) is summarized below. Per the MECP standards and guidelines referenced above, dioxin, furan and dioxin-like PCB toxicity equivalent emission data calculated using the WHO toxicity equivalence factors and half the detection limit are used for dispersion modelling analysis for comparison with the point of impingement criteria discussed in Section 8.

Total Dioxin and Furan Isomer and PBCs Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (pg TEQ/m^3)	6.87	7.39
Dry Reference Conc. (pg TEQ/Rm^3)*	11.8	12.9
Dry Adjusted Conc. (pg TEQ/Rm^3)**	9.13	9.80
Wet Reference Conc. (pg TEQ/Rm^3)*	9.86	10.7
Emission Rate (ng TEQ/s)	0.17	0.19

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average dioxin and furan dry adjusted toxicity equivalent concentration, calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit (Table 46B in Appendix 1 and Appendix 2) is summarized below. Dioxin and furan toxicity equivalent emission data for the BH Outlet, calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit, is used for comparison with the in-stack emission limit specified in the ECA.

Dioxin and Furan Isomer Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Dry Adjusted Conc. (pg TEQ/Rm^3)*	<10.4	<10.5

* at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The dioxin and furan dry adjusted TEQ concentration at the BH Outlet of each Boiler was well below the maximum in-stack emission limit stated in the ECA of 60 pgTEQ/Rm^3, adjusted to 11% oxygen.

7.9.2 Chlorobenzene and Chlorophenol Emission Data

As with dioxins and furans, chlorobenzenes and chlorophenols are groups of compounds that have different molecular structures and may also have different numbers of chlorine atoms in the basic molecule. Chlorobenzenes have the structure of the benzene molecule except that between one and six chlorine atoms are substituted for an equal number of hydrogen atoms in the benzene ring. Benzene has the molecular formula C_6H_6. Chlorobenzene congener groups have the molecular formulae C_6H_5Cl, $C_6H_4Cl_2$, $C_6H_3Cl_3$, $C_6H_2Cl_4$, C_6HCl_5 and C_6Cl_6. Chlorophenols have the structure of the phenol molecule except that between one and five chlorine atoms are substituted for an equal number of hydrogen atoms in the benzene ring. Phenol has the molecular formula C_6H_5OH. Chlorophenol congener groups have the molecular formulae C_6H_4ClOH, $C_6H_3Cl_2OH$, $C_6H_2Cl_3OH$, C_6HCl_4OH and C_6Cl_5OH.

Chlorobenzene congener and isomer analytical results and emission data are given in Table 51 to Table 59 for the BH Outlet.

Amounts collected were assumed to be equivalent to the detection limit, where the analytical results were below the detection limit.

The average total chlorobenzene emission data is presented below:

Chlorobenzenes Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<377	<363
Dry Reference Conc. (ng/Rm^3)*	<650	<634
Dry Adjusted Conc. (ng/Rm^3)**	<501	<482
Wet Reference Conc. (ng/Rm^3)*	<541	<528
Emission Rate (µg/s)	<9.57	<9.14

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Blank sampling train and laboratory blank analytical results for chlorobenzenes are given in Table 60. The blank analyses were not subtracted from the test sample analyses during the calculation of chlorobenzene emission data.

Chlorophenol congener and isomer analytical results and emission data is given in Table 61 to Table 69 for the BH Outlet of each Boiler.

Amounts collected were assumed to be equivalent to the detection limit, where the analytical results were below the detection limits (<DL).

The average total chlorophenol emission data is presented below:

Chlorophenol Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<245	<210
Dry Reference Conc. (ng/Rm^3)*	<423	<367
Dry Adjusted Conc. (ng/Rm^3)**	<326	<279
Wet Reference Conc. (ng/Rm^3)*	<352	<305
Emission Rate (µg/s)	<6.23	<5.29

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Blank sampling train and laboratory blank analytical results for chlorophenols are given in Table 70. The blank analyses were not subtracted from the test sample analyses during the calculation of chlorophenol emission data.

7.9.3 Polycyclic Aromatic Hydrocarbon Emission Data

The SVOC samples from the BH Outlet sampling location on each Boiler were also analyzed for select polycyclic aromatic hydrocarbon (PAH) compounds.

Analytical results and PAH emission data for the tests performed are provided in Table 71, 72 and Table 73 for Test No. 1, Test No. 2 and Test No. 3, respectively. PAH actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates are shown in Tables 74 to 78, respectively. A summary of the average emission data is given in Table 79.

The average total PAH emission data is presented below:

Total PAH Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<367	<261
Dry Reference Conc. (ng/Rm^3)*	<633	<455
Dry Adjusted Conc. (ng/Rm^3)**	<488	<346
Wet Reference Conc. (ng/Rm^3)*	<527	<379
Emission Rate (µg/s)	<9.32	<6.56

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Table 80 summarizes the lab blank and blank train PAH analyses. The blank train sample analyses were not subtracted from the test train sample analyses for the purposes of emission rate calculations.

7.10 Aldehydes

Acetaldehyde, formaldehyde and acrolein emission data for the tests conducted at the BH Outlet of each Boiler is presented in Table 81.

The concentrations of acetaldehyde and formaldehyde reported in the two blank samples were similar to, and in some cases greater than, the concentrations in the test samples. The emission data for acetaldehyde and formaldehyde may be elevated due to the high blank results.

The test and blank samples were diluted prior to analysis for acrolein due to the presence of acetone in the samples, which elutes next to the acrolein peak during analysis. Acetone is a common laboratory solvent and is readily adsorbed by the DNPH impinger solution. The source of the acetone background was not determined, however it should be noted that ORTECH took steps during the preparation and recovery of the sampling trains to minimize exposure to acetone including using a separate recovery lab used only for the aldehyde trains. As a result the detection limits for acrolein were elevated resulting in higher emission data than previous emission testing programs. Acrolein was not detected in any of the samples in quantities greater than the detection limit and the detection limit was used to calculate emission data.

Average acetaldehyde, formaldehyde and acrolein emission data for the tests conducted at the BH Outlet of each Boiler is summarized below:

Aldehydes Emission Parameter	Acetaldehyde		Formaldehyde		Acrolein	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	<51.3	<43.6	170	193	<256	<218
Dry Reference Conc. (µg/Rm^3)*	<88.5	<76.0	292	336	<443	<380
Dry Adjusted Conc. (µg/Rm^3)**	<68.2	<57.1	225	253	<341	<286
Wet Reference Conc. (µg/Rm^3)*	<73.6	<63.2	243	280	<368	<316
Emission Rate (mg/s)	<1.31	<1.09	4.30	4.81	<6.54	<5.43

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Acetaldehyde and formaldehyde were detected in the blank samples in quantities similar to those found in the test samples. The blank analysis was not subtracted from the test sample analyses during calculation of the emission data.

7.11 Volatile Organic Emission Data

Three twenty minute runs were completed for each test at the BH Outlet of each Boiler at an approximate flowrate of one liter per minute for 20 minutes for volatile organic compounds. One backup pair of tubes was collected for each test and archived in case a sample was lost during the extraction process by the analytical laboratory.

Volatile organic analysis data for the tests is provided in Table 82, 83 and Table 84 for Test No. 1, Test No. 2 and Test No. 3, respectively. These tables indicate the total amount of each compound collected in the combined adsorbent tube samples from each volatile organics sampling train run. Emission data for the tests performed are provided in Table 85, 86 and 87 for Test No. 1, Test No. 2 and Test No. 3, respectively. The average test results of volatile organic actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates are shown in Table 88 to 92, respectively. The average volatile organic emission data is summarized in Table 93.

For the purpose of determining average and total analytical results for the VOC compounds, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

The average total VOC emission data collected from the VOST sampling train is presented below:

VOC Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	<46.7	<63.7
Dry Reference Conc. (µg/Rm^3)*	<80.6	<111
Dry Adjusted Conc. (µg/Rm^3)**	<62.2	<83.5
Wet Reference Conc. (µg/Rm^3)*	<67.1	<92.4
Emission Rate (mg/s)	<1.19	<1.59

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average total VOC emission data, including acetaldehyde, formaldehyde and acrolein, per the list provided in Schedule D of the ECA is presented below:

VOC Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Dry Reference Conc. (µg/Rm^3)*	<904	<903
Dry Adjusted Conc. (µg/Rm^3)**	<696	<680
Emission Rate (mg/s)	<13.3	<12.9

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The total VOC emission data is higher than previous emission testing programs primarily due to the elevated detection limits for acrolein and acetaldehyde, and the high levels of formaldehyde found in the blank trains as discussed in the previous section.

Analysis of blank adsorbent tubes is provided in Table 94. The field blank tubes were taken to the test site and uncapped in order to expose the tubes to the ambient environment at the sampling location. Test sample analyses were not blank corrected during the calculation of the emission data.

8. DISPERSION MODELLING

The emission data measured during the testing program was used to assess emissions from the main stack against the point of impingement criteria detailed in Ontario Regulation 419/05 or the applicable MECP guideline.

Dispersion modelling was completed using the CALPUFF model (using Version 6.263 as requested by the MECP) by Golder Associates. The dispersion modelling results are detailed in Appendix 27. Golder Associates can provide the dispersion modelling zip files upon request.

The predicted ground level Point of Impingement (POI) concentrations, calculated based on the average total emission rate, for each contaminant included in the May/June 2018 emission testing program was well below the applicable standard, guideline or upper risk threshold. The contaminant with the highest predicted concentration relative to the standard was nitrogen oxides (21% of the standard), all other contaminants were less than 5% of the relevant standard.

9. FACILITY PROCESS DATA

Continuous Emission Monitoring (CEM) data was supplied by DYEC personnel for the emission test program. The 1-hour CEM System data was provided for the following process parameters at the BH Outlet sampling locations:

- Hydrogen Chloride (mg/Rm^3, adjusted to 11% oxygen)
- Nitrogen Oxides (mg/Rm^3, adjusted to 11% oxygen)
- Sulphur Dioxide (mg/Rm^3, adjusted to 11% oxygen)
- Carbon Monoxide (mg/Rm^3, adjusted to 11% oxygen)
- Oxygen (% volume, dry)
- Carbon Dioxide (kg/Rm^3)
- Total Hydrocarbons (mg/Rm^3, adjusted to 11% oxygen)

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from May 29, 2018 at 08:00 to June 1, 2018 at 18:00 for each Boiler. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

The combustion gas concentrations, expressed as 1-hour average concentrations, 4-hour rolling average and 24-hour rolling average where applicable, at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 28.

1-minute CEM data provided by DYEC was used to calculate the average oxygen, carbon dioxide and carbon monoxide concentrations for each isokinetic test period. The average oxygen, carbon dioxide and carbon monoxide concentrations were used to calculate the molecular weight of the gas stream. The average oxygen concentrations were also used to adjust the dry reference concentration data to 11% oxygen. The 1-minute data for the isokinetic test periods has been retained by ORTECH and can be provided upon request.

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The facility process data was also supplied by DYEC personnel for each test day. Hourly process data has been retained by Covanta and can be provided upon request. The process data is summarized below:

Test Date	Total Power Output* (MWh/d)	Aux. Fuel Combusted** (m^3/d)		Avg. Combustion Zone Temp. (°C)		Steam (tonnes/d)		MSW Combusted*** (tonnes/d)		NO_X Reagent Inj. Rate (liters/d)		Carbon Inj. Rate (kg/d)		Lime Inj. Rate (kg/d)	
		Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
May 29, 2018	360	0	0	1235	1321	794	798	200	197	499	494	125	124	4170	4301
May 30, 2018	369	0	0	1232	1331	796	798	213	209	495	560	126	125	4178	4295
May 31, 2018	371	0	256	1254	1310	798	797	211	207	455	481	126	126	4195	4190
June 1, 2018	400	0	0	1247	1309	807	806	230	229	560	724	126	125	4174	4185
Average	375	0	64.1	1242	1318	799	800	214	211	502	565	126	125	4179	4242

* Gross turbine output

** Auxiliary fuel was not combusted during the conduct of reference test runs to demonstrate ECA compliance.

*** Calculated by crane scales.

10. CONCLUSIONS

The main conclusions which can be drawn from the present emission testing program are:

- During the stack test periods the facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation. Testing was conducted at a steam production rate of greater than 794 tonnes of steam per day for each Boiler. 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 the ECA.

- Using CALPUFF dispersion modelling techniques (using Version 6.263 as requested by the MECP), the predicted maximum point of impingement concentrations, based on the average test results for both boilers, show DYEC to be operating well below the current standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MECP criteria including guidelines and upper risk thresholds.

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. Emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter as the results from compliance source testing. 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.

The Fall 2017 relative accuracy and system bias testing was conducted on the Continuous Emission Monitoring Systems (CEMS) installed at the Scrubber Inlet and BH Outlet of each Boiler prior to the compliance testing program. Covanta informed ORTECH that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA. Therefore, 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 isokinetic test days at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA.

Total hydrocarbon concentration data was measured by ORTECH on May 29, 2018 at the Quench Inlet and BH Outlet sampling locations. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was well below the total hydrocarbons (organic matter) in-stack emissions 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)*	-	-	-	375	-
Average Combustion Zone Temp. (°C)*	-	-	-	1242	-
Steam (tonnes/day)*	-	-	-	799	-
MSW Combusted (tonnes/day)*	-	-	-	214	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	502	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4179	-
Filterable Particulate (mg/Rm^3) (1)	0.78	1.16	1.39	1.11	9
PM_{10} with Condensable (mg/Rm^3) (1)	<3.84	<3.97	<3.54	<3.79	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<3.77	<3.77	<3.47	<3.67	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	1.06	0.89	0.72	0.89	-
Cadmium (µg/Rm^3) (1)	0.13	0.14	0.14	0.14	7
Lead (µg/Rm^3) (1)	0.44	0.38	0.53	0.45	50
Mercury (µg/Rm^3) (1)	0.20	0.24	0.20	0.22	15
Antimony (µg/Rm^3) (1)	0.055	0.077	0.24	0.12	-
Arsenic (µg/Rm^3) (1)	0.051	<0.048	<0.049	<0.049	-
Barium (µg/Rm^3) (1)	2.74	2.90	2.86	2.84	-
Beryllium (µg/Rm^3) (1)	<0.046	<0.048	<0.049	<0.048	-
Chromium (µg/Rm^3) (1)	0.79	1.33	1.53	1.22	-
Cobalt (µg/Rm^3) (1)	0.12	0.13	0.16	0.14	-
Copper (µg/Rm^3) (1)	0.97	0.98	0.95	0.97	-
Molybdenum (µg/Rm^3) (1)	5.14	5.63	5.50	5.42	-
Nickel (µg/Rm^3) (1)	3.57	2.98	3.15	3.23	-
Selenium (µg/Rm^3) (1)	<0.23	<0.24	<0.24	<0.24	-
Silver (µg/Rm^3) (1)	<0.046	0.062	<0.049	<0.052	-
Thallium (µg/Rm^3) (1)	<0.046	<0.048	<0.049	<0.048	-
Vanadium (µg/Rm^3) (1)	0.048	0.10	0.060	0.069	-
Zinc (µg/Rm^3) (1)	3.85	4.40	7.49	5.25	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<11.4	<9.91	<9.84	<10.4	60
Total Chlorobenzenes (ng/Rm^3) (1)	<516	<515	<472	<501	-
Total Chlorophenols (ng/Rm^3) (1)	<334	<327	<318	<326	-
Total PAHs (ng/Rm^3) (1)	<787	<360	<316	<488	-
VOCs (µg/Rm^3) (1)	<61.7	<48.3	<76.6	<62.2	-
Aldehydes (µg/Rm^3) (1)	<493	<527	<882	<634	-
Total VOCs (µg/Rm^3) (1) (4)	<555	<575	<959	<696	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.9	0.8	0.8	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

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

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)*	-	-	-	375	-
Average Combustion Zone Temp. (°C)*	-	-	-	1318	-
Steam (tonnes/day)*	-	-	-	800	-
MSW Combusted (tonnes/day)*	-	-	-	211	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	565	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4242	-
Filterable Particulate (mg/Rm^3) (1)	1.00	1.04	0.85	0.96	9
PM_{10} with Condensable (mg/Rm^3) (1)	<6.45	<4.09	<3.63	<4.72	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<6.39	<4.02	3.56	<4.66	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.54	0.50	0.40	0.48	-
Cadmium (µg/Rm^3) (1)	0.20	0.082	0.065	0.12	7
Lead (µg/Rm^3) (1)	0.38	0.29	0.20	0.29	50
Mercury (µg/Rm^3) (1)	1.20	0.81	0.30	0.77	15
Antimony (µg/Rm^3) (1)	<0.045	0.049	<0.045	<0.047	-
Arsenic (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Barium (µg/Rm^3) (1)	2.63	2.49	2.48	2.53	-
Beryllium (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Chromium (µg/Rm^3) (1)	1.63	2.86	3.12	2.54	-
Cobalt (µg/Rm^3) (1)	0.16	0.17	0.28	0.20	-
Copper (µg/Rm^3) (1)	1.00	1.28	2.59	1.63	-
Molybdenum (µg/Rm^3) (1)	5.63	5.29	5.20	5.37	-
Nickel (µg/Rm^3) (1)	4.94	5.70	12.2	7.63	-
Selenium (µg/Rm^3) (1)	<0.23	<0.22	<0.22	<0.22	-
Silver (µg/Rm^3) (1)	0.079	0.19	<0.045	<0.10	-
Thallium (µg/Rm^3) (1)	<0.045	<0.044	<0.045	<0.045	-
Vanadium (µg/Rm^3) (1)	0.043	0.039	0.049	0.044	-
Zinc (µg/Rm^3) (1)	4.47	13.7	8.27	8.83	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<10.5	<10.1	<10.9	<10.5	60
Total Chlorobenzenes (ng/Rm^3) (1)	<494	<471	<481	<482	-
Total Chlorophenols (ng/Rm^3) (1)	<281	<274	<282	<279	-
Total PAHs (ng/Rm^3) (1)	<390	<275	<373	<346	-
VOCs (µg/Rm^3) (1)	<86.3	<79.2	<85.0	<83.5	-
Aldehydes (µg/Rm^3) (1)	<509	<700	<579	<596	-
Total VOCs (µg/Rm^3) (1) (4)	<595	<779	<664	<680	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.8	0.9	1.8	1.2	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

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

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)	11.3	19.7	27.8	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.8	2.0	2.2	9
	Nitrogen Oxides (mg/Rm^3) (2)	108	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.02	0.1	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.3	13.0	30.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	3.6	3.8	4.4	9
	Nitrogen Oxides (mg/Rm^3) (2)	108	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	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

APPENDIX 1

Boiler No. 1 BH Outlet
Data Tables
(96 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 1
Isokinetic Sampling Train Test Schedules

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 29, 2018	8:45	11:57	180
2	May 29, 2018	13:05	16:17	180
3	May 30, 2018	9:15	13:12	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 30, 2018	8:34	11:54	120
2	May 30, 2018	13:29	15:32	120
3	May 30, 2018	16:37	18:40	120

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 29, 2018	8:46	9:57	60
2	May 29, 2018	10:42	11:42	60
3	May 29, 2018	13:28	14:28	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 31, 2018	9:09	13:22	240
2	May 31, 2018	15:26	19:37	240
3	June 1, 2018	12:44	16:50	240

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 1
Organic Compounds Test Schedules

Acrolein and Aldehydes Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	May 31, 2018	9:20	10:20	60
2	May 31, 2018	17:16	18:16	60
3	June 1, 2018	12:50	13:50	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	May 31, 2018	11:05	11:25	20
	2	May 31, 2018	11:33	11:53	20
	3	May 31, 2018	12:00	12:20	20
	4	May 31, 2018	12:25	12:45	20
2	1	May 31, 2018	15:27	15:47	20
	2	May 31, 2018	15:51	16:11	20
	3	May 31, 2018	16:16	16:36	20
	4	May 31, 2018	16:40	17:00	20
3	1	June 1, 2018	14:15	14:35	20
	2	June 1, 2018	14:41	15:01	20
	3	June 1, 2018	15:07	15:27	20
	4	June 1, 2018	15:33	15:53	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	May 29, 2018	16:00	17:00	60
BH Outlet	2	May 29, 2018	17:08	18:08	60
BH Outlet	3	May 29, 2018	18:14	19:14	60
Quench Inlet	1	May 29, 2018	8:45	9:45	60
Quench Inlet	2	May 29, 2018	9:56	10:56	60
Quench Inlet	3	May 29, 2018	11:09	12:09	60

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Sampling Parameters

Particulate and Metals Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.851	0.981	6.46	3.459	100.5
2	0.851	0.981	6.46	3.288	100.2
3	0.840	0.988	5.97	3.132	102.7

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.845	0.981	4.50	1.148	98.1
2	0.845	0.981	4.50	1.153	101.6
3	0.845	0.981	4.50	1.152	100.8

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.850	0.988	6.54	1.236	101.6
2	0.850	0.988	6.54	1.250	102.8
3	0.850	0.988	6.54	1.186	100.3

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.840	0.981	5.97	4.022	100.3
2	0.840	0.981	5.97	4.021	100.5
3	0.840	0.981	5.97	4.141	102.2

* Dry at 25°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Physical Parameters

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	140	16.2	16.5	-2.47	98.3	10.9	8.42
2	140	15.5	15.7	-2.47	98.3	11.0	8.40
3	141	16.8	17.4	-2.47	98.0	11.2	7.91
Average	140	16.2	16.5	-2.47	98.2	11.0	8.24

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	140	16.4	17.3	-2.47	98.1	11.3	7.88
2	140	16.3	16.9	-2.47	97.9	10.9	8.14
3	140	17.0	17.1	-2.44	97.7	10.9	8.07
Average	140	16.6	17.1	-2.46	97.9	11.0	8.03

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	16.2	17.2	-2.47	98.3	10.9	8.41
2	140	16.2	17.2	-2.47	98.3	11.1	8.22
3	140	15.2	16.5	-2.47	98.3	11.0	8.41
Average	140	15.9	16.9	-2.47	98.3	11.0	8.35

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	139	16.6	17.1	-2.37	97.5	11.0	8.01
2	138	16.5	17.1	-2.37	97.3	11.0	8.04
3	139	17.0	17.4	-2.37	97.4	11.0	8.07
Average	139	16.7	17.2	-2.37	97.4	11.0	8.04

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically at a single point in the duct.

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Volumetric Flowrates

Particulate and Metals Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	24.4	14.4	18.1	17.1
2	23.1	13.7	17.3	16.2
3	25.7	14.9	19.5	17.9
Average	24.4	14.3	18.3	17.1

Particle Size Distribution Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.5	14.9	19.6	17.8
2	25.0	14.6	18.8	17.4
3	25.4	14.7	19.1	17.7
Average	25.3	14.7	19.2	17.6

Acid Gases Trains ***

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.4	14.9	18.7	17.7
2	25.3	14.9	19.0	17.7
3	24.3	14.4	18.2	17.0
Average	25.0	14.7	18.7	17.5

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.3	14.7	19.1	17.6
2	25.2	14.7	19.0	17.6
3	25.7	14.8	19.2	17.9
Average	25.4	14.7	19.1	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

*** Sampling was conducted isokinetically at a single point in the duct. Volumetric flowrates from the corresponding particulate and metals tests were used to calculate emission data.

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Particulate Emission Data

Test No.	Particulate Collected			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	0.9	2.5	3.4	3.459	0.58	0.98	0.78	0.82	14.1
2	1.0	3.8	4.8	3.288	0.86	1.46	1.16	1.23	20.0
3	2.9	2.8	5.7	3.132	1.06	1.82	1.39	1.51	27.1
Average					0.83	1.42	1.11	1.19	20.4
Blank	<0.1	3.3							

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
$PM_{2.5}$ and PM_{10} Emission Data

$PM_{2.5}$

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	$PM_{2.5}$ Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.6	1.148	<0.31	<0.52	<0.40	<0.44	<7.79
2	<0.3	1.153	<0.15	<0.26	<0.20	<0.22	<3.80
3	<0.2	1.152	<0.10	<0.17	<0.13	<0.14	<2.55
Average			<0.19	<0.32	<0.24	<0.27	<4.71
Blank	<0.2						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.7	1.148	<0.36	<0.61	<0.46	<0.51	<9.09
2	<0.6	1.153	<0.30	<0.52	<0.40	<0.44	<7.60
3	<0.3	1.152	<0.15	<0.26	<0.20	<0.22	<3.83
Average			<0.27	<0.46	<0.36	<0.39	<6.84
Blank	<0.3						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Condensable Particulate Emission Data

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration: Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	3.7	1.148	1.88	3.22	2.45	2.70	48.0
2	3.7	1.153	1.87	3.21	2.49	2.69	46.9
3	3.3	1.152	1.66	2.86	2.20	2.38	42.1
Average			1.81	3.10	2.38	2.59	45.7
Blank	0.8						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration: Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	1.4	1.148	0.71	1.22	0.93	1.02	18.2
2	1.6	1.153	0.81	1.39	1.08	1.16	20.3
3	1.7	1.152	0.85	1.48	1.14	1.23	21.7
Average			0.79	1.36	1.05	1.14	20.0
Blank	1.3						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Halides and Ammonia Emission Data

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Chloride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HCl Emission Rate mg/s
1	6.56	1.236	3.13	5.31	4.22	4.47	76.4
2	7.02	1.250	3.31	5.62	4.47	4.73	80.9
3	6.76	1.186	3.38	5.70	4.51	4.82	78.1
Average			3.28	5.54	4.40	4.67	78.5
Blank	<0.290						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Fluoride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HF Emission Rate mg/s
1	<0.158	1.236	<0.075	<0.13	<0.10	<0.11	<1.84
2	<0.174	1.250	<0.082	<0.14	<0.11	<0.12	<2.00
3	<0.161	1.186	<0.081	<0.14	<0.11	<0.11	<1.86
Average			<0.079	<0.13	<0.11	<0.11	<1.90
Blank	<0.165						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm^3*	Ammonia Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Ammonia Emission Rate mg/s
1	1.65	1.236	0.79	1.33	1.06	1.12	19.2
2	1.40	1.250	0.66	1.12	0.89	0.94	16.1
3	1.08	1.186	0.54	0.91	0.72	0.77	12.5
Average			0.66	1.12	0.89	0.95	15.9
Blank	<0.425						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 1
Combustion Gas Analyses

Data measured by the DYEC CEMS from May 29 to June 1, 2018

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.53	8.19	9.46
BH Outlet	Carbon Dioxide (kg/Rm^3, 1 hr Avg) *	0.18	0.20	0.21
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	9	20	37
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	11.3	19.7	27.8
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0.04	2
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0.02	0.1
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	99	109	115
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	108	109	110
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	1	2	3
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	1.8	2.0	2.2
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0	0
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	9

Data measured by the ORTECH CEMS on May 29, 2018

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	1.5	15.2
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.2	0.5	1.1
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.1	0.5	1.2
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.8	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.6	1.8
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.9	4.1
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.8	2.3
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.8	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	0.3	0.6	1.3
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	0.3	0.9	2.2
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0.5	0.8	1.3
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		0.8	

* Reference conditions, dry basis adjusted to 11% oxygen

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 1

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.24	<0.1	0.24
Arsenic	<1	0.22	0.22
Barium	10.9	1.00	11.9
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.44	0.11	0.55
Chromium	2.69	0.76	3.45
Cobalt	0.53	<0.1	0.53
Copper	2.28	1.92	4.20
Lead	1.07	0.86	1.93
Mercury *	<0.015	0.89	0.89
Molybdenum	22.0	0.37	22.4
Nickel	15.5	<0.1	15.5
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.21	0.21
Zinc	10.5	6.25	16.8
Total			<80.3

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 2

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.32	<0.1	0.32
Arsenic	<1	<0.2	<0.20
Barium	11.1	0.96	12.1
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.38	0.23	0.60
Chromium	4.73	0.78	5.51
Cobalt	0.54	<0.1	0.54
Copper	1.60	2.48	4.08
Lead	1.14	0.45	1.59
Mercury *	<0.015	1.01	1.01
Molybdenum	22.7	0.68	23.4
Nickel	10.0	2.38	12.4
Selenium	<2	<1	<1.00
Silver	0.26	<0.1	0.26
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.42	0.42
Zinc	13.3	4.98	18.3
Total			<82.0

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 3

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.97	<0.1	0.97
Arsenic	<1	<0.2	<0.20
Barium	10.9	0.84	11.7
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.43	0.16	0.59
Chromium	5.77	0.52	6.29
Cobalt	0.66	<0.1	0.66
Copper	2.26	1.63	3.89
Lead	1.83	0.36	2.19
Mercury *	<0.015	0.83	0.83
Molybdenum	22.3	0.24	22.5
Nickel	12.9	<0.1	12.9
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.24	0.24
Zinc	27.4	3.30	30.7
Total			<95.3

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 1

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.24	0.041	0.069	0.055	0.058	0.00099
Arsenic	0.22	0.038	0.064	0.051	0.054	0.00092
Barium	11.9	2.03	3.44	2.74	2.90	0.050
Beryllium	<0.20	<0.034	<0.058	<0.046	<0.049	<0.00083
Cadmium	0.55	0.093	0.16	0.13	0.13	0.0023
Chromium	3.45	0.59	1.00	0.79	0.84	0.014
Cobalt	0.53	0.091	0.15	0.12	0.13	0.0022
Copper	4.20	0.72	1.21	0.97	1.02	0.017
Lead	1.93	0.33	0.56	0.44	0.47	0.0080
Mercury	0.89	0.15	0.26	0.20	0.22	0.0037
Molybdenum	22.4	3.82	6.47	5.14	5.45	0.093
Nickel	15.5	2.64	4.48	3.57	3.77	0.065
Selenium	<1.00	<0.17	<0.29	<0.23	<0.24	<0.0042
Silver	<0.20	<0.034	<0.058	<0.046	<0.049	<0.00083
Thallium	<0.20	<0.034	<0.058	<0.046	<0.049	<0.00083
Vanadium	0.21	0.035	0.060	0.048	0.051	0.00087
Zinc	16.8	2.86	4.84	3.85	4.08	0.070
Total	<80.3	<13.7	<23.2	<18.5	<19.6	<0.33

Dry Gas Volume Sampled (Rm^3*) :	3.459
Actual Flowrate (m^3/s) :	24.4
Dry Reference Flowrate (Rm^3/s*) :	14.4
Dry Adjusted Flowrate (Rm^3/s**) :	18.1
Wet Reference Flowrate (Rm^3/s*) :	17.1

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 2

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.32	0.058	0.097	0.077	0.082	0.0013
Arsenic	<0.20	<0.036	<0.061	<0.048	<0.051	<0.00083
Barium	12.1	2.18	3.67	2.90	3.10	0.050
Beryllium	<0.20	<0.036	<0.061	<0.048	<0.051	<0.00083
Cadmium	0.60	0.11	0.18	0.14	0.15	0.0025
Chromium	5.51	0.99	1.68	1.33	1.42	0.023
Cobalt	0.54	0.097	0.16	0.13	0.14	0.0022
Copper	4.08	0.74	1.24	0.98	1.05	0.017
Lead	1.59	0.29	0.48	0.38	0.41	0.0066
Mercury	1.01	0.18	0.31	0.24	0.26	0.0042
Molybdenum	23.4	4.22	7.11	5.63	6.01	0.097
Nickel	12.4	2.23	3.77	2.98	3.18	0.052
Selenium	<1.00	<0.18	<0.30	<0.24	<0.26	<0.0042
Silver	0.26	0.047	0.079	0.062	0.067	0.0011
Thallium	<0.20	<0.036	<0.061	<0.048	<0.051	<0.00083
Vanadium	0.42	0.075	0.13	0.10	0.11	0.0017
Zinc	18.3	3.30	5.56	4.40	4.70	0.076
Total	<82.0	<14.8	<24.9	<19.8	<21.1	<0.34

Dry Gas Volume Sampled (Rm^3*) :	3.288
Actual Flowrate (m^3/s) :	23.1
Dry Reference Flowrate (Rm^3/s*) :	13.7
Dry Adjusted Flowrate (Rm^3/s**) :	17.3
Wet Reference Flowrate (Rm^3/s*) :	16.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 3

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.97	0.18	0.31	0.24	0.26	0.0046
Arsenic	<0.20	<0.037	<0.064	<0.049	<0.053	<0.00095
Barium	11.7	2.17	3.75	2.86	3.12	0.056
Beryllium	<0.20	<0.037	<0.064	<0.049	<0.053	<0.00095
Cadmium	0.59	0.11	0.19	0.14	0.16	0.0028
Chromium	6.29	1.16	2.01	1.53	1.67	0.030
Cobalt	0.66	0.12	0.21	0.16	0.17	0.0031
Copper	3.89	0.72	1.24	0.95	1.03	0.019
Lead	2.19	0.41	0.70	0.53	0.58	0.010
Mercury	0.83	0.15	0.26	0.20	0.22	0.0039
Molybdenum	22.5	4.17	7.20	5.50	5.99	0.11
Nickel	12.9	2.39	4.12	3.15	3.43	0.061
Selenium	<1.00	<0.19	<0.32	<0.24	<0.27	<0.0048
Silver	<0.20	<0.037	<0.064	<0.049	<0.053	<0.00095
Thallium	<0.20	<0.037	<0.064	<0.049	<0.053	<0.00095
Vanadium	0.24	0.045	0.078	0.060	0.065	0.0012
Zinc	30.7	5.68	9.80	7.49	8.16	0.15
Total	<95.3	<17.6	<30.4	<23.3	<25.3	<0.45

Dry Gas Volume Sampled (Rm^3*) :	3.132
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Actual Concentrations

Metal	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/m³	µg/m³	µg/m³	µg/m³	%
Antimony	0.041	0.058	0.18	0.093	82.0
Arsenic	0.038	<0.036	<0.037	<0.037	2.4
Barium	2.03	2.18	2.17	2.13	3.9
Beryllium	<0.034	<0.036	<0.037	<0.036	4.1
Cadmium	0.093	0.11	0.11	0.10	8.6
Chromium	0.59	0.99	1.16	0.92	32.3
Cobalt	0.091	0.097	0.12	0.10	15.8
Copper	0.72	0.74	0.72	0.72	1.4
Lead	0.33	0.29	0.41	0.34	17.7
Mercury	0.15	0.18	0.15	0.16	10.7
Molybdenum	3.82	4.22	4.17	4.07	5.4
Nickel	2.64	2.23	2.39	2.42	8.6
Selenium	<0.17	<0.18	<0.19	<0.18	4.1
Silver	<0.034	0.047	<0.037	<0.039	16.8
Thallium	<0.034	<0.036	<0.037	<0.036	4.1
Vanadium	0.035	0.075	0.045	0.052	39.7
Zinc	2.86	3.30	5.68	3.95	38.5
Total	<13.7	<14.8	<17.6	<15.4	13.2

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Dry Reference Concentrations

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.069	0.097	0.31	0.16	83.2
Arsenic	0.064	<0.061	<0.064	<0.063	2.9
Barium	3.44	3.67	3.75	3.62	4.4
Beryllium	<0.058	<0.061	<0.064	<0.061	5.0
Cadmium	0.16	0.18	0.19	0.18	9.1
Chromium	1.00	1.68	2.01	1.56	33.0
Cobalt	0.15	0.16	0.21	0.18	17.1
Copper	1.21	1.24	1.24	1.23	1.3
Lead	0.56	0.48	0.70	0.58	19.0
Mercury	0.26	0.31	0.26	0.28	9.9
Molybdenum	6.47	7.11	7.20	6.92	5.8
Nickel	4.48	3.77	4.12	4.12	8.7
Selenium	<0.29	<0.30	<0.32	<0.30	5.0
Silver	<0.058	0.079	<0.064	<0.067	16.1
Thallium	<0.058	<0.061	<0.064	<0.061	5.0
Vanadium	0.060	0.13	0.078	0.088	39.0
Zinc	4.84	5.56	9.80	6.73	39.8
Total	<23.2	<24.9	<30.4	<26.2	14.4

* At 25°C and 1 atmosphere

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Dry Adjusted Concentrations

Metal	Dry Adjusted Concentration				Coefficient
	Test No. 1 µg/Rm³**	Test No. 2 µg/Rm³**	Test No. 3 µg/Rm³**	Average µg/Rm³**	of Variation %
Antimony	0.055	0.077	0.24	0.12	81.0
Arsenic	0.051	<0.048	<0.049	<0.049	3.1
Barium	2.74	2.90	2.86	2.84	3.1
Beryllium	<0.046	<0.048	<0.049	<0.048	3.1
Cadmium	0.13	0.14	0.14	0.14	7.7
Chromium	0.79	1.33	1.53	1.22	31.4
Cobalt	0.12	0.13	0.16	0.14	14.7
Copper	0.97	0.98	0.95	0.97	1.7
Lead	0.44	0.38	0.53	0.45	16.9
Mercury	0.20	0.24	0.20	0.22	10.8
Molybdenum	5.14	5.63	5.50	5.42	4.6
Nickel	3.57	2.98	3.15	3.23	9.3
Selenium	<0.23	<0.24	<0.24	<0.24	3.1
Silver	<0.046	0.062	<0.049	<0.052	16.7
Thallium	<0.046	<0.048	<0.049	<0.048	3.1
Vanadium	0.048	0.10	0.060	0.069	39.7
Zinc	3.85	4.40	7.49	5.25	37.4
Total	<18.5	<19.8	<23.3	<20.5	12.1

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Wet Reference Concentrations

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.058	0.082	0.26	0.13	82.4
Arsenic	0.054	<0.051	<0.053	<0.053	2.5
Barium	2.90	3.10	3.12	3.04	4.1
Beryllium	<0.049	<0.051	<0.053	<0.051	4.4
Cadmium	0.13	0.15	0.16	0.15	8.7
Chromium	0.84	1.42	1.67	1.31	32.5
Cobalt	0.13	0.14	0.17	0.15	16.2
Copper	1.02	1.05	1.03	1.04	1.3
Lead	0.47	0.41	0.58	0.49	18.1
Mercury	0.22	0.26	0.22	0.23	10.5
Molybdenum	5.45	6.01	5.99	5.82	5.5
Nickel	3.77	3.18	3.43	3.46	8.6
Selenium	<0.24	<0.26	<0.27	<0.26	4.4
Silver	<0.049	0.067	<0.053	<0.056	16.6
Thallium	<0.049	<0.051	<0.053	<0.051	4.4
Vanadium	0.051	0.11	0.065	0.074	39.5
Zinc	4.08	4.70	8.16	5.65	38.9
Total	<19.6	<21.1	<25.3	<22.0	13.6

* At 25°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Emission Rates

Metal	Emission Rate				Coefficient
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %
Antimony	0.00099	0.0013	0.0046	0.0023	86.7
Arsenic	0.00092	<0.00083	<0.00095	<0.00090	6.8
Barium	0.050	0.050	0.056	0.052	6.7
Beryllium	<0.00083	<0.00083	<0.00095	<0.00087	7.8
Cadmium	0.0023	0.0025	0.0028	0.0025	10.4
Chromium	0.014	0.023	0.030	0.022	34.8
Cobalt	0.0022	0.0022	0.0031	0.0025	20.6
Copper	0.017	0.017	0.019	0.018	4.4
Lead	0.0080	0.0066	0.010	0.0084	23.0
Mercury	0.0037	0.0042	0.0039	0.0039	6.5
Molybdenum	0.093	0.097	0.11	0.099	7.3
Nickel	0.065	0.052	0.061	0.059	11.4
Selenium	<0.0042	<0.0042	<0.0048	<0.0044	7.8
Silver	<0.00083	0.0011	<0.00095	<0.00095	12.9
Thallium	<0.00083	<0.00083	<0.00095	<0.00087	7.8
Vanadium	0.00087	0.0017	0.0012	0.0013	35.2
Zinc	0.070	0.076	0.15	0.097	43.5
Total	<0.33	<0.34	<0.45	<0.38	17.7

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Emission Data

Metal	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.093	0.16	0.12	0.13	0.0023
Arsenic	<0.037	<0.063	<0.049	<0.053	<0.00090
Barium	2.13	3.62	2.84	3.04	0.052
Beryllium	<0.036	<0.061	<0.048	<0.051	<0.00087
Cadmium	0.10	0.18	0.14	0.15	0.0025
Chromium	0.92	1.56	1.22	1.31	0.022
Cobalt	0.10	0.18	0.14	0.15	0.0025
Copper	0.72	1.23	0.97	1.04	0.018
Lead	0.34	0.58	0.45	0.49	0.0084
Mercury	0.16	0.28	0.22	0.23	0.0039
Molybdenum	4.07	6.92	5.42	5.82	0.099
Nickel	2.42	4.12	3.23	3.46	0.059
Selenium	<0.18	<0.30	<0.24	<0.26	<0.0044
Silver	<0.039	<0.067	<0.052	<0.056	<0.00095
Thallium	<0.036	<0.061	<0.048	<0.051	<0.00087
Vanadium	0.052	0.088	0.069	0.074	0.0013
Zinc	3.95	6.73	5.25	5.65	0.097
Total	<15.4	<26.2	<20.5	<22.0	<0.38

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Train Metal Analyses

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	0.75	0.75
Arsenic	<1	<0.2	<0.20
Barium	10.9	0.66	11.6
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	3.21	0.33	3.54
Cobalt	0.60	<0.1	0.60
Copper	1.16	0.89	2.05
Lead	0.50	0.32	0.83
Mercury *	<0.015	<0.050	<0.050
Molybdenum	23.3	<0.1	23.3
Nickel	12.5	<0.1	12.5
Selenium	<2	<1	<1.00
Silver	12.2	<0.1	12.2
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.15	0.15
Zinc	<6	<3	<6.00
Total			<75.2

* Includes the permanganate impingers.

Note: "<" indicates that the analyte was not detected. Where all values are reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate the total collected in the blank, the remaining fractions are assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate the total collected in the blank.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	505	0.073	0.13	0.097	0.10	1.85
Pentachlorodibenzo-p-dioxins	566	0.082	0.14	0.11	0.12	2.07
Hexachlorodibenzo-p-dioxins	1680	0.24	0.42	0.32	0.35	6.14
Heptachlorodibenzo-p-dioxins	1450	0.21	0.36	0.28	0.30	5.30
Octachlorodibenzo-p-dioxin	706	0.10	0.18	0.14	0.15	2.58
Total	4907	0.71	1.22	0.94	1.02	17.9

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	229	0.033	0.057	0.044	0.048	0.84
Pentachlorodibenzofurans	187	0.027	0.046	0.036	0.039	0.68
Hexachlorodibenzofurans	256	0.037	0.064	0.049	0.053	0.94
Heptachlorodibenzofurans	200	0.029	0.050	0.038	0.042	0.73
Octachlorodibenzofuran	72.5	0.010	0.018	0.014	0.015	0.26
Total	945	0.14	0.23	0.18	0.20	3.45

Dry Gas Volume Sampled (Rm^3*) :	4.022
Actual Flowrate (m^3/s) :	25.3
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.1
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	373	0.054	0.093	0.072	0.077	1.36
Pentachlorodibenzo-p-dioxins	653	0.095	0.16	0.13	0.14	2.39
Hexachlorodibenzo-p-dioxins	1580	0.23	0.39	0.30	0.33	5.78
Heptachlorodibenzo-p-dioxins	1280	0.19	0.32	0.25	0.27	4.68
Octachlorodibenzo-p-dioxin	743	0.11	0.18	0.14	0.15	2.72
Total	4629	0.67	1.15	0.89	0.96	16.9

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	155	0.022	0.039	0.030	0.032	0.57
Pentachlorodibenzofurans	199	0.029	0.049	0.038	0.041	0.73
Hexachlorodibenzofurans	210	0.030	0.052	0.040	0.044	0.77
Heptachlorodibenzofurans	160	0.023	0.040	0.031	0.033	0.58
Octachlorodibenzofuran	57.6	0.0084	0.014	0.011	0.012	0.21
Total	782	0.11	0.19	0.15	0.16	2.86

Dry Gas Volume Sampled (Rm^3*) :	4.021
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	407	0.057	0.098	0.076	0.081	1.45
Pentachlorodibenzo-p-dioxins	544	0.076	0.13	0.10	0.11	1.94
Hexachlorodibenzo-p-dioxins	1560	0.22	0.38	0.29	0.31	5.58
Heptachlorodibenzo-p-dioxins	1380	0.19	0.33	0.26	0.28	4.93
Octachlorodibenzo-p-dioxin	728	0.10	0.18	0.14	0.15	2.60
Total	4619	0.64	1.12	0.86	0.92	16.5

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	56.3	0.0078	0.014	0.010	0.011	0.20
Pentachlorodibenzofurans	147	0.020	0.035	0.027	0.029	0.53
Hexachlorodibenzofurans	194	0.027	0.047	0.036	0.039	0.69
Heptachlorodibenzofurans	176	0.024	0.043	0.033	0.035	0.63
Octachlorodibenzofuran	<61	<0.0085	<0.015	<0.011	<0.012	<0.22
Total	<634	<0.088	<0.15	<0.12	<0.13	<2.27

Dry Gas Volume Sampled (Rm^3*) :	4.141
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.073	0.054	0.057	0.061	16.7
Pentachlorodibenzo-p-dioxins	0.082	0.095	0.076	0.084	11.6
Hexachlorodibenzo-p-dioxins	0.24	0.23	0.22	0.23	5.6
Heptachlorodibenzo-p-dioxins	0.21	0.19	0.19	0.20	6.3
Octachlorodibenzo-p-dioxin	0.10	0.11	0.10	0.10	3.5
Total	0.71	0.67	0.64	0.67	4.9

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.033	0.022	0.0078	0.021	60.0
Pentachlorodibenzofurans	0.027	0.029	0.020	0.025	17.4
Hexachlorodibenzofurans	0.037	0.030	0.027	0.031	16.1
Heptachlorodibenzofurans	0.029	0.023	0.024	0.026	11.7
Octachlorodibenzofuran	0.010	0.0084	<0.0085	<0.0091	13.0
Total	0.14	0.11	<0.088	<0.11	21.4

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.13	0.093	0.098	0.11	16.6
Pentachlorodibenzo-p-dioxins	0.14	0.16	0.13	0.14	11.0
Hexachlorodibenzo-p-dioxins	0.42	0.39	0.38	0.40	5.2
Heptachlorodibenzo-p-dioxins	0.36	0.32	0.33	0.34	6.3
Octachlorodibenzo-p-dioxin	0.18	0.18	0.18	0.18	2.9
Total	1.22	1.15	1.12	1.16	4.6

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.057	0.039	0.014	0.036	59.8
Pentachlorodibenzofurans	0.046	0.049	0.035	0.044	16.8
Hexachlorodibenzofurans	0.064	0.052	0.047	0.054	15.8
Heptachlorodibenzofurans	0.050	0.040	0.043	0.044	11.7
Octachlorodibenzofuran	0.018	0.014	<0.015	<0.016	12.9
Total	0.23	0.19	<0.15	<0.19	21.0

* At 25°C and 1 atmosphere

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.097	0.072	0.076	0.081	16.4
Pentachlorodibenzo-p-dioxins	0.11	0.13	0.10	0.11	11.2
Hexachlorodibenzo-p-dioxins	0.32	0.30	0.29	0.31	5.1
Heptachlorodibenzo-p-dioxins	0.28	0.25	0.26	0.26	6.1
Octachlorodibenzo-p-dioxin	0.14	0.14	0.14	0.14	3.2
Total	0.94	0.89	0.86	0.90	4.5

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.044	0.030	0.010	0.028	59.7
Pentachlorodibenzofurans	0.036	0.038	0.027	0.034	16.9
Hexachlorodibenzofurans	0.049	0.040	0.036	0.042	15.7
Heptachlorodibenzofurans	0.038	0.031	0.033	0.034	11.4
Octachlorodibenzofuran	0.014	0.011	<0.011	<0.012	12.7
Total	0.18	0.15	<0.12	<0.15	20.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.10	0.077	0.081	0.088	16.9
Pentachlorodibenzo-p-dioxins	0.12	0.14	0.11	0.12	11.4
Hexachlorodibenzo-p-dioxins	0.35	0.33	0.31	0.33	5.7
Heptachlorodibenzo-p-dioxins	0.30	0.27	0.28	0.28	6.5
Octachlorodibenzo-p-dioxin	0.15	0.15	0.15	0.15	3.3
Total	1.02	0.96	0.92	0.97	5.0

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.048	0.032	0.011	0.030	60.1
Pentachlorodibenzofurans	0.039	0.041	0.029	0.037	17.3
Hexachlorodibenzofurans	0.053	0.044	0.039	0.045	16.2
Heptachlorodibenzofurans	0.042	0.033	0.035	0.037	11.9
Octachlorodibenzofuran	0.015	0.012	<0.012	<0.013	13.2
Total	0.20	0.16	<0.13	<0.16	21.5

* At 25°C and 1 atmosphere

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	1.85	1.36	1.45	1.55	16.5
Pentachlorodibenzo-p-dioxins	2.07	2.39	1.94	2.13	10.7
Hexachlorodibenzo-p-dioxins	6.14	5.78	5.58	5.83	4.9
Heptachlorodibenzo-p-dioxins	5.30	4.68	4.93	4.97	6.3
Octachlorodibenzo-p-dioxin	2.58	2.72	2.60	2.63	2.8
Total	17.9	16.9	16.5	17.1	4.3

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	0.84	0.57	0.20	0.53	59.6
Pentachlorodibenzofurans	0.68	0.73	0.53	0.65	16.5
Hexachlorodibenzofurans	0.94	0.77	0.69	0.80	15.5
Heptachlorodibenzofurans	0.73	0.58	0.63	0.65	11.6
Octachlorodibenzofuran	0.26	0.21	<0.22	<0.23	12.8
Total	3.45	2.86	<2.27	<2.86	20.7

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.061	0.11	0.081	0.088	1.55
Pentachlorodibenzo-p-dioxins	0.084	0.14	0.11	0.12	2.13
Hexachlorodibenzo-p-dioxins	0.23	0.40	0.31	0.33	5.83
Heptachlorodibenzo-p-dioxins	0.20	0.34	0.26	0.28	4.97
Octachlorodibenzo-p-dioxin	0.10	0.18	0.14	0.15	2.63
Total	0.67	1.16	0.90	0.97	17.1

Furans

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.021	0.036	0.028	0.030	0.53
Pentachlorodibenzofurans	0.025	0.044	0.034	0.037	0.65
Hexachlorodibenzofurans	0.031	0.054	0.042	0.045	0.80
Heptachlorodibenzofurans	0.026	0.044	0.034	0.037	0.65
Octachlorodibenzofuran	<0.0091	<0.016	<0.012	<0.013	<0.23
Total	<0.11	<0.19	<0.15	<0.16	<2.86

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 33
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<2.2	<3.2
Pentachlorodibenzo-p-dioxins	<1.6	2.25
Hexachlorodibenzo-p-dioxins	<1.7	2.53
Heptachlorodibenzo-p-dioxins	6.19	<2.5
Octachlorodibenzo-p-dioxin	216	211
Total	<228	<221

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<1.2	<1.5
Pentachlorodibenzofurans	<1.1	<1.0
Hexachlorodibenzofurans	<2.0	6.70
Heptachlorodibenzofurans	<1.0	3.59
Octachlorodibenzofuran	4.19	<4.7
Total	<9.49	<17.5

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 34
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<4.6	<0.66	<1.14	<0.88	<0.96	<0.017
12378-pentachlorodibenzo-p-dioxin	<12	<1.73	<2.98	<2.30	<2.49	<0.044
123478-hexachlorodibenzo-p-dioxin	35.8	5.17	8.90	6.85	7.43	0.13
123678-hexachlorodibenzo-p-dioxin	87.3	12.6	21.7	16.7	18.1	0.32
123789-hexachlorodibenzo-p-dioxin	32.3	4.67	8.03	6.18	6.71	0.12
1234678-heptachlorodibenzo-p-dioxin	698	101	174	134	145	2.55
Octachlorodibenzo-p-dioxin	706	102	176	135	147	2.58
2378-tetrachlorodibenzofuran	8.85	1.28	2.20	1.69	1.84	0.032
12378-pentachlorodibenzofuran	13.2	1.91	3.28	2.53	2.74	0.048
23478-pentachlorodibenzofuran	23.5	3.39	5.84	4.50	4.88	0.086
123478-hexachlorodibenzofuran	27.3	3.94	6.79	5.22	5.67	0.10
123678-hexachlorodibenzofuran	29.2	4.22	7.26	5.59	6.06	0.11
234678-hexachlorodibenzofuran	46.4	6.70	11.5	8.88	9.64	0.17
123789-hexachlorodibenzofuran	6.33	0.91	1.57	1.21	1.31	0.023
1234678-heptachlorodibenzofuran	133	19.2	33.1	25.5	27.6	0.49
1234789-heptachlorodibenzofuran	24.7	3.57	6.14	4.73	5.13	0.090
Octachlorodibenzofuran	72.5	10.5	18.0	13.9	15.1	0.26
PCB 81	105	15.2	26.1	20.1	21.8	0.38
PCB 77	234	33.8	58.2	44.8	48.6	0.86
PCB 123	<810	<117	<201	<155	<168	<2.96
PCB 118	9530	1377	2369	1824	1979	34.8
PCB 114	274	39.6	68.1	52.4	56.9	1.00
PCB 105	3390	490	843	649	704	12.4
PCB 126	<27	<3.90	<6.71	<5.17	<5.61	<0.099
PCB 167	<55	<7.95	<13.7	<10.5	<11.4	<0.20
PCB 156	252	36.4	62.7	48.2	52.3	0.92
PCB 157	60.0	8.67	14.9	11.5	12.5	0.22
PCB 169	<13	<1.88	<3.23	<2.49	<2.70	<0.048
PCB 189	18.2	2.63	4.53	3.48	3.78	0.067
Total Dioxins & Furans Only	<1961	<283	<488	<375	<407	<7.17
Total PCBs Only	<14768	<2133	<3672	<2826	<3067	<54.0
Total Dioxins & Furans and PCBs	<16729	<2417	<4159	<3201	<3474	<61.1

Dry Gas Volume Sampled (Rm³*) :	4.022
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.7
Dry Adjusted Flowrate (Rm³/s**) :	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 35
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<4.9	<0.71	<1.22	<0.94	<1.02	<0.018
12378-pentachlorodibenzo-p-dioxin	<8.2	<1.19	<2.04	<1.58	<1.70	<0.030
123478-hexachlorodibenzo-p-dioxin	32.7	4.74	8.13	6.29	6.79	0.12
123678-hexachlorodibenzo-p-dioxin	77.1	11.2	19.2	14.8	16.0	0.28
123789-hexachlorodibenzo-p-dioxin	33.6	4.87	8.36	6.47	6.98	0.12
1234678-heptachlorodibenzo-p-dioxin	630	91.4	157	121	131	2.30
Octachlorodibenzo-p-dioxin	743	108	185	143	154	2.72
2378-tetrachlorodibenzofuran	4.90	0.71	1.22	0.94	1.02	0.018
12378-pentachlorodibenzofuran	12.4	1.80	3.08	2.39	2.58	0.045
23478-pentachlorodibenzofuran	16.6	2.41	4.13	3.19	3.45	0.061
123478-hexachlorodibenzofuran	30.8	4.47	7.66	5.93	6.40	0.11
123678-hexachlorodibenzofuran	23.7	3.44	5.89	4.56	4.92	0.087
234678-hexachlorodibenzofuran	42.4	6.15	10.5	8.16	8.81	0.16
123789-hexachlorodibenzofuran	<3.5	<0.51	<0.87	<0.67	<0.73	<0.013
1234678-heptachlorodibenzofuran	137	19.9	34.1	26.4	28.5	0.50
1234789-heptachlorodibenzofuran	22.6	3.28	5.62	4.35	4.69	0.083
Octachlorodibenzofuran	57.6	8.36	14.3	11.1	12.0	0.21
PCB 81	<60	<8.70	<14.9	<11.5	<12.5	<0.22
PCB 77	343	49.8	85.3	66.0	71.2	1.25
PCB 123	<530	<76.9	<132	<102	<110	<1.94
PCB 118	5910	857	1470	1137	1228	21.6
PCB 114	182	26.4	45.3	35.0	37.8	0.67
PCB 105	2170	315	540	418	451	7.93
PCB 126	<15	<2.18	<3.73	<2.89	<3.12	<0.055
PCB 167	<22	<3.19	<5.47	<4.23	<4.57	<0.080
PCB 156	127	18.4	31.6	24.4	26.4	0.46
PCB 157	26.0	3.77	6.47	5.00	5.40	0.095
PCB 169	<5.0	<0.73	<1.24	<0.96	<1.04	<0.018
PCB 189	<8.8	<1.28	<2.19	<1.69	<1.83	<0.032
Total Dioxins & Furans Only	<1881	<273	<468	<362	<391	<6.88
Total PCBs Only	<9399	<1363	<2337	<1808	<1952	<34.4
Total Dioxins & Furans and PCBs	<11280	<1636	<2805	<2170	<2343	<41.2

Dry Gas Volume Sampled (Rm³*) :	4.021
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.7
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 36
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<6.9	<0.96	<1.67	<1.28	<1.38	<0.025
12378-pentachlorodibenzo-p-dioxin	<9.9	<1.38	<2.39	<1.84	<1.98	<0.035
123478-hexachlorodibenzo-p-dioxin	<25	<3.48	<6.04	<4.65	<4.99	<0.089
123678-hexachlorodibenzo-p-dioxin	78.0	10.8	18.8	14.5	15.6	0.28
123789-hexachlorodibenzo-p-dioxin	32.2	4.48	7.78	5.99	6.43	0.12
1234678-heptachlorodibenzo-p-dioxin	657	91.4	159	122	131	2.35
Octachlorodibenzo-p-dioxin	728	101	176	136	145	2.60
2378-tetrachlorodibenzofuran	5.15	0.72	1.24	0.96	1.03	0.018
12378-pentachlorodibenzofuran	8.99	1.25	2.17	1.67	1.79	0.032
23478-pentachlorodibenzofuran	17.7	2.46	4.27	3.29	3.53	0.063
123478-hexachlorodibenzofuran	20.0	2.78	4.83	3.72	3.99	0.071
123678-hexachlorodibenzofuran	25.0	3.48	6.04	4.65	4.99	0.089
234678-hexachlorodibenzofuran	39.3	5.47	9.49	7.32	7.85	0.14
123789-hexachlorodibenzofuran	4.83	0.67	1.17	0.90	0.96	0.017
1234678-heptachlorodibenzofuran	118	16.4	28.5	22.0	23.6	0.42
1234789-heptachlorodibenzofuran	23.9	3.32	5.77	4.45	4.77	0.085
Octachlorodibenzofuran	<61	<8.48	<14.7	<11.4	<12.2	<0.22
PCB 81	<14	<1.95	<3.38	<2.61	<2.80	<0.050
PCB 77	65.4	9.09	15.8	12.2	13.1	0.23
PCB 123	<130	<18.1	<31.4	<24.2	<26.0	<0.46
PCB 118	1450	202	350	270	290	5.18
PCB 114	40.6	5.65	9.80	7.56	8.11	0.15
PCB 105	442	61.5	107	82.3	88.3	1.58
PCB 126	<7.7	<1.07	<1.86	<1.43	<1.54	<0.028
PCB 167	<11	<1.53	<2.66	<2.05	<2.20	<0.039
PCB 156	23.5	3.27	5.67	4.37	4.69	0.084
PCB 157	<5.2	<0.72	<1.26	<0.97	<1.04	<0.019
PCB 169	<3.6	<0.50	<0.87	<0.67	<0.72	<0.013
PCB 189	<5.2	<0.72	<1.26	<0.97	<1.04	<0.019
Total Dioxins & Furans Only	<1861	<259	<449	<346	<372	<6.65
Total PCBs Only	<2198	<306	<531	<409	<439	<7.86
Total Dioxins & Furans and PCBs	<4059	<564	<980	<756	<810	<14.5

Dry Gas Volume Sampled (Rm³*) :	4.141
Actual Flowrate (m³/s) :	25.7
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<0.66	<0.71	<0.96	<0.78	20.4
12378-pentachlorodibenzo-p-dioxin	<1.73	<1.19	<1.38	<1.43	19.3
123478-hexachlorodibenzo-p-dioxin	5.17	4.74	<3.48	<4.46	19.7
123678-hexachlorodibenzo-p-dioxin	12.6	11.2	10.8	11.5	8.1
123789-hexachlorodibenzo-p-dioxin	4.67	4.87	4.48	4.67	4.2
1234678-heptachlorodibenzo-p-dioxin	101	91.4	91.4	94.5	5.8
Octachlorodibenzo-p-dioxin	102	108	101	104	3.5
2378-tetrachlorodibenzofuran	1.28	0.71	0.72	0.90	36.2
12378-pentachlorodibenzofuran	1.91	1.80	1.25	1.65	21.3
23478-pentachlorodibenzofuran	3.39	2.41	2.46	2.75	20.1
123478-hexachlorodibenzofuran	3.94	4.47	2.78	3.73	23.1
123678-hexachlorodibenzofuran	4.22	3.44	3.48	3.71	11.8
234678-hexachlorodibenzofuran	6.70	6.15	5.47	6.11	10.2
123789-hexachlorodibenzofuran	0.91	<0.51	0.67	<0.70	29.3
1234678-heptachlorodibenzofuran	19.2	19.9	16.4	18.5	9.9
1234789-heptachlorodibenzofuran	3.57	3.28	3.32	3.39	4.6
Octachlorodibenzofuran	10.5	8.36	<8.48	9.10	13.0
PCB 81	15.2	<8.70	<1.95	<8.61	76.8
PCB 77	33.8	49.8	9.09	30.9	66.3
PCB 123	<117	<76.9	<18.1	<70.7	70.4
PCB 118	1377	857	202	812	72.5
PCB 114	39.6	26.4	5.65	23.9	71.7
PCB 105	490	315	61.5	289	74.6
PCB 126	<3.90	<2.18	<1.07	<2.38	59.9
PCB 167	<7.95	<3.19	<1.53	<4.22	78.9
PCB 156	36.4	18.4	3.27	19.4	85.7
PCB 157	8.67	3.77	<0.72	<4.39	91.3
PCB 169	<1.88	<0.73	<0.50	<1.03	71.4
PCB 189	2.63	<1.28	<0.72	<1.54	63.5
Total Dioxins & Furans Only	<283	<273	<259	<272	4.5
Total PCBs Only	<2133	<1363	<306	<1268	72.4
Total Dioxins & Furans and PCBs	<2417	<1636	<564	<1539	60.4

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 38
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.14	<1.22	<1.67	<1.34	21.0
12378-pentachlorodibenzo-p-dioxin	<2.98	<2.04	<2.39	<2.47	19.3
123478-hexachlorodibenzo-p-dioxin	8.90	8.13	<6.04	<7.69	19.3
123678-hexachlorodibenzo-p-dioxin	21.7	19.2	18.8	19.9	7.9
123789-hexachlorodibenzo-p-dioxin	8.03	8.36	7.78	8.05	3.6
1234678-heptachlorodibenzo-p-dioxin	174	157	159	163	5.7
Octachlorodibenzo-p-dioxin	176	185	176	179	2.9
2378-tetrachlorodibenzofuran	2.20	1.22	1.24	1.55	36.0
12378-pentachlorodibenzofuran	3.28	3.08	2.17	2.85	20.8
23478-pentachlorodibenzofuran	5.84	4.13	4.27	4.75	20.0
123478-hexachlorodibenzofuran	6.79	7.66	4.83	6.43	22.6
123678-hexachlorodibenzofuran	7.26	5.89	6.04	6.40	11.7
234678-hexachlorodibenzofuran	11.5	10.5	9.49	10.5	9.7
123789-hexachlorodibenzofuran	1.57	<0.87	1.17	<1.20	29.3
1234678-heptachlorodibenzofuran	33.1	34.1	28.5	31.9	9.3
1234789-heptachlorodibenzofuran	6.14	5.62	5.77	5.84	4.6
Octachlorodibenzofuran	18.0	14.3	<14.7	15.7	12.9
PCB 81	26.1	<14.9	<3.38	<14.8	76.8
PCB 77	58.2	85.3	15.8	53.1	66.0
PCB 123	<201	<132	<31.4	<122	70.3
PCB 118	2369	1470	350	1396	72.4
PCB 114	68.1	45.3	9.80	41.1	71.6
PCB 105	843	540	107	496	74.5
PCB 126	<6.71	<3.73	<1.86	<4.10	59.7
PCB 167	<13.7	<5.47	<2.66	<7.27	78.8
PCB 156	62.7	31.6	5.67	33.3	85.7
PCB 157	14.9	6.47	<1.26	<7.55	91.4
PCB 169	<3.23	<1.24	<0.87	<1.78	71.3
PCB 189	4.53	<2.19	<1.26	<2.66	63.4
Total Dioxins & Furans Only	<488	<468	<449	<468	4.1
Total PCBs Only	<3672	<2337	<531	<2180	72.3
Total Dioxins & Furans and PCBs	<4159	<2805	<980	<2648	60.2

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 39
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.88	<0.94	<1.28	<1.04	21.0
12378-pentachlorodibenzo-p-dioxin	<2.30	<1.58	<1.84	<1.91	19.1
123478-hexachlorodibenzo-p-dioxin	6.85	6.29	<4.65	<5.93	19.2
123678-hexachlorodibenzo-p-dioxin	16.7	14.8	14.5	15.4	7.7
123789-hexachlorodibenzo-p-dioxin	6.18	6.47	5.99	6.21	3.8
1234678-heptachlorodibenzo-p-dioxin	134	121	122	126	5.4
Octachlorodibenzo-p-dioxin	135	143	136	138	3.2
2378-tetrachlorodibenzofuran	1.69	0.94	0.96	1.20	35.8
12378-pentachlorodibenzofuran	2.53	2.39	1.67	2.20	20.8
23478-pentachlorodibenzofuran	4.50	3.19	3.29	3.66	19.8
123478-hexachlorodibenzofuran	5.22	5.93	3.72	4.96	22.7
123678-hexachlorodibenzofuran	5.59	4.56	4.65	4.93	11.5
234678-hexachlorodibenzofuran	8.88	8.16	7.32	8.12	9.6
123789-hexachlorodibenzofuran	1.21	<0.67	0.90	<0.93	29.1
1234678-heptachlorodibenzofuran	25.5	26.4	22.0	24.6	9.4
1234789-heptachlorodibenzofuran	4.73	4.35	4.45	4.51	4.3
Octachlorodibenzofuran	13.9	11.1	<11.4	12.1	12.7
PCB 81	20.1	<11.5	<2.61	<11.4	76.6
PCB 77	44.8	66.0	12.2	41.0	66.2
PCB 123	<155	<102	<24.2	<94	70.2
PCB 118	1824	1137	270	1077	72.3
PCB 114	52.4	35.0	7.56	31.7	71.4
PCB 105	649	418	82.3	383	74.4
PCB 126	<5.17	<2.89	<1.43	<3.16	59.5
PCB 167	<10.5	<4.23	<2.05	<5.60	78.6
PCB 156	48.2	24.4	4.37	25.7	85.5
PCB 157	11.5	5.00	<0.97	<5.82	91.2
PCB 169	<2.49	<0.96	<0.67	<1.37	71.1
PCB 189	3.48	<1.69	<0.97	<2.05	63.2
Total Dioxins & Furans Only	<375	<362	<346	<361	4.0
Total PCBs Only	<2826	<1808	<409	<1681	72.2
Total Dioxins & Furans and PCBs	<3201	<2170	<756	<2042	60.1

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 40
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.96	<1.02	<1.38	<1.12	20.4
12378-pentachlorodibenzo-p-dioxin	<2.49	<1.70	<1.98	<2.06	19.5
123478-hexachlorodibenzo-p-dioxin	7.43	6.79	<4.99	<6.41	19.8
123678-hexachlorodibenzo-p-dioxin	18.1	16.0	15.6	16.6	8.2
123789-hexachlorodibenzo-p-dioxin	6.71	6.98	6.43	6.71	4.1
1234678-heptachlorodibenzo-p-dioxin	145	131	131	136	5.9
Octachlorodibenzo-p-dioxin	147	154	145	149	3.3
2378-tetrachlorodibenzofuran	1.84	1.02	1.03	1.29	36.3
12378-pentachlorodibenzofuran	2.74	2.58	1.79	2.37	21.3
23478-pentachlorodibenzofuran	4.88	3.45	3.53	3.95	20.3
123478-hexachlorodibenzofuran	5.67	6.40	3.99	5.35	23.0
123678-hexachlorodibenzofuran	6.06	4.92	4.99	5.33	12.0
234678-hexachlorodibenzofuran	9.64	8.81	7.85	8.76	10.2
123789-hexachlorodibenzofuran	1.31	<0.73	0.96	<1.00	29.5
1234678-heptachlorodibenzofuran	27.6	28.5	23.6	26.5	9.9
1234789-heptachlorodibenzofuran	5.13	4.69	4.77	4.87	4.8
Octachlorodibenzofuran	15.1	12.0	<12.2	13.1	13.2
PCB 81	21.8	<12.5	<2.80	<12.4	76.9
PCB 77	48.6	71.2	13.1	44.3	66.2
PCB 123	<168	<110	<26.0	<101	70.5
PCB 118	1979	1228	290	1165	72.6
PCB 114	56.9	37.8	8.11	34.3	71.7
PCB 105	704	451	88.3	414	74.7
PCB 126	<5.61	<3.12	<1.54	<3.42	60.0
PCB 167	<11.4	<4.57	<2.20	<6.06	79.0
PCB 156	52.3	26.4	4.69	27.8	85.8
PCB 157	12.5	5.40	<1.04	<6.30	91.5
PCB 169	<2.70	<1.04	<0.72	<1.49	71.6
PCB 189	3.78	<1.83	<1.04	<2.22	63.7
Total Dioxins & Furans Only	<407	<391	<372	<390	4.6
Total PCBs Only	<3067	<1952	<439	<1819	72.5
Total Dioxins & Furans and PCBs	<3474	<2343	<810	<2209	60.5

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.017	<0.018	<0.025	<0.020	21.5
12378-pentachlorodibenzo-p-dioxin	<0.044	<0.030	<0.035	<0.036	19.2
123478-hexachlorodibenzo-p-dioxin	0.13	0.12	<0.089	<0.11	18.9
123678-hexachlorodibenzo-p-dioxin	0.32	0.28	0.28	0.29	7.6
123789-hexachlorodibenzo-p-dioxin	0.12	0.12	0.12	0.12	3.3
1234678-heptachlorodibenzo-p-dioxin	2.55	2.30	2.35	2.40	5.5
Octachlorodibenzo-p-dioxin	2.58	2.72	2.60	2.63	2.8
2378-tetrachlorodibenzofuran	0.032	0.018	0.018	0.023	35.8
12378-pentachlorodibenzofuran	0.048	0.045	0.032	0.042	20.5
23478-pentachlorodibenzofuran	0.086	0.061	0.063	0.070	19.8
123478-hexachlorodibenzofuran	0.10	0.11	0.071	0.095	22.2
123678-hexachlorodibenzofuran	0.11	0.087	0.089	0.094	11.6
234678-hexachlorodibenzofuran	0.17	0.16	0.14	0.16	9.4
123789-hexachlorodibenzofuran	0.023	<0.013	0.017	<0.018	29.2
1234678-heptachlorodibenzofuran	0.49	0.50	0.42	0.47	9.0
1234789-heptachlorodibenzofuran	0.090	0.083	0.085	0.086	4.5
Octachlorodibenzofuran	0.26	0.21	<0.22	0.23	12.8
PCB 81	0.38	<0.22	<0.050	<0.22	76.6
PCB 77	0.86	1.25	0.23	0.78	65.8
PCB 123	<2.96	<1.94	<0.46	<1.8	70.2
PCB 118	34.8	21.6	5.18	20.5	72.3
PCB 114	1.00	0.67	0.15	0.60	71.4
PCB 105	12.4	7.93	1.58	7.30	74.4
PCB 126	<0.099	<0.055	<0.028	<0.060	59.5
PCB 167	<0.20	<0.080	<0.039	<0.11	78.6
PCB 156	0.92	0.46	0.084	0.49	85.6
PCB 157	0.22	0.095	<0.019	<0.11	91.3
PCB 169	<0.048	<0.018	<0.013	<0.026	71.1
PCB 189	0.067	<0.032	<0.019	<0.039	63.2
Total Dioxins & Furans Only	<7.17	<6.88	<6.65	<6.90	3.8
Total PCBs Only	<54.0	<34.4	<7.86	<32.1	72.2
Total Dioxins & Furans and PCBs	<61.1	<41.2	<14.5	<39.0	60.1

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.78	<1.34	<1.04	<1.12	<0.020
12378-pentachlorodibenzo-p-dioxin	<1.43	<2.47	<1.91	<2.06	<0.036
123478-hexachlorodibenzo-p-dioxin	<4.46	<7.69	<5.93	<6.41	<0.11
123678-hexachlorodibenzo-p-dioxin	11.5	19.9	15.4	16.6	0.29
123789-hexachlorodibenzo-p-dioxin	4.67	8.05	6.21	6.71	0.12
1234678-heptachlorodibenzo-p-dioxin	94.5	163	126	136	2.40
Octachlorodibenzo-p-dioxin	104	179	138	149	2.63
2378-tetrachlorodibenzofuran	0.90	1.55	1.20	1.29	0.023
12378-pentachlorodibenzofuran	1.65	2.85	2.20	2.37	0.042
23478-pentachlorodibenzofuran	2.75	4.75	3.66	3.95	0.070
123478-hexachlorodibenzofuran	3.73	6.43	4.96	5.35	0.095
123678-hexachlorodibenzofuran	3.71	6.40	4.93	5.33	0.094
234678-hexachlorodibenzofuran	6.11	10.5	8.12	8.76	0.16
123789-hexachlorodibenzofuran	<0.70	<1.20	<0.93	<1.00	<0.018
1234678-heptachlorodibenzofuran	18.5	31.9	24.6	26.5	0.47
1234789-heptachlorodibenzofuran	3.39	5.84	4.51	4.87	0.086
Octachlorodibenzofuran	9.10	15.7	12.1	13.1	0.23
PCB 81	<8.61	<14.8	<11.4	<12.4	<0.22
PCB 77	30.9	53.1	41.0	44.3	0.78
PCB 123	<70.7	<122	<93.7	<101	<1.8
PCB 118	812	1396	1077	1165	20.5
PCB 114	23.9	41.1	31.7	34.3	0.60
PCB 105	289	496	383	414	7.30
PCB 126	<2.38	<4.10	<3.16	<3.42	<0.060
PCB 167	<4.22	<7.27	<5.60	<6.06	<0.11
PCB 156	19.4	33.3	25.7	27.8	0.49
PCB 157	<4.39	<7.55	<5.82	<6.30	<0.11
PCB 169	<1.03	<1.78	<1.37	<1.49	<0.026
PCB 189	<1.54	<2.66	<2.05	<2.22	<0.039
Total Dioxins & Furans Only	<272	<468	<361	<390	<6.90
Total PCBs Only	<1268	<2180	<1681	<1819	<32.1
Total Dioxins & Furans and PCBs	<1539	<2648	<2042	<2209	<39.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 43
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<2.2	<3.2
12378-pentachlorodibenzo-p-dioxin	<1.6	2.25
123478-hexachlorodibenzo-p-dioxin	<1.7	2.53
123678-hexachlorodibenzo-p-dioxin	<1.6	<3.3
123789-hexachlorodibenzo-p-dioxin	<1.7	<2.1
1234678-heptachlorodibenzo-p-dioxin	6.19	<7.2
Octachlorodibenzo-p-dioxin	216	211
2378-tetrachlorodibenzofuran	<1.2	<1.5
12378-pentachlorodibenzofuran	<2.2	<2.3
23478-pentachlorodibenzofuran	<1.1	<1.9
123478-hexachlorodibenzofuran	<1.7	2.79
123678-hexachlorodibenzofuran	<1.6	<2.3
234678-hexachlorodibenzofuran	<1.7	<2.2
123789-hexachlorodibenzofuran	<3.1	3.91
1234678-heptachlorodibenzofuran	<1.6	3.59
1234789-heptachlorodibenzofuran	<2.1	<1.7
Octachlorodibenzofuran	4.19	<4.7
PCB 81	<5.2	<5.3
PCB 77	10.2	<6.7
PCB 123	8.71	<3.4
PCB 118	138	<31
PCB 114	<4.9	<3.0
PCB 105	57.8	20.6
PCB 126	<5.1	<3.1
PCB 167	<2.8	<2.3
PCB 156	<8.4	<2.5
PCB 157	<3.0	<2.5
PCB 169	<3.1	<2.6
PCB 189	<1.1	<2.00
Total Dioxins & Furans Only	<251	<258
Total PCBs Only	<248	<85.0
Total Dioxins & Furans and PCBs	<500	<343

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 44
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.66	<0.71	<0.96	<0.78
12378-pentachlorodibenzo-p-dioxin	1.000	<1.73	<1.19	<1.38	<1.43
123478-hexachlorodibenzo-p-dioxin	0.100	0.52	0.47	<0.35	<0.45
123678-hexachlorodibenzo-p-dioxin	0.100	1.26	1.12	1.08	1.15
123789-hexachlorodibenzo-p-dioxin	0.100	0.47	0.49	0.45	0.47
1234678-heptachlorodibenzo-p-dioxin	0.010	1.01	0.91	0.91	0.95
Octachlorodibenzo-p-dioxin	0.0003	0.031	0.032	0.030	0.031
2378-tetrachlorodibenzofuran	0.100	0.13	0.071	0.072	0.090
12378-pentachlorodibenzofuran	0.030	0.057	0.054	0.038	0.050
23478-pentachlorodibenzofuran	0.300	1.02	0.72	0.74	0.83
123478-hexachlorodibenzofuran	0.100	0.39	0.45	0.28	0.37
123678-hexachlorodibenzofuran	0.100	0.42	0.34	0.35	0.37
234678-hexachlorodibenzofuran	0.100	0.67	0.62	0.55	0.61
123789-hexachlorodibenzofuran	0.100	0.091	<0.051	0.067	<0.070
1234678-heptachlorodibenzofuran	0.010	0.19	0.20	0.16	0.18
1234789-heptachlorodibenzofuran	0.010	0.036	0.033	0.033	0.034
Octachlorodibenzofuran	0.0003	0.0031	0.0025	<0.0025	0.0027
PCB 81	0.0003	0.0046	<0.0026	<0.00058	<0.0026
PCB 77	0.0001	0.0034	0.0050	0.00091	0.0031
PCB 123	0.00003	<0.0035	<0.0023	<0.00054	<0.0021
PCB 118	0.00003	0.041	0.026	0.0060	0.024
PCB 114	0.00003	0.0012	0.00079	0.00017	0.00072
PCB 105	0.00003	0.015	0.0094	0.0018	0.0087
PCB 126	0.100	<0.39	<0.22	<0.11	<0.24
PCB 167	0.00003	<0.00024	<0.000096	<0.000046	<0.00013
PCB 156	0.00003	0.0011	0.00055	0.000098	0.00058
PCB 157	0.00003	0.00026	0.00011	<0.000022	<0.00013
PCB 169	0.030	<0.056	<0.022	<0.015	<0.031
PCB 189	0.00003	0.000079	<0.000038	<0.000022	<0.000046
Total Dioxins & Furans Only		<8.69	<7.47	<7.45	<7.87
Total PCBs Only		<0.52	<0.29	<0.13	<0.31
Total Dioxins & Furans and PCBs		<9.21	<7.75	<7.58	<8.18

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 45
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.14	<1.22	<1.67	<1.34
12378-pentachlorodibenzo-p-dioxin	1.000	<2.98	<2.04	<2.39	<2.47
123478-hexachlorodibenzo-p-dioxin	0.100	0.89	0.81	<0.60	<0.77
123678-hexachlorodibenzo-p-dioxin	0.100	2.17	1.92	1.88	1.99
123789-hexachlorodibenzo-p-dioxin	0.100	0.80	0.84	0.78	0.81
1234678-heptachlorodibenzo-p-dioxin	0.010	1.74	1.57	1.59	1.63
Octachlorodibenzo-p-dioxin	0.0003	0.053	0.055	0.053	0.054
2378-tetrachlorodibenzofuran	0.100	0.22	0.12	0.12	0.16
12378-pentachlorodibenzofuran	0.030	0.098	0.093	0.065	0.085
23478-pentachlorodibenzofuran	0.300	1.75	1.24	1.28	1.42
123478-hexachlorodibenzofuran	0.100	0.68	0.77	0.48	0.64
123678-hexachlorodibenzofuran	0.100	0.73	0.59	0.60	0.64
234678-hexachlorodibenzofuran	0.100	1.15	1.05	0.95	1.05
123789-hexachlorodibenzofuran	0.100	0.16	<0.087	0.12	<0.12
1234678-heptachlorodibenzofuran	0.010	0.33	0.34	0.28	0.32
1234789-heptachlorodibenzofuran	0.010	0.061	0.056	0.058	0.058
Octachlorodibenzofuran	0.0003	0.0054	0.0043	<0.0044	0.0047
PCB 81	0.0003	0.0078	<0.0045	<0.0010	<0.0044
PCB 77	0.0001	0.0058	0.0085	0.0016	0.0053
PCB 123	0.00003	<0.0060	<0.0040	<0.00094	<0.0036
PCB 118	0.00003	0.071	0.044	0.011	0.042
PCB 114	0.00003	0.0020	0.0014	0.00029	0.0012
PCB 105	0.00003	0.025	0.016	0.0032	0.0149
PCB 126	0.100	<0.67	<0.37	<0.19	<0.41
PCB 167	0.00003	<0.00041	<0.00016	<0.000080	<0.00022
PCB 156	0.00003	0.0019	0.00095	0.00017	0.0010
PCB 157	0.00003	0.00045	0.00019	<0.000038	<0.00023
PCB 169	0.030	<0.097	<0.037	<0.026	<0.053
PCB 189	0.00003	0.00014	<0.000066	<0.000038	<0.000080
Total Dioxins & Furans Only		<15.0	<12.8	<12.9	<13.6
Total PCBs Only		<0.89	<0.49	<0.23	<0.54
Total Dioxins & Furans and PCBs		<15.9	<13.3	<13.2	<14.1

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.88	<0.94	<1.28	<1.04
12378-pentachlorodibenzo-p-dioxin	1.000	<2.30	<1.58	<1.84	<1.91
123478-hexachlorodibenzo-p-dioxin	0.100	0.69	0.63	<0.47	<0.59
123678-hexachlorodibenzo-p-dioxin	0.100	1.67	1.48	1.45	1.54
123789-hexachlorodibenzo-p-dioxin	0.100	0.62	0.65	0.60	0.62
1234678-heptachlorodibenzo-p-dioxin	0.010	1.34	1.21	1.22	1.26
Octachlorodibenzo-p-dioxin	0.0003	0.041	0.043	0.041	0.041
2378-tetrachlorodibenzofuran	0.100	0.17	0.094	0.096	0.12
12378-pentachlorodibenzofuran	0.030	0.076	0.072	0.050	0.066
23478-pentachlorodibenzofuran	0.300	1.35	0.96	0.99	1.10
123478-hexachlorodibenzofuran	0.100	0.52	0.59	0.37	0.50
123678-hexachlorodibenzofuran	0.100	0.56	0.46	0.47	0.49
234678-hexachlorodibenzofuran	0.100	0.89	0.82	0.73	0.81
123789-hexachlorodibenzofuran	0.100	0.12	<0.067	0.090	<0.093
1234678-heptachlorodibenzofuran	0.010	0.25	0.26	0.22	0.25
1234789-heptachlorodibenzofuran	0.010	0.047	0.043	0.044	0.045
Octachlorodibenzofuran	0.0003	0.0042	0.0033	<0.0034	0.0036
PCB 81	0.0003	0.0060	<0.0035	<0.00078	<0.0034
PCB 77	0.0001	0.0045	0.0066	0.0012	0.0041
PCB 123	0.00003	<0.0046	<0.0031	<0.00073	<0.0028
PCB 118	0.00003	0.055	0.034	0.0081	0.032
PCB 114	0.00003	0.0016	0.0011	0.00023	0.00095
PCB 105	0.00003	0.019	0.013	0.0025	0.011
PCB 126	0.100	<0.52	<0.29	<0.14	<0.32
PCB 167	0.00003	<0.00032	<0.00013	<0.000061	<0.00017
PCB 156	0.00003	0.0014	0.00073	0.00013	0.00077
PCB 157	0.00003	0.00034	0.00015	<0.000029	<0.00017
PCB 169	0.030	<0.075	<0.029	<0.020	<0.041
PCB 189	0.00003	0.00010	<0.000051	<0.000029	<0.000061
Total Dioxins & Furans Only		<11.5	<9.90	<9.97	<10.5
Total PCBs Only		<0.68	<0.38	<0.18	<0.41
Total Dioxins & Furans and PCBs		<12.2	<10.28	<10.15	<10.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46A
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.44	0.47	0.64	0.52
12378-pentachlorodibenzo-p-dioxin	1.000	1.15	0.79	0.92	0.95
123478-hexachlorodibenzo-p-dioxin	0.100	0.69	0.63	0.23	0.52
123678-hexachlorodibenzo-p-dioxin	0.100	1.67	1.48	1.45	1.54
123789-hexachlorodibenzo-p-dioxin	0.100	0.62	0.65	0.60	0.62
1234678-heptachlorodibenzo-p-dioxin	0.010	1.34	1.21	1.22	1.26
Octachlorodibenzo-p-dioxin	0.0003	0.041	0.043	0.041	0.041
2378-tetrachlorodibenzofuran	0.100	0.17	0.094	0.096	0.12
12378-pentachlorodibenzofuran	0.030	0.076	0.072	0.050	0.066
23478-pentachlorodibenzofuran	0.300	1.35	0.96	0.99	1.10
123478-hexachlorodibenzofuran	0.100	0.52	0.59	0.37	0.50
123678-hexachlorodibenzofuran	0.100	0.56	0.46	0.47	0.49
234678-hexachlorodibenzofuran	0.100	0.89	0.82	0.73	0.81
123789-hexachlorodibenzofuran	0.100	0.12	0.034	0.090	0.082
1234678-heptachlorodibenzofuran	0.010	0.25	0.26	0.22	0.25
1234789-heptachlorodibenzofuran	0.010	0.047	0.043	0.044	0.045
Octachlorodibenzofuran	0.0003	0.0042	0.0033	0.0017	0.0031
PCB 81	0.0003	0.0060	0.0017	0.00039	0.0027
PCB 77	0.0001	0.0045	0.0066	0.0012	0.0041
PCB 123	0.00003	0.0023	0.0015	0.00036	0.0014
PCB 118	0.00003	0.055	0.034	0.0081	0.032
PCB 114	0.00003	0.0016	0.0011	0.00023	0.00095
PCB 105	0.00003	0.019	0.013	0.0025	0.011
PCB 126	0.100	0.26	0.14	0.072	0.16
PCB 167	0.00003	0.00016	0.000063	0.000031	0.000084
PCB 156	0.00003	0.0014	0.00073	0.00013	0.00077
PCB 157	0.00003	0.00034	0.00015	0.000015	0.00017
PCB 169	0.030	0.037	0.014	0.010	0.021
PCB 189	0.00003	0.00010	0.000025	0.000015	0.000048
Total Dioxins & Furans Only		9.93	8.61	8.17	8.90
Total PCBs Only		0.39	0.22	0.095	0.23
Total Dioxins & Furans and PCBs		10.3	8.82	8.27	9.13

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 46B
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00	<0.88	<0.94	<1.28	<1.04
12378-pentachlorodibenzo-p-dioxin	0.50	<1.15	<0.79	<0.92	<0.95
123478-hexachlorodibenzo-p-dioxin	0.10	0.69	0.63	<0.47	<0.59
123678-hexachlorodibenzo-p-dioxin	0.10	1.67	1.48	1.45	1.54
123789-hexachlorodibenzo-p-dioxin	0.10	0.62	0.65	0.60	0.62
1234678-heptachlorodibenzo-p-dioxin	0.01	1.34	1.21	1.22	1.26
Octachlorodibenzo-p-dioxin	0.00	0.14	0.14	0.14	0.14
2378-tetrachlorodibenzofuran	0.10	0.17	0.094	0.096	0.12
12378-pentachlorodibenzofuran	0.05	0.13	0.12	0.084	0.11
23478-pentachlorodibenzofuran	0.50	2.25	1.60	1.65	1.83
123478-hexachlorodibenzofuran	0.10	0.52	0.59	0.37	0.50
123678-hexachlorodibenzofuran	0.10	0.56	0.46	0.47	0.49
234678-hexachlorodibenzofuran	0.10	0.89	0.82	0.73	0.81
123789-hexachlorodibenzofuran	0.10	0.12	<0.067	0.090	<0.093
1234678-heptachlorodibenzofuran	0.01	0.25	0.26	0.22	0.25
1234789-heptachlorodibenzofuran	0.01	0.047	0.043	0.044	0.045
Octachlorodibenzofuran	0.00	0.014	0.011	<0.011	0.012
Total Dioxins & Furans		<11.4	<9.91	<9.84	<10.4
In-Stack Emission Limit					60

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 47
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.96	<1.02	<1.38	<1.12
12378-pentachlorodibenzo-p-dioxin	1.000	<2.49	<1.70	<1.98	<2.06
123478-hexachlorodibenzo-p-dioxin	0.100	0.74	0.68	<0.50	<0.64
123678-hexachlorodibenzo-p-dioxin	0.100	1.81	1.60	1.56	1.66
123789-hexachlorodibenzo-p-dioxin	0.100	0.67	0.70	0.64	0.67
1234678-heptachlorodibenzo-p-dioxin	0.010	1.45	1.31	1.31	1.36
Octachlorodibenzo-p-dioxin	0.0003	0.044	0.046	0.044	0.045
2378-tetrachlorodibenzofuran	0.100	0.18	0.10	0.10	0.13
12378-pentachlorodibenzofuran	0.030	0.082	0.077	0.054	0.071
23478-pentachlorodibenzofuran	0.300	1.46	1.03	1.06	1.19
123478-hexachlorodibenzofuran	0.100	0.57	0.64	0.40	0.54
123678-hexachlorodibenzofuran	0.100	0.61	0.49	0.50	0.53
234678-hexachlorodibenzofuran	0.100	0.96	0.88	0.78	0.88
123789-hexachlorodibenzofuran	0.100	0.13	<0.073	0.096	<0.10
1234678-heptachlorodibenzofuran	0.010	0.28	0.28	0.24	0.27
1234789-heptachlorodibenzofuran	0.010	0.051	0.047	0.048	0.049
Octachlorodibenzofuran	0.0003	0.0045	0.0036	<0.0037	0.0039
PCB 81	0.0003	0.0065	<0.0037	<0.00084	<0.0037
PCB 77	0.0001	0.0049	0.0071	0.0013	0.0044
PCB 123	0.00003	<0.0050	<0.0033	<0.00078	<0.0030
PCB 118	0.00003	0.059	0.037	0.0087	0.035
PCB 114	0.00003	0.0017	0.0011	0.00024	0.0010
PCB 105	0.00003	0.021	0.014	0.0026	0.012
PCB 126	0.100	<0.56	<0.31	<0.15	<0.34
PCB 167	0.00003	<0.00034	<0.00014	<0.000066	<0.00018
PCB 156	0.00003	0.0016	0.00079	0.00014	0.00083
PCB 157	0.00003	0.00037	0.00016	<0.000031	<0.00019
PCB 169	0.030	<0.081	<0.031	<0.022	<0.045
PCB 189	0.00003	0.00011	<0.000055	<0.000031	<0.000066
Total Dioxins & Furans Only		<12.5	<10.7	<10.7	<11.3
Total PCBs Only		<0.74	<0.41	<0.19	<0.45
Total Dioxins & Furans and PCBs		<13.2	<11.1	<10.9	<11.7

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 48
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.017	<0.018	<0.025	<0.020
12378-pentachlorodibenzo-p-dioxin	1.000	<0.044	<0.030	<0.035	<0.036
123478-hexachlorodibenzo-p-dioxin	0.100	0.013	0.012	<0.0089	<0.011
123678-hexachlorodibenzo-p-dioxin	0.100	0.032	0.028	0.028	0.029
123789-hexachlorodibenzo-p-dioxin	0.100	0.012	0.012	0.012	0.012
1234678-heptachlorodibenzo-p-dioxin	0.010	0.026	0.023	0.023	0.024
Octachlorodibenzo-p-dioxin	0.0003	0.00077	0.00081	0.00078	0.00079
2378-tetrachlorodibenzofuran	0.100	0.0032	0.0018	0.0018	0.0023
12378-pentachlorodibenzofuran	0.030	0.0014	0.0014	0.00096	0.0013
23478-pentachlorodibenzofuran	0.300	0.026	0.018	0.019	0.021
123478-hexachlorodibenzofuran	0.100	0.010	0.011	0.0071	0.0095
123678-hexachlorodibenzofuran	0.100	0.011	0.0087	0.0089	0.0094
234678-hexachlorodibenzofuran	0.100	0.017	0.016	0.014	0.016
123789-hexachlorodibenzofuran	0.100	0.0023	<0.0013	0.0017	<0.0018
1234678-heptachlorodibenzofuran	0.010	0.0049	0.0050	0.0042	0.0047
1234789-heptachlorodibenzofuran	0.010	0.00090	0.00083	0.00085	0.00086
Octachlorodibenzofuran	0.0003	0.000079	0.000063	<0.000065	0.000069
PCB 81	0.0003	0.00012	<0.000066	<0.000015	<0.000065
PCB 77	0.0001	0.000086	0.00013	0.000023	0.000078
PCB 123	0.00003	<0.000089	<0.000058	<0.000014	<0.000054
PCB 118	0.00003	0.0010	0.00065	0.00016	0.00062
PCB 114	0.00003	0.000030	0.000020	0.0000044	0.000018
PCB 105	0.00003	0.00037	0.00024	0.000047	0.00022
PCB 126	0.100	<0.0099	<0.0055	<0.0028	<0.0060
PCB 167	0.00003	<0.0000060	<0.0000024	<0.0000012	<0.0000032
PCB 156	0.00003	0.000028	0.000014	0.0000025	0.000015
PCB 157	0.00003	0.0000066	0.0000029	<0.00000056	<0.0000033
PCB 169	0.030	<0.0014	<0.00055	<0.00039	<0.00079
PCB 189	0.00003	0.0000020	<0.00000097	<0.00000056	<0.0000012
Total Dioxins & Furans Only		<0.22	<0.19	<0.19	<0.20
Total PCBs Only		<0.013	<0.0072	<0.0034	<0.0079
Total Dioxins & Furans and PCBs		<0.23	<0.20	<0.19	<0.21

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<0.78	<1.34	<1.04	<1.12	<0.020
12378-pentachlorodibenzo-p-dioxin	<1.43	<2.47	<1.91	<2.06	<0.036
123478-hexachlorodibenzo-p-dioxin	<0.45	<0.77	<0.59	<0.64	<0.011
123678-hexachlorodibenzo-p-dioxin	1.15	1.99	1.54	1.66	0.029
123789-hexachlorodibenzo-p-dioxin	0.47	0.81	0.62	0.67	0.012
1234678-heptachlorodibenzo-p-dioxin	0.95	1.63	1.26	1.36	0.024
Octachlorodibenzo-p-dioxin	0.031	0.054	0.041	0.045	0.00079
2378-tetrachlorodibenzofuran	0.090	0.16	0.12	0.13	0.0023
12378-pentachlorodibenzofuran	0.050	0.085	0.066	0.071	0.0013
23478-pentachlorodibenzofuran	0.83	1.42	1.10	1.19	0.021
123478-hexachlorodibenzofuran	0.37	0.64	0.50	0.54	0.0095
123678-hexachlorodibenzofuran	0.37	0.64	0.49	0.53	0.0094
234678-hexachlorodibenzofuran	0.61	1.05	0.81	0.88	0.016
123789-hexachlorodibenzofuran	<0.070	<0.12	<0.093	<0.10	<0.0018
1234678-heptachlorodibenzofuran	0.18	0.32	0.25	0.27	0.0047
1234789-heptachlorodibenzofuran	0.034	0.058	0.045	0.049	0.00086
Octachlorodibenzofuran	0.0027	0.0047	0.0036	0.0039	0.000069
PCB 81	<0.0026	<0.0044	<0.0034	<0.0037	<0.000065
PCB 77	0.0031	0.0053	0.0041	0.0044	0.000078
PCB 123	<0.0021	<0.0036	<0.0028	<0.0030	<0.000054
PCB 118	0.024	0.042	0.032	0.035	0.00062
PCB 114	0.00072	0.0012	0.00095	0.0010	0.000018
PCB 105	0.0087	0.015	0.011	0.012	0.00022
PCB 126	<0.24	<0.41	<0.32	<0.34	<0.0060
PCB 167	<0.00013	<0.00022	<0.00017	<0.00018	<0.0000032
PCB 156	0.00058	0.0010	0.00077	0.00083	0.000015
PCB 157	<0.00013	<0.00023	<0.00017	<0.00019	<0.0000033
PCB 169	<0.031	<0.053	<0.041	<0.045	<0.00079
PCB 189	<0.000046	<0.000080	<0.000061	<0.000066	<0.0000012
Total Dioxins & Furans Only	<7.87	<13.6	<10.5	<11.3	<0.20
Total PCBs Only	<0.31	<0.54	<0.41	<0.45	<0.0079
Total Dioxins & Furans and PCBs	<8.18	<14.1	<10.9	<11.7	<0.21

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 50
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm³**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.39	0.67	0.52	0.56	0.0099
12378-pentachlorodibenzo-p-dioxin	0.72	1.24	0.95	1.03	0.018
123478-hexachlorodibenzo-p-dioxin	0.39	0.67	0.52	0.56	0.0098
123678-hexachlorodibenzo-p-dioxin	1.15	1.99	1.54	1.66	0.029
123789-hexachlorodibenzo-p-dioxin	0.47	0.81	0.62	0.67	0.012
1234678-heptachlorodibenzo-p-dioxin	0.95	1.63	1.26	1.36	0.024
Octachlorodibenzo-p-dioxin	0.031	0.054	0.041	0.045	0.00079
2378-tetrachlorodibenzofuran	0.090	0.16	0.12	0.13	0.0023
12378-pentachlorodibenzofuran	0.050	0.085	0.066	0.071	0.0013
23478-pentachlorodibenzofuran	0.83	1.42	1.10	1.19	0.021
123478-hexachlorodibenzofuran	0.37	0.64	0.50	0.54	0.0095
123678-hexachlorodibenzofuran	0.37	0.64	0.49	0.53	0.0094
234678-hexachlorodibenzofuran	0.61	1.05	0.81	0.88	0.016
123789-hexachlorodibenzofuran	0.061	0.11	0.082	0.088	0.0016
1234678-heptachlorodibenzofuran	0.18	0.32	0.25	0.27	0.0047
1234789-heptachlorodibenzofuran	0.034	0.058	0.045	0.049	0.00086
Octachlorodibenzofuran	0.0023	0.0040	0.0031	0.0033	0.000058
PCB 81	0.0020	0.0035	0.0027	0.0029	0.000052
PCB 77	0.0031	0.0053	0.0041	0.0044	0.000078
PCB 123	0.0011	0.0018	0.0014	0.0015	0.000027
PCB 118	0.024	0.042	0.032	0.0350	0.00062
PCB 114	0.00072	0.0012	0.00095	0.0010	0.000018
PCB 105	0.0087	0.015	0.011	0.012	0.00022
PCB 126	0.12	0.21	0.16	0.17	0.0030
PCB 167	0.000063	0.00011	0.000084	0.000091	0.0000016
PCB 156	0.00058	0.00100	0.00077	0.00083	0.000015
PCB 157	0.00013	0.00022	0.00017	0.00018	0.0000032
PCB 169	0.016	0.027	0.021	0.022	0.00039
PCB 189	0.000036	0.000062	0.000048	0.000052	0.00000092
Total Dioxins & Furans Only	6.70	11.5	8.90	9.61	0.17
Total PCBs Only	0.18	0.30	0.23	0.25	0.0044
Total Dioxins & Furans and PCBs	6.87	11.8	9.13	9.86	0.17

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 51
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2000	289	497	383	415	7.31
1,3-Dichlorobenzene	248	35.8	61.7	47.5	51.5	0.91
1,4-Dichlorobenzene	106	15.3	26.4	20.3	22.0	0.39
1,2-Dichlorobenzene	137	19.8	34.1	26.2	28.5	0.50
Total Dichlorobenzene	491	70.9	122	94.0	102	1.79
1,3,5-trichlorobenzene	24.8	3.58	6.17	4.75	5.15	0.091
1,2,4-trichlorobenzene	63.1	9.12	15.7	12.1	13.1	0.23
1,2,3-trichlorobenzene	27.2	3.93	6.76	5.20	5.65	0.099
Total Trichlorobenzene	115	16.6	28.6	22.0	23.9	0.42
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	19.1	2.76	4.75	3.65	3.97	0.070
1,2,3,4-tetrachlorobenzene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Total Tetrachlorobenzene	<29.1	<4.20	<7.24	<5.57	<6.04	<0.11
Pentachlorobenzene	20.2	2.92	5.02	3.87	4.19	0.074
Hexachlorobenzene	41.7	6.02	10.4	7.98	8.66	0.15
Total Chlorobenzenes	<2697	<390	<671	<516	<560	<9.86

Dry Gas Volume Sampled (Rm^3*) :	4.022
Actual Flowrate (m^3/s) :	25.3
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.1
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 52
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2000	290	497	385	415	7.31
1,3-Dichlorobenzene	258	37.4	64.2	49.6	53.6	0.94
1,4-Dichlorobenzene	103	14.9	25.6	19.8	21.4	0.38
1,2-Dichlorobenzene	151	21.9	37.6	29.1	31.4	0.55
Total Dichlorobenzene	512	74.3	127	98.5	106	1.87
1,3,5-trichlorobenzene	29.0	4.21	7.21	5.58	6.02	0.11
1,2,4-trichlorobenzene	66.9	9.71	16.6	12.9	13.9	0.24
1,2,3-trichlorobenzene	19.8	2.87	4.92	3.81	4.11	0.072
Total Trichlorobenzene	116	16.8	28.8	22.3	24.0	0.42
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	18.6	2.70	4.63	3.58	3.86	0.068
1,2,3,4-tetrachlorobenzene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Total Tetrachlorobenzene	<28.6	<4.15	<7.11	<5.50	<5.94	<0.10
Pentachlorobenzene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Hexachlorobenzene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Total Chlorobenzenes	<2676	<388	<666	<515	<556	<9.78

Dry Gas Volume Sampled (Rm^3*) :	4.021
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 53
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1850	257	447	344	369	6.61
1,3-Dichlorobenzene	230	32.0	55.5	42.8	45.9	0.82
1,4-Dichlorobenzene	159	22.1	38.4	29.6	31.7	0.57
1,2-Dichlorobenzene	143	19.9	34.5	26.6	28.6	0.51
Total Dichlorobenzene	532	74.0	128	99.0	106	1.90
1,3,5-trichlorobenzene	24.5	3.41	5.92	4.56	4.89	0.088
1,2,4-trichlorobenzene	60.3	8.39	14.6	11.2	12.0	0.22
1,2,3-trichlorobenzene	23.4	3.25	5.65	4.36	4.67	0.084
Total Trichlorobenzene	108	15.0	26.1	20.1	21.6	0.39
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	16.7	2.32	4.03	3.11	3.33	0.060
1,2,3,4-tetrachlorobenzene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Total Tetrachlorobenzene	<26.7	<3.71	<6.45	<4.97	<5.33	<0.095
Pentachlorobenzene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Hexachlorobenzene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Total Chlorobenzenes	<2537	<353	<613	<472	<507	<9.07

Dry Gas Volume Sampled (Rm^3*) :	4.141
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 54
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	289	290	257	279	6.7
1,3-Dichlorobenzene	35.8	37.4	32.0	35.1	8.0
1,4-Dichlorobenzene	15.3	14.9	22.1	17.5	23.1
1,2-Dichlorobenzene	19.8	21.9	19.9	20.5	5.8
Total Dichlorobenzene	70.9	74.3	74.0	73.1	2.5
1,3,5-trichlorobenzene	3.58	4.21	3.41	3.73	11.3
1,2,4-trichlorobenzene	9.12	9.71	8.39	9.07	7.3
1,2,3-trichlorobenzene	3.93	2.87	3.25	3.35	16.0
Total Trichlorobenzene	16.6	16.8	15.0	16.2	6.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.76	2.70	2.32	2.59	9.1
1,2,3,4-tetrachlorobenzene	<1.44	<1.45	<1.39	<1.43	2.3
Total Tetrachlorobenzene	<4.20	<4.15	<3.71	<4.02	6.7
Pentachlorobenzene	2.92	<1.45	<1.39	<1.92	45.1
Hexachlorobenzene	6.02	<1.45	<1.39	<2.96	89.9
Total Chlorobenzenes	<390	<388	<353	<377	5.5

TABLE 55
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dry Reference Concentrations for Chlorobenzenes

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	497	497	447	480	6.1
1,3-Dichlorobenzene	61.7	64.2	55.5	60.5	7.3
1,4-Dichlorobenzene	26.4	25.6	38.4	30.1	23.8
1,2-Dichlorobenzene	34.1	37.6	34.5	35.4	5.4
Total Dichlorobenzene	122	127	128	126	2.7
1,3,5-trichlorobenzene	6.17	7.21	5.92	6.43	10.7
1,2,4-trichlorobenzene	15.7	16.6	14.6	15.6	6.6
1,2,3-trichlorobenzene	6.76	4.92	5.65	5.78	16.0
Total Trichlorobenzene	28.6	28.8	26.1	27.8	5.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	4.75	4.63	4.03	4.47	8.6
1,2,3,4-tetrachlorobenzene	<2.49	<2.49	<2.41	<2.46	1.7
Total Tetrachlorobenzene	<7.24	<7.11	<6.45	<6.93	6.1
Pentachlorobenzene	5.02	<2.49	<2.41	<3.31	44.9
Hexachlorobenzene	10.4	<2.49	<2.41	<5.09	89.8
Total Chlorobenzenes	<671	<666	<613	<650	4.9

* At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	383	385	344	371	6.1
1,3-Dichlorobenzene	47.5	49.6	42.8	46.6	7.5
1,4-Dichlorobenzene	20.3	19.8	29.6	23.2	23.7
1,2-Dichlorobenzene	26.2	29.1	26.6	27.3	5.6
Total Dichlorobenzene	94.0	98.5	99.0	97.2	2.9
1,3,5-trichlorobenzene	4.75	5.58	4.56	4.96	10.9
1,2,4-trichlorobenzene	12.1	12.9	11.2	12.1	6.8
1,2,3-trichlorobenzene	5.20	3.81	4.36	4.46	15.8
Total Trichlorobenzene	22.0	22.3	20.1	21.5	5.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.65	3.58	3.11	3.45	8.6
1,2,3,4-tetrachlorobenzene	<1.91	<1.92	<1.86	<1.90	1.8
Total Tetrachlorobenzene	<5.57	<5.50	<4.97	<5.35	6.1
Pentachlorobenzene	3.87	<1.92	<1.86	<2.55	44.7
Hexachlorobenzene	7.98	<1.92	<1.86	<3.92	89.6
Total Chlorobenzenes	<516	<515	<472	<501	5.0

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 57
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Wet Reference Concentrations for Chlorobenzenes

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	415	415	369	400	6.6
1,3-Dichlorobenzene	51.5	53.6	45.9	50.3	7.9
1,4-Dichlorobenzene	22.0	21.4	31.7	25.1	23.2
1,2-Dichlorobenzene	28.5	31.4	28.6	29.5	5.6
Total Dichlorobenzene	102	106	106	105	2.4
1,3,5-trichlorobenzene	5.15	6.02	4.89	5.36	11.1
1,2,4-trichlorobenzene	13.1	13.9	12.0	13.0	7.2
1,2,3-trichlorobenzene	5.65	4.11	4.67	4.81	16.2
Total Trichlorobenzene	23.9	24.0	21.6	23.2	5.9
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.97	3.86	3.33	3.72	9.1
1,2,3,4-tetrachlorobenzene	<2.08	<2.08	<2.00	<2.05	2.3
Total Tetrachlorobenzene	<6.04	<5.94	<5.33	<5.77	6.7
Pentachlorobenzene	4.19	<2.08	<2.00	<2.76	45.2
Hexachlorobenzene	8.66	<2.08	<2.00	<4.24	90.1
Total Chlorobenzenes	<560	<556	<507	<541	5.5

* At 25°C and 1 atmosphere

TABLE 58
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Rates for Chlorobenzenes

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Monochlorobenzene	7.31	7.31	6.61	7.08	5.7
1,3-Dichlorobenzene	0.91	0.94	0.82	0.89	7.0
1,4-Dichlorobenzene	0.39	0.38	0.57	0.44	24.2
1,2-Dichlorobenzene	0.50	0.55	0.51	0.52	5.2
Total Dichlorobenzene	1.79	1.87	1.90	1.86	3.0
1,3,5-trichlorobenzene	0.091	0.11	0.088	0.095	10.4
1,2,4-trichlorobenzene	0.23	0.24	0.22	0.23	6.3
1,2,3-trichlorobenzene	0.099	0.072	0.084	0.085	15.9
Total Trichlorobenzene	0.42	0.42	0.39	0.41	5.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.070	0.068	0.060	0.066	8.2
1,2,3,4-tetrachlorobenzene	<0.037	<0.037	<0.036	<0.036	1.3
Total Tetrachlorobenzene	<0.11	<0.10	<0.095	<0.10	5.7
Pentachlorobenzene	0.074	<0.037	<0.036	<0.049	44.7
Hexachlorobenzene	0.15	<0.037	<0.036	<0.075	89.6
Total Chlorobenzenes	<9.86	<9.78	<9.07	<9.57	4.6

TABLE 59
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Emission Data for Chlorobenzenes

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	279	480	371	400	7.08
1,3-Dichlorobenzene	35.1	60.5	46.6	50.3	0.89
1,4-Dichlorobenzene	17.5	30.1	23.2	25.1	0.44
1,2-Dichlorobenzene	20.5	35.4	27.3	29.5	0.52
Total Dichlorobenzene	73.1	126	97.2	105	1.86
1,3,5-trichlorobenzene	3.73	6.43	4.96	5.36	0.095
1,2,4-trichlorobenzene	9.07	15.6	12.1	13.0	0.23
1,2,3-trichlorobenzene	3.35	5.78	4.46	4.81	0.085
Total Trichlorobenzene	16.2	27.8	21.5	23.2	0.41
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.59	4.47	3.45	3.72	0.066
1,2,3,4-tetrachlorobenzene	<1.43	<2.46	<1.90	<2.05	<0.036
Total Tetrachlorobenzene	<4.02	<6.93	<5.35	<5.77	<0.10
Pentachlorobenzene	<1.92	<3.31	<2.55	<2.76	<0.049
Hexachlorobenzene	<2.96	<5.09	<3.92	<4.24	<0.075
Total Chlorobenzenes	<377	<650	<501	<541	<9.57

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 60
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorobenzene Blank Analyses

Isomers and Congener Group Totals	Blank Train Total ng	Laboratory Blank Total ng
Monochlorobenzene	<10	<10
1,3-Dichlorobenzene	<10	<10
1,4-Dichlorobenzene	11.5	12.3
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<31.5	<32.3
1,3,5-trichlorobenzene	<10	<10
1,2,4-trichlorobenzene	<10	<10
1,2,3-trichlorobenzene	<10	<10
Total Trichlorobenzene	<30.0	<30.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<10
1,2,3,4-tetrachlorobenzene	<10	<10
Total Tetrachlorobenzene	<20.0	<20.0
Pentachlorobenzene	<10	<10
Hexachlorobenzene	<10	<10
Total Chlorobenzenes	<112	<112

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 61
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	105	15.2	26.1	20.1	21.8	0.38
3-monochlorophenol	115	16.6	28.6	22.0	23.9	0.42
4-monochlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
Total Monochlorophenols	<320	<46.2	<79.6	<61.2	<66.5	<1.17
2,6-dichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,4 & 2,5-dichlorophenol	125	18.1	31.1	23.9	26.0	0.46
3,5-dichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,3-dichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
3,4-dichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
Total Dichlorophenols	<525	<75.8	<131	<100	<109	<1.92
2,4,6-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,3,6-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,3,5-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,4,5-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,3,4-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
3,4,5-trichlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
Total Trichlorophenols	<600	<86.7	<149	<115	<125	<2.19
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
2,3,4,5-tetrachlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
Total Tetrachlorophenols	<200	<28.9	<49.7	<38.3	<41.5	<0.73
Pentachlorophenol	<100	<14.4	<24.9	<19.1	<20.8	<0.37
Total Chlorophenols	<1745	<252	<434	<334	<362	<6.38

Dry Gas Volume Sampled (Rm^3*) :	4.022
Actual Flowrate (m^3/s) :	25.3
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.1
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 62
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
3-monochlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
4-monochlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
Total Monochlorophenols	<300	<43.5	<74.6	<57.7	<62.3	<1.10
2,6-dichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,4 & 2,5-dichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
3,5-dichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,3-dichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
3,4-dichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
Total Dichlorophenols	<500	<72.5	<124	<96.2	<104	<1.83
2,4,6-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,3,6-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,3,5-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,4,5-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,3,4-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
3,4,5-trichlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
Total Trichlorophenols	<600	<87.0	<149	<115	<125	<2.19
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
2,3,4,5-tetrachlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
Total Tetrachlorophenols	<200	<29.0	<49.7	<38.5	<41.5	<0.73
Pentachlorophenol	<100	<14.5	<24.9	<19.2	<20.8	<0.37
Total Chlorophenols	<1700	<247	<423	<327	<353	<6.21

Dry Gas Volume Sampled (Rm^3*) :	4.021
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 63
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	108	15.0	26.1	20.1	21.6	0.39
3-monochlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
4-monochlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
Total Monochlorophenols	<308	<42.8	<74.4	<57.3	<61.5	<1.10
2,6-dichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,4 & 2,5-dichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
3,5-dichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,3-dichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
3,4-dichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
Total Dichlorophenols	<500	<69.5	<121	<93.1	<99.8	<1.79
2,4,6-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,3,6-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,3,5-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,4,5-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,3,4-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
3,4,5-trichlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
Total Trichlorophenols	<600	<83.4	<145	<112	<120	<2.14
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
2,3,4,5-tetrachlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
Total Tetrachlorophenols	<200	<27.8	<48.3	<37.2	<39.9	<0.71
Pentachlorophenol	<100	<13.9	<24.1	<18.6	<20.0	<0.36
Total Chlorophenols	<1708	<238	<412	<318	<341	<6.10

Dry Gas Volume Sampled (Rm^3*) :	4.141
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	15.2	<14.5	15.0	<14.9	2.3
3-monochlorophenol	16.6	<14.5	<13.9	<15.0	9.5
4-monochlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
Total Monochlorophenols	<46.2	<43.5	<42.8	<44.2	4.1
2,6-dichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,4 & 2,5-dichlorophenol	18.1	<14.5	<13.9	<15.5	14.5
3,5-dichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,3-dichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
3,4-dichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
Total Dichlorophenols	<75.8	<72.5	<69.5	<72.6	4.3
2,4,6-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,3,6-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,3,5-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,4,5-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,3,4-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
3,4,5-trichlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
Total Trichlorophenols	<86.7	<87.0	<83.4	<85.7	2.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
2,3,4,5-tetrachlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
Total Tetrachlorophenols	<28.9	<29.0	<27.8	<28.6	2.3
Pentachlorophenol	<14.4	<14.5	<13.9	<14.3	2.3
Total Chlorophenols	<252	<247	<238	<245	3.0

TABLE 65
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	26.1	<24.9	26.1	<25.7	2.8
3-monochlorophenol	28.6	<24.9	<24.1	<25.9	9.2
4-monochlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
Total Monochlorophenols	<79.6	<74.6	<74.4	<76.2	3.8
2,6-dichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,4 & 2,5-dichlorophenol	31.1	<24.9	<24.1	<26.7	14.3
3,5-dichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,3-dichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
3,4-dichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
Total Dichlorophenols	<131	<124	<121	<125	4.0
2,4,6-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,3,6-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,3,5-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,4,5-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,3,4-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
3,4,5-trichlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
Total Trichlorophenols	<149	<149	<145	<148	1.7
2,3,5,6/2,3,4,6-tetrachlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
2,3,4,5-tetrachlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
Total Tetrachlorophenols	<49.7	<49.7	<48.3	<49.3	1.7
Pentachlorophenol	<24.9	<24.9	<24.1	<24.6	1.7
Total Chlorophenols	<434	<423	<412	<423	2.5

* At 25°C and 1 atmosphere

TABLE 66
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	20.1	<19.2	20.1	<19.8	2.5
3-monochlorophenol	22.0	<19.2	<18.6	<20.0	9.0
4-monochlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
Total Monochlorophenols	<61.2	<57.7	<57.3	<58.8	3.7
2,6-dichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,4 & 2,5-dichlorophenol	23.9	<19.2	<18.6	<20.6	14.1
3,5-dichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,3-dichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
3,4-dichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
Total Dichlorophenols	<100	<96.2	<93.1	<96.6	3.8
2,4,6-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,3,6-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,3,5-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,4,5-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,3,4-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
3,4,5-trichlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
Total Trichlorophenols	<115	<115	<112	<114	1.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
2,3,4,5-tetrachlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
Total Tetrachlorophenols	<38.3	<38.5	<37.2	<38.0	1.8
Pentachlorophenol	<19.1	<19.2	<18.6	<19.0	1.8
Total Chlorophenols	<334	<327	<318	<326	2.5

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 67
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	21.8	<20.8	21.6	<21.4	2.5
3-monochlorophenol	23.9	<20.8	<20.0	<21.5	9.6
4-monochlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
Total Monochlorophenols	<66.5	<62.3	<61.5	<63.4	4.2
2,6-dichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,4 & 2,5-dichlorophenol	26.0	<20.8	<20.0	<22.2	14.6
3,5-dichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,3-dichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
3,4-dichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
Total Dichlorophenols	<109	<104	<99.8	<104	4.4
2,4,6-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,3,6-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,3,5-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,4,5-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,3,4-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
3,4,5-trichlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
Total Trichlorophenols	<125	<125	<120	<123	2.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
2,3,4,5-tetrachlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
Total Tetrachlorophenols	<41.5	<41.5	<39.9	<41.0	2.3
Pentachlorophenol	<20.8	<20.8	<20.0	<20.5	2.3
Total Chlorophenols	<362	<353	<341	<352	3.0

* At 25°C and 1 atmosphere

TABLE 68
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Emission Rates

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
2-monochlorophenol	0.38	<0.37	0.39	<0.38	3.0
3-monochlorophenol	0.42	<0.37	<0.36	<0.38	9.0
4-monochlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
Total Monochlorophenols	<1.17	<1.10	<1.10	<1.12	3.6
2,6-dichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,4 & 2,5-dichlorophenol	0.46	<0.37	<0.36	<0.39	14.0
3,5-dichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,3-dichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
3,4-dichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
Total Dichlorophenols	<1.92	<1.83	<1.79	<1.84	3.7
2,4,6-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,3,6-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,3,5-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,4,5-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,3,4-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
3,4,5-trichlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
Total Trichlorophenols	<2.19	<2.19	<2.14	<2.18	1.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
2,3,4,5-tetrachlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
Total Tetrachlorophenols	<0.73	<0.73	<0.71	<0.73	1.3
Pentachlorophenol	<0.37	<0.37	<0.36	<0.36	1.3
Total Chlorophenols	<6.38	<6.21	<6.10	<6.23	2.2

TABLE 69
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Emission Data for Chlorophenol Isomer and Congener Groups

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	<14.9	<25.7	<19.8	<21.4	<0.38
3-monochlorophenol	<15.0	<25.9	<20.0	<21.5	<0.38
4-monochlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
Total Monochlorophenols	<44.2	<76.2	<58.8	<63.4	<1.12
2,6-dichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,4 & 2,5-dichlorophenol	<15.5	<26.7	<20.6	<22.2	<0.39
3,5-dichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,3-dichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
3,4-dichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
Total Dichlorophenols	<72.6	<125	<96.6	<104	<1.84
2,4,6-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,3,6-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,3,5-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,4,5-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,3,4-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
3,4,5-trichlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
Total Trichlorophenols	<85.7	<148	<114	<123	<2.18
2,3,5,6/2,3,4,6-tetrachlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
2,3,4,5-tetrachlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
Total Tetrachlorophenols	<28.6	<49.3	<38.0	<41.0	<0.73
Pentachlorophenol	<14.3	<24.6	<19.0	<20.5	<0.36
Total Chlorophenols	<245	<423	<326	<352	<6.23

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 70
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Blank Analyses

Congener Group	Lab Blank Total ng	Blank Train Total ng
2-monochlorophenol	<100	<100
3-monochlorophenol	<100	<100
4-monochlorophenol	<100	<100
Total Monochlorophenols	<300	<300
2,6-dichlorophenol	<100	<100
2,4 & 2,5-dichlorophenol	<100	<100
3,5-dichlorophenol	<100	<100
2,3-dichlorophenol	<100	<100
3,4-dichlorophenol	<100	<100
Total Dichlorophenols	<500	<500
2,4,6-trichlorophenol	<100	<100
2,3,6-trichlorophenol	<100	<100
2,3,5-trichlorophenol	<100	<100
2,4,5-trichlorophenol	<100	<100
2,3,4-trichlorophenol	<100	<100
3,4,5-trichlorophenol	<100	<100
Total Trichlorophenols	<600	<600
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<100
2,3,4,5-tetrachlorophenol	<100	<100
Total Tetrachlorophenols	<200	<200
Pentachlorophenol	<100	<100
Total Chlorophenols	<1700	<1700

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 71
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	46.1	6.66	11.5	8.82	9.57	0.17
Acenaphthylene	39.5	5.71	9.82	7.56	8.20	0.14
Anthracene	21.0	3.03	5.22	4.02	4.36	0.077
Benzo(a)Anthracene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(b)Fluoranthene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(k)Fluoranthene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(a)fluorene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(b)fluorene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(g,h,i)Perylene	22.6	3.26	5.62	4.32	4.69	0.083
Benzo(a)Pyrene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Benzo(e)Pyrene	11.8	1.70	2.93	2.26	2.45	0.043
Biphenyl	100	14.4	24.9	19.1	20.8	0.37
2-Chloronaphthalene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Chrysene/Triphenylene	18.8	2.72	4.67	3.60	3.90	0.069
Coronene	<50	<7.22	<12.4	<9.57	<10.4	<0.18
Dibenzo(a,c/a,h)Anthracene	16	2.31	3.98	3.06	3.32	0.058
Dibenzo(a,e)pyrene	<50	<7.22	<12.4	<9.57	<10.4	<0.18
9,10-dimethylanthracene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
7,12-Dimethylbenzo(a)anthracene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Fluoranthene	46.6	6.73	11.6	8.92	9.68	0.17
Fluorene	99.2	14.3	24.7	19.0	20.6	0.36
Indeno(1,2,3-cd)Pyrene	13.0	1.88	3.23	2.49	2.70	0.048
2-methylanthracene	36.6	5.29	9.10	7.00	7.60	0.13
3-Methylcholanthrene	<50	<7.22	<12.4	<9.57	<10.4	<0.18
1-Methylnaphthalene	196	28.3	48.7	37.5	40.7	0.72
2-Methylnaphthalene	259	37.4	64.4	49.6	53.8	0.95
1-Methylphenanthrene	30.3	4.38	7.53	5.80	6.29	0.11
9-Methylphenanthrene	28.1	4.06	6.99	5.38	5.84	0.10
Naphthalene	2000	289	497	383	415	7.31
Perylene	<10	<1.44	<2.49	<1.91	<2.08	<0.037
Phenanthrene	232	33.5	57.7	44.4	48.2	0.85
Picene	<50	<7.22	<12.4	<9.57	<10.4	<0.18
Pyrene	59.5	8.60	14.8	11.4	12.4	0.22
Tetralin	452	65.3	112	86.5	93.9	1.65
m-terphenyl	33.4	4.83	8.30	6.39	6.94	0.12
o-Terphenyl	33.6	4.85	8.35	6.43	6.98	0.12
p-terphenyl	18.5	2.67	4.60	3.54	3.84	0.068
Total	<4114	<594	<1023	<787	<854	<15.0

Dry Gas Volume Sampled (Rm³*) :	4.022
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.7
Dry Adjusted Flowrate (Rm³/s**) :	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 72
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	10.2	1.48	2.54	1.96	2.12	0.037
Acenaphthylene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Anthracene	17.7	2.57	4.40	3.41	3.68	0.065
Benzo(a)Anthracene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Benzo(b)Fluoranthene	18	2.61	4.48	3.46	3.74	0.066
Benzo(k)Fluoranthene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Benzo(a)fluorene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Benzo(b)fluorene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Benzo(g,h,i)Perylene	192	27.9	47.7	36.9	39.9	0.70
Benzo(a)Pyrene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Benzo(e)Pyrene	37.7	5.47	9.38	7.25	7.83	0.14
Biphenyl	33.4	4.85	8.31	6.43	6.94	0.12
2-Chloronaphthalene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Chrysene/Triphenylene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Coronene	250	36.3	62.2	48.1	51.9	0.91
Dibenzo(a,c/a,h)Anthracene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Dibenzo(a,e)pyrene	<50	<7.25	<12.4	<9.62	<10.4	<0.18
9,10-dimethylanthracene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
7,12-Dimethylbenzo(a)anthracene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Fluoranthene	46.6	6.76	11.6	8.97	9.68	0.17
Fluorene	27.9	4.05	6.94	5.37	5.80	0.10
Indeno(1,2,3-cd)Pyrene	29.2	4.24	7.26	5.62	6.07	0.11
2-methylanthracene	52.0	7.54	12.9	10.0	10.8	0.19
3-Methylcholanthrene	<50	<7.25	<12.4	<9.62	<10.4	<0.18
1-Methylnaphthalene	81.6	11.8	20.3	15.7	16.9	0.30
2-Methylnaphthalene	42.9	6.22	10.7	8.25	8.91	0.16
1-Methylphenanthrene	43.0	6.24	10.7	8.27	8.93	0.16
9-Methylphenanthrene	30.5	4.42	7.59	5.87	6.34	0.11
Naphthalene	213	30.9	53.0	41.0	44.2	0.78
Perylene	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Phenanthrene	223	32.4	55.5	42.9	46.3	0.82
Picene	<50	<7.25	<12.4	<9.62	<10.4	<0.18
Pyrene	49.2	7.14	12.2	9.47	10.2	0.18
Tetralin	174	25.2	43.3	33.5	36.1	0.64
m-terphenyl	10.7	1.55	2.66	2.06	2.22	0.039
o-Terphenyl	<10	<1.45	<2.49	<1.92	<2.08	<0.037
p-terphenyl	<10	<1.45	<2.49	<1.92	<2.08	<0.037
Total	<1873	<272	<466	<360	<389	<6.85

Dry Gas Volume Sampled (Rm^3*) :	4.021
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 73
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Acenaphthylene	15.4	2.14	3.72	2.87	3.07	0.055
Anthracene	11.1	1.54	2.68	2.07	2.22	0.040
Benzo(a)Anthracene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(b)Fluoranthene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(k)Fluoranthene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(a)fluorene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(b)fluorene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(g,h,i)Perylene	213	29.6	51.4	39.6	42.5	0.76
Benzo(a)Pyrene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Benzo(e)Pyrene	34.7	4.83	8.38	6.46	6.93	0.12
Biphenyl	27.1	3.77	6.54	5.04	5.41	0.097
2-Chloronaphthalene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Chrysene/Triphenylene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Coronene	253	35.2	61.1	47.1	50.5	0.90
Dibenzo(a,c/a,h)Anthracene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Dibenzo(a,e)pyrene	<50	<6.95	<12.1	<9.31	<9.98	<0.18
9,10-dimethylanthracene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
7,12-Dimethylbenzo(a)anthracene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Fluoranthene	26.7	3.71	6.45	4.97	5.33	0.095
Fluorene	18.3	2.54	4.42	3.41	3.65	0.065
Indeno(1,2,3-cd)Pyrene	28.0	3.89	6.76	5.21	5.59	0.10
2-methylanthracene	18.9	2.63	4.56	3.52	3.77	0.068
3-Methylcholanthrene	<50	<6.95	<12.1	<9.31	<9.98	<0.18
1-Methylnaphthalene	74.3	10.3	17.9	13.8	14.8	0.27
2-Methylnaphthalene	24.4	3.39	5.89	4.54	4.87	0.087
1-Methylphenanthrene	18.4	2.56	4.44	3.43	3.67	0.066
9-Methylphenanthrene	13.2	1.84	3.19	2.46	2.64	0.047
Naphthalene	116	16.1	28.0	21.6	23.2	0.41
Perylene	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Phenanthrene	104	14.5	25.1	19.4	20.8	0.37
Picene	<50	<6.95	<12.1	<9.31	<9.98	<0.18
Pyrene	37.2	5.17	8.98	6.92	7.43	0.13
Tetralin	354	49.2	85.5	65.9	70.7	1.27
m-terphenyl	<10	<1.39	<2.41	<1.86	<2.00	<0.036
o-Terphenyl	<10	<1.39	<2.41	<1.86	<2.00	<0.036
p-terphenyl	<10	<1.39	<2.41	<1.86	<2.00	<0.036
Total	<1698	<236	<410	<316	<339	<6.07

Dry Gas Volume Sampled (Rm^3*) :	4.141
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 74
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	6.66	1.48	<1.39	<3.18	95.0
Acenaphthylene	5.71	<1.45	2.14	<3.10	73.7
Anthracene	3.03	2.57	1.54	2.38	32.0
Benzo(a)Anthracene	<1.44	<1.45	<1.39	<1.43	2.3
Benzo(b)Fluoranthene	<1.44	2.61	<1.39	<1.82	38.0
Benzo(k)Fluoranthene	<1.44	<1.45	<1.39	<1.43	2.3
Benzo(a)fluorene	<1.44	<1.45	<1.39	<1.43	2.3
Benzo(b)fluorene	<1.44	<1.45	<1.39	<1.43	2.3
Benzo(g,h,i)Perylene	3.26	27.9	29.6	20.2	72.8
Benzo(a)Pyrene	<1.44	<1.45	<1.39	<1.43	2.3
Benzo(e)Pyrene	1.70	5.47	4.83	4.00	50.3
Biphenyl	14.4	4.85	3.77	7.69	76.5
2-Chloronaphthalene	<1.44	<1.45	<1.39	<1.43	2.3
Chrysene/Triphenylene	2.72	<1.45	<1.39	<1.85	40.4
Coronene	<7.22	36.3	35.2	<26.2	62.8
Dibenzo(a,c/a,h)Anthracene	2.31	<1.45	<1.39	<1.72	30.0
Dibenzo(a,e)pyrene	<7.22	<7.25	<6.95	<7.14	2.3
9,10-dimethylanthracene	<1.44	<1.45	<1.39	<1.43	2.3
7,12-Dimethylbenzo(a)anthracene	<1.44	<1.45	<1.39	<1.43	2.3
Fluoranthene	6.73	6.76	3.71	5.74	30.5
Fluorene	14.3	4.05	2.54	6.97	92.0
Indeno(1,2,3-cd)Pyrene	1.88	4.24	3.89	3.34	38.2
2-methylanthracene	5.29	7.54	2.63	5.15	47.7
3-Methylcholanthrene	<7.22	<7.25	<6.95	<7.14	2.3
1-Methylnaphthalene	28.3	11.8	10.3	16.8	59.3
2-Methylnaphthalene	37.4	6.22	3.39	15.7	120
1-Methylphenanthrene	4.38	6.24	2.56	4.39	41.9
9-Methylphenanthrene	4.06	4.42	1.84	3.44	40.7
Naphthalene	289	30.9	16.1	112	137
Perylene	<1.44	<1.45	<1.39	<1.43	2.3
Phenanthrene	33.5	32.4	14.5	26.8	39.9
Picene	<7.22	<7.25	<6.95	<7.14	2.3
Pyrene	8.60	7.14	5.17	6.97	24.6
Tetralin	65.3	25.2	49.2	46.6	43.3
m-terphenyl	4.83	1.55	<1.39	<2.59	74.8
o-Terphenyl	4.85	<1.45	<1.39	<2.57	77.3
p-terphenyl	2.67	<1.45	<1.39	<1.84	39.4
Total	<594	<272	<236	<367	53.7

TABLE 75
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	11.5	2.54	<2.41	<5.47	94.8
Acenaphthylene	9.82	<2.49	3.72	<5.34	73.5
Anthracene	5.22	4.40	2.68	4.10	31.6
Benzo(a)Anthracene	<2.49	<2.49	<2.41	<2.46	1.7
Benzo(b)Fluoranthene	<2.49	4.48	<2.41	<3.13	37.4
Benzo(k)Fluoranthene	<2.49	<2.49	<2.41	<2.46	1.7
Benzo(a)fluorene	<2.49	<2.49	<2.41	<2.46	1.7
Benzo(b)fluorene	<2.49	<2.49	<2.41	<2.46	1.7
Benzo(g,h,i)Perylene	5.62	47.7	51.4	34.9	72.9
Benzo(a)Pyrene	<2.49	<2.49	<2.41	<2.46	1.7
Benzo(e)Pyrene	2.93	9.38	8.38	6.90	50.3
Biphenyl	24.9	8.31	6.54	13.2	76.3
2-Chloronaphthalene	<2.49	<2.49	<2.41	<2.46	1.7
Chrysene/Triphenylene	4.67	<2.49	<2.41	<3.19	40.2
Coronene	<12.4	62.2	61.1	<45.2	62.8
Dibenzo(a,c/a,h)Anthracene	3.98	<2.49	<2.41	<2.96	29.8
Dibenzo(a,e)pyrene	<12.4	<12.4	<12.1	<12.3	1.7
9,10-dimethylanthracene	<2.49	<2.49	<2.41	<2.46	1.7
7,12-Dimethylbenzo(a)anthracene	<2.49	<2.49	<2.41	<2.46	1.7
Fluoranthene	11.6	11.6	6.45	9.87	30.1
Fluorene	24.7	6.94	4.42	12.0	91.9
Indeno(1,2,3-cd)Pyrene	3.23	7.26	6.76	5.75	38.2
2-methylanthracene	9.10	12.9	4.56	8.87	47.3
3-Methylcholanthrene	<12.4	<12.4	<12.1	<12.3	1.7
1-Methylnaphthalene	48.7	20.3	17.9	29.0	59.1
2-Methylnaphthalene	64.4	10.7	5.89	27.0	120
1-Methylphenanthrene	7.53	10.7	4.44	7.56	41.4
9-Methylphenanthrene	6.99	7.59	3.19	5.92	40.3
Naphthalene	497	53.0	28.0	193	137
Perylene	<2.49	<2.49	<2.41	<2.46	1.7
Phenanthrene	57.7	55.5	25.1	46.1	39.5
Picene	<12.4	<12.4	<12.1	<12.3	1.7
Pyrene	14.8	12.2	8.98	12.0	24.3
Tetralin	112	43.3	85.5	80.4	43.3
m-terphenyl	8.30	2.66	<2.41	<4.46	74.7
o-Terphenyl	8.35	<2.49	<2.41	<4.42	77.1
p-terphenyl	4.60	<2.49	<2.41	<3.17	39.2
Total	<1023	<466	<410	<633	53.5

* At 25°C and 1 atmosphere

TABLE 76
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	8.82	1.96	<1.86	<4.22	94.6
Acenaphthylene	7.56	<1.92	2.87	<4.12	73.3
Anthracene	4.02	3.41	2.07	3.16	31.6
Benzo(a)Anthracene	<1.91	<1.92	<1.86	<1.90	1.8
Benzo(b)Fluoranthene	<1.91	3.46	<1.86	<2.41	37.7
Benzo(k)Fluoranthene	<1.91	<1.92	<1.86	<1.90	1.8
Benzo(a)fluorene	<1.91	<1.92	<1.86	<1.90	1.8
Benzo(b)fluorene	<1.91	<1.92	<1.86	<1.90	1.8
Benzo(g,h,i)Perylene	4.32	36.9	39.6	27.0	72.9
Benzo(a)Pyrene	<1.91	<1.92	<1.86	<1.90	1.8
Benzo(e)Pyrene	2.26	7.25	6.46	5.32	50.4
Biphenyl	19.1	6.43	5.04	10.2	76.1
2-Chloronaphthalene	<1.91	<1.92	<1.86	<1.90	1.8
Chrysene/Triphenylene	3.60	<1.92	<1.86	<2.46	40.0
Coronene	<9.57	48.1	47.1	<34.9	62.9
Dibenzo(a,c/a,h)Anthracene	3.06	<1.92	<1.86	<2.28	29.6
Dibenzo(a,e)pyrene	<9.57	<9.62	<9.31	<9.5	1.8
9,10-dimethylanthracene	<1.91	<1.92	<1.86	<1.90	1.8
7,12-Dimethylbenzo(a)anthracene	<1.91	<1.92	<1.86	<1.90	1.8
Fluoranthene	8.92	8.97	4.97	7.62	30.1
Fluorene	19.0	5.37	3.41	9.25	91.7
Indeno(1,2,3-cd)Pyrene	2.49	5.62	5.21	4.44	38.3
2-methylanthracene	7.00	10.0	3.52	6.84	47.4
3-Methylcholanthrene	<9.57	<9.62	<9.31	<9.50	1.8
1-Methylnaphthalene	37.5	15.7	13.8	22.3	58.9
2-Methylnaphthalene	49.6	8.25	4.54	20.8	120
1-Methylphenanthrene	5.80	8.27	3.43	5.83	41.6
9-Methylphenanthrene	5.38	5.87	2.46	4.57	40.4
Naphthalene	383	41.0	21.6	148	137
Perylene	<1.91	<1.92	<1.86	<1.90	1.8
Phenanthrene	44.4	42.9	19.4	35.6	39.5
Picene	<9.57	<9.62	<9.31	<9.50	1.8
Pyrene	11.4	9.47	6.92	9.26	24.2
Tetralin	86.5	33.5	65.9	62.0	43.1
m-terphenyl	6.39	2.06	<1.86	<3.44	74.5
o-Terphenyl	6.43	<1.92	<1.86	<3.41	76.9
p-terphenyl	3.54	<1.92	<1.86	<2.44	39.0
Total	<787	<360	<316	<488	53.3

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 77
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Wet Reference Concentrations

Compound	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	9.57	2.12	<2.00	<4.56	95.1
Acenaphthylene	8.20	<2.08	3.07	<4.45	73.8
Anthracene	4.36	3.68	2.22	3.42	32.1
Benzo(a)Anthracene	<2.08	<2.08	<2.00	<2.05	2.3
Benzo(b)Fluoranthene	<2.08	3.74	<2.00	<2.60	37.8
Benzo(k)Fluoranthene	<2.08	<2.08	<2.00	<2.05	2.3
Benzo(a)fluorene	<2.08	<2.08	<2.00	<2.05	2.3
Benzo(b)fluorene	<2.08	<2.08	<2.00	<2.05	2.3
Benzo(g,h,i)Perylene	4.69	39.9	42.5	29.0	72.7
Benzo(a)Pyrene	<2.08	<2.08	<2.00	<2.05	2.3
Benzo(e)Pyrene	2.45	7.83	6.93	5.74	50.2
Biphenyl	20.8	6.94	5.41	11.0	76.6
2-Chloronaphthalene	<2.08	<2.08	<2.00	<2.05	2.3
Chrysene/Triphenylene	3.90	<2.08	<2.00	<2.66	40.6
Coronene	<10.4	51.9	50.5	<37.6	62.7
Dibenzo(a,c/a,h)Anthracene	3.32	<2.08	<2.00	<2.47	30.2
Dibenzo(a,e)pyrene	<10.4	<10.4	<9.98	<10.3	2.3
9,10-dimethylanthracene	<2.08	<2.08	<2.00	<2.05	2.3
7,12-Dimethylbenzo(a)anthracene	<2.08	<2.08	<2.00	<2.05	2.3
Fluoranthene	9.68	9.68	5.33	8.23	30.5
Fluorene	20.6	5.80	3.65	10.0	92.1
Indeno(1,2,3-cd)Pyrene	2.70	6.07	5.59	4.79	38.1
2-methylanthracene	7.60	10.8	3.77	7.39	47.6
3-Methylcholanthrene	<10.4	<10.4	<9.98	<10.3	2.3
1-Methylnaphthalene	40.7	16.9	14.8	24.2	59.4
2-Methylnaphthalene	53.8	8.91	4.87	22.5	121
1-Methylphenanthrene	6.29	8.93	3.67	6.30	41.7
9-Methylphenanthrene	5.84	6.34	2.64	4.94	40.7
Naphthalene	415	44.2	23.2	161	137
Perylene	<2.08	<2.08	<2.00	<2.05	2.3
Phenanthrene	48.2	46.3	20.8	38.4	39.9
Picene	<10.4	<10.4	<9.98	<10.3	2.3
Pyrene	12.4	10.2	7.43	10.0	24.7
Tetralin	93.9	36.1	70.7	66.9	43.4
m-terphenyl	6.94	2.22	<2.00	<3.72	75.0
o-Terphenyl	6.98	<2.08	<2.00	<3.68	77.4
p-terphenyl	3.84	<2.08	<2.00	<2.64	39.5
Total	<854	<389	<339	<527	53.9

* At 25°C and 1 atmosphere

TABLE 78
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Rates

Compound	Emission Rate				Coefficient
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	of Variation %
Acenaphthene	0.17	0.037	<0.036	<0.081	94.7
Acenaphthylene	0.14	<0.037	0.055	<0.079	73.3
Anthracene	0.077	0.065	0.040	0.060	31.3
Benzo(a)Anthracene	<0.037	<0.037	<0.036	<0.036	1.3
Benzo(b)Fluoranthene	<0.037	0.066	<0.036	<0.046	37.2
Benzo(k)Fluoranthene	<0.037	<0.037	<0.036	<0.036	1.3
Benzo(a)fluorene	<0.037	<0.037	<0.036	<0.036	1.3
Benzo(b)fluorene	<0.037	<0.037	<0.036	<0.036	1.3
Benzo(g,h,i)Perylene	0.083	0.70	0.76	0.52	72.9
Benzo(a)Pyrene	<0.037	<0.037	<0.036	<0.036	1.3
Benzo(e)Pyrene	0.043	0.14	0.12	0.10	50.3
Biphenyl	0.37	0.12	0.097	0.19	76.1
2-Chloronaphthalene	<0.037	<0.037	<0.036	<0.036	1.3
Chrysene/Triphenylene	0.069	<0.037	<0.036	<0.047	40.0
Coronene	<0.18	0.91	0.90	<0.67	62.9
Dibenzo(a,c/a,h)Anthracene	0.058	<0.037	<0.036	<0.044	29.6
Dibenzo(a,e)pyrene	<0.18	<0.18	<0.18	<0.18	1.3
9,10-dimethylanthracene	<0.037	<0.037	<0.036	<0.036	1.3
7,12-Dimethylbenzo(a)anthracene	<0.037	<0.037	<0.036	<0.036	1.3
Fluoranthene	0.17	0.17	0.095	0.15	29.8
Fluorene	0.36	0.10	0.065	0.18	91.7
Indeno(1,2,3-cd)Pyrene	0.048	0.11	0.10	0.085	38.3
2-methylanthracene	0.13	0.19	0.068	0.13	47.0
3-Methylcholanthrene	<0.18	<0.18	<0.18	<0.18	1.3
1-Methylnaphthalene	0.72	0.30	0.27	0.43	58.9
2-Methylnaphthalene	0.95	0.16	0.087	0.40	120
1-Methylphenanthrene	0.11	0.16	0.066	0.11	41.1
9-Methylphenanthrene	0.10	0.11	0.047	0.087	40.0
Naphthalene	7.31	0.78	0.41	2.83	137
Perylene	<0.037	<0.037	<0.036	<0.036	1.3
Phenanthrene	0.85	0.82	0.37	0.68	39.2
Picene	<0.18	<0.18	<0.18	<0.18	1.3
Pyrene	0.22	0.18	0.13	0.18	24.0
Tetralin	1.65	0.64	1.27	1.18	43.3
m-terphenyl	0.12	0.039	<0.036	<0.066	74.5
o-Terphenyl	0.12	<0.037	<0.036	<0.065	76.9
p-terphenyl	0.068	<0.037	<0.036	<0.047	39.0
Total	<15.0	<6.85	<6.07	<9.32	53.3

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Polycyclic Aromatic Hydrocarbon Emission Data

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<3.18	<5.47	<4.22	<4.56	<0.081
Acenaphthylene	<3.10	<5.34	<4.12	<4.45	<0.079
Anthracene	2.38	4.10	3.16	3.42	0.060
Benzo(a)Anthracene	<1.43	<2.46	<1.90	<2.05	<0.036
Benzo(b)Fluoranthene	<1.82	<3.13	<2.41	<2.60	<0.046
Benzo(k)Fluoranthene	<1.43	<2.46	<1.90	<2.05	<0.036
Benzo(a)fluorene	<1.43	<2.46	<1.90	<2.05	<0.036
Benzo(b)fluorene	<1.43	<2.46	<1.90	<2.05	<0.036
Benzo(g,h,i)Perylene	20.2	34.9	27.0	29.0	0.52
Benzo(a)Pyrene	<1.43	<2.46	<1.90	<2.05	<0.036
Benzo(e)Pyrene	4.00	6.90	5.32	5.74	0.10
Biphenyl	7.69	13.2	10.2	11.0	0.19
2-Chloronaphthalene	<1.43	<2.46	<1.90	<2.05	<0.036
Chrysene/Triphenylene	<1.85	<3.19	<2.46	<2.66	<0.047
Coronene	<26.2	<45.2	<34.9	<37.6	<0.67
Dibenzo(a,c/a,h)Anthracene	<1.72	<2.96	<2.28	<2.47	<0.044
Dibenzo(a,e)pyrene	<7.14	<12.3	<9.50	<10.3	<0.18
9,10-dimethylanthracene	<1.43	<2.46	<1.90	<2.05	<0.036
7,12-Dimethylbenzo(a)anthracene	<1.43	<2.46	<1.90	<2.05	<0.036
Fluoranthene	5.74	9.87	7.62	8.23	0.15
Fluorene	6.97	12.0	9.25	10.0	0.18
Indeno(1,2,3-cd)Pyrene	3.34	5.75	4.44	4.79	0.085
2-methylanthracene	5.15	8.87	6.84	7.39	0.13
3-Methylcholanthrene	<7.14	<12.3	<9.50	<10.3	<0.18
1-Methylnaphthalene	16.8	29.0	22.3	24.2	0.43
2-Methylnaphthalene	15.7	27.0	20.8	22.5	0.40
1-Methylphenanthrene	4.39	7.56	5.83	6.30	0.11
9-Methylphenanthrene	3.44	5.92	4.57	4.94	0.087
Naphthalene	112	193	148	161	2.83
Perylene	<1.43	<2.46	<1.90	<2.05	<0.036
Phenanthrene	26.8	46.1	35.6	38.4	0.68
Picene	<7.14	<12.3	<9.50	<10.3	<0.18
Pyrene	6.97	12.0	9.26	10.0	0.18
Tetralin	46.6	80.4	62.0	66.9	1.18
m-terphenyl	<2.59	<4.46	<3.44	<3.72	<0.066
o-Terphenyl	<2.57	<4.42	<3.41	<3.68	<0.065
p-terphenyl	<1.84	<3.17	<2.44	<2.64	<0.047
Total	<367	<633	<488	<527	<9.32

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 80
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Polycyclic Aromatic Hydrocarbon Analyses

Compound	Blank Train ng	Laboratory Blank ng
Acenaphthene	<10	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	<10	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(k)Fluoranthene	<10	<10
Benzo(a)fluorene	<10	<10
Benzo(b)fluorene	<10	<10
Benzo(g,h,i)Perylene	22.1	16.3
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	<10	<10
Biphenyl	<10	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene	<10	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	27.9	21.2
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	10.8	<10
Fluorene	<10	<10
Indeno(1,2,3-cd)Pyrene	17.6	15.0
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	65.8	13.6
2-Methylnaphthalene	10.8	<10
1-Methylphenanthrene	16.7	13.1
9-Methylphenanthrene	<10	<10
Naphthalene	70.8	70.5
Perylene	<10	<10
Phenanthrene	19.0	13.7
Picene	<50	<50
Pyrene	14.8	11.5
Tetralin	326	496
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<1022	<1111

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 81
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Acetaldehyde, Formaldehyde and Acrolein Emission Data

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acetaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acetaldehyde Emission Rate mg/s
1	<2.2	0.0360	<35.5	<61.1	<46.9	<51.0	<0.90
2	<2.0	0.0336	<34.6	<59.5	<45.8	<49.7	<0.87
3	<4.6	0.0317	<83.7	<145	<112	<120	<2.15
Average			<51.3	<88.5	<68.2	<73.6	<1.31
Blank	<2.8						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Formaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Formaldehyde Emission Rate mg/s
1	9.9	0.0360	160	275	211	229	4.04
2	11	0.0336	190	327	252	273	4.80
3	8.7	0.0317	158	274	211	227	4.07
Average			170	292	225	243	4.30
Blank	9.0						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acrolein Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acrolein Emission Rate mg/s
1	<11	0.0360	<177	<306	<235	<255	<4.49
2	<10	0.0336	<173	<298	<229	<248	<4.36
3	<23	0.0317	<419	<725	<559	<601	<10.8
Average			<256	<443	<341	<368	<6.54
Blank	<14						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

Sampling was conducted at a single point. Volumetric flowrates from the corresponding isokinetic SVOC tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 82
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 1A/1B	Run No. 2 Tube 2A/2B	Run No. 3 Tube 3A/3B			
	µg	µg	µg	µg	%	µg
Acetone	0.28	0.20	0.16	0.21	27.9	0.64
Benzene	0.086	0.050	0.49	0.21	117	0.63
Bromodichloromethane	0.012	0.012	0.011	0.012	4.9	0.035
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.053	0.057	0.065	0.058	10.5	0.18
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.025	0.026	0.027	0.026	3.8	0.078
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	0.091	0.078	0.12	0.097	23.3	0.29
1,2-Dichloroethane	<0.01	<0.01	0.017	<0.012	32.8	<0.037
trans,1,2-Dichloroethene	0.036	<0.01	<0.01	<0.019	80.4	<0.056
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	0.023	<0.01	<0.01	<0.014	52.4	<0.043
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.15	<0.02	<0.02	<0.064	119	<0.19
Methylene Chloride	0.48	0.72	0.11	0.44	69.6	1.31
Styrene	0.022	<0.02	<0.02	<0.021	5.6	<0.062
Tetrachloroethene	0.033	0.035	0.031	0.033	6.1	0.099
Toluene	0.19	0.33	<0.05	<0.19	74.1	<0.57
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	0.050	<0.03	<0.03	<0.037	31.5	<0.11
O-Xylene	0.022	<0.01	<0.01	<0.014	49.5	<0.042
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<1.82	<1.87	<1.45	<1.71	13.4	<5.14

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0220
Run No. 2	0.0207
Run No. 3	0.0214

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 83
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 2

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 5A/5B	Run No. 2 Tube 6A/6B	Run No. 3 Tube 7A/7B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.36	<0.1	0.10	<0.19	80.7	<0.56
Benzene	0.22	0.072	0.062	0.12	73.6	0.35
Bromodichloromethane	0.010	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.033	0.018	0.019	0.023	35.9	0.070
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.017	0.011	0.012	0.013	24.1	0.040
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.011	<0.01	<0.01	<0.010	5.6	<0.031
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	0.49	0.16	<0.1	<0.25	84.2	<0.75
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.041	0.026	0.025	0.031	29.2	0.092
Toluene	0.43	0.18	0.23	0.28	47.6	0.83
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<1.98	<0.96	<0.94	<1.30	45.9	<3.89

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0208
Run No. 2	0.0206
Run No. 3	0.0210

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 84
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 3

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 10A/10B	Run No. 2 Tube 11A/11B	Run No. 3 Tube 12A/12B			
	µg	µg	µg	µg	%	µg
Acetone	<0.1	0.15	<0.1	<0.12	23.0	<0.35
Benzene	0.072	0.22	0.055	0.11	77.4	0.34
Bromodichloromethane	<0.01	0.012	<0.01	<0.011	10.8	<0.032
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.014	0.23	<0.01	<0.085	149	<0.26
Carbon Tetrachloride	<0.01	0.063	<0.01	<0.028	111	<0.083
Chloroform	0.017	0.026	<0.01	<0.018	45.4	<0.053
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.20	<0.02	<0.02	<0.080	130	<0.24
1,2-Dichloroethane	<0.01	0.010	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	0.017	<0.01	<0.012	32.8	<0.037
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	0.044	<0.01	<0.021	92.0	<0.064
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	0.24	0.18	0.49	0.30	54.2	0.91
Styrene	<0.02	0.021	<0.02	<0.020	2.8	<0.061
Tetrachloroethene	0.038	0.077	0.038	0.051	44.2	0.15
Toluene	0.22	0.95	0.72	0.63	58.8	1.89
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	0.011	<0.01	<0.010	5.6	<0.031
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	0.032	<0.02	<0.024	28.9	<0.072
M&P-Xylene	<0.03	0.26	<0.03	<0.11	125	<0.32
O-Xylene	<0.01	0.088	<0.01	<0.036	125	<0.11
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<1.28	<2.65	<1.82	<1.92	35.9	<5.76

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0208
Run No. 2	0.0190
Run No. 3	0.0182

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 85
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 1

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	0.64	5.75	9.90	7.62	8.27	0.15
Benzene	0.63	5.68	9.78	7.53	8.17	0.14
Bromodichloromethane	0.035	0.32	0.55	0.42	0.46	0.0080
Bromoform	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Bromomethane	<0.27	<2.45	<4.21	<3.24	<3.52	<0.062
1,3-Butadiene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
2-Butanone	0.18	1.59	2.73	2.10	2.28	0.040
Carbon Tetrachloride	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Chloroform	0.078	0.71	1.22	0.94	1.02	0.018
Cumene (Isopropylbenzene)	<0.060	<0.54	<0.94	<0.72	<0.78	<0.014
Dibromochloromethane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Dichlorodifluoromethane	0.29	2.64	4.54	3.49	3.79	0.067
1,2-Dichloroethane	<0.037	<0.34	<0.58	<0.44	<0.48	<0.0085
trans,1,2-Dichloroethene	<0.056	<0.51	<0.87	<0.67	<0.73	<0.013
1,1-Dichloroethene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
1,2-Dichloropropane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Ethylbenzene	<0.043	<0.39	<0.67	<0.52	<0.56	<0.0099
Ethylene Dibromide	<0.060	<0.54	<0.94	<0.72	<0.78	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.19	<1.74	<2.99	<2.30	<2.50	<0.044
Methylene Chloride	1.31	11.8	20.4	15.7	17.0	0.30
Styrene	<0.062	<0.56	<0.97	<0.74	<0.81	<0.014
Tetrachloroethene	0.099	0.90	1.54	1.19	1.29	0.023
Toluene	<0.57	<5.19	<8.94	<6.88	<7.46	<0.13
1,1,1-Trichloroethane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Trichlorotrifluoroethane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0069
Trichlorofluoromethane	<0.060	<0.54	<0.94	<0.72	<0.78	<0.014
M&P-Xylene	<0.11	<1.00	<1.72	<1.32	<1.43	<0.025
O-Xylene	<0.042	<0.38	<0.65	<0.50	<0.55	<0.0096
Vinyl Chloride	<0.060	<0.54	<0.94	<0.72	<0.78	<0.014
Total	<5.14	<46.6	<80.2	<61.7	<67.0	<1.18

Dry Gas Volume Sampled (Rm^3*) :	0.0641
Actual Flowrate (m^3/s) :	25.3
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.1
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 86
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.56	<5.26	<9.01	<6.97	<7.53	<0.13
Benzene	0.35	3.26	5.60	4.33	4.67	0.082
Bromodichloromethane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Bromoform	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Bromomethane	<0.27	<2.53	<4.33	<3.35	<3.62	<0.064
1,3-Butadiene	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
2-Butanone	0.070	0.65	1.12	0.87	0.94	0.017
Carbon Tetrachloride	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Chloroform	0.040	0.37	0.64	0.50	0.54	0.0094
Cumene (Isopropylbenzene)	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
Dibromochloromethane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Dichlorodifluoromethane	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
1,2-Dichloroethane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
trans,1,2-Dichloroethene	<0.031	<0.29	<0.50	<0.38	<0.42	<0.0073
1,1-Dichloroethene	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
1,2-Dichloropropane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Ethylbenzene	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Ethylene Dibromide	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
Methylene Chloride	<0.75	<6.98	<12.0	<9.26	<9.99	<0.18
Styrene	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
Tetrachloroethene	0.092	0.86	1.48	1.14	1.23	0.022
Toluene	0.83	7.77	13.3	10.3	11.1	0.20
1,1,1-Trichloroethane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Trichlorotrifluoroethane	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Trichlorofluoromethane	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
M&P-Xylene	<0.090	<0.84	<1.44	<1.12	<1.21	<0.021
O-Xylene	<0.030	<0.28	<0.48	<0.37	<0.40	<0.0071
Vinyl Chloride	<0.060	<0.56	<0.96	<0.74	<0.80	<0.014
Total	<3.89	<36.4	<62.4	<48.3	<52.1	<0.92

Dry Gas Volume Sampled (Rm^3*) :	0.0624
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 87
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.35	<3.44	<5.97	<4.60	<4.94	<0.088
Benzene	0.34	3.41	5.92	4.56	4.90	0.088
Bromodichloromethane	<0.032	<0.32	<0.55	<0.43	<0.46	<0.0082
Bromoform	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
Bromomethane	<0.27	<2.68	<4.66	<3.59	<3.85	<0.069
1,3-Butadiene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
2-Butanone	<0.26	<2.55	<4.42	<3.41	<3.65	<0.065
Carbon Tetrachloride	<0.083	<0.83	<1.43	<1.10	<1.18	<0.021
Chloroform	<0.053	<0.53	<0.92	<0.71	<0.76	<0.014
Cumene (Isopropylbenzene)	<0.060	<0.60	<1.04	<0.80	<0.86	<0.015
Dibromochloromethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
Dichlorodifluoromethane	<0.24	<2.39	<4.14	<3.19	<3.43	<0.061
1,2-Dichloroethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
trans,1,2-Dichloroethene	<0.037	<0.37	<0.64	<0.49	<0.53	<0.0095
1,1-Dichloroethene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
1,2-Dichloropropane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
Ethylbenzene	<0.064	<0.64	<1.10	<0.85	<0.91	<0.016
Ethylene Dibromide	<0.060	<0.60	<1.04	<0.80	<0.86	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.60	<1.04	<0.80	<0.86	<0.015
Methylene Chloride	0.91	9.06	15.7	12.1	13.0	0.23
Styrene	<0.061	<0.61	<1.05	<0.81	<0.87	<0.016
Tetrachloroethene	0.15	1.52	2.64	2.04	2.18	0.039
Toluene	1.89	18.8	32.7	25.2	27.0	0.48
1,1,1-Trichloroethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.031	<0.31	<0.54	<0.41	<0.44	<0.0079
Trichlorotrifluoroethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0077
Trichlorofluoromethane	<0.072	<0.72	<1.24	<0.96	<1.03	<0.018
M&P-Xylene	<0.32	<3.21	<5.58	<4.30	<4.61	<0.083
O-Xylene	<0.11	<1.07	<1.86	<1.44	<1.54	<0.028
Vinyl Chloride	<0.060	<0.60	<1.04	<0.80	<0.86	<0.015
Total	<5.76	<57.2	<99.4	<76.6	<82.2	<1.47

Dry Gas Volume Sampled (Rm^3*) :	0.0579
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 88
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Acetone	5.75	<5.26	<3.44	<4.82
Benzene	5.68	3.26	3.41	4.12
Bromodichloromethane	0.32	<0.28	<0.32	<0.31
Bromoform	<0.27	<0.28	<0.30	<0.28
Bromomethane	<2.45	<2.53	<2.68	<2.55
1,3-Butadiene	<0.27	<0.28	<0.30	<0.28
2-Butanone	1.59	0.65	<2.55	<1.60
Carbon Tetrachloride	<0.27	<0.28	<0.83	<0.46
Chloroform	0.71	0.37	<0.53	<0.54
Cumene (Isopropylbenzene)	<0.54	<0.56	<0.60	<0.57
Dibromochloromethane	<0.27	<0.28	<0.30	<0.28
Dichlorodifluoromethane	2.64	<0.56	<2.39	<1.86
1,2-Dichloroethane	<0.34	<0.28	<0.30	<0.30
trans,1,2-Dichloroethene	<0.51	<0.29	<0.37	<0.39
1,1-Dichloroethene	<0.27	<0.28	<0.30	<0.28
1,2-Dichloropropane	<0.27	<0.28	<0.30	<0.28
Ethylbenzene	<0.39	<0.28	<0.64	<0.44
Ethylene Dibromide	<0.54	<0.56	<0.60	<0.57
Mesitylene (1,3,5-Trimethylbenzene)	<1.74	<0.56	<0.60	<0.97
Methylene Chloride	11.8	<6.98	9.06	<9.29
Styrene	<0.56	<0.56	<0.61	<0.58
Tetrachloroethene	0.90	0.86	1.52	1.09
Toluene	<5.19	7.77	18.8	<10.6
1,1,1-Trichloroethane	<0.27	<0.28	<0.30	<0.28
Trichloroethene/1,1,2-Trichloroethene	<0.27	<0.28	<0.31	<0.29
Trichlorotrifluoroethane	<0.27	<0.28	<0.30	<0.28
Trichlorofluoromethane	<0.54	<0.56	<0.72	<0.61
M&P-Xylene	<1.00	<0.84	<3.21	<1.68
O-Xylene	<0.38	<0.28	<1.07	<0.58
Vinyl Chloride	<0.54	<0.56	<0.60	<0.57
Total	<46.6	<36.4	<57.2	<46.7

TABLE 89
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	9.90	<9.01	<5.97	<8.30
Benzene	9.78	5.60	5.92	7.10
Bromodichloromethane	0.55	<0.48	<0.55	<0.53
Bromoform	<0.47	<0.48	<0.52	<0.49
Bromomethane	<4.21	<4.33	<4.66	<4.40
1,3-Butadiene	<0.47	<0.48	<0.52	<0.49
2-Butanone	2.73	1.12	<4.42	<2.76
Carbon Tetrachloride	<0.47	<0.48	<1.43	<0.79
Chloroform	1.22	0.64	<0.92	<0.92
Cumene (Isopropylbenzene)	<0.94	<0.96	<1.04	<0.98
Dibromochloromethane	<0.47	<0.48	<0.52	<0.49
Dichlorodifluoromethane	4.54	<0.96	<4.14	<3.21
1,2-Dichloroethane	<0.58	<0.48	<0.52	<0.53
trans,1,2-Dichloroethene	<0.87	<0.50	<0.64	<0.67
1,1-Dichloroethene	<0.47	<0.48	<0.52	<0.49
1,2-Dichloropropane	<0.47	<0.48	<0.52	<0.49
Ethylbenzene	<0.67	<0.48	<1.10	<0.75
Ethylene Dibromide	<0.94	<0.96	<1.04	<0.98
Mesitylene (1,3,5-Trimethylbenzene)	<2.99	<0.96	<1.04	<1.66
Methylene Chloride	20.4	<12.0	15.7	<16.0
Styrene	<0.97	<0.96	<1.05	<0.99
Tetrachloroethene	1.54	1.48	2.64	1.89
Toluene	<8.94	13.3	32.7	<18.3
1,1,1-Trichloroethane	<0.47	<0.48	<0.52	<0.49
Trichloroethene/1,1,2-Trichloroethene	<0.47	<0.48	<0.54	<0.49
Trichlorotrifluoroethane	<0.47	<0.48	<0.52	<0.49
Trichlorofluoromethane	<0.94	<0.96	<1.24	<1.05
M&P-Xylene	<1.72	<1.44	<5.58	<2.91
O-Xylene	<0.65	<0.48	<1.86	<1.00
Vinyl Chloride	<0.94	<0.96	<1.04	<0.98
Total	<80.2	<62.4	<99.4	<80.6

* At 25°C and 1 atmosphere

TABLE 90
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	7.62	<6.97	<4.60	<6.40
Benzene	7.53	4.33	4.56	5.47
Bromodichloromethane	0.42	<0.37	<0.43	<0.41
Bromoform	<0.36	<0.37	<0.40	<0.38
Bromomethane	<3.24	<3.35	<3.59	<3.39
1,3-Butadiene	<0.36	<0.37	<0.40	<0.38
2-Butanone	2.10	0.87	<3.41	<2.13
Carbon Tetrachloride	<0.36	<0.37	<1.10	<0.61
Chloroform	0.94	0.50	<0.71	<0.71
Cumene (Isopropylbenzene)	<0.72	<0.74	<0.80	<0.75
Dibromochloromethane	<0.36	<0.37	<0.40	<0.38
Dichlorodifluoromethane	3.49	<0.74	<3.19	<2.48
1,2-Dichloroethane	<0.44	<0.37	<0.40	<0.41
trans,1,2-Dichloroethene	<0.67	<0.38	<0.49	<0.52
1,1-Dichloroethene	<0.36	<0.37	<0.40	<0.38
1,2-Dichloropropane	<0.36	<0.37	<0.40	<0.38
Ethylbenzene	<0.52	<0.37	<0.85	<0.58
Ethylene Dibromide	<0.72	<0.74	<0.80	<0.75
Mesitylene (1,3,5-Trimethylbenzene)	<2.30	<0.74	<0.80	<1.28
Methylene Chloride	15.7	<9.26	12.1	<12.4
Styrene	<0.74	<0.74	<0.81	<0.77
Tetrachloroethene	1.19	1.14	2.04	1.46
Toluene	<6.88	10.3	25.2	<14.1
1,1,1-Trichloroethane	<0.36	<0.37	<0.40	<0.38
Trichloroethene/1,1,2-Trichloroethene	<0.36	<0.37	<0.41	<0.38
Trichlorotrifluoroethane	<0.36	<0.37	<0.40	<0.38
Trichlorofluoromethane	<0.72	<0.74	<0.96	<0.81
M&P-Xylene	<1.32	<1.12	<4.30	<2.25
O-Xylene	<0.50	<0.37	<1.44	<0.77
Vinyl Chloride	<0.72	<0.74	<0.80	<0.75
Total	<61.7	<48.3	<76.6	<62.2

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 91
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Wet Reference Concentrations

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	8.27	<7.53	<4.94	<6.91
Benzene	8.17	4.67	4.90	5.91
Bromodichloromethane	0.46	<0.40	<0.46	<0.44
Bromoform	<0.39	<0.40	<0.43	<0.41
Bromomethane	<3.52	<3.62	<3.85	<3.66
1,3-Butadiene	<0.39	<0.40	<0.43	<0.41
2-Butanone	2.28	0.94	<3.65	<2.29
Carbon Tetrachloride	<0.39	<0.40	<1.18	<0.66
Chloroform	1.02	0.54	<0.76	<0.77
Cumene (Isopropylbenzene)	<0.78	<0.80	<0.86	<0.81
Dibromochloromethane	<0.39	<0.40	<0.43	<0.41
Dichlorodifluoromethane	3.79	<0.80	<3.43	<2.67
1,2-Dichloroethane	<0.48	<0.40	<0.43	<0.44
trans,1,2-Dichloroethene	<0.73	<0.42	<0.53	<0.56
1,1-Dichloroethene	<0.39	<0.40	<0.43	<0.41
1,2-Dichloropropane	<0.39	<0.40	<0.43	<0.41
Ethylbenzene	<0.56	<0.40	<0.91	<0.63
Ethylene Dibromide	<0.78	<0.80	<0.86	<0.81
Mesitylene (1,3,5-Trimethylbenzene)	<2.50	<0.80	<0.86	<1.39
Methylene Chloride	17.0	<9.99	13.0	<13.3
Styrene	<0.81	<0.80	<0.87	<0.83
Tetrachloroethene	1.29	1.23	2.18	1.57
Toluene	<7.46	11.1	27.0	<15.2
1,1,1-Trichloroethane	<0.39	<0.40	<0.43	<0.41
Trichloroethene/1,1,2-Trichloroethene	<0.39	<0.40	<0.44	<0.41
Trichlorotrifluoroethane	<0.39	<0.40	<0.43	<0.41
Trichlorofluoromethane	<0.78	<0.80	<1.03	<0.87
M&P-Xylene	<1.43	<1.21	<4.61	<2.42
O-Xylene	<0.55	<0.40	<1.54	<0.83
Vinyl Chloride	<0.78	<0.80	<0.86	<0.81
Total	<67.0	<52.1	<82.2	<67.1

* At 25°C and 1 atmosphere

TABLE 92
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Rates

Compound	Emission Rate			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s
Acetone	0.15	<0.13	<0.088	<0.12
Benzene	0.14	0.082	0.088	0.10
Bromodichloromethane	0.0080	<0.0071	<0.0082	<0.0078
Bromoform	<0.0069	<0.0071	<0.0077	<0.0072
Bromomethane	<0.062	<0.064	<0.069	<0.065
1,3-Butadiene	<0.0069	<0.0071	<0.0077	<0.0072
2-Butanone	0.040	0.017	<0.065	<0.041
Carbon Tetrachloride	<0.0069	<0.0071	<0.021	<0.012
Chloroform	0.018	0.0094	<0.014	<0.014
Cumene (Isopropylbenzene)	<0.014	<0.014	<0.015	<0.014
Dibromochloromethane	<0.0069	<0.0071	<0.0077	<0.0072
Dichlorodifluoromethane	0.067	<0.014	<0.061	<0.047
1,2-Dichloroethane	<0.0085	<0.0071	<0.0077	<0.0077
trans,1,2-Dichloroethene	<0.013	<0.0073	<0.0095	<0.0099
1,1-Dichloroethene	<0.0069	<0.0071	<0.0077	<0.0072
1,2-Dichloropropane	<0.0069	<0.0071	<0.0077	<0.0072
Ethylbenzene	<0.0099	<0.0071	<0.016	<0.011
Ethylene Dibromide	<0.014	<0.014	<0.015	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.044	<0.014	<0.015	<0.024
Methylene Chloride	0.30	<0.18	0.23	<0.24
Styrene	<0.014	<0.014	<0.016	<0.015
Tetrachloroethene	0.023	0.022	0.039	0.028
Toluene	<0.13	0.20	0.48	<0.27
1,1,1-Trichloroethane	<0.0069	<0.0071	<0.0077	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.0069	<0.0071	<0.0079	<0.0073
Trichlorotrifluoroethane	<0.0069	<0.0071	<0.0077	<0.0072
Trichlorofluoromethane	<0.014	<0.014	<0.018	<0.015
M&P-Xylene	<0.025	<0.021	<0.083	<0.043
O-Xylene	<0.0096	<0.0071	<0.028	<0.015
Vinyl Chloride	<0.014	<0.014	<0.015	<0.014
Total	<1.18	<0.92	<1.47	<1.19

TABLE 93
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Volatile Organic Emission Data

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	<4.82	<8.30	<6.40	<6.91	<0.12
Benzene	4.12	7.10	5.47	5.91	0.10
Bromodichloromethane	<0.31	<0.53	<0.41	<0.44	<0.0078
Bromoform	<0.28	<0.49	<0.38	<0.41	<0.0072
Bromomethane	<2.55	<4.40	<3.39	<3.66	<0.065
1,3-Butadiene	<0.28	<0.49	<0.38	<0.41	<0.0072
2-Butanone	<1.60	<2.76	<2.13	<2.29	<0.041
Carbon Tetrachloride	<0.46	<0.79	<0.61	<0.66	<0.012
Chloroform	<0.54	<0.92	<0.71	<0.77	<0.014
Cumene (Isopropylbenzene)	<0.57	<0.98	<0.75	<0.81	<0.014
Dibromochloromethane	<0.28	<0.49	<0.38	<0.41	<0.0072
Dichlorodifluoromethane	<1.86	<3.21	<2.48	<2.67	<0.047
1,2-Dichloroethane	<0.30	<0.53	<0.41	<0.44	<0.0077
trans,1,2-Dichloroethene	<0.39	<0.67	<0.52	<0.56	<0.0099
1,1-Dichloroethene	<0.28	<0.49	<0.38	<0.41	<0.0072
1,2-Dichloropropane	<0.28	<0.49	<0.38	<0.41	<0.0072
Ethylbenzene	<0.44	<0.75	<0.58	<0.63	<0.011
Ethylene Dibromide	<0.57	<0.98	<0.75	<0.81	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.97	<1.66	<1.28	<1.39	<0.024
Methylene Chloride	<9.29	<16.0	<12.4	<13.3	<0.24
Styrene	<0.58	<0.99	<0.77	<0.83	<0.015
Tetrachloroethene	1.09	1.89	1.46	1.57	0.028
Toluene	<10.6	<18.3	<14.1	<15.2	<0.27
1,1,1-Trichloroethane	<0.28	<0.49	<0.38	<0.41	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.49	<0.38	<0.41	<0.0073
Trichlorotrifluoroethane	<0.28	<0.49	<0.38	<0.41	<0.0072
Trichlorofluoromethane	<0.61	<1.05	<0.81	<0.87	<0.015
M&P-Xylene	<1.68	<2.91	<2.25	<2.42	<0.043
O-Xylene	<0.58	<1.00	<0.77	<0.83	<0.015
Vinyl Chloride	<0.57	<0.98	<0.75	<0.81	<0.014
Total	<46.7	<80.6	<62.2	<67.1	<1.19

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 94
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Volatile Organic Analyses

Compound	Field Blank 1 Tube 30/30B	Field Blank 2 Tube 9A/9B	Field Blank 3 Tube 29A/29B	Trip Blank Tube 14A/14B	Method Blank
	µg	µg	µg	µg	µg
Acetone	<0.1	<0.1	0.15	0.19	<0.1
Benzene	<0.05	<0.05	<0.05	0.073	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.01	<0.01	<0.01	<0.01	<0.01
2-Butanone	<0.01	0.017	<0.01	0.026	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	0.30	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	0.84	1.05	1.52	1.70	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.11	2.14	0.13	5.27	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02	<0.02
Total	<1.80	<3.78	<2.28	<7.69	<0.73

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

APPENDIX 2

Boiler No. 2 BH Outlet
Data Tables
(96 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 2
Isokinetic Sampling Train Test Schedules

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 30, 2018	8:15	11:32	180
2	May 30, 2018	12:59	16:09	180
3	May 31, 2018	9:18	13:03	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 29, 2018	9:23	11:26	120
2	May 29, 2018	13:12	15:16	120
3	May 29, 2018	16:24	18:27	120

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 30, 2018	8:12	9:12	60
2	May 30, 2018	10:21	11:21	60
3	May 30, 2018	12:57	13:57	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	May 31, 2018	9:13	13:29	240
2	June 1, 2018	8:26	12:38	240
3	June 1, 2018	13:09	17:19	240

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 2
Organic Compounds Test Schedules

Acrolein and Aldehydes Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	May 31, 2018	9:11	10:11	60
2	May 31, 2018	17:01	18:01	60
3	June 1, 2018	8:30	9:30	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	May 31, 2018	10:44	11:04	20
	2	May 31, 2018	11:14	11:34	20
	3	May 31, 2018	11:43	12:03	20
	4	May 31, 2018	12:09	12:29	20
2	1	May 31, 2018	14:56	15:16	20
	2	May 31, 2018	15:27	15:47	20
	3	May 31, 2018	15:54	16:14	21
	4	May 31, 2018	16:22	16:42	20
3	1	June 1, 2018	10:04	10:24	20
	2	June 1, 2018	10:32	10:52	20
	3	June 1, 2018	11:03	11:23	20
	4	June 1, 2018	11:33	11:53	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	May 29, 2018	16:00	17:00	60
BH Outlet	2	May 29, 2018	17:08	18:08	60
BH Outlet	3	May 29, 2018	18:14	19:14	60
Quench Inlet	1	May 29, 2018	8:45	9:45	60
Quench Inlet	2	May 29, 2018	9:56	10:56	60
Quench Inlet	3	May 29, 2018	11:09	12:09	60

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Sampling Parameters

Particulate and Metals Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.851	0.998	6.46	3.333	99.6
2	0.851	0.998	6.46	3.372	100.5
3	0.851	0.995	6.45	3.320	99.8

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.845	0.995	4.50	1.180	108.1
2	0.845	0.995	4.50	1.176	102.4
3	0.845	0.995	4.50	1.172	101.5

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.850	0.995	6.54	1.210	100.1
2	0.850	0.995	6.54	1.189	100.5
3	0.850	0.995	6.54	1.211	101.0

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.850	0.998	6.54	4.543	98.0
2	0.850	0.998	6.54	4.713	98.6
3	0.850	0.998	6.54	4.709	99.6

* Dry at 25°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Physical Parameters

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	142	16.4	16.2	-2.39	98.2	11.2	7.83
2	142	17.2	16.5	-2.39	97.9	11.4	7.61
3	140	16.8	16.3	-2.39	97.5	11.2	7.63
Average	142	16.8	16.3	-2.39	97.9	11.2	7.69

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	140	15.6	16.0	-2.12	98.7	11.4	7.74
2	141	15.7	16.9	-2.12	98.7	11.4	7.73
3	141	15.1	16.9	-2.12	98.6	11.3	7.86
Average	141	15.5	16.6	-2.12	98.7	11.4	7.78

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	15.7	17.0	-2.39	98.2	11.3	7.80
2	141	16.2	16.7	-2.39	98.2	11.0	7.94
3	141	16.4	17.0	-2.39	98.1	11.3	7.79
Average	141	16.1	16.9	-2.39	98.1	11.2	7.84

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	142	16.9	16.7	-2.39	97.5	11.2	7.65
2	143	16.6	17.2	-2.22	97.6	11.1	7.91
3	143	17.4	17.2	-2.22	97.5	11.0	7.99
Average	143	17.0	17.0	-2.27	97.6	11.1	7.85

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically at a single point in the duct.

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Volumetric Flowrates

Particulate and Metals Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	24.0	13.9	18.4	16.7
2	24.4	14.0	18.8	16.9
3	24.1	13.9	18.7	16.7
Average	24.2	14.0	18.6	16.8

Particle Size Distribution Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	23.7	14.1	18.7	16.6
2	25.0	14.8	19.7	17.6
3	24.9	14.8	19.5	17.5
Average	24.5	14.6	19.3	17.2

Acid Gases Trains ***

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.1	14.8	19.5	17.5
2	24.7	14.4	18.9	17.2
3	25.2	14.6	19.4	17.5
Average	25.0	14.6	19.3	17.4

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	24.7	14.2	18.9	17.0
2	25.4	14.6	19.2	17.5
3	25.4	14.5	18.8	17.5
Average	25.1	14.4	19.0	17.4

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

*** Sampling was conducted isokinetically at a single point in the duct. Volumetric flowrates from the corresponding particulate and metals tests were used to calculate emission data.

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Particulate Emission Data

Test No.	Particulate Collected			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	1.4	3.0	4.4	3.333	0.77	1.32	1.00	1.10	18.4
2	2.4	2.3	4.7	3.372	0.80	1.39	1.04	1.15	19.5
3	1.2	2.6	3.8	3.320	0.66	1.14	0.85	0.95	15.9
Average					0.74	1.29	0.96	1.07	17.9
Blank	0.1	3.8							

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
$PM_{2.5}$ and PM_{10} Emission Data

$PM_{2.5}$

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	$PM_{2.5}$ Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.3	1.180	<0.15	<0.25	<0.19	<0.22	<3.58
2	<0.2	1.176	<0.10	<0.17	<0.13	<0.14	<2.52
3	0.3	1.172	0.15	0.26	0.19	0.22	3.79
Average			<0.13	<0.23	<0.17	<0.19	<3.30
Blank	<0.3						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.4	1.180	<0.20	<0.34	<0.26	<0.29	<4.78
2	<0.3	1.176	<0.15	<0.26	<0.19	<0.21	<3.78
3	<0.4	1.172	<0.20	<0.34	<0.26	<0.29	<5.05
Average			<0.19	<0.31	<0.24	<0.26	<4.54
Blank	<0.4						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Condensable Particulate Emission Data

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	7.1	1.180	3.58	6.02	4.54	5.11	84.8
2	4.5	1.176	2.27	3.83	2.87	3.22	56.6
3	3.2	1.172	1.62	2.73	2.07	2.31	40.4
Average			2.49	4.19	3.16	3.55	60.6
Blank	1.1						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	2.6	1.180	1.31	2.20	1.66	1.87	31.1
2	1.6	1.176	0.81	1.36	1.02	1.14	20.1
3	2.0	1.172	1.01	1.71	1.30	1.44	25.3
Average			1.04	1.76	1.33	1.49	25.5
Blank	1.2						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Halides and Ammonia Emission Data

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Chloride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HCl Emission Rate mg/s
1	6.79	1.210	3.25	5.61	4.24	4.67	78.0
2	6.09	1.189	2.97	5.12	3.87	4.26	71.2
3	6.75	1.211	3.20	5.57	4.15	4.62	78.0
Average			3.14	5.44	4.09	4.52	75.7
Blank	<0.293						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Fluoride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HF Emission Rate mg/s
1	<0.167	1.210	<0.080	<0.14	<0.10	<0.11	<1.92
2	<0.170	1.189	<0.083	<0.14	<0.11	<0.12	<1.99
3	<0.182	1.211	<0.086	<0.15	<0.11	<0.12	<2.10
Average			<0.083	<0.14	<0.11	<0.12	<2.00
Blank	<0.167						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm^3*	Ammonia Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Ammonia Emission Rate mg/s
1	0.871	1.210	0.42	0.72	0.54	0.60	10.0
2	0.784	1.189	0.38	0.66	0.50	0.55	9.17
3	0.650	1.211	0.31	0.54	0.40	0.44	7.51
Average			0.37	0.64	0.48	0.53	8.90
Blank	<0.430						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 2
Combustion Gas Analyses

Data measured by the DYEC CEMS from May 29 to June 1, 2018

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.29	7.86	8.55
BH Outlet	Carbon Dioxide (kg/Rm^3, 1 hr Avg) *	0.19	0.20	0.21
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	7	13	36
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	8.3	13.0	30.3
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0	0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0	0
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	88	109	119
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	108	109	110
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	3	4	5
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	3.6	3.8	4.4
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0.04	1
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	9

Data measured by the ORTECH CEMS on May 29, 2018

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	1.1	6.5
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.4	3.6
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	1.4	5.1
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		1.0	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.8	8.5
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.9	5.2
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	1.8	7.5
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		1.2	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	0	0.8	1.7
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	0.3	0.9	1.9
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0	1.9	3.6
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		1.2	

* Reference conditions, dry basis adjusted to 11% oxygen

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 1

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	10.7	0.91	11.6
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.77	0.12	0.89
Chromium	6.50	0.68	7.18
Cobalt	0.72	<0.1	0.72
Copper	2.81	1.62	4.43
Lead	0.76	0.94	1.70
Mercury *	<0.015	5.29	5.29
Molybdenum	24.4	0.45	24.8
Nickel	21.8	<0.1	21.8
Selenium	<2	<1	<1.00
Silver	0.35	<0.1	0.35
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.19	0.19
Zinc	15.0	4.73	19.7
Total			<101

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 2

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.22	<0.1	0.22
Arsenic	<1	<0.2	<0.20
Barium	10.4	0.89	11.3
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.30	0.067	0.37
Chromium	12.4	0.56	13.0
Cobalt	0.75	<0.1	0.75
Copper	3.48	2.32	5.80
Lead	1.10	0.20	1.30
Mercury *	0.015	3.67	3.69
Molybdenum	23.8	0.14	23.9
Nickel	25.8	<0.1	25.8
Selenium	<2	<1	<1.00
Silver	0.85	<0.1	0.85
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.18	0.18
Zinc	59.2	3.05	62.3
Total			<151

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 3

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	9.76	1.31	11.1
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.21	0.078	0.29
Chromium	13.4	0.56	14.0
Cobalt	1.27	<0.1	1.27
Copper	9.01	2.58	11.6
Lead	0.67	0.22	0.89
Mercury *	<0.015	1.36	1.36
Molybdenum	23.1	0.12	23.2
Nickel	54.7	<0.1	54.7
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.22	0.22
Zinc	32.3	4.62	36.9
Total			<157

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 1

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00083
Arsenic	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00083
Barium	11.6	2.02	3.48	2.63	2.90	0.048
Beryllium	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00083
Cadmium	0.89	0.16	0.27	0.20	0.22	0.0037
Chromium	7.18	1.25	2.15	1.63	1.79	0.030
Cobalt	0.72	0.13	0.22	0.16	0.18	0.0030
Copper	4.43	0.77	1.33	1.00	1.11	0.018
Lead	1.70	0.30	0.51	0.38	0.42	0.0071
Mercury	5.29	0.92	1.59	1.20	1.32	0.022
Molybdenum	24.8	4.32	7.46	5.63	6.21	0.10
Nickel	21.8	3.79	6.54	4.94	5.44	0.091
Selenium	<1.00	<0.17	<0.30	<0.23	<0.25	<0.0042
Silver	0.35	0.060	0.10	0.079	0.087	0.0015
Thallium	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00083
Vanadium	0.19	0.033	0.057	0.043	0.047	0.00079
Zinc	19.7	3.43	5.92	4.47	4.93	0.082
Total	<101	<17.5	<30.2	<22.8	<25.1	<0.42

Dry Gas Volume Sampled (Rm^3*) :	3.333
Actual Flowrate (m^3/s) :	24.0
Dry Reference Flowrate (Rm^3/s*) :	13.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.4
Wet Reference Flowrate (Rm^3/s*) :	16.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 2

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.22	0.038	0.066	0.049	0.055	0.00093
Arsenic	<0.20	<0.034	<0.059	<0.044	<0.049	<0.00083
Barium	11.3	1.92	3.35	2.49	2.77	0.047
Beryllium	<0.20	<0.034	<0.059	<0.044	<0.049	<0.00083
Cadmium	0.37	0.063	0.11	0.082	0.091	0.0015
Chromium	13.0	2.21	3.84	2.86	3.18	0.054
Cobalt	0.75	0.13	0.22	0.17	0.18	0.0031
Copper	5.80	0.99	1.72	1.28	1.42	0.024
Lead	1.30	0.22	0.39	0.29	0.32	0.0054
Mercury	3.69	0.63	1.09	0.81	0.91	0.015
Molybdenum	23.9	4.07	7.10	5.29	5.88	0.099
Nickel	25.8	4.39	7.65	5.70	6.34	0.11
Selenium	<1.00	<0.17	<0.30	<0.22	<0.25	<0.0042
Silver	0.85	0.15	0.25	0.19	0.21	0.0035
Thallium	<0.20	<0.034	<0.059	<0.044	<0.049	<0.00083
Vanadium	0.18	0.030	0.053	0.039	0.044	0.00074
Zinc	62.3	10.6	18.5	13.7	15.3	0.26
Total	<151	<25.7	<44.8	<33.3	<37.1	<0.63

Dry Gas Volume Sampled (Rm^3*) :	3.372
Actual Flowrate (m^3/s) :	24.4
Dry Reference Flowrate (Rm^3/s*) :	14.0
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
Wet Reference Flowrate (Rm^3/s*) :	16.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 3

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00084
Arsenic	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00084
Barium	11.1	1.92	3.33	2.48	2.78	0.046
Beryllium	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00084
Cadmium	0.29	0.050	0.087	0.065	0.072	0.0012
Chromium	14.0	2.42	4.20	3.12	3.50	0.058
Cobalt	1.27	0.22	0.38	0.28	0.32	0.0053
Copper	11.6	2.01	3.49	2.59	2.91	0.049
Lead	0.89	0.16	0.27	0.20	0.22	0.0037
Mercury	1.36	0.24	0.41	0.30	0.34	0.0057
Molybdenum	23.2	4.03	7.00	5.20	5.82	0.097
Nickel	54.7	9.50	16.5	12.2	13.7	0.23
Selenium	<1.00	<0.17	<0.30	<0.22	<0.25	<0.0042
Silver	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00084
Thallium	<0.20	<0.035	<0.060	<0.045	<0.050	<0.00084
Vanadium	0.22	0.038	0.066	0.049	0.055	0.00092
Zinc	36.9	6.41	11.1	8.27	9.26	0.15
Total	<157	<27.4	<47.4	<35.3	<39.5	<0.66

Dry Gas Volume Sampled (Rm^3*) :	3.320
Actual Flowrate (m^3/s) :	24.1
Dry Reference Flowrate (Rm^3/s*) :	13.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	16.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Actual Concentrations

Metal	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/m³	µg/m³	µg/m³	µg/m³	%
Antimony	<0.035	0.038	<0.035	<0.036	5.4
Arsenic	<0.035	<0.034	<0.035	<0.035	1.2
Barium	2.02	1.92	1.92	1.95	2.8
Beryllium	<0.035	<0.034	<0.035	<0.035	1.2
Cadmium	0.16	0.063	0.050	0.089	64.1
Chromium	1.25	2.21	2.42	1.96	31.9
Cobalt	0.13	0.13	0.22	0.16	34.4
Copper	0.77	0.99	2.01	1.26	52.9
Lead	0.30	0.22	0.16	0.22	31.2
Mercury	0.92	0.63	0.24	0.59	57.7
Molybdenum	4.32	4.07	4.03	4.14	3.7
Nickel	3.79	4.39	9.50	5.89	53.3
Selenium	<0.17	<0.17	<0.17	<0.17	1.2
Silver	0.060	0.15	<0.035	<0.080	72.2
Thallium	<0.035	<0.034	<0.035	<0.035	1.2
Vanadium	0.033	0.030	0.038	0.034	11.9
Zinc	3.43	10.6	6.41	6.81	52.8
Total	<17.5	<25.7	<27.4	<23.5	22.5

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Dry Reference Concentrations

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.060	0.066	<0.060	<0.062	5.9
Arsenic	<0.060	<0.059	<0.060	<0.060	0.8
Barium	3.48	3.35	3.33	3.39	2.4
Beryllium	<0.060	<0.059	<0.060	<0.060	0.8
Cadmium	0.27	0.11	0.087	0.15	63.7
Chromium	2.15	3.84	4.20	3.40	32.2
Cobalt	0.22	0.22	0.38	0.27	34.3
Copper	1.33	1.72	3.49	2.18	52.8
Lead	0.51	0.39	0.27	0.39	30.9
Mercury	1.59	1.09	0.41	1.03	57.4
Molybdenum	7.46	7.10	7.00	7.18	3.4
Nickel	6.54	7.65	16.5	10.2	53.3
Selenium	<0.30	<0.30	<0.30	<0.30	0.8
Silver	0.10	0.25	<0.060	<0.14	72.6
Thallium	<0.060	<0.059	<0.060	<0.060	0.8
Vanadium	0.057	0.053	0.066	0.059	11.7
Zinc	5.92	18.5	11.1	11.8	53.2
Total	<30.2	<44.8	<47.4	<40.8	22.8

* At 25°C and 1 atmosphere

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Dry Adjusted Concentrations

Metal	Dry Adjusted Concentration				Coefficient
	Test No. 1 µg/Rm³**	Test No. 2 µg/Rm³**	Test No. 3 µg/Rm³**	Average µg/Rm³**	of Variation %
Antimony	<0.045	0.049	<0.045	<0.047	5.5
Arsenic	<0.045	<0.044	<0.045	<0.045	1.3
Barium	2.63	2.49	2.48	2.53	3.3
Beryllium	<0.045	<0.044	<0.045	<0.045	1.3
Cadmium	0.20	0.082	0.065	0.12	64.7
Chromium	1.63	2.86	3.12	2.54	31.5
Cobalt	0.16	0.17	0.28	0.20	33.7
Copper	1.00	1.28	2.59	1.63	52.2
Lead	0.38	0.29	0.20	0.29	31.8
Mercury	1.20	0.81	0.30	0.77	58.1
Molybdenum	5.63	5.29	5.20	5.37	4.3
Nickel	4.94	5.70	12.2	7.63	52.7
Selenium	<0.23	<0.22	<0.22	<0.22	1.3
Silver	0.079	0.19	<0.045	<0.10	72.2
Thallium	<0.045	<0.044	<0.045	<0.045	1.3
Vanadium	0.043	0.039	0.049	0.044	11.4
Zinc	4.47	13.7	8.27	8.83	52.8
Total	<22.8	<33.3	<35.3	<30.5	22.1

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Wet Reference Concentrations

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.050	0.055	<0.050	<0.052	5.6
Arsenic	<0.050	<0.049	<0.050	<0.050	1.1
Barium	2.90	2.77	2.78	2.82	2.6
Beryllium	<0.050	<0.049	<0.050	<0.050	1.1
Cadmium	0.22	0.091	0.072	0.13	63.9
Chromium	1.79	3.18	3.50	2.83	32.1
Cobalt	0.18	0.18	0.32	0.23	34.5
Copper	1.11	1.42	2.91	1.81	53.0
Lead	0.42	0.32	0.22	0.32	31.0
Mercury	1.32	0.91	0.34	0.86	57.5
Molybdenum	6.21	5.88	5.82	5.97	3.5
Nickel	5.44	6.34	13.7	8.50	53.4
Selenium	<0.25	<0.25	<0.25	<0.25	1.1
Silver	0.087	0.21	<0.050	<0.12	72.3
Thallium	<0.050	<0.049	<0.050	<0.050	1.1
Vanadium	0.047	0.044	0.055	0.049	11.9
Zinc	4.93	15.3	9.26	9.83	53.0
Total	<25.1	<37.1	<39.5	<33.9	22.7

* At 25°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Emission Rates

Metal	Emission Rate				Coefficient
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %
Antimony	<0.00083	0.00093	<0.00084	<0.00087	6.3
Arsenic	<0.00083	<0.00083	<0.00084	<0.00083	0.4
Barium	0.048	0.047	0.046	0.047	2.3
Beryllium	<0.00083	<0.00083	<0.00084	<0.00083	0.4
Cadmium	0.0037	0.0015	0.0012	0.0022	63.5
Chromium	0.030	0.054	0.058	0.047	32.2
Cobalt	0.0030	0.0031	0.0053	0.0038	34.1
Copper	0.018	0.024	0.049	0.030	52.6
Lead	0.0071	0.0054	0.0037	0.0054	30.9
Mercury	0.022	0.015	0.0057	0.014	57.3
Molybdenum	0.10	0.099	0.097	0.10	3.3
Nickel	0.091	0.11	0.23	0.14	53.0
Selenium	<0.0042	<0.0042	<0.0042	<0.0042	0.4
Silver	0.0015	0.0035	<0.00084	<0.0019	73.0
Thallium	<0.00083	<0.00083	<0.00084	<0.00083	0.4
Vanadium	0.00079	0.00074	0.00092	0.00082	11.4
Zinc	0.082	0.26	0.15	0.17	53.6
Total	<0.42	<0.63	<0.66	<0.57	22.9

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Emission Data

Metal	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.036	<0.062	<0.047	<0.052	<0.00087
Arsenic	<0.035	<0.060	<0.045	<0.050	<0.00083
Barium	1.95	3.39	2.53	2.82	0.047
Beryllium	<0.035	<0.060	<0.045	<0.050	<0.00083
Cadmium	0.089	0.15	0.12	0.13	0.0022
Chromium	1.96	3.40	2.54	2.83	0.047
Cobalt	0.16	0.27	0.20	0.23	0.0038
Copper	1.26	2.18	1.63	1.81	0.030
Lead	0.22	0.39	0.29	0.32	0.0054
Mercury	0.59	1.03	0.77	0.86	0.014
Molybdenum	4.14	7.18	5.37	5.97	0.10
Nickel	5.89	10.2	7.63	8.50	0.14
Selenium	<0.17	<0.30	<0.22	<0.25	<0.0042
Silver	<0.080	<0.14	<0.10	<0.12	<0.0019
Thallium	<0.035	<0.060	<0.045	<0.050	<0.00083
Vanadium	0.034	0.059	0.044	0.049	0.00082
Zinc	6.81	11.8	8.83	9.83	0.17
Total	<23.5	<40.8	<30.5	<33.9	<0.57

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Train Metal Analyses

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	0.75	0.75
Arsenic	<1	<0.2	<0.20
Barium	12.1	0.65	12.8
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	<1	0.37	0.37
Cobalt	<0.2	<0.1	<0.20
Copper	<1	0.84	0.84
Lead	<0.5	0.44	0.44
Mercury *	<0.015	<0.050	<0.050
Molybdenum	24.1	<0.1	24.1
Nickel	<0.2	<0.1	<0.20
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	0.18	0.18
Zinc	<6	<3	<6.00
Total			<47.8

* Includes the permanganate impingers.

Note: "<" indicates that the analyte was not detected. Where all values are reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate the total collected in the blank, the remaining fractions are assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate the total collected in the blank.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	160	0.020	0.035	0.026	0.029	0.50
Pentachlorodibenzo-p-dioxins	681	0.086	0.15	0.11	0.13	2.13
Hexachlorodibenzo-p-dioxins	2060	0.26	0.45	0.34	0.38	6.44
Heptachlorodibenzo-p-dioxins	1440	0.18	0.32	0.24	0.26	4.50
Octachlorodibenzo-p-dioxin	1160	0.15	0.26	0.19	0.21	3.63
Total	5501	0.70	1.21	0.91	1.01	17.2

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	20.7	0.0026	0.0046	0.0034	0.0038	0.065
Pentachlorodibenzofurans	154	0.019	0.034	0.025	0.028	0.48
Hexachlorodibenzofurans	372	0.047	0.082	0.062	0.068	1.16
Heptachlorodibenzofurans	308	0.039	0.068	0.051	0.057	0.96
Octachlorodibenzofuran	83.8	0.011	0.018	0.014	0.015	0.26
Total	939	0.12	0.21	0.16	0.17	2.93

Dry Gas Volume Sampled (Rm^3*) :	4.543
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	163	0.020	0.035	0.026	0.029	0.50
Pentachlorodibenzo-p-dioxins	710	0.087	0.15	0.11	0.13	2.20
Hexachlorodibenzo-p-dioxins	2120	0.26	0.45	0.34	0.38	6.57
Heptachlorodibenzo-p-dioxins	1550	0.19	0.33	0.25	0.27	4.80
Octachlorodibenzo-p-dioxin	1230	0.15	0.26	0.20	0.22	3.81
Total	5773	0.70	1.22	0.93	1.02	17.9

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	63.8	0.0078	0.014	0.010	0.011	0.20
Pentachlorodibenzofurans	289	0.035	0.061	0.047	0.051	0.90
Hexachlorodibenzofurans	387	0.047	0.082	0.062	0.069	1.20
Heptachlorodibenzofurans	325	0.040	0.069	0.052	0.058	1.01
Octachlorodibenzofuran	98.7	0.012	0.021	0.016	0.017	0.31
Total	1164	0.14	0.25	0.19	0.21	3.60

Dry Gas Volume Sampled (Rm^3*) :	4.713
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	252	0.031	0.054	0.041	0.044	0.78
Pentachlorodibenzo-p-dioxins	774	0.094	0.16	0.13	0.14	2.38
Hexachlorodibenzo-p-dioxins	2160	0.26	0.46	0.35	0.38	6.65
Heptachlorodibenzo-p-dioxins	1620	0.20	0.34	0.27	0.29	4.99
Octachlorodibenzo-p-dioxin	1450	0.18	0.31	0.24	0.26	4.46
Total	6256	0.76	1.33	1.02	1.10	19.3

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	98.6	0.012	0.021	0.016	0.017	0.30
Pentachlorodibenzofurans	269	0.033	0.057	0.044	0.047	0.83
Hexachlorodibenzofurans	445	0.054	0.094	0.073	0.078	1.37
Heptachlorodibenzofurans	279	0.034	0.059	0.046	0.049	0.86
Octachlorodibenzofuran	107	0.013	0.023	0.018	0.019	0.33
Total	1199	0.15	0.25	0.20	0.21	3.69

Dry Gas Volume Sampled (Rm^3*) :	4.709
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.5
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.020	0.020	0.031	0.024	25.7
Pentachlorodibenzo-p-dioxins	0.086	0.087	0.094	0.089	4.8
Hexachlorodibenzo-p-dioxins	0.26	0.26	0.26	0.26	0.6
Heptachlorodibenzo-p-dioxins	0.18	0.19	0.20	0.19	3.7
Octachlorodibenzo-p-dioxin	0.15	0.15	0.18	0.16	10.1
Total	0.70	0.70	0.76	0.72	4.7

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.0026	0.0078	0.012	0.0075	62.7
Pentachlorodibenzofurans	0.019	0.035	0.033	0.029	29.0
Hexachlorodibenzofurans	0.047	0.047	0.054	0.049	8.0
Heptachlorodibenzofurans	0.039	0.040	0.034	0.037	8.5
Octachlorodibenzofuran	0.011	0.012	0.013	0.012	10.0
Total	0.12	0.14	0.15	0.14	10.7

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.035	0.035	0.054	0.041	26.2
Pentachlorodibenzo-p-dioxins	0.15	0.15	0.16	0.15	5.3
Hexachlorodibenzo-p-dioxins	0.45	0.45	0.46	0.45	1.0
Heptachlorodibenzo-p-dioxins	0.32	0.33	0.34	0.33	4.1
Octachlorodibenzo-p-dioxin	0.26	0.26	0.31	0.27	10.5
Total	1.21	1.22	1.33	1.25	5.1

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.0046	0.014	0.021	0.013	63.1
Pentachlorodibenzofurans	0.034	0.061	0.057	0.051	29.1
Hexachlorodibenzofurans	0.082	0.082	0.094	0.086	8.4
Heptachlorodibenzofurans	0.068	0.069	0.059	0.065	8.1
Octachlorodibenzofuran	0.018	0.021	0.023	0.021	10.4
Total	0.21	0.25	0.25	0.24	10.9

* At 25°C and 1 atmosphere

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.026	0.026	0.041	0.031	27.4
Pentachlorodibenzo-p-dioxins	0.11	0.11	0.13	0.12	6.5
Hexachlorodibenzo-p-dioxins	0.34	0.34	0.35	0.35	2.1
Heptachlorodibenzo-p-dioxins	0.24	0.25	0.27	0.25	5.4
Octachlorodibenzo-p-dioxin	0.19	0.20	0.24	0.21	11.8
Total	0.91	0.93	1.02	0.96	6.4

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.0034	0.010	0.016	0.010	64.0
Pentachlorodibenzofurans	0.025	0.047	0.044	0.039	29.8
Hexachlorodibenzofurans	0.062	0.062	0.073	0.066	9.6
Heptachlorodibenzofurans	0.051	0.052	0.046	0.050	7.1
Octachlorodibenzofuran	0.014	0.016	0.018	0.016	11.7
Total	0.16	0.19	0.20	0.18	12.1

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.029	0.029	0.044	0.034	25.7
Pentachlorodibenzo-p-dioxins	0.13	0.13	0.14	0.13	4.8
Hexachlorodibenzo-p-dioxins	0.38	0.38	0.38	0.38	0.7
Heptachlorodibenzo-p-dioxins	0.26	0.27	0.29	0.27	3.7
Octachlorodibenzo-p-dioxin	0.21	0.22	0.26	0.23	10.1
Total	1.01	1.02	1.10	1.04	4.7

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.0038	0.011	0.017	0.011	62.7
Pentachlorodibenzofurans	0.028	0.051	0.047	0.042	28.9
Hexachlorodibenzofurans	0.068	0.069	0.078	0.072	7.9
Heptachlorodibenzofurans	0.057	0.058	0.049	0.054	8.5
Octachlorodibenzofuran	0.015	0.017	0.019	0.017	10.0
Total	0.17	0.21	0.21	0.20	10.6

* At 25°C and 1 atmosphere

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.50	0.50	0.78	0.59	26.6
Pentachlorodibenzo-p-dioxins	2.13	2.20	2.38	2.24	5.9
Hexachlorodibenzo-p-dioxins	6.44	6.57	6.65	6.55	1.6
Heptachlorodibenzo-p-dioxins	4.50	4.80	4.99	4.76	5.2
Octachlorodibenzo-p-dioxin	3.63	3.81	4.46	3.97	11.1
Total	17.2	17.9	19.3	18.1	5.8

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	0.065	0.20	0.30	0.19	63.5
Pentachlorodibenzofurans	0.48	0.90	0.83	0.73	30.2
Hexachlorodibenzofurans	1.16	1.20	1.37	1.24	8.9
Heptachlorodibenzofurans	0.96	1.01	0.86	0.94	8.0
Octachlorodibenzofuran	0.26	0.31	0.33	0.30	11.5
Total	2.93	3.60	3.69	3.41	12.2

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.024	0.041	0.031	0.034	0.59
Pentachlorodibenzo-p-dioxins	0.089	0.15	0.12	0.13	2.24
Hexachlorodibenzo-p-dioxins	0.26	0.45	0.35	0.38	6.55
Heptachlorodibenzo-p-dioxins	0.19	0.33	0.25	0.27	4.76
Octachlorodibenzo-p-dioxin	0.16	0.27	0.21	0.23	3.97
Total	0.72	1.25	0.96	1.04	18.1

Furans

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.0075	0.013	0.010	0.011	0.19
Pentachlorodibenzofurans	0.029	0.051	0.039	0.042	0.73
Hexachlorodibenzofurans	0.049	0.086	0.066	0.072	1.24
Heptachlorodibenzofurans	0.037	0.065	0.050	0.054	0.94
Octachlorodibenzofuran	0.012	0.021	0.016	0.017	0.30
Total	0.14	0.24	0.18	0.20	3.41

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 33
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<2.4	<3.2
Pentachlorodibenzo-p-dioxins	<1.8	2.25
Hexachlorodibenzo-p-dioxins	<1.6	2.53
Heptachlorodibenzo-p-dioxins	10.6	<2.5
Octachlorodibenzo-p-dioxin	214	211
Total	<230	<221

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<1.3	<1.5
Pentachlorodibenzofurans	<1.3	<1.0
Hexachlorodibenzofurans	<1.9	6.70
Heptachlorodibenzofurans	<1.3	3.59
Octachlorodibenzofuran	<1.2	<4.7
Total	<7.00	<17.5

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 34
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<3.6	<0.46	<0.79	<0.60	<0.66	<0.011
12378-pentachlorodibenzo-p-dioxin	13.4	1.70	2.95	2.22	2.46	0.042
123478-hexachlorodibenzo-p-dioxin	44.9	5.68	9.88	7.43	8.26	0.14
123678-hexachlorodibenzo-p-dioxin	107	13.5	23.6	17.7	19.7	0.33
123789-hexachlorodibenzo-p-dioxin	40.3	5.10	8.87	6.66	7.41	0.13
1234678-heptachlorodibenzo-p-dioxin	721	91.2	159	119	133	2.25
Octachlorodibenzo-p-dioxin	1160	147	255	192	213	3.63
2378-tetrachlorodibenzofuran	<2.2	<0.28	<0.48	<0.36	<0.40	<0.0069
12378-pentachlorodibenzofuran	8.23	1.04	1.81	1.36	1.51	0.026
23478-pentachlorodibenzofuran	19.8	2.51	4.36	3.27	3.64	0.062
123478-hexachlorodibenzofuran	31.1	3.94	6.85	5.14	5.72	0.097
123678-hexachlorodibenzofuran	33.1	4.19	7.29	5.47	6.09	0.10
234678-hexachlorodibenzofuran	59.4	7.52	13.1	9.82	10.9	0.19
123789-hexachlorodibenzofuran	<4.0	<0.51	<0.88	<0.66	<0.74	<0.013
1234678-heptachlorodibenzofuran	167	21.1	36.8	27.6	30.7	0.52
1234789-heptachlorodibenzofuran	36.1	4.57	7.95	5.97	6.64	0.11
Octachlorodibenzofuran	83.8	10.6	18.4	13.9	15.4	0.26
PCB 81	22.9	2.90	5.04	3.79	4.21	0.072
PCB 77	99.7	12.6	21.9	16.5	18.3	0.31
PCB 123	<150	<19.0	<33.0	<24.8	<27.6	<0.47
PCB 118	1740	220	383	288	320	5.44
PCB 114	54.9	6.95	12.1	9.08	10.1	0.17
PCB 105	517	65.4	114	85.5	95.1	1.62
PCB 126	<5.7	<0.72	<1.25	<0.94	<1.05	<0.018
PCB 167	<8.4	<1.06	<1.85	<1.39	<1.54	<0.026
PCB 156	35.9	4.54	7.90	5.94	6.60	0.11
PCB 157	<13	<1.65	<2.86	<2.15	<2.39	<0.041
PCB 169	<9.7	<1.23	<2.14	<1.60	<1.78	<0.030
PCB 189	<22	<2.78	<4.84	<3.64	<4.05	<0.069
Total Dioxins & Furans Only	<2535	<321	<558	<419	<466	<7.92
Total PCBs Only	<2679	<339	<590	<443	<493	<8.37
Total Dioxins & Furans and PCBs	<5214	<660	<1148	<862	<959	<16.3

Dry Gas Volume Sampled (Rm³*) :	4.543
Actual Flowrate (m³/s) :	24.7
Dry Reference Flowrate (Rm³/s*) :	14.2
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 35
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<3.8	<0.46	<0.81	<0.61	<0.67	<0.012
12378-pentachlorodibenzo-p-dioxin	<10	<1.22	<2.12	<1.61	<1.77	<0.031
123478-hexachlorodibenzo-p-dioxin	47.4	5.78	10.1	7.65	8.39	0.15
123678-hexachlorodibenzo-p-dioxin	97.4	11.9	20.7	15.7	17.2	0.30
123789-hexachlorodibenzo-p-dioxin	37.7	4.60	8.00	6.08	6.67	0.12
1234678-heptachlorodibenzo-p-dioxin	774	94.4	164	125	137	2.40
Octachlorodibenzo-p-dioxin	1230	150	261	198	218	3.81
2378-tetrachlorodibenzofuran	<4.5	<0.55	<0.95	<0.73	<0.80	<0.014
12378-pentachlorodibenzofuran	11.4	1.39	2.42	1.84	2.02	0.035
23478-pentachlorodibenzofuran	20.0	2.44	4.24	3.23	3.54	0.062
123478-hexachlorodibenzofuran	32.5	3.96	6.90	5.24	5.75	0.10
123678-hexachlorodibenzofuran	36.8	4.49	7.81	5.94	6.51	0.11
234678-hexachlorodibenzofuran	64.4	7.85	13.7	10.4	11.4	0.20
123789-hexachlorodibenzofuran	<2.4	<0.29	<0.51	<0.39	<0.42	<0.0074
1234678-heptachlorodibenzofuran	174	21.2	36.9	28.1	30.8	0.54
1234789-heptachlorodibenzofuran	36.7	4.48	7.79	5.92	6.50	0.11
Octachlorodibenzofuran	98.7	12.0	20.9	15.9	17.5	0.31
PCB 81	19.8	2.41	4.20	3.19	3.50	0.061
PCB 77	111	13.5	23.6	17.9	19.6	0.34
PCB 123	<110	<13.4	<23.3	<17.7	<19.5	<0.34
PCB 118	2140	261	454	345	379	6.63
PCB 114	55.7	6.79	11.8	8.99	9.86	0.17
PCB 105	650	79.3	138	105	115	2.01
PCB 126	<18	<2.20	<3.82	<2.90	<3.19	<0.056
PCB 167	<11	<1.34	<2.33	<1.77	<1.95	<0.034
PCB 156	<47	<5.73	<9.97	<7.58	<8.32	<0.15
PCB 157	<17	<2.07	<3.61	<2.74	<3.01	<0.053
PCB 169	<4.2	<0.51	<0.89	<0.68	<0.74	<0.013
PCB 189	<18	<2.20	<3.82	<2.90	<3.19	<0.056
Total Dioxins & Furans Only	<2682	<327	<569	<433	<475	<8.31
Total PCBs Only	<3202	<390	<679	<517	<567	<9.92
Total Dioxins & Furans and PCBs	<5883	<718	<1248	<949	<1041	<18.2

Dry Gas Volume Sampled (Rm³*) :	4.713
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 36
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<4.4	<0.53	<0.93	<0.72	<0.77	<0.014
12378-pentachlorodibenzo-p-dioxin	<9.2	<1.12	<1.95	<1.51	<1.62	<0.028
123478-hexachlorodibenzo-p-dioxin	41.8	5.07	8.88	6.85	7.35	0.13
123678-hexachlorodibenzo-p-dioxin	104	12.6	22.1	17.0	18.3	0.32
123789-hexachlorodibenzo-p-dioxin	46.4	5.63	9.85	7.60	8.16	0.14
1234678-heptachlorodibenzo-p-dioxin	804	97.5	171	132	141	2.48
Octachlorodibenzo-p-dioxin	1450	176	308	237	255	4.46
2378-tetrachlorodibenzofuran	4.90	0.59	1.04	0.80	0.86	0.015
12378-pentachlorodibenzofuran	<10	<1.21	<2.12	<1.64	<1.76	<0.031
23478-pentachlorodibenzofuran	21.0	2.55	4.46	3.44	3.70	0.065
123478-hexachlorodibenzofuran	36.8	4.46	7.81	6.03	6.48	0.11
123678-hexachlorodibenzofuran	42.1	5.10	8.94	6.90	7.41	0.13
234678-hexachlorodibenzofuran	70.1	8.50	14.9	11.5	12.3	0.22
123789-hexachlorodibenzofuran	3.93	0.48	0.83	0.64	0.69	0.012
1234678-heptachlorodibenzofuran	184	22.3	39.1	30.1	32.4	0.57
1234789-heptachlorodibenzofuran	35.0	4.24	7.43	5.73	6.16	0.11
Octachlorodibenzofuran	107	13.0	22.7	17.5	18.8	0.33
PCB 81	<35	<4.24	<7.43	<5.73	<6.16	<0.11
PCB 77	195	23.6	41.4	31.9	34.3	0.60
PCB 123	<290	<35.2	<61.6	<47.5	<51.0	<0.89
PCB 118	2910	353	618	477	512	8.96
PCB 114	82.3	9.98	17.5	13.5	14.5	0.25
PCB 105	1060	129	225	174	187	3.26
PCB 126	<11	<1.33	<2.34	<1.80	<1.94	<0.034
PCB 167	27.0	3.27	5.73	4.42	4.75	0.083
PCB 156	95.1	11.5	20.2	15.6	16.7	0.29
PCB 157	26.4	3.20	5.61	4.32	4.65	0.081
PCB 169	<8.2	<0.99	<1.74	<1.34	<1.44	<0.025
PCB 189	<22	<2.67	<4.67	<3.60	<3.87	<0.068
Total Dioxins & Furans Only	<2975	<361	<632	<487	<523	<9.16
Total PCBs Only	<4762	<577	<1011	<780	<838	<14.7
Total Dioxins & Furans and PCBs	<7737	<938	<1643	<1267	<1361	<23.8

Dry Gas Volume Sampled (Rm^3*) :	4.709
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.5
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<0.46	<0.46	<0.53	<0.48	8.8
12378-pentachlorodibenzo-p-dioxin	1.70	<1.22	<1.12	<1.34	23.0
123478-hexachlorodibenzo-p-dioxin	5.68	5.78	5.07	5.51	7.0
123678-hexachlorodibenzo-p-dioxin	13.5	11.9	12.6	12.7	6.6
123789-hexachlorodibenzo-p-dioxin	5.10	4.60	5.63	5.11	10.1
1234678-heptachlorodibenzo-p-dioxin	91.2	94.4	97.5	94.4	3.3
Octachlorodibenzo-p-dioxin	147	150	176	158	10.1
2378-tetrachlorodibenzofuran	<0.28	<0.55	0.59	<0.47	36.0
12378-pentachlorodibenzofuran	1.04	1.39	<1.21	<1.21	14.4
23478-pentachlorodibenzofuran	2.51	2.44	2.55	2.50	2.2
123478-hexachlorodibenzofuran	3.94	3.96	4.46	4.12	7.2
123678-hexachlorodibenzofuran	4.19	4.49	5.10	4.59	10.2
234678-hexachlorodibenzofuran	7.52	7.85	8.50	7.96	6.3
123789-hexachlorodibenzofuran	<0.51	<0.29	0.48	<0.43	27.2
1234678-heptachlorodibenzofuran	21.1	21.2	22.3	21.6	3.0
1234789-heptachlorodibenzofuran	4.57	4.48	4.24	4.43	3.8
Octachlorodibenzofuran	10.6	12.0	13.0	11.9	10.0
PCB 81	2.90	2.41	<4.24	<3.19	29.7
PCB 77	12.6	13.5	23.6	16.6	36.8
PCB 123	<19.0	<13.4	<35.2	<22.5	50.2
PCB 118	220	261	353	278	24.4
PCB 114	6.95	6.79	9.98	7.91	22.7
PCB 105	65.4	79.3	129	91.1	36.4
PCB 126	<0.72	<2.20	<1.33	<1.42	52.3
PCB 167	<1.06	<1.34	3.27	<1.89	63.6
PCB 156	4.54	<5.73	11.5	<7.27	51.4
PCB 157	<1.65	<2.07	3.20	<2.31	34.8
PCB 169	<1.23	<0.51	<0.99	<0.91	40.0
PCB 189	<2.78	<2.20	<2.67	<2.55	12.2
Total Dioxins & Furans Only	<321	<327	<361	<336	6.4
Total PCBs Only	<339	<390	<577	<436	28.8
Total Dioxins & Furans and PCBs	<660	<718	<938	<772	19.0

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 38
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.79	<0.81	<0.93	<0.84	9.3
12378-pentachlorodibenzo-p-dioxin	2.95	<2.12	<1.95	<2.34	22.8
123478-hexachlorodibenzo-p-dioxin	9.88	10.1	8.88	9.61	6.6
123678-hexachlorodibenzo-p-dioxin	23.6	20.7	22.1	22.1	6.5
123789-hexachlorodibenzo-p-dioxin	8.87	8.00	9.85	8.91	10.4
1234678-heptachlorodibenzo-p-dioxin	159	164	171	165	3.7
Octachlorodibenzo-p-dioxin	255	261	308	275	10.5
2378-tetrachlorodibenzofuran	<0.48	<0.95	1.04	<0.83	36.2
12378-pentachlorodibenzofuran	1.81	2.42	<2.12	<2.12	14.3
23478-pentachlorodibenzofuran	4.36	4.24	4.46	4.35	2.5
123478-hexachlorodibenzofuran	6.85	6.90	7.81	7.19	7.6
123678-hexachlorodibenzofuran	7.29	7.81	8.94	8.01	10.6
234678-hexachlorodibenzofuran	13.1	13.7	14.9	13.9	6.7
123789-hexachlorodibenzofuran	<0.88	<0.51	0.83	<0.74	27.3
1234678-heptachlorodibenzofuran	36.8	36.9	39.1	37.6	3.4
1234789-heptachlorodibenzofuran	7.95	7.79	7.43	7.72	3.4
Octachlorodibenzofuran	18.4	20.9	22.7	20.7	10.4
PCB 81	5.04	4.20	<7.43	<5.56	30.2
PCB 77	21.9	23.6	41.4	29.0	37.3
PCB 123	<33.0	<23.3	<61.6	<39.3	50.6
PCB 118	383	454	618	485	24.8
PCB 114	12.1	11.8	17.5	13.8	23.1
PCB 105	114	138	225	159	36.8
PCB 126	<1.25	<3.82	<2.34	<2.47	52.1
PCB 167	<1.85	<2.33	5.73	<3.31	64.0
PCB 156	7.90	<9.97	20.2	<12.7	51.9
PCB 157	<2.86	<3.61	5.61	<4.02	35.3
PCB 169	<2.14	<0.89	<1.74	<1.59	40.0
PCB 189	<4.84	<3.82	<4.67	<4.44	12.3
Total Dioxins & Furans Only	<558	<569	<632	<586	6.8
Total PCBs Only	<590	<679	<1011	<760	29.2
Total Dioxins & Furans and PCBs	<1148	<1248	<1643	<1346	19.4

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 39
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.60	<0.61	<0.72	<0.64	10.5
12378-pentachlorodibenzo-p-dioxin	2.22	<1.61	<1.51	<1.78	21.5
123478-hexachlorodibenzo-p-dioxin	7.43	7.65	6.85	7.31	5.7
123678-hexachlorodibenzo-p-dioxin	17.7	15.7	17.0	16.8	6.0
123789-hexachlorodibenzo-p-dioxin	6.66	6.08	7.60	6.78	11.3
1234678-heptachlorodibenzo-p-dioxin	119	125	132	125	5.0
Octachlorodibenzo-p-dioxin	192	198	237	209	11.8
2378-tetrachlorodibenzofuran	<0.36	<0.73	0.80	<0.63	37.2
12378-pentachlorodibenzofuran	1.36	1.84	<1.64	<1.61	14.9
23478-pentachlorodibenzofuran	3.27	3.23	3.44	3.31	3.4
123478-hexachlorodibenzofuran	5.14	5.24	6.03	5.47	8.8
123678-hexachlorodibenzofuran	5.47	5.94	6.90	6.10	11.9
234678-hexachlorodibenzofuran	9.82	10.4	11.5	10.6	8.0
123789-hexachlorodibenzofuran	<0.66	<0.39	0.64	<0.56	27.2
1234678-heptachlorodibenzofuran	27.6	28.1	30.1	28.6	4.7
1234789-heptachlorodibenzofuran	5.97	5.92	5.73	5.87	2.1
Octachlorodibenzofuran	13.9	15.9	17.5	15.8	11.7
PCB 81	3.79	3.19	<5.73	<4.24	31.3
PCB 77	16.5	17.9	31.9	22.1	38.6
PCB 123	<24.8	<17.7	<47.5	<30.0	51.8
PCB 118	288	345	477	370	26.2
PCB 114	9.08	8.99	13.5	10.5	24.4
PCB 105	85.5	105	174	121	38.2
PCB 126	<0.94	<2.90	<1.80	<1.88	52.2
PCB 167	<1.39	<1.77	4.42	<2.53	65.3
PCB 156	5.94	<7.58	15.6	<9.70	53.2
PCB 157	<2.15	<2.74	4.32	<3.07	36.6
PCB 169	<1.60	<0.68	<1.34	<1.21	39.5
PCB 189	<3.64	<2.90	<3.60	<3.38	12.2
Total Dioxins & Furans Only	<419	<433	<487	<446	8.1
Total PCBs Only	<443	<517	<780	<580	30.5
Total Dioxins & Furans and PCBs	<862	<949	<1267	<1026	20.8

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 40
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.66	<0.67	<0.77	<0.70	8.8
12378-pentachlorodibenzo-p-dioxin	2.46	<1.77	<1.62	<1.95	23.1
123478-hexachlorodibenzo-p-dioxin	8.26	8.39	7.35	8.00	7.0
123678-hexachlorodibenzo-p-dioxin	19.7	17.2	18.3	18.4	6.6
123789-hexachlorodibenzo-p-dioxin	7.41	6.67	8.16	7.42	10.1
1234678-heptachlorodibenzo-p-dioxin	133	137	141	137	3.2
Octachlorodibenzo-p-dioxin	213	218	255	229	10.1
2378-tetrachlorodibenzofuran	<0.40	<0.80	0.86	<0.69	36.0
12378-pentachlorodibenzofuran	1.51	2.02	<1.76	<1.76	14.3
23478-pentachlorodibenzofuran	3.64	3.54	3.70	3.63	2.2
123478-hexachlorodibenzofuran	5.72	5.75	6.48	5.98	7.1
123678-hexachlorodibenzofuran	6.09	6.51	7.41	6.67	10.1
234678-hexachlorodibenzofuran	10.9	11.4	12.3	11.6	6.2
123789-hexachlorodibenzofuran	<0.74	<0.42	0.69	<0.62	27.2
1234678-heptachlorodibenzofuran	30.7	30.8	32.4	31.3	3.0
1234789-heptachlorodibenzofuran	6.64	6.50	6.16	6.43	3.8
Octachlorodibenzofuran	15.4	17.5	18.8	17.2	10.0
PCB 81	4.21	3.50	<6.16	<4.62	29.7
PCB 77	18.3	19.6	34.3	24.1	36.8
PCB 123	<27.6	<19.5	<51.0	<32.7	50.1
PCB 118	320	379	512	404	24.4
PCB 114	10.1	9.86	14.5	11.5	22.7
PCB 105	95.1	115	187	132	36.4
PCB 126	<1.05	<3.19	<1.94	<2.06	52.2
PCB 167	<1.54	<1.95	4.75	<2.75	63.6
PCB 156	6.60	<8.32	16.7	<10.6	51.4
PCB 157	<2.39	<3.01	4.65	<3.35	34.8
PCB 169	<1.78	<0.74	<1.44	<1.32	40.1
PCB 189	<4.05	<3.19	<3.87	<3.70	12.3
Total Dioxins & Furans Only	<466	<475	<523	<488	6.3
Total PCBs Only	<493	<567	<838	<632	28.7
Total Dioxins & Furans and PCBs	<959	<1041	<1361	<1120	19.0

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.011	<0.012	<0.014	<0.012	9.9
12378-pentachlorodibenzo-p-dioxin	0.042	<0.031	<0.028	<0.034	21.3
123478-hexachlorodibenzo-p-dioxin	0.14	0.15	0.13	0.14	6.6
123678-hexachlorodibenzo-p-dioxin	0.33	0.30	0.32	0.32	5.1
123789-hexachlorodibenzo-p-dioxin	0.13	0.12	0.14	0.13	10.3
1234678-heptachlorodibenzo-p-dioxin	2.25	2.40	2.48	2.38	4.7
Octachlorodibenzo-p-dioxin	3.63	3.81	4.46	3.97	11.1
2378-tetrachlorodibenzofuran	<0.0069	<0.014	0.015	<0.012	37.2
12378-pentachlorodibenzofuran	0.026	0.035	<0.031	<0.031	15.7
23478-pentachlorodibenzofuran	0.062	0.062	0.065	0.063	2.5
123478-hexachlorodibenzofuran	0.097	0.10	0.11	0.10	8.2
123678-hexachlorodibenzofuran	0.10	0.11	0.13	0.12	11.4
234678-hexachlorodibenzofuran	0.19	0.20	0.22	0.20	7.5
123789-hexachlorodibenzofuran	<0.013	<0.0074	0.012	<0.011	26.4
1234678-heptachlorodibenzofuran	0.52	0.54	0.57	0.54	4.1
1234789-heptachlorodibenzofuran	0.11	0.11	0.11	0.11	2.9
Octachlorodibenzofuran	0.26	0.31	0.33	0.30	11.5
PCB 81	0.072	0.061	<0.11	<0.080	30.4
PCB 77	0.31	0.34	0.60	0.42	37.8
PCB 123	<0.47	<0.34	<0.89	<0.57	50.9
PCB 118	5.44	6.63	8.96	7.01	25.6
PCB 114	0.17	0.17	0.25	0.20	23.6
PCB 105	1.62	2.01	3.26	2.30	37.4
PCB 126	<0.018	<0.056	<0.034	<0.036	53.2
PCB 167	<0.026	<0.034	0.083	<0.048	64.5
PCB 156	0.11	<0.15	0.29	<0.18	52.4
PCB 157	<0.041	<0.053	0.081	<0.058	35.9
PCB 169	<0.030	<0.013	<0.025	<0.023	38.9
PCB 189	<0.069	<0.056	<0.068	<0.064	11.3
Total Dioxins & Furans Only	<7.92	<8.31	<9.16	<8.46	7.5
Total PCBs Only	<8.37	<9.92	<14.7	<11.0	29.8
Total Dioxins & Furans and PCBs	<16.3	<18.2	<23.8	<19.4	20.1

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.48	<0.84	<0.64	<0.70	<0.012
12378-pentachlorodibenzo-p-dioxin	<1.34	<2.34	<1.78	<1.95	<0.034
123478-hexachlorodibenzo-p-dioxin	5.51	9.61	7.31	8.00	0.14
123678-hexachlorodibenzo-p-dioxin	12.7	22.1	16.8	18.4	0.32
123789-hexachlorodibenzo-p-dioxin	5.11	8.91	6.78	7.42	0.13
1234678-heptachlorodibenzo-p-dioxin	94.4	165	125	137	2.38
Octachlorodibenzo-p-dioxin	158	275	209	229	3.97
2378-tetrachlorodibenzofuran	<0.47	<0.83	<0.63	<0.69	<0.012
12378-pentachlorodibenzofuran	<1.21	<2.12	<1.61	<1.76	<0.031
23478-pentachlorodibenzofuran	2.50	4.35	3.31	3.63	0.063
123478-hexachlorodibenzofuran	4.12	7.19	5.47	5.98	0.10
123678-hexachlorodibenzofuran	4.59	8.01	6.10	6.67	0.12
234678-hexachlorodibenzofuran	7.96	13.9	10.6	11.6	0.20
123789-hexachlorodibenzofuran	<0.43	<0.74	<0.56	<0.62	<0.011
1234678-heptachlorodibenzofuran	21.6	37.6	28.6	31.3	0.54
1234789-heptachlorodibenzofuran	4.43	7.72	5.87	6.43	0.11
Octachlorodibenzofuran	11.9	20.7	15.8	17.2	0.30
PCB 81	<3.19	<5.56	<4.24	<4.62	<0.080
PCB 77	16.6	29.0	22.1	24.1	0.42
PCB 123	<22.5	<39.3	<30.0	<32.7	<0.57
PCB 118	278	485	370	404	7.01
PCB 114	7.91	13.8	10.5	11.5	0.20
PCB 105	91.1	159	121	132	2.30
PCB 126	<1.42	<2.47	<1.88	<2.06	<0.036
PCB 167	<1.89	<3.31	<2.53	<2.75	<0.048
PCB 156	<7.27	<12.7	<9.70	<10.6	<0.18
PCB 157	<2.31	<4.02	<3.07	<3.35	<0.058
PCB 169	<0.91	<1.59	<1.21	<1.32	<0.023
PCB 189	<2.55	<4.44	<3.38	<3.70	<0.064
Total Dioxins & Furans Only	<336	<586	<446	<488	<8.46
Total PCBs Only	<436	<760	<580	<632	<11.0
Total Dioxins & Furans and PCBs	<772	<1346	<1026	<1120	<19.4

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 43
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<2.4	<3.2
12378-pentachlorodibenzo-p-dioxin	<1.8	2.25
123478-hexachlorodibenzo-p-dioxin	<1.6	2.53
123678-hexachlorodibenzo-p-dioxin	<1.5	<3.3
123789-hexachlorodibenzo-p-dioxin	<1.6	<2.1
1234678-heptachlorodibenzo-p-dioxin	6.21	<7.2
Octachlorodibenzo-p-dioxin	214	211
2378-tetrachlorodibenzofuran	<1.3	<1.5
12378-pentachlorodibenzofuran	<1.3	<2.3
23478-pentachlorodibenzofuran	<1.3	<1.9
123478-hexachlorodibenzofuran	<1.6	2.79
123678-hexachlorodibenzofuran	<1.5	<2.3
234678-hexachlorodibenzofuran	<1.6	<2.2
123789-hexachlorodibenzofuran	<3.7	3.91
1234678-heptachlorodibenzofuran	<0.99	3.59
1234789-heptachlorodibenzofuran	<1.8	<1.7
Octachlorodibenzofuran	<1.2	<4.7
PCB 81	<8.8	<5.3
PCB 77	43.3	<6.7
PCB 123	<17	<3.4
PCB 118	233	<31
PCB 114	<9.5	<3.0
PCB 105	<110	20.6
PCB 126	<3.0	<3.1
PCB 167	<4.7	<2.3
PCB 156	18.3	<2.5
PCB 157	<6.8	<2.5
PCB 169	<3.7	<2.6
PCB 189	<1.7	<2.0
Total Dioxins & Furans Only	<245	<258
Total PCBs Only	<460	<85.0
Total Dioxins & Furans and PCBs	<705	<343

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 44
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.46	<0.46	<0.53	<0.48
12378-pentachlorodibenzo-p-dioxin	1.000	1.70	<1.22	<1.12	<1.34
123478-hexachlorodibenzo-p-dioxin	0.100	0.57	0.58	0.51	0.55
123678-hexachlorodibenzo-p-dioxin	0.100	1.35	1.19	1.26	1.27
123789-hexachlorodibenzo-p-dioxin	0.100	0.51	0.46	0.56	0.51
1234678-heptachlorodibenzo-p-dioxin	0.010	0.91	0.94	0.97	0.94
Octachlorodibenzo-p-dioxin	0.0003	0.044	0.045	0.053	0.047
2378-tetrachlorodibenzofuran	0.100	<0.028	<0.055	0.059	<0.047
12378-pentachlorodibenzofuran	0.030	0.031	0.042	<0.036	<0.036
23478-pentachlorodibenzofuran	0.300	0.75	0.73	0.76	0.75
123478-hexachlorodibenzofuran	0.100	0.39	0.40	0.45	0.41
123678-hexachlorodibenzofuran	0.100	0.42	0.45	0.51	0.46
234678-hexachlorodibenzofuran	0.100	0.75	0.79	0.85	0.80
123789-hexachlorodibenzofuran	0.100	<0.051	<0.029	0.048	<0.043
1234678-heptachlorodibenzofuran	0.010	0.21	0.21	0.22	0.22
1234789-heptachlorodibenzofuran	0.010	0.046	0.045	0.042	0.044
Octachlorodibenzofuran	0.0003	0.0032	0.0036	0.0039	0.0036
PCB 81	0.0003	0.00087	0.00072	<0.0013	<0.00096
PCB 77	0.0001	0.0013	0.0014	0.0024	0.0017
PCB 123	0.00003	<0.00057	<0.00040	<0.0011	<0.00068
PCB 118	0.00003	0.0066	0.0078	0.011	0.0083
PCB 114	0.00003	0.00021	0.00020	0.00030	0.00024
PCB 105	0.00003	0.0020	0.0024	0.0039	0.0027
PCB 126	0.100	<0.072	<0.22	<0.13	<0.14
PCB 167	0.00003	<0.000032	<0.000040	0.000098	<0.000057
PCB 156	0.00003	0.00014	<0.00017	0.00035	<0.00022
PCB 157	0.00003	<0.000049	<0.000062	0.000096	<0.000069
PCB 169	0.030	<0.037	<0.015	<0.030	<0.027
PCB 189	0.00003	<0.000084	<0.000066	<0.000080	<0.000076
Total Dioxins & Furans Only		<8.23	<7.65	<7.99	<7.95
Total PCBs Only		<0.12	<0.25	<0.18	<0.18
Total Dioxins & Furans and PCBs		<8.35	<7.89	<8.17	<8.14

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 45
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.79	<0.81	<0.93	<0.84
12378-pentachlorodibenzo-p-dioxin	1.000	2.95	<2.12	<1.95	<2.34
123478-hexachlorodibenzo-p-dioxin	0.100	0.99	1.01	0.89	0.96
123678-hexachlorodibenzo-p-dioxin	0.100	2.36	2.07	2.21	2.21
123789-hexachlorodibenzo-p-dioxin	0.100	0.89	0.80	0.99	0.89
1234678-heptachlorodibenzo-p-dioxin	0.010	1.59	1.64	1.71	1.65
Octachlorodibenzo-p-dioxin	0.0003	0.077	0.078	0.092	0.082
2378-tetrachlorodibenzofuran	0.100	<0.048	<0.095	0.10	<0.083
12378-pentachlorodibenzofuran	0.030	0.054	0.073	<0.064	<0.064
23478-pentachlorodibenzofuran	0.300	1.31	1.27	1.34	1.31
123478-hexachlorodibenzofuran	0.100	0.68	0.69	0.78	0.72
123678-hexachlorodibenzofuran	0.100	0.73	0.78	0.89	0.80
234678-hexachlorodibenzofuran	0.100	1.31	1.37	1.49	1.39
123789-hexachlorodibenzofuran	0.100	<0.088	<0.051	0.083	<0.074
1234678-heptachlorodibenzofuran	0.010	0.37	0.37	0.39	0.38
1234789-heptachlorodibenzofuran	0.010	0.079	0.078	0.074	0.077
Octachlorodibenzofuran	0.0003	0.0055	0.0063	0.0068	0.0062
PCB 81	0.0003	0.0015	0.0013	<0.0022	<0.0017
PCB 77	0.0001	0.0022	0.0024	0.0041	0.0029
PCB 123	0.00003	<0.00099	<0.00070	<0.0018	<0.0012
PCB 118	0.00003	0.011	0.014	0.019	0.015
PCB 114	0.00003	0.00036	0.00035	0.00052	0.00041
PCB 105	0.00003	0.0034	0.0041	0.0068	0.0048
PCB 126	0.100	<0.13	<0.38	<0.23	<0.25
PCB 167	0.00003	<0.000055	<0.000070	0.00017	<0.000099
PCB 156	0.00003	0.00024	<0.00030	0.00061	<0.00038
PCB 157	0.00003	<0.000086	<0.00011	0.00017	<0.00012
PCB 169	0.030	<0.064	<0.027	<0.052	<0.048
PCB 189	0.00003	<0.00015	<0.00011	<0.00014	<0.00013
Total Dioxins & Furans Only		<14.3	<13.3	<14.0	<13.9
Total PCBs Only		<0.21	<0.43	<0.32	<0.32
Total Dioxins & Furans and PCBs		<14.5	<13.7	<14.3	<14.2

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.60	<0.61	<0.72	<0.64
12378-pentachlorodibenzo-p-dioxin	1.000	2.22	<1.61	<1.51	<1.78
123478-hexachlorodibenzo-p-dioxin	0.100	0.74	0.76	0.68	0.73
123678-hexachlorodibenzo-p-dioxin	0.100	1.77	1.57	1.70	1.68
123789-hexachlorodibenzo-p-dioxin	0.100	0.67	0.61	0.76	0.68
1234678-heptachlorodibenzo-p-dioxin	0.010	1.19	1.25	1.32	1.25
Octachlorodibenzo-p-dioxin	0.0003	0.058	0.060	0.071	0.063
2378-tetrachlorodibenzofuran	0.100	<0.036	<0.073	0.080	<0.063
12378-pentachlorodibenzofuran	0.030	0.041	0.055	<0.049	<0.048
23478-pentachlorodibenzofuran	0.300	0.98	0.97	1.03	0.99
123478-hexachlorodibenzofuran	0.100	0.51	0.52	0.60	0.55
123678-hexachlorodibenzofuran	0.100	0.55	0.59	0.69	0.61
234678-hexachlorodibenzofuran	0.100	0.98	1.04	1.15	1.06
123789-hexachlorodibenzofuran	0.100	<0.066	<0.039	0.064	<0.056
1234678-heptachlorodibenzofuran	0.010	0.28	0.28	0.30	0.29
1234789-heptachlorodibenzofuran	0.010	0.060	0.059	0.057	0.059
Octachlorodibenzofuran	0.0003	0.0042	0.0048	0.0053	0.0047
PCB 81	0.0003	0.0011	0.00096	<0.0017	<0.0013
PCB 77	0.0001	0.0016	0.0018	0.0032	0.0022
PCB 123	0.00003	<0.00074	<0.00053	<0.0014	<0.00090
PCB 118	0.00003	0.0086	0.010	0.014	0.011
PCB 114	0.00003	0.00027	0.00027	0.00040	0.00032
PCB 105	0.00003	0.0026	0.0031	0.0052	0.0036
PCB 126	0.100	<0.094	<0.29	<0.18	<0.19
PCB 167	0.00003	<0.000042	<0.000053	0.00013	<0.000076
PCB 156	0.00003	0.00018	<0.00023	0.00047	<0.00029
PCB 157	0.00003	<0.000064	<0.000082	0.00013	<0.000092
PCB 169	0.030	<0.048	<0.020	<0.040	<0.036
PCB 189	0.00003	<0.00011	<0.000087	<0.00011	<0.00010
Total Dioxins & Furans Only		<10.7	<10.1	<10.8	<10.6
Total PCBs Only		<0.16	<0.33	<0.25	<0.24
Total Dioxins & Furans and PCBs		<10.9	<10.4	<11.0	<10.8

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46A
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.30	0.31	0.36	0.32
12378-pentachlorodibenzo-p-dioxin	1.000	2.22	0.81	0.75	1.26
123478-hexachlorodibenzo-p-dioxin	0.100	0.74	0.76	0.68	0.73
123678-hexachlorodibenzo-p-dioxin	0.100	1.77	1.57	1.70	1.68
123789-hexachlorodibenzo-p-dioxin	0.100	0.67	0.61	0.76	0.68
1234678-heptachlorodibenzo-p-dioxin	0.010	1.19	1.25	1.32	1.25
Octachlorodibenzo-p-dioxin	0.0003	0.058	0.060	0.071	0.063
2378-tetrachlorodibenzofuran	0.100	0.018	0.036	0.080	0.045
12378-pentachlorodibenzofuran	0.030	0.041	0.055	0.025	0.040
23478-pentachlorodibenzofuran	0.300	0.98	0.97	1.03	0.99
123478-hexachlorodibenzofuran	0.100	0.51	0.52	0.60	0.55
123678-hexachlorodibenzofuran	0.100	0.55	0.59	0.69	0.61
234678-hexachlorodibenzofuran	0.100	0.98	1.04	1.15	1.06
123789-hexachlorodibenzofuran	0.100	0.033	0.019	0.064	0.039
1234678-heptachlorodibenzofuran	0.010	0.28	0.28	0.30	0.29
1234789-heptachlorodibenzofuran	0.010	0.060	0.059	0.057	0.059
Octachlorodibenzofuran	0.0003	0.0042	0.0048	0.0053	0.0047
PCB 81	0.0003	0.0011	0.00096	0.00086	0.00098
PCB 77	0.0001	0.0016	0.0018	0.0032	0.0022
PCB 123	0.00003	0.00037	0.00027	0.00071	0.00045
PCB 118	0.00003	0.0086	0.010	0.014	0.011
PCB 114	0.00003	0.00027	0.00027	0.00040	0.00032
PCB 105	0.00003	0.0026	0.0031	0.0052	0.0036
PCB 126	0.100	0.047	0.15	0.090	0.094
PCB 167	0.00003	0.000021	0.000027	0.00013	0.000060
PCB 156	0.00003	0.00018	0.00011	0.00047	0.00025
PCB 157	0.00003	0.000032	0.000041	0.00013	0.000068
PCB 169	0.030	0.024	0.010	0.020	0.018
PCB 189	0.00003	0.000055	0.000044	0.000054	0.000051
Total Dioxins & Furans Only		10.4	8.95	9.66	9.67
Total PCBs Only		0.086	0.17	0.14	0.13
Total Dioxins & Furans and PCBs		10.5	9.12	9.79	9.80

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 46B
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00	<0.60	<0.61	<0.72	<0.64
12378-pentachlorodibenzo-p-dioxin	0.50	1.11	<0.81	<0.75	<0.89
123478-hexachlorodibenzo-p-dioxin	0.10	0.74	0.76	0.68	0.73
123678-hexachlorodibenzo-p-dioxin	0.10	1.77	1.57	1.70	1.68
123789-hexachlorodibenzo-p-dioxin	0.10	0.67	0.61	0.76	0.68
1234678-heptachlorodibenzo-p-dioxin	0.01	1.19	1.25	1.32	1.25
Octachlorodibenzo-p-dioxin	0.00	0.19	0.20	0.24	0.21
2378-tetrachlorodibenzofuran	0.10	<0.036	<0.073	0.080	<0.063
12378-pentachlorodibenzofuran	0.05	0.068	0.092	<0.082	<0.081
23478-pentachlorodibenzofuran	0.50	1.64	1.61	1.72	1.66
123478-hexachlorodibenzofuran	0.10	0.51	0.52	0.60	0.55
123678-hexachlorodibenzofuran	0.10	0.55	0.59	0.69	0.61
234678-hexachlorodibenzofuran	0.10	0.98	1.04	1.15	1.06
123789-hexachlorodibenzofuran	0.10	<0.066	<0.039	0.064	<0.056
1234678-heptachlorodibenzofuran	0.01	0.28	0.28	0.30	0.29
1234789-heptachlorodibenzofuran	0.01	0.060	0.059	0.057	0.059
Octachlorodibenzofuran	0.00	0.014	0.016	0.018	0.016
Total Dioxins & Furans		<10.5	<10.1	<10.9	<10.5
In-Stack Emission Limit					60

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 47
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.66	<0.67	<0.77	<0.70
12378-pentachlorodibenzo-p-dioxin	1.000	2.46	<1.77	<1.62	<1.95
123478-hexachlorodibenzo-p-dioxin	0.100	0.83	0.84	0.74	0.80
123678-hexachlorodibenzo-p-dioxin	0.100	1.97	1.72	1.83	1.84
123789-hexachlorodibenzo-p-dioxin	0.100	0.74	0.67	0.82	0.74
1234678-heptachlorodibenzo-p-dioxin	0.010	1.33	1.37	1.41	1.37
Octachlorodibenzo-p-dioxin	0.0003	0.064	0.065	0.077	0.069
2378-tetrachlorodibenzofuran	0.100	<0.040	<0.080	0.086	<0.069
12378-pentachlorodibenzofuran	0.030	0.045	0.061	<0.053	<0.053
23478-pentachlorodibenzofuran	0.300	1.09	1.06	1.11	1.09
123478-hexachlorodibenzofuran	0.100	0.57	0.58	0.65	0.60
123678-hexachlorodibenzofuran	0.100	0.61	0.65	0.74	0.67
234678-hexachlorodibenzofuran	0.100	1.09	1.14	1.23	1.16
123789-hexachlorodibenzofuran	0.100	<0.074	<0.042	0.069	<0.062
1234678-heptachlorodibenzofuran	0.010	0.31	0.31	0.32	0.31
1234789-heptachlorodibenzofuran	0.010	0.066	0.065	0.062	0.064
Octachlorodibenzofuran	0.0003	0.0046	0.0052	0.0056	0.0052
PCB 81	0.0003	0.0013	0.0011	<0.0018	<0.0014
PCB 77	0.0001	0.0018	0.0020	0.0034	0.0024
PCB 123	0.00003	<0.00083	<0.00058	<0.0015	<0.00098
PCB 118	0.00003	0.0096	0.011	0.015	0.012
PCB 114	0.00003	0.00030	0.00030	0.00043	0.00034
PCB 105	0.00003	0.0029	0.0035	0.0056	0.0040
PCB 126	0.100	<0.10	<0.32	<0.19	<0.21
PCB 167	0.00003	<0.000046	<0.000058	0.00014	<0.000082
PCB 156	0.00003	0.00020	<0.00025	0.00050	<0.00032
PCB 157	0.00003	<0.000072	<0.000090	0.00014	<0.00010
PCB 169	0.030	<0.054	<0.022	<0.043	<0.040
PCB 189	0.00003	<0.00012	<0.000096	<0.00012	<0.00011
Total Dioxins & Furans Only		<12.0	<11.1	<11.6	<11.5
Total PCBs Only		<0.18	<0.36	<0.27	<0.27
Total Dioxins & Furans and PCBs		<12.1	<11.5	<11.9	<11.8

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 48
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.011	<0.012	<0.014	<0.012
12378-pentachlorodibenzo-p-dioxin	1.000	0.042	<0.031	<0.028	<0.034
123478-hexachlorodibenzo-p-dioxin	0.100	0.014	0.015	0.013	0.014
123678-hexachlorodibenzo-p-dioxin	0.100	0.033	0.030	0.032	0.032
123789-hexachlorodibenzo-p-dioxin	0.100	0.013	0.012	0.014	0.013
1234678-heptachlorodibenzo-p-dioxin	0.010	0.023	0.024	0.025	0.024
Octachlorodibenzo-p-dioxin	0.0003	0.0011	0.0011	0.0013	0.0012
2378-tetrachlorodibenzofuran	0.100	<0.00069	<0.0014	0.0015	<0.0012
12378-pentachlorodibenzofuran	0.030	0.00077	0.0011	<0.00092	<0.00092
23478-pentachlorodibenzofuran	0.300	0.019	0.019	0.019	0.019
123478-hexachlorodibenzofuran	0.100	0.0097	0.010	0.011	0.010
123678-hexachlorodibenzofuran	0.100	0.010	0.011	0.013	0.012
234678-hexachlorodibenzofuran	0.100	0.019	0.020	0.022	0.020
123789-hexachlorodibenzofuran	0.100	<0.0013	<0.00074	0.0012	<0.0011
1234678-heptachlorodibenzofuran	0.010	0.0052	0.0054	0.0057	0.0054
1234789-heptachlorodibenzofuran	0.010	0.0011	0.0011	0.0011	0.0011
Octachlorodibenzofuran	0.0003	0.000079	0.000092	0.000099	0.000090
PCB 81	0.0003	0.000021	0.000018	<0.000032	<0.000024
PCB 77	0.0001	0.000031	0.000034	0.000060	0.000042
PCB 123	0.00003	<0.000014	<0.000010	<0.000027	<0.000017
PCB 118	0.00003	0.00016	0.00020	0.00027	0.00021
PCB 114	0.00003	0.0000051	0.0000052	0.0000076	0.0000060
PCB 105	0.00003	0.000048	0.000060	0.000098	0.000069
PCB 126	0.100	<0.0018	<0.0056	<0.0034	<0.0036
PCB 167	0.00003	<0.00000079	<0.0000010	0.0000025	<0.0000014
PCB 156	0.00003	0.0000034	<0.0000044	0.0000088	<0.0000055
PCB 157	0.00003	<0.0000012	<0.0000016	0.0000024	<0.0000017
PCB 169	0.030	<0.00091	<0.00039	<0.00076	<0.00069
PCB 189	0.00003	<0.0000021	<0.0000017	<0.0000020	<0.0000019
Total Dioxins & Furans Only		<0.20	<0.19	<0.20	<0.20
Total PCBs Only		<0.0030	<0.0063	<0.0047	<0.0046
Total Dioxins & Furans and PCBs		<0.21	<0.20	<0.21	<0.20

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<0.48	<0.84	<0.64	<0.70	<0.012
12378-pentachlorodibenzo-p-dioxin	<1.34	<2.34	<1.78	<1.95	<0.034
123478-hexachlorodibenzo-p-dioxin	0.55	0.96	0.73	0.80	0.014
123678-hexachlorodibenzo-p-dioxin	1.27	2.21	1.68	1.84	0.032
123789-hexachlorodibenzo-p-dioxin	0.51	0.89	0.68	0.74	0.013
1234678-heptachlorodibenzo-p-dioxin	0.94	1.65	1.25	1.37	0.024
Octachlorodibenzo-p-dioxin	0.047	0.082	0.063	0.069	0.0012
2378-tetrachlorodibenzofuran	<0.047	<0.083	<0.063	<0.069	<0.0012
12378-pentachlorodibenzofuran	<0.036	<0.064	<0.048	<0.053	<0.00092
23478-pentachlorodibenzofuran	0.75	1.31	0.99	1.09	0.019
123478-hexachlorodibenzofuran	0.41	0.72	0.55	0.60	0.010
123678-hexachlorodibenzofuran	0.46	0.80	0.61	0.67	0.012
234678-hexachlorodibenzofuran	0.80	1.39	1.06	1.16	0.020
123789-hexachlorodibenzofuran	<0.043	<0.074	<0.056	<0.062	<0.0011
1234678-heptachlorodibenzofuran	0.22	0.38	0.29	0.31	0.0054
1234789-heptachlorodibenzofuran	0.044	0.077	0.059	0.064	0.0011
Octachlorodibenzofuran	0.0036	0.0062	0.0047	0.0052	0.000090
PCB 81	<0.00096	<0.0017	<0.0013	<0.0014	<0.000024
PCB 77	0.0017	0.0029	0.0022	0.0024	0.000042
PCB 123	<0.00068	<0.0012	<0.00090	<0.00098	<0.000017
PCB 118	0.0083	0.015	0.011	0.012	0.00021
PCB 114	0.00024	0.00041	0.00032	0.00034	0.0000060
PCB 105	0.0027	0.0048	0.0036	0.0040	0.000069
PCB 126	<0.14	<0.25	<0.19	<0.21	<0.0036
PCB 167	<0.000057	<0.000099	<0.000076	<0.000082	<0.0000014
PCB 156	<0.00022	<0.00038	<0.00029	<0.00032	<0.0000055
PCB 157	<0.000069	<0.00012	<0.000092	<0.00010	<0.0000017
PCB 169	<0.027	<0.048	<0.036	<0.040	<0.00069
PCB 189	<0.000076	<0.00013	<0.00010	<0.00011	<0.0000019
Total Dioxins & Furans Only	<7.95	<13.9	<10.6	<11.5	<0.20
Total PCBs Only	<0.18	<0.32	<0.24	<0.27	<0.0046
Total Dioxins & Furans and PCBs	<8.14	<14.2	<10.8	<11.8	<0.20

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 50
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm³**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.24	0.42	0.32	0.35	0.0061
12378-pentachlorodibenzo-p-dioxin	0.95	1.66	1.26	1.39	0.024
123478-hexachlorodibenzo-p-dioxin	0.55	0.96	0.73	0.80	0.014
123678-hexachlorodibenzo-p-dioxin	1.27	2.21	1.68	1.84	0.032
123789-hexachlorodibenzo-p-dioxin	0.51	0.89	0.68	0.74	0.013
1234678-heptachlorodibenzo-p-dioxin	0.94	1.65	1.25	1.37	0.024
Octachlorodibenzo-p-dioxin	0.047	0.082	0.063	0.069	0.0012
2378-tetrachlorodibenzofuran	0.034	0.059	0.045	0.049	0.00085
12378-pentachlorodibenzofuran	0.030	0.053	0.040	0.044	0.00076
23478-pentachlorodibenzofuran	0.75	1.31	0.99	1.09	0.019
123478-hexachlorodibenzofuran	0.41	0.72	0.55	0.60	0.010
123678-hexachlorodibenzofuran	0.46	0.80	0.61	0.67	0.012
234678-hexachlorodibenzofuran	0.80	1.39	1.06	1.16	0.020
123789-hexachlorodibenzofuran	0.029	0.051	0.039	0.042	0.00074
1234678-heptachlorodibenzofuran	0.22	0.38	0.29	0.31	0.0054
1234789-heptachlorodibenzofuran	0.044	0.077	0.059	0.064	0.0011
Octachlorodibenzofuran	0.0036	0.0062	0.0047	0.0052	0.000090
PCB 81	0.00074	0.0013	0.00098	0.0011	0.000019
PCB 77	0.0017	0.0029	0.0022	0.0024	0.000042
PCB 123	0.00034	0.00059	0.00045	0.00049	0.0000085
PCB 118	0.0083	0.015	0.011	0.012	0.00021
PCB 114	0.00024	0.00041	0.00032	0.00034	0.0000060
PCB 105	0.0027	0.0048	0.0036	0.0040	0.000069
PCB 126	0.071	0.12	0.094	0.10	0.0018
PCB 167	0.000045	0.000078	0.000060	0.000065	0.0000011
PCB 156	0.00019	0.00033	0.00025	0.00027	0.0000048
PCB 157	0.000051	0.000088	0.000068	0.000073	0.0000013
PCB 169	0.014	0.024	0.018	0.020	0.00034
PCB 189	0.000038	0.000067	0.000051	0.000056	0.00000096
Total Dioxins & Furans Only	7.29	12.7	9.67	10.6	0.18
Total PCBs Only	0.099	0.17	0.13	0.14	0.0025
Total Dioxins & Furans and PCBs	7.39	12.9	9.80	10.7	0.19

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 51
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2300	291	506	380	423	7.19
1,3-Dichlorobenzene	259	32.8	57.0	42.8	47.6	0.81
1,4-Dichlorobenzene	120	15.2	26.4	19.8	22.1	0.38
1,2-Dichlorobenzene	154	19.5	33.9	25.5	28.3	0.48
Total Dichlorobenzene	533	67.4	117	88.1	98.0	1.67
1,3,5-trichlorobenzene	25.3	3.20	5.57	4.18	4.65	0.079
1,2,4-trichlorobenzene	60.5	7.66	13.3	10.0	11.1	0.19
1,2,3-trichlorobenzene	21.8	2.76	4.80	3.61	4.01	0.068
Total Trichlorobenzene	108	13.6	23.7	17.8	19.8	0.34
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	15.1	1.91	3.32	2.50	2.78	0.047
1,2,3,4-tetrachlorobenzene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Total Tetrachlorobenzene	<25.1	<3.18	<5.52	<4.15	<4.61	<0.078
Pentachlorobenzene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Hexachlorobenzene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Total Chlorobenzenes	<2986	<378	<657	<494	<549	<9.33

Dry Gas Volume Sampled (Rm^3*) :	4.543
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 52
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2060	251	437	332	365	6.38
1,3-Dichlorobenzene	247	30.1	52.4	39.9	43.7	0.77
1,4-Dichlorobenzene	322	39.3	68.3	52.0	57.0	1.00
1,2-Dichlorobenzene	144	17.6	30.6	23.2	25.5	0.45
Total Dichlorobenzene	713	87.0	151	115	126	2.21
1,3,5-trichlorobenzene	23.9	2.91	5.07	3.86	4.23	0.074
1,2,4-trichlorobenzene	61.0	7.44	12.9	9.84	10.8	0.19
1,2,3-trichlorobenzene	16.9	2.06	3.59	2.73	2.99	0.052
Total Trichlorobenzene	102	12.4	21.6	16.4	18.0	0.32
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	16.3	1.99	3.46	2.63	2.89	0.050
1,2,3,4-tetrachlorobenzene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Total Tetrachlorobenzene	<26.3	<3.21	<5.58	<4.24	<4.66	<0.081
Pentachlorobenzene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Hexachlorobenzene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Total Chlorobenzenes	<2921	<356	<620	<471	<517	<9.05

Dry Gas Volume Sampled (Rm^3*) :	4.713
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 53
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2120	257	450	347	373	6.53
1,3-Dichlorobenzene	258	31.3	54.8	42.3	45.4	0.79
1,4-Dichlorobenzene	242	29.3	51.4	39.6	42.6	0.75
1,2-Dichlorobenzene	155	18.8	32.9	25.4	27.3	0.48
Total Dichlorobenzene	655	79.4	139	107	115	2.02
1,3,5-trichlorobenzene	28.4	3.44	6.03	4.65	5.00	0.087
1,2,4-trichlorobenzene	64.7	7.84	13.7	10.6	11.4	0.20
1,2,3-trichlorobenzene	23.0	2.79	4.88	3.77	4.05	0.071
Total Trichlorobenzene	116	14.1	24.7	19.0	20.4	0.36
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	18.5	2.24	3.93	3.03	3.26	0.057
1,2,3,4-tetrachlorobenzene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Total Tetrachlorobenzene	<28.5	<3.46	<6.05	<4.67	<5.01	<0.088
Pentachlorobenzene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Hexachlorobenzene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Total Chlorobenzenes	<2940	<356	<624	<481	<517	<9.05

Dry Gas Volume Sampled (Rm^3*) :	4.709
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.5
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 54
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	291	251	257	266	8.1
1,3-Dichlorobenzene	32.8	30.1	31.3	31.4	4.2
1,4-Dichlorobenzene	15.2	39.3	29.3	27.9	43.3
1,2-Dichlorobenzene	19.5	17.6	18.8	18.6	5.2
Total Dichlorobenzene	67.4	87.0	79.4	77.9	12.6
1,3,5-trichlorobenzene	3.20	2.91	3.44	3.19	8.3
1,2,4-trichlorobenzene	7.66	7.44	7.84	7.65	2.6
1,2,3-trichlorobenzene	2.76	2.06	2.79	2.54	16.2
Total Trichlorobenzene	13.6	12.4	14.1	13.4	6.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	1.91	1.99	2.24	2.05	8.5
1,2,3,4-tetrachlorobenzene	<1.27	<1.22	<1.21	<1.23	2.3
Total Tetrachlorobenzene	<3.18	<3.21	<3.46	<3.28	4.7
Pentachlorobenzene	<1.27	<1.22	<1.21	<1.23	2.3
Hexachlorobenzene	<1.27	<1.22	<1.21	<1.23	2.3
Total Chlorobenzenes	<378	<356	<356	<363	3.4

TABLE 55
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Reference Concentrations for Chlorobenzenes

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	506	437	450	465	7.9
1,3-Dichlorobenzene	57.0	52.4	54.8	54.7	4.2
1,4-Dichlorobenzene	26.4	68.3	51.4	48.7	43.3
1,2-Dichlorobenzene	33.9	30.6	32.9	32.5	5.3
Total Dichlorobenzene	117	151	139	136	12.7
1,3,5-trichlorobenzene	5.57	5.07	6.03	5.56	8.6
1,2,4-trichlorobenzene	13.3	12.9	13.7	13.3	3.0
1,2,3-trichlorobenzene	4.80	3.59	4.88	4.42	16.4
Total Trichlorobenzene	23.7	21.6	24.7	23.3	6.7
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.32	3.46	3.93	3.57	8.9
1,2,3,4-tetrachlorobenzene	<2.20	<2.12	<2.12	<2.15	2.1
Total Tetrachlorobenzene	<5.52	<5.58	<6.05	<5.72	5.1
Pentachlorobenzene	<2.20	<2.12	<2.12	<2.15	2.1
Hexachlorobenzene	<2.20	<2.12	<2.12	<2.15	2.1
Total Chlorobenzenes	<657	<620	<624	<634	3.2

* At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	380	332	347	353	7.0
1,3-Dichlorobenzene	42.8	39.9	42.3	41.6	3.8
1,4-Dichlorobenzene	19.8	52.0	39.6	37.1	43.6
1,2-Dichlorobenzene	25.5	23.2	25.4	24.7	5.1
Total Dichlorobenzene	88.1	115	107	103	13.4
1,3,5-trichlorobenzene	4.18	3.86	4.65	4.23	9.4
1,2,4-trichlorobenzene	10.0	9.84	10.6	10.1	3.9
1,2,3-trichlorobenzene	3.61	2.73	3.77	3.37	16.6
Total Trichlorobenzene	17.8	16.4	19.0	17.7	7.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.50	2.63	3.03	2.72	10.2
1,2,3,4-tetrachlorobenzene	<1.65	<1.61	<1.64	<1.64	1.2
Total Tetrachlorobenzene	<4.15	<4.24	<4.67	<4.35	6.3
Pentachlorobenzene	<1.65	<1.61	<1.64	<1.64	1.2
Hexachlorobenzene	<1.65	<1.61	<1.64	<1.64	1.2
Total Chlorobenzenes	<494	<471	<481	<482	2.3

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 57
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Wet Reference Concentrations for Chlorobenzenes

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	423	365	373	387	8.1
1,3-Dichlorobenzene	47.6	43.7	45.4	45.6	4.3
1,4-Dichlorobenzene	22.1	57.0	42.6	40.5	43.3
1,2-Dichlorobenzene	28.3	25.5	27.3	27.0	5.3
Total Dichlorobenzene	98.0	126	115	113	12.6
1,3,5-trichlorobenzene	4.65	4.23	5.00	4.63	8.3
1,2,4-trichlorobenzene	11.1	10.8	11.4	11.1	2.6
1,2,3-trichlorobenzene	4.01	2.99	4.05	3.68	16.3
Total Trichlorobenzene	19.8	18.0	20.4	19.4	6.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.78	2.89	3.26	2.97	8.4
1,2,3,4-tetrachlorobenzene	<1.84	<1.77	<1.76	<1.79	2.4
Total Tetrachlorobenzene	<4.61	<4.66	<5.01	<4.76	4.6
Pentachlorobenzene	<1.84	<1.77	<1.76	<1.79	2.4
Hexachlorobenzene	<1.84	<1.77	<1.76	<1.79	2.4
Total Chlorobenzenes	<549	<517	<517	<528	3.5

* At 25°C and 1 atmosphere

TABLE 58
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Rates for Chlorobenzenes

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	7.19	6.38	6.53	6.70	6.4
1,3-Dichlorobenzene	0.81	0.77	0.79	0.79	2.9
1,4-Dichlorobenzene	0.38	1.00	0.75	0.71	44.3
1,2-Dichlorobenzene	0.48	0.45	0.48	0.47	4.1
Total Dichlorobenzene	1.67	2.21	2.02	1.96	14.0
1,3,5-trichlorobenzene	0.079	0.074	0.087	0.080	8.4
1,2,4-trichlorobenzene	0.19	0.19	0.20	0.19	3.1
1,2,3-trichlorobenzene	0.068	0.052	0.071	0.064	15.6
Total Trichlorobenzene	0.34	0.32	0.36	0.34	6.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.047	0.050	0.057	0.052	9.6
1,2,3,4-tetrachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.8
Total Tetrachlorobenzene	<0.078	<0.081	<0.088	<0.083	5.7
Pentachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.8
Hexachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.8
Total Chlorobenzenes	<9.33	<9.05	<9.05	<9.14	1.8

TABLE 59
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Emission Data for Chlorobenzenes

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	266	465	353	387	6.70
1,3-Dichlorobenzene	31.4	54.7	41.6	45.6	0.79
1,4-Dichlorobenzene	27.9	48.7	37.1	40.5	0.71
1,2-Dichlorobenzene	18.6	32.5	24.7	27.0	0.47
Total Dichlorobenzene	77.9	136	103	113	1.96
1,3,5-trichlorobenzene	3.19	5.56	4.23	4.63	0.080
1,2,4-trichlorobenzene	7.65	13.3	10.1	11.1	0.19
1,2,3-trichlorobenzene	2.54	4.42	3.37	3.68	0.064
Total Trichlorobenzene	13.4	23.3	17.7	19.4	0.34
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.05	3.57	2.72	2.97	0.052
1,2,3,4-tetrachlorobenzene	<1.23	<2.15	<1.64	<1.79	<0.031
Total Tetrachlorobenzene	<3.28	<5.72	<4.35	<4.76	<0.083
Pentachlorobenzene	<1.23	<2.15	<1.64	<1.79	<0.031
Hexachlorobenzene	<1.23	<2.15	<1.64	<1.79	<0.031
Total Chlorobenzenes	<363	<634	<482	<528	<9.14

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 60
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorobenzene Blank Analyses

Isomers and Congener Group Totals	Blank Train Total ng	Laboratory Blank Total ng
Monochlorobenzene	<10	<10
1,3-Dichlorobenzene	<10	<10
1,4-Dichlorobenzene	11.5	12.3
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<31.5	<32.3
1,3,5-trichlorobenzene	<10	<10
1,2,4-trichlorobenzene	<10	<10
1,2,3-trichlorobenzene	<10	<10
Total Trichlorobenzene	<30.0	<30.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<10
1,2,3,4-tetrachlorobenzene	<10	<10
Total Tetrachlorobenzene	<20.0	<20.0
Pentachlorobenzene	<10	<10
Hexachlorobenzene	<10	<10
Total Chlorobenzenes	<112	<112

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 61
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
3-monochlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
4-monochlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
Total Monochlorophenols	<300	<38.0	<66.0	<49.6	<55.2	<0.94
2,6-dichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,4 & 2,5-dichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
3,5-dichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,3-dichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
3,4-dichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
Total Dichlorophenols	<500	<63.3	<110	<82.7	<91.9	<1.56
2,4,6-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,3,6-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,3,5-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,4,5-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,3,4-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
3,4,5-trichlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
Total Trichlorophenols	<600	<75.9	<132	<99.2	<110	<1.88
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
2,3,4,5-tetrachlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
Total Tetrachlorophenols	<200	<25.3	<44.0	<33.1	<36.8	<0.63
Pentachlorophenol	<100	<12.7	<22.0	<16.5	<18.4	<0.31
Total Chlorophenols	<1700	<215	<374	<281	<313	<5.31

Dry Gas Volume Sampled (Rm^3*) :	4.543
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 62
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
3-monochlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
4-monochlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
Total Monochlorophenols	<300	<36.6	<63.7	<48.4	<53.1	<0.93
2,6-dichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,4 & 2,5-dichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
3,5-dichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,3-dichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
3,4-dichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
Total Dichlorophenols	<500	<61.0	<106	<80.7	<88.5	<1.55
2,4,6-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,3,6-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,3,5-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,4,5-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,3,4-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
3,4,5-trichlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
Total Trichlorophenols	<600	<73.2	<127	<96.8	<106	<1.86
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
2,3,4,5-tetrachlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
Total Tetrachlorophenols	<200	<24.4	<42.4	<32.3	<35.4	<0.62
Pentachlorophenol	<100	<12.2	<21.2	<16.1	<17.7	<0.31
Total Chlorophenols	<1700	<207	<361	<274	<301	<5.27

Dry Gas Volume Sampled (Rm^3*) :	4.713
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 63
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	121	14.7	25.7	19.8	21.3	0.37
3-monochlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
4-monochlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
Total Monochlorophenols	<321	<38.9	<68.2	<52.6	<56.5	<0.99
2,6-dichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,4 & 2,5-dichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
3,5-dichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,3-dichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
3,4-dichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
Total Dichlorophenols	<500	<60.6	<106	<81.9	<88.0	<1.54
2,4,6-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,3,6-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,3,5-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,4,5-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,3,4-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
3,4,5-trichlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
Total Trichlorophenols	<600	<72.7	<127	<98.3	<106	<1.85
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
2,3,4,5-tetrachlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
Total Tetrachlorophenols	<200	<24.2	<42.5	<32.8	<35.2	<0.62
Pentachlorophenol	<100	<12.1	<21.2	<16.4	<17.6	<0.31
Total Chlorophenols	<1721	<209	<365	<282	<303	<5.30

Dry Gas Volume Sampled (Rm^3*) :	4.709
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.5
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	<12.7	<12.2	14.7	<13.2	10.0
3-monochlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
4-monochlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
Total Monochlorophenols	<38.0	<36.6	<38.9	<37.8	3.1
2,6-dichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,4 & 2,5-dichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
3,5-dichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,3-dichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
3,4-dichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
Total Dichlorophenols	<63.3	<61.0	<60.6	<61.6	2.3
2,4,6-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,3,6-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,3,5-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,4,5-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,3,4-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
3,4,5-trichlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
Total Trichlorophenols	<75.9	<73.2	<72.7	<73.9	2.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
2,3,4,5-tetrachlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
Total Tetrachlorophenols	<25.3	<24.4	<24.2	<24.6	2.3
Pentachlorophenol	<12.7	<12.2	<12.1	<12.3	2.3
Total Chlorophenols	<215	<207	<209	<210	2.0

TABLE 65
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<22.0	<21.2	25.7	<23.0	10.4
3-monochlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
4-monochlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
Total Monochlorophenols	<66.0	<63.7	<68.2	<66.0	3.4
2,6-dichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,4 & 2,5-dichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
3,5-dichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,3-dichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
3,4-dichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
Total Dichlorophenols	<110	<106	<106	<107	2.1
2,4,6-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,3,6-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,3,5-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,4,5-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,3,4-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
3,4,5-trichlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
Total Trichlorophenols	<132	<127	<127	<129	2.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
2,3,4,5-tetrachlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
Total Tetrachlorophenols	<44.0	<42.4	<42.5	<43.0	2.1
Pentachlorophenol	<22.0	<21.2	<21.2	<21.5	2.1
Total Chlorophenols	<374	<361	<365	<367	1.9

* At 25°C and 1 atmosphere

TABLE 66
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<16.5	<16.1	19.8	<17.5	11.5
3-monochlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
4-monochlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
Total Monochlorophenols	<49.6	<48.4	<52.6	<50.2	4.3
2,6-dichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,4 & 2,5-dichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
3,5-dichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,3-dichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
3,4-dichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
Total Dichlorophenols	<82.7	<80.7	<81.9	<81.8	1.2
2,4,6-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,3,6-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,3,5-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,4,5-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,3,4-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
3,4,5-trichlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
Total Trichlorophenols	<99.2	<96.8	<98.3	<98.1	1.2
2,3,5,6/2,3,4,6-tetrachlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
2,3,4,5-tetrachlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
Total Tetrachlorophenols	<33.1	<32.3	<32.8	<32.7	1.2
Pentachlorophenol	<16.5	<16.1	<16.4	<16.4	1.2
Total Chlorophenols	<281	<274	<282	<279	1.5

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 67
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<18.4	<17.7	21.3	<19.1	10.0
3-monochlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
4-monochlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
Total Monochlorophenols	<55.2	<53.1	<56.5	<54.9	3.1
2,6-dichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,4 & 2,5-dichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
3,5-dichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,3-dichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
3,4-dichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
Total Dichlorophenols	<91.9	<88.5	<88.0	<89.5	2.4
2,4,6-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,3,6-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,3,5-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,4,5-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,3,4-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
3,4,5-trichlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
Total Trichlorophenols	<110	<106	<106	<107	2.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
2,3,4,5-tetrachlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
Total Tetrachlorophenols	<36.8	<35.4	<35.2	<35.8	2.4
Pentachlorophenol	<18.4	<17.7	<17.6	<17.9	2.4
Total Chlorophenols	<313	<301	<303	<305	2.0

* At 25°C and 1 atmosphere

TABLE 68
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
2-monochlorophenol	<0.31	<0.31	0.37	<0.33	10.7
3-monochlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
4-monochlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
Total Monochlorophenols	<0.94	<0.93	<0.99	<0.95	3.4
2,6-dichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,4 & 2,5-dichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
3,5-dichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,3-dichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
3,4-dichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
Total Dichlorophenols	<1.56	<1.55	<1.54	<1.55	0.8
2,4,6-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,3,6-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,3,5-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,4,5-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,3,4-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
3,4,5-trichlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
Total Trichlorophenols	<1.88	<1.86	<1.85	<1.86	0.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
2,3,4,5-tetrachlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
Total Tetrachlorophenols	<0.63	<0.62	<0.62	<0.62	0.8
Pentachlorophenol	<0.31	<0.31	<0.31	<0.31	0.8
Total Chlorophenols	<5.31	<5.27	<5.30	<5.29	0.5

TABLE 69
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Emission Data for Chlorophenol Isomer and Congener Groups

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	<13.2	<23.0	<17.5	<19.1	<0.33
3-monochlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
4-monochlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
Total Monochlorophenols	<37.8	<66.0	<50.2	<54.9	<0.95
2,6-dichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,4 & 2,5-dichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
3,5-dichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,3-dichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
3,4-dichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
Total Dichlorophenols	<61.6	<107	<81.8	<89.5	<1.55
2,4,6-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,3,6-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,3,5-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,4,5-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,3,4-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
3,4,5-trichlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
Total Trichlorophenols	<73.9	<129	<98.1	<107	<1.86
2,3,5,6/2,3,4,6-tetrachlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
2,3,4,5-tetrachlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
Total Tetrachlorophenols	<24.6	<43.0	<32.7	<35.8	<0.62
Pentachlorophenol	<12.3	<21.5	<16.4	<17.9	<0.31
Total Chlorophenols	<210	<367	<279	<305	<5.29

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 70
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Blank Analyses

Congener Group	Lab Blank Total ng	Blank Train Total ng
2-monochlorophenol	<100	<100
3-monochlorophenol	<100	<100
4-monochlorophenol	<100	<100
Total Monochlorophenols	<300	<300
2,6-dichlorophenol	<100	<100
2,4 & 2,5-dichlorophenol	<100	<100
3,5-dichlorophenol	<100	<100
2,3-dichlorophenol	<100	<100
3,4-dichlorophenol	<100	<100
Total Dichlorophenols	<500	<500
2,4,6-trichlorophenol	<100	<100
2,3,6-trichlorophenol	<100	<100
2,3,5-trichlorophenol	<100	<100
2,4,5-trichlorophenol	<100	<100
2,3,4-trichlorophenol	<100	<100
3,4,5-trichlorophenol	<100	<100
Total Trichlorophenols	<600	<600
2,3,5,6/2,3,4,6-tetrachlorophenol	<100	<100
2,3,4,5-tetrachlorophenol	<100	<100
Total Tetrachlorophenols	<200	<200
Pentachlorophenol	<100	<100
Total Chlorophenols	<1700	<1700

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 71
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	23.7	3.00	5.22	3.92	4.36	0.074
Acenaphthylene	24.7	3.13	5.44	4.08	4.54	0.077
Anthracene	15.5	1.96	3.41	2.56	2.85	0.048
Benzo(a)Anthracene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(b)Fluoranthene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(k)Fluoranthene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(a)fluorene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(b)fluorene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(g,h,i)Perylene	149	18.9	32.8	24.6	27.4	0.47
Benzo(a)Pyrene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Benzo(e)Pyrene	39.5	5.00	8.69	6.53	7.26	0.12
Biphenyl	117	14.8	25.8	19.3	21.5	0.37
2-Chloronaphthalene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Chrysene/Triphenylene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Coronene	114	14.4	25.1	18.9	21.0	0.36
Dibenzo(a,c/a,h)Anthracene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Dibenzo(a,e)pyrene	<50	<6.33	<11.0	<8.27	<9.19	<0.16
9,10-dimethylanthracene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Fluoranthene	43.0	5.44	9.47	7.11	7.91	0.13
Fluorene	58.1	7.35	12.8	9.61	10.7	0.18
Indeno(1,2,3-cd)Pyrene	27.1	3.43	5.97	4.48	4.98	0.085
2-methylanthracene	32.7	4.14	7.20	5.41	6.01	0.10
3-Methylcholanthrene	<50	<6.33	<11.0	<8.27	<9.19	<0.16
1-Methylnaphthalene	139	17.6	30.6	23.0	25.6	0.43
2-Methylnaphthalene	147	18.6	32.4	24.3	27.0	0.46
1-Methylphenanthrene	35.7	4.52	7.86	5.90	6.56	0.11
9-Methylphenanthrene	24.7	3.13	5.44	4.08	4.54	0.077
Naphthalene	587	74.3	129	97.1	108	1.83
Perylene	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Phenanthrene	242	30.6	53.3	40.0	44.5	0.76
Picene	<50	<6.33	<11.0	<8.27	<9.19	<0.16
Pyrene	62.9	7.96	13.8	10.4	11.6	0.20
Tetralin	178	22.5	39.2	29.4	32.7	0.56
m-terphenyl	<10	<1.27	<2.20	<1.65	<1.84	<0.031
o-Terphenyl	<10	<1.27	<2.20	<1.65	<1.84	<0.031
p-terphenyl	<10	<1.27	<2.20	<1.65	<1.84	<0.031
Total	<2361	<299	<520	<390	<434	<7.38

Dry Gas Volume Sampled (Rm^3*) :	4.543
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 72
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Acenaphthylene	15.2	1.85	3.23	2.45	2.69	0.047
Anthracene	12.8	1.56	2.72	2.07	2.27	0.040
Benzo(a)Anthracene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Benzo(b)Fluoranthene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Benzo(k)Fluoranthene	10.1	1.23	2.14	1.63	1.79	0.031
Benzo(a)fluorene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Benzo(b)fluorene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Benzo(g,h,i)Perylene	177	21.6	37.6	28.6	31.3	0.55
Benzo(a)Pyrene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Benzo(e)Pyrene	50.1	6.11	10.6	8.08	8.87	0.16
Biphenyl	40.8	4.98	8.66	6.58	7.22	0.13
2-Chloronaphthalene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Chrysene/Triphenylene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Coronene	141	17.2	29.9	22.7	25.0	0.44
Dibenzo(a,c/a,h)Anthracene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Dibenzo(a,e)pyrene	<50	<6.10	<10.6	<8.07	<8.85	<0.15
9,10-dimethylanthracene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Fluoranthene	44.4	5.42	9.42	7.16	7.86	0.14
Fluorene	25.0	3.05	5.30	4.03	4.43	0.077
Indeno(1,2,3-cd)Pyrene	32.8	4.00	6.96	5.29	5.81	0.10
2-methylanthracene	31.7	3.87	6.73	5.11	5.61	0.098
3-Methylcholanthrene	<50	<6.10	<10.6	<8.07	<8.85	<0.15
1-Methylnaphthalene	71.2	8.68	15.1	11.5	12.6	0.22
2-Methylnaphthalene	24.3	2.96	5.16	3.92	4.30	0.075
1-Methylphenanthrene	22.7	2.77	4.82	3.66	4.02	0.070
9-Methylphenanthrene	23.6	2.88	5.01	3.81	4.18	0.073
Naphthalene	129	15.7	27.4	20.8	22.8	0.40
Perylene	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Phenanthrene	166	20.2	35.2	26.8	29.4	0.51
Picene	<50	<6.10	<10.6	<8.07	<8.85	<0.15
Pyrene	75.0	9.15	15.9	12.1	13.3	0.23
Tetralin	314	38.3	66.6	50.7	55.6	0.97
m-terphenyl	<10	<1.22	<2.12	<1.61	<1.77	<0.031
o-Terphenyl	<10	<1.22	<2.12	<1.61	<1.77	<0.031
p-terphenyl	<10	<1.22	<2.12	<1.61	<1.77	<0.031
Total	<1707	<208	<362	<275	<302	<5.29

Dry Gas Volume Sampled (Rm^3*) :	4.713
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 73
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	26.3	3.19	5.59	4.31	4.63	0.081
Acenaphthylene	34.9	4.23	7.41	5.72	6.14	0.11
Anthracene	14.6	1.77	3.10	2.39	2.57	0.045
Benzo(a)Anthracene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Benzo(b)Fluoranthene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Benzo(k)Fluoranthene	24.7	2.99	5.25	4.05	4.35	0.076
Benzo(a)fluorene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Benzo(b)fluorene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Benzo(g,h,i)Perylene	100	12.1	21.2	16.4	17.6	0.31
Benzo(a)Pyrene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Benzo(e)Pyrene	35.2	4.27	7.48	5.77	6.19	0.11
Biphenyl	67.7	8.21	14.4	11.1	11.9	0.21
2-Chloronaphthalene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Chrysene/Triphenylene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Coronene	88.6	10.7	18.8	14.5	15.6	0.27
Dibenzo(a,c/a,h)Anthracene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Dibenzo(a,e)pyrene	<50	<6.06	<10.6	<8.19	<8.80	<0.15
9,10-dimethylanthracene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Fluoranthene	55.6	6.74	11.8	9.11	9.78	0.17
Fluorene	61.1	7.41	13.0	10.0	10.8	0.19
Indeno(1,2,3-cd)Pyrene	13.9	1.69	2.95	2.28	2.45	0.043
2-methylanthracene	29.7	3.60	6.31	4.86	5.23	0.091
3-Methylcholanthrene	<50	<6.06	<10.6	<8.19	<8.80	<0.15
1-Methylnaphthalene	135	16.4	28.7	22.1	23.8	0.42
2-Methylnaphthalene	127	15.4	27.0	20.8	22.3	0.39
1-Methylphenanthrene	26.0	3.15	5.52	4.26	4.57	0.080
9-Methylphenanthrene	24.9	3.02	5.29	4.08	4.38	0.077
Naphthalene	512	62.1	109	83.9	90.1	1.58
Perylene	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Phenanthrene	194	23.5	41.2	31.8	34.1	0.60
Picene	<50	<6.06	<10.6	<8.19	<8.80	<0.15
Pyrene	107	13.0	22.7	17.5	18.8	0.33
Tetralin	312	37.8	66.3	51.1	54.9	0.96
m-terphenyl	<10	<1.21	<2.12	<1.64	<1.76	<0.031
o-Terphenyl	<10	<1.21	<2.12	<1.64	<1.76	<0.031
p-terphenyl	<10	<1.21	<2.12	<1.64	<1.76	<0.031
Total	<2280	<276	<484	<373	<401	<7.02

Dry Gas Volume Sampled (Rm³*) :	4.709
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.5
Dry Adjusted Flowrate (Rm³/s**) :	18.8
Wet Reference Flowrate (Rm³/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 74
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	3.00	<1.22	3.19	<2.47	44.0
Acenaphthylene	3.13	1.85	4.23	3.07	38.7
Anthracene	1.96	1.56	1.77	1.76	11.4
Benzo(a)Anthracene	<1.27	<1.22	<1.21	<1.23	2.3
Benzo(b)Fluoranthene	<1.27	<1.22	<1.21	<1.23	2.3
Benzo(k)Fluoranthene	<1.27	1.23	2.99	<1.83	55.1
Benzo(a)fluorene	<1.27	<1.22	<1.21	<1.23	2.3
Benzo(b)fluorene	<1.27	<1.22	<1.21	<1.23	2.3
Benzo(g,h,i)Perylene	18.9	21.6	12.1	17.5	27.8
Benzo(a)Pyrene	<1.27	<1.22	<1.21	<1.23	2.3
Benzo(e)Pyrene	5.00	6.11	4.27	5.13	18.1
Biphenyl	14.8	4.98	8.21	9.33	53.7
2-Chloronaphthalene	<1.27	<1.22	<1.21	<1.23	2.3
Chrysene/Triphenylene	<1.27	<1.22	<1.21	<1.23	2.3
Coronene	14.4	17.2	10.7	14.1	22.9
Dibenzo(a,c/a,h)Anthracene	<1.27	<1.22	<1.21	<1.23	2.3
Dibenzo(a,e)pyrene	<6.33	<6.10	<6.06	<6.16	2.3
9,10-dimethylanthracene	<1.27	<1.22	<1.21	<1.23	2.3
7,12-Dimethylbenzo(a)anthracene	<1.27	<1.22	<1.21	<1.23	2.3
Fluoranthene	5.44	5.42	6.74	5.87	12.9
Fluorene	7.35	3.05	7.41	5.94	42.1
Indeno(1,2,3-cd)Pyrene	3.43	4.00	1.69	3.04	39.7
2-methylanthracene	4.14	3.87	3.60	3.87	6.9
3-Methylcholanthrene	<6.33	<6.10	<6.06	<6.16	2.3
1-Methylnaphthalene	17.6	8.68	16.4	14.2	34.0
2-Methylnaphthalene	18.6	2.96	15.4	12.3	67.0
1-Methylphenanthrene	4.52	2.77	3.15	3.48	26.4
9-Methylphenanthrene	3.13	2.88	3.02	3.01	4.1
Naphthalene	74.3	15.7	62.1	50.7	60.9
Perylene	<1.27	<1.22	<1.21	<1.23	2.3
Phenanthrene	30.6	20.2	23.5	24.8	21.4
Picene	<6.33	<6.10	<6.06	<6.16	2.3
Pyrene	7.96	9.15	13.0	10.0	26.1
Tetralin	22.5	38.3	37.8	32.9	27.3
m-terphenyl	<1.27	<1.22	<1.21	<1.23	2.3
o-Terphenyl	<1.27	<1.22	<1.21	<1.23	2.3
p-terphenyl	<1.27	<1.22	<1.21	<1.23	2.3
Total	<299	<208	<276	<261	18.1

TABLE 75
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	5.22	<2.12	5.59	<4.31	44.2
Acenaphthylene	5.44	3.23	7.41	5.36	39.1
Anthracene	3.41	2.72	3.10	3.08	11.3
Benzo(a)Anthracene	<2.20	<2.12	<2.12	<2.15	2.1
Benzo(b)Fluoranthene	<2.20	<2.12	<2.12	<2.15	2.1
Benzo(k)Fluoranthene	<2.20	2.14	5.25	<3.20	55.5
Benzo(a)fluorene	<2.20	<2.12	<2.12	<2.15	2.1
Benzo(b)fluorene	<2.20	<2.12	<2.12	<2.15	2.1
Benzo(g,h,i)Perylene	32.8	37.6	21.2	30.5	27.5
Benzo(a)Pyrene	<2.20	<2.12	<2.12	<2.15	2.1
Benzo(e)Pyrene	8.69	10.6	7.48	8.93	17.8
Biphenyl	25.8	8.66	14.4	16.3	53.5
2-Chloronaphthalene	<2.20	<2.12	<2.12	<2.15	2.1
Chrysene/Triphenylene	<2.20	<2.12	<2.12	<2.15	2.1
Coronene	25.1	29.9	18.8	24.6	22.6
Dibenzo(a,c/a,h)Anthracene	<2.20	<2.12	<2.12	<2.15	2.1
Dibenzo(a,e)pyrene	<11.0	<10.6	<10.6	<10.7	2.1
9,10-dimethylanthracene	<2.20	<2.12	<2.12	<2.15	2.1
7,12-Dimethylbenzo(a)anthracene	<2.20	<2.12	<2.12	<2.15	2.1
Fluoranthene	9.47	9.42	11.8	10.2	13.3
Fluorene	12.8	5.30	13.0	10.4	42.3
Indeno(1,2,3-cd)Pyrene	5.97	6.96	2.95	5.29	39.4
2-methylanthracene	7.20	6.73	6.31	6.74	6.6
3-Methylcholanthrene	<11.0	<10.6	<10.6	<10.7	2.1
1-Methylnaphthalene	30.6	15.1	28.7	24.8	34.1
2-Methylnaphthalene	32.4	5.16	27.0	21.5	67.0
1-Methylphenanthrene	7.86	4.82	5.52	6.07	26.3
9-Methylphenanthrene	5.44	5.01	5.29	5.24	4.2
Naphthalene	129	27.4	109	88.4	60.9
Perylene	<2.20	<2.12	<2.12	<2.15	2.1
Phenanthrene	53.3	35.2	41.2	43.2	21.3
Picene	<11.0	<10.6	<10.6	<10.7	2.1
Pyrene	13.8	15.9	22.7	17.5	26.6
Tetralin	39.2	66.6	66.3	57.4	27.4
m-terphenyl	<2.20	<2.12	<2.12	<2.15	2.1
o-Terphenyl	<2.20	<2.12	<2.12	<2.15	2.1
p-terphenyl	<2.20	<2.12	<2.12	<2.15	2.1
Total	<520	<362	<484	<455	18.1

* At 25°C and 1 atmosphere

TABLE 76
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	3.92	<1.61	4.31	<3.28	44.4
Acenaphthylene	4.08	2.45	5.72	4.08	40.0
Anthracene	2.56	2.07	2.39	2.34	10.8
Benzo(a)Anthracene	<1.65	<1.61	<1.64	<1.64	1.2
Benzo(b)Fluoranthene	<1.65	<1.61	<1.64	<1.64	1.2
Benzo(k)Fluoranthene	<1.65	1.63	4.05	<2.44	56.8
Benzo(a)fluorene	<1.65	<1.61	<1.64	<1.64	1.2
Benzo(b)fluorene	<1.65	<1.61	<1.64	<1.64	1.2
Benzo(g,h,i)Perylene	24.6	28.6	16.4	23.2	26.8
Benzo(a)Pyrene	<1.65	<1.61	<1.64	<1.64	1.2
Benzo(e)Pyrene	6.53	8.08	5.77	6.79	17.4
Biphenyl	19.3	6.58	11.1	12.3	52.5
2-Chloronaphthalene	<1.65	<1.61	<1.64	<1.64	1.2
Chrysene/Triphenylene	<1.65	<1.61	<1.64	<1.64	1.2
Coronene	18.9	22.7	14.5	18.7	22.0
Dibenzo(a,c/a,h)Anthracene	<1.65	<1.61	<1.64	<1.64	1.2
Dibenzo(a,e)pyrene	<8.27	<8.07	<8.19	<8.18	1.2
9,10-dimethylanthracene	<1.65	<1.61	<1.64	<1.64	1.2
7,12-Dimethylbenzo(a)anthracene	<1.65	<1.61	<1.64	<1.64	1.2
Fluoranthene	7.11	7.16	9.11	7.79	14.6
Fluorene	9.61	4.03	10.0	7.88	42.4
Indeno(1,2,3-cd)Pyrene	4.48	5.29	2.28	4.02	38.9
2-methylanthracene	5.41	5.11	4.86	5.13	5.3
3-Methylcholanthrene	<8.27	<8.07	<8.19	<8.18	1.2
1-Methylnaphthalene	23.0	11.5	22.1	18.9	33.9
2-Methylnaphthalene	24.3	3.92	20.8	16.3	66.7
1-Methylphenanthrene	5.90	3.66	4.26	4.61	25.2
9-Methylphenanthrene	4.08	3.81	4.08	3.99	4.0
Naphthalene	97.1	20.8	83.9	67.3	60.6
Perylene	<1.65	<1.61	<1.64	<1.64	1.2
Phenanthrene	40.0	26.8	31.8	32.9	20.3
Picene	<8.27	<8.07	<8.19	<8.18	1.2
Pyrene	10.4	12.1	17.5	13.3	27.9
Tetralin	29.4	50.7	51.1	43.7	28.3
m-terphenyl	<1.65	<1.61	<1.64	<1.64	1.2
o-Terphenyl	<1.65	<1.61	<1.64	<1.64	1.2
p-terphenyl	<1.65	<1.61	<1.64	<1.64	1.2
Total	<390	<275	<373	<346	17.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 77
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Wet Reference Concentrations

Compound	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	4.36	<1.77	4.63	<3.59	44.0
Acenaphthylene	4.54	2.69	6.14	4.46	38.7
Anthracene	2.85	2.27	2.57	2.56	11.4
Benzo(a)Anthracene	<1.84	<1.77	<1.76	<1.79	2.4
Benzo(b)Fluoranthene	<1.84	<1.77	<1.76	<1.79	2.4
Benzo(k)Fluoranthene	<1.84	1.79	4.35	<2.66	55.0
Benzo(a)fluorene	<1.84	<1.77	<1.76	<1.79	2.4
Benzo(b)fluorene	<1.84	<1.77	<1.76	<1.79	2.4
Benzo(g,h,i)Perylene	27.4	31.3	17.6	25.4	27.8
Benzo(a)Pyrene	<1.84	<1.77	<1.76	<1.79	2.4
Benzo(e)Pyrene	7.26	8.87	6.19	7.44	18.1
Biphenyl	21.5	7.22	11.9	13.5	53.8
2-Chloronaphthalene	<1.84	<1.77	<1.76	<1.79	2.4
Chrysene/Triphenylene	<1.84	<1.77	<1.76	<1.79	2.4
Coronene	21.0	25.0	15.6	20.5	22.9
Dibenzo(a,c/a,h)Anthracene	<1.84	<1.77	<1.76	<1.79	2.4
Dibenzo(a,e)pyrene	<9.19	<8.85	<8.80	<8.95	2.4
9,10-dimethylanthracene	<1.84	<1.77	<1.76	<1.79	2.4
7,12-Dimethylbenzo(a)anthracene	<1.84	<1.77	<1.76	<1.79	2.4
Fluoranthene	7.91	7.86	9.78	8.52	12.9
Fluorene	10.7	4.43	10.8	8.62	42.1
Indeno(1,2,3-cd)Pyrene	4.98	5.81	2.45	4.41	39.7
2-methylanthracene	6.01	5.61	5.23	5.62	7.0
3-Methylcholanthrene	<9.19	<8.85	<8.80	<8.95	2.4
1-Methylnaphthalene	25.6	12.6	23.8	20.6	34.0
2-Methylnaphthalene	27.0	4.30	22.3	17.9	67.1
1-Methylphenanthrene	6.56	4.02	4.57	5.05	26.5
9-Methylphenanthrene	4.54	4.18	4.38	4.37	4.2
Naphthalene	108	22.8	90.1	73.6	61.0
Perylene	<1.84	<1.77	<1.76	<1.79	2.4
Phenanthrene	44.5	29.4	34.1	36.0	21.5
Picene	<9.19	<8.85	<8.80	<8.95	2.4
Pyrene	11.6	13.3	18.8	14.6	26.1
Tetralin	32.7	55.6	54.9	47.7	27.2
m-terphenyl	<1.84	<1.77	<1.76	<1.79	2.4
o-Terphenyl	<1.84	<1.77	<1.76	<1.79	2.4
p-terphenyl	<1.84	<1.77	<1.76	<1.79	2.4
Total	<434	<302	<401	<379	18.1

* At 25°C and 1 atmosphere

TABLE 78
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Rates

Compound	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Acenaphthene	0.074	<0.031	0.081	<0.062	43.7
Acenaphthylene	0.077	0.047	0.11	0.077	39.1
Anthracene	0.048	0.040	0.045	0.044	10.0
Benzo(a)Anthracene	<0.031	<0.031	<0.031	<0.031	0.8
Benzo(b)Fluoranthene	<0.031	<0.031	<0.031	<0.031	0.8
Benzo(k)Fluoranthene	<0.031	0.031	0.076	<0.046	56.0
Benzo(a)fluorene	<0.031	<0.031	<0.031	<0.031	0.8
Benzo(b)fluorene	<0.031	<0.031	<0.031	<0.031	0.8
Benzo(g,h,i)Perylene	0.47	0.55	0.31	0.44	27.7
Benzo(a)Pyrene	<0.031	<0.031	<0.031	<0.031	0.8
Benzo(e)Pyrene	0.12	0.16	0.11	0.13	18.5
Biphenyl	0.37	0.13	0.21	0.23	52.1
2-Chloronaphthalene	<0.031	<0.031	<0.031	<0.031	0.8
Chrysene/Triphenylene	<0.031	<0.031	<0.031	<0.031	0.8
Coronene	0.36	0.44	0.27	0.36	23.1
Dibenzo(a,c/a,h)Anthracene	<0.031	<0.031	<0.031	<0.031	0.8
Dibenzo(a,e)pyrene	<0.16	<0.15	<0.15	<0.16	0.8
9,10-dimethylanthracene	<0.031	<0.031	<0.031	<0.031	0.8
7,12-Dimethylbenzo(a)anthracene	<0.031	<0.031	<0.031	<0.031	0.8
Fluoranthene	0.13	0.14	0.17	0.15	13.8
Fluorene	0.18	0.077	0.19	0.15	41.7
Indeno(1,2,3-cd)Pyrene	0.085	0.10	0.043	0.076	39.6
2-methylanthracene	0.10	0.098	0.091	0.097	5.6
3-Methylcholanthrene	<0.16	<0.15	<0.15	<0.16	0.8
1-Methylnaphthalene	0.43	0.22	0.42	0.36	33.2
2-Methylnaphthalene	0.46	0.075	0.39	0.31	66.4
1-Methylphenanthrene	0.11	0.070	0.080	0.087	24.7
9-Methylphenanthrene	0.077	0.073	0.077	0.076	2.9
Naphthalene	1.83	0.40	1.58	1.27	60.2
Perylene	<0.031	<0.031	<0.031	<0.031	0.8
Phenanthrene	0.76	0.51	0.60	0.62	19.8
Picene	<0.16	<0.15	<0.15	<0.16	0.8
Pyrene	0.20	0.23	0.33	0.25	27.2
Tetralin	0.56	0.97	0.96	0.83	28.6
m-terphenyl	<0.031	<0.031	<0.031	<0.031	0.8
o-Terphenyl	<0.031	<0.031	<0.031	<0.031	0.8
p-terphenyl	<0.031	<0.031	<0.031	<0.031	0.8
Total	<7.38	<5.29	<7.02	<6.56	17.0

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Polycyclic Aromatic Hydrocarbon Emission Data

Compound	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<2.47	<4.31	<3.28	<3.59	<0.062
Acenaphthylene	3.07	5.36	4.08	4.46	0.077
Anthracene	1.76	3.08	2.34	2.56	0.044
Benzo(a)Anthracene	<1.23	<2.15	<1.64	<1.79	<0.031
Benzo(b)Fluoranthene	<1.23	<2.15	<1.64	<1.79	<0.031
Benzo(k)Fluoranthene	<1.83	<3.20	<2.44	<2.66	<0.046
Benzo(a)fluorene	<1.23	<2.15	<1.64	<1.79	<0.031
Benzo(b)fluorene	<1.23	<2.15	<1.64	<1.79	<0.031
Benzo(g,h,i)Perylene	17.5	30.5	23.2	25.4	0.44
Benzo(a)Pyrene	<1.23	<2.15	<1.64	<1.79	<0.031
Benzo(e)Pyrene	5.13	8.93	6.79	7.44	0.13
Biphenyl	9.33	16.3	12.3	13.5	0.23
2-Chloronaphthalene	<1.23	<2.15	<1.64	<1.79	<0.031
Chrysene/Triphenylene	<1.23	<2.15	<1.64	<1.79	<0.031
Coronene	14.1	24.6	18.7	20.5	0.36
Dibenzo(a,c/a,h)Anthracene	<1.23	<2.15	<1.64	<1.79	<0.031
Dibenzo(a,e)pyrene	<6.16	<10.7	<8.18	<8.95	<0.16
9,10-dimethylanthracene	<1.23	<2.15	<1.64	<1.79	<0.031
7,12-Dimethylbenzo(a)anthracene	<1.23	<2.15	<1.64	<1.79	<0.031
Fluoranthene	5.87	10.2	7.79	8.52	0.15
Fluorene	5.94	10.4	7.88	8.62	0.15
Indeno(1,2,3-cd)Pyrene	3.04	5.29	4.02	4.41	0.076
2-methylanthracene	3.87	6.74	5.13	5.62	0.097
3-Methylcholanthrene	<6.16	<10.7	<8.18	<8.95	<0.16
1-Methylnaphthalene	14.2	24.8	18.9	20.6	0.36
2-Methylnaphthalene	12.3	21.5	16.3	17.9	0.31
1-Methylphenanthrene	3.48	6.07	4.61	5.05	0.087
9-Methylphenanthrene	3.01	5.24	3.99	4.37	0.076
Naphthalene	50.7	88.4	67.3	73.6	1.27
Perylene	<1.23	<2.15	<1.64	<1.79	<0.031
Phenanthrene	24.8	43.2	32.9	36.0	0.62
Picene	<6.16	<10.7	<8.18	<8.95	<0.16
Pyrene	10.0	17.5	13.3	14.6	0.25
Tetralin	32.9	57.4	43.7	47.7	0.83
m-terphenyl	<1.23	<2.15	<1.64	<1.79	<0.031
o-Terphenyl	<1.23	<2.15	<1.64	<1.79	<0.031
p-terphenyl	<1.23	<2.15	<1.64	<1.79	<0.031
Total	<261	<455	<346	<379	<6.56

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 80
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Polycyclic Aromatic Hydrocarbon Analyses

Compound	Blank Train ng	Laboratory Blank ng
Acenaphthene	<10	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	14.0	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(k)Fluoranthene	<10	<10
Benzo(a)fluorene	<10	<10
Benzo(b)fluorene	<10	<10
Benzo(g,h,i)Perylene	52.2	16.3
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	19.2	<10
Biphenyl	<10	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene	17.0	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	28.3	21.2
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	79.1	<10
Fluorene	<10	<10
Indeno(1,2,3-cd)Pyrene	21.6	15.0
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	66.1	13.6
2-Methylnaphthalene	<10	<10
1-Methylphenanthrene	<10	13.1
9-Methylphenanthrene	<10	<10
Naphthalene	65.7	70.5
Perylene	<10	<10
Phenanthrene	<10	13.7
Picene	<50	<50
Pyrene	126	11.5
Tetralin	407	496
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<1316	<1111

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 81
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Acetaldehyde, Formaldehyde and Acrolein Emission Data

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acetaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acetaldehyde Emission Rate mg/s
1	<1.8	0.0279	<37.1	<64.6	<48.3	<53.7	<0.91
2	<2.2	0.0247	<51.1	<89.1	<66.6	<74.0	<1.26
3	<2.2	0.0297	<42.7	<74.2	<56.5	<61.8	<1.08
Average			<43.6	<76.0	<57.1	<63.2	<1.09
Blank	<2.8						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Formaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Formaldehyde Emission Rate mg/s
1	8.2	0.0279	169	294	220	244	4.17
2	9.9	0.0247	230	401	300	333	5.67
3	9.3	0.0297	181	314	239	261	4.58
Average			193	336	253	280	4.81
Blank	10						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acrolein Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acrolein Emission Rate mg/s
1	<9.0	0.0279	<185	<323	<241	<268	<4.57
2	<11	0.0247	<256	<446	<333	<370	<6.30
3	<11	0.0297	<214	<371	<283	<309	<5.41
Average			<218	<380	<286	<316	<5.43
Blank	<14						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

Sampling was conducted at a single point. Volumetric flowrates from the corresponding isokinetic tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 82
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 16A/16B	Run No. 2 Tube 17A/17B	Run No. 3 Tube 18A/18B			
	µg	µg	µg	µg	%	µg
Acetone	0.11	0.42	0.22	0.25	63.6	0.74
Benzene	0.086	0.086	0.076	0.083	7.0	0.25
Bromodichloromethane	<0.01	0.014	<0.01	<0.011	20.4	<0.034
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.036	0.29	<0.01	<0.11	138	<0.33
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.013	0.025	0.029	0.022	37.3	0.067
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	0.14	0.56	<0.24	117	<0.72
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	0.018	<0.01	<0.01	<0.013	36.5	<0.038
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	0.013	<0.01	<0.01	<0.011	15.7	<0.033
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.11	<0.02	<0.02	<0.049	103	<0.15
Methylene Chloride	1.34	0.60	0.95	0.96	38.4	2.89
Styrene	0.022	<0.02	<0.02	<0.021	5.6	<0.062
Tetrachloroethene	0.043	0.054	0.050	0.049	11.4	0.15
Toluene	0.16	0.12	0.14	0.14	16.8	0.41
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	0.034	<0.03	<0.03	<0.031	7.4	<0.094
O-Xylene	0.013	<0.01	<0.01	<0.011	15.7	<0.033
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.29	<2.11	<2.41	<2.27	6.7	<6.80

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0195
Run No. 2	0.0207
Run No. 3	0.0190

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 83
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 2

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 20A/20B	Run No. 2 Tube 21A/21B	Run No. 3 Tube 22A/22B			
	µg	µg	µg	µg	%	µg
Acetone	0.30	0.20	<0.1	<0.20	50.7	<0.60
Benzene	0.11	0.13	0.08	0.10	24.9	0.31
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.065	0.041	0.026	0.044	44.7	0.13
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.020	0.014	0.012	0.015	27.2	0.046
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	0.93	0.79	1.90	1.20	50.3	3.61
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.040	0.048	0.044	0.044	9.1	0.13
Toluene	0.13	0.11	0.093	0.11	17.0	0.34
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.00	<1.72	<2.65	<2.12	22.4	<6.36

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0200
Run No. 2	0.0200
Run No. 3	0.0203

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 84
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 3

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 24A/24B	Run No. 2 Tube 25A/25B	Run No. 4 Tube 27A/27B			
	µg	µg	µg	µg	%	µg
Acetone	0.13	0.17	0.16	0.15	12.4	0.45
Benzene	0.051	<0.05	0.068	<0.056	18.0	<0.17
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.01	<0.01	<0.01	<0.010	-	<0.030
2-Butanone	0.042	0.059	0.033	0.045	29.6	0.13
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.011	0.014	0.017	0.014	21.4	0.042
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	0.020	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	0.023	<0.014	52.4	<0.043
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.94	0.26	1.96	1.39	70.3	4.17
Styrene	<0.02	<0.02	0.061	<0.034	70.3	<0.10
Tetrachloroethene	0.028	0.030	0.019	0.026	22.8	0.077
Toluene	0.17	0.066	0.15	0.13	42.1	0.38
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	0.012	<0.01	<0.01	<0.011	10.8	<0.032
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.77	<1.05	<2.86	<2.23	46.0	<6.68

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0206
Run No. 2	0.0196
Run No. 4	0.0195

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 85
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	0.74	7.22	12.6	9.44	10.5	0.18
Benzene	0.25	2.41	4.19	3.15	3.50	0.059
Bromodichloromethane	<0.034	<0.33	<0.57	<0.43	<0.48	<0.0082
Bromoform	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Bromomethane	<0.27	<2.62	<4.56	<3.43	<3.81	<0.065
1,3-Butadiene	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
2-Butanone	<0.33	<3.22	<5.61	<4.21	<4.68	<0.080
Carbon Tetrachloride	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Chloroform	0.067	0.65	1.13	0.85	0.95	0.016
Cumene (Isopropylbenzene)	<0.060	<0.58	<1.01	<0.76	<0.85	<0.014
Dibromochloromethane	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Dichlorodifluoromethane	<0.72	<6.97	<12.1	<9.11	<10.1	<0.17
1,2-Dichloroethane	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
trans,1,2-Dichloroethene	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
1,1-Dichloroethene	<0.038	<0.37	<0.64	<0.48	<0.54	<0.0091
1,2-Dichloropropane	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Ethylbenzene	<0.033	<0.32	<0.56	<0.42	<0.47	<0.0079
Ethylene Dibromide	<0.060	<0.58	<1.01	<0.76	<0.85	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.15	<1.43	<2.48	<1.87	<2.07	<0.035
Methylene Chloride	2.89	28.0	48.7	36.6	40.7	0.69
Styrene	<0.062	<0.60	<1.05	<0.79	<0.87	<0.015
Tetrachloroethene	0.15	1.43	2.48	1.87	2.07	0.035
Toluene	0.41	3.99	6.94	5.22	5.80	0.099
1,1,1-Trichloroethane	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Trichlorotrifluoroethane	<0.030	<0.29	<0.51	<0.38	<0.42	<0.0072
Trichlorofluoromethane	<0.060	<0.58	<1.01	<0.76	<0.85	<0.014
M&P-Xylene	<0.094	<0.91	<1.59	<1.19	<1.33	<0.023
O-Xylene	<0.033	<0.32	<0.56	<0.42	<0.47	<0.0079
Vinyl Chloride	<0.060	<0.58	<1.01	<0.76	<0.85	<0.014
Total	<6.80	<66.1	<115	<86.3	<96.0	<1.63

Dry Gas Volume Sampled (Rm^3*) :	0.0592
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 86
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	<0.60	<5.70	<9.92	<7.45	<8.28	<0.14
Benzene	0.31	2.97	5.17	3.89	4.32	0.073
Bromodichloromethane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Bromoform	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Bromomethane	<0.27	<2.57	<4.48	<3.36	<3.74	<0.064
1,3-Butadiene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
2-Butanone	0.13	1.26	2.19	1.64	1.83	0.031
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Chloroform	0.046	0.44	0.76	0.57	0.64	0.011
Cumene (Isopropylbenzene)	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
Dibromochloromethane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Dichlorodifluoromethane	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
trans,1,2-Dichloroethene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
1,1-Dichloroethene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Ethylbenzene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Ethylene Dibromide	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.57	<0.99	<0.747	<0.83	<0.014
Methylene Chloride	3.61	34.4	59.8	44.9	49.9	0.85
Styrene	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
Tetrachloroethene	0.13	1.26	2.19	1.64	1.83	0.031
Toluene	0.34	3.19	5.55	4.17	4.64	0.079
1,1,1-Trichloroethane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Trichlorotrifluoroethane	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Trichlorofluoromethane	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
M&P-Xylene	<0.090	<0.86	<1.49	<1.12	<1.25	<0.021
O-Xylene	<0.030	<0.29	<0.50	<0.37	<0.42	<0.0071
Vinyl Chloride	<0.060	<0.57	<0.99	<0.75	<0.83	<0.014
Total	<6.36	<60.6	<105	<79.2	<88.1	<1.50

Dry Gas Volume Sampled (Rm^3*) :	0.0603
Actual Flowrate (m^3/s) :	24.7
Dry Reference Flowrate (Rm^3/s*) :	14.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 87
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	0.45	4.37	7.60	5.78	6.34	0.11
Benzene	<0.17	<1.63	<2.83	<2.15	<2.36	<0.041
Bromodichloromethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Bromoform	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Bromomethane	<0.27	<2.60	<4.52	<3.44	<3.77	<0.066
1,3-Butadiene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
2-Butanone	0.13	1.29	2.24	1.71	1.87	0.033
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Chloroform	0.042	0.40	0.70	0.53	0.59	0.010
Cumene (Isopropylbenzene)	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
Dibromochloromethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Dichlorodifluoromethane	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
trans,1,2-Dichloroethene	<0.043	<0.41	<0.72	<0.55	<0.60	<0.011
1,1-Dichloroethene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Ethylbenzene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Ethylene Dibromide	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
Methylene Chloride	4.17	40.1	69.7	53.0	58.2	1.02
Styrene	<0.10	<0.97	<1.69	<1.29	<1.41	<0.025
Tetrachloroethene	0.077	0.74	1.29	0.98	1.08	0.019
Toluene	0.38	3.67	6.38	4.85	5.32	0.093
1,1,1-Trichloroethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Trichloroethene/1,1,2-Trichloroethene	<0.032	<0.31	<0.54	<0.41	<0.45	<0.0078
Trichlorotrifluoroethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Trichlorofluoromethane	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
M&P-Xylene	<0.090	<0.87	<1.51	<1.15	<1.26	<0.022
O-Xylene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0073
Vinyl Chloride	<0.060	<0.58	<1.00	<0.76	<0.84	<0.015
Total	<6.68	<64.3	<112	<85.0	<93.3	<1.63

Dry Gas Volume Sampled (Rm^3*) :	0.0597
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 88
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Acetone	7.22	<5.70	4.37	<5.76
Benzene	2.41	2.97	<1.63	<2.34
Bromodichloromethane	<0.33	<0.29	<0.29	<0.30
Bromoform	<0.29	<0.29	<0.29	<0.29
Bromomethane	<2.62	<2.57	<2.60	<2.60
1,3-Butadiene	<0.29	<0.29	<0.29	<0.29
2-Butanone	<3.22	1.26	1.29	<1.92
Carbon Tetrachloride	<0.29	<0.29	<0.29	<0.29
Chloroform	0.65	0.44	0.40	0.50
Cumene (Isopropylbenzene)	<0.58	<0.57	<0.58	<0.58
Dibromochloromethane	<0.29	<0.29	<0.29	<0.29
Dichlorodifluoromethane	<6.97	<0.57	<0.58	<2.71
1,2-Dichloroethane	<0.29	<0.29	<0.29	<0.29
trans,1,2-Dichloroethene	<0.29	<0.29	<0.41	<0.33
1,1-Dichloroethene	<0.37	<0.29	<0.29	<0.31
1,2-Dichloropropane	<0.29	<0.29	<0.29	<0.29
Ethylbenzene	<0.32	<0.29	<0.29	<0.30
Ethylene Dibromide	<0.58	<0.57	<0.58	<0.58
Mesitylene (1,3,5-Trimethylbenzene)	<1.43	<0.57	<0.58	<0.86
Methylene Chloride	28.0	34.4	40.1	34.2
Styrene	<0.60	<0.57	<0.97	<0.72
Tetrachloroethene	1.43	1.26	0.74	1.14
Toluene	3.99	3.19	3.67	3.62
1,1,1-Trichloroethane	<0.29	<0.29	<0.29	<0.29
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.29	<0.31	<0.30
Trichlorotrifluoroethane	<0.29	<0.29	<0.29	<0.29
Trichlorofluoromethane	<0.58	<0.57	<0.58	<0.58
M&P-Xylene	<0.91	<0.86	<0.87	<0.88
O-Xylene	<0.32	<0.29	<0.29	<0.30
Vinyl Chloride	<0.58	<0.57	<0.58	<0.58
Total	<66.1	<60.6	<64.3	<63.7

TABLE 89
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	12.6	<9.92	7.60	<10.0
Benzene	4.19	5.17	<2.83	<4.06
Bromodichloromethane	<0.57	<0.50	<0.50	<0.52
Bromoform	<0.51	<0.50	<0.50	<0.50
Bromomethane	<4.56	<4.48	<4.52	<4.52
1,3-Butadiene	<0.51	<0.50	<0.50	<0.50
2-Butanone	<5.61	2.19	2.24	<3.35
Carbon Tetrachloride	<0.51	<0.50	<0.50	<0.50
Chloroform	1.13	0.76	0.70	0.87
Cumene (Isopropylbenzene)	<1.01	<0.99	<1.00	<1.00
Dibromochloromethane	<0.51	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<12.1	<0.99	<1.00	<4.71
1,2-Dichloroethane	<0.51	<0.50	<0.50	<0.50
trans,1,2-Dichloroethene	<0.51	<0.50	<0.72	<0.57
1,1-Dichloroethene	<0.64	<0.50	<0.50	<0.55
1,2-Dichloropropane	<0.51	<0.50	<0.50	<0.50
Ethylbenzene	<0.56	<0.50	<0.50	<0.52
Ethylene Dibromide	<1.01	<0.99	<1.00	<1.00
Mesitylene (1,3,5-Trimethylbenzene)	<2.48	<0.99	<1.00	<1.49
Methylene Chloride	48.7	59.8	69.7	59.4
Styrene	<1.05	<0.99	<1.69	<1.24
Tetrachloroethene	2.48	2.19	1.29	1.99
Toluene	6.94	5.55	6.38	6.29
1,1,1-Trichloroethane	<0.51	<0.50	<0.50	<0.50
Trichloroethene/1,1,2-Trichloroethene	<0.51	<0.50	<0.54	<0.51
Trichlorotrifluoroethane	<0.51	<0.50	<0.50	<0.50
Trichlorofluoromethane	<1.01	<0.99	<1.00	<1.00
M&P-Xylene	<1.59	<1.49	<1.51	<1.53
O-Xylene	<0.56	<0.50	<0.50	<0.52
Vinyl Chloride	<1.01	<0.99	<1.00	<1.00
Total	<115	<105	<112	<111

* At 25°C and 1 atmosphere

TABLE 90
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	9.44	<7.45	5.78	<7.56
Benzene	3.15	3.89	<2.15	<3.06
Bromodichloromethane	<0.43	<0.37	<0.38	<0.40
Bromoform	<0.38	<0.37	<0.38	<0.38
Bromomethane	<3.43	<3.36	<3.44	<3.41
1,3-Butadiene	<0.38	<0.37	<0.38	<0.38
2-Butanone	<4.21	1.64	1.71	<2.52
Carbon Tetrachloride	<0.38	<0.37	<0.38	<0.38
Chloroform	0.85	0.57	0.53	0.65
Cumene (Isopropylbenzene)	<0.76	<0.75	<0.76	<0.76
Dibromochloromethane	<0.38	<0.37	<0.38	<0.38
Dichlorodifluoromethane	<9.11	<0.75	<0.76	<3.54
1,2-Dichloroethane	<0.38	<0.37	<0.38	<0.38
trans,1,2-Dichloroethene	<0.38	<0.37	<0.55	<0.43
1,1-Dichloroethene	<0.48	<0.37	<0.38	<0.41
1,2-Dichloropropane	<0.38	<0.37	<0.38	<0.38
Ethylbenzene	<0.42	<0.37	<0.38	<0.39
Ethylene Dibromide	<0.76	<0.75	<0.76	<0.76
Mesitylene (1,3,5-Trimethylbenzene)	<1.87	<0.747	<0.76	<1.13
Methylene Chloride	36.6	44.9	53.0	44.9
Styrene	<0.79	<0.75	<1.29	<0.94
Tetrachloroethene	1.87	1.64	0.98	1.50
Toluene	5.22	4.17	4.85	4.75
1,1,1-Trichloroethane	<0.38	<0.37	<0.38	<0.38
Trichloroethene/1,1,2-Trichloroethene	<0.38	<0.37	<0.41	<0.39
Trichlorotrifluoroethane	<0.38	<0.37	<0.38	<0.38
Trichlorofluoromethane	<0.76	<0.75	<0.76	<0.76
M&P-Xylene	<1.19	<1.12	<1.15	<1.15
O-Xylene	<0.42	<0.37	<0.38	<0.39
Vinyl Chloride	<0.76	<0.75	<0.76	<0.76
Total	<86.3	<79.2	<85.0	<83.5

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 91
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Wet Reference Concentrations

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	10.5	<8.28	6.34	<8.37
Benzene	3.50	4.32	<2.36	<3.39
Bromodichloromethane	<0.48	<0.42	<0.42	<0.44
Bromoform	<0.42	<0.42	<0.42	<0.42
Bromomethane	<3.81	<3.74	<3.77	<3.77
1,3-Butadiene	<0.42	<0.42	<0.42	<0.42
2-Butanone	<4.68	1.83	1.87	<2.79
Carbon Tetrachloride	<0.42	<0.42	<0.42	<0.42
Chloroform	0.95	0.64	0.59	0.72
Cumene (Isopropylbenzene)	<0.85	<0.83	<0.84	<0.84
Dibromochloromethane	<0.42	<0.42	<0.42	<0.42
Dichlorodifluoromethane	<10.1	<0.83	<0.84	<3.93
1,2-Dichloroethane	<0.42	<0.42	<0.42	<0.42
trans,1,2-Dichloroethene	<0.42	<0.42	<0.60	<0.48
1,1-Dichloroethene	<0.54	<0.42	<0.42	<0.46
1,2-Dichloropropane	<0.42	<0.42	<0.42	<0.42
Ethylbenzene	<0.47	<0.42	<0.42	<0.43
Ethylene Dibromide	<0.85	<0.83	<0.84	<0.84
Mesitylene (1,3,5-Trimethylbenzene)	<2.07	<0.83	<0.84	<1.25
Methylene Chloride	40.7	49.9	58.2	49.6
Styrene	<0.87	<0.83	<1.41	<1.04
Tetrachloroethene	2.07	1.83	1.08	1.66
Toluene	5.80	4.64	5.32	5.25
1,1,1-Trichloroethane	<0.42	<0.42	<0.42	<0.42
Trichloroethene/1,1,2-Trichloroethene	<0.42	<0.42	<0.45	<0.43
Trichlorotrifluoroethane	<0.42	<0.42	<0.42	<0.42
Trichlorofluoromethane	<0.85	<0.83	<0.84	<0.84
M&P-Xylene	<1.33	<1.25	<1.26	<1.28
O-Xylene	<0.47	<0.42	<0.42	<0.43
Vinyl Chloride	<0.85	<0.83	<0.84	<0.84
Total	<96.0	<88.1	<93.3	<92.4

* At 25°C and 1 atmosphere

TABLE 92
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Rates

Compound	Emission Rate			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s
Acetone	0.18	<0.14	0.11	<0.14
Benzene	0.059	0.073	<0.041	<0.058
Bromodichloromethane	<0.0082	<0.0071	<0.0073	<0.0075
Bromoform	<0.0072	<0.0071	<0.0073	<0.0072
Bromomethane	<0.065	<0.064	<0.066	<0.065
1,3-Butadiene	<0.0072	<0.0071	<0.0073	<0.0072
2-Butanone	<0.080	0.031	0.033	<0.048
Carbon Tetrachloride	<0.0072	<0.0071	<0.0073	<0.0072
Chloroform	0.016	0.011	0.010	0.012
Cumene (Isopropylbenzene)	<0.014	<0.014	<0.015	<0.014
Dibromochloromethane	<0.0072	<0.0071	<0.0073	<0.0072
Dichlorodifluoromethane	<0.17	<0.014	<0.015	<0.067
1,2-Dichloroethane	<0.0072	<0.0071	<0.0073	<0.0072
trans,1,2-Dichloroethene	<0.0072	<0.0071	<0.011	<0.0083
1,1-Dichloroethene	<0.0091	<0.0071	<0.0073	<0.0078
1,2-Dichloropropane	<0.0072	<0.0071	<0.0073	<0.0072
Ethylbenzene	<0.0079	<0.0071	<0.0073	<0.0074
Ethylene Dibromide	<0.014	<0.014	<0.015	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.035	<0.014	<0.015	<0.021
Methylene Chloride	0.69	0.85	1.02	0.85
Styrene	<0.015	<0.014	<0.025	<0.018
Tetrachloroethene	0.035	0.031	0.019	0.028
Toluene	0.099	0.079	0.093	0.090
1,1,1-Trichloroethane	<0.0072	<0.0071	<0.0073	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.0072	<0.0071	<0.0078	<0.0074
Trichlorotrifluoroethane	<0.0072	<0.0071	<0.0073	<0.0072
Trichlorofluoromethane	<0.014	<0.014	<0.015	<0.014
M&P-Xylene	<0.023	<0.021	<0.022	<0.022
O-Xylene	<0.0079	<0.0071	<0.0073	<0.0074
Vinyl Chloride	<0.014	<0.014	<0.015	<0.014
Total	<1.63	<1.50	<1.63	<1.59

TABLE 93
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Volatile Organic Emission Data

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	<5.76	<10.0	<7.56	<8.37	<0.14
Benzene	<2.34	<4.06	<3.06	<3.39	<0.058
Bromodichloromethane	<0.30	<0.52	<0.40	<0.44	<0.0075
Bromoform	<0.29	<0.50	<0.38	<0.42	<0.0072
Bromomethane	<2.60	<4.52	<3.41	<3.77	<0.065
1,3-Butadiene	<0.29	<0.50	<0.38	<0.42	<0.0072
2-Butanone	<1.92	<3.35	<2.52	<2.79	<0.048
Carbon Tetrachloride	<0.29	<0.50	<0.38	<0.42	<0.0072
Chloroform	0.50	0.87	0.65	0.72	0.012
Cumene (Isopropylbenzene)	<0.58	<1.00	<0.76	<0.84	<0.014
Dibromochloromethane	<0.29	<0.50	<0.38	<0.42	<0.0072
Dichlorodifluoromethane	<2.71	<4.71	<3.54	<3.93	<0.067
1,2-Dichloroethane	<0.29	<0.50	<0.38	<0.42	<0.0072
trans,1,2-Dichloroethene	<0.33	<0.57	<0.43	<0.48	<0.0083
1,1-Dichloroethene	<0.31	<0.55	<0.41	<0.46	<0.0078
1,2-Dichloropropane	<0.29	<0.50	<0.38	<0.42	<0.0072
Ethylbenzene	<0.30	<0.52	<0.39	<0.43	<0.0074
Ethylene Dibromide	<0.58	<1.00	<0.76	<0.84	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	<0.86	<1.49	<1.13	<1.25	<0.021
Methylene Chloride	34.2	59.4	44.9	49.6	0.85
Styrene	<0.72	<1.24	<0.94	<1.04	<0.018
Tetrachloroethene	1.14	1.99	1.50	1.66	0.028
Toluene	3.62	6.29	4.75	5.25	0.090
1,1,1-Trichloroethane	<0.29	<0.50	<0.38	<0.42	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.30	<0.51	<0.39	<0.43	<0.0074
Trichlorotrifluoroethane	<0.29	<0.50	<0.38	<0.42	<0.0072
Trichlorofluoromethane	<0.58	<1.00	<0.76	<0.84	<0.014
M&P-Xylene	<0.88	<1.53	<1.15	<1.28	<0.022
O-Xylene	<0.30	<0.52	<0.39	<0.43	<0.0074
Vinyl Chloride	<0.58	<1.00	<0.76	<0.84	<0.014
Total	<63.7	<111	<83.5	<92.4	<1.59

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 94
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Volatile Organic Analyses

Compound	Field Blank 1 Tube 30/30B	Field Blank 2 Tube 9A/9B	Field Blank 3 Tube 29A/29B	Trip Blank Tube 14A/14B	Method Blank
	µg	µg	µg	µg	µg
Acetone	<0.1	<0.1	0.15	0.19	<0.1
Benzene	<0.05	<0.05	<0.05	0.073	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.01	<0.01	<0.01	<0.01	<0.01
2-Butanone	<0.01	0.017	<0.01	0.026	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	0.30	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	0.84	1.05	1.52	1.70	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.11	2.14	0.13	5.27	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02	<0.02
Total	<1.80	<3.78	<2.28	<7.69	<0.73

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

APPENDIX 3

Pre-Test Plan Acceptance Letter and
ECA No. 7306-8FDKNX
(87 pages)

If you require this information in an accessible format, please contact The Regional Municipality of Durham at 1-800-372-1102 ext. 3560.



York Region



Sent via mail and email
(celeste.dugas@ontario.ca and tamer.alexangorgy@ontario.ca)

March 2, 2018

Celeste Dugas, Manager,
York Durham District Office
Ministry of the Environment and Climate Change
230 Westney Road South, Floor 5
Ajax, ON L1S 7J5

and

Dr. Tamer Alexan Gorgy, Manager,
Technology Standards Section
Ministry of the Environment and Climate Change
40 St. Clair Avenue West, Floor 9, Foster Building
Toronto, ON M4V 1M2

Dear Ms. Dugas and Dr. Alexan Gorgy:

RE: Durham York Energy Centre
Voluntary Spring 2018 Source Test
Environmental Compliance Approval #7306-8FDKNX

The Regional Municipalities of Durham and York (Regions) are planning to complete a voluntary Source Test at the Durham York Energy Centre (DYEC) commencing on May 7, 2018. The purpose of this Source Test is to measure DYEC emissions under a directive from the Regional Municipality of Durham's Council. Conduct of this Source Test is not a requirement of the Environmental Assessment (EA) approval, or the Environmental Compliance Approval (ECA) for the DYEC.

ORTECH Consulting Inc. (ORTECH) is the consultant selected to conduct the Source Test. ORTECH will be following the 2017 Pre-Test Plan for Source Testing as approved by the Ministry of the Environment and Climate Change (MOECC) prior to the October 2017 Source Test with the exception of Dioxin and Furan Inlet Testing, which was a voluntary initiative and not a requirement of the approved Air Emissions Monitoring Plan.

The analytical laboratory will be ALS Environmental in Mississauga, Ontario. This laboratory is certified to conduct the analysis for all test parameters.

Please accept this courtesy notification of the planned voluntary Source Test. If you have any questions regarding this notification and the impending conduct of the DYEC Source Testing Program, please do not hesitate to contact the undersigned.

Sincerely,

Mirka Januszkiewicz, P.Eng.
Director, Waste Management Services

The Regional Municipality of Durham
905-668-7711 extension 3464
Mirka.Januszkiewicz@durham.ca

Laura McDowell, P.Eng.
Director, Environmental Promotion and Protection
The Regional Municipality of York
905-830-4444 extension 75077
Laura.McDowell@york.ca

c. ✓ G. Azocar, Source Assessment Specialist, Technology Standards Section, MOECC
S. Thomas, Issues Project Coordinator, York Durham District Office, MOECC
P. Dunn, Senior Environmental Officer, York Durham District Office, MOECC
L. Brasowski, Director, Environmental Engineering, Covanta
M. Neild, DYEC Facility Manager, Covanta
A. Huxter, Environmental Specialist, Covanta
G. Anello, Manager, Waste Planning and Technical Services, The Regional Municipality of Durham
S. Dittman, Supervisor, Technical Services, Waste Management, The Regional Municipality of York

THE REGIONAL
MUNICIPALITY OF
DURHAM

DURHAM
REGION

605 ROSSLAND RD E
PO BOX 623
WHITBY ON L1N 6A3



NE014 3534680
002288 jzf75
0305 105906

CANADA POSTES
POST CANADA
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L1N 6A3 2018.03.05

Guillermo Azocar, Source Assessmt. Spec.
Technology Standards Section
Ministry of the Environ. & Climate Change
40 St. Clair Avenue West, Flr 9 Foster Bldg
Toronto, ON M4V 1M2

Ontario

Ministry of the Environment
Ministère de l'Environnement

CERTIFICATE OF APPROVAL
MULTI-MEDIA
Number 7306-8FDKNX
Issue Date: June 28, 2011

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
United States of America
07960

Site Location: Durham York Energy Centre
72 Osbourne Road
Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham

You have applied in accordance with Sections 9 and 27 of the Environmental Protection Act and Section 53 of the Ontario Water Resources Act for approval of:

A thermal treatment facility to be used for the receipt and manual and/or mechanical sorting 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 of Waste, the nominal electricity generation rate is 20 Megawatts and the nominal steam generation rate 72,000 kilograms per hour of steam.

The facility consists of the following major processes and support units:

(1) two (2) identical combustion trains, each having a nominal capacity of 218 tonnes of Waste per day venting into the atmosphere via a common exhaust stack, having an exit diameter of 1.71 metres, extending 87.6 metres above grade.

Each combustion train is an independent process train and it consists of the following main components:

(a) a stoker grate steam Boiler, having a design heat input of 118 Gigajoules per hour, equipped with a natural gas fired auxiliary Low NOx burner, having a nominal heat input of 59.5 Gigajoules per hour; and

(b) the following air pollution control equipment:

(i) a Selective Non Catalytic Reduction System (SNCR System) with ammonia injection for NOx control;
(ii) an activated carbon injection system, to reduce mercury and dioxins in flue gas;
(iii) a dry recirculation lime injection scrubber to control acid gases;
(iv) a pulse jet type baghouse to control particulate emissions;

(2) one (1) steam turbine generator set having a rated capacity of 20 Megawatts;

(3) waste and reagent storage as described in Condition 2.:

(4) fly ash conditioning system including two (2) surge bins, two (2) pugmills and seven (7) curing/storage bunkers;

(5) bottom ash sorting system including conveyors, screens, a rotary drum magnet and an eddy separator;

(6) one (1) emergency diesel generator, rated at 250 Kilowatts;

(7) natural gas-fired combustion equipment for comfort heating;

(8) a wastewater management system for collection, recirculation and reuse of the process water; and

(9) a stormwater management facility for collection, transmission and discharge of non-contact runoff at the Site, as described in the attached Schedule "G",

Note: Use of the site for any other type of waste is not approved under this Certificate, and requires obtaining a separate approval amending this Certificate.

For the purpose of this Provisional Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"***Acoustic Assessment Report***" means the report, prepared in accordance with *Publication NPC-233* by Paul Niejadlik / Golder Associates Ltd. and dated March 2011 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility;

"**Acoustic Assessment Summary Table**" means a table summarizing the results of the Acoustic Assessment Report;

"**Acoustic Audit**" means an investigative procedure consisting of measurements of all noise emissions due to the operation of the Facility, assessed in comparison to the Performance Limits for the Facility regarding noise emissions, completed in accordance with the procedures set in the Ministry's *Publication NPC-103* and reported in accordance with the Ministry's *Publication NPC-233;*

"**Acoustic Audit Report**" means a report presenting the results of an Acoustic Audit, prepared in accordance with the Ministry's *Publication NPC-233;*

"**Acoustical Consultant**" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;

"**Air Standards Manager**" means the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, as those duties relate to the conditions of this Certificate;

"**APC Building**" means the building at the Site where the APC Equipment and the reagent indoor storage tanks are located;

"**APC Equipment**" means all the air pollution control equipment at the Facility, including the SNCR System, the activated carbon injection system, the dry recirculation lime injection scrubber and the pulse jet type baghouse to control emissions from the combustion chamber of the Boilers, the dust collectors to control emissions from the Residue Building and the dust collectors to control emissions from the reagent storage silos;

"**Boiler Building**" means the building at the Site where the Boilers, turbine generator and the air cooled condenser(s) are located;

"**Boilers**" means the two (2) steam boilers firing the approved Waste described in this Certificate;

"**Bulky Unprocessable Items**" means the incoming Waste received at the Site that cannot be processed in the Equipment;

"**CEM Systems**" means the continuous monitoring and recording systems used to measure and record the temperature and the emissions from the Boilers as specified in the attached Schedule "F";

"**Certificate**" means this entire provisional Certificate of Approval, issued in accordance with Sections 39 and 9 of the *EPA* and Section 53 of the *OWRA,* and includes any schedules attached to it, the application and the supporting documentation listed in the attached Schedule "A;

"***40 CFR 60***" means title 40, part 60 under the Code of Federal Regulations (Air Programs, U.S. Environmental Protection Agency), revised as of July 1, 1990, published by the Office of the Federal Register, National Archives and Records, Administration in the United States of America;

"**Complaint**" means a complaint received either by the Owner or the District Manager that has been confirmed by staff of the Ministry and the cause of which is attributed to the Owner's activities at the Facility;

"**Commencement Date of Operation**" means the date when the approved Waste is first received at the Site;

"**Compound of Concern**" means a contaminant that, based on generally available information, may be emitted to the atmosphere in a quantity from any source at the Facility that is significant either in comparison to the relevant Ministry Point of Impingement Limit or if a Ministry Point of Impingement Limit is not available for the compound then, based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the *EPA* at a Point of Impingement;

"**Controlled Shutdown**" means an immediate cut-off of all waste into the Boilers, while maintaining the operation of the combustion chamber and the APC Equipment within the Performance Requirements;

"**Description Section**" means the section on page one of the Certificate describing the Owner's operations and the Equipment located at the Facility and specifying the Facility Production Limit for the Facility;

"**Dioxins and Furans**" means polychlorinated dibenzo-dioxins and polychlorinated dibenzofurans;

"**Director**" means any person appointed in writing by the Minister of the Environment pursuant to section 5 of the *EPA* and pursuant to section 5 of the *OWRA* as a Director for the purposes of Part V of the *EPA,* section 9 of the *EPA* and section 53 of the *OWRA;*

"**District Manager**" means the District Manager of the York Durham District Office of the Ministry;

"**Emergency Shutdown**" means an immediate cut-off of all waste feed into the Boilers, followed by an accelerated extinction of all combustion in the Boilers, while maintaining the combustion temperature within the Performance Requirements, except when unreasonable;

"**Emission Summary Table**" means the table prepared in accordance with *O. Reg. 419/05* and the Procedure Document listing the appropriate Point of Impingement concentrations of each Compound of Concern from the Facility and providing comparison to the corresponding Ministry Point of Impingement Limit;

"*EAA*" means the Environmental Assessment Act, R.S.O. 1990, c. E.18, as amended;

"**EA Approval**" means the Notice of Approval to Proceed with the Undertaking signed by the Minister of the Environment on November 3, 2010, EA File No. 04-EA-02-08;

"*EPA*" means the Environmental Protection Act, R.S.O. 1990, c. E.19, as amended;

"**Equipment**" means equipment or processes associated with the thermal treatment of the approved Waste described in this Certificate and in the Supporting Documentation referred to herein and any other equipment or processes handling wastes and reagents;

"**ESDM Report**" means the Emission Summary and Dispersion Modelling Report prepared in accordance with the Procedure Document by Golder Associates and dated March 2011 submitted in support of the application, and includes any amendments to the ESDM Report listed in the attached Schedule "A" and all subsequent up-dated ESDM Reports as applicable;

"**Facility**" means the entire operation associated with thermal treatment of Waste located on the property where the Equipment is located;

"**Facility Production Limit**" means the production limit placed on the main product(s) or raw materials used by the Facility that represents the design capacity of the Facility and assists in the definition of the operations approved by the Director;

"**Grizzly Building**" means the building at the Site where the bottom ash is screened and where the oversized constituents of the bottom ash (grizzly overs) are temporarily stored prior to transport for subsequent storage in the Residue Building;

"**Independent Acoustical Consultant**" means an Acoustical Consultant who is not representing the Owner and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;

"**I-TEF**" means International Toxic Equivalency Factor derived for each dioxin and furan congener by comparing its toxicity to the toxicity of 2,3,7,8 tetrachloro dibenzo-p-dioxin, as recommended by the North Atlantic Treaty Organization Committee on Challenges to Modern Society (NATO CCMS) in 1989 and adopted by Canada in 1990;

"**I-TEQ**" means International Toxic Equivalent of dioxins and furans calculated using the I-TEFs, as recommended by the NATO CCMS in 1989 and adopted by Canada in 1990;

"**Manager**" means the Manager, Technology Standards Section, Standards Development Branch, who has been appointed under Section 5 of the *EPA* for the purposes of Section 11(1)2 of the *O. Reg. 419/05,* or any other person who represents and carries out the duties of the Manager,

Technology Standards Section, Standards Development Branch, as those duties relate to the conditions of this Certificate;

"**Ministry**" means the ministry of the government of Ontario responsible for the *EPA* and the *OWRA* and includes all officials, employees or other persons acting on its behalf or the Ontario Ministry of the Environment;

"**Municipality**" means the Municipality of Clarington;

"***NMA***" means the *Nutrient Management Act*, 2002, S.O. 2002, c. 4, as amended;

"**Noise Control Measures**" means measures to reduce the noise emission from the Facility and/or Equipment including, but not limited to silencers, acoustic louvers, enclosures, absorptive treatment, plenums and barriers;

"**LDR**" means the Lands Disposal Restrictions referred to in sections 74 through 85 of the *O. Reg. 347,* which prohibit the disposal of hazardous wastes on land until they have been treated to meet the treatment standards under the *O. Reg. 347;*

"**Leachate Toxicity Criteria**" means the concentrations of any of the contaminants listed in Schedule 4 at a concentration equal to or in excess of the concentration specified for that contaminant in Schedule 4 using the Toxicity Characteristic Leaching Procedure, defined in the *O. Reg. 347*;

"***O. Reg. 419/05***" means the *Ontario Regulation 419/05,* Air Pollution – Local Air Quality enacted under the *EPA,* as amended;

*"**O. Reg. 347**"* means the *Ontario Regulation 347,* R.R.O 1990 (General –Waste Management) enacted under the *EPA,* as amended;

"***OWRA***" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;

"**Owner**" means any person that is responsible for the establishment and operation of the Site being approved by this Certificate, and it includes The Regional Municipality of Durham, The Regional Municipality of York, and Covanta Durham York Renewable Energy Limited Partnership (operator), their successors and assignees;

"***PA***" means the *Pesticides Act*, R.S.O. 1990, c.P. 11, as amended;

"**Performance Requirements**" means the performance requirements and emission limits specified in the section of this Certificate entitled "Performance Requirements";

"**Point of Impingement**" means any point outside the Facility in the natural environment and as defined by s.2 of the *O. Reg. 419/05;*

"**Point of Reception**" means the Point of Reception as defined by *Publication NPC-205* and/or *Publication NPC-232*, as applicable;

"**Pre-test Information**" means the information outlined in Section 1.1 of the Source Testing Code;

"**Procedure Document**" means the Ministry's document entitled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2005, as amended;

"**Professional Engineer**" means a Professional Engineer as defined within the *Professional Engineers Act*, R.S.O. 1990, c. P.28, as amended;

"**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA* or Section 5 of the *EPA* or Section 17 of the *PA* or Section 4 of the *NMA* or Section 8 of the *SDWA;*

"***Publication NPC-103***" means the Ministry's Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, dated August 1978, published by the Ministry, as amended;

"***Publication NPC-205***" means the Ministry's Publication NPC-205, entitled "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)", dated October, 1995, as amended;

"***Publication NPC-207***" means the Ministry's draft technical publication entitled "Impulse Vibration in Residential Buildings", dated November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, dated August 1978, published by the Ministry, as amended;

"***Publication NPC-232***" means the Ministry's Publication NPC-232, entitled "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)", dated October, 1995, as amended;

"***Publication NPC-233***" means the Ministry's Publication NPC-233, entitled "Information to be Submitted for Approval of Stationary Sources of Sound", dated October, 1995, as amended;

"**Rejected Waste**" means either municipal waste which cannot be processed at the Facility or waste which the Site is not approved to accept. Rejected Waste includes but is not limited to the Bulky Unprocessable Items and the Unacceptable Waste;

"**Regional Director**" means the Regional Director of the Central Region of the Ministry;

"**Regions**" means The Regional Municipality of Durham and The Regional Municipality of York;

*"**Report EPS 1/PG/7**"* means the Environment Canada Report EPS 1/PG/7, entitled "Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Generation", dated September, 1993, as amended;

"**Residual Waste**" means waste resulting from the Waste processing activities at the Site. Residual Waste is limited to the recovered ferrous metals, the recovered non-ferrous metals, the bottom ash (consisting of the ash fines and the grizzly overs) and the fly ash (untreated and following conditioning);

"**Residue Building**" means the building at the Site where the bottom ash and the fly ash are processed, temporarily stored and loaded in transport vehicles for off-site disposal;

"**Schedules**" means the following schedules "A", "B", "C", "D", "F" and "G", attached to the Certificate and forming part of the Certificate;

"***SDWA***" means the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended;

"**Sensitive Receptor**" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Facility, including one or a combination of:

(a) private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.);

(b) institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.);

(c) outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.); and

(d) other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

"**Site**" means the property where the Owner has located and operates the Facility and the Works and located at 72 Osbourne Road, 27, Concession Broken Front, Part 1 in the Municipality of Clarington, Regional Municipality of Durham;

"**Source Testing**" means 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;

"***Source Testing Code***" means the Ministry's document entitled "Source Testing Code, Version 2, Report No. ARB-66-80", dated November 1980, as amended;

"**Stack**" means the stack that discharges emissions from the Boilers after those emissions have been controlled by the associated APC Equipment;

"**Substantial Completion**" has the same meaning as "substantial performance" in the *Construction Lien Act* R.S.O. 1990, c.C-30, as amended;

"**Supporting Documentation**" means the documents listed in the attached Schedule "A" of this Certificate which forms part of this Certificate;

"**Test Contaminants**" means the contaminants set out in the attached Schedule "D";

"**Tipping Building**" means the building at the Site where the incoming Waste is received, sorted and temporarily stored;

"**Total Power Failure**" means the loss of the external power supply and concurrent loss of all in-plant power generation;

"**Trained Personnel**" means one or more Site personnel trained in accordance with the requirements of Condition 9.;

"**Waste**" means municipal solid waste as defined in the *O. Reg. 347* and limited to the approved waste set out in Condition No. 2.(2);

"**Waste Processing Rate** means the mass of Waste fed into one of the Boilers;

"**Works**" means the sewage works described in the Owner's application, this Certificate and in the Supporting Documentation referred to herein, to the extent approved by this Certificate;

"**Unacceptable Waste**" means the incoming Waste received at the Site that does not meet the incoming Waste quality criteria set out in this Certificate, is of hazardous nature and requires caution when handling; and

"**Undiluted Gases**" means the flue gas stream which contains oxygen, carbon monoxide, total hydrocarbons and all contaminants in the same concentrations as they exist in the flue gas stream emerging from an individual piece of equipment, such as the combustion chamber of one Boiler or one baghouse, and into which gas stream no ambient air and/or no other gas stream originating from another piece of equipment, except for dilution air introduced within the CEM Systems, has been introduced.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

GENERAL PROVISIONS

1. GENERAL

Compliance

(1) The Owner shall ensure compliance with all the conditions of this Certificate and shall ensure that any person authorized to carry out work on or operate any aspect of the Site, including the Works, is notified of this Certificate and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Any person authorized to carry out work on or operate any aspect of the Site shall comply with the conditions of this Certificate.

Build in Accordance

(3) (a) Except as otherwise provided by this Certificate, the Site shall be designed, developed, built, operated, monitored, inspected and maintained in accordance with the following applications:

(i) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of

Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(ii) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(iii) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(b) (i) Any design optimization or modification that is inconsistent with the conceptual design set out in the Supporting Documentation in Schedule "A" shall be clearly identified, along with an explanation of the reasons for the change and submitted to the Director for approval.

(ii) If a change to the conceptual design is submitted to the Director for approval, no construction of the Site shall commence prior to the Director approving, in writing, the final conceptual design of the Site.

As-built Drawings

(4) (a) Within ninety (90) days of the completion of the initial successful Source Testing program, a set of as-built drawings showing the Facility and the Works and bearing the stamp of a Professional Engineer, shall be prepared and retained at the Site.

(b) These drawings shall be kept up-to-date through revisions undertaken from time to time and a copy shall be retained at the location of the Site or at the operational office of the Owner for the operational life of the Site.

(c) Notwithstanding provisions of Condition 1.(4)(b), an amendment to this Certificate shall be sought for changes to the as-built drawings, requiring approval.

(d) The as-built drawings shall be made available to Ministry staff upon request.

Interpretation

(5) Where there is a conflict between a provision of any document, including the application referred to in this Certificate and the conditions of this Certificate, the conditions in this Certificate shall take precedence.

(6) Where there is a conflict between the applications and a provision in any documents listed in Schedule "A", the applications shall take precedence, unless it is clear that the purpose of the document was to amend the applications and that the Ministry approved the amendment.

(7) Where there is a conflict between any two documents listed in Schedule "A", other than the applications, the document bearing the most recent date shall take precedence.

(8) The requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

Other Legal Obligations

(9) The issuance of, and compliance with the conditions of this Certificate does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

(b) limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner to furnish any further information related to compliance with this Certificate.

Adverse Effects

(10) The Site shall be constructed, operated and maintained in a manner which ensures the health and safety of all persons and prevents adverse effects on the natural environment or on any persons.

(11) The Owner shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the approved operations at the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

(12) Despite the Owner or any other person fulfilling any obligations imposed by this Certificate, the person remains responsible for any contravention of any other condition of this Certificate or any applicable statute, regulation, or other legal requirement resulting from any act or emission that caused the adverse effect to the natural environment or impairment of water quality.

(13) If at any time odours, pests, litter, dust, noise or other such negative effects are generated at this Site and cause an adverse effect, the Owner shall take immediate appropriate remedial action that may be necessary to alleviate the adverse effect, including suspension of all waste management activities if necessary.

Change of Ownership

(14) The Owner shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any changes:

(a) the ownership of the Site;
(b) the operator of the Site;
(c) the address of the Owner;
(d) the partners, where the Owner is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B.17, as amended, shall be included in the notification;
(e) the name of the corporation where the Owner is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

(15) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this Certificate, and the Owner shall provide a copy of the notification to the District Manager and the Director.

Inspections by the Ministry

(16) No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the *OWRA*, the *EPA*, the *PA*, the *SDWA* or the *NMA* of any place to which this Certificate relates, and without limiting the foregoing:

(a) to enter upon the premises where the approved processing is undertaken, or the location where the records required by the conditions of this Certificate are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this Certificate;
(c) to inspect the Site, related equipment and appurtenances;
(d) to inspect the practices, procedures, or operations required by the conditions of this Certificate;
(e) to conduct interviews with staff, contractors, agents and assignees of the Owner; and
(f) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Certificate or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information

(17) Any information requested by the Ministry, concerning the operation of the Site and its operation under this Certificate, including but not limited to any records required to be kept by this Certificate, manuals, plans, records, data, procedures and supporting documentation shall be provided to the Ministry, in a timely manner, upon request.

(18) The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action, under this Certificate or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

(a) an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Certificate or any statute, regulation or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

(19) The Owner shall ensure that a copy of this Certificate, in its entirety and including all its Notices of Amendment and the Supporting Documentation listed in Schedule "A" are retained at the Site at all times.

2. **SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE**

(1) The service area for the Site is the area within the jurisdictional boundaries of The Regional Municipality of Durham and The Regional Municipality of York.

(2) The operation of this Site is limited to:

(a) receipt, temporary storage, transfer and processing, including thermal treatment, of solid non-hazardous waste remaining after Waste Diversion required by the EA Approval, limited to Waste from the following sources:

(i) domestic waste and Industrial Commercial and Institutional waste from the Regions' curbside collection and/or from the Regions' waste management facilities; and

(ii) waste generated on-Site through activities not relating to the handling and processing of Waste (ie. office, lunch room, etc.);

(b) collection and management of the stormwater run-off generated at the Site.

(3) The following Unacceptable Waste is prohibited from being accepted at the Site:

(a) hazardous waste, as defined in the *O. Reg. 347;*
(b) wastes which have been source-separated for the purposes of diversion;

(c) international waste generated outside of Canada, but collected within the jurisdictional boundaries of The Regional Municipality of Durham and The Regional Municipality of York.

(4) Waste Receipt Rate:

(a) The maximum daily amount of Waste that is approved to be accepted at the Site shall not exceed 1,520 tonnes per day.

(5) Storage Restrictions:

Solids:

(a) A maximum of 7,350 cubic metres shall be stored inside the Waste pit within the Tipping Building as shown in the Supporting Documentation.

(b) Rejected Waste, limited to the Bulky Unprocessable Items removed from the incoming Waste in the Tipping Building shall be stored:

(i) in two (2) roll-off bins having a maximum total storage capacity of 30 cubic metres, located within the confines of the Tipping Building; and/or

(ii) in the appropriate dedicated bunkers, located within the confines of the Residue Building and described in Conditions 2.(5)(c), 2.(5)(d) and 2.(5)(d), below.

(c) A maximum of approximately 77 tonnes or 106 cubic metres of the Residual Waste, limited to the recovered ferrous metals, shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(d) A maximum of approximately 120 tonnes or 100 cubic metres of the Residual Waste, limited to the recovered non-ferrous metals, shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(e) A maximum of 630 tonnes of the Residual Waste, limited to bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(f) A maximum of 700 tonnes of the Residual Waste, limited to the fly ash shall be stored in seven (7) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of thirty six (36) days.

(g) A maximum of 85 cubic metres of activated carbon for the carbon injection system shall be stored in one (1) outdoor tank, located adjacent to the APC Building.

(h) A maximum of 150 cubic metres of lime for the dry scrubber shall be stored in one (1) or more indoor tank(s), located within the confines of the APC Building.

(i) If required, recirculated residue shall be stored in one (1) or more indoor tank(s), located within the confines of the APC Building.

(j) A maximum of 35 tonnes or 25 cubic metres of cement for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

(k) A maximum of 25 tonnes or 45 cubic metres of pozzolan for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

Liquids:

(l) (i) A maximum of 36 cubic metres or 40 tonnes of aqueous ammonia for the SNCR System shall be stored in one (1) outdoor tank, located adjacent to the APC Building.

(ii) The Owner shall ensure that the aqueous ammonia storage tank is equipped with a liquid level monitoring device designed to provide a visual and an auditory alarm when the high level setpoint is reached.

(iii) The aqueous ammonia storage tank spill containment area and the loading area shall be designed in accordance with the requirements in the Ministry's document entitled *"Guidelines for Environmental Protection Measures at Chemical and Waste Storage Facilities"* dated May 2007, as amended.

(6) No outdoor storage of waste, including storage in vehicles, is approved under this Certificate.

(7) The Owner shall ensure that storage of all wastes is undertaken in a manner that does not cause an adverse effect or a hazard to the environment or any person.

(8) (a) Waste received at the Site shall be processed within four (4) days from its receipt at the Site.

(b) Emergency Waste storage duration extension:

(i) The Owner may store the incoming Waste inside the tipping pit within the confines of the Tipping Building for up-to seven (7) days from its receipt at the Site, on an emergency basis only.

(ii) Within twenty four (24) hours from the start of the emergency storage of the incoming Waste, the Owner shall notify, in writing, the District Manager that the incoming Waste is being stored longer then four (4) days.

(iii) Should there be public complaints about the extended incoming Waste storage, the Owner, in consultation with the District Manager, shall determine the cause of the complaints, propose appropriate abatement measures, including but not be limited to the removal and off-site disposal of the Waste contained in the tipping pit, and implement the said measures upon receiving written concurrence from the District Manager within the time frame acceptable to the District Manager.

(9) In the event that Waste cannot be processed at the Site and the Site is at its approved storage capacity, the Owner shall cease accepting additional Waste. Receipt of additional Waste may be resumed once such receipt complies with the waste storage limitations approved in this Certificate.

3. **SIGNS and SITE SECURITY**

(1) Prior to receipt of Waste at the Site, the Owner shall ensure that a sign is posted at the entrance to the Site. The sign shall be visible from the main road leading to the Site. The following information shall be included on the sign:

(a) name of the Owner;
(b) this Certificate number;
(c) hours during which the Site is open;
(d) waste types that are approved to be accepted at the Site;
(e) Owner's telephone number to which complaints may be directed;
(f) Owner's twenty-four hour emergency telephone number (if different from above);
(g) a warning against unauthorized access; and
(h) a warning against dumping at the Site.

(2) The Owner shall ensure that appropriate and visible signs are posted at the Site clearly identifying the wastes and the process reagents and stating warnings about the nature and any possible hazards of the wastes and the reagents.

(3) The Owner shall ensure that appropriate and visible signs are posted at the Site to prohibit smoking, open flames or sources of ignition from being allowed near any flammable materials storage areas.

(4) The Owner shall install and maintain appropriate and visible signs at the Site to direct vehicles to the Waste receiving and Residual Waste removal areas and to the reagent unloading areas.

(5) The Owner shall post appropriate and visible signs along the traffic route providing clear directions to the Site.

(6) The Owner shall ensure that the Site is fenced in and that all entrances are secured by lockable gates to restrict access only to authorized personnel when the Site is not open.

(7) The Owner shall ensure that access to the Site, with the exception of the area designated as a Public Information Centre, is regulated and that no unauthorized persons are permitted at the Site without the Trained Personnel escort.

(8) The Owner shall ensure that the Site is operated in a safe and secure manner, and that Waste, the Residual Waste and the Unacceptable Waste are properly handled, packaged or contained and stored so as not to pose any threat to the general public and the Site personnel.

4. **SITE OPERATIONS**

(1) **Operating hours:**

(a) The Site is approved to operate twenty-four (24) hours per day three hundred and sixty-five (365) days per year.

(b) Notwithstanding Condition 4.(1)(a), Waste shall only be received at the Site and the Residual Waste shall only be transferred from the Site between 7:00 a.m. and 7:00 p.m. Monday to Saturday. No receipt of the Waste or transfer of the Residual Waste shall be undertaken on statutory holidays.

(c) Emergency Receipt of Waste:

(i) The Owner may receive Waste at the Site outside of the operating hours specified in Condition 4.(1)(b), above, on an emergency basis only.

(ii) Within twenty four (24) hours from the receipt of Waste outside of the approved receiving hours, the Owner shall notify, in writing, the District Manager that Waste was received outside of the approved receiving hours.

(iii) Should there be complaints about Waste shipments outside of the approved hours, the Owner, in consultation with the District Manager, shall determine the cause of the complaint, propose appropriate abatement measures and implement the said measures upon receiving written concurrence from the District Manager within the time frame acceptable to the District Manager.

(2) **Incoming Waste receipt:**

(a) At the weigh scale, the Trained Personnel shall:

(i) inspect the required documentation prior to acceptance of the incoming Waste at the Site; and

(ii) inspect the incoming Waste with radiation detection equipment.

(b) In the Tipping Building, the Trained Personnel shall:

(i) visually inspect all incoming Waste being unloaded into the Waste pit; and

(ii) once per hour, or as accepted by the District Manager, unload the incoming Waste on the tipping floor for a manual visual inspection and sorting of the incoming Waste.

(c) The Owner shall only accept the incoming Waste that is delivered in vehicles that have been approved by the Ministry.

(d) The Owner shall ensure that all unloading of incoming Waste at the Site takes place entirely within the confines of the Tipping Building.

(3) **Unacceptable Waste handling:**

(a) In the event that waste that is not approved under this Certificate is inadvertently accepted at the Site, the Owner shall ensure that the Unacceptable Waste:

(i) is stored in a way that ensures that no adverse effects result from its storage;
(ii) is segregated from all other waste;
(iii) is handled and removed from the Site in accordance with the *O. Reg. 347* and the *EPA*; and
(iv) is removed from the Site within (4) days of its receipt or as acceptable to the District Manager.

(b) The Owner shall ensure that all loading of the Unacceptable Waste into transport vehicles is carried out entirely within the confines of the Tipping Building.

(4) **Waste Sorting:**

(a) The Trained Personnel shall remove the Bulky Unprocessable Items and Unacceptable Waste from the incoming Waste prior to charging of the Waste to the Boilers.

(b) All sorting of the incoming Waste at the Site shall be undertaken indoors, within the confines of the Tipping Building and/or the Refuse Building.

(5) **Residual Waste Handling and Disposal:**

(a) (i) Except for transportation of the Residual Waste between the Grizzly Building and the Residue Building, the Owner shall ensure that all

handling of the bottom ash and its segregated constituents, and of the fly ash, is undertaken within the confines of enclosed conveyors and enclosed buildings.

(ii) The Owner shall ensure that all loading of the Residual Waste into vehicles for its transport from the Site is carried out entirely within the confines of the Residue Building.

(b) (i) Different constituents of the Residual Waste shall not be comingled prior to the required compliance testing, unless all Residual Waste is to be disposed of at a Waste Disposal Site that is approved to accept hazardous waste.

(ii) The Owner shall ensure that the equipment used in handling of the hazardous wastes or that came in direct contact with the hazardous wastes is not used to handle other wastes.

(iii) On an emergency basis, the Owner may use equipment used to handle the hazardous wastes to handle other wastes provided that prior to such use the equipment has been thoroughly cleaned first.

(c) (i) Only haulers approved by the Ministry shall be used to transport the Residual Waste from the Site.

(ii) The Residual Waste shall be transported from the Site in appropriately covered vehicles that will not allow fugitive dust emissions to be emitted into the natural environment during the said transport.

d) Residual Waste generated at the Site shall be disposed of shall only be disposed of at an approved waste disposal site in accordance with the requirements in the *EPA* and the *O. Reg. 347* or at a location with the appropriate jurisdictional approval or a license, if required.

(e) Should the Residual Waste limited to the conditioned fly ash and/or the bottom ash be deemed a hazardous waste, the ash shall be disposed of at an approved waste disposal site in accordance with the Land Disposal Restrictions requirements in the *EPA* and the *O. Reg.* 347 or at a location with the appropriate jurisdictional approval or a license, if required.

(6) **Wastewater Management**

(a) The Owner shall ensure that all wastewater generated at the Site is contained within enclosed buildings, tanks, pipes and conveyors at the Site and the approved outdoor Wastewater Settling Basin.

(b) The Owner shall ensure that all wastewater generated at the Site is collected in leak-proof and sufficiently designed wastewater storage facilities:

(i) Wastewater Holding Tank, to collect the continuous reject water flow from the Boiler make-up water treatment system and the Boiler blowdown, having an approximate holding capacity of 100 cubic metres, located within the confines of the Boiler Building and venting to the atmosphere; and

(ii) Wastewater Settling Basin, to collect the wastewater from the floor drains in the buildings at the Site, except for the Tipping Building and the Residue Building, the ash discharger overflow and drain water, the Boiler and turbine-generator washdown water and the APC Equipment area washdown water, having an approximate holding capacity of 38 cubic metres, located outdoors, open to the atmosphere and equipped with a filter basket and an oil skimmer board.

(c) The wastewater pumps shall be located in the area designed in accordance with the Supporting Documentation to ensure that any potential leaks or drips are contained and directed to the Wastewater Settling Basin.

(d) (i) The wastewater level in the Wastewater Holding Tank shall be monitored and controlled to ensure that the wastewater inflow to the Tank does not cause the Tank overflow.

(ii) The wastewater level in the Wastewater Settling Basin shall be monitored and controlled to ensure that the atmospheric precipitation does not cause an overflow from the Basin.

(e) The Owner shall regularly empty, and clean as necessary, all sumps, wastewater storage/holding areas and equipment that are used to contain, collect and handling the wastewater generated at the Site.

(f) Should the Owner find it necessary to remove the wastewater from the Site, the wastewater shall only be disposed of at a Ministry-approved site in accordance with the site's certificate of approval or be discharged to the sanitary sewer in accordance with the agreement with the municipality accepting the discharge.

(g) The floors of the Tipping Building and the Residue Building shall be sufficiently sloped to facilitate the flow of the wastewater generated from the floor cleaning activities and from the truck washdown towards the designated wastewater collection area.

(h) The Owner shall ensure that the Wastewater Settling Basin is regularly cleaned out and that it does not become a source of odour emissions.

(7) All activities approved under this Certificate shall only be carried out by appropriately Trained Personnel.

5. EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

Operation and Maintenance

(1) Prior to the receipt of the Waste at the Site, the Owner shall prepare and update as necessary, an Operation and Maintenance Manual for all the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility. The Manual shall be prepared in accordance with the written manufacturer's and/or supplier's specifications and good engineering practice.

As a minimum, the Operation and Maintenance Manual shall specify:

(a) operation procedures of the Equipment, the APC Equipment, the CEM Systems, the Works, and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility, in accordance with manufacturers' recommendations and good engineering practices to achieve compliance with this Certificate, the *EPA,* the *OWRA* and their Regulations;
(b) calibration procedures for the CEM Systems as required by this Certificate;
(c) procedures for start-up and shutdown, including Controlled Shutdown and Emergency Shutdown;
(d) quality assurance procedures for the operation and calibration of the CEM Systems in accordance with *40 CFR 60*, Appendix F or *Report EPS 1/PG/7,* as appropriate;
(e) Waste receiving and screening procedures;
(f) Waste, Rejected Waste and Residual Waste handling procedures;
(g) testing and monitoring procedures as required by this Certificate;
(h) maintenance and preventative maintenance procedures as required by this Certificate;
(i) Facility inspection, including frequency of inspections, procedures;
(j) procedure for handling complaints as required by this Certificate.
(k) contingency measures to resolve upset conditions and/or minimize the environmental impacts from the Facility;
(l) emergency response procedures, including procedures for dealing with power failure, fire, explosion, spills and any other potential emergencies;
(m) procedures for record keeping activities as required by this Certificate;
(n) description of the responsibilities of the Site personnel and the personnel training protocols; and
(o) a list of personnel positions responsible for operation and maintenance, including supervisory personnel and personnel responsible for handling of the emergency situations, recording and reporting pursuant to the requirements of this Certificate, along with the training and experience required for the positions and a description of the responsibilities.

(2) A copy of this Operations and Maintenance Manual shall be kept at the Site, be accessible to the Site personnel at all times and be updated, as required. The Operations and Maintenance Manual shall be available for inspection by a Provincial Officer upon request.

(3) The Owner shall implement the operation, maintenance, preventative maintenance and calibration procedures set out in the Operations and Maintenance Manual required by this Certificate.

Critical Spare Parts

(4) (a) The Owner shall prepare a list of critical spare parts, update this list annually or more frequently, if necessary, to ensure that this list is maintained up-to-date and shall be available for inspection by a Provincial Officer upon request.

(b) The Owner shall ensure that the critical spare parts are available at the Site at all times or are immediately available from an off-Site supplier.

Inspections

(5) Prior to receipt of the Waste at the Site, the Owner shall prepare a comprehensive written inspection program which includes inspections of all aspects of the Site's operations including, but not limited to the following:

(a) buildings and the indoor waste storage facilities and presence of dust and odour and leaks in or near any openings, such as doorways, window, vent, louver or any other opening;
(b) outdoor Residual Waste transport equipment, and the presence of dust and leaks at or near transfer points or the equipment seams;
(c) the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility;
(d) spill containment areas, loading areas and the conditions around the Wastewater Settling Basin;
(e) security fencing, gates, barriers and signs;
(f) off-site nuisance impacts such as odour, dust, litter, etc.
(g) presence of stormwater pooling at the Site; and
(h) condition of the on-Site roads for presence of leaks and drips from the waste delivery trucks or excessive dust emissions.

(6) The inspections, except for the inspection of the Works, are to be undertaken daily by the Trained Personnel in accordance with the inspection program to ensure that the Facility is maintained in good working order at all times and that no off-Site impacts are occurring. Any deficiencies detected during these regular inspections must be promptly corrected.

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.

6. PERFORMANCE REQUIREMENTS

(1) The Owner shall, ensure that the Facility/Equipment is designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) the maximum 10-minute average concentration of odour at the most impacted Sensitive Receptor, resulting from the operation of the Facility/Equipment, calculated in accordance with the procedures outlined in the attached Schedule "B", shall not exceed 1 odour unit;

(b) the noise emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-205;*

(c) the vibration emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-207.*

(2) The Owner shall ensure that the Boilers and the associated APC Equipment and the CEM Systems are designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) (i) The temperature in the combustion zone of each Boiler shall reach a minimum of 1000 degrees Celsius (°C) for one second, prior to introduction of the Waste into the combustion chamber of the Boiler during the start-up, and thereafter maintained during the entire thermal treatment cycle and subsequent shutdown until all Waste combustion is completed.

(ii) Compliance with the minimum temperature requirement shall be demonstrated by direct measurement at the location where the combustion gases have achieved the residence time of one second at a minimum temperature of 1000°C (the Target Location) or by correlation of the required temperature of 1000°C for one second to the temperature measured downstream of the Target Location as proven by a method acceptable to the Director.

(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.

(c) (i) The operational target for the concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler is 40 milligrams per dry cubic metre, as a 4-hour rolling average, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, as measured and recorded by the CEM System, for the period from and including initial commissioning of the facility to twelve months following the completion of the first Source Testing program.

(ii) The 4-hour average concentration of carbon monoxide 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 more than 40 milligrams per dry cubic metre, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, after the first twelve months following the completion of the first Source Testing program.

(d) The emissions from the Boilers after those emissions have been controlled by the associated APC Equipment for discharge into the atmosphere via the Stack shall comply with the emission concentration limits listed in the attached Schedule "C", as measured by a CEM System or by Source Testing as applicable.

(e) The Boilers shall include combustion air control systems, which are capable of automatically adjusting the distribution and the quantity of combustion air, in such a manner that changes in the Waste Processing Rate and/or Waste composition or irregularities in the loading and/or combustion shall not adversely affect the performance of the Boilers.

(f) The Boilers shall provide and maintain a high degree of gas turbulence and mixing in the combustion chamber.

(g) The Boilers shall achieve the temperature, oxygen availability and turbulence requirements over the complete range of operating parameters, including feed rate, feed characteristics, combustion air, flue gas flow rate and heat losses.

(h) The inlet temperature into each baghouse of the APC Equipment of the Boilers shall not be less than 120°C and not more than 185°C.

(3) The Owner shall install and maintain visual and audible alarm systems to alert the Facility/Equipment operators of any potential deviation from the above Performance Requirements for parameters that are continuously monitored by applicable CEM Systems and shall forthwith take all reasonable actions to bring the Equipment/Facility into compliance with all Performance Conditions.

(4) In the event that the CEM Systems indicate that emissions from the Boilers and the Stack exceed any Performance Requirements in the attached Schedule "C" for a continuous three (3) hour period, the Owner shall forthwith cut-off all Waste feed into the affected Boiler and initiate an Emergency Shutdown, while maintaining a temperature of 1000°C, as practicable, in the combustion zone of the Boiler.

Residual Waste Compliance Criteria

(5) (a) The Residual Waste generated at the Site and destined for a non-hazardous waste disposal site in Ontario shall not meet any of the criteria from the definition of "hazardous waste" set out in the *O. Reg. 347.*

(b) The Residual Waste that meets any of the criteria from the definition of "hazardous waste" set out in the *O. Reg.* 347 shall be handled and disposed of in accordance with the LDR requirements set out in the *EPA* and the *O. Reg. 347.*

(6) The Residual Waste, limited to the bottom ash, destined for a non-hazardous waste disposal site shall meet the definition of "incinerator ash" set out in the *O. Reg. 347.*

7. TESTING, MONITORING and AUDITING

Source Testing

(1) The Owner shall perform annual Source Testing in accordance with the procedures and schedule outlined in the attached Schedule "E", to determine the rate of emission of the Test Contaminants from the Stack. The first Source Testing program shall be conducted not later than six (6) months after the Commencement Date of Operation of the Facility/Equipment and subsequent Source Testing program shall be conducted once (1) every calendar year thereafter.

Continuous Monitoring

(2) The Owner shall select, test and install appropriate CEM Systems and continuous recording devices in accordance with the requirements outlined in the attached Schedule "F" to conduct and maintain a program to continuously monitor, as a minimum, the following parameters prior to commencement of operation of the Boilers:

(a) the temperature at one (1) second downstream of the combustion zone of each Boiler where most of the combustion has been completed and the combustion temperature is fully developed;

(b) the inlet temperature of the gases into each baghouse of the APC Equipment of each Boiler;

(c) the concentration of carbon monoxide, oxygen and organic matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler;

(d) the opacity and moisture content of the flue gas and the concentration of oxygen, nitrogen oxides, sulphur dioxide, hydrogen chloride, hydrogen fluoride and ammonia in the Undiluted Gases leaving the baghouse of the APC Equipment of each Boiler.

Long-Term Sampling for Dioxins and Furans

(3) (a) The Owner shall develop, install, maintain and update as necessary a long-term sampling system, with a minimum monthly sampling frequency, to measure the concentration of Dioxins and Furans in the Undiluted Gases leaving the APC Equipment associated with each Boiler. The performance of

this sampling system will be evaluated during the annual Source Testing programs in accordance with the principles outlined by 40 CFR 60, Appendix B, Specification 4.

(b) The Owner shall evaluate the performance of the long-term sampling system in determining Dioxins and Furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers.

Ambient Air Monitoring

(4) (a) The Regions shall develop and implement the Ambient Air Monitoring and Reporting Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable by the Regional Director.

(b) The Regions shall report the results of the Ambient Air Monitoring program to the Regional Director in accordance with the Ambient Air Monitoring and Reporting Plan and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Ambient Air Monitoring and Reporting Plan and the results of the Ambient Air Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233* and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved Noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

Residual Waste Testing

(7) (a) A minimum of six (6) months prior to the Commencement Date of Operation, the Owner shall submit to the Director for approval, a Testing Protocol for testing of the bottom ash for compliance with the criteria set out in the "incinerator ash" definition from the *O. Reg.* 347 and for testing of the Residual Waste for compliance with the criteria set out in this Certificate.

(b) As a minimum, the Testing Protocol shall comply with the Ministry's regulatory requirements for sampling and testing of waste, including the requirements set out in the Ministry's document entitled "Principles of Sampling and Analysis of Waste for TCLP under Ontario Regulation 347", dated February 2002, as amended.

(c) The Testing Protocol shall include the rationale for the proposed methods and the following:

(i) a sampling protocol, including the proposed number of samples to be taken and their locations, to ensure that representative sample(s) are being tested for compliance with this Certificate;

(ii) sample(s) handling and preserving procedures;

(iii) analytical protocol for the applicable contaminants to ensure that appropriate analytical method(s) are being used for compliance testing required by this Certificate; and

(iv) a testing protocol for the bottom ash during the Site commissioning period.

(d) The Owner shall implement the Testing Protocol on the Commencement Date of Operation.

(8) For handling of the bottom ash as a solid non-hazardous waste, the Owner shall follow the following schedule for compliance testing:

(a) for the Site commissioning period, the bottom ash shall be tested in accordance with the Testing Protocol approved by the Director;

(b) for the period following the Site commissioning period, the bottom ash shall be tested for the content of the combustible materials on an annual basis, until the compliance testing results indicate that the bottom ash meets the "incinerator ash" definition from the *O. Reg. 347* for three (3) consecutive years, following which a triennial compliance testing event may be carried out;

(c) should any annual or triennial compliance testing event indicate that the bottom ash does not meet the "incinerator ash" definition, prior to each of the next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re - establish compliance with the "incinerator ash" definition from the *O. Reg. 347* and that the bottom ash does not exceed the Leachate Toxicity Criteria, the compliance testing schedule set out in Condition 7.(8)(b) may be resumed; and

(d) should the results of any compliance testing of the bottom ash indicate that the concentrations of the leachate toxic contaminants in the bottom ash equal to or exceed the Leachate Toxicity Criteria, the bottom ash shall be handled as a hazardous waste. Once three (3) consecutive tests re - establish that the bottom ash does not exceed the Leachate Toxicity Criteria, the bottom ash compliance testing schedule set out in Condition 7.(8)(b) may be resumed.

(9) (a) For handling of the bottom ash as a hazardous waste and for handling of the fly ash, prior to final disposal at a hazardous waste landfill site in Ontario, the Owner shall undertake any sampling and testing that would be required to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347.*

(b) The Owner shall follow the following schedule for compliance testing:

(i) prior to each of the first three (3) shipments of the ash from the Site, the ash shall be tested so that for the compliance with the LDR requirements can be demonstrated;

(ii) following the three (3) initial compliance testing events, the ash shall be tested on an annual basis, until the compliance testing results indicate that the ash meets the LDR requirements during the three (3) consecutive years, following which a triennial compliance testing may be carried out; and

(iii) should any annual or triennial compliance testing event indicate that the ash does not meet the LDR requirements, prior to next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re - establish compliance with the LDR requirements, the compliance testing schedule set out in Condition 7.(9)(b)(ii) may be resumed.

Soil Testing:

(10) (a) Within one hundred and twenty (120) days from the date of this Certificate, the Regions shall undertake the soil testing in accordance with the Soil Testing Plan required by this Certificate.

(b) The soil testing shall be repeated every three (3) years or as agreed upon in writing by the Regional Director.

Disposal of Residual Waste

(11) The Owners shall ensure that no portion of the Residual Waste undergoing compliance testing is transferred from the Site until the results of the compliance testing required by this Certificate demonstrate compliance with the relevant Ministry's requirements.

(12) Bottom ash that is not a hazardous waste, as defined in the *O. Reg. 347,* may be disposed of at an approved non-hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

(13) Residual Waste shall be treated to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347* prior to disposal of at an approved hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

Groundwater and Surface Water Monitoring

(14) (a) The Regions shall develop and implement the Groundwater and Surface Water Monitoring Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(b) The Regions shall report the results of the Groundwater and Surface Water Monitoring program to the Regional Director and to the Director in accordance with the schedule set out in the EA Approval and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Groundwater and Surface Water Monitoring Plan and the results of the Groundwater and Surface Water Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

8. NUISANCE IMPACT CONTROL and HOUSEKEEPING

Odour Management

(1) (a) The Owner shall maintain a negative air pressure atmosphere in the Tipping Building at all times to contain any potential odours within the confines of the Tipping Building.

(b) (i) Once per year, or as required by the District Manager, the Owner shall undertake a test to measure the worse case scenario negative air pressure atmosphere throughout the Tipping Building, while the activities approved in this Certificate are carried out in the Tipping Building.

(ii) Notwithstanding the requirements set out in Condition 8.(1)(b)(i), the Owner shall install sufficient instrumentation to measure the air flow into the Boilers and demonstrate that adequate air flow is maintained

to maintain a negative air pressure atmosphere throughout the Tipping Building.

(c) In the event that adequate negative air pressure cannot be maintained, the Owner shall implement any necessary additional odour containment and control measures, including, but not necessarily limited to, those in the required Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the entrance and exit doors into the Tipping Building, the Residue Building and the Grizzly Building are kept closed at all times except to permit the entry or exit of the respective waste transport vehicles and waste handling equipment into and out of these Buildings.

(3) The Owner shall ensure that, at all times, the air from the Tipping Building, the Residue Building, the Grizzly Building and from the Equipment is exhausted through an appropriate and fully functional APC Equipment approved by this Certificate.

(4) The Owner shall undertake appropriate housekeeping activities, including regular cleaning of the tipping floor to control potential sources of fugitive odour emissions.

(5) The Owner shall ensure that no Waste handling equipment or empty storage containers are stored outside, unless they have been washed to prevent fugitive odour emissions.

(6) The Owner shall regularly clean all equipment and storage areas that are used to handle, process and store waste at the Site, including the surfaces of the outdoor spill containment areas, as required.

(7) (i) Prior to the receipt of Waste at the Site, the Owner shall provide documentation which outlines the testing carried out by a licensed structural engineer to confirm the effectiveness of the containment in the buildings, conveyors and tanks and silos at the Site.

(ii) The testing shall be carried out and repeated as directed by the District Manager in accordance with the test protocol prepared in consultation with and approved by the District Manager.

(iii) These tests shall be repeated as directed or agreed by the District Manager.

(8) The Owner shall prepare and implement an Odour Management and Mitigation Plan in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(9) (a) In addition to the requirements set out in the EA Approval, the Odour Management and Mitigation Plan shall include the following:

(i) identification of all potential sources of odourous emissions;

(ii) description of the preventative and control measures to minimize odourous emissions from the identified sources;
(iii) procedures for the implementation of the Odour Management and Mitigation Plan;
(iv) inspection and maintenance procedures to ensure effective implementation of the Odour Management and Mitigation Plan; and
(v) procedures for verification and recording the progress of the implementation of the Odour Management and Mitigation Plan.

(b) The Owner shall continue to submit an updated Odour Management and Mitigation Plan until such time as the Regional Director notifies the Owner in writing that further submissions are no longer required.

Vehicles and Traffic

(10) (a) The Owner shall ensure that all vehicles transporting waste to and from the Site are not leaking or dripping waste when arriving at or leaving the Site.

(b) Should the Owner become aware that the truck(s) delivering waste to the Site have leaked wastewater on the municipal roadways, the Owner shall immediately report the violation to the owner of the vehicle(s) and to the District Manager.

(c) The Owner shall ensure that the exterior of all vehicles delivering Waste to the Site or hauling waste from the Site is washed prior to the trucks' departure from the Site, if necessary.

(d) Any necessary truck washing shall occur only in the designated wash down area of the Tipping Building or the Residue Building.

(11) The Owner shall ensure that there is no queuing or parking of vehicles that are waiting to enter the Site on any roadway that is not a distinct part of the Site.

Litter

(12) The Owner shall:

(a) take all practical steps to prevent the escape of litter from the Site;
(b) pick up litter around the Site on a daily basis, or more frequently if necessary; and
(c) if necessary, erect litter fences around the areas causing a litter problem.

Dust

(13) The Owner shall ensure that all on-site roads and operations/yard areas are regularly swept/washed to prevent dust impacts off-Site.

Vermin and Vectors

(14) The Owner shall:

(a) implement necessary housekeeping procedures to eliminate sources and potential sources of attraction for vermin and vectors; and

(b) hire a qualified, licensed pest control professional to design and implement a pest control plan for the Site. The pest control plan shall remain in place, and be updated from time to time as necessary, until the Site has been closed and this Certificate has been revoked.

Visual Screening

(15) The Owner shall provide visual screening for the Site in accordance with the documentation included in the attached Schedule "A".

9. **STAFF TRAINING**

(1) (a) The Owner shall ensure that all operators of the Site are trained with respect to the following, as per the specific job requirements of each individual operator:

(i) terms and conditions of this Certificate and the requirements of the EA Approval;
(ii) operation and management of the Site, or area(s) within the Site, as per the specific job requirements of each individual operator, and which may include procedures for receiving, screening and identifying Waste, refusal, handling, processing and temporarily storing wastes, operation of the Equipment, the APC Equipment, the CEM System and the Works;
(iii) testing, monitoring and operating requirements;
(iv) maintenance and inspection procedures;
(v) recording procedures;
(vi) nuisance impact control and housekeeping procedures;
(vii) procedures for recording and responding to public complaints;
(viii) an outline of the responsibilities of Site personnel including roles and responsibilities during emergency situations;
(ix) the Contingency and Emergency Response Plan including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
(x) environmental, and occupational health and safety concerns pertaining to the wastes to be handled;
(xi) emergency first-aid information; and
(xii) relevant waste management legislation and regulations, including the *EPA*, the *OWRA*, the *O. Reg. 347*, the *O. Reg. 419/05* and the Ministry guidelines affecting thermal treatment facilities.

(2) The Owner shall ensure that all personnel are trained in the requirements of this Certificate relevant to the employee's position:

(a) upon commencing employment at the Site in a particular position;
(b) whenever items listed in Condition 9.(1) are changed or updated; and
(c) during the planned refresher training.

10. **COMPLAINTS / ODOUR-CONTAMINANT EMISSIONS RESPONSE PROCEDURE**

(1) The Owner or a designated representative of the Owner shall be available to receive public complaints caused by the operations at the Site twenty-four (24) hours per day, seven (7) days per week.

(2) If at any time, the Owner or the Ministry receives a complaint or the Owner or the Provincial Officer detects an emission of odour or any contaminant, (Emission Event), from the Site, in addition to the requirements set out in the EA approval, the Owner shall record all relevant information in the computerized tracking system and shall respond to the complaint/Emission Event according to the following procedure:

Step 1: Record of Complaint/Emission Event

(a) (i) The Owner shall record each complaint/Emission Event and each record shall include the following:

(A) name, address and the telephone number of the complainant, if known;
(B) time and date of the complaint/Emission Event;
(C) details of the complaint; and

(ii) After the complaint/Emission Event has been recorded in the tracking system, the Owner shall immediately report to the District Manager by phone or e-mail during office hours and to the Ministry's Spills Actions Centre at 1-800-268-6060 after office hours on the receipt of the complaint or occurrence of the Emission Event.

Step 2: Investigation and Handling of Complaint/Emission Event

(b) The Owner shall immediately initiate investigation of the complaint/Emission Event. As a minimum, the investigation shall include the following:

(i) determination of the activities being undertaken at the Site at the time of the complaint/Emission Event;
(ii) meteorological conditions including, but not limited to the ambient temperature, approximate wind speed and its direction.
(iii) determination if the complaint is attributed to activities being undertaken at the Site and if so, the possible cause(s) of the complaint/Emission Event; and

(iv) determination of the remedial action(s) to address the cause(s) of the Complaint/Emission Event, and the schedule for the implementation of the necessary remedial action(s).

(c) The Owner shall respond to the complainant, if known, and the response shall include the results of the investigation of the Complaint, the action(s) taken or planned to be taken to address the cause(s) of the Complaint, and if any follow-up response(s) will be provided.

(d) Upon completed investigation of the Complaint/Emission event, the Owner shall, within three (3) business days, submit a report to the District Manager on the Complaint, on the action(s) taken or planned to be taken to address the cause(s) of the Complaint and on all proposed action(s) to prevent recurrence of the Complaint/Emission Event in the future.

(3) If, in the opinion of the District Manager, failure of the APC Equipment and/or any other process or equipment upset or malfunction results in off-site Complaint/Emission Event, confirmed by the Owner or a Provincial Officer of the Ministry, the Owner shall, immediately upon notification from the District Manager, implement any necessary additional control measures, including, but not necessarily limited to, those in the Contingency and Emergency Response Plan required by this Certificate.

(4) If the District Manager deems the additional control measures taken as per condition 10.(3) to be unsuitable, insufficient or ineffective, the District Manager may direct the Owner, in writing, to take further measures to address the noted failure, upset or malfunction including pursuant to section 39 of the *EPA* requiring a reduction in the receipt of Waste, cessation of the receipt of Waste, removal and off-site disposal of Waste from the Tipping Building as well as making repairs or modifications to equipment or processes.

11. CONTINGENCY and EMERGENCY RESPONSE PLAN

(1) (a) The Owner shall develop and implement a Contingency and Emergency Response Plan in accordance with the requirements set out in the EA Approval.

(b) Notwithstanding the requirements set out in the EA Approval, the Contingency and Emergency Response Plan shall be prepared in consultation with the District Manager or designate, the local Municipality and the Fire Department.

(2) In addition to the requirements set out in the EA Approval, the Contingency and Emergency Response Plan, as a minimum, shall include the following:

(a) the Site plan clearly showing the equipment layout and all storage areas for wastes and reagents;

(b) a list of Site personnel responsible for the implementation of the contingency measures and various emergency response tasks and their training requirements;
(c) a list of equipment and materials required for the implementation of the contingency measures and the emergency situation response;
(d) maintenance and testing program for equipment required for the implementation of the contingency measures and the emergency situation response;
(e) procedures to be undertaken as part of the implementation of the contingency measures and the emergency situation response;
(f) names and telephone numbers of waste management companies available for emergency response;
(g) notification protocol, with names and telephone numbers of persons to be contacted, including the Owner, the Site personnel, the Ministry of the Environment Spills Action Centre and the York Durham District, the local Fire and Police Departments, the local Municipality, the local Medical Officer of Health, and the Ministry of Labour;
(h) procedures and actions to be taken should the incoming Waste not meet the applicable quality criteria specified in this Certificate;
(i) procedures and actions to be taken should the outgoing Residual Waste fail to meet the criteria specified in this Certificate;
(j) procedures and actions to be taken should the current disposal options for the outgoing Residual Waste become unavailable;
(k) design of the contingency measure, procedures and actions should the emissions from the Site, including the fugitive odour/dust emissions, cause occurrences of public Complaints;
(l) procedures and actions to be taken should the Owner be unable to maintain the negative pressure in the Tipping Building;
(m) procedures and actions to be taken should the occurrence of Complaints require the Owner to suspend the waste processing activities at the Site; and
(n) identification and risk assessment of all reasonably foreseeable incidents that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate, including but not limited to:
    (i) a breakdown of the Facility/Equipment or part of the Facility/Equipment, including the APC Equipment and the CEM Systems associated with the Boilers;
    (ii) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements;
    (iii) any change in process parameters which may result in non compliance with the Performance Requirements;
    (iv) power failure resulting in the use of the Emergency Diesel Generator or Total Power Failure; and
    (v) description of the preventative and control measures to minimize the occurrence or impacts of the above incidents; and
    (vi) procedures for corrective measures and timelines to take to address the above incidents in a timely manner to effectively prevent or minimize the discharge of any contaminant into the natural environment and continue to maintain compliance with the *EPA* , the Regulations and

this Certificate, including procedures for Waste Processing Rate reduction, waste feed cut-off, Controlled Shutdown or Emergency Shutdown of the Boilers as applicable.

(3) The Owner shall submit the finalized Contingency and Emergency Response Plan to the Director a minimum of one hundred and twenty (120) days prior to the Commencement Date of Operation, for approval.

(4) An up-to-date version of the Contingency and Emergency Response Plan shall be kept at the Site at all times, in a central location available to all staff, and it shall be available for inspection by a Provincial Officer upon request.

(5) The Owner shall ensure that the names and telephone numbers of the persons to be contacted in the event of an emergency situation are kept up-to-date, and that these numbers are prominently displayed at the Site and at all times available to all staff and emergency response personnel.

(6) The Contingency and Emergency Response Plan shall be reviewed on a regular basis and updated, as necessary. The revised version of the Contingency and Emergency Response Plan shall be submitted to the local Municipality and the Fire Department for comments and to the District Manager for comments and concurrence.

(7) The Owner shall implement the recommendations of the updated Contingency and Emergency Response Plan, immediately upon receipt of the written concurrence from the District Manager.

12. **EMERGENCY SITUATION RESPONSE and REPORTING**

(1) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site and manage any emergency situation in accordance with the Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the equipment and materials listed in the Contingency and Emergency Response Plan are immediately available at the Site, are in a good state of repair, and fully operational at all times.

(3) The Owner shall ensure that all Site personnel responsible for the emergency situation response are fully trained in the use of the equipment and related materials, and in the procedures to be employed in the event of an emergency.

(4) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

13. **SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER**

(1) The Owner shall notify the District Manager in writing, at least six (60) days prior to the scheduled date for the first receipt of Waste at the Site, as to whether or not the construction of the Facility has been carried out in accordance with this Certificate to a point of Substantial Completion.

(2) (a) The Owner shall forthwith notify the District Manager and the Spills Action Centre by telephone, when any of the following incidents occur that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate:

(i) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements triggering a Waste Processing Rate Reduction, Waste Feed cut-off, Controlled Shutdown or Emergency Shutdown as specified in the Emergency Response and Contingency Plan;
(ii) failure of the APC Equipment associated with the Boilers; and
(iii) power failure resulting in the use of the emergency diesel generator or Total Power Failure;

(b) In addition to fulfilling the notification requirements from the *EPA,* the Owner shall prepare and submit a written report to the District Manager with respect to any of the above said occurrences, within five (5) calendar days of the occurrence, in the following format:

(i) date of the occurrence;
(ii) general description of the occurrence;
(iii) duration of the occurrence;
(iv) effect of the occurrence on the emissions from the Facility;
(v) measures taken to alleviate the effect of the occurrence on the emissions from the Facility; and
(vi) measures taken to prevent the occurrence of the same or similar occurrence in the future.

(3) Should a Spill, as defined in the *EPA*, occur at the Site, in addition to fulfilling the requirements from the *EPA* and applicable regulations, the Owner shall submit to the District Manager a written report within three (3) calendar days outlining the nature of the Spill, remedial measure taken and the measures taken to prevent future occurrences at the Site.

(4) (a) Within ninety (90) days from the date of this Certificate, the Regions shall prepare and submit to the District Manager for concurrence, a Soil Testing Plan to monitor the impact of the Site operations at the locations where the ambient air monitoring is proposed by the Owner in accordance with the requirements set out in the EA Approval.

(b) (i) This Plan shall ensure that representative samples of the soil to be tested are collected in sufficient numbers and that the samples are properly preserved and tested so that reliable data on the soil characteristics is collected.

(ii) As a minimum, the Plan shall include testing for cadmium, lead, chromium, nickel, cobalt, copper, molybdenum, selenium, zinc and mercury, Dioxins and Furans.

(iii) This Plan shall comply with the Ministry's regulatory requirements for sampling and testing of soil and it shall include the rationale for the proposed methods.

(iv) This Plan be kept at the Site at all times and be available for inspection by a Provincial Officer upon request.

14. RECORDS KEEPING

(1) Any information requested by the Ministry concerning the Facility and its operation under this Certificate, including, but not limited to, any records required to be kept by this Certificate, shall be provided to the Ministry, upon request, in a timely manner.

(2) The Owner shall retain, for a minimum of seven (7) years from the date of their creation, except as noted below, all reports, records and information described in this Certificate.

Daily Activities

(3) 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:

(a) date of record and the name and signature of the person completing the report;
(b) quantity and source of the incoming Waste received at the Site;
(c) records of the estimated quantity of Waste thermally treated in the Boilers;
(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;
(e) quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;
(f) destination and/or receiving site(s) for the Residual Waste shipped from the Site;
(g) quantity and type of any Rejected Waste accepted at the Site;
(h) destination and/or receiving site(s) for the Rejected Waste shipped from the Site;
(i) housekeeping activities, including litter collection and washing/cleaning activities, etc.
(j) amount of electricity produced;

(k) amount of excess electricity exported to the electrical grid.

Monitoring and Testing Records

(4) 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:

(a) day and time of the activity;
(b) all original records produced by the recording devices associated with the CEM Systems;
(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 average readings for temperature measurements.
(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;
(e) all records produced during any Acoustic Audit;
(f) all records produced during any Source Testing;
(g) all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;
(h) all records produced during the Residual Waste compliance testing;
(i) all records produced during the Soil Testing;
(j) all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;
(k) all records produced during the Ambient Air Monitoring required by this Certificate;
(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.

(m) results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;

(n) results the negative pressure in the Tipping Building carried out, as required.

Inspections/Maintenance/Repairs

(5) The Owner shall maintain an on-Site written or 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.

Emergency Situations

(6) 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.

Complaints Response Records

(7) The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.

Training

(8) 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.

Reports

(9) The Owner shall keep at the Site the following reports required by this Certificate:

(a) the ESDM Report
(b) the Acoustic Assessment Report;
(c) the Annual Report; and
(d) the Third Party Audit.

15. REPORTING

Annual Report

(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:

(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;

(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;

(c) estimated material balance for each month documenting the maximum amount of wastes stored at the Site;

(d) annual water usage;

(e) annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;

(f) summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;

(g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;

(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;

(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;

(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;

(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;

(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;

(m) a summary of any emergency situations that have occurred at the Site and how they were handled;

(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;

(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;

(p) any recommendations to improve the environmental and process performance of the Site in the future;

(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

(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.

Third Party Audit

(2) (a) The Regions shall ensure that an independent technical review of the operations at the Site is undertaken in accordance with the requirements of the EA Approval.

(b) In addition to the Third Party Audit requirements set out in the EA approval, the Third Party Audit shall include the following:

(i) a review of the data from the monitoring and testing required by this Certificate;
(ii) a review of all complaints received about the operation of the Facility;
(iii) any recommendations for improving the operation of the Facility received from the Advisory Committee; and
(iv) a recommendation of any improvements that could be made to ensure that the operation of the Facility is optimized and is protective of the health and safety of people and the environment.

(3) The Regions shall submit a Written Audit Report on the results of the independent technical review to the Regional Director in accordance with the Audit Plan and retain a copy at the Site.

Soil Testing Report

(4) Within one (1) month of completion of each Soil Testing event, the Regions shall submit to the District Manager a Soil Testing Report, which includes the details on the sampling/testing procedures, the results of the testing and a comparison with the results obtained during the previous Soil Testing.

16. PUBLIC ACCESS TO DOCUMENTATION

(1) The Owner shall, at all times, maintain documentation that describes the current operations of the Facility. The Owner shall post the documentation at the website for the undertaking and during regular business hours, the Owner shall make the following documents available for inspection at the Site by any interested member of the public, upon submission to the Ministry for review:

(a) a current ESDM Report that demonstrates compliance with the Performance Limits for the Facility regarding all Compounds of Concern;

(b) a current Acoustic Assessment Report that demonstrates compliance with the Performance Limits for the Facility regarding noise emissions;

(c) the most recent Annual Report;

(d) the most current Third Party Audit Report;

(e) Odour Management and Mitigation Plan, prepared in accordance with the requirements of the EA Approval;

(f) Noise Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval; and

(g) Groundwater and Surface Water Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval.

(2) The Owner shall ensure that necessary hardware and software are provided at a location available to the public, to provide on-line real-time reporting of the operating parameter data for the Facility, including acceptable operating limits, stack emissions, and all other parameters for which continuous monitoring is required and that continuous records of the same be kept and made available to the public.

17. ADVISORY COMMITTEE

(1) The Regions shall establish an Advisory Committee in accordance with the requirements set out in the EA Approval.

18. CLOSURE of the SITE

(1) A minimum of nine (9) months prior to closure of the Site, the Owner shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Owner shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

SCHEDULE "A"

Supporting Documentation

(1) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Emission Summary and Dispersion Modelling Report, dated March 2011, prepared by Golder Associates;

(b) Acoustic Assessment Report prepared by Golder Associates Ltd., dated March 2011 and signed by Paul Niejadlik.

(2) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Attachment #1 containing the "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.;

(b) Attachment #3 containing the "Public Consultation Report", dated March 2011, prepared by Golder Associates Ltd.;

(c) Attachment #4 containing the Host Community Agreement

(d) Attachment #5 containing the proof of legal name for Covanta Durham York Renewable Energy Limited Partnership; and

(e) A letter May 24, 2011 from Anthony Ciccone, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, providing additional technical information on the proposal and attaching a report entitled "Amendment #1 Durham York Energy Centre Design and Operations Report", dated May 2011;

(3) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of Durham and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) "Surface Water and Groundwater Technical Study Report" dated July 2009, prepared by Jacques Whitford, Markham, Ontario (CD Report).

(b) "Stormwater Design Model Output" prepared by Sigma Energy, dated March 2001 (CD Report).

(c) Clearance letter from Central Lake Ontario Conservation date February 22, 2011.

(d) A letter dated March 23, 2011, from Brian Bahor, Covanta Energy Corporation, to Stefanos Habtom, Ontario Ministry of the Environment, providing additional technical design information on the proposed stormwater management ponds.

SCHEDULE "B"

Procedure to calculate and record the 10-minute average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor

(a) Calculate and record one-hour average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor, employing CALPUFF atmospheric dispersion model or the dispersion model acceptable to the Director that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour average odour concentrations.

(b) Convert and record each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations using the One-hour Average to 10-Minute Average Conversion described below; and

(c) Record and present the 10-Minute Average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the most impacted Sensitive Receptor in a histogram. The histogram shall identify all predicted 10-minute average odour concentration occurrences in terms of frequency, identifying the number of occurrences over the entire range of predicted odour concentration in increments of not more than 1/10 of one odour unit. The maximum 10-minute average concentration of odour at the Sensitive Receptor will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

One-hour Average To 10-minute Average Conversion

1. Use the following formula to convert and record one-hour average concentrations predicted by the CALPUFF atmospheric dispersion model or by the dispersion model acceptable to the Director to 10-minute average concentrations:

X10min = X60min*1.65

where X10min = 10-minute average concentration
X60min = one-hour average concentration

SCHEDULE "C"

PERFORMANCE REQUIREMENTS

In-Stack Emission Limits

Parameter	In-Stack Emission Limit	Verification of Compliance
Total Suspended Particulate Matter (filterable particulate measured in accordance with the Ontario Source Testing Code)	9 mg/Rm3	Results from compliance Source Testing
cadmium	7 µg/Rm3	Results from compliance Source Testing
lead	50 µg/Rm3	Results from compliance Source Testing
mercury	15 µg/Rm3	Results from compliance Source Testing
dioxins and furans	60 pg/Rm3	Results from compliance Source Testing; results expressed as I-TEQ
hydrochloric acid (HCl)	9 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
sulphur dioxide (SO2)	35 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
nitrogen oxides (NOx)	121 mg/ Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
organic matter (undiluted, expressed as equivalent methane)	50 ppmdv (33 mg/ Rm3)	Results from compliance source testing
carbon monoxide	35 ppmdv (40 mg/Rm3)	Calculated as the rolling arithmetic average of four (4) hours of data measured by a CEM System that provides data at least once every fifteen minutes, in accordance with condition 6 (2) (c)
opacity	10 percent	Calculated as the rolling arithmetic average of six (6) minutes of data measured by a CEM System that provides data at least once every minute
	5 percent	Calculated as the rolling arithmetic average of two (2) hours of data measured by a CEM System that provides data at least once every

		fifteen minutes

mg/Rm3- milligrams per reference cubic metre;

pg/Rm3 - picograms per reference cubic metre

ppmdv parts per million by dry volume,

µg/Rm3 - micrograms per reference cubic metre

R- reference conditions - 25 degrees Celsius, 101.3 kilopascals, dry basis, 11% oxygen

SCHEDULE "D"

TEST CONTAMINANTS

Hydrogen Chloride
Hydrogen Fluoride
Oxides of Nitrogen expressed as Nitrogen Dioxide
Sulphur Dioxide
Total Hydrocarbons, expressed as methane on wet basis
Carbon Dioxide
Total Suspended Particulate Matter (< 44 microns)
Total PM-10 including condensables
Total PM-2.5 including condensables

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Schedule "D" - Cont'd

Chlorobenzenes	Chlorophenols
Monochlorobenzene (MCB) 1,2-Dichlorobenzene (1,2-DCB) 1,3-Dichlorobenzene (1,3-DCB) 1,4-Dichlorobenzene (1,4-DCB) 1,2,3-Trichlorobenzene (1,2,3-TCB) 1,2,4-Trichlorobenzene (1,2,4-TCB) 1,3,5-Trichlorobenzene (1,3,5-TCB) 1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB) 1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB) 1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB) Pentachlorobenzene (PeCB) Hexachlorobenzene (HxCB)	2-monochlorophenol (2-MCP) 3-monochlorophenol (3-MCP) 4-monochlorophenol (4-MCP) 2,3-dichlorophenol (2,3-DCP) 2,4-dichlorophenol (2,4-DCP) 2,5-dichlorophenol (2,5-DCP) 2,6-dichlorophenol (2,6-DCP) 3,4-dichlorophenol (3,4-DCP) 3,5-dichlorophenol (3,5-DCP) 2,3,4-trichlorophenol (2,3,4-T3CP) 2,3,5-trichlorophenol (2,3,5-T3CP) 2,3,6-trichlorophenol (2,3,6-T3CP) 2,4,5-trichlorophenol (2,4,5-T3CP) 2,4,6-trichlorophenol (2,4,6-T3CP) 3,4,5-trichlorophenol (3,4,5-T3CP) 2,3,4,5-tetrachlorophenol (2,3,4,5-T4CP) 2,3,4,6-tetrachlorophenol (2,3,4,6-T4CP) 2,3,5,6-tetrachlorophenol (2,3,5,6-T4CP) Pentachlorophenol (PeCP)

Schedule "D" - Cont'd

Co-Planar PCBs (Dioxin-like PCBs)	Volatile Organic Matter
PCB-077 (3,3',4,4'-TCB)	Acetaldehyde
PCB-081 (3,4,4',5-TCB)	Acetone
PCB-105 (2,3,3',4,4'-PeCB)	Acrolein
PCB-114 (2,3,4,4',5-PeCB)	Benzene
PCB-118 (2,3',4,4',5-PeCB)	Bromodichloromethane
PCB-123 (2',3,4,4',5-PeCB)	Bromoform
PCB-126 (3,3',4,4',5-PeCB)	Bromomethane
PCB-156 (2,3,3',4,4',5-HxCB)	Butadiene, 1,3 -
PCB-157 (2,3,3',4,4',5'-HxCB)	Butanone, 2 -
PCB-167 (2,3',4,4',5,5'-HxCB)	Carbon Tetrachloride
PCB-169 (3,3',4,4',5,5'-HxCB)	Chloroform
PCB-189 (2,3,3',4,4',5,5'-HpCB)	Cumene
	Dibromochloromethane
	Dichlorodifluoromethane
	Dichloroethane, 1,2 -
	Dichloroethene, Trans - 1,2
	Dichloroethene, 1,1 -
	Dichloropropane, 1,2 -
	Ethylbenzene
	Ethylene Dibromide
	Formaldehyde
	Mesitylene
	Methylene Chloride
	Styrene
	Tetrachloroethene
	Toluene
	Trichloroethane, 1,1,1 -
	Trichloroethene
	Trichloroethylene, 1,1,2 -
	Trichlorotrifluoroethane
	Trichlorofluoromethane
	Xylenes, M-, P- and O-
	Vinyl Chloride

Schedule "D" - Cont'd

Polycyclic Organic Matter	Dioxin/Furan Isomers
Acenaphthylene	
Acenaphthene	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Anthracene	1,2,3,7,8-Pentachlorodibenzo-p-dioxin
Benzo(a)anthracene	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
Benzo(b)fluoranthene	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
Benzo(k)fluoranthene	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
Benzo(a)fluorene	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
Benzo(b)fluorene	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin
Benzo(ghi)perylene	
Benzo(a)pyrene	2,3,7,8-Tetrachlorodibenzofuran
Benzo(e)pyrene	2,3,4,7,8-Pentachlorodibenzofuran
Biphenyl	1,2,3,7,8-Pentachlorodibenzofuran
2-Chloronaphthalene	1,2,3,4,7,8-Hexachlorodibenzofuran
Chrysene	1,2,3,6,7,8-Hexachlorodibenzofuran
Coronene	1,2,3,7,8,9-Hexachlorodibenzofuran
Dibenzo(a,c)anthracene	2,3,4,6,7,8-Hexachlorodibenzofuran
Dibenzo(a,h)anthracene	1,2,3,4,6,7,8-Heptachlorodibenzofuran
Dibenzo(a,e)pyrene	1,2,3,4,7,8,9-Heptachlorodibenzofuran
9,10-Dimethylanthracene	1,2,3,4,6,7,8,9-Octachlorodibenzofuran
7,12-Dimethylbenzo(a)anthracene	
Fluoranthene	
Fluorene	
Indeno(1,2,3-cd)pyrene	
2-Methylanthracene	
3-Methylcholanthrene	
1-Methylnaphthalene	
2-Methylnaphthalene	
1-Methylphenanthrene	
9-Methylphenanthrene	
Naphthalene	
Perylene	
Phenanthrene	
Picene	
Pyrene	
Tetralin	
M-terphenyl	
O-terphenyl	
P-terphenyl	
Triphenylene	

SCHEDULE "E"

SOURCE TESTING PROCEDURES

1. The Owner shall submit, to the Manager a test protocol including the Pre-Test Information required by the Source Testing Code, at least two (2) months prior to the scheduled Source Testing date.

2. (1) For the purpose of the Source Testing program, the Owner is temporarily permitted to operate the Boilers at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b) during the period of the Source Testing. The Owner shall ensure that the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone of the Boilers, as measured and recorded by the CEM System, shall not be less than 5 percent by volume on a dry basis, during this Source Testing program.

   (2) If the Source Testing results demonstrate that compliance with the Performance Requirements can be maintained at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b), the Owner may apply to the Director for approval to alter the required residual oxygen concentration.

3. The Owner shall finalize the test protocol in consultation with the Manager.

4. The Owner shall not commence the Source Testing until the Manager has accepted the test protocol.

5. The Owner shall complete the first Source Testing not later than six (6) months after Commencement of Operation of the Facility/Equipment.

6. The Owner shall conduct subsequent Source Testing at least once (1) every calendar year thereafter.

7. The Owner shall notify the District Manager and the Manager in writing of the location, date and time of any impending Source Testing required by this Certificate, at least fifteen (15) days prior to the Source Testing.

8. The Owner shall submit a report on the Source Testing programs to the District Manager and the Manager not later than three (3) months after completing each Source Testing program. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

   (1) an executive summary;
   (2) records of operating conditions; including process description, records of waste composition and feed rate during the Source Testing;
   (3) all records produced by the CEM Equipment;
   (4) procedures followed during the Source Testing and any deviation from the proposed test protocol and the reasons therefore;
   (5) the results of the analyses of the stack emissions;

(6) a summary table that compares the Source Testing results, the monitoring data and the records of operating conditions during the Source Testing to the requirements imposed by the *EPA*, the Regulation and/or the Performance Requirements;

(7) the results of dispersion calculations in accordance with the *O. Reg. 419/05*, indicating the maximum concentration of the Test Contaminants, at the Point of Impingement.

(8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the Test Contaminants.

9. The Owner shall ensure that the Source Testing Report is made available and easily accessible for review by the public at the Facility, immediately after the document is submitted to the Ministry.

10. The Director may not accept the results of the Source Testing if:

(1) the Source Testing Code or the requirements of the Manager were not followed; or

(2) the Owner did not notify the District Manager and the Manager of the Source Testing; or

(3) the Owner failed to provide a complete report on the Source Testing.

11. If the Director does not accept the results of the Source Testing, the Director may require re-testing.

SCHEDULE "F"

PARAMETER:
Temperature

LOCATION:
The sample point for the Continuous Temperature Monitor shall be located at a point where the temperature in the combustion zone of the Boilers has reached at least 1000°C for a period of not less than one second. Compliance shall be proven by direct measurement or/and a correlation between the measured temperature and the intended target proven by a method acceptable to the Director.

PERFORMANCE:
The Continuous Temperature Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	SPECIFICATION
1)	Type:	"K", "J" or other type or alternative measurement device with equivalent measurement accuracy and suitable to the temperature range being measured
2)	Accuracy:	± 1.5 percent of the minimum gas temperature

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor without a significant loss of accuracy and with a time resolution of 1 minutes or better. Temperature readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.

PARAMETER:
Carbon Monoxide

INSTALLATION:
The Continuous Carbon Monoxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Carbon Monoxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2.5 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤5 percent of span value
8) Response Time (90 percent response to a step change):	≤180 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Oxygen

INSTALLATION:
The Continuous Oxygen Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (percentage):	0 - 20 or 0 - 25
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Oxygen Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (percentage):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data
3) Calibration Error:	0.25 percent O_2
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 0.5 percent O_2
7) Span Calibration Drift (24-hour):	≤ 0.5 percent O_2
8) Response Time (90 percent response to a step change):	≤ 90 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Oxygen concentration readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Hydrogen Chloride

INSTALLATION:
The Continuous Hydrogen Chloride Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of hydrogen chloride in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Hydrogen Chloride Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 20 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated daily at the sample point, to ensure that it meets the drift limits specified above, during the periods of the operation of the . The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 5 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Nitrogen Oxides

INSTALLATION:
The Continuous Nitrogen Oxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of nitrogen oxides in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Analyzer Operating Range (parts per million, ppm):	0 to ≥200 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Nitrogen Oxides Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Sulphur Dioxide

INSTALLATION:
The Continuous Sulphur Dioxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of sulphur dioxide in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1. Range (parts per million, ppm):	0 to ≥100 ppm
2. Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Sulphur Dioxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1. Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2. Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3. Calibration Error:	≤ 2 percent of actual concentration
4. System Bias:	≤ 4 percent of the mean value of the reference method test data
5. Procedure for Zero and Span Calibration Check:	all system components checked
6. Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7. Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8. Response Time (90 percent response to a step change):	≤ 200 seconds
9. Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Total Hydrocarbons

INSTALLATION:
The Total Hydrocarbons Monitor shall be installed at an accessible location where the measurements are representative of the concentrations of Organic Matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and shall meet the following installation specifications.

	PARAMETERS	SPECIFICATION
1.	Detector Type:	Flame Ionization
2.	Oven Temperature:	160°C minimum
3.	Flame Temperature:	1800 °C minimum at the corona of the hydrogen flame
4.	Range (parts per million, ppm):	0 to ≥200 ppm
5.	Calibration Gas:	propane in air or nitrogen
6.	Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Total Hydrocarbons Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	SPECIFICATION
1.	Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2.	Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3.	System Bias:	≤ 4 percent of the mean value of the reference method test data
4.	Noise:	≤ 1 percent of span value on most sensitive range
5.	Repeatability:	≤ 1 percent of span value
6.	Linearity (response with propane in air):	≤ 3 percent of span value over all ranges
7.	Calibration Error:	≤ 2 percent of actual concentration
8.	Procedure for Zero and Span Calibration Check:	all system components checked on all ranges
9.	Zero Calibration Drift (24-hours):	≤ 2.5 percent of span value on all ranges
10.	Span Calibration Drift (24-hours):	≤ 2.5 percent of span value
11.	Response Time (90 percent response to a step change):	≤ 60 seconds
12.	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Measurements of concentrations of organic matter (as methane) shall be kept as 10 minute average values for record keeping and reporting purposes.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER: Opacity

INSTALLATION: The Continuous Opacity Monitor shall be installed at an accessible location where the measurements are representative of the actual opacity of the Undiluted Gases leaving the APC Equipment associated with each Boiler and shall meet the following design and installation specifications.

	PARAMETERS	**SPECIFICATION**
1)	Wavelength at Peak Spectral Response (nanometres, nm):	500 - 600
2)	Wavelength at Mean Spectral Response (nm):	500 - 600
3)	Detector Angle of View:	≤ 5 degrees
4)	Angle of Projection:	≤ 5 degrees
5)	Range (percent of opacity):	0 -100

PERFORMANCE:
The Continuous Opacity Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	**SPECIFICATION**
1)	Span Value (percent opacity):	2 times the average normal opacity of the source
2)	Calibration Error:	≤3 percent opacity
3)	Attenuator Calibration:	≤2 percent opacity
4)	Response Time (95 percent response to a step change):	≤ 10 seconds
5)	Schedule for Zero and Calibration Checks:	daily minimum
6)	Procedure for Zero and Calibration Checks:	all system components checked
7)	Zero Calibration Drift (24-hours):	≤ 2 percent opacity
8)	Span Calibration Drift (24-hours):	≤ 2 percent opacity
9)	Conditioning Test Period:	≥ 168 hours without corrective maintenance
10)	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated, to ensure that it meets the drift limits specified above, during the periods of the operation of the Equipment. The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 30 seconds or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Moisture, Hydrogen Fluoride and Ammonia

Selection and Installation

The Owner shall select and install a CEM System, to measure moisture content of the stack gases, the concentration of hydrogen fluoride and ammonia in the Undiluted Gases leaving the APC Equipment associated with each Boiler, as follows:

a) Design and Performance Specifications shall be in accordance with 40 CFR 60, Appendix B, Specification 4.

b) The Owner shall select the probe locations in compliance with 40 CFR 60, Appendix B, Specification 2.

Test Procedures

The Owner shall verify compliance with the Design and Performance Specifications in accordance with 40 CFR 60, Appendix B, Specification 4, with the reference method for the relative accuracy test being Method 4. of the Source Testing Code.

In furtherance of, but without limiting the generality of the foregoing, the mean difference between the calibration gas value and the analyzer response value at each of the four test concentrations shall be less than 5 percent of the measurement range.

SCHEDULE "G"

A stormwater management facility to service a 10.0 ha drainage area of the Durham York Energy Centre located on the west side of Osbourne Road and north of the CN Rail, Lot 27, Concession Broken Front, Part, Municipality of Clarington, Regional Municipality of Durham, designed to provide quality and quantity control of stormwater run-off by attenuating runoff from storm events up to 1:100 years return frequency to or below the pre-development levels, consisting of:

East Stormwater Management Pond (East SWM Pond)

A stormwater management facility to service a 5.7 ha drainage area comprising of the eastern part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 128 m long drainage ditch collecting stormwater runoff from the north eastern part of the site, having an average horizontal slope of 1.56%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- one (1) approximately 199 m long drainage ditch collecting stormwater runoff from the eastern part of the site, having an average horizontal slope of 2.77%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately fourteen (14) catch basins/maintenance holes and a total of 466.8 m long 450 mm diameter and 34.6 m of 600 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the north and north eastern part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 11.0 m wide and 34.8 m long and depth of 1.0 m, equipped with 600 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south east part of the site, with approximate bottom dimensions of 21.0 m wide and 71.4 m long and a maximum depth of 2.7 m at 96.70 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent pool storage capacity of 1,008 m^3 at elevation 95.0 m masl, an active storage capacity of 3,099 m^3 at 96.70 m masl elevation, and total storage capacity of 4,107 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 97.0 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

West Stormwater Management Pond (West SWM Pond)

A stormwater management facility to service a 4.3 ha drainage area comprising of the western part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 296 m long drainage ditch collecting stormwater runoff from the north western part of the site, having an average horizontal slope of 1.0%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately five (5) catch basins/maintenance holes and a total of 272.2 m long 450 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the western part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 13.0 m wide and 26.0 m long and depth of 1.0 m, equipped with 450 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south western part of the site, with approximate bottom dimensions of 13.0 m wide and 58.0 m long and a maximum depth of 2.5 m at 96.5 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent storage capacity of 623 m^3 at elevation 95.0 m masl, an active storage capacity of 2,054 m^3 at 96.50 m masl elevation, and total storage capacity of 2,677 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 96.80 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

including all associated controls and appurtenances.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

Conditions 1.(1), (2), (5), (6), (7), (8), (9), (10), (11), (12), (13), (17), (18) and (19) are included to clarify the legal rights and responsibilities of the Owner.

Conditions Nos.1.(3) and (4) are included to ensure that the Site is operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

Condition No. 1.(14) is included to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

Condition No.1.(15) is included to restrict potential transfer or encumbrance of the Site without the notification to the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate.

Condition No. 1.(16) is included to ensure that the appropriate Ministry staff has ready access to the operations of the Site which are approved under this Certificate. The Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *EPA*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.

SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE

Condition No. 2. is included to specify the approved waste receipt rates, the approved waste types and the service area from which waste may be accepted at the Site based on the Owner's application and supporting documentation. Condition No. 2. is also included to specify the maximum amount of waste that is approved to be stored at the Site.

SIGNS and SITE SECURITY

Condition No. 3. is included to ensure that the Site's users, operators and the public are fully aware of important information and restrictions related to the operation of the Site. Condition No. 3. is also included to ensure that the Site is sufficiently secured, supervised and operated by properly trained personnel and to ensure controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site personnel is on duty.

SITE OPERATIONS

Condition No. 4. is included to outline the operational requirements for the Facility to ensure that the said operation does not result in an adverse effect or a hazard to the natural environment or any person.

EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

Condition No. 5. is included to require the Site to be maintained and inspected thoroughly on a regular basis to ensure that the operations at the Site are undertaken in a manner which does not result in an adverse effect or a hazard to the health and safety of the environment or any person.

PERFORMANCE REQUIREMENTS

Condition No. 6 is included to set out the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.

TESTING, MONITORING and AUDITING

Condition No. 7. is to require the Owner to gather accurate information on the operation of the Facility so that the environmental impact and subsequent compliance with the *EPA*, the *OWRA*, their Regulations and this Certificate can be verified.

NUISANCE IMPACT CONTROL and HOUSEKEEPING

Condition No. 8. is included to ensure that the Site is operated and maintained in an environmentally acceptable manner which does not result in a negative impact on the natural environment or any person. Condition No. 8 is also included to specify odour control measures to minimize a potential for odour emissions from the Site.

STAFF TRAINING

Condition No. 9. is included to ensure that staff are properly trained in the operation of the equipment and instrumentation used at the Site, in the emergency response procedures and on the requirements and restrictions related to the Site operations under this Certificate.

COMPLAINTS RECORDING PROCEDURE

Condition No.10. is included to require the Owner to respond to any environmental complaints resulting from the Facility appropriately and in a timely manner and that appropriate actions are taken to prevent any further incidents that may cause complaints in the future.

CONTINGENCY and EMERGENCY RESPONSE PLAN and EMERGENCY SITUATIONS RESPONSE AND REPORTING

Conditions Nos.11. and 12. are included to ensure that the Owner is prepared and properly equipped to take immediate action in the event of an emergency situation.

SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER

Condition No. 13. is included to set out the requirements for the submissions to the District Manager and the Regional Director regarding the operation of the Facility and the activities required by this Certificate.

RECORDS KEEPING

Condition No.14. is included to ensure that detailed records of Site activities, inspections, monitoring and upsets are recorded and maintained for inspection and information purposes.

REPORTING

Condition No.15. is to ensure that regular review of site, operations and monitoring is carried out and findings documented by a third party for determining whether or not the Site is being operated in compliance with this Certificate of Approval, the EPA and its regulations and whether or not any changes should be considered.

PUBLIC ACCESS to DOCUMENTATION

Condition No.16. is included to ensure that the public has access to information on the operation of the Site in order to participate in the activities of the Advisory Committee in a meaningful and effective way.

ADVISORY COMMITTEE

Condition No.17. is included to require the Owner to establish a forum for the exchange of information and public dialogue on activities carried out at the Site and to ensure that the local residents are properly informed of the activities at the Site and that their concerns can be heard and acted upon , as necessary. Open communication with the public and local authorities is important in helping to maintain high standards for the operation of the Site and protection of the natural environment. Condition 16. is also included to ensure that the requirements of the EA Approval are fulfilled.

CLOSURE of the SITE

Condition No.18. is included to ensure that the final closure of the Site is completed in accordance with Ministry's standards.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, and in accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written Notice served upon me, the Environmental Review Tribunal, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act and Section 101 of the

Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 9 and 39, *Environmental Protection Act*
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted site is approved under Section 9 and Section 27 of the Environmental Protection Act and Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 28th day of June, 2011

Signature
Ian Parrott, P .Eng.
Director
Section 9, *EPA*
Section 39, *EPA*
Section 53, *OWRA*

MW,QN,SH/

c: District Manager, MOE York-Durham
Regional Director, MOE Central Region

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Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 1
Issue Date: August 12, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
United States of America
07960

Site Location: Durham York Energy Centre
72 Osbourne Rd Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 forWaste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment,, as follows:

1. The following definition has been added:

"Contingency and Emergency Response Plan" also means the document entitled "Spill Contingency and Emergency Response Plan";

2. The following Conditions are amended to read as follows:

2.(5)(b)(iii) The Owner may use equipment used to handle the hazardous wastes to handle other wastes provided that prior to such use the equipment has been thoroughly cleaned first.

4.(5)(e) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is as follows:

(i) The storage duration is limited to a maximum of seven (7) days.

(ii) Should longer storage duration be required to accommodate the duration of the required compliance testing, a minimum of forty eight (48) hours before the storage extension is commenced, the Owner shall notify the District Manager of the required extension. The

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notification shall include the duration of the extension and the reasons.

3. The following Conditions are added:

7.(7) (e) The Owner shall carry out the required bottom and fly ash compliance testing in accordance with the document entitled "Ash Sampling and Testing Protocol", listed in the attached Schedule.

11.8 Containment evaluations performed under the Spill Contingency and Emergency Response Plan shall be conducted by the Owner in accordance to procedures agreed by the District Manager pursuant to Conditions 8.(7)(i),(ii) and (iii).

4. The following documents have been added to Schedule "A":

4. October 31, 2013 letter from Mirka Januszkiewicz, the Regional Municipality of Durham to Ian Parrott, Ministry of the Environment and Climate Change, requesting approval of the Ash Sampling and Testing Protocol and the document entitled "Durham York Energy Centre, Ash Sampling and Testing Protocol", prepared by by Golder Associates and dated June 2014.

5. Document entitled "Durham York Energy Centre, Spill Contingency & Emergency Response Plan" prepared by Covanta Durham York Renewable Energy Limited Partnership and dated January 13, 2014, excluding section entitled "Containment Evaluation".

6. Document entitled "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations", prepared by Covanta Durham York Renewable Energy Limited Partnership and dated June 2014.

7. Document entitled "Durham York Energy Centre, Noise Monitoring and Reporting Plan", prepared by Golder Associates and dated September 2011.

The reasons for this amendment to the Approval are as follows:

to approve the "Ash Sampling and Testing Protocol" as required Condition 7.(7)(a), the "Durham York Energy Centre, Spill Contingency & Emergency Response Plan", as required Condition 11.(3), "Durham York Energy Centre, Noise Monitoring and Reporting Plan" as required Condition 7.(5)(a) and "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations" as proposed by the applicant.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;

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8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of August, 2014

Ian Parrott, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MW/
c: District Manager, MOE York-Durham
n/a, The Regional Municipality of Durham

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Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 2
Issue Date: October 24, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and
The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership
445 South St
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, as follows:

1. The address of the Site has been changed to read as follows:

Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

2. The following definitions have been added:

"**Operator**" means any person other than the Regions' employees, authorized by the Regions as having the charge, management or control of any aspect of the Site and includes TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change, and includes its successors and assignees, their successors and assignees;

"**Regions**" means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and it includes The Regional Municipality of Durham and The Regional Municipality of York, their successors and assignees;

2. The following definition has been amended to read as follows:

CONTENT COPY OF ORIGINAL

"**Site**" means the property referred to as Durham York Energy Centre where the Owner has located and operates the Facility and the Works and located at 1835 Energy Drive in the Municipality of Clarington, Regional Municipality of Durham;

"**Owner**" within the context of this Approval, means the Regions and the Operator;

3. The following Conditions have been amended to read as follows:

"General: Change of Ownership" Conditions 1.(14) and 1.(15):

(14) The Regions shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any changes:

(a) the ownership of the Site;
(b) the operator of the Site;
(c) the address of the Regions;
(d) the partners, where the Regions are or at any time become a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B.17, as amended, shall be included in the notification;
(e) the name of the corporation where the Regions are or at any time become a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

(15) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Regions shall notify the successor of and provide the successor with a copy of this Approval, and the Regions shall provide a copy of the notification to the District Manager and the Director.

"Service Area, Approved Waste Types, Rates And Storage: Storage Restrictions" Condition 2.(5)(e):

2.(5)(e) (i) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation.

(ii) The storage duration of bottom ash in the bunkers is limited to a maximum of seven (7) days.

(iii) Should additional storage location(s) and a longer storage duration be required during testing, a minimum of forty eight (48) hours before the storage parameters are changed from those approved in Condition 2.(5)(e)(i) and (ii), the Owner shall notify the District Manager, in writing, of the proposed changes and provide the reasons for the changes.

"Site Operations: Residual Waste Handling and Disposal" Condition 4.(5)(b)(iii):

4.(5)(b)(iii) The Owner may use the equipment that comes in contact with the hazardous wastes to handle other wastes provided that prior to such use, the equipment has been cleaned, as confirmed by visual inspections, to ensure the removal of any hazardous waste residues and to prevent cross contamination.

"Closure of the Site" Conditions 18.(1) and 18.(2):

(1) A minimum of nine (9) months prior to closure of the Site, the Regions shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Regions shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

4. "Covanta Durham York Renewable Energy Limited Partnership" is replaced with "TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under

CONTENT COPY OF ORIGINAL

the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change and includes its successors and assignees", in the Environmental Compliance Approval dated June 28, 2011 and in the Notice of Amendment dated August 12, 2014.

5. The following documents are added to Schedule "A":

8. Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Matthew R. Mulcahy, Covanta Durham York Renewable Energy Limited Partnership, Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Cliff Curtis, The Regional Municipality of Durham and Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Laura McDowell, The Regional Municipality of York, including the following attached supporting documentation:

(a) revised Section 8.0 "Ash Handling and Associated System" and revised Section 10.0 "Potable Process and Wastewater" dated May 2014, of the document entitled "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.

(b) Drawing No. M-2530, entitled "Piping & Instrumentation Diagram Bottom Ash Lime Slurry System"

(c) Drawing No. 70258-1-ME-GA-SK-001, entitled "Covanta Durham York Hydrated Lime System for Boiler Bottom Ash"

9. E-mail dated September 10, 2014 (2:26 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Margaret Wojcik, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the proposal, including an attachment entitled "M-1500^0360 Highlighted for MOE.pdf".

10. E-mail dated October 13, 2014 (3:23 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Ricki Allum, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the legal name of the applicant, including an attachment entitled "Partnership Legal Clarification.pdf".

The reasons for this amendment to the Approval are as follows:

to approve the proposed Bottom Ash Lime Conditioning System, to correct the typographical errors in the Notice of Amendment dated August 12, 2014, to clarify the intent of the Residual Waste equipment cleaning condition and to allow different bottom ash storage conditions during testing.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;

CONTENT COPY OF ORIGINAL

7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of October, 2014

Tesfaye Gebrezghi, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MW/
c: District Manager, MOE York-Durham
Leon Brasowski, Covanta Energy Corporation

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 3
Issue Date: December 23, 2015

The Regional Municipality of Durham
605 Rossland Road Level 5
Whitby, Ontario
L1N 6A3

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment , as follows:

The following Conditions are revoked:

7. TESTING, MONITORING and AUDITING

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233* and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and

M5G 1E5

Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 23rd day of December, 2015

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 4
Issue Date: February 24, 2016

The Regional Municipality of Durham
605 Rossland Road East, Level 5
Whitby, Ontario
L1N 6A3

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

TransRiver Canada Incorporated operating as Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for a Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, , as follows:

The following Conditions are revoked:

7. **TESTING , MONITORING** and **AUDITING**

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233*

and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved Noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the
purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of February, 2016

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

APPENDIX 4

Particulate and Metals Field Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particulate/Metals
Test Date	May 29 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Team 2
Impinger Box No.:	13

Pitot Factor	.857	-
DGMCF	.981	-
Barometric Pressure	29.76	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2544	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	468.9	-	g
WCBDA	23.4	-	g

Combustion Gas Concentration

Oxygen	8.40	-	%
Carbon Dioxide	10.89	-	%
Carbon Monoxide	24.8		ppm

Measuring Device	MII Numbers
Probe / Pitot S/	B03761
Trendicator	COE 20092
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2550
2	.2550
3	.2535
4	.2540
Average:	.2544

Site Diagram

Notes:

Field Data Sheet

Date: May 29, 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	152.15	.67	.70	282	256	251	67	228	78	77	1.65	4
	2.5	154.04	.71	.73	283	254	251	66	243	79	77	1.8	4
	5	155.89	.71	.74	284	253	253	63	247	79	77	1.8	4
2	7.5	157.74	.74	.75	284	257	256	61	249	79	77	1.9	4
	10	159.62	.71	.74	284	254	256	59	249	80	77	1.8	4
	12.5	161.44	.71	.74	284	255	255	58	249	80	77	1.85	4
3	15	163.30	.71	.74	284	256	255	58	249	81	78	1.85	4
	17.5	165.16	.71	.74	284	252	256	58	249	81	78	1.85	4
	20	167.02	.71	.74	284	244	255	58	249	81	78	1.85	4
4	22.5	168.87	.72	.74	285	254	255	58	249	81	78	1.85	4
	25	170.74	.69	.73	285	251	255	59	249	82	78	1.8	4
	27.5	172.61	.67	.72	285	251	255	59	249	82	78	1.7	4
5	30	174.40	.64	.70	285	257	255	58	248	83	78	1.6	4
	32.5	176.16	.65	.71	285	257	254	58	248	83	78	1.7	4
	35	177.96	.65	.71	285	254	254	58	248	83	79	1.7	4
6	37.5	179.76	.62	.69	285	257	254	58	247	83	79	1.65	4
	40	181.52	.61	.69	285	255	255	58	247	84	79	1.6	4
	42.5	183.26	.61	.69	285	256	254	58	247	84	79	1.6	4
7	45	184.99	.60	.68	285	255	255	58	247	84	79	1.5	4
	47.5	186.71	.61	.69	285	255	255	58	247	84	79	1.6	4
	50	188.45	.61	.69	285	252	249	59	248	85	80	1.6	4

Traverse:				
Start Time: 8:45	Initial Leak Check: .002	cfm@	15	"Hg
Finish Time:	Final Leak Check:	cfm@		"Hg

72

static −9.9

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	190, 21	.64	.70	285	252	264	58	253	85	80	1.65	4
	55	191, 98	.62	.69	284	251	258	58	252	85	80	1.6	4
	57.5	193, 72	.62	.69	285	256	255	58	250	85	80	1.6	4
9	60	195, 46	.62	.69	284	256	255	58	248	85	81	1.6	4
	62.5	197. 21	.62	.69	284	256	251	58	248	86	81	1.6	4
	65	198, 97	.62	.69	284	258	248	58	248	86	81	1.6	4
10	67.5	200.69	.62	.69	283	252	254	58	251	86	81	1.65	4
	70	202, 47	.62	.69	284	252	265	57	255	86	81	1.6	4
	72.5	204. 24	.62	.70	282	251	258	57	254	86	82	1.65	4
11	75	206.01	.62	.70	283	253	255	56	251	86	82	1.65	4
	77.5	207, 77	.53	.64	283	252	254	55	248	87	82	1.35	3.5
	80	209, 40	.53	.64	284	258	256	55	247	87	82	1.35	3.5
12	82.5	211, 02	.55	.66	282	252	256	55	243	87	82	1.4	3.5
	85	212, 66	.54	.65	284	255	255	53	246	87	83	1.4	3.5
	87.5	214, 30	.54	.65	282	252	253	52	246	87	83	1.4	3.5
	90	215, 96											

Traverse: 1					
Start Time: —	Initial Leak Check:	—	cfm@	—	"Hg
Finish Time: 10:15	Final Leak Check:	.004	cfm@	17	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	216.43	.67	.72	284	253	256	61	165	86	83	1.8	5
	2.5	218.32	.69	.73	282	256	252	52	242	86	83	1.85	5
	5	220.21	.71	.74	284	257	256	49	250	86	83	1.8	5
2	7.5	222.05	.71	.74	284	257	256	48	251	86	83	1.8	5
	10	223.92	.72	.75	282	252	257	48	251	86	83	1.9	5
	12.5	225.85	.70	.74	284	257	255	48	251	86	83	1.8	5
3	15	227.71	.71	.74	284	253	255	48	251	86	83	1.8	5
	17.5	229.55	.71	.74	284	258	256	48	251	86	83	1.8	5
	20	231.42	.70	.74	284	253	255	48	251	86	83	1.8	5
4	22.5	233.29	.65	.71	284	257	256	48	251	87	83	1.7	5
	25	235.10	.67	0.72	284	259	256	48	250	87	83	1.8	5
	27.5	236.92	0.65	0.73	284	258	254	48	250	88	83	1.8	5
5	30	238.76	.6	.68	284	257	254	48	250	87	83	1.55	4.5
	32.5	240.51	.59	.68	284	259	256	48	250	87	83	1.55	4.5
	35	242.26	.59	.68	284	259	256	48	250	87	83	1.55	4.5
6	37.5	243.98	.6	.68	284	258	255	48	250	87	83	1.55	4.5
	40	245.70	.60	.68	284	256	255	49	250	87	83	1.55	4.5
	42.5	247.43	.52	.64	284	256	255	49	250	87	83	1.35	4
7	45	249.06	.56	.66	284	258	258	49	249	87	83	1.4	4
	47.5	250.71	.56	.66	284	258	258	49	250	87	83	1.4	4
	50	252.38	.56	.66	284	258	257	49	250	87	83	1.4	4

Traverse:	2				
Start Time:	10:27	Initial Leak Check:	.002	cfm@	14.5 "Hg
Finish Time:	—	Final Leak Check:	—	cfm@	— "Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	254.04	.55	.66	284	257	256	49	249	87	83	1.4	4
	55	255.69	.58	.67	284	256	256	49	248	87	83	1.5	4
	57.5	257.40	.58	.67	284	258	256	49	248	87	84	1.5	4
9	60	259.10	.56	.66	284	257	256	49	249	87	84	1.4	4
	62.5	260.75	.56	.66	283	252	256	49	249	87	83	1.4	4
	65	262.40	.55	.66	283	257	256	49	248	87	84	1.45	4
10	67.5	264.08	.55	.66	283	253	253	49	248	87	84	1.45	4.5
	70	265.75	.59	.68	282	257	257	49	249	87	84	1.55	5
	72.5	267.49	.57	.67	282	251	255	50	250	87	84	1.5	5
11	75	269.19	.57	.67	281	257	251	50	250	87	84	1.5	5
	77.5	270.89	.51	.63	282	257	251	50	251	87	84	1.3	4.5
	80	272.52	.50	.63	281	257	252	50	253	87	84	1.3	4.5
12	82.5	274.11	.45	.59	282	257	252	51	255	87	84	1.1	4.5
	85	275.64	.45	.59	281	253	252	51	258	87	84	1.1	4.5
	87.5	277.14	.45	.59	282	255	253	51	258	87	84	1.1	4.5
	90	278.69											

Traverse: 2				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg	
Finish Time: 11:57	Final Leak Check: .003	cfm@ 14	"Hg	

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	May 29, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	7 Series
Meter Box No.:	Team 2
Impinger Box No.:	3

Pitot Factor	.851	-
DGMCF	.981	-
Barometric Pressure	29.76	"Hg
Static Pressure	- 9.9	"H2O
Nozzle Size	.2544	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal /(Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	416.9	-	g
WCBDA	28.3	-	g

Combustion Gas Concentration

Oxygen	8.40	-	%
Carbon Dioxide	10.95	-	%
Carbon Monoxide	26.0		ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot S/	B03761
Trendicator	COLE 20092
Control Box	COLE 20092
Incline Manometer	COLE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F 200	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	279.22	.66	.72	279	254	256	76	85	82	82	1.7	3.5
	2.5	281.03	.66	.72	282	252	258	71	224	82	81	1.7	3.5
	5	282.83	.66	.72	282	255	257	54	227	82	81	1.7	3.5
2	7.5	284.68	.66	.71	282	257	257	65	228	82	81	1.7	3.5
	10	286.49	.68	.73	282	252	258	67	229	83	81	1.8	3.5
	12.5	288.33	.67	.72	282	257	258	67	230	83	81	1.7	3.5
3	15	290.14	.67	.72	282	255	258	67	231	83	81	1.7	3.5
	17.5	291.98	.65	.71	282	253	258	67	232	83	81	1.7	3.5
	20	293.78	.65	.71	283	252	258	67	230	83	81	1.7	3.5
4	22.5	295.59	.62	.69	282	255	258	63	231	84	81	1.6	3.5
	25	297.33	.62	.69	283	253	257	63	231	84	81	1.6	3.5
	27.5	299.08	.63	.70	283	257	258	62	232	84	81	1.65	3.5
5	30	300.86	.56	.66	282	257	258	60	232	84	81	1.45	3.5
	32.5	302.53	.56	.66	283	258	258	58	231	84	81	1.45	3.5
	35	304.20	.55	.65	283	256	258	57	232	84	81	1.4	3.5
6	37.5	305.85	.50	.62	283	257	258	56	231	84	81	1.3	3.5
	40	307.43	.49	.62	283	257	258	55	231	84	81	1.3	3.5
	42.5	308.99	.50	.62	283	257	258	54	231	85	81	1.3	3.5
7	45	310.58	.54	.65	283	252	258	54	231	85	81	1.4	3.5
	47.5	312.23	.55	.65	283	257	255	53	232	85	81	1.4	3.5
	50	313.88	.54	.65	283	253	258	53	234	85	81	1.4	3.5

Traverse: 2			
Start Time: 13:05	Initial Leak Check: .008	cfm@ 15	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	315.54	.55	.65	283	254	258	52	233	85	81	1.4	3.5
	55	317.19	.55	.65	283	258	256	53	233	85	81	1.4	3.5
	57.5	318.84	.55	.65	283	253	258	53	233	85	81	1.4	3.5
9	60	320.47	.54	.65	282	255	258	54	232	86	81	1.4	3.5
	62.5	322.12	.56	.66	281	256	257	54	232	86	82	1.45	3.5
	65	323.78	.56	.66	281	252	257	54	232	86	82	1.45	3.5
10	67.5	325.48	.52	.64	282	254	257	54	232	86	82	1.35	3.5
	70	327.09	.52	.64	281	257	258	54	231	86	82	1.3	3.5
	72.5	328.72	.53	.64	282	256	257	55	231	86	82	1.3	3.5
11	75	330.32	.48	.61	282	254	257	55	230	86	82	1.2	3
	77.5	331.85	.49	.62	281	257	258	55	229	86	82	1.25	3
	80	333.40	.47	.61	282	256	257	56	229	86	82	1.2	3
12	82.5	334.93	.47	.61	282	251	257	55	221	86	82	1.2	3
	85	336.48	.47	.61	282	251	257	55	221	86	82	1.2	3
	87.5	338.0	.51	.63	281	252	258	49	191	86	82	1.3	3
	90	339.63											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 14:36	Final Leak Check: .003	cfm@ 14	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
										81			
1	0	340.10	.71	.74	281	255	257	58	58		85	1.9	4
	2.5	342.02	.71	.74	284	252	258	50	202	85	82	1.9	4
	5	343.92	.71	.74	285	251	257	47	211	85	82	1.9	4
2	7.5	345.81	.70	.74	285	257	258	46	211	86	82	1.9	4
	10	347.68	.69	.73	286	252	258	47	212	85	82	1.8	4
	12.5	349.53	.69	.73	286	252	258	47	212	85	82	1.8	4
3	15	351.38	.71	.74	285	258	258	48	212	86	82	1.9	4
	17.5	353.26	.68	.73	285	258	258	48	211	85	82	1.8	4
	20	355.12	.66	.72	285	257	258	48	211	86	82	1.75	4
4	22.5	356.94	.61	.69	285	256	258	49	212	86	82	1.6	4
	25	358.68	.61	.69	285	256	258	49	211	86	83	1.6	4
	27.5	360.43	.61	.69	285	256	258	49	210	86	83	1.6	4
5	30	362.10	.60	0.68	285	256	258	49	210	86	83	1.6	4
	32.5	364.0	.57	0.67	285	258	258	49	227	86	83	1.45	4
	35	365.63	.57	0.67	285	254	258	50	234	86	83	1.5	4
6	37.5	367.30	.52	0.64	285	256	258	50	234	87	83	1.35	4
	40	368.96	.52	0.62	285	258	258	50	233	86	83	1.25	4
	42.5	370.62	.51	0.63	285	258	258	51	233	86	83	1.35	4
7	45	372.12	.58	.67	285	252	258	52	233	87	83	1.5	4
	47.5	373.77	.53	.60	285	259	258	53	233	87	83	1.2	4
	50	375.34	.59	.68	285	257	~~258~~ 258	55	233	86	83	1.6	4

Traverse:	1				
Start Time:	14:47	Initial Leak Check:	.004	cfm@	15.5 "Hg
Finish Time:	~	Final Leak Check:	~	cfm@	~ "Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 29 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
		377.02											
8	52.5	~~377.02~~	.58	0.67	285	255	257	56	234	87	83	1.5	4
	55	378.74	.58	0.67	285	252	258	57	235	86	83	1.5	4
	57.5	380.43	.59	0.68	285	252	258	58	235	87	83	1.55	4
9	60	382.14	.63	0.70	285	258	258	59	234	87	83	1.7	4
	62.5	383.92	.60	0.68	284	258	258	60	234	87	83	1.6	4
	65	385.67	.58	0.67	284	252	258	61	234	87	83	1.5	4
10	67.5	387.38	.59	0.68	283	258	258	62	233	87	83	1.55	4
	70	389.10	.64	0.71	282	257	256	63	233	87	82	1.7	4
	72.5	390.88	.58	0.67	282	257	258	65	234	87	83	1.55	4
11	75	392.63	.30	048	282	253	258	66	169	87	83	0.57	4
	77.5	394.91	.26	045	282	254	258	66	203	87	83	0.35	4
	80	395.03	.24	0.43	282	256	258	65	204	87	83	0.32	4
12	82.5	~~396.11~~ 396.1	.24	.493	282	252	258	65	204	87	83	.31	4
	85	~~396.11~~ 396.11	.25	44	282	256	258	63	211	87	84	.36	4
	87.5	398.42	.25	.44	282	254	257	63	210	87	83	.36	4
	90	399.60											

Traverse:					
Start Time:	Initial Leak Check:		cfm@		"Hg
Finish Time: 16:17	Final Leak Check:	0.002	cfm@	18	"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3 &	Particulate/Metals
Test Date	MAY 30, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	6 SERIES.
Meter Box No.:	TEAM 4
Impinger Box No.:	3

Pitot Factor	0.840	
DGMCF	0.988	
Barometric Pressure	29.68	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	0.2350	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	445.6	g
WCBDA	19.7	g

Combustion Gas Concentration

Oxygen	7.91	%
Carbon Dioxide	11.20	%
Carbon Monoxide	20.7	ppm

Measuring Device	MII Numbers
Probe / Pitot S/B	603769
Trendicator	COE 20690
Control Box	COE 20690
Incline Manometer	COE 20690
Comb.Gas.Analyzer	
Micromanometer	
Barometer	ENVCAN
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.2340
2	.2360
3	.2345
4	.2355
Average:	0.2350.

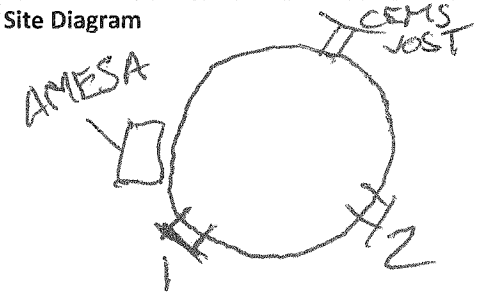
Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes:

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: #3	Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	195.46	.61	.57	285	248	252	68	104	76	76	1.2	5
*	2.5	196.4	.61	.57	285	250	250	68	214	79	76	1.0	5
	5	197.58	.63	.58	285	250	250	68	214	79	76	1.1	5
2	7.5	199.06	.63	.58	285	248	252	54	214	77	76	1.1	5
	10	200.55	.61	.57	285	247	252	53	214	77	84	1.2	5
	12.5	202.05	.61	.58	285	247	252	53	215	77	86	1.2	5
3	15	203.55	.77	.66	* 285	247	252	53	215	77	89	1.4	5
	17.5	205.17	.78	.67	285	247	249	52	214	77	91	1.51	5
	20	206.88	.72	.63	287	247	250	51	212	78	93	1.4	5
4	22.5	208.58	.72	.63	287	247	249	50	212	78	94	1.3	5
	25	210.17	.70	.63	288	247	254	51	212	78	95	1.4	5
	27.5	211.79	.67	.61	287	247	250	49	212	79	96	1.3	5
5	30	213.40	.72	.64	287	247	254	49	212	79	96	1.4	5
	32.5	215.04	.68	.62	287	248	252	48	212	79	97	1.4	5
	35	216.67	.72	.64	287	247	254	48	229	80	97	1.4	5
6	37.5	218.26	.68	.62	287	247	252	48	232	80	97	1.4	5
	40	219.90	.68	.62	287	247	253	48	231	80	98	1.4	5
	42.5	221.54	.67	.62	287	247	252	47	233	80	98	1.4	5
7	45	223.12	.62	.59	287	247	253	47	231	81	98	1.2	5
	47.5	224.68	.62	.59	287	246	247	47	230	81	98	1.2	5
	50	226.17	.60	.58	287	247	254	47	232	81	98	1.2	5

Traverse: 1 0915			
Start Time: ~~0915~~	Initial Leak Check: .005	cfm@ 15	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg

DGM VOLUME AT START OF LEAK CHECKS 195.0.
OFF @ 3MIN MARK OR 0918,
ON @ 0920
* BAD ISO GF TAPE OVER PITOTS GIVING LOW FLOW
BAD PORT SEAL AMBIENT AIR GIVING LOW STACK TEMP.

Project No.: 21840
Operator :

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	227.79	.64	.63	287	247	249	47	232	81	98	1.3	5
	55	229.28	.67	.62	286	247	255	47	232	81	98	1.3	5
	57.5	230.90	.67	.62	280	247	250	47	233	81	98	1.3	5
9	60	232.50	.81	.68	286	247	253	47	233	83	97	1.6	5.5
	62.5	234.22	.78	.66	286	248	250	47	234	81	97	1.5	5.0
	65	235.93	.78	.67	286	247	251	47	235	81	99	1.5	5.0
10	67.5	237.66	.81	.68	286	248	250	47	233	82	98	1.65	5.0
	70	239.36	.82	.68	286	248	250	47	234	81	98	1.65	5.0
	72.5	241.13	.87	.68	286	248	253	48	235	82	98	1.65	5.0
11	75	242.91	.90	.72	286	249	251	48	235	82	98	1.8	5.5
	77.5	244.78	.86	.70	286	248	252	48	236	82	98	1.6	5.5
	80	246.62	.90	.72	286	248	253	48	236	82	98	1.8	5.5
12	82.5	248.49	.85	.70	286	249	249	49	236	82	98	1.75	5.5
	85	250.30	.85	.70	286	248	253	49	236	82	98	1.75	5.5
	87.5	252.11	.85	.69	287	249	251	49	237	82	98	1.65	5.5
	90	253.91											

Traverse: 1			
Start Time: 1047	Initial Leak Check: .007	cfm@ 18	"Hg
Finish Time: 1047	Final Leak Check: .007	cfm@ 18	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: MAY 8, 2018	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	254.78	.60	.68	287	250	253	54	186	80	80	1.1	5
	2.5	256.31	.62	.58	287	250	252	56	215	80	81	1.1	5
	5	257.75	.62	.59	287	248	251	53	227	80	85	1.2	5
2	7.5	259.23	.58	.57	287	248	251	52	229	80	88	1.1	5
	10	260.69	.57	.56	287	255	252	52	230	80	92	1.1	5
	12.5	262.16	.58	.57	287	248	251	52	231	80	94	1.1	5
3	15	263.61	.65	.61	285	247	251	52	230	80	95	1.2	5
	17.5	265.15	.61	.59	287	248	251	54	232	81	98	1.2	5
	20	266.67	.65	.60	283	246	252	53	209	81	97	1.25	5
4	22.5	268.23	.64	.60	283	246	252	51	214	81	98	1.25	5
	25	269.79	~~.626~~	.59	283	245	252	51	215	81	98	1.25	5
	27.5	271.35	.63	.60	283	246	253	50	215	82	99	1.25	5
5	30	272.91	.65	.61	283	247	254	50	213	82	99	1.3	5
	32.5	274.6	.65	.61	283	247	252	50	213	82	99	1.3	5
*	35	276.3	.67	.62	282	249	260	53	217	83	82	1.4	5
6	37.5	276.91	.55	.55	284	249	261	51	212	81	85	1	5
	40	278.35	.57	.56	282	249	258	51	212	81	87	1	5
	42.5	279.73	.60	.58	282	249	250	52	212	81	90	1.1	5
7	45	281.20	.60	.58	282	248	254	52	212	81	92	1.1	5
	47.5	282.72	.62	.59	283	249	254	52	211	82	93	1.2	5
	50	284.23	.62	.59	283	249	253	52	231	81	94	1.2	5

Traverse: 2			
Start Time: 1120	Initial Leak Check: .007 cfm@ 23.5 "Hg		
Finish Time: —	Final Leak Check: — cfm@ — "Hg		

* LOST POWER @ 33 MIN MARK - BAD ISO.
ON @ 1215 -

Project No.: 21840
Operator :

Field Data Sheet

Date: MAY 30, 2018	Plant: Covanta DYEC	Test No.: 1 2 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	285.78	.67	.62	283	248	251	53	233	82	95	1.3	5
	55	287.36	.69	.63	283	248	255	53	233	82	95	1.3	5
	57.5	288.98	.69	.63	283	248	256	53	233	82	95	1.3	5
9	60	290.56	.58	.57	283	249	254	255	235	82	96	1.1	5
	62.5	292.10	.58	.57	283	249	255	55	234	82	96	1.1	5
	65	293.58	.58	.57	283	248	255	55	233	82	96	1.1	5
10	67.5	295.07	.75	.65	283	248	252	53	213	82	96	1.5	5.5
	70	296.70	.75	.65	284	247	252	50	212	83	96	1.5	5.5
	72.5	298.41	.76	.66	284	249	253	48	212	83	96	1.5	5.5
11	75	300.12	.83	.69	284	250	250	47	212	83	96	1.7	5.5
	77.5	301.90	.83	.69	285	248	254	47	212	83	96	1.7	5.5
	80	303.70	.83	.69	285	248	251	46	210	83	96	1.7	5.5
12	82.5	305.50	.84	.69	285	249	252	46	235	83	97	1.7	5.5
	85	307.30	.84	.69	285	248	254	46	235	83	97	1.7	5.5
	87.5	309.10	.84	.69	286	249	252	46	236	83	98		
	90	310.89											

Traverse: 2			
Start Time: 1252	Initial Leak Check: .006	cfm@ 14	"Hg
Finish Time: 1312	Final Leak Check: .007	cfm@ 14	"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particulate/Metals
Test Date	May 30 2018
Test Location	APC Outlet No. 2
Operator Signature	TT

Project No.:	21840
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Team 3
Impinger Box No.:	13

Pitot Factor	.857	
DGMCF	.998	
Barometric Pressure	29.70	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2544	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal/ (Teflon) / Other_____

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	460.9	g
WCBDA	20.7	g

Combustion Gas Concentration

Oxygen	7.83	%
Carbon Dioxide	11.18	%
Carbon Monoxide	9.7	ppm

Measuring Device	MII Numbers
Probe / Pitot S1	
Trendicator	COE 20093
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	132.72	.48	.59	281	251	248	72	105	77	77	1.2	3
	2.5	134.24	.48	.59	282	248	248	62	204	77	78	1.2	3
	5	135.68	.48	.59	284	254	247	60	231	77	78	1.2	3
2	7.5	137.13	.47	.58	284	251	248	59	234	78	78	1.2	3
	10	138.58	.47	.59	281	255	248	59	235	78	79	1.25	3
	12.5	140.02	.47	.59	282	251	247	59	235	78	80	1.2	3
3	15	141.50	.53	.62	281	256	247	59	236	78	81	1.45	3
	17.5	143.05	.53	.62	281	254	247	59	237	78	82	1.45	3
	20	144.61	.53	.62	282	256	251	59	239	78	82	1.45	3
4	22.5	146.18	.54	.63	282	254	258	58	244	79	83	1.5	3
	25	147.76	.54	.63	285	256	261	58	247	79	84	1.5	3
	27.5	149.36	.53	.62	285	254	261	58	249	79	84	1.45	3
5	30	150.94	.54	.63	286	252	260	58	250	79	85	1.5	3
	32.5	152.53	.55	.64	289	250	260	58	249	80	85	1.55	3
	35	154.14	.54	.63	289	255	259	58	249	80	85	1.5	3
6	37.5	155.74	.52	.62	289	254	259	58	249	80	86	1.45	3
	40	157.34	.52	.62	290	257	260	58	249	80	86	1.45	3
	42.5	158.92	.53	.62	290	250	260	58	249	81	86	1.45	3
7	45	160.50	.51	.61	291	257	260	58	249	81	87	1.4	3
	47.5	162.02	.50	.61	291	255	260	58	248	81	87	1.4	3
	50	163.56	.50	.61	291	257	259	58	247	82	87	1.4	3

Traverse: 2			
Start Time: 8:15	Initial Leak Check: .003	cfm@ 17	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/~~Trap~~ °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	165.09	.56	.64	290	251	259	58	247	82	87	1.55	3
	55	166.71	.56	.64	291	251	259	58	247	82	88	1.55	3
	57.5	168.33	.54	.63	290	257	259	58	247	82	88	1.5	3
9	60	169.94	.63	.68	290	257	259	58	247	82	88	1.75	3
	62.5	171.65	.64	.69	290	257	259	57	248	82	88	1.75	3
	65	173.39	.64	.69	291	256	259	58	248	83	88	1.75	3
10	67.5	175.13	.68	.71	291	257	259	58	248	83	88	1.85	3
	70	176.90	.69	.72	291	258	259	58	248	83	88	1.9	3.5
	72.5	178.71	.70	.72	291	254	259	58	248	83	88	1.9	3.5
11	75	180.53	.70	.72	291	255	259	58	249	83	88	1.9	3.5
	77.5	182.35	.70	.72	291	252	259	58	249	83	88	1.9	3.5
	80	184.16	.71	.73	290	252	259	58	248	83	88	1.95	4
12	82.5	186.0	.71	.73	290	253	259	57	248	84	88	1.95	4
	85	187.84	.69	.72	290	258	260	57	249	84	88	1.9	4
	87.5	189.65	.69	.72	290	256	260	58	249	84	88	1.9	4
	90	191.45											

Traverse:	2				
Start Time:	—	Initial Leak Check:	—	cfm@	— "Hg
Finish Time:	9:45	Final Leak Check:	.002	cfm@	17 "Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2017	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/~~Trap~~ °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	192.0	.66	.70	288	257	260	70	131	84	84	1.85	4
	2.5	193.77	.70	.72	290	256	256	60	243	84	84	1.9	4
	5	195.58	.70	.72	291	256	257	56	251	84	84	1.9	4
2	7.5	197.39	.69	.71	291	257	258	55	252	83	84	1.9	4
	10	199.19	.68	.71	291	259	260	54	253	83	84	1.9	4
	12.5	200.98	.71	.72	291	253	260	54	253	83	84	1.95	4
3	15	202.81	.71	.72	291	258	259	54	253	83	85	1.95	4
	17.5	204.63	.72	.73	291	259	258	54	253	83	85	2.0	4
	20	206.48	.70	.72	291	258	259	53	253	83	85	1.95	4
4	22.5	208.29	.64	.69	291	256	259	53	254	83	85	1.75	4
	25	210.02	.66	.70	291	258	257	54	253	83	85	1.8	4
	27.5	211.77	.66	.70	291	252	259	54	253	83	86	1.8	4
5	30	213.53	.62	.68	291	258	259	54	253	83	86	1.7	4
	32.5	215.23	.62	.68	291	258	259	54	253	83	86	1.7	4
	35	216.94	.62	.68	291	257	259	54	253	83	86	1.7	4
6	37.5	218.65	.58	.65	291	255	259	54	253	83	87	1.6	4
	40	220.31	.55	.64	291	256	262	54	252	83	87	1.55	4
	42.5	221.93	.55	.64	291	251	261	55	251	83	87	1.55	4
7	45	223.54	.58	.66	290	254	257	55	250	83	87	1.6	4
	47.5	225.22	.58	.66	290	255	250	54	252	83	87	1.6	4
	50	226.89	.58	.66	290	252	261	55	257	83	87	1.6	4

Traverse: 1			
Start Time: 10:02	Initial Leak Check: .002 cfm@ 17 "Hg		
Finish Time: —	Final Leak Check: — cfm@ — "Hg		

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2016	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	228.54	.58	.66	290	258	258	55	258	84	88	1.6	4
	55	230.19	.56	.65	290	258	267	55	260	84	88	1.55	4
	57.5	231.81	.56	.65	289	256	262	55	259	84	88	1.55	4
9	60	233.44	.54	.63	289	251	248	55	256	84	88	1.5	4
	62.5	235.03	.56	.65	288	256	264	55	257	84	88	1.55	4
	65	236.65	.56	.65	288	254	262	56	257	84	88	1.55	4
10	67.5	238.28	.54	.64	287	250	251	56	256	84	89	1.5	4
	70	239.88	.56	.65	286	252	264	56	257	84	89	1.55	4
	72.5	241.51	.60	.67	287	253	263	56	257	85	89	1.7	4
11	75	243.19	.58	.66	287	257	258	56	257	85	89	1.65	4
	77.5	244.87	.58	.66	287	254	253	57	255	85	89	1.65	4
	80	246.54	.58	.66	287	255	250	57	256	85	89	1.65	4
12	82.5	248.21	.55	.64	281	254	258	57	259	85	89	1.55	4
	85	249.83	.54	.64	281	255	259	58	262	85	89	1.55	4
	87.5	251.45	.54	.64	281	251	255	58	263	85	89	1.55	4
	90	253.08											

Traverse: 1			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 11:32	Final Leak Check: .004	cfm@ 15.5	"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	May 30 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Team 3
Impinger Box No.:	10

Pitot Factor	.851	
DGMCF	.998	
Barometric Pressure	29.63	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2544	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	492.5	g
WCBDA	22.4	g

Combustion Gas Concentration

Oxygen	7.61	%
Carbon Dioxide	11.35	%
Carbon Monoxide	10.3	ppm

Measuring Device	MII Numbers
Probe / Pitot S1	
Trendicator	COE 20093
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average: .2544

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	253.98	.56	.64	285	255	261	78	139	81	82	1.55	3
	2.5	255.56	.56	.64	283	254	255	68	204	82	82	1.55	3
	5	257.18	.56	.64	282	255	255	64	214	82	82	1.55	3
2	7.5	258.83	.56	.64	281	250	256	61	218	82	82	1.55	3
	10	260.46	.56	.64	282	250	257	59	218	82	83	1.55	3
	12.5	262.07	.56	.64	283	254	257	58	219	82	84	1.55	3
3	15	263.68	.58	.66	281	250	257	57	219	82	85	1.65	3
	17.5	265.33	.58	.66	282	253	257	57	220	82	85	1.65	3
	20	266.99	.56	.64	285	251	257	56	221	82	86	1.55	3
4	22.5	268.63	.56	.64	283	252	257	56	220	83	87	1.55	3
	25	270.23	.63	.68	288	252	257	56	220	83	87	1.75	3
	27.5	271.94	.61	.67	288	257	257	56	220	83	88	1.7	3
5	30	273.64	.60	.67	288	254	256	56	220	84	88	1.7	3
	32.5	275.33	.58	.66	288	257	256	56	221	84	88	1.6	3
	35	276.99	.59	.66	289	251	256	56	221	84	88	1.6	3
6	37.5	278.63	.56	.65	289	250	256	56	220	84	88	1.55	3
	40	280.25	.56	.65	290	254	256	56	219	84	89	1.55	3
	42.5	281.89	.56	.65	290	254	257	56	221	85	90	1.55	3
7	45	283.50	.56	.65	290	257	256	57	222	85	90	1.6	3
	47.5	285.13	.56	.65	290	253	256	57	220	85	90	1.6	3
	50	286.79	.56	.65	290	256	256	56	222	85	90	1.6	3

Traverse: 2			
Start Time: 12:59	Initial Leak Check:	cfm@	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	288.43	.58	.66	290	250	256	56	220	85	90	1.7	3
	55	290.10	.6	.67	290	251	256	56	220	85	91	1.7	3
	57.5	291.79	.58	.66	290	252	256	57	216	85	91	1.7	3
9	60	293.47	.58	.66	291	256	256	57	214	86	91	1.7	3
	62.5	295.15	.63	.69	291	256	256	57	214	86	91	1.8	3
	65	296.89	.66	.70	290	255	256	57	215	86	91	1.9	3
10	67.5	298.68	.71	.73	291	257	256	57	215	86	91	2.0	3
	70	300.52	.71	.73	291	252	256	57	217	86	91	2.0	3
	72.5	302.38	.71	.73	291	257	256	58	216	87	92	2.0	3
11	75	304.22	.71	.73	291	257	257	58	217	87	91	2.0	3
	77.5	306.07	.72	.74	290	255	256	58	217	87	91	2.0	3
	80	307.92	.73	.74	290	255	256	58	217	87	91	2.0	3
12	82.5	309.78	.73	.74	290	253	256	58	217	87	91	2.0	3
	85	311.64	.73	.74	290	257	256	59	217	87	91	2.0	3
	87.5	313.49	.74	.75	289	259	256	59	216	87	91	2.05	3
	90	315.37											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 14:29	Final Leak Check: .004	cfm@ 15	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	315.77	.76	.76	285	252	256	72	160	88	88	2.1	3.5
	2.5	317.67	.76	.76	291	256	256	65	208	88	89	2.1	3.5
	5	319.53	.71	.73	292	256	256	62	215	89	89	2.05	3.5
2	7.5	321.36	.71	.73	292	257	256	60	216	88	89	2	3.5
	10	323.20	.73	.74	292	259	257	60	216	88	90	2.05	3.5
	12.5	325.05	.73	.74	292	255	257	60	217	88	90	2.05	3.5
3	15	326.91	.71	.73	292	258	257	61	217	88	90	2.05	3.5
	17.5	328.76	.71	.73	292	256	256	61	216	88	91	2.05	3.5
	20	330.61	.71	.73	292	260	256	61	216	88	91	2.05	3.5
4	22.5	332.45	.67	.71	292	254	256	61	216	88	91	1.9	3.5
	25	334.25	.68	.72	291	259	256	62	216	88	91	1.9	3.5
	27.5	336.05	.66	.71	291	253	256	61	218	88	92	1.9	3.5
5	30	337.85	.63	.69	291	260	257	60	218	88	92	1.8	3.5
	32.5	339.58	.59	.67	291	258	256	60	217	88	92	1.7	3.5
	35	341.28	.59	.67	291	259	256	60	217	89	92	1.7	3.5
6	37.5	343.00	.55	.64	290	259	256	60	217	88	92	1.6	3.5
	40	344.66	.54	.64	290	254	257	61	217	88	93	1.5	3.5
	42.5	346.29	.54	.64	291	253	256	61	217	89	93	1.55	3.5
7	45	347.91	.53	.63	290	257	256	61	217	89	94	1.5	3.5
	47.5	349.52	.56	.65	290	254	255	61	217	89	94	1.55	3.5
	50	351.17	.54	.64	290	256	256	62	216	89	94	1.55	3.5

Traverse: 1					
Start Time: 14:39	Initial Leak Check: .004	cfm@ 15	"Hg		
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		

Project No.: 21840

Operator :

Field Data Sheet

Date: May 30 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	352.77	.55	.65	289	259	256	62	216	89	94	1.6	3.5
	55	354.42	.55	.65	289	256	256	62	221	90	95	1.6	3.5
	57.5	356.08	.55	.65	289	258	257	63	223	90	95	1.6	3.5
9	60	357.72	.56	.65	289	257	256	63	222	90	95	1.6	3.5
	62.5	359.35	.53	.64	288	258	256	63	223	90	95	1.5	3.5
	65	360.94	.54	.64	287	257	256	63	223	90	95	1.55	3.5
10	67.5	362.57	.54	.64	287	258	256	62	219	90	95	1.55	3.5
	70	364.19	.54	.65	282	257	256	60	220	91	95	1.55	3.5
	72.5	365.82	.54	.65	282	254	256	59	222	91	95	1.55	3.5
11	75	367.45	.50	.62	282	256	256	59	218	91	95	1.5	3.5
	77.5	369.04	.52	.63	283	253	256	59	217	91	95	1.5	3.5
	80	370.63	.50	.62	283	253	256	59	214	90	94	1.4	3.5
12	82.5	372.18	.50	.62	284	255	255	59	213	90	94	1.4	3.5
	85	373.75	.49	.61	283	258	255	59	212	90	94	1.4	3.5
	87.5	375.29	.50	.62	281	251	255	59	212	90	94	1.4	3.5
	90	376.87											

67.5

Traverse: 1					
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg		
Finish Time: 16:09	Final Leak Check: .004	cfm@ 14	"Hg		

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T3	Particulate/Metals
Test Date	May 31/18
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	6B
Meter Box No.:	Team 1
Impinger Box No.:	13

Pitot Factor	.851	
DGMCF	.995	
Barometric Pressure	29.50	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2540	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal / Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None / Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	472.5	g
WCBDA	21.3	g

Combustion Gas Concentration

Oxygen	7.63	%
Carbon Dioxide	11.20	%
Carbon Monoxide	21.5	ppm

Measuring Device	MII Numbers
Probe / Pitot S1	B03761
Trendicator	
Control Box	Team 1
Incline Manometer	Team 1
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	B03906

Nozzle Measurements	
1	.2555
2	.2540
3	.2530
4	.2535
Average:	.2540

Site Diagram

Notes:

Field Data Sheet

Date: May 31/18	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	722.41	.27	.44	283	239	261	107 ~~65~~	65 ~~76~~	76	75	.45	2
	2.5	723.54	.54	.63	283	243	266	~~60~~ 50	262	77	77	1.3	2
	5	725.00	.57	.64	283	240	270	47	261	76	76	1.5	2
2	7.5	726.62	.58	.65	281	243	266	45	261	76	76	1.5	2
	10	728.24	.58	.65	281	243	260	45	256	~~76~~ 76	76	1.5	2
	12.5	729.94	.57	.64	281	241	259	44	254	76	76	1.5	2
3	15	731.58	.58	.65	281	243	259	~~45~~	252	~~76~~	~~76~~	1.5	2
	17.5	733.21	.57	.64	281	242	261	46	252	76	76	1.4	2
	20	734.81	.57	.64	281	242	261	45	252	~~76~~	~~76~~	1.45	2
4	22.5	736.43	.56	.64	281	244	262	45	252	~~76~~	~~76~~	1.4	2
	25	738.04	.56	.64	282	244	262	~~45~~ 45	251	76	76	1.4	2
	27.5	739.35	.55	.63	283	243	261	45	250	~~76~~	~~76~~	1.4	2
5	30	741.05	.54	.63	283	244	261	48	250	76	~~76~~	1.4	2
	32.5	742.68	.54	.63	282	240	261	46	249	~~77~~	~~76~~	1.4	2
	35	744.28	.54	.63	282	243	261	46	250	~~76~~	~~76~~	1.35	2
6	37.5	745.88	.56	.64	282	244	261	45	250	~~77~~	~~76~~	1.4	2
	40	747.46	.56	.64	283	241	262	46	250	~~76~~	~~76~~	1.45	2
	42.5	749.05	.57	.64	284	241	261	46	250	~~77~~	~~76~~	1.45	2
7	45	750.67	.57	.64	284	244	261	46	250	~~77~~	~~76~~	1.45	2
	47.5	752.30	.56	.64	284	242	261	46	250	~~77~~	~~76~~	1.4	2
	50	753.94	.59	.65	284	243	261	46	250	~~77~~	~~76~~	1.5	2

Traverse:					
Start Time: 9:18	Initial Leak Check:	.005	cfm@	15	"Hg
Finish Time:	Final Leak Check:		cfm@		"Hg

Project No.: 21840

Operator: AS

Field Data Sheet

Date: May 31/18	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	755.57	.57	.64	284	243	261	46	249	77	76	1.45	2
	55	757.20	.57	.64	285	242	261	46	250	77	76	1.45	2
	57.5	758.85	.58	.65	285	242	261	46	248	77	76	1.45	2
9	60	760.48	.56	.64	285	241	260	44	248	77	76	1.4	2
	62.5	762.05	.61	.66	285	243	260	44	248	77	76	1.55	2
	65	763.72	.60	.66	285	241	260	45	248	77	76	1.5	2
10	67.5	765.42	.63	.68	285	241	260	44	248	77	76	1.55	2
	70	767.01	.62	.67	285	242	260	44	246	77	76	1.6	2
	72.5	768.81	.68	.70	286	243	259	44	238	77	76	1.75	2
11	75	770.58	.66	.69	286	243	257	44	231	77	76	1.7	2
	77.5	772.36	.65	.69	286	243	258	44	228	78	76	1.6	2
	80	774.09	.68	.70	285	244	259	44	226	77	76	1.75	2
12	82.5	775.87	.68	.70	285	242	258	44	226	78	77	1.75	2
	85	777.66	.67	.70	285	244	257	44	226	78	77	1.7	2
	87.5	779.42	.65	.69	285	244	258	44	225	78	77	1.68	2
	90	781.17											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 10:48	Final Leak Check: .002	cfm@ 11	"Hg

Project No.: 21840

Operator : DB

Field Data Sheet

Date:	May 31/18	Plant:	Covanta DYEC	Test No.:	3	Particulate/Metals	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:		APC Outlet No. 3	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	781.59	0.7	.71	283	241	260	66	107	78	77	1.8	3
	2.5	783.4	.74	.73	285	240	256	47	234	78	77	1.9	3
	5	785.19	.72	.72	285	242	257	47	235	78	77	1.9	3
2	7.5	787.05	.71	.72	285	244	258	46	236	79	78	1.85	3
	10	788.91	.69	.71	285	244	259	46	235	78	78	1.75	3
	12.5	790.70	.68	.70	285	242	259	47	234	78	78	1.75	3
3	15	792.50	.68	.70	285	244	259	48	234	79	78	1.75	3
	17.5	794.27	.66	.69	286	243	258	48	234	78	78	1.7	3
	20	796.04	.66	.69	286	245	259	48	234	79	78	1.7	3
4	22.5	797.79	.67	.70	285	243	259	49	234	79	78	1.7	3
	25	799.55	.67	.70	285	242	258	50	233	78	78	1.7	3
	27.5	801.32	.61	.67	285	245	259	51	233	79	78	1.65	3
5	30	803.03	.62	.67	285	242	258	51	233	79	78	1.6	3
	32.5	804.71	.58	.65	285	245	259	51	234	79	78	1.5	3
	35	806.38	.57	.65	285	245	259	52	234	79	78	1.45	3
6	37.5	808.00	.58	.63	285	245	259	51	233	79	78	1.4	3
	40	809.60	.52	.62	285	242	259	52	233	79	78	1.3	3
	42.5	811.16	.53	.62	285	242	259	52	233	79	78	1.3	3
7	45	812.68	.54	.63	285	243	259	52	233	79	78	1.35	3
	47.5	814.26	.54	.63	285	242	258	52	236	79	78	1.35	3
	50	815.84	.57	.65	285	244	258	52	239	79	79	1.45	3

Traverse:	2				
Start Time:	11:33	Initial Leak Check:	.003	cfm@	17 "Hg
Finish Time:		Final Leak Check:		cfm@	X "Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31/16	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	817.50	.58	.65	285 ~~289~~	243	259	52	241	79	78	1.5	3
	55	819.16	.57	.65	285	241	259	52	241	80	78	1.45	3
	57.5	~~820~~.76	.57	.65	285	244	259	53	241	80	78	1.45	3
9	60	822.40	.57	.65	285	242	259	53	241	80	79	1.45	3
	62.5	824.02	.57	.65	284	242	260	53	241	80	78	1.45	3
	65	825.65	.58	.65	284	244	259	53	241	80	79	1.5	3
10	67.5	827.29	.59	.66	284	245	259	53	241	81	79	1.5	3
	70	828.94	.60	.67	282	245	258	53	241	81	79	1.55	3
	72.5	830.63	.58	.65	282	241	258	53	242	81	79	1.5	3
11	75	832.28	.56	.64	282	241	259	54	242	81	79	1.4	3
	77.5	833.90	.56	.64	282	244	260	54	241	80	79	1.4	3
	80	835.51	.56	.64	282	244	260	53	241	81	79	1.45	3
12	82.5	837.13	.55	.64	282	243	260	54	240	81	79	1.4	3
	85	838.74	.56	.64	282	241	259	54	238	80	79	1.4	3
	87.5	840.34	.56	.64	282	244	259	55	238	81	79	1.4	3
	90	841.96											

Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: ~~12:37~~	Final Leak Check:	.002	cfm@	15 "Hg

~~13:30~~ ~~12:37~~ 13:03

Project No.: 21840

Operator: DB

APPENDIX 5

Particle Size Distribution Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particle Size
Test Date	MAY 30, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	72
Impinger Box No.:	14

Pitot Factor	0.845	—
DGMCF	0.981	—
Barometric Pressure	29.70	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	DWELL	
Number of Ports	2	
Number of Points/Port	12	

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	153.0	—	g
WCBDA	12.1	—	g

Combustion Gas Concentration

Oxygen	7.88	—	%
Carbon Dioxide	11.25	—	%
Carbon Monoxide	19.1		ppm

Measuring Device	MII Numbers
Probe / Pitot	PM10/2.5
Trendicator	7
Control Box	ECOE 20092
Incline Manometer	3
Comb.Gas.Analyzer	
Micromanometer	
Barometer	ENVCAN
Calipers	B03922

Nozzle Measurements	
1	
2	
3	
4	
Average:	

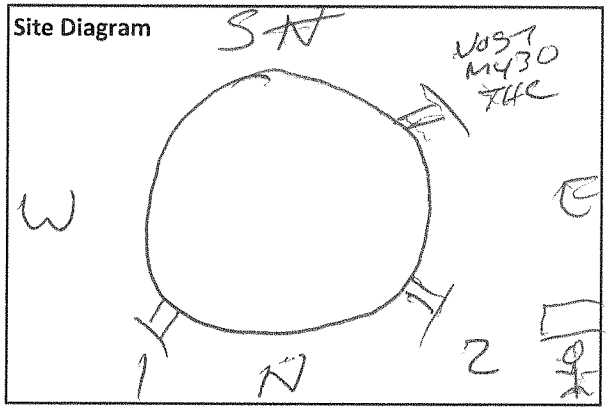
Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other

Union None / Metal / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram



Notes:

Field Data Sheet

Date: MAY 30/A	Plant: Covanta DYEC	Test No.: 1 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	0.30	.76	.35	284	255	60	74	73	76	75	0.38	4
2	10.2	3.86	.74		285	258	256	63	73	78	75		4
3	20.8	7.62	.70		285	259	257	55	70	79	76		4
4	31.2	11.25	.71		285	257	258	54	73	80	76		4
5	41.1	14.72	.68		286	259	256	55	74	82	77		4
6	50.7	17.98	.596		286	255	256	55	75	82	78		4
	59.9	21.15											
1	0	21.15	.786		285	259	256	59	76	79	78		4
2	10.3	24.77	.798		286	256	256	60	77	81	78		4
3	21.0	28.45	.68		286	256	256	61	76	79	78		4
4	31.4	32.05	.65		284	258	256	61	68	82	79		4
5	41.3	35.46	.57		283	254	256	60	69	83	79		4
6	50.9	38.70	.50		282	258	257	60	68	84	80		4
	60.1	42.00											

Traverse: R					Traverse: 1				
Start Time: 8:34	Initial Leak Check: .003	cfm@ 15	"Hg		Start Time: 11:54	Initial Leak Check:	cfm @	"Hg	
Finish Time: 9:34	Final Leak Check:	cfm@	"Hg		Finish Time: 12:54	Final Leak Check:	cfm @	"Hg	

* MAY HAVE READ WRONG

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	2 Particle Size
Test Date	MAY 30, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	T2
Impinger Box No.:	9

Pitot Factor	0.845	
DGMCF	0.981	
Barometric Pressure	29.63	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	DWELL
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	154.5	g
WCBDA	10.3	g

Combustion Gas Concentration

Oxygen	8.14	%
Carbon Dioxide	10.93	%
Carbon Monoxide	24.8	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	7657
Control Box	
Incline Manometer	1
Comb.Gas.Analyzer	
Micromanometer	UNIT 1
Barometer	ENV-CAN
Calipers	305922

Probe Liner Glass / Metal /Teflon / Other DFA

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date: May 30/19	Plant: Covanta DYEC	Test No.: 2 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	42.64	.77	.35	285	254	255	73	63	82	79	0.38	4
2	10.8	46.50	.73		285	258	257	59	68	82	79		4
3	21.5	50.28	.70		285	257	257	63	64	83	80		4
4	31.5	53.83	.63		285	259	257	61	62	84	81		4
5	41.4	57.30	.56		285	256	257	60	63	84	81		4
6	50.6	60.52	.50		284	260	258	59	64	85	81		4
	59.2	63.56											
1	0	63.56	.68		284	257	255	64	69	86	82		4
2	10.6	67.39	.69		283	259	258	62	66	86	83		4
3	21.1	71.17	.71		282	260	259	64	69	87	83		4
4	31.3	74.72	.66		283	257	258	67	72	88	84		4
5	41.5	78.25	.60		284	260	258	68	74	88	84		4
6	51.6	81.77	.53		284	261	258	70	69	89	85		4
	60.8	85.01											

Traverse: 1				Traverse: 2			
Start Time: 1329	Initial Leak Check: .005	cfm@ 17	"Hg	Start Time: 1431	Initial Leak Check: ✓	cfm @ ✓	"Hg
Finish Time: 1429	Final Leak Check: —	cfm@ —	"Hg	Finish Time: 1532	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : [illegible]

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	MAY 30 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	T2
Impinger Box No.:	14

Pitot Factor	0.845	
DGMCF	0.981	
Barometric Pressure	29.56	"Hg
Static Pressure	-9.8	"H2O
Nozzle Size	0.173	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	164.5	g
WCBDA	8.5	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	10.92	%
Carbon Monoxide	22.4	ppm

Measuring Device	MII Numbers
Probe / Pitot	355
Trendicator	TEST
Control Box	1
Incline Manometer	
Comb.Gas.Analyzer	UNIT
Micromanometer	1
Barometer	
Calipers	

Reading Interval	DUCT
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: MAY 30 2018	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	85.16	.75	.35	282	267	257	76	80	88	85	.38	4.5
2	10.3	88.76	.75		283	256	259	59	67	89	86		4.5
3	20.6	92.43	.73		284	259	259	56	65	90	86		4.5
4	31.1	96.15	.69		284	258	259	55	64	91	87		4.5
5	41.2	~~99.82~~	.62		289	264	263	58	66	94	90		4.5
6	50.9	103.20	.62		289	264	263	58	64	94	90		4.5
	60.0	106.60											
1	0	106.60	.77		283	258	255	58	67	91	88		4.5
2	10.9	110.51	.75		282	259	259	56	65	92	88		4.5
3	21.6	114.24	.67		282	261	258	56	65	92	89		4.5
4	32.0	118.10	.598		281	261	259	56	66	92	89		4.5
5	41.9	121.56	.52		280	258	258	56	65	93	89		4.5
6	51.2	124.94	.52		281	256	259	57	68	93	89		4.5
	60.0	128.07											

Traverse: 2			
Start Time: 1637	Initial Leak Check: 0.003 cfm@ 17	"Hg	
Finish Time: 1737	Final Leak Check:	cfm@	"Hg

Traverse: 1			
Start Time: 1740	Initial Leak Check:	cfm @	"Hg
Finish Time: 1840	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particle Size
Test Date	MAY 29, 2019
Test Location	APC Outlet No. 2
Operator Signature	DJ HS

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	TEAM 1
Impinger Box No.:	9

Pitot Factor	0.85	
DGMCF	0.995	
Barometric Pressure	29.77	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	DWELL
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	146.8	g
WCBDA	13.0	g

Combustion Gas Concentration

Oxygen	~~8.44~~ 7.74	%
Carbon Dioxide	11.43	%
Carbon Monoxide	13.7	ppm

Measuring Device	MII Numbers
Probe / Pitot	PM10 12.5
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	—
Micromanometer	—
Barometer	ENV CAN
Calipers	B03922

Nozzle Measurements	
1	.1775
2	.1775
3	.1770
4	.1770
Average:	

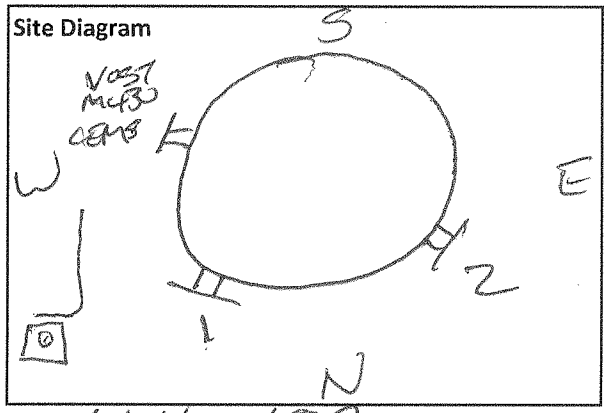
Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes: 45.8 51.5 55.4 58.6 61.4 63.9

Field Data Sheet

Date: MAY 29/18	Plant: Covanta DYEC	Test No.: 1 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	65.00	.64	.35	285	255	260	67	67	80	81	.38	3
2	10.5	68.63	.64		284	241	261	60	63	79	82	.38	3
3	20.9	72.29	.62		284	244	261	58	64	80	79	.38	3
4	31.2	75.85	.58		285	240	260	59	64	80	80	.38	3
5	41.1	79.50	.55		285	243	260	58	64	81	80	.38	3
6	50.9	82.96	.54		284	243	260	58	64	82	81	.39	3.5
	60.3	86.29											
1	0	86.29	.67		285	243	260	62	67	82	80	.38	3.5
2	10.5	90.03	.65		286	242	260	60	66	82	81	.38	3.5
3	21.0	93.73	.59		285	240	260	60	67	82	81	.38	3.5
4	31.1	97.26	.53		285	243	260	60	67	82	81	.38	3.5
5	40.9	100.75	.52		285	243	260	62	68	82	81	.38	3.5
6	50.4	104.11	.50	↓	283	243	260	63	68	82	81	.38	3.5
	59.7	107.34											

Traverse: 1					Traverse:				
Start Time: 923	Initial Leak Check: .007	cfm@	15	"Hg	Start Time: 1026	Initial Leak Check: ✓	cfm @	✓	"Hg
Finish Time:	Final Leak Check:	cfm@		"Hg	Finish Time: 1041126	Final Leak Check: ✓	cfm @	✓	"Hg

RUSH SVOC ONLY

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particle Size
Test Date	MAY 29 2019
Test Location	APC Outlet No. 2
Operator Signature	DJ UG

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	EGAM1
Impinger Box No.:	M

Pitot Factor	0.845	
DGMCF	0.995	
Barometric Pressure	29.76	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	DWELL
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	150.1	g
WCBDA	11.0	g

Combustion Gas Concentration

Oxygen	7.73	%
Carbon Dioxide	11.39	%
Carbon Monoxide	16.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEC
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	UNIT 2
Calipers	

Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle (Glass) / Metal / Other_____

Union None /(Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date: MAY 29/18	Plant: Covanta DYEC	Test No.: 2 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	7.41	.74	.35	286	240	262	59	66	79	79	.38	4
2	10.7	11.25	.74		286	240	262	60	65	80	80		4
3	21.2	14.95	.67		286	241	263	53	59	80	80		4
4	31.3	18.53	.62		285	241	262	53	59	79	79		4
5	40.8	21.90	.59		285	240	260	52	58	80	80		4
6	50.2	25.2	.52		285	241	263	52	59	80	80		4
	59.6	28.54											
1	0	28.54	.68		285	241	261	54	64	80	80		4
2	10.4	32.28	.69		285	241	263	54	63	80	80		4
3	20.9	35.98	.72		285	241	261	51	60	81	80		4
4	31.2	39.55	.68		285	242	263	51	62	81	80		4
5	41.1	42.95	.63		283	243	263	52	64	80	80		4
6	50.9	46.28	.58		285	243	262	53	66	80	80		
	60.4	49.55											

Traverse:							
Start Time:	1312	Initial Leak Check:	.004	cfm@	17	"Hg
Finish Time:	1412	Final Leak Check:		cfm@		"Hg

Traverse:							
Start Time:	1416	Initial Leak Check:		cfm @		"Hg
Finish Time:	1516	Final Leak Check:		cfm @		"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	MAY 29 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of
Probe No.:	5
Meter Box No.:	TEAM 1
Impinger Box No.:	9

Pitot Factor	0.845	
DGMCF	0.995	
Barometric Pressure	29.74	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	145.5	g
WCBDA	8.3	g

Combustion Gas Concentration

Oxygen	7.86	%
Carbon Dioxide	11.30	%
Carbon Monoxide	13.7	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEG
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	UNIT 2
Calipers	

Reading Interval	DUCT
Number of Ports	2
Number of Points/Port	12

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: MAY 29/18	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	49.66	.78	.35	286	241	259	70	65	79	79	.38	3
2	10.2	53.23	.73		286	242	259	57	60	79	79		3
3	20.5	56.90	.69		286	241	259	53	58	79	79		3
4	31.0	60.46	.64		285	240	259	52	57	79	79		3
5	41.2	64.06	.58		285	240	260	52	57	79	78		3
6	51.0	67.56	.52		285	242	260	52	58	79	79		
	60.4	70.86											
1	0	70.86	.66		285	242	260	56	62	80	79		3
2	10.6	74.7	.68		285	241	260	56	59	79	79		3
3	21.3	78.37	.70		285	242	261	52	59	80	80		3
4	31.4	81.90	.66		285	241	261	52	59	80	80		3
5	41.2	85.29	.63		285	242	262	55	61	81	80		3
6	50.7	88.55	.55		286	242	262	54	62	81	80		
	59.6	91.66											

Traverse: 1624 2			
Start Time: 1624	Initial Leak Check: .007 cfm@ 15 "Hg		
Finish Time: 1724	Final Leak Check: – cfm@ – "Hg		

Traverse: 1			
Start Time: 1727	Initial Leak Check: / cfm @ / "Hg		
Finish Time: 1827	Final Leak Check: / cfm @ / "Hg		

Project No.: 21840

Operator : [signature]

Rev: April 28, 2005

ORTECH Environmental

APPENDIX 6

SVOC Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	May 31 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Team 2
Impinger Box No.:	6

Pitot Factor	.840	
DGMCF	.981	
Barometric Pressure	29.50	"Hg
Static Pressure	-9.5	"H2O
Nozzle Size	.2350	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	577.0	g
WCBDA	11.4	g

Combustion Gas Concentration

Oxygen	8.01	%
Carbon Dioxide	11.04	%
Carbon Monoxide	24.8	ppm

Measuring Device	MII Numbers
Probe / Pitot S8	B03769
Trendicator	COE 20092
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2340
2	.2360
3	.2345
4	.2355
Average:	.2350

Probe Liner (Glass) / Metal / Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None / Metal / (Teflon) / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	528.16	.76	.64	281	245	257	67	49	77	75	1.4	4.5
	5	531.39	.74	.63	282	247	257	52	41	76	75	1.35	5
2	10	534.61	.78	.65	282	246	257	52	41	76	75	1.4	5
	15	537.91	.79	.65	282	247	257	51	42	76	75	1.4	5
3	20	541.21	.73	.63	283	247	257	51	43	77	75	1.3	5
	25	544.39	.74	.63	282	246	257	51	42	77	75	1.3	5
4	30	547.61	.72	.62	283	246	257	51	42	77	75	1.25	5
	35	550.71	.70	.62	283	246	256	51	41	77	75	1.25	5
5	40	553.84	.65	.59	282	247	257	51	41	77	75	1.1	5
	45	556.83	.66	.60	282	247	257	51	41	77	75	1.15	5
6	50	559.83	.56	.55	283	247	257	52	42	77	75	.91	4.5
	55	562.56	.56	.55	282	246	256	52	42	77	75	.93	4.5
7	60	565.32	.63	.58	282	247	255	51	42	77	76	1.1	5
	65	568.20	.66	.60	283	247	258	51	43	77	76	1.2	5
8	70	571.19	.64	.59	282	247	256	50	42	78	76	1.1	5
	75	574.22	.66	.60	283	247	258	51	42	78	76	1.15	5
9	80	577.26	.67	.60	283	247	257	50	43	78	76	1.15	5
	85	580.28	.67	.60	283	247	258	50	42	78	76	1.15	5
10	90	583.34	.67	.60	281	247	258	51	41	78	76	1.15	5
	95	586.37	.67	.60	280	247	258	51	41	78	76	1.15	5
11	100	589.41	.67	.60	281	247	258	51	41	78	77	1.15	5

Traverse: 1					Traverse:				
Start Time: 9:09	Initial Leak Check: .004	cfm@ 15	"Hg		Start Time:	Initial Leak Check:	cfm @	"Hg	
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		Finish Time:	Final Leak Check:	cfm @	"Hg	

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2016	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	592.49	.63	.59	282	247	257	51	42	79	77	1.1	5
12	110	595.42	.65	.60	283	247	258	52	44	79	77	1.15	5
	115	598.41	.67	.61	284	247	258	52	46	79	77	1.2	5
	120	601.45											

Traverse: 1					Traverse:				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg		Start Time:	Initial Leak Check:	cfm @	"Hg	
Finish Time: 11:09	Final Leak Check: .006	cfm@ 14	"Hg		Finish Time:	Final Leak Check:	cfm @	"Hg	

static - 9.5

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	601.80	.78	.65	282	246	257	56	54	79	77	1.4	5.5
	5	605.10	.76	.64	282	246	258	48	45	79	77	1.4	6
2	10	608.44	.80	.66	283	246	258	47	46	79	77	1.5	6
	15	611.79	.81	.66	284	246	258	46	48	79	77	1.5	6
3	20	615.16	.80	.66	283	246	258	46	50	79	77	1.5	6
	25	618.54	.77	.65	283	246	257	46	52	80	77	1.4	6
4	30	621.84	.72	.63	284	246	258	47	56	80	77	1.25	5.5
	35	624.99	.70	.62	283	246	258	47	53	80	77	1.2	5.5
5	40	628.12	.62	.58	283	246	258	48	45	81	77	1.1	5
	45	631.04	.62	.58	283	247	257	49	43	81	77	1.1	5
6	50	633.98	.62	.58	283	247	258	49	42	81	78	1.1	5
	55	636.88	.50	.52	283	247	258	49	42	81	78	.80	4.5
7	60	639.47	.64	.59	283	247	257	50	41	82	78	1.15	5
	65	642.40	.65	.60	283	247	258	49	41	82	78	~~1.25~~ 1.2	5.5
8	70	645.40	.65	.60	283	247	258	49	42	82	78	1.2	5.5
	75	648.49	.67	.61	284	247	258	42	42	83	79	1.2	5.5
9	80	651.56	.69	.62	284	247	258	50	42	83	79	1.25	5.5
	85	654.66	.69	.62	284	247	258	49	42	83	79	1.25	5.5
10	90	657.80	.69	.62	281	247	258	50	43	83	79	1.25	5.5
	95	660.92	.68	.61	281	247	258	50	44	83	80	1.2	5.5
11	100	664.02	.56	.56	282	247	258	50	45	83	80	.95	5

Traverse: 2					
Start Time: 11:27	Initial Leak Check: .002	cfm@ 14	"Hg	Traverse:	
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg	Start Time: /	Initial Leak Check: / cfm @ / "Hg
				Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	666.81	.56	.56	282	247	258	51	46	84	80	.95	5
12	110	669.61	.55	.55	281	247	257	52	48	84	80	.93	5
	115	672.37	.56	.56	280	247	258	52	50	84	80	.95	5
	120	675.16											

Traverse: 2					Traverse:				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg		Start Time: /	Initial Leak Check: /	cfm @ /	"Hg	
Finish Time: 13:22	Final Leak Check: .004	cfm@ 14	"Hg		Finish Time: /	Final Leak Check: /	cfm @ /	"Hg	

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	May 31 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	7 Series
Meter Box No.:	Team 2
Impinger Box No.:	11

Pitot Factor	.840	
DGMCF	.981	
Barometric Pressure	29.44	"Hg
Static Pressure	-9.5	"H2O
Nozzle Size	.2350	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	567.6	g
WCBDA	17.4	g

Combustion Gas Concentration

Oxygen	8.04	%
Carbon Dioxide	10.95	%
Carbon Monoxide	23.2	ppm

Measuring Device	MII Numbers
Probe / Pitot S8	B03769
Trendicator	COE 20092
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2340
2	.2360
3	.2345
4	.2355
Average:	.2350

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	679.18	.76	.65	282	249	248	48	59	82	80	1.4	6
	5	682.37	.83	.68	282	249	257	60	43	82	80	1.55	8
2	10	685.76	.83	.68	282	249	257	55	44	83	81	1.55	8
	15	689.25	.83	.68	282	249	259	53	44	83	81	1.5	8
3	20	692.65	.84	.68	283	249	258	51	44	84	81	1.5	8
	25	696.17	.80	.67	282	249	258	51	43	84	81	1.5	8
4	30	699.52	.75	.65	282	249	250	51	43	84	81	1.4	8
	35	702.83	.75	.65	282	249	254	51	42	85	81	1.35	8
5	40	706.12	.64	.60	283	249	252	51	43	85	82	1.15	7
	45	709.14	.67	.61	283	249	252	52	43	85	81	1.2	7
6	50	712.22	.52	.54	283	249	252	52	45	85	82	.87	6
	55	714.93	.51	.53	283	249	252	52	44	86	82	.85	6
7	60	717.62	.66	.61	283	249	253	52	43	86	82	1.2	7.5
	65	720.60	.68	.62	283	249	252	51	43	86	83	1.25	7.5
8	70	723.76	.68	.62	283	249	252	50	44	86	82	1.25	7.5
	75	726.87	.71	.63	283	249	252	50	44	86	83	1.3	8
9	80	730.04	.71	.63	283	250	253	50	45	87	83	1.3	8
	85	733.26	.69	.62	282	249	252	50	45	87	83	1.3	8
10	90	736.38	.69	.62	282	249	252	51	46	87	83	1.3	8
	95	739.53	.69	.62	281	249	252	51	46	87	83	1.3	8
11	100	742.81	.68	.62	281	249	252	52	46	87	84	1.25	8

Traverse: 2					Traverse:				
Start Time: 15:26	Initial Leak Check: .004	cfm@ 14	"Hg		Start Time:	Initial Leak Check:	cfm @	"Hg	
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		Finish Time:	Final Leak Check:	cfm @	"Hg	

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	745.94	.68	.62	281	249	252	52	46	87	84	1.25	8
12	110	749.09	.7	.63	281	249	253	52	48	87	84	1.3	8
	115	752.27	.71	.63	281	249	252	52	51	87	84	1.3	8
	120	755.44											

Traverse: 2				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 17:25	Final Leak Check: .008	cfm@ 17	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	755.83	.77	.66	281	246	252	67	56	87	87	1.5	8.5
	5	759.23	.77	.66	282	250	253	53	58	86	87	1.45	8.5
2	10	762.56	.77	.66	282	249	253	52	52	87	84	1.45	8.5
	15	765.98	.76	.65	281	249	253	51	48	87	84	1.4	8
3	20	769.30	.75	.65	281	250	252	54	47	87	84	1.4	8
	25	772.62	.73	.64	281	249	252	54	48	87	84	1.35	8
4	30	775.82	.69	.62	281	249	252	54	50	87	84	1.3	8
	35	778.98	.68	.62	281	249	252	54	51	87	84	1.3	8
5	40	782.30	.60	.58	280	250	252	54	54	87	84	1.05	7
	45	785.23	.62	.59	280	249	252	55	49	87	84	1.1	7
6	50	788.19	.56	.56	280	249	252	55	45	88	84	.98	7
	55	791.04	.56	.56	280	249	253	55	43	88	85	.98	7
7	60	793.90	.61	.59	280	249	252	55	42	88	84	1.1	7
	65	796.84	.61	.59	280	249	252	54	43	88	85	1.1	7
8	70	799.79	.61	.59	279	249	252	54	43	88	85	1.1	7
	75	802.75	.63	.60	278	249	252	54	43	88	85	1.15	7
9	80	805.79	.66	.61	277	249	252	54	43	88	85	1.2	7.5
	85	808.84	.66	.61	277	249	252	54	44	88	85	1.2	7.5
10	90	812.00	.57	.57	277	249	252	55	44	89	85	1.0	7
	95	814.81	.57	.57	276	248	252	55	44	89	85	1.0	7
11	100	817.71	.49	.53	272	252	257	59	46	92	88	.84	6.5

Traverse: 17, 37				
Start Time:	Initial Leak Check:	.004	cfm@ 17	"Hg
Finish Time:	Final Leak Check:		cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator :

Field Data Sheet

Date: May 31 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	820.37	.49	.53	271	248	252	55	40	89	85	.83	6.5
12	110	823.01	.49	.53	270	248	252	54	39	88	85	.85	6.5
	115	825.65	.49	.53	268	248	252	55	39	88	85	.85	6.5
	120	828.32											

Traverse: 1				Traverse:			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg	Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time: 19:37	Final Leak Check: .004	cfm@ 14	"Hg	Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	JUNE 1 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	6 SERIES
Meter Box No.:	TEAM 2
Impinger Box No.:	16

Pitot Factor	0.840	
DGMCF	0.981	
Barometric Pressure	29.47	"Hg
Static Pressure	-9.5	"H2O
Nozzle Size	0.2350	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Probe Liner Glass / Metal /Teflon / Other_____

Nozzle Glass / Metal / Other_____

Union None /Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	611.6	g
WCBDA	12.4	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	11.01	%
Carbon Monoxide	15.6	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot S8	B03769
Trendicator	CUE2009 2
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	SEE
2	TEST 2
3	UNIT 2
4	
Average:	

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: June 1/18	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	29.02	.85	.69	282	248	251	66	59	77	75	1.6	5
	5	32.44	.85	.69	280	251	251	52	43	77	75	1.6	5
2	10	35.89	.86	.69	282	246	251	48	41	78	75	1.6	5
	15	39.33	.86	.69	283	246	251	46	41	78	76	1.6	5
3	20	42.80	.79	.66	282	246	251	45	42	79	76	1.5	5.5
	25	46.17	.79	.66	282	246	252	46	42	79	76	1.5	5.5
4	30	49.54	.67	.61	282	247	251	46	43	80	77	1.2	5
	35	52.67	.65	.60	282	247	251	46	44	81	77	1.2	5
5	40	55.76	.53	.54	281	247	251	47	46	81	77	0.9	4.5
	45	58.50	.52	.54	281	248	252	48	48	82	77	0.9	4.5
6	50	61.17	.52	.54	281	248	252	49	50	82	78	0.95	4.5
	55	63.96	.52	.54	282	247	252	49	53	83	78	0.9	4.5
7	60	66.65	.65	.60	281	248	252	49	55	84	79	1.2	5.5
	65	69.74	.65	.60	281	248	252	49	50	84	79	1.2	5.5
8	70	72.86	.68	.62	281	248	252	49	45	84	80	1.2	5.5
	75	75.60	.67	.61	281	247	252	48	41	84	80	1.2	5.5
9	80	79.14	.69	.62	281	248	252	49	41	85	80	1.2	5.5
	85	82.26	.70	.63	281	247	252	48	40	85	81	1.2	5.5
10	90	85.39	.69	.62	281	247	252	49	41	85	81	1.2	5.5
	95	88.52	.72	.64	281	247	252	49	41	85	81	1.2	5.5
11	100	91.63	.62	.59	281	247	252	49	42	85	81	1.1	5.5

1238

Traverse:	1		
Start Time: 1244	Initial Leak Check: .003 cfm@ 15~~76~~ "Hg		
Finish Time: —	Final Leak Check: — cfm@ — "Hg		

Traverse:			
Start Time: /	Initial Leak Check: /	cfm @	"Hg
Finish Time: /	Final Leak Check: /	cfm @	"Hg

Project No.: 21840

Operator : [signature]

0.7475

1071 11.5

Rev: April 28, 2005

ORTECH Environmental

Field Data Sheet

Date: June 1/16	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	94.65	.63	.60	282	248	253	51	44	86	81	1.1	5
12	110	97.64	.63	.60	282	252	252	51	45	86	82	1.1	5
	115	100.65	.65	.61	282	247	252	51	48	86	82	1.2	5
	120	103.68											

Traverse: 1				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 14:44	Final Leak Check: .003	cfm@ 10	"Hg

Traverse:				
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : Dil Ut

Field Data Sheet

Date: June 1/18	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	103.90	.80	.67	281	249	251	54	80	85	82	1.5	6
	5	107.28 ~~105.9~~	.81	.68	282	248	252	51	44	85	82	1.5	6
2	10	110.69	.82	.68	282	248	252	51	41	86	82	1.5	6
	15	114.09	.83	.69	282	249	252	51	40	86	83	1.6	6
3	20	117.55	.81	.68	282	249	252	51	41	87	83	1.6	6
	25	121.05	.77	.66	282	250	253	51	40	87	83	1.5	6
4	30	124.50	.73	.64	282	249	252	52	41	87	83	1.4	6
	35	127.85	.75	.65	282	249	253	52	41	86	83	1.4	6
5	40	131.16	.67	.62	283	250	253	52	41	86	84	~~1.4~~ 1.4	6
	45	134.48	.67	.62	282	249	252	53	42	86	84	1.3	6
6	50	137.67	.56	.58	282	249	253	53	43	86	84	1.0	5
	55	140.60	.56	.56	282	249	252	54	44	89	85	1.0	5
7	60	143.45	.67	.62	282	249	252	54	46	89	85	1.3	6
	65	146.63	.64	.61	282	249	252	54	48	89	85	1.3	6
8	70	149.84	.67	.62	282	249	253	54	50	90	85	1.3	6
	75	153.02	.64	.6	282	249	252	54	53	90	85	1.3	6
9	80	156.24	.70	.63	280	249	252	55	55	90	86	1.3	6
	85	159.44	.69	.63	281	249	253	55	58	90	86	1.3	6
10	90	162.65	.70	.63	281	249	253	55	48	91	86	1.3	6
	95	165.93	.69	.63	281	249	252	55	41	91	87	1.3	6
11	100	169.18	.66	.62	281	249	252	55	41	91	87	1.3	6

Traverse: 2			
Start Time: 1450	Initial Leak Check: .003 cfm@ 10 "Hg		
Finish Time:	Final Leak Check: cfm@ "Hg		

Traverse:			
Start Time:	Initial Leak Check: cfm @ "Hg		
Finish Time:	Final Leak Check: cfm @ "Hg		

Project No.: 21840

Operator :

Field Data Sheet

Date: JUN-1/18	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	172.40	.67	.62	280	249	252	56	40	91	87	1.2	6
12	110	175.56	.69	.63	280	249	252	55	40	91	87	1.2	6
	115	178.70	.69	.63	281	249	253	56	41	91	87	1.2	6
	120	181.84											

Traverse: 2					Traverse:				
Start Time:	Initial Leak Check:	—	cfm@	— "Hg	Start Time:	/	Initial Leak Check:	/	cfm @ "Hg
Finish Time: 1650	Final Leak Check:	.004	cfm@	15.5 "Hg	Finish Time:	/	Final Leak Check:	/	cfm @ "Hg

Project No.: 21840

Operator : RJ

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date May 31, 2018	
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	6D
Meter Box No.:	Team 3
Impinger Box No.:	~~10~~

Pitot Factor	.850	
DGMCF	.998	
Barometric Pressure	29.50	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	661.9	g
WCBDA	16.6	g

Combustion Gas Concentration

Oxygen	7.65	%
Carbon Dioxide	11.20	%
Carbon Monoxide	22.2	ppm

Measuring Device	MII Numbers
Probe / Pitot 34	B03765
Trendicator	
Control Box	Team 3 COF 2009'3
Incline Manometer	Team 3
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: May 31, 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	377.355	0.68	.71	287	250	258	74	46	77	77	1.8	4.5
	5	380.77	.67	.71	287	251	257	53	51	77	78	1.8	4.5
2	10	384.25	.71	.73	287	251	259	52	52	77	78	1.9	4.5
	15	387.83	.74	.74	288	252	260	52	53	78	79	2.0	4.5
3	20	391.50	.70	.72	288	252	258	51	54	78	79	1.95	4.5
	25	395.13	.69	.72	288	252	259	52	54	78	80	1.90	4.5
4	30	398.76	.64	.69	288	252	259	52	54	79	80	1.75	4.5
	35	402.25	.63	.69	288	252	259	52	53	79	81	1.75	4.5
5	40	405.70	.59	.67	288	252	259	52	53	79	82	1.6	4.5
	45	409.04	.61	.68	288	252	259	53	53	79	83	1.7	4.5
6	50	412.39	.55	.64	289	253	259	53	55	80	84	1.55	5.0
	55	415.66	.56	.65	289	253	257	53	54	80	84	1.50	5.0
7	60	418.88	.58	.66	289	252	256	53	54	80	85	1.6	5
	65	422.14	.56	.65	289	253	258	53	56	81	85	1.6	5.0
8	70	425.43	.61	.68	289	252	259	53	58	81	85	1.7	5.0
	75	428.80	.61	.68	290	252	259	53	56	81	85	1.7	5.0
9	80	432.19	.63	.69	290	252	258	54	54	82	85	1.75	5.0
	85	435.64	.63	.69	290	252	258	54	53	82	85	1.75	5.0
10	90	439.13	.61	.68	289	252	258	54	52	82	85	1.70	5.0
	95	442.56	.59	.67	287	253	258	54	52	82	85	1.65	5.0
11	100	445.94	.51	.62	287	253	258	55	52	82	85	1.40	5.0

Traverse: 2			
Start Time: 9:13	Initial Leak Check: 0.004	cfm@ 14.5	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : JB

Field Data Sheet

Date: May 31, 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	449.08	.53	.64	288	253	258	55	51	82	86	1.50	5.0
12	110	452.22	.52	.63	288	253	257	56	52	82	86	1.50	5.0
	115	455.39	.50	.62	288	253	257	56	52	83	87	1.40	5.0
	120	458.51											

Traverse: 2					
Start Time:	Initial Leak Check:		cfm@		"Hg
Finish Time: 11:13	Final Leak Check:	.002	cfm@	15	"Hg

Traverse:				
Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time:	Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator : JB

Field Data Sheet

Date: May 31, 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	458.89	0.60	.68	~~288~~ 286	253	258	670	51	83	83	1.7	5.0
	5	462.20	.63	.69	286	252	258	59	56	83	84	1.8	5.0
2	10	465.65	.62	.69	286	252	259	57	56	83	84	1.8	5.0
	15	469.14	.60	.68	287	253	259	57	55	83	84	1.65	5.0
3	20	472.51	.61	.68	287	253	259	58	54	82	84	1.70	5.0
	25	475.89	.60	.68	288	253	258	57	52	82	85	1.70	5.0
4	30	479.27	.61	.68	287	253	255	55	51	83	85	1.70	5.0
	35	482.65	.61	.68	289	253	258	54	51	83	86	1.70	5.0
5	40	486.03	.61	.68	289	253	258	54	52	83	86	1.70	5.0
	45	489.42	.61	.68	289	253	258	54	53	83	86	1.70	5.0
6	50	492.82	.59	.67	289	253	258	54	53	83	87	1.70	5.0
	55	496.21	.62	.69	289	253	258	54	53	84	87	1.75	5.0
7	60	499.65	.57	.66	289	253	258	55	52	84	87	1.60	5.0
	65	502.97	.56	.66	290	253	258	56	52	84	87	1.60	5.0
8	70	506.26	.60	.68	290	253	257	56	51	84	88	1.70	5.0
	75	509.63	.61	.68	290	253	258	56	52	85	88	1.70	5.0
9	80	513.01	.66	.71	290	253	258	57	52	85	88	1.90	5.5
	85	516.58	.64	.70	289	252	258	57	52	85	88	1.80	5.5
10	90	520.09	.66	.71	289	252	257	57	53	85	88	1.85	5.5
	95	523.66	.67	.72	289	253	258	57	54	85	87	1.90	5.5
11	100	527.25	.71	.74	289	253	258	57	54	85	87	2.0	6.0

Traverse: 1					Traverse:				
Start Time: 11:29	Initial Leak Check:	.002	cfm@	15 "Hg	Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time:	Final Leak Check:		cfm@	"Hg	Finish Time:	Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator: JB.

Field Data Sheet

Date: May 31, 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	530.92	.71	.74	289	252	258	58	55	85	87	2.0	6.0
12	110	534.59	.68	.72	289	252	258	58	56	85	89	1.9	6.0
	115	538.22	.68	.72	288	252	257	58	53	85	90	1.9	6.0
	120	541.86											

Traverse: 1				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: ~~13:29~~ 13:29	Final Leak Check:	.002	cfm@ 15	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date June 1, 2018	
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	6D
Meter Box No.:	Team 3
Impinger Box No.:	4

Pitot Factor	.850 ✓	
DGMCF	.998 ✓	
Barometric Pressure	29.48	"Hg
Static Pressure	-0.9	"H2O
Nozzle Size	.2574 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	672.5 ✓	g
WCBDA	17.1 ✓	g

Combustion Gas Concentration

Oxygen	7.91 ✓	%
Carbon Dioxide	11.12 ✓	%
Carbon Monoxide	10.3	ppm

Measuring Device	MII Numbers
Probe / Pitot	B03765
Trendicator	Team 3
Control Box	Team 3 COE20093
Incline Manometer	Team 3
Comb.Gas.Analyzer	DYEC
Micromanometer	
Barometer	Env Can
Calipers	

Nozzle Measurements	
1	See Test 1
2	
3	
4	
Average:	

See Test

Site Diagram

Notes:

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	682.94	.81	.78	288	249	258	53	48	76	76	2.8	6
	5	686.73	.77	.76	288	250	259	53	48	76	76	2.2	6
2	10	690.60	.79	.77	288	250	261	52	51	76	77	2.1	6
	15	694.41	.76	.76	289	250	260	52	52	77	78	2.1	6
3	20	698.20	.79	.77	288	250	259	52	52	77	79	2.2	6
	25	702.08	.80	.78	289	251	260	53	54	77	80	2.2	6
4	30	705.99	.73	.75	289	250	260	53	57	78	81	2.1	6.5
	35	709.79	.74	.75	289	251	260	53	60	78	82	2.0	6.5
5	40	713.52	.67	.72	290	252	260	54	63	79	83	1.9	6
	45	717.18	.69	.73	290	252	260	54	52	79	83	1.9	6
6	50	720.78	.62	.69	290	252	259	55	49	80	84	1.75	6
	55	724.26	.61	.68	291	252	259	55	49	80	84	1.7	5.5
7	60	727.68	.65	.71	291	252	259	55	49	81	85	1.8	5.5
	65	731.24	.63	.70	290	252	259	54	48	81	85	1.9	6
8	70	734.70	.62	.69	289	252	259	54	50	81	86	1.7	5.5
	75	738.12	.63	.70	289	252	259	54	50	81	85	1.8	5.5
9	80	741.58	.61	.69	289	252	259	55	52	82	86	1.8	6
	85	745.03	.62	.69	289	252	259	54	55	82	86	1.8	6
10	90	748.50	.62	.69	289	252	259	55	52	82	86	1.8	6
	95	751.97	.63	.70	288	252	259	54	50	82	86	1.8	6
11	100	755.45	.67	.72	288	252	259	52	50	83	86	1.9	6

Traverse: 1				
Start Time: 8:26	Initial Leak Check: 0.004	cfm@ 13	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator: JB, DB

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	759.[illegible]09	.63	.70	288	251	258	51	51	83	86	1.8	6
12	110	762.52	.59	.68	288	251	259	51	50	83	86	1.8	6
	115	766.02	.56	.66	288	252	259	51	51	83	86	1.55	5.5
	120	769.26											

Traverse: 1				Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg	Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time: 10:26	Final Leak Check: 0.002	cfm@ 14	"Hg	Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : JB, DB

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	769.71	.78	.78	289	251	260	54	49	82	83	2.2	7.0
	5	773.56	.72	.75	289	251	259	52	49	82	83	2.05	6.5
2	10	777.35	.73	.73	289	251	260	53	49	82	83	1.9	6
	15	781.09	.73	.75	290	252	260	54	49	82	83	2.0	6
3	20	784.58	.70	.74	289	252	259	54	48	82	84	2.1	6.5
	25	788.33	.70	.74	289	252	260	54	49	82	84	1.95	6
4	30	791.99	.64	.70	288	252	260	55	47	82	85	1.80	6
	35	795.52	.66	.72	288	252	259	55	47	82	85	1.85	6
5	40	799.07	.61	.69	289	252	260	55	48	82	85	1.75	6
	45	802.50	.59	.68	289	253	259	54	48	82	85	1.7	6
6	50	805.85	.54	.65	289	253	259	54	47	82	86	1.5	5.5
	55	809.08	.54	.65	289	252	259	55	47	82	86	1.5	5.5
7	60	812.31	.56	.66	289	253	259	55	47	83	87	1.6	6
	65	815.58	.59	.68	289	253	259	54	47	83	87	1.7	6
8	70	818.96	.63	.70	289	252	259	54	48	83	87	1.8	6
	75	822.42	.63	.70	290	252	259	54	50	83	86	1.85	6.5
9	80	825.94	.66	.72	290	252	259	54	51	83	86	1.9	6.5
	85	829.53	.67	.72	291	252	259	54	51	83	86	1.95	7
10	90	833.15	.60	.68	291	251	258	55	52	83	86	1.70	6.5
	95	836.57	.63	.70	289	251	258	55	51	83	86	1.80	6.5
11	100	840.02	.58	.67	289	252	258	56	52	83	86	1.70	6.5

Traverse: 2					Traverse:				
Start Time: 10:38	Initial Leak Check:	.004	cfm@ 13	"Hg	Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time:	Final Leak Check:		cfm@	"Hg	Finish Time:	Final Leak Check:		cfm @	"Hg

~~EU~~ DU

Project No.: 21840

Operator : JB, DB

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	843.42	.59	.68	289	251	258	56	51	83	86	1.70	6.5
12	110	846.82	.57	.67	289	251	258	56	50	83	86	1.65	6
	115	850.19	.57	.67	289	251	258	56	49	83	87	1.65	6
	120	853.54											

Traverse: 2					Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg	Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time: 12:38	Final Leak Check:	0.002	cfm@	16 "Hg	Finish Time:	Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator: JB, DR

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date June 1, 2018	
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 5
Probe No.:	65A
Meter Box No.:	Team 3
Impinger Box No.:	11

Pitot Factor	.850 ✓	
DGMCF	.998 ✓	
Barometric Pressure	~~28.9~~ 29.46	"Hg
Static Pressure	-3.9	"H2O
Nozzle Size	.257 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	712.8 ✓	g
WCBDA	18.2 ✓	g

Combustion Gas Concentration

Oxygen	7.99 ✓	%
Carbon Dioxide	11.01 ✓	%
Carbon Monoxide	10.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	B037165
Trendicator	Team 3
Control Box	Team 3 COE20093
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 See Test 1
2
3
4
Average:

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
		854.40											
1	0	[illegible]	.70	.73	289	250	258	57	45	82	82	2.0	5.
	5	858.05	.63	.70	289	250	258	54	46	82	82	1.75	5.
2	10	861.48	.74	.75	290	250	259	57	45	82	83	2.05	5.5
	15	865.27	.77	.77	289	251	258	49	47	87	85	2.10	5.5
3	20	869.08	.77	.77	289	251	258	49	48	87	86	2.10	5.8
	25	872.88	.77	.77	290	251	258	49	48	83	87	2.10	5.8
4	30	876.64	.75	.76	290	251	257	50	48	83	87	2.10	5.8
	35	880.41	.73	.75	290	251	257	50	49	83	88	2.10	6.0
5	40	884.19	.71	.74	290	252	257	50	48	84	89	2.0	6.0
	45	887.89	.72	.75	290	252	257	50	48	84	89	2.1	6.0
6	50	891.64	.61	.69	290	252	257	51	48	85	89	1.8	5.5
	55	895.12	.62	.70	290	251	257	51	46	85	90	1.8	5.2
7	60	898.58	.66	.72	290	252	257	51	47	86	90	1.9	5.5
	65	902.15	.66	.72	290	251	257	52	48	86	91	2.0	6.0
8	70	905.77	.68	.73	290	251	257	52	49	86	91	2.0	6.0
	75	909.40	.66	.72	291	251	257	48	48	86	91	2.0	6.0
9	80	913.03	.68	.73	290	251	256	47	47	86	91	2.0	6.0
	85	916.68	.69	.74	290	251	256	47	48	86	91	2.0	6.0
10	90	920.31	.68	.73	289	251	256	47	49	86	91	2.0	6.0
	95	923.97	.66	.72	289	250	256	48	50	86	91	2.0	6.0
11	100	927.64	.57	.67	289	250	256	48	50	87	92	1.6	5.0

Traverse: 1	.003	Traverse:	
Start Time: 13:09	Initial Leak Check: [illegible] cfm@ 16 "Hg	Start Time:	Initial Leak Check: cfm@ "Hg
Finish Time:	Final Leak Check: cfm@ "Hg	Finish Time:	Final Leak Check: cfm@ "Hg

Project No.: 21840

Operator : JB, DB, CB.

ORTECH Environmental

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	930.95	.55	.66	289	250	256	50	50	87	92	1.65	5.0
12	110	934.27	.56	.67	289	250	256	50	51	87	92	1.65	5.0
	115	937.59	.56	.67	289	249	256	50	53	88	93	1.65	5.0
	120	940.92											

Traverse: 1					Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg	Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time: 15:09	Final Leak Check:	.002	cfm@ 14	"Hg	Finish Time:	Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator : JB, DB

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	941.37	.78	.78	289	250	257	56	46	88	90	2.25	6.5
	5	945.21	.79	.79	289	250	256	51	49	88	91	2.3	6.5
2	10	949.17	.79	.79	289	250	256	51	50	88	91	2.3	6.5
	15	953.12	.78	.79	289	251	256	52	52	88	91	2.3	6.5
3	20	957.05	.76	.78	289	251	256	52	53	88	91	2.25	6.5
	25	960.99	.75	.77	289	250	255	52	51	88	91	2.15	6.5
4	30	964.84	.67	.73	289	250	255	52	49	88	91	2.0	6.0
	35	968.53	.67	.73	288	250	255	53	48	89	92	2.0	6.0
5	40	972.20	.63	.71	288	250	255	53	49	89	93	1.9	6.0
	45	975.81	.63	.71	288	250	255	53	49	89	94	1.85	6.0
6	50	979.36	.58	.68	288	250	255	53	49	89	94	1.70	5.5
	55	982.80	.58	.68	288	250	255	54	48	89	95	1.70	5.5
7	60	986.21	.57	.68	288	250	255	54	50	90	95	1.7	5.5
	65	989.62	.57	.68	288	250	254	54	51	91	96	1.7	5.5
8	70	993.01	.62	.71	288	250	253	55	54	91	98	1.85	6.0
	75	996.55	.57	.68	289	252	245	54	51	91	96	1.70	6.0
9	80	999.99	.60	.69	288	249	255	51	47	91	96	1.75	6.0
	85	1003.46	.59	.69	288	250	255	51	47	91	96	1.75	6.0
10	90	1006.92	.63	.71	287	250	260	51	47	92	97	1.85	6.0
	95	1010.48	.63	.71	287	249	245	51	48	92	97	1.90	6.0
11	100	1014.07	.51	.64	287	250	245	52	48	93	97	1.55	5.5

Traverse: 2				
Start Time: 15:19	Initial Leak Check: .002	cfm@ 14	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator: JB, DB

Field Data Sheet

Date: June 1, 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	1017.34	.50	.64	287	249	245	53	49	93	97	1.45	5.5
12	110	1020.54	.52	.65	287	249	245	53	49	93	97	1.55	5.5
	115	1023.81	.52	.65	287	248	245	53	50	93	97	1.55	5.5
	120	1027.08											

Traverse: 2				Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg	Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time: 17:19	Final Leak Check: .004	cfm@ 14	"Hg	Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator: JB, DB

APPENDIX 7

Acid Gas Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T1	M26A
Test Date	May 29/18
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	6D
Meter Box No.:	Team 4
Impinger Box No.:	

Pitot Factor	.850	
DGMCF	.988	
Barometric Pressure	29.75	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	159.3	g
WCBDA	16.4	g

Combustion Gas Concentration

Oxygen	8.41	%
Carbon Dioxide	10.90	%
Carbon Monoxide	29.8	ppm

Measuring Device	MII Numbers
Probe / Pitot S4	
Trendicator	
Control Box	Team 4
Incline Manometer	Team 4
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.2565
2	.2575
3	.2580
4	.2575
Average:	.2574

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: May 29/18	Plant: Covanta DYEC	Test No.: T1 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	59.62	.52	.65	284	263	248	68	126	78	79	1.4	4
2	5	62.87	.52	.64	284	261	256	56	234	86	80	1.4	4
3	10	66.14	.56	.68	284	262	257	55	235	90	81	1.6	4
4	15	69.58	.65	.73	285	262	256	55	236	95	80	1.8	4.5
5	20	73.30	.65	.73	286	262	248	55	235	97	81	1.8	4.5
6	25	76.96	.64	.72	286	266	257	59	190	84	82	1.8	4.5
7	30	80.73	.60	.70	286	263	255	56	235	91	83	1.65	4.5
8	35	84.30	0.67	0.74	286	263	248	57	234	97	82	1.9	4.5
9	40	88.05	0.77	0.80	286	263	255	57	239	100	83	2.2	~~4.5~~ 5
10	45	92.05	0.79	0.81	286	264	259	59	240	102	85	2.2	5
11	50	96.24	0.80	0.82	286	264	250	61	238	103	85	2.3	5
12	55	100.47	0.83	0.84	285	264	251	64	238	104	85	2.3	5
	60	104.72											

Traverse: 1					Traverse:				
Start Time: 08:46	Initial Leak Check:	.005	cfm@ 27	"Hg	Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time: 09:57	Final Leak Check:	0.002	cfm@ 15	"Hg	Finish Time:	Final Leak Check:		cfm @	"Hg

paused @ 9:11
so M29 can cross half
restarted @ 9:22

Project No.: 21840

Operator: AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T2	M26A
Test Date	May 28th 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	6D
Meter Box No.:	Team 4
Impinger Box No.:	1

Pitot Factor	.850	
DGMCF	.988	
Barometric Pressure	29.77	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	1666.6	g
WCBDA	11.6	g

Combustion Gas Concentration

Oxygen	8.22	%
Carbon Dioxide	11.05	%
Carbon Monoxide	18.1	ppm

See T1

See T1

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

See T1

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: May 29/18	Plant: Covanta DYEC	Test No.: 2 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	105.30	.58	.69	280	252	254	65 ~~75~~	100	82	82	1.6	5
2	5	108.82	.58	.69	283	253	247	60	209	87	83	1.6	5
3	10	112.33	.68	.75	283	253	256	62	223	92	83	1.9	5
4	15	116.17	.66	.74	284	254	252	67	225	94	83	1.9	5
5	20	119.98	.66	.74	285	254	250	64	225	96	83	1.8	5
6	25	123.74	.67	.74	285	254	251	61	228	97	83	1.85	5
7	30	127.53	.58	.69	285	254	256	59	231	98	83	1.7	5
8	35	131.13	.64	.73	286	254	248	56	229	99	84	1.8	5
9	40	134.85	.69	.76	286	254	257	55	233	99	84	2.0	5
10	45	138.78	.71	.77	286	254	250	55	230	98	84	2.0	5
11	50	142.69	.74	.78	286	254	253	55	232	97	84	2.1	5
12	55	146.70	.78	.80	285	255	256	56	233	97	85	2.2	5
	60	150.96											

Traverse: 2					
Start Time: 10:42	Initial Leak Check: .007	cfm@ 15	"Hg		
Finish Time: 11:42	Final Leak Check: .0041	cfm@ 16	"Hg		

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T3	M26A
Test Date	May 29, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	6D
Meter Box No.:	Team 4
Impinger Box No.:	1

Pitot Factor	.850	
DGMCF	.988	
Barometric Pressure	29.76	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

See T1

Moisture Gain

CWTR	143.4	g
WCBDA	13.1	g

Combustion Gas Concentration

Oxygen	3.41	%
Carbon Dioxide	10.99	%
Carbon Monoxide	33.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

see T1

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: May 29/18	Plant: Covanta DYEC	Test No.: 3 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	151.35	.54	.66	280	253	247	68	117	79	79	1.5	4
2	5	154.73	.54	.66	283	254	251	60	239	81	81	1.5	4
3	10	158.05	.58	0.69	283	253	248	59	243	88	80	1.6	4
4	15	161.54	0.62	0.71	283	254	254	61	247	92	80	1.7	4
5	20	165.92	0.62	0.71	284	254	257	64	247	93	80	1.7	4.5
6	25	168.78	0.60	0.71	284	254	249	64	242	95	85	1.7	4.5
7	30	172.35	0.54	0.67	284	254	251	62	247	96	83	1.5	4.5
8	35	175.75	0.56	0.68	284	254	258	60	248	97	82	1.6	4.5
9	40	179.22	0.65	0.74	284	254	256	60	246	98	83	1.8	4.5
10	45	182.94	0.68	0.75	284	254	248	61	245	98	83	1.9	4.5
11	50	186.75	0.72	0.77	284	255	253	64	249	98	83	2.0	4.5
12	55	190.65	0.73	0.78	284	255	259	67	251	97	84	2.0	5
	60	194.58											

Traverse: 2					
Start Time: 13:28	Initial Leak Check: .005	cfm@ 16	"Hg		
Finish Time: 14.28	Final Leak Check: .005	cfm@ 26	"Hg		

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator: AS / Dillon

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	M26A
Test Date	May 30/18
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	6D
Meter Box No.:	Team 1
Impinger Box No.:	5

Pitot Factor	.850	
DGMCF	.995	
Barometric Pressure	29.71	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	156.1	g
WCBDA	9.9	g

Combustion Gas Concentration

Oxygen	7.80	%
Carbon Dioxide	11.28	%
Carbon Monoxide	10.1	ppm

Measuring Device	MII Numbers
Probe / Pitot S4	
Trendicator	
Control Box	Team 1 CAE 200944
Incline Manometer	Team 1
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: May 30, 18	Plant: Covanta DYEC	Test No.: 1 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
FW 1	0	592.07	.75	.75	285	238	259 ~~258~~	63 ~~59~~	220 ~~63~~	77	76	2	2
2	5	595.91	.75	.75	287	240	259	58	237	77	76	2	2
3	10	599.73	.74	.75	287	240	261	61	241	77	76	2	2
4	15	603.54	.69	.72	287	240	263	65	243	77	76	1.9 ~~2.18~~	2
5	20	607.29	.65	.70	287	240	263	59	243	77	77	1.7	2
6	25	610.85	.59	.67	286	240	262	54	242	78	76	1.55	2
7	30	614.26	.59	.67	286	240	261	51	241	77	77	1.55	2
8	35	617.64	.62	.68	286	240	262	50	242	78	77	1.65	2
9	40	621.13	.63	.69	287	240	261	50	243	77	77	1.7	2
10	45	624.67	.64	.70	287	240	262	50	243	79	77	1.78	2
11	50	628.23	.59	.67	287	240	261	51	243	78	77	1.55	2
12	55	631.67	.59	.67	287	240	260	50	243	79	77	1.55	2
	60	635.12											

Traverse:	1					
Start Time:	8:12	Initial Leak Check:	0.003	cfm@	15	"Hg
Finish Time:	9:12	Final Leak Check:	.002	cfm@	16	"Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	M26A
Test Date	May 30/18
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	6D
Meter Box No.:	Team 1
Impinger Box No.:	1

Pitot Factor	.850	
DGMCF	.995	
Barometric Pressure	29.69	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter		mg
Probe		mg

see T1

Moisture Gain

CWTR	159.0	g
WCBDA	9.6	g

Combustion Gas Concentration

Oxygen	7.94	%
Carbon Dioxide	11.03	%
Carbon Monoxide	8.3	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: May 30/18	Plant: Covanta DYEC	Test No.: 2 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
NW 1	0	635.63	.54	.64	286	239	260	65	89	78	78	1.4	2
2	5	638.95	.53	.63	286	239	260	50	210	78	78	1.4	2
3	10	642.17	.65	.70	286	239	260	48	220	78	78	1.75	2
4	15	645.75	.66	.71	286	240	261	48	249	79	78	1.8	2
5	20	649.38	.60	.67	286	239	261	48	250	79	78	1.6	2
6	25	652.86	.57	.66	287	240	261	49	250	79	78	1.5	2
7	30	656.19	.58	.66	287	240	261	48	250	78	78	1.5	2
8	35	659.53	.61	.68	286	240	262	49	250	79	78	1.6	2
9	40	662.98	.66	.71	285	240	261	49	251	80	78	1.8	2
10	45	666.62	.68	.72	285	240	261	49	252	79	78	1.8	2
11	50	6270.29	.72	.74	284	241	261	50	253	80	79	1.95	2
12	55	674.12	.75	.76	284	240	261	50	254	80	79	2.0	2
	60	678.06											

Traverse: 2					
Start Time: 10:21	Initial Leak Check: .002	cfm@	16	"Hg
Finish Time: 11:21	Final Leak Check: .003	cfm@	19	"Hg

Traverse:					
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21840

Operator: AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	M26A
Test Date	May 30/18
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21840
Page	1 of 2
Probe No.:	60
Meter Box No.:	Team 1
Impinger Box No.:	5

Pitot Factor	.850	
DGMCF	.995	
Barometric Pressure	29.66	"Hg
Static Pressure	-.96	"H2O
Nozzle Size	.2574	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

See T1

Moisture Gain

CWTR	161.9	g
WCBDA	12.3	g

Combustion Gas Concentration

Oxygen	7.79	%
Carbon Dioxide	11.39	%
Carbon Monoxide	10.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date:	May 30/18	Plant:	Covanta DYEC	Test No.:	3	M26A	Page 2 of 2
		Plant Location:	Courtice, Ontario	Test Location:		APC Outlet No. 1	

FW

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	678.55	.73	.75	284	242	256	65	82	80	79	2.0	2
2	5	682.29	.74	.75	286	240	259	58	183	80	80	2.0	2
3	10	686.20	.76	.76	287	242	262	62	217	80	80	2.0	2
4	15	690.13	.72	.74	287	241	261	59	235	80	80	1.95	2
5	20	693.97	.65	.71	287	242	262	56	236	80	80	1.7	2
6	25	697.80	.60	.68	286	241	262	55	236	80	80	1.6	2
7	30	701.04	.61	.68	287	241	262	55	236	81	80	1.65	2
8	35	704.57	.680	.68	289	242	262	56	239	81	81	1.6	2
9	40	707.96	.63	.70	286	241	261	55	237	81	80	1.7	2
10	45	711.56	.63	.70	285	240	261	55	237	81	80	1.7	2
11	50	715.08	.58	.67	285	240	261	55	237	81	80	1.5	2
12	55	718.54	.56	.66	285	240	261	56	236	82	80	1.5	2
	60	721.95											

Traverse:	1					
Start Time:	12:57	Initial Leak Check:	.006	cfm@	19	"Hg
Finish Time:	13:57	Final Leak Check:	.003	cfm@	15	"Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21840

Operator : AS

APPENDIX 8

VOST Field Data Sheets
(6 pages)

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Locatior Courtice, ON	Test No: 1	Control Box ID:	2-A10117
Test location: APC Outlet No. 1	DGMCF: ~~0.978~~ 0.987	Operator:	JG
Date: MAY 3rd, 2018	Barometric Pressure: ~~29.78~~ 29.50 "Hg	Project No:	21840
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID:	30 - L2078545-77.

Tube Pair 1 Start Time: 11:05	Initial Leak Check NDL @ 14 "Hg	Sample ID:	IB-21840-1A,
Tube Pair 1 End Time: 1125	Final Leak Check NDL @ 16 "Hg	Lab ID:	L2078545-48

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8328.35	135	147	15	25	3.0	0.5
5	8334.4	140	159	13	27	2.8	0.5
10	8340.3	142	160	12	29	~~2.825~~	0.5
15	8345.7	141	160	9	30	2.5	0.5
20	8351.0	145	161	9	30	2.5	0.5

Tube Pair 2 Start Time: 1153	Initial Leak Check NDL @ 16 "Hg	Sample ID:	IB-21840-2A2
Tube Pair 2 End Time: 1153	Final Leak Check NDL @ 15 "Hg	Lab ID:	L2078545-49

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8351.50	142	166	12	27	2.5	0.5
5	8356.85	142	164	10	30	2.5	0.5
10	8362.30	140	163	11	30	2.5	0.5
15	8367.70	144	163	11	34	2.5	0.5
20	8373.1	140	163	11	34	2.5	0.5

Tube Pair 3 Start Time: 1200	Initial Leak Check NDL @ 15 "Hg	Sample ID:	IB-21840-3A,3B
Tube Pair 3 End Time: 1220.	Final Leak Check NDL @ 15 "Hg	Lab ID:	L2078545-50

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8373.5	140	166	12	29	2.5	1.0
5	8379.1	140	163	12	29	2.5	1.0
10	8384.65	143	163	11	29	2.5	1.0
15	8390.30	143	162	12	29	2.5	1.0
20	8395.70	139	163	12	30	2.6	1.0

Tube Pair 4 Start Time: 1225	Initial Leak Check NDL @ 16 "Hg	Sample ID:	IB-21840-4A,4B
Tube Pair 4 End Time: 1245	Final Leak Check NDL @ 15 "Hg	Lab ID:	L2078545-60

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8395.9	143	167	14	28	2.5	0.5
5	8401.6	139	163	13	30	2.5	0.5
10	8407.15	139	163	13	30	2.5	0.5
15	8412.70	140	163	12	31	2.5	0.5
20	8418.30	144	164	12	31	2.5	0.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC		Test Condition:	
Plant Locatior Courtice, ON		Test No: 2	Control Box ID: #2A 10117
Test location: APC Outlet No. 1		DGMCF: ~~0.978~~ 0.987	Operator: JG
Date: MAY 31, 2018		Barometric Pressure: ~~29.70~~ 29.45 "Hg	Project No: 21840
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak		Field Blank Pair ID: 9-L2078545-56

Tube Pair 1 Start Time: 1527		Initial Leak Check NDL @ 16 "Hg			Sample ID: 18-21840-5A,5B
Tube Pair 1 End Time: 1547		Final Leak Check NDL @ 15 "Hg			Lab ID: L2078545-52

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	8418.95	141	168	12	26	2.5	1.0
5	8424.46	144	163	12	29	2.5	1.0
10	8430.1	145	162	13	30	2.6	1.0
15	8435.6	141	162	13	32	2.5	1.0
20	8440.6	141	162	13	32	2.5	1.0

Tube Pair 2 Start Time: 1551		Initial Leak Check NDL @ 15 "Hg			Sample ID: 18-21840-6A,6B
Tube Pair 2 End Time: 1611		Final Leak Check NDL @ 15 "Hg			Lab ID: L2078545-53

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	8441.65	140	164	12	30	2.5	1.0
5	8446.8	142	163	11	30	2.5	1.0
10	8452.40	144	163	11	31	2.5	1.0
15	8457.7	146	163	10	32	2.5	1.0
20	8463.1	140	163	9	32	2.5	1.0

Tube Pair 3 Start Time: 1616		Initial Leak Check NDL @ 16 "Hg			Sample ID: 18-21840-7A,7B
Tube Pair 3 End Time: 1636		Final Leak Check @ 16 "Hg			Lab ID: L2078545-54

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	8463.65	140	163	9	32	2.6	1.0
5	8468.80	140	163	10	33	2.5	1.0
10	8475.0	142	163	9	33	2.5	1.0
15	8480.40	145	164	9	34	2.6	1.0
20	8485.6	145	164	9	34	2.5	1.0

Tube Pair 4 Start Time: 1640		Initial Leak Check NDL @ 16 "Hg			Sample ID: 18-21840-8A,8B
Tube Pair 4 End Time: 1700		Final Leak Check @ 17 "Hg			Lab ID: L2078545-55

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	8486.0	142	168	11	32	2.5	0.5
5	8491.5	141	164	10	33	2.6	0.5
10	8497.10	144	164	10	32	2.6	0.5
15	8502.26	148	163	10	33	2.6	0.5
20	8508.0	145	164	11	33	2.5	0.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Locatior Courtice, ON	Test No: 3	Control Box ID: #2 - A6117	
Test location: APC Outlet No. 1	DGMCF: ~~0.978~~ 0.987	Operator: JG.	
Date: JUNE 1, 2018.	Barometric Pressure: 29.46. "Hg	Project No: 21840	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: L2078545-76 2914/2915	

Tube Pair 1 Start Time: 1415	Initial Leak Check NDL @ 12 "Hg	Sample ID: 10A / 10B			
Tube Pair 1 End Time: 1435	Final Leak Check NDL @ 14 "Hg	Lab ID: L2078545-57			

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	80.7	142	165	27	28	2.7	2
5	86.5	141	167	9	30	2.5	2
10	92.10	139	166	9	29	2.5	2
15	97.60	139	168	10	31	2.5	2
20	102.30	136	168	10	31	2.5	2

Tube Pair 2 Start Time: 1441	Initial Leak Check NDL @ 14 "Hg	Sample ID: HB-21480-11A			
Tube Pair 2 End Time: 1501	Final Leak Check NDL @ 14 "Hg	Lab ID: L2078545-58			

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8602.5	138	147	13	30	2.5	2
5	8607.5	138	147	13	32	2.5	2
10	8612.5	136	147	12	32	2.5	2
15	8617.4	135	144	13	34	2.5	2
20	8622.4	139	144	13	35	2.5	2

Tube Pair 3 Start Time: 1507	Initial Leak Check NDL @ 14 "Hg	Sample ID: 18-21480 12A, 12B			
Tube Pair 3 End Time: 1527	Final Leak Check NDL @ 14 "Hg	Lab ID: L2078545-59			

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8622.70	140.	147	14	32	2.5	1
5	8627.80	140	147	13	32	2.5	1.
10	8632.70	141	143	11	34	2.5	1
15	8637.90	135	143	10	35	2.5	1
20	8642.80	139	143	9	35	2.5	1

Tube Pair 4 Start Time: 1532	Initial Leak Check NDL @ 15 "Hg	Sample ID: 18-21480-13A, 13B			
Tube Pair 4 End Time: 1553	Final Leak Check NDL @ 15 "Hg	Lab ID: L2078545-60			

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	8642.35	135	146	10	32	2.5	2
5	8647.65	140	144	9	33	2.5	2
10	8652.6	140	144	9	33	2.5	2
15	8658.0	141	143	9	34	2.5	2
20	8663.20	141	143	9	34	2.5	2.

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:	
Plant Locatior Courtice, ON	Test No: 1	Control Box ID: A11542
Test location: APC Outlet No. 2	DGMCF: 0.987	Operator: DU
Date: MAY 31, 2018	Barometric Pressure: ~~29.78~~ 29.50 "Hg	Project No: 21840
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: L2078545-77 30A/30B

Tube Pair 1 Start Time: 1044	Initial Leak Check NDL @ 15 "Hg	Sample ID: 16A/16B
Tube Pair 1 End Time: 1104	Final Leak Check NDL @ 15.5 "Hg	Lab ID: L2078545-63

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	99.5	130	141	13	34	0.9	3
5	104.5	130	443	9	36	0.9	3
10	109.9	126	142	9	37	0.9	3
15	115.3	126	143	9	38	0.9	3
20	120.3	126	143	9	38	0.9	3

Tube Pair 2 Start Time: 1114	Initial Leak Check NDL @ 15.5 "Hg	Sample ID: 17A/17B
Tube Pair 2 End Time: 1134	Final Leak Check NDL @ 11.0 "Hg	Lab ID: L2078545-64

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	21.0	121	141	8	35	0.9	3
5	26.8	125	142	9	39	0.9	3
10	32.8	126	142	9	39	0.9	3
15	38.0	126	142	9	41	0.9	3
20	43.2	126	142	9	41	0.9	3

Tube Pair 3 Start Time: 1143	Initial Leak Check NDL @ 11.0 "Hg	Sample ID: 18A/18B
Tube Pair 3 End Time: 1203	Final Leak Check NDL @ 11.0 "Hg	Lab ID: L2078545-65

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	43.9	122	141	11	37	0.9	2.5
5	49.7	123	141	13	41	0.9	2.5
10	54.2	122	141	14	41	0.9	2.5
15	59.4	123	142	11	42	0.9	2.5
20	64.4	122	141	10	42	0.9	3

Tube Pair 4 Start Time: 1209	Initial Leak Check NDL @ 11.0 "Hg	Sample ID: 19A/19B
Tube Pair 4 End Time: 1229	Final Leak Check NDL @ 11.0 "Hg	Lab ID: L2078545-66

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	64.8	124	140	6	39	0.9	2.5
5	70.4	123	141	8	42	0.9	2.5
10	~~80.7~~ 58	122	141	9	43	0.9	2.5
15	81.1	122	142	9	43	0.9	2.5
20	86.4	128	141	8	44	0.9	2.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:	
Plant Locatior Courtice, ON	Test No: 2	Control Box ID: A11542
Test location: APC Outlet No. 2	DGMCF: 0.987	Operator: [illegible]
Date: MAY 31, 2018	Barometric Pressure: ~~29.76~~ 29.46"Hg	Project No: 21840
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: L2078545-56

9A/9B 20A/20B

Tube Pair 1 Start Time: 1456	Initial Leak Check NDL @ 11.0 "Hg	Sample ID: ~~18A/18B~~
Tube Pair 1 End Time: 1516	Final Leak Check NDL @ 11.0 "Hg	Lab ID: L2078545-67

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	86.6	129	142	25	29	0.9	3
5	92.3	127	143	~~29~~ 14	33	0.9	3
10	97.5	129	143	13	34	0.9	3
15	102.6	131	143	14	36	0.9	3
20	107.7	130	143	14	36	0.9	3

Tube Pair 2 Start Time: 1527	Initial Leak Check NDL @ 11 "Hg	Sample ID: 21A/21B
Tube Pair 2 End Time: 1547	Final Leak Check NDL @ 12 "Hg	Lab ID: L2078545-69

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	~~408~~.0	128	142	14	32	0.9	2.5
5	13.8	127	142	15	37	0.9	2.5
10	19.1	128	142	16	39	0.9	2.5
15	24.3	129	142	16	39	0.9	2.5
20	29.4	129	142	14	39	0.9	2.5

Tube Pair 3 Start Time: 1554	Initial Leak Check NDL @ 12 "Hg	Sample ID: 22A/22B
Tube Pair 3 End Time: 1614	Final Leak Check NDL @ 10.5 "Hg	Lab ID: L2078545-69

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	30.0	125	140	7	37	0.9	2.5
5	35.0	127	141	7	42	0.9	2.5
10	41.0	127	141	7	42	0.9	2.5
15	46.8	127	141	7	43	0.9	2.5
20	52.0	127	141	7	43	0.9	2.5

Tube Pair 4 Start Time: 1622	Initial Leak Check NDL @ 11.5 "Hg	Sample ID: 23A/23B
Tube Pair 4 End Time: 1642	Final Leak Check NDL @ 12 "Hg	Lab ID: L2078545-70

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	52.6	128	141	8	42	0.9	3.5
5	57.9	127	142	9	43	0.9	3.5
10	64.0	127	142	9	44	0.9	3.5
15	69.8	127	142	9	44	0.9	3.5
20	74.8	127	142	9	44	0.9	3.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Locatior Courtice, ON	Test No: 3		Control Box ID: A1542
Test location: APC Outlet No. 2	DGMCF: 0.981		Operator: D. Mc
Date: JUNE 1 2018	Barometric Pressure: 29.48 "Hg		Project No: 21840
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak		Field Blank Pair ID: LZ0785 45-76 29A/29B

Tube Pair 1 Start Time: 10 04	Initial Leak Check NDL @ 12.5 "Hg		Sample ID: 24A / 24B
Tube Pair 1 End Time: 10 24	Final Leak Check NDL @ 11 "Hg		Lab ID: LZ0785 45-71

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	35.6	126	141	10	34	0.9	2
5	41.3	124	142	11	37	0.9	2
10	47.3	121	142	11	38	0.9	2
15	52.2	124	142	11	39	0.9	2
20	57.6	124	143	11	39	0.9	2

Tube Pair 2 Start Time: 1032	Initial Leak Check NDL @ 11.5 "Hg		Sample ID: 25A / 25B
Tube Pair 2 End Time: 1052	Final Leak Check NDL @ 13 "Hg		Lab ID: LZ0785 45-72

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	57.9	125	142	13	35	0.9	3
5	63.6	123	143	12	38	0.9	3
10	68.6	123	143	15	40	0.9	3
15	74.6	126	142	12	41	0.9	3
20	79.8	126	141	11	41	0.9	3

Tube Pair 3 Start Time: 1103	Initial Leak Check NDL @ 13.5 "Hg		Sample ID: 26A / 26B
Tube Pair 3 End Time: 1123	Final Leak Check NDL @ 15 "Hg		Lab ID: LZ0785 45-73

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	79.8	125	140	12	37	0.9	4
5	85.1	125	142	14	39	0.9	4.5
10	90.4	126	141	13	40	0.9	5
15	95.8	125	142	13	41	0.9	5
20	100.8	125	142	13	41	0.9	5

Tube Pair 4 Start Time: 1133	Initial Leak Check NDL @ 12 "Hg		Sample ID: 27A / 27B
Tube Pair 4 End Time: 1153	Final Leak Check NDL @ 13 "Hg		Lab ID: LZ0785 45-74

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	1.2	125	140	13	38	0.9	2
5	6.9	125	142	15	41	0.9	2
10	11.9	126	141	15	42	0.9	2
15	16.9	126	141	15	42	0.9	2
20	22.3	125	141	14	42	0.9	2

0 10 11 11.5

APPENDIX 9

Aldehydes Field Data Sheets
(6 pages)

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 1
Date:	MAY 31, 2018.
Project No.:	21840

Measuring Device	MII Number
Control Module #2	A10117
Barometer	ENV CAN

Barometric Pressure:	29.50	"Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	8289.45	128	*77	157	22	27	1.3	0.5
5	8292.95	130	86	154	20	28	1.5	0.5
10	8296.60	131	99	135	20	29	1.5	0.5
15	8300.25	131	99	135	20	29	~~1.5~~ 1.4	0.5
20	8303.70	131	*98	133	20	29	1.3	0.5
25	8306.60	131	~~139~~ 139	134	20	30	1.5	0.5
30	8309.40	131	139	132	20	30	1.3	0.5
35	8312.20	131	139	133	20	30	1.3	0.5
40	8315.40	131	140	133	21	30	1.3	0.5
45	8318.30	131	139	133	20	30	1.3	0.5
50	8321.30	132	139	136	21	31	1.3	0.5
55	8324.0	131	140	134	21	30	1.3	0.5
60	8326.80	132	139	135	21	31	1.5	0.5

Start Time:	0920		
Finish Time:	1020		
Initial Leak Check:	<.01	Lpm @ 15	" Hg
Final Leak Check:	<.01	Lpm @ 12	" Hg

DGMCF:	0.989
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments: PURGE ON @0908 @ 8280.9 OFF @0918 @ 8289.45 JG

: sample @ ~0.5 lpm for 60 minutes. * BAD CONNECTION FOUND IN STACK T-COUPLE. FROM 0920-0940 TEMP WAS APPROX 281 BASED ON SVOC TEST TRAIN.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 1
Date:	May 31, 2018
Project No.:	21840

Measuring Device	MII Number
Control Module	#2 - A10117
Barometer	ENV CAN

Barometric Pressure:	29.43	"Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	8509.0	180	144	121	27	30	1.3	0.5
5	8512.3	144	147	134	27	32	1.3	0.5
10	8515.0	139	142	142	26	33	1.2	0.5
15	8517.2	140	141	130	25	34	1.2	0.5
20	8520.2	141	140	138	25	35	1.2	0.5
25	8523.3	141	140	139	29	35	1.2	0.5
30	8526.45	144	141	130	15	35	1.2	0.5
35	8529.40	145	140	140	26	35	1.2	0.5
40	8532.40	140	143	140	16	36	1.2	0.5
45	8535.50	140	144	135	14	35	1.2	0.5
50	8538.50	144	142	137	16	36	1.2	0.5
55	8540.60	142	140	141	16	36	1.2	0.5
60	8544.60	141	140	141	16	36	1.2	0.5

Start Time:	1746		
Finish Time:	1846		
Initial Leak Check:	<.01	Lpm @ 17	" Hg
Final Leak Check:	<.01	Lpm @ 17	" Hg

DGMCF:	0.989
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments: 16

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 1
Date:	JUNE 1, 2018
Project No.:	21840

Measuring Device	MII Number
Control Module	#2 A16117
Barometer	ENV CAN

Barometric Pressure:	29.48	"Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	8546.10	145	~~157~~ 144	157	24	27	1.2	0.5
5	8549.95	145	146	146	25	26	1.2	0.5
10	8552.9	140	147	145	23	28	1.1	0.5
15	8555.4	145	147	144	23	29	1.1	0.5
20	8558.2	141	146	145	23	29	1.1	0.5
25	8560.7	143	146	145	23	30	1.1	0.5
30	8563.4	140	145	145	25	30	1.1	0.5
35	8566.0	143	146	146	24	31	1.1	0.5
40	8568.7	146	146	146	24	32	1.1	0.5
45	8571.25	144	146	148	25	32	1.1	0.5
50	8573.95	142	145	147	25	32	1.1	0.5
55	8576.45	146	146	147	26	33	1.1	0.5
60	8579.10	146	146	148	26	33	1.1	0.5

Start Time:	~~1249~~ 1250		
Finish Time:	1350		
Initial Leak Check:	<01	Lpm @ 13	" Hg
Final Leak Check:		Lpm @	" Hg

DGMCF:	0.989
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 2
Date:	MAY 31 2019
Project No.:	21840

Measuring Device	MII Number
Control Module	A11542
Barometer	ENV. CAN

Barometric Pressure: 29.50 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	69.3	136	150	131	21	24	0.5	1
5	71.95	142	142	133	21	29	0.5	1
10	74.2	136	142	135	16	30	0.5	1
15	76.7	137	142	130	21	32	0.5	1
20	79.3	136	142	131	21	33	0.5	1
25	81.7	136	141	133	21	34	0.5	1
30	84.2	134	141	130	21	36	0.5	1
35	86.5	135	141	131	21	36	0.5	1
40	89.0	134	141	134	20	36	0.5	1
45	91.4	136	141	132	20	36	0.5	1
50	93.9	136	141	131	21	40	0.5	1
55	96.3	137	141	132	21	40	0.5	1
60	98.7	135	141	132	21	41	0.5	1

Start Time:	9:11		
Finish Time:	10:11		
Initial Leak Check:	<.01	Lpm @ 15	" Hg
Final Leak Check:	<.01	Lpm @ 5	" Hg

DGMCF:	~~0.988~~ 0.991
Sample Volume:	
Average DGM Temp:	34.7
Average DGM Δ H:	0.5

Comments: ICE BATH IS VERY COLD

: sample @ ~0.5 lpm for 60 minutes.

DOUG

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 2
Date:	MAY 31, 2018
Project No.:	21840

Measuring Device	MII Number
Control Module	A11542
Barometer	ENV. CAN

Barometric Pressure: 29.43 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	76.0	126	140	135	27	43	0.5	1
5	78.5	126	135	133	26	43	0.5	1
10	80.7	126	135	133	26	45	0.5	1
15	82.9	121	142	136	26	45	0.5	1
20	85.1	123	142	136	26	46	0.5	1
25	87.3	123	142	135	25	46	0.5	1
30	89.5	123	141	135	25	47	0.5	1
35	91.5	122	142	133	25	47	0.5	
40	93.8	120	141	132	25	47	0.5	1
45	96.0	126	142	134	25	48	0.5	1
50	98.1	126	142	134	25	48	0.5	1
55	100.6	122	142	133	26	48	0.5	1
60	103.1	123	142	133	26	49	0.5	1

Start Time:	1701
Finish Time:	1501
Initial Leak Check:	<.01 Lpm @ 10 " Hg
Final Leak Check:	<.01 Lpm @ 2 " Hg

DGMCF:	~~0.983~~ 0.991
Sample Volume:	
Average DGM Temp:	46.2
Average DGM Δ H:	0.5

Comments:

AC ICE BATH REAL COLD 3°C

: sample @ ~0.5 lpm for 60 minutes.

DU

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 2
Date:	JUNE 1 2015
Project No.:	21840

Measuring Device	MII Number
Control Module	A11542
Barometer	ENV. CAN

Barometric Pressure:	29.48	"Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	4.0	124	141	134	19	26	0.5	1
5	6.5	126	141	132	20	27	0.5	1
10	9.0	125	143	133	21	30	0.5	1
15	11.3	126	143	132	21	32	0.5	1
20	13.2	126	143	132	21	33	0.5	1
25	15.7	125	142	132	20	34	0.5	1
30	18.2	124	142	132	20	35	0.5	1
35	21.1	125	142	131	21	37	0.5	1
40	24.0	125	142	134	20	37	0.5	1
45	26.8	125	142	134	21	37	0.5	1
50	29.5	124	142	133	20	40	0.5	1
55	32.4	125	142	133	20	40	0.5	1
60	35.3	125	142	133	20	40	0.5	1

Start Time:	8:30		
Finish Time:	9:30		
Initial Leak Check:	<0.01	Lpm @ 10	" Hg
Final Leak Check:		Lpm @	" Hg

DGMCF:	~~0.988~~ 0.991
Sample Volume:	
Average DGM Temp:	31.6
Average DGM Δ H:	0.5

Comments:

: sample @ ~0.5 lpm for 60 minutes.

NM

APPENDIX 10

ORTECH Sample Log/Chain of Custody Forms
(10 pages)

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21840 - J2469

ORTECH Sample ID 18-21840-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
1	MAY 29, 18	#1 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
2				Probe Rinse Nitric	0.1N Nitric	Metals
3				Filter	Particulate	Particulate & Metals
4				Impinger 1-5 Solution	Nitric/Peroxide	Metals
5				Impinger 6-7 Solution	Acid. KMnO4	Mercury
6				Impinger 6-7 Rinse	8N HCl	Mercury
7	MAY 29, 18	#1 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
8				Probe Rinse Nitric	0.1N Nitric	Metals
9				Filter	Particulate	Particulate & Metals
10				Impinger 1-5 Solution	Nitric/Peroxide	Metals
11				Impinger 6-7 Solution	Acid. KMnO4	Mercury
12				Impinger 6-7 Rinse	8N HCl	Mercury
13	MAY 30, 18	#1 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
14				Probe Rinse Nitric	0.1N Nitric	Metals
15				Filter	Particulate	Particulate & Metals
16				Impinger 1-5 Solution	Nitric/Peroxide	Metals
17				Impinger 6-7 Solution	Acid. KMnO4	Mercury
18				Impinger 6-7 Rinse	8N HCl	Mercury
19	MAY 30, 18	Blank 1	Blank 1	Probe Rinse Acetone	Acetone	Particulate & Metals
20				Probe Rinse Nitric	0.1N Nitric	Metals
21				Filter	Particulate	Particulate & Metals
22				Impinger 1-5 Solution	Nitric/Peroxide	Metals
23				Impinger 6-7 Solution	Acid. KMnO4	Mercury
24				Impinger 6-7 Rinse	8N HCl	Mercury

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21840 - J2469

ORTECH Sample ID 18-21840-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
25	MAY 30, 18	#2 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
26				Probe Rinse Nitric	0.1N Nitric	Metals
27				Filter	Particulate	Particulate & Metals
28				Impinger 1-5 Solution	Nitric/Peroxide	Metals
29				Impinger 6-7 Solution	Acid. KMnO4	Mercury
30				Impinger 6-7 Rinse	8N HCl	Mercury
31	MAY 30, 18	#2 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
32				Probe Rinse Nitric	0.1N Nitric	Metals
33				Filter	Particulate	Particulate & Metals
34				Impinger 1-5 Solution	Nitric/Peroxide	Metals
35				Impinger 6-7 Solution	Acid. KMnO4	Mercury
36				Impinger 6-7 Rinse	8N HCl	Mercury
37	MAY 31/18	#2 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
38				Probe Rinse Nitric	0.1N Nitric	Metals
39				Filter	Particulate	Particulate & Metals
40				Impinger 1-5 Solution	Nitric/Peroxide	Metals
41				Impinger 6-7 Solution	Acid. KMnO4	Mercury
42				Impinger 6-7 Rinse	8N HCl	Mercury
43	MAY 30, 18	Blank 1	Blank 1	Probe Rinse Acetone	Acetone	Particulate & Metals
44				Probe Rinse Nitric	0.1N Nitric	Metals
45				Filter	Particulate	Particulate & Metals
46				Impinger 1-5 Solution	Nitric/Peroxide	Metals
47				Impinger 6-7 Solution	Acid. KMnO4	Mercury
48				Impinger 6-7 Rinse	8N HCl	Mercury

Relinquished By: Thomas Turner Date: June 1 - 2018

Relinquished To: AARON BURTON Date: 1-JUNE-2018 10:30

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
b/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21840 - J2469

ORTECH Sample ID 18-21840-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
36	May 29/18	3	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
37				PM 2.5 cyclone Rinse	Acetone	Particulate
38				PM 2.5 exit & connectors	Acetone	Particulate
39				Back up filter	Filter	Particulate
40				Impinger Soln & rinse	Water	Particulate
41				Secondary Filter	Filter	Particulate*
42				Impinger Rinse	Acetone & Hexane	Particulate
43	May 30, 18	Blank 1	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
44				PM 2.5 cyclone Rinse	Acetone	Particulate
45				PM 2.5 exit & connectors	Acetone	Particulate
46				Back up filter	filter	Particulate
47				Impinger Soln & rinse	Water	Particulate
48				Secondary Filter	Filter	Particulate*
49				Impinger Rinse	Acetone & Hexane	Particulate
50	May 30, 18	Blank 2	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
51				PM 2.5 cyclone Rinse	Acetone	Particulate
52				PM 2.5 exit & connectors	Acetone	Particulate
53				Back up filter	Filter	Particulate
54				Impinger Soln & rinse	Water	Particulate
55				Secondary Filter	Filter	Particulate*
56				Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

Relinquished To: Aaron Burton Date: 1-JUNE-2018 10:30

Relinquished By: Thomas Timm Date: June 1 2018

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21840 - J2469

ORTECH Sample ID 18 - 21840 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1	MAY 31, 18	Test 1 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
2		Test 1 Filter		Particulate	SVOC
3		Test 1 XAD-II Trap		N.A.	SVOC
4		Test 1 Impinger Solution		Ethylene Glycol	SVOC
5		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
6	MAY 31, 18	Test 2 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
7		Test 2 Filter		Particulate	SVOC
8		Test 2 XAD-II Trap		N.A.	SVOC
9		Test 2 Impinger Solution		Ethylene Glycol	SVOC
10		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
11	TO BE DELIVERED LATER	Test 3 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
12		Test 3 Filter		Particulate	SVOC
13		Test 3 XAD-II Trap		N.A.	SVOC
14		Test 3 Impinger Solution		Ethylene Glycol	SVOC
15		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
16	MAY 31, 18	Blank 1 Probe Rinse	Blank	Hexane/Acetone	SVOC
17		Blank 1 Filter		Particulate	SVOC
18		Blank 1 XAD-II Trap		N.A.	SVOC
19		Blank 1 Impinger Solution		Ethylene Glycol	SVOC
20		Blank 1 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated April 10, 2018 for lists of analytes.

Relinquished To: AARON BURTON Date: 1-JUNE-2018 10:30

Relinquished By: Thomas Tinn Date: June 1 2018

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21840 - J2469

ORTECH Sample ID 18 - 21840 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
11		Test 3 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
12		Test 3 Filter		Particulate	SVOC
13		Test 3 XAD-II Trap		N.A.	SVOC
14		Test 3 Impinger Solution		Ethylene Glycol	SVOC
15		Test 3 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated April 10, 2018 for lists of analytes.

Relinquished To: Arran Burton — Date: 4-June-2018

Relinquished By: [signature] — Date: June 6, '18

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21840 - J2469

ORTECH Sample ID 18 - 21840 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
21	MAY 31, 18	Test 1 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
22		Test 1 Filter		Particulate	SVOC
23		Test 1 XAD-II Trap		N.A.	SVOC
24		Test 1 Impinger Solution		Ethylene Glycol	SVOC
25		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
26	~~MAY 31, 18~~ TO BE DELIVERED LATER	Test 2 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
27		Test 2 Filter		Particulate	SVOC
28		Test 2 XAD-II Trap		N.A.	SVOC
29		Test 2 Impinger Solution		Ethylene Glycol	SVOC
30		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
31	TO BE DELIVERED LATER	Test 3 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
32		Test 3 Filter		Particulate	SVOC
33		Test 3 XAD-II Trap		N.A.	SVOC
34		Test 3 Impinger Solution		Ethylene Glycol	SVOC
35		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
36	MAY 31, 18	Blank 2 Probe Rinse	Blank	Hexane/Acetone	SVOC
37		Blank 2 Filter		Particulate	SVOC
38		Blank 2 XAD-II Trap		N.A.	SVOC
39		Blank 2 Impinger Solution		Ethylene Glycol	SVOC
40		Blank 2 Impinger Rinse		Hexane/Acetone	SVOC

~~Refer to letter dated September 8, 2017 for lists of analytes.~~
Refer to letter dated April 10, 2018 for lists of analytes.

Relinquished To: AARON BURTON Date: 1-JUNE-2018 10:30

Relinquished By: Thomas Timar Date: June 1 2018

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21840 - J2469

ORTECH Sample ID 18 - 21840 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
26		Test 2 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
27		Test 2 Filter		Particulate	SVOC
28		Test 2 XAD-II Trap		N.A.	SVOC
29		Test 2 Impinger Solution		Ethylene Glycol	SVOC
30		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
31		Test 3 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
32		Test 3 Filter		Particulate	SVOC
33		Test 3 XAD-II Trap		N.A.	SVOC
34		Test 3 Impinger Solution		Ethylene Glycol	SVOC
35		Test 3 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated April 10, 2018 for lists of analytes.

Relinquished To: Arthur Boulton Date: 4-June-2018

Relinquished By: June 6, 18 Date:

ORTECH Environmental Sample Log

Acid Gases

Covanta

Client: Covanta
Job/Report Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
~~**Quote / PO #:** 21840-J2469~~

ORTECH Sample ID 18-21840-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Final Volume(ml)	Sample Analysis
1	MAY 29, 18	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
2	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
3	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
4	MAY 30, 18	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
5	↓	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
6	↓	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
Blank 1	↓	APC # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia
Blank 2	↓	APC # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200		HCl, HF & Ammonia

Analyze for HCl, HF and Ammonia

Relinquished By: Thomas Timar Date: June 1 2018

Relinquished To: AARON BURTON Date: 1-JUNE-2018 10:30

ORTECH Sample Log
Method 430 Samples
Covanta

Client: Covanta
Project Number: 21840
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/P.O.: Ortech P.O. : 21840 - J2469

Test Location	Test Number	ORTECH Sample ID 18-21840-M430-	Sample Date	Sample Media
#1 APC Outlet	1	1	May 31, 2018	DNPH & Toluene
	2	2	May 31, 2018	DNPH & Toluene
	3	3	June 1, 2018	DNPH & Toluene
	Blank 1	Blank 1	May 31, 2018	DNPH & Toluene
#2 APC Outlet	1	4	May 31, 2018	DNPH & Toluene
	2	5	May 31, 2018	DNPH & Toluene
	3	6	June 1, 2018	DNPH & Toluene
	Blank 2	Blank 2	May 31, 2018	DNPH & Toluene
	Trip Spike			

Analyse for: **Formaldehyde**
Acetaldehyde
Acrolein

Relinquished To: Aaron Burton Date: 4-June-2018

Relinquished By: [signature] Date: June 4, 18

ORTECH Sample Log
VOCs

Client: Covanta
Project Number: 21840
Received By:
Job Assigned To: ALS
Quote / PO : ORTECH PO: 21840 - J2469

Test Location	Test Number	Pair Number	ORTECH Sample ID 18-21840-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet	1	1	1a,1b	May 31, 2018	Tenax and Tenax/Charcoal	VOCs
		2	2a, 2b		Tenax and Tenax/Charcoal	VOCs
		3	3a,3b		Tenax and Tenax/Charcoal	VOCs
		4	4a,4b		Tenax and Tenax/Charcoal	archive
	2	1	5a,5b	May 31, 2018	Tenax and Tenax/Charcoal	VOCs
		2	6a,6b		Tenax and Tenax/Charcoal	VOCs
		3	7a,7b		Tenax and Tenax/Charcoal	VOCs
		4	8a,8b		Tenax and Tenax/Charcoal	archive
		Field Blank	9a,9b		Tenax and Tenax/Charcoal	VOCs
	3	1	10a,10b	June 1, 2018	Tenax and Tenax/Charcoal	VOCs
		2	11a,11b		Tenax and Tenax/Charcoal	VOCs
		3	12a,12b		Tenax and Tenax/Charcoal	VOCs
		4	13a,13b		Tenax and Tenax/Charcoal	archive
		Trip Blank			Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	
# 2 APC Outlet	1	1	16a,16b	May 31, 2018	Tenax and Tenax/Charcoal	VOCs
		2	17a,17b		Tenax and Tenax/Charcoal	VOCs
		3	18a,18b		Tenax and Tenax/Charcoal	VOCs
		4	19a,19b		Tenax and Tenax/Charcoal	archive
		Field Blank	30a,30b		Tenax and Tenax/Charcoal	VOCs
	2	1	20a,20b	May 31, 2018	Tenax and Tenax/Charcoal	VOCs
		2	21a,21b		Tenax and Tenax/Charcoal	VOCs
		3	22a,22b		Tenax and Tenax/Charcoal	VOCs
		4	23a,23b		Tenax and Tenax/Charcoal	archive
	3	1	24a,24b	June 1, 2018	Tenax and Tenax/Charcoal	VOCs
		2	25a,25b		Tenax and Tenax/Charcoal	VOCs
		3	26a,26b		Tenax and Tenax/Charcoal	archive
		4	27a,27b		Tenax and Tenax/Charcoal	VOCs
		Field Blank	29a,29b		Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	

Refer to letter dated April 10, 2018 for lists of analytes.

Custody Relinquished by: _____ Date: June 4, 18

Received by
Aaron Burton
4-June-2018

APPENDIX 11

Particulate and Metals Train Recovery Data Sheets
(8 pages)

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	May 29, 18
Test No.:	1
Test Location:	Unit #1

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.1
After Act. Rinse:	417.4
Total TS1:	284.7 135.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.3
After 0.1N HNO_3 Rinse:	466.2
Total TS2:	184.9

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17-DF-9

CONTAINER TS3

Initial Wt:	7562
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	664.1
Final Wt:	964.1
1 Gain:	300.0
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	669.0
Initial Wt:	762.5
Final Wt:	897.8
2 Gain:	135.3
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	672.9
Initial Wt:	791.0
Final Wt:	917.7
3 Gain:	126.7
Colour:	clear

Impinger #4 Empty	
Empty Wt:	611.6
Final Wt:	613.6
4 Gain:	2.0
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	425.0
w/ Imp. 1-4 Soln:	1096.5
Imp. 1 to 4 Volume:	671.5
After HNO_3 Rinse:	1209.5
Total TS4:	784.5

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	677.9
Initial Wt:	793.0
Final Wt:	797.5
5 Gain:	4.5
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	675.5
Initial Wt:	785.7
Final Wt:	786.1
6 Gain:	0.4
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	425.7
With Imp. 5&6 Soln:	641.7
Imp. 5&6 Volume:	216.0
After $KMnO_4$ Rinse:	732.6
After100g H_2O Rinse:	855.3
Total TS5-A:	429.6

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	287.1
With 150 mL DI H_2O:	423.3
After HCl Rinse:	478.9
After DI H_2O Rinse:	714.7
Total TS5-B:	431.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	882.6
Final Wt:	906.0
8 Gain:	23.4

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

#13

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	1
TS2 (Probe Rinse-0.1N HNO_3)	2
TS3 (Filter)	3
TS4 (Impinger 1-4 Sol'n-HNO_3)	4
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	5
TS5-B (Impinger 5,6 Rinse-HCl)	6

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	May 29, 18

CWTR = 1 to 6:	468.9 ✓
WCBDA= 7:	23.4

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAY 29/18
Test No.:	2
Test Location:	UNIT #1

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.6
After Act. Rinse:	371.8
Total TS1:	90.2

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.3
After 0.1N HNO_3 Rinse:	464.1
Total TS2:	181.8

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17-2F8

CONTAINER TS3

Initial Wt:	.7483
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	519.7
Final Wt:	812.2
1 Gain:	293.5
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	574.2
Initial Wt:	681.3
Final Wt:	794.7
2 Gain:	113.4
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	652.1
Initial Wt:	756.5
Final Wt:	770.8
3 Gain:	14.3
Colour:	clear

Impinger #4 Empty	
Empty Wt:	598.1
Final Wt:	600.6
4 Gain:	2.5
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	425.6
w/ Imp. 1-4 Soln:	1054.0
Imp. 1 to 4 Volume:	628.4
After HNO_3 Rinse:	1153.5
Total TS4:	729.9

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	663.9
Initial Wt:	780.1
Final Wt:	774.5
5 Gain:	-5.6
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	689.8
Initial Wt:	803.7
Final Wt:	802.5
6 Gain:	-1.2
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	425.3
With Imp. 5&6 Soln:	640.9
Imp. 5&6 Volume:	215.6
After $KMnO_4$ Rinse:	755.7
After100g H_2O Rinse:	848.2
Total TS5-A:	422.7

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.6
With 150 mL DI H_2O:	428.8
After HCl Rinse:	468.3
After DI H_2O Rinse:	606.1
Total TS5-B:	323.4

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	948.6
Final Wt:	976.9
8 Gain:	+28.3

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

F 3

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	7
TS2 (Probe Rinse-0.1N HNO_3)	8
TS3 (Filter)	9
TS4 (Impinger 1-4 Sol'n-HNO_3)	10
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	11
TS5-B (Impinger 5,6 Rinse-HCl)	12

Train Loaded By:	DT
Train Recovered By:	DT/AS
Recovery Witnessed By:	
Date:	MAY 29/18

CWTR = 1 to 6:	716.9 ✓
WCBDA= 7:	28.3

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	3
Test Location:	UNIT 1

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.2
After Act. Rinse:	388.5
Total TS1:	106.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	292.3
After 0.1N HNO_3 Rinse:	495.7
Total TS2:	203.4

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17-QF-14

CONTAINER TS3

Initial Wt:	.7791
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	519.5
Final Wt:	852.0
1 Gain:	332.5
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	977.4
Initial Wt:	682.5
Final Wt:	784.2
2 Gain:	101.7
Colour:	CLEAR

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	654.2
Initial Wt:	756.7
Final Wt:	767.9
3 Gain:	11.2
Colour:	CLEAR

Impinger #4 Empty	
Empty Wt:	538.9
Final Wt:	600.0
4 Gain:	1.1
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	428.4
w/ Imp. 1-4 Soln:	1080.5
Imp. 1 to 4 Volume:	652.1
After HNO_3 Rinse:	1197.5
Total TS4:	769.1

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	667.1
Initial Wt:	779.6
Final Wt:	778.8
5 Gain:	0
Colour:	PURPLE

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	692.0
Initial Wt:	802.4
Final Wt:	801.5
6 Gain:	-0.9
Colour:	PURPLE

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	428.3
With Imp. 5&6 Soln:	647.0
Imp. 5&6 Volume:	218.7
After $KMnO_4$ Rinse:	757.4
After100g H_2O Rinse:	855.5
Total TS5-A:	427.2

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.5
With 150 mL DI H_2O:	420.8
After HCl Rinse:	468.3
After DI H_2O Rinse:	571.1
Total TS5-B:	288.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	976.7
Final Wt:	996.4
8 Gain:	19.7

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	13
TS2 (Probe Rinse-0.1N HNO_3)	14
TS3 (Filter)	15
TS4 (Impinger 1-4 Sol'n-HNO_3)	16
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	17
TS5-B (Impinger 5,6 Rinse-HCl)	18

#3

Train Loaded By:	DT/MT
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	MAY 30, 18

CWTR = 1 to 6:	445.6 ✓
WCBDA= 7:	19.7

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	BLANK 1
Test Location:	

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.5
After Act. Rinse:	520.5
Total TS1:	238.0

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.5
After 0.1N HNO_3 Rinse:	596.0
Total TS2:	313.5

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 1785-16

CONTAINER TS3

Initial Wt:	.7767
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Empty	
Empty Wt:	
Final Wt:	
4 Gain:	
Colour:	

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.9
w/ Imp. 1-4 Soln:	645.4
Imp. 1 to 4 Volume:	217.5
After HNO_3 Rinse:	772.5
Total TS4:	344.6

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
5 Gain:	
Colour:	

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
6 Gain:	
Colour:	

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	428.1
With Imp. 5&6 Soln:	652.4
Imp. 5&6 Volume:	224.3
After $KMnO_4$ Rinse:	763.1
After100g H_2O Rinse:	863.2
Total TS5-A:	435.1

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.6
With 150 mL DI H_2O:	433.3
After HCl Rinse:	484.2
After DI H_2O Rinse:	586.3
Total TS5-B:	303.7

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
8 Gain:	

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	19
TS2 (Probe Rinse-0.1N HNO_3)	20
TS3 (Filter)	21
TS4 (Impinger 1-4 Sol'n-HNO_3)	22
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	23
TS5-B (Impinger 5,6 Rinse-HCl)	24

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAY 30, 18

CWTR = 1 to 6:	
WCBDA= 7:	

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 30, 18
Test No.:
Test Location: UNIT 2

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	382.3
After Act. Rinse:	548.8
Total TS1:	166.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	291.4
After 0.1N HNO_3 Rinse:	480.6
Total TS2:	189.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17-9F-10

CONTAINER TS3

Initial Wt:	.7975
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	665.0
Final Wt:	970.9
1 Gain:	305.9
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	669.8
Initial Wt:	776.5
Final Wt:	902.4
2 Gain:	125.9
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	674.5
Initial Wt:	780.4
Final Wt:	804.8
3 Gain:	24.4
Colour:	clear

Impinger #4 Empty	
Empty Wt:	612.0
Final Wt:	614.8
4 Gain:	2.8
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	429.0
w/ Imp. 1-4 Soln:	1099.9
Imp. 1 to 4 Volume:	671.9
After HNO_3 Rinse:	1209.0
Total TS4:	781.0

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	680.2
Initial Wt:	804.2
Final Wt:	806.4
5 Gain:	2.2
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	675.8
Initial Wt:	782.5
Final Wt:	782.2
6 Gain:	-0.3
Colour:	Purple

460.9

CWTR = 1 to 6: 459.0 ✓

WCBDA= 7: 20.7

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	428.3
With Imp. 5&6 Soln:	654.3
Imp. 5&6 Volume:	226.0
After $KMnO_4$ Rinse:	771.3
After100g H_2O Rinse:	870.0
Total TS5-A:	441.7

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	292.5
With 150 mL DI H_2O:	432.2
After HCl Rinse:	468.4
After DI H_2O Rinse:	611.5
Total TS5-B:	329.0

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	906.0
Final Wt:	926.7
8 Gain:	20.7

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	25
TS2 (Probe Rinse-0.1N HNO_3)	26
TS3 (Filter)	27
TS4 (Impinger 1-4 Sol'n-HNO_3)	28
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	29
TS5-B (Impinger 5,6 Rinse-HCl)	30

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

#13

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: MAY 30, 18

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	2
Test Location:	UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.85
After Act. Rinse:	389.95
Total TS1:	108.1

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.8
After 0.1N HNO_3 Rinse:	428.7
Total TS2:	146.9

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17 2F 15

CONTAINER TS3

Initial Wt:	1.767
Final Wt:	
Gain:	
Colour:	

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	553.4
Final Wt:	917.5
1 Gain:	364.1
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	663.7
Initial Wt:	758.5
Final Wt:	850.7
2 Gain:	92.2
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	678.9
Initial Wt:	797.6
Final Wt:	825.4
3 Gain:	27.8
Colour:	clear

Impinger #4 Empty	
Empty Wt:	473.5
Final Wt:	474.6
4 Gain:	1.1
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.5
w/ Imp. 1-4 Soln:	1124.2
Imp. 1 to 4 Volume:	696.7
After HNO_3 Rinse:	1271.7
Total TS4:	844.2

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	572.9
Initial Wt:	671.7
Final Wt:	675.2
5 Gain:	3.5
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	660.0
Initial Wt:	789.2
Final Wt:	793.0
6 Gain:	3.8
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	428.7
With Imp. 5&6 Soln:	656.9
Imp. 5&6 Volume:	228.2
After $KMnO_4$ Rinse:	769.3
After100g H_2O Rinse:	873.1
Total TS5-A:	444.4

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.6
With 150 mL DI H_2O:	432.6
After HCl Rinse:	462.3
After DI H_2O Rinse:	615.1
Total TS5-B:	332.5

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	968.4
Final Wt:	990.8
8 Gain:	22.4

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	31
TS2 (Probe Rinse-0.1N HNO_3)	32
TS3 (Filter)	33
TS4 (Impinger 1-4 Sol'n-HNO_3)	34
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	35
TS5-B (Impinger 5,6 Rinse-HCl)	36

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

#15

Train Loaded By:	DT
Train Recovered By:	DT JAS
Recovery Witnessed By:	
Date:	MAY 30, 18

CWTR = 1 to 6:	492.5 ~~304.3~~ ✓
WCBDA= 7:	22.4

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAY 31, 18
Test No.:	3
Test Location:	UNIT 2

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

Filter

Filter ID: 17-RF-13

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	382.2
After Act. Rinse:	487.9
Total TS1:	205.7

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.5
After 0.1N HNO_3 Rinse:	438.0
Total TS2:	155.5

MARK FLUID LEVEL

SEAL AND LABEL TS2

CONTAINER TS3

Initial Wt:	.7612
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	664.8
Final Wt:	965.1
1 Gain:	300.3
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	670.1
Initial Wt:	791.1
Final Wt:	946.5
2 Gain:	155.4
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	674.6
Initial Wt:	765.0
Final Wt:	775.9
3 Gain:	10.9
Colour:	clear

Impinger #4 Empty	
Empty Wt:	611.8
Final Wt:	613.8
4 Gain:	2.0
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.6
w/ Imp. 1-4 Soln:	1103.6
Imp. 1 to 4 Volume:	687.0
After HNO_3 Rinse:	1224.3
Total TS4:	797.7

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	630.1
Initial Wt:	794.0
Final Wt:	794.5
5 Gain:	0.5
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	676.8
Initial Wt:	787.8
Final Wt:	791.2
6 Gain:	3.4
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	431.1
With Imp. 5&6 Soln:	656.0
Imp. 5&6 Volume:	224.9
After $KMnO_4$ Rinse:	774.2
After100g H_2O Rinse:	872.3
Total TS5-A:	441.2

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.4
With 150 mL DI H_2O:	432.9
After HCl Rinse:	492.6
After DI H_2O Rinse:	634.8
Total TS5-B:	351.4

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	817.6
Final Wt:	838.9
8 Gain:	21.3

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

#13

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	37
TS2 (Probe Rinse-0.1N HNO_3)	38
TS3 (Filter)	39
TS4 (Impinger 1-4 Sol'n-HNO_3)	40
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	41
TS5-B (Impinger 5,6 Rinse-HCl)	42

Train Loaded By:	DI
Train Recovered By:	DI
Recovery Witnessed By:	
Date:	MAY 31, 18

CWTR = 1 to 6: 472.5 ✓

WCBDA= 7: 21.3

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Date:	MAR 30, 18
Test No.:	BLANK 2
Test Location:	

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	283.0
After Act. Rinse:	530.9
Total TS1:	247.9

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.4
After 0.1N HNO_3 Rinse:	652.9
Total TS2:	370.5

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 17 QF 17

CONTAINER TS3

Initial Wt:	7747
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	18-21840-PM-
TS1 (Probe Rinse-Acetone)	43
TS2 (Probe Rinse-0.1N HNO_3)	44
TS3 (Filter)	45
TS4 (Impinger 1-4 Sol'n-HNO_3)	46
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	47
TS5-B (Impinger 5,6 Rinse-HCl)	48

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Empty	
Empty Wt:	
Final Wt:	
4 Gain:	
Colour:	

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.3
w/ Imp. 1-4 Soln:	640.2
Imp. 1 to 4 Volume:	213.9
After HNO_3 Rinse:	745.0
Total TS4:	318.7

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
5 Gain:	
Colour:	

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
6 Gain:	
Colour:	

CWTR = 1 to 6:

WCBDA= 7:

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	424.9
With Imp. 5&6 Soln:	648.4
Imp. 5&6 Volume:	223.5
After $KMnO_4$ Rinse:	757.5
After100g H_2O Rinse:	857.8
Total TS5-A:	432.9

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.1
With 150 mL DI H_2O:	428.5
After HCl Rinse:	479.4
After DI H_2O Rinse:	587.6
Total TS5-B:	305.5

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
8 Gain:	

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAR 30, 18

ORTECH Enivronmental

APPENDIX 12

Inorganics Analytical Reports
(28 pages)

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	Ortech Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104662		Mississauga, ON L5J 2Y4
Date of Report	13-Jun-18		Canada
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 11-Jun-18)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(7 THRU 12) TEST#2 (#1 APC OUTLET)	18-21840-PM-(13 THRU 18) TEST#3 (#1 APC OUTLET)	18-21840-PM-(19 THRU 24) BLANK#1	18-21840-PM-(25 THRU 30) TEST#1 (#2 APC OUTLET)
ALS Sample ID		L2104662-1	L2104662-2	L2104662-3	L2104662-4	L2104662-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		29-May-18	29-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis	LOR					
Method 5	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	2.5	3.8	2.8	3.3	3.0
Acetone Particulate Matter	0.4	0.9	1.0	2.9	<0.1	1.4
	g	g	g	g	g	g
Acetone Mass	0.02	134	89.7	105	238	165

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-PM-(31 THRU 36) TEST#2 (#2 APC OUTLET)	18-21840-PM-(37 THRU 42) TEST#3 (#2 APC OUTLET)	18-21840-PM-(43 THRU 48) BLANK#2		MB
ALS Sample ID		L2104662-6	L2104662-7	L2104662-8		L2104662-MB
Matrix		Stack	Stack	Stack		n/a
Analysis type		Sample	Sample	Sample		Sample
Sampling Date/Time		30-May-18	31-May-18	30-May-18		n/a
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18		n/a
PM via Gravimetric Analysis Method 5	LOR					
	mg	mg	mg	mg		mg
Filter Particulate Matter	0.8	2.3	2.6	3.8		1.9
Acetone Particulate Matter	0.4	2.4	1.2	0.1	J	<0.1
	g	g	g	g		g
Acetone Mass	0.02	108	205	247		31.4

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2105096		Mississauga, ON L5J 2Y4
Date of Report	14-Jun-18		Canada
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 201A (SR 11-Jun-18)
Sample Particulate Analysis via Gravimetric USEPA Method 202 (SR 14-Jun-18)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-1 TEST#1 (#1 APC OUTLET)	18-21840-M201A-2 TEST#1 (#1 APC OUTLET)	18-21840-M201A-3 TEST#1 (#1 APC OUTLET)	18-21840-M201A-4 TEST#1 (#1 APC OUTLET)	18-21840-M201A-(5-7) TEST#1 (#1 APC OUTLET)
ALS Sample ID		L2105096-1	L2105096-2	L2105096-3	L2105096-4	L2105096-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		30-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	LOR					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	0.5 J	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	30.2	28.8	13.5	-	-
PM via Gravimetric Analysis Method 202	LOR					
	mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	1.4
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.7
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	268

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-8 TEST#2 (#1 APC OUTLET)	18-21840-M201A-9 TEST#2 (#1 APC OUTLET)	18-21840-M201A-10 TEST#2 (#1 APC OUTLET)	18-21840-M201A-11 TEST#2 (#1 APC OUTLET)	18-21840-M201A-(12-14) TEST#2 (#1 APC OUTLET)
ALS Sample ID		L2105096-6	L2105096-7	L2105096-8	L2105096-9	L2105096-10
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		30-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.2 J	-
Acetone Particulate Matter	0.4	0.1 J	0.3 J	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	27.8	22.0	15.3	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.6
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.7
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	231

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-15 TEST#3 (#1 APC OUTLET)	18-21840-M201A-16 TEST#3 (#1 APC OUTLET)	18-21840-M201A-17 TEST#3 (#1 APC OUTLET)	18-21840-M201A-18 TEST#3 (#1 APC OUTLET)	18-21840-M201A-(19-21) TEST#3 (#1 APC OUTLET)
ALS Sample ID		L2105096-11	L2105096-12	L2105096-13	L2105096-14	L2105096-15
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		30-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.1 J	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	26.9	51.3	13.3	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.7
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.3
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	276

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-22 TEST#1 (#2 APC OUTLET)	18-21840-M201A-23 TEST#1 (#2 APC OUTLET)	18-21840-M201A-24 TEST#1 (#2 APC OUTLET)	18-21840-M201A-25 TEST#1 (#2 APC OUTLET)	18-21840-M201A-(26-28) TEST#1 (#2 APC OUTLET)
ALS Sample ID		L2105096-16	L2105096-17	L2105096-18	L2105096-19	L2105096-20
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		29-May-18	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	LOR					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	0.1 J	0.2 J	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	26.0	59.0	12.0	-	-
PM via Gravimetric Analysis Method 202	LOR					
	mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	2.6
Non-Extractale Condensable Particulates	0.4	-	-	-	-	7.1
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	234

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-29 TEST#2 (#2 APC OUTLET)	18-21840-M201A-30 TEST#2 (#2 APC OUTLET)	18-21840-M201A-31 TEST#2 (#2 APC OUTLET)	18-21840-M201A-32 TEST#2 (#2 APC OUTLET)	18-21840-M201A-(33-35) TEST#2 (#2 APC OUTLET)
ALS Sample ID		L2105096-21	L2105096-22	L2105096-23	L2105096-24	L2105096-25
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		29-May-18	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	25.1	40.3	15.2	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.6
Non-Extractale Condensable Particulates	0.4	-	-	-	-	4.5
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	231

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-36 TEST#3 (#2 APC OUTLET)	18-21840-M201A-37 TEST#3 (#2 APC OUTLET)	18-21840-M201A-38 TEST#3 (#2 APC OUTLET)	18-21840-M201A-39 TEST#3 (#2 APC OUTLET)	18-21840-M201A-(40-42) TEST#3 (#2 APC OUTLET)
ALS Sample ID		L2105096-26	L2105096-27	L2105096-28	L2105096-29	L2105096-30
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		29-May-18	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.2 J	-
Acetone Particulate Matter	0.4	0.1 J	<0.1	0.1 J	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	42.0	30.7	11.6	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	2.0
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.2
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	276

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Sample Analysis Summary Report

Sample Name		18-21840-M201A-43 BLANK 1 (#1 APC OUTLET)	18-21840-M201A-44 BLANK 1 (#1 APC OUTLET)	18-21840-M201A-45 BLANK 1 (#1 APC OUTLET)	18-21840-M201A-46 BLANK 1 (#1 APC OUTLET)	18-21840-M201A-(47-49) BLANK 1 (#1 APC OUTLET)
ALS Sample ID		L2105096-31	L2105096-32	L2105096-33	L2105096-34	L2105096-35
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		30-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.1 J	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	21.1	24.8	23.1	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.3
Non-Extractale Condensable Particulates	0.4	-	-	-	-	0.8
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	205

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21840-M201A-50 BLANK 2 (#2 APC OUTLET)	18-21840-M201A-51 BLANK 2 (#2 APC OUTLET)	18-21840-M201A-52 BLANK 2 (#2 APC OUTLET)	18-21840-M201A-53 BLANK 2 (#2 APC OUTLET)	18-21840-M201A-(54-56) BLANK 2 (#2 APC OUTLET)
ALS Sample ID		L2105096-36	L2105096-37	L2105096-38	L2105096-39	L2105096-40
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		30-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.2 J	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	20.9	26.1	21.6	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.2
Non-Extractale Condensable Particulates	0.4	-	-	-	-	1.1
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	208

ALS Environmental

Sample Analysis Summary Report

Sample Name		MB
ALS Sample ID		L2105096-MB
Matrix		n/a
Analysis type		Sample
Sampling Date/Time		n/a
Date of Receipt		n/a
PM via Gravimetric Analysis Method 201A	**LOR**	
	mg	**mg**
Filter Particulate Matter	0.8	2.3
Acetone Particulate Matter	0.4	<0.1
	g	**g**
Acetone Mass	0.02	31.5
PM via Gravimetric Analysis Method 202	**LOR**	
	mg	**mg**
Extractable Condensable Particulates	0.4	0.4
Non-Extractale Condensable Particulates	0.4	0.8
	g	**g**
Water Mass	0.02	243

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104648		Mississauga, ON L5J 2Y4
Date of Report	13-Jun-18		Canada
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS:

Ammonia, Total (as NH_3) via Ion Chromatography USEPA Method CTM-027 (FE 8-Jun-2018)

Cl as HCl Anion Analysed via Ion Chromatography USEPA Method 26A (FE 7-Jun-2018)

F as HF Anion Analysed via Ion Chromatography USEPA Method 26A (FE 7-Jun-2018)

LOR = Limit of Reporting

LCB = Laboratory Control Blank (limits: <LOR)

LCS = Laboratory Control Sample (limits: 90-110%)

MS = Matrix Spike Sample (limits: 90-110%, NH_3: 85-115%)

RPD = Relative Percent Difference (limits: <20% for sample duplicate, <10% for duplicate injection)

CVS = Calibration Verification Standard (limits: 90-110%)

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-M26A-1 (APC OUTLET #1)	18-21840-M26A-2 (APC OUTLET #1)	18-21840-M26A-3 (APC OUTLET #1)	18-21840-M26A-4 (APC OUTLET #2)	18-21840-M26A-5 (APC OUTLET #2)
ALS Sample ID	L2104648-1	L2104648-2	L2104648-3	L2104648-4	L2104648-5
Matrix	Stack	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample	Sample
Sampling Date/Time	29-May-18	29-May-18	29-May-18	30-May-18	30-May-18
Date of Receipt	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**	mg	**mg**
Total F^- as HF (ave)	<0.158	<0.174	<0.161	<0.167	<0.170
Analysis 1	<0.158	<0.174	<0.161	<0.167	<0.170
Analysis 2	<0.158	<0.174	<0.161	<0.167	<0.170
Total Cl^- as HCl (ave)	6.56	7.02	6.76	6.79	6.09
Analysis 1	6.59	7.06	6.71	6.78	6.10
Analysis 2	6.54	6.98	6.81	6.80	6.08
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**mg**	**mg**
Total Ammonia as NH_3	1.65	1.40	1.08	0.871	0.784

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-M26A-6 (APC OUTLET #2)	18-21840-M26A-BLANK 1 (APC OUTLET #1)	18-21840-M26A-BLANK 2 (APC OUTLET #2)
ALS Sample ID	L2104648-6	L2104648-7	L2104648-8
Matrix	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample
Sampling Date/Time	30-May-18	30-May-18	30-May-18
Date of Receipt	1-Jun-18	1-Jun-18	1-Jun-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.182	<0.165	<0.167
Analysis 1	<0.182	<0.165	<0.167
Analysis 2	<0.182	<0.165	<0.167
Total Cl^- as HCl (ave)	6.75	<0.290	<0.293
Analysis 1	6.78	<0.290	<0.293
Analysis 2	6.72	<0.290	<0.293
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.650	<0.425	<0.430

ALS Environmental

Sample QC Summary Report

Sample Name	LCB	LCS	LCS
ALS Sample ID	LCB	LCS	LCS
Matrix	Stack	Stack	Stack
Analysis type	Method Blank	Blank Spike	Blank Spike
Sampling Date/Time	n/a	n/a	n/a
Date of Receipt	n/a	n/a	n/a
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.0175	0.529	99%
Analysis 1	<0.0175	0.527	
Analysis 2	<0.0175	0.530	
Total Cl^- as HCl (ave)	<0.0309	0.764	96%
Analysis 1	<0.0309	0.765	
Analysis 2	<0.0309	0.763	
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.0472	0.502	106%

ALS Environmental

Sample QC Summary Report

Sample Name	18-21840-M26A-1 (APC OUTLET #1)	18-21840-M26A-1 (APC OUTLET #1)	18-21840-M26A-1 (APC OUTLET #1)	18-21840-M26A-1 (APC OUTLET #1)
ALS Sample ID	L2104648-1	L2104648-1DUP	L2104648-1MS	L2104648-1MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Spike	Matrix Spike
Sampling Date/Time	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.158	<0.158	4.79	100%
Analysis 1	<0.158	<0.158	4.77	
Analysis 2	<0.158	<0.158	4.81	
Total Cl^- as HCl (ave)	6.56	6.54	13.5	101%
Analysis 1	6.59	6.52	13.5	
Analysis 2	6.54	6.56	13.6	
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	1.65	1.59	5.75	101%

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1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road Mississauga, ON L5J 2Y4 Canada
ALS WO#:	L2104662		
Date of Report	14-Jun-18		
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 12-Jun-18)

Sample Preparation via USEPA Method 29 (12-Jun-18)

ANALYT COMMENTS:

1A:

Sb, Mo, Ni observed in the method blank at levels >3x their LORs. These same targets were also observed in the reagent blank for this fraction. Data for these targets are likely elevated as a result of this background.

Ag recovery in the LCSD is very low. LCS recovery is within range. This may be due to Ag binding other ions in solution. MS shows no such bias. Data is likely not impacted.

2A:

Pb recoveries in the LCS, LCSD, MS, and MSD indicate this fraction likely has a low bias for this target.

Some spurious recovery excursions in the LCS and LCSD are validated by passing recoveries in the LCSD or LCS (respectively). This is unlikely to have an impact on data quality. **PE 14-Jun-18**

LCB = Laboratory Control Blank

LCS = Laboratory Control Sample

LCSD = Laboratory Control Sample Duplicate

LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

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Sample Analysis Summary Report

Sample Name		18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(7 THRU 12) TEST#2 (#1 APC OUTLET)	18-21840-PM-(13 THRU 18) TEST#3 (#1 APC OUTLET)	18-21840-PM-(19 THRU 24) BLANK#1	18-21840-PM-(25 THRU 30) TEST#1 (#2 APC OUTLET)	18-21840-PM-(31 THRU 36) TEST#2 (#2 APC OUTLET)
ALS Sample ID		L2104662-1	L2104662-2	L2104662-3	L2104662-4	L2104662-5	L2104662-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		29-May-18	29-May-18	30-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A							
Antimony	0.2	0.238	0.320	0.974	<	<	0.224
Arsenic	1	<	<	<	<	<	<
Barium	5	10.9	11.1	10.9	10.9	10.7	10.4
Beryllium	0.2	<	<	<	<	<	<
Cadmium	0.1	0.437	0.376	0.430	<	0.774	0.303
Chromium	1	2.69	4.73	5.77	3.21	6.50	12.4
Cobalt	0.2	0.532	0.537	0.657	0.603	0.722	0.751
Copper	1	2.28	1.60	2.26	1.16	2.81	3.48
Lead	0.5	1.07	1.14	1.83	0.502	0.755	1.10
Molybdenum	0.2	22.0	22.7	22.3	23.3	24.4	23.8
Nickel	0.2	15.5	10.0	12.9	12.5	21.8	25.8
Selenium	2	<	<	<	<	<	<
Silver	0.2	<	0.259	<	12.2	0.348	0.854
Thallium	0.2	<	<	<	<	<	<
Vanadium	1	<	<	<	<	<	<
Zinc	6	10.5	13.3	27.4	<	15.0	59.2
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	<	0.752	<	<
Arsenic	0.2	0.222	<	<	<	<	<
Barium	0.5	0.998	0.960	0.843	0.657	0.910	0.890
Beryllium	0.1	<	<	<	<	<	<
Cadmium	0.05	0.111	0.226	0.160	<	0.119	0.0669
Chromium	0.15	0.762	0.784	0.521	0.332	0.682	0.564
Cobalt	0.1	<	<	<	<	<	<
Copper	0.3	1.92	2.48	1.63	0.894	1.62	2.32
Lead	0.05	0.857	0.448	0.360	0.324	0.943	0.202
Molybdenum	0.1	0.367	0.682	0.236	<	0.448	0.135
Nickel	0.1	<	2.38	<	<	<	<
Selenium	1	<	<	<	<	<	<
Silver	0.1	<	<	<	<	<	<
Thallium	0.05	<	<	<	<	<	<
Vanadium	0.1	0.208	0.416	0.244	0.149	0.190	0.178
Zinc	3	6.25	4.98	3.30	<	4.73	3.05

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Sample Analysis Summary Report

Sample Name		18-21840-PM-(37 THRU 42) TEST#3 (#2 APC OUTLET)	18-21840-PM-(43 THRU 48) BLANK#2	MB
ALS Sample ID		L2104662-7	L2104662-8	L2104662-MB
Matrix		Stack	Stack	n/a
Analysis Type		Sample	Sample	Sample
Sampling Date		31-May-18	30-May-18	n/a
Date of Receipt		1-Jun-18	1-Jun-18	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A				
Antimony	0.2	<	<	0.954
Arsenic	1	<	<	<
Barium	5	9.76	12.1	<
Beryllium	0.2	<	<	<
Cadmium	0.1	0.210	<	<
Chromium	1	13.4	<	<
Cobalt	0.2	1.27	<	<
Copper	1	9.01	<	<
Lead	0.5	0.670	<	<
Molybdenum	0.2	23.1	24.1	12.0
Nickel	0.2	54.7	<	1.37
Selenium	2	<	<	<
Silver	0.2	<	<	<
Thallium	0.2	<	<	<
Vanadium	1	<	<	<
Zinc	6	32.3	<	<
Back Half (HNO3 / H2O2) Fraction 2A				
Antimony	0.1	<	0.746	-
Arsenic	0.2	<	<	-
Barium	0.5	1.31	0.652	-
Beryllium	0.1	<	<	-
Cadmium	0.05	0.0781	<	-
Chromium	0.15	0.555	0.369	-
Cobalt	0.1	<	<	-
Copper	0.3	2.58	0.835	-
Lead	0.05	0.224	0.436	-
Molybdenum	0.1	0.124	<	-
Nickel	0.1	<	<	-
Selenium	1	<	<	-
Silver	0.1	<	<	-
Thallium	0.05	<	<	-
Vanadium	0.1	0.220	0.179	-
Zinc	3	4.62	<	-

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Sample QC Summary Report

Sample Name		RB	LCS	LCS	LCSD	LCSD
ALS Sample ID		RB	LCS	LCS	LCSD	LCSD
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis Type		Blank	LCS	LCS	LCS	LCS
Sampling Date		n/a	n/a	n/a	n/a	n/a
Date of Receipt		n/a	n/a	n/a	n/a	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A						
Antimony	0.2	0.349	11.2	90	11.0	88
Arsenic	1	<	56.5	94	55.4	92
Barium	5	<	60.6	97	56.9	91
Beryllium	0.2	<	58.9	98	58.8	98
Cadmium	0.1	<	27.2	90	27.7	92
Chromium	1	<	53.0	88	53.2	89
Cobalt	0.2	<	53.4	89	53.9	90
Copper	1	<	53.3	89	54.5	91
Lead	0.5	<	56.7	94	56.3	94
Molybdenum	0.2	0.345	27.7	91	27.8	91
Nickel	0.2	2.73	55.1	87	57.5	91
Selenium	2	<	57.2	96	52.3	88
Silver	0.2	0.392	26.6	87	16.5	54
Thallium	0.2	<	57.8	96	57.1	95
Vanadium	1	<	52.4	87	52.3	87
Zinc	6	<	107	88	107	88
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	0.125	5.35	87	5.17	84
Arsenic	0.2	<	30.3	101	29.2	97
Barium	0.5	<	30.5	102	28.2	94
Beryllium	0.1	<	31.5	105	29.5	98
Cadmium	0.05	<	14.3	95	13.5	90
Chromium	0.15	<	27.6	92	25.8	86
Cobalt	0.1	<	28.5	95	27.5	92
Copper	0.3	<	28.1	94	26.9	89
Lead	0.05	0.0665	24.1	80	24.2	81
Molybdenum	0.1	0.211	17.9	118	16.7	110
Nickel	0.1	<	28.2	94	27.2	91
Selenium	1	<	26.2	88	25.5	86
Silver	0.1	<	15.4	103	14.2	94
Thallium	0.05	<	25.7	86	25.3	84
Vanadium	0.1	<	27.4	91	25.6	85
Zinc	3	<	52.5	88	48.7	81

ALS Environmental

Sample QC Summary Report

Sample Name		18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)
ALS Sample ID		L2104662-1	L2104662-1	MS	MS	MSD	MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date		29-May-18	29-May-18	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Multi-Metals via ICP-MS	**LOR**						
	ug	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	0.238	0.209	21.7	89	23.3	96
Arsenic	1	<	<	113	94	116	96
Barium	5	10.9	10.9	120	91	126	96
Beryllium	0.2	<	<	117	97	128	106
Cadmium	0.1	0.437	0.473	55.0	91	58.2	96
Chromium	1	2.69	3.67	133	109	137	112
Cobalt	0.2	0.532	0.759	132	110	138	115
Copper	1	2.28	2.72	136	111	141	115
Lead	0.5	1.07	1.07	116	96	116	96
Molybdenum	0.2	22.0	22.2	75.0	88	79.4	96
Nickel	0.2	15.5	16.3	147	109	153	115
Selenium	2	<	<	105	88	109	90
Silver	0.2	<	<	53.5	89	56.4	94
Thallium	0.2	<	<	119	99	117	98
Vanadium	1	<	<	127	106	130	108
Zinc	6	10.5	12.4	286	115	296	119
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	11.2	93	10.9	90
Arsenic	0.2	0.222	<	58.7	97	58.4	97
Barium	0.5	0.998	1.04	60.3	99	59.5	97
Beryllium	0.1	<	<	57.4	96	59.3	99
Cadmium	0.05	0.111	0.120	27.6	92	28.2	94
Chromium	0.15	0.762	0.858	55.4	91	56.3	93
Cobalt	0.1	<	<	57.8	96	56.7	94
Copper	0.3	1.92	2.03	58.6	94	57.0	92
Lead	0.05	0.857	0.917	48.4	79	48.2	79
Molybdenum	0.1	0.367	0.348	35.6	118	34.8	115
Nickel	0.1	<	<	57.7	96	56.3	94
Selenium	1	<	<	51.8	86	52.4	87
Silver	0.1	<	<	29.8	99	30.2	101
Thallium	0.05	<	<	50.0	83	50.6	84
Vanadium	0.1	0.208	0.185	54.7	91	55.2	92
Zinc	3	6.25	6.65	109	85	108	85

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Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104662		Mississauga, ON L5J 2Y4
Date of Report	14-Jun-18		Canada
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS:

Mercury Analysis via CVAA using Method USEPA 7470A (NOB 2018-06-12)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: L. Wrona
Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Environmental

Sample Analysis Summary Report

Sample Name			18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(7 THRU 12) TEST#2 (#1 APC OUTLET)	18-21840-PM-(13 THRU 18) TEST#3 (#1 APC OUTLET)	18-21840-PM-(19 THRU 24) BLANK#1	18-21840-PM-(25 THRU 30) TEST#1 (#2 APC OUTLET)
ALS Sample ID			L2104662-1	L2104662-2	L2104662-3	L2104662-4	L2104662-5
Matrix			Stack	Stack	Stack	Stack	Stack
Analysis type			Sample	Sample	Sample	Sample	Sample
Sampling Date/Time			29-May-18	29-May-18	30-May-18	30-May-18	30-May-18
Date of Receipt			1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Mercury via CVAA		LOR					
	Method 29	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
	Analytical Fraction 1B	0.015	<	<	<	<	<
	Analytical Fraction 2B	0.050	0.793	0.931	0.773	<	4.88
	Analytical Fraction 3B	0.025	<	<	<	<	<
	Analytical Fraction 3C	0.025	0.0950	0.0800	0.0550	<	0.405

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Sample Analysis Summary Report

Sample Name			18-21840-PM-(31 THRU 36) TEST#2 (#2 APC OUTLET)	18-21840-PM-(37 THRU 42) TEST#3 (#2 APC OUTLET)	18-21840-PM-(43 THRU 48) BLANK#2
ALS Sample ID			L2104662-6	L2104662-7	L2104662-8
Matrix			Stack	Stack	Stack
Analysis type			Sample	Sample	Sample
Sampling Date/Time			30-May-18	31-May-18	30-May-18
Date of Receipt			1-Jun-18	1-Jun-18	1-Jun-18
Mercury via CVAA		**LOR**			
	Method 29	**ug**	**ug**	**ug**	**ug**
	Analytical Fraction 1B	0.015	0.015	<	<
	Analytical Fraction 2B	0.050	3.220	0.878	<
	Analytical Fraction 3B	0.025	<	<	<
	Analytical Fraction 3C	0.025	0.450	0.480	<

ALS Environmental

Sample QC Summary Report

Sample Name		LCB	LCS	LCS	LCSD	LCSD
ALS Sample ID		LCB	LCS	LCS	LCSD	LCSD
Analysis type		Method Blank	Blank Spike	Blank Spike	Blank Spike Dup	Blank Spike Dup
Sampling Date/Time		N/A	N/A	N/A	N/A	N/A
Date of Receipt		N/A	N/A	N/A	N/A	N/A
Mercury via CVAA	LOR					
Method 29	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<	0.292	97%	0.309	103%
Analytical Fraction 2B	0.050	<	0.966	96%	0.968	97%
Analytical Fraction 3B	0.025	<	0.460	92%	0.469	94%
Analytical Fraction 3C	0.025	<	0.485	97%	0.505	101%

ALS Environmental

Sample QC Summary Report

Sample Name		18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)	18-21840-PM-(1 THRU 6) TEST#1 (#1 APC OUTLET)
ALS Sample ID		L2104662-1	L2104662-1DUP	L2104662-1MS	L2104662-1MS	L2104662-1MSD	L2104662-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		29-May-18	29-May-18	29-May-18	29-May-18	29-May-18	29-May-18
Date of Receipt		1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18	1-Jun-18
Mercury via CVAA	LOR						
Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<	<	0.306	98%	0.306	98%
Analytical Fraction 2B	0.050	0.793	0.932	8.32	98%	8.39	99%
Analytical Fraction 3B	0.025	<	<	0.463	92%	0.455	90%
Analytical Fraction 3C	0.025	0.0950	0.0900	4.98	98%	4.93	97%

APPENDIX 13

Particle Size Distribution Train Recovery Data Sheets
(8 pages)

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 30, 18

Test No.: 1
Test Location: UNIT #1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ4914	Impinger #1 Knock Out Empty Wt: 489.1 Final Wt: 648.0 1 Gain: 158.9 Colour: clear	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 113.1 After Act. Rinse: 157.2 Total TS1: 44.1	Container TS2 Weights Empty Wt: 126.9 After Act. Rinse: ~~155.9~~ Total TS2: 29.0	Container TS3 Weights Empty Wt: 126.58 After Act. Rinse: 140.4 Total TS3: 13.6	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 652.4 Final Wt: 649.7 2 Gain: -2.7 Colour: clear	Purge On: 13:15 Purge Off: 14:15	Acetone/Hexane Rinse Empty Wt: 283.6 After Acetone Rinse: 362.6 After Hexane Rinse: 422.0
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: 660.6 Initial Wt: 757.8 Final Wt: 754.6 3 Gain: -3.2 Colour: clear	CONTAINER TS5 Empty Wt: 283.2 With Imp 2: 424.4 After H_2O Rinse: 551.7 Total Volume TS5: 268.5	
				Impinger #4 Silica Gel Initial Wt: 938.0 Final Wt: 950.1 4 Gain: 12.1 % Spent: 30	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	~~17~~-21840-M201A-18
TS1 (Part. > 10)	1
TS2 (Part. > 2.5)	2
TS3 (Part. < 2.5)	3
TS4 (Back Up Filter, <2.5)	4
TS5 (Imp 2 H_2O and rinse)	5
TS6 (Secondary Filter)	6
TS7 (Acetone / Hexane rinse)	7

CWTR=1+2+3:	~~562~~ 153.0 ✓
WCBDA=4:	12.1

Train Loaded By: DT
Train Recovered By: DT / DH
Recovery Witnessed By:
Date: MAY 30, 18

14

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: May 30, 18

Test No.: 2
Test Location: UNIT #1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 024917	Impinger #1 Knock Out Empty Wt: 475.7 Final Wt: 621.3 1 Gain: 145.6 Colour: clear	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 172.3 After Act. Rinse: 180.9 Total TS1: 17.3	Container TS2 Weights Empty Wt: 123.4 After Act. Rinse: 135.1 Total TS2: 11.7	Container TS3 Weights Empty Wt: 129.5 After Act. Rinse: 142.8 Total TS3: 13.3	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 626.0 Final Wt: 636.5 2 Gain: 10.5 Colour: clear	Purge On: 15:53 Purge Off: 16:53	Acetone/Hexane Rinse Empty Wt: 282.7 After Acetone Rinse: 354.1 After Hexane Rinse: 392.4
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: 563.3 Initial Wt: 663.3 Final Wt: 661.7 3 Gain: 1.6 Colour: clear	CONTAINER TS5 Empty Wt: 281.7 With Imp 2: 390.0 After H_2O Rinse: 513.7 Total Volume TS5: 232.0	
				Impinger #4 Silica Gel Initial Wt: 852.8 Final Wt: 863.1 4 Gain: 10.3 % Spent:	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	~~17~~ 18-21840-M201A-
TS1 (Part. > 10)	8
TS2 (Part. > 2.5)	9
TS3 (Part. < 2.5)	10
TS4 (Back Up Filter, <2.5)	11
TS5 (Imp 2 H_20 and rinse)	12
TS6 (Secondary Filter)	13
TS7 (Acetone / Hexane rinse)	14

CWTR=1+2+3:	154.5 ✓
WCBDA=4:	10.3

Train Loaded By: DT
Train Recovered By: DT / BH
Recovery Witnessed By:
Date: May 30, 18

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ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: May 30, 2018

Test No.: 3
Test Location: UNIT #1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 024918	Impinger #1 Knock Out Empty Wt: 489.1 Final Wt: 653.5 1 Gain: 164.4 Colour: CLEAR	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * if there is no gain purge is not required.	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 113.1 After Act. Rinse: 140.1 Total TS1: 27.0	Container TS2 Weights Empty Wt: 113.2 After Act. Rinse: 142.0 Total TS2: 28.8	Container TS3 Weights Empty Wt: 113.2 After Act. Rinse: 131.0 Total TS3: 17.8	Initial Wt: Final Wt: Gain: Colour:	Impinger #2 Empty Empty Wt: 649.7 Final Wt: 649.8 2 Gain: 0.1 Colour: CLEAR	Purge On: 1855 Purge Off: 1955	Acetone/Hexane Rinse Empty Wt: 292.5 After Acetone Rinse: 365.2 After Hexane Rinse: 436.0 Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	
				Impinger #3 H_2O Empty Wt: 660.6 Initial Wt: 754.6 Final Wt: 754.6 3 Gain: 0 Colour: CLEAR	CONTAINER TS5 Empty Wt: 282.9 With Imp 2: 440.4 After H_2O Rinse: 559.6 Total Volume TS5: 276.7	
				Impinger #4 Silica Gel Initial Wt: 950.1 Final Wt: 958.6 4 Gain: 8.5 % Spent: 80%	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	~~17~~ 18-21840-M201A-
TS1 (Part. > 10)	15
TS2 (Part. > 2.5)	16
TS3 (Part. < 2.5)	17
TS4 (Back Up Filter, <2.5)	18
TS5 (Imp 2 H_2O and rinse)	19
TS6 (Secondary Filter)	20
TS7 (Acetone / Hexane rinse)	21

Train Loaded By: DS
Train Recovered By: DO / JG
Recovery Witnessed By:
Date: MAY 30, 2018

CWTR=1+2+3:	164.5 ✓
WCBDA=4:	8.5

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ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 29, 18

Test No.: 1
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ 4770	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt: 475.8		
				Final Wt: 626.2		
				1 Gain: 150.4		
				Colour: clear	* if there is no goin purge is not required.	
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:	Impinger #2 Empty	Purge On: 11:55	Acetone/Hexane Rinse
Empty Wt: 112.0	Empty Wt: 112.3	Empty Wt: 112.4	Final Wt:	Empty Wt: 675.1	Purge Off: 12:55	Empty Wt: 283.1
After Act. Rinse: 139.7	After Act. Rinse: 171.9	After Act. Rinse: 125.3	Gain:	Final Wt: 675.1		After Acetone Rinse: 353.4
Total TS1: 27.7	Total TS2: 59.6	Total TS3: 12.9	Colour: WHITE	2 Gain: 0.0		After Hexane Rinse: 431.9
				Colour:	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter		
				Impinger #3 H_2O	CONTAINER TS5	
				Empty Wt: 563.3	Empty Wt: 282.0	
				Initial Wt: 669.8	With Imp 2: 365.3	
				Final Wt: 666.2	After H_2O Rinse: 506.3	
				3 Gain: -3.6	Total Volume TS5: 224.3	
				Colour: clear		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt: 832.1	Secondary Filter	
				Final Wt: 845.1		
				4 Gain: 13.0	Seal and label container TS6	
				% Spent: 10%		

SAMPLE IDENTIFICATION	~~17~~ 18 -21840-M201A-
TS1 (Part. > 10)	22
TS2 (Part. > 2.5)	23
TS3 (Part. < 2.5)	24
TS4 (Back Up Filter, <2.5)	25
TS5 (Imp 2 H_20 and rinse)	26
TS6 (Secondary Filter)	27
TS7 (Acetone / Hexane rinse)	28

CWTR=1+2+3:	146.8
WCBDA=4:	13.0

Train Loaded By: DU
Train Recovered By: DU/DT
Recovery Witnessed By:
Date: MAY 29, 18

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ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 29, 18

Test No.: 2
Test Location: UNIT 2 OUTLET

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter
			Filter ID: Q2 4771
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:
Empty Wt: 112.1	Empty Wt: 112.2	Empty Wt: 112.0	Final Wt:
After Act. Rinse: 138.0	After Act. Rinse: 153.5	After Act. Rinse: 128.0	Gain:
Total TS1: 25.9	Total TS2: 41.3	Total TS3: 16.0	Colour: WHITE
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4

Impingers 1, 2, 3, 4

	Impinger #1 Knock Out
	Empty Wt: 488.5
	Final Wt: 639.1
1	Gain: 150.6
	Colour: Clear

	Impinger #2 Empty
	Empty Wt: 649.6
	Final Wt: 650.5
2	Gain: 0.9
	Colour: Clear

Secondary Filter

	Impinger #3 H_2O
	Empty Wt: 660.6
	Initial Wt: 759.2
	Final Wt: 757.8
3	Gain: -1.4
	Colour: Clear

	Impinger #4 Silica Gel
	Initial Wt: 927.0
	Final Wt: 938.0
4	Gain: 11.0
	% Spent: 10%

CWTR=1+2+3:	150.1 ✓
WCBDA=4:	11.0

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)
** if there is no gain purge is not required.*

Purge On: 15:35
Purge Off: 16:35

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5	
Empty Wt:	282.0
With Imp 2:	352.0
After H_2O Rinse:	514.6
Total Volume TS5:	232.6

CONTAINER TS6
Secondary Filter
Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse	
Empty Wt:	282.4
After Acetone Rinse:	338.8
After Hexane Rinse:	402.1
Mark Fluid Level and Seal and Label Container	

SAMPLE IDENTIFICATION	~~17~~ 18-21840-M201A-
TS1 (Part. > 10)	29
TS2 (Part. > 2.5)	30
TS3 (Part. < 2.5)	31
TS4 (Back Up Filter, <2.5)	32
TS5 (Imp 2 H_20 and rinse)	33
TS6 (Secondary Filter)	34
TS7 (Acetone / Hexane rinse)	35

Train Loaded By: DU
Train Recovered By: DU/DT
Recovery Witnessed By:
Date: MAY 29, 18

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ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 29/18

Test No.: 3
Test Location: AR outlet 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 824913	Impinger #1 Knock Out Empty Wt: 476.1 Final Wt: 624.6 1 Gain: 148.5 Colour: CLEAR	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 113.3 After Act. Rinse: 155.4 Total TS1: 42.1	Container TS2 Weights Empty Wt: 112.9 After Act. Rinse: 143.7 Total TS2: 30.9	Container TS3 Weights Empty Wt: 112.9 After Act. Rinse: 132.9 Total TS3: 20.0	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 675.6 Final Wt: 675.0 2 Gain: -0.6 Colour: —	Purge On: 1855 Purge Off: 1955	Acetone/Hexane Rinse Empty Wt: 292.7 After Acetone Rinse: 353.8 After Hexane Rinse: 421.7
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4		Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Secondary Filter		
				Impinger #3 H_2O Empty Wt: 563.3 Initial Wt: 666.2 Final Wt: 663.8 3 Gain: -2.4 Colour: CLEAR	CONTAINER TS5 Empty Wt: 282.6 With Imp 2: 421.6 After H_2O Rinse: 559.5 Total Volume TS5: 276.9	
				Impinger #4 Silica Gel Initial Wt: 845.1 Final Wt: 853.4 4 Gain: 8.3 % Spent: 30%	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	18-21840-M201A-
TS1 (Part. > 10)	36
TS2 (Part. > 2.5)	37
TS3 (Part. < 2.5)	38
TS4 (Back Up Filter, <2.5)	39
TS5 (Imp 2 H_2O and rinse)	40
TS6 (Secondary Filter)	41
TS7 (Acetone / Hexane rinse)	42

Train Loaded By: DT
Train Recovered By: DM
Recovery Witnessed By: —
Date: MAY 29/18

CWTR=1+2+3:	145.5 ✓
WCBDA=4:	8.3

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ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 30, 18

Test No.: BLANK 1
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 02495	Impinger #1 Knock Out Empty Wt: Final Wt: 1 Gain: Colour:	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * if there is no gain purge is not required.	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 127.0 After Act. Rinse: 147.7 Total TS1: 20.7	Container TS2 Weights Empty Wt: 126.2 After Act. Rinse: 151.4 Total TS2: 25.2	Container TS3 Weights Empty Wt: 126.8 After Act. Rinse: 150.3 Total TS3: 23.5	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: Final Wt: 2 Gain: Colour:	Purge On: Purge Off:	Acetone/Hexane Rinse Empty Wt: 283.2 After Acetone Rinse: 353.1 After Hexane Rinse: 424.2
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	17-21840-M201A-
TS1 (Part. > 10)	43
TS2 (Part. > 2.5)	44
TS3 (Part. < 2.5)	45
TS4 (Back Up Filter, <2.5)	46
TS5 (Imp 2 H_20 and rinse)	47
TS6 (Secondary Filter)	48
TS7 (Acetone / Hexane rinse)	49

Impinger #3 H_2O	CONTAINER TS5
Empty Wt:	Empty Wt: 283.3
Initial Wt:	With Imp 2: 386.5
Final Wt:	After H_2O Rinse: 487.1
3 Gain:	Total Volume TS5: 305.8
Colour:	

Impinger #4 Silica Gel	CONTAINER TS6
Initial Wt:	Secondary Filter
Final Wt:	
4 Gain:	5eal and label container TS6
% Spent:	

CWTR=1+2+3:
WCBDA=4:

Train Loaded By: BT
Train Recovered By: BT
Recovery Witnessed By:
Date: MAY 30, 18

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21840
Date: MAY 30, 18

Test No.: BLANK 2
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ4916	Impinger #1 Knock Out Empty Wt: Final Wt: 1 Gain: Colour:	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) ** if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 126.9 After Act. Rinse: 148.2 Total TS1: 21.3	Container TS2 Weights Empty Wt: 127.5 After Act. Rinse: 153.8 Total TS2: 26.3	Container TS3 Weights Empty Wt: 126.9 After Act. Rinse: 148.7 Total TS3: 21.8	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: Final Wt: 2 Gain: Colour:	Purge On: Purge Off:	Acetone/Hexane Rinse Empty Wt: 282.5 After Acetone Rinse: 327.8 After Hexane Rinse: 393.5
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: Initial Wt: Final Wt: 3 Gain: Colour:	CONTAINER TS5 Empty Wt: 282.9 With Imp 2: 385.0 After H_2O Rinse: 492.0 Total Volume TS5: 209.1	
				Impinger #4 Silica Gel Initial Wt: Final Wt: 4 Gain: % Spent:	CONTAINER TS6 Secondary Filter Seal and label container TS6	
				CWTR=1+2+3: WCBDA=4:		

SAMPLE IDENTIFICATION	17-21840-M201A-
TS1 (Part. > 10)	50
TS2 (Part. > 2.5)	51
TS3 (Part. < 2.5)	52
TS4 (Back Up Filter, <2.5)	53
TS5 (Imp 2 H_20 and rinse)	54
TS6 (Secondary Filter)	55
TS7 (Acetone / Hexane rinse)	56

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: MAY 30, 18

APPENDIX 14

SVOC Train Recovery Data Sheets
(8 pages)

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: 1
Test Date: May 31, 18
Test Location: WHT

Sample ID 1	Sample ID 2	Sample ID 3	Sample ID 4	Sample ID 5	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 426.2	Colour: WHITE	Initial Wt: 367.6	Impinger #1 Empty	Empty Wt: 422.4	Initial Wt: 957.2
After Acetone/ Hexane Rinse: 661.6	FOLD IN FOIL	1 Final Wt: 374.1	Empty Wt: 608.3	After Acetone Rinse: 540.1	Final Wt: 968.6
Total TS1: 235.4	SEAL AND LABEL CONTAINER TS2	Gain: 6.5	2 Final Wt: 1142.6	After Hexane Rinse: 840.2	5 Gain: 11.4
MARK FLUID LEVEL		Colour: WHITE	Gain: 534.3	Total TS5: 217.8	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CLEAR		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 665.1		
			Initial Wt: 778.9		
			Final Wt: 814.7		
			3 Gain: 35.8		
			Colour: CLEAR		
			Impinger #3 Empty		
			Empty Wt: 654.4		
			Final Wt: 654.8		
			4 Gain: 0.4		
			Colour: CLEAR		

Impinger Box ID: 6

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-J
Trap ID:	8
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178671
Acetone Batch No.:	166960

Container TS4 Weights	
Empty Wt:	422.5
With Imp Soln:	1095.7
Imp Volume:	673.2
After ~100g H_2O Rinse:	1192.2
Total TS4:	769.7

CWTR = 1 + 2 + 3 + 4: 577.0 ✓

WCBDA=5: 11.4

Train Loaded By: RM
Train Recovered By: DT
Recovery Witnessed By:
Date: May 31, 18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: 2
Test Date: MAY 31, 18
Test Location: UNIT 1

Sample ID 6	Sample ID 7	Sample ID 8	Sample ID 9	Sample ID 10	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 426.4	Colour: WHITE	Initial Wt: 326.4	Impinger #1 Empty	Empty Wt: 429.1	Initial Wt: 860.8
After Acetone/ Hexane Rinse: 720.6	FOLD IN FOIL	1 Final Wt: 333.0	Empty Wt: 602.6	After Acetone Rinse: 931.2	Final Wt: 878.3
Total TS1: 294.2	SEAL AND LABEL CONTAINER TS2	Gain: 6.6	Final Wt: 1117.5	After Hexane Rinse: 635.7	5 Gain: 17.4
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 514.9	Total TS5: 306.6	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: clear		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 652.4		
			Initial Wt: 754.2		
			Final Wt: 799.7		
			3 Gain: 45.5		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 641.8		
			Final Wt: 648.4		
			4 Gain: 0.6		
			Colour: clear		

Impinger Box ID: 11

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-J
Trap ID:	4
HPLC Batch No.:	174181S
Ethylene Gylcol Batch No.:	ALS R
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	423.9
With Imp Soln:	1075.8
Imp Volume:	651.9
After ~100g H_2O Rinse:	~~446.1~~ 1176.1
Total TS4:	752.2

CWTR = 1 + 2 + 3 + 4: 567.6

WCBDA=5: 17.4

Train Loaded By: RM
Train Recovered By: RM
Recovery Witnessed By:
Date: MAY 31, 18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: 3
Test Date: JUNE 1, 18
Test Location: UNIT 4

Sample ID 11	Sample ID 12	Sample ID 13	Sample ID 14	Sample ID 15	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 427.0	Colour: WHITE	Initial Wt: 396.3	Impinger #1 Empty	Empty Wt: 429.0	Initial Wt: 909.7
After Acetone/ Hexane Rinse: 708.1	FOLD IN FOIL	1 Final Wt: 393.2	Empty Wt: 485.1	After Acetone Rinse: 541.9	Final Wt: 922.1
Total TS1: 281.1		Gain: 69	Final Wt: 1042.8	After Hexane Rinse: 629.3	5 Gain: 12.4
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 557.7	Total TS5: 200.3	% Spent:
MARK FLUID LEVEL		SEAL TRAP	Colour: CLEAR		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
SEAL AND LABEL CONTAINER TS1		LABEL A5 CONTAINER TS3	Empty Wt: 670.5		
			Initial Wt: 782.9		
			Final Wt: 829.5		
			3 Gain: 46.6		
			Colour: CLEAR		
			Impinger #3 Empty		
			Empty Wt: 583.0	Impinger Box ID: 16	
			Final Wt: 583.4		
			4 Gain: 0.4		
			Colour: CLEAR		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-J
Trap ID:	5
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	174157
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	423.4
With Imp Soln:	1130.7
Imp Volume:	707.3
After ~100g H_2O Rinse:	1229.4
Total TS4:	806.0

CWTR = 1 + 2 + 3 + 4: 611.6

WCBDA=5: 12.4

Train Loaded By: DM
Train Recovered By: ST
Recovery Witnessed By:
Date: June 1, 18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client :	Covanta DYEC
Project No.:	21840
Sample Batch No.:	18-21840-SVOC-

Test No.:	1
Test Date:	MAY 2, 18
Test Location:	UNIT 2

Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	
21	22	23	24	25	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 426.0	Colour: WHITE	Initial Wt: 393.5 (300.1)	Impinger #1 Empty	Empty Wt: 429.3	Initial Wt: 888.8
After Acetone/ Hexane Rinse: 602.8	FOLD IN FOIL	Final Wt: 402.2	Empty Wt: 607.6	After Acetone Rinse: 578.3	Final Wt: 905.4
Total TS1: 176.8	SEAL AND LABEL CONTAINER TS2	1 Gain: 8.4	Final Wt: 1137.8	After Hexane Rinse: 627.0	5 Gain: 16.6
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 530.2	Total TS5: 197.7	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CLEAR		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 665.2		
			Initial Wt: 783.6		
			Final Wt: 906.5		
			3 Gain: 122.9		
			Colour: CLEAR		
			Impinger #3 Empty		
			Empty Wt: 685.4		
			Final Wt: 685.8		
			4 Gain: 0.4		
			Colour: CLEAR		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-1
Trap ID:	9x7
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178367
Acetone Batch No.:	166960

Container TS4 Weights	
Empty Wt:	426.2
With Imp Soln:	1184.2
Imp Volume:	758.0
After ~100g H_2O Rinse:	1294.2
Total TS4:	868.0

CWTR = 1 + 2 + 3 + 4:	661.9
WCBDA=5:	16.6

Impinger Box ID: 8

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By:	DH
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAY 3, 18

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: 2
Test Date: JUNE 1, 18
Test Location: UNIT 2

Sample ID 26	Sample ID 27	Sample ID 28	Sample ID 29	Sample ID 30	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 423.1	Colour: WHITE	Initial Wt: 411.4	Impinger #1 Empty	Empty Wt: 423.4	Initial Wt: 850.5
After Acetone/ Hexane Rinse: 662.5	FOLD IN FOIL	1 Final Wt: 417.2	Empty Wt: 658.6	After Acetone Rinse: 823.8	Final Wt: 867.6
Total TS1: 239.4		Gain: 5.8	Final Wt: 1159.7	After Hexane Rinse: 625.4	5 Gain: 17.1
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 521.1	Total TS5: 202.0	% Spent: —
MARK FLUID LEVEL		SEAL TRAP	Colour: CLEAR		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
SEAL AND LABEL CONTAINER TS1		LABEL AS CONTAINER TS3	Empty Wt: 619.6		
			Initial Wt: 759.8		
			Final Wt: 904.4		
			3 Gain: 144.6		
			Colour: CLEAR		
			Impinger #3 Empty		
			Empty Wt: 656.0	Impinger Box ID: 4	
			Final Wt: 657.0		
			4 Gain: 1.0		
			Colour: CLEAR		
			Container TS4 Weights		
			Empty Wt: 427.7		
			With Imp Soln: 1184.7		
			Imp Volume: 767.0		
			After ~100g H_2O Rinse: 1320.1		
			Total TS4: 892.4		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-J
Trap ID:	6
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178567
Acetone Batch No.:	166960

CWTR = 1 + 2 + 3 + 4: 672.5 ✓

WCBDA=5: 17.1

Train Loaded By: RM
Train Recovered By: DP
Recovery Witnessed By:
Date: JUNE 1, 18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: 3
Test Date: UNIT 2
Test Location: June 1, 18

Sample ID 31	Sample ID 32	Sample ID 33	Sample ID 34	Sample ID 35	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 426.9	Colour: White	Initial Wt: 391.4	Impinger #1 Empty	Empty Wt: 427.8	Initial Wt: 987.3
After Acetone/ Hexane Rinse: 841.3	FOLD IN FOIL	1 Final Wt: 393.2	Empty Wt: 601.6	After Acetone Rinse: 533.5	Final Wt: 1005.5
Total TS1: 414.4	SEAL AND LABEL CONTAINER TS2	Gain: 1.8	2 Final Wt: 1123.1	After Hexane Rinse: 628.5	5 Gain: 18.2
MARK FLUID LEVEL	SEAL TRAP	Colour: WHITE	Gain: 521.5	Total TS5: 28.7	% Spent: —
SEAL AND LABEL CONTAINER TS1	WRAP IN FOIL	LABEL AS CONTAINER TS3	Colour: CLEAR		
			Impinger #2 Ethylene Glycol		
			Empty Wt: 655.3		
			Initial Wt: 755.8		
			Final Wt: 936.8		
			3 Gain: 181.0		
			Colour: CLEAR		
			Impinger #3 Empty		
			Empty Wt: 611.1		
			Final Wt: 613.6		
			4 Gain: 2.5		
			Colour: CLEAR		

Impinger Box ID: 1)

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-J
Trap ID:	11
HPLC Batch No.:	ACS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178567
Acetone Batch No.:	166760

Container TS4 Weights	
Empty Wt:	430.6
With Imp Soln:	1223.0
Imp Volume:	792.4
After ~100g H_2O Rinse:	1338.4
Total TS4:	907.8

CWTR = 1 + 2 + 3 + 4: 712.8 ✓

WCBDA=5: 18.2

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: June 1, 18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: BLANK 1
Test Date: MAY 3 4, 18
Test Location:

Sample ID 16	Sample ID 17	Sample ID 18	Sample ID 19	Sample ID 20	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 427.5 After Acetone/ Hexane Rinse: 619.6 Total TS1: 192.1	Colour: WHITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 369.2 Final Wt: 369.3 1 Gain: 0 Colour: WHITE SEAL TRAP WRAP IN FOIL LABEL AS CONTAINER TS3	Impinger #1 Empty Empty Wt: 602.0 Final Wt: 602.0 2 Gain: 0 Colour: — Impinger #2 Ethylene Glycol Empty Wt: 676.3 Initial Wt: 784.2 Final Wt: 784.2 3 Gain: 0 Colour: — Impinger #3 Empty Empty Wt: 643.3 Final Wt: 643.1 4 Gain: 0 Colour: — Container TS4 Weights Empty Wt: 431.6 With Imp Soln: 533.3 Imp Volume: 101.6 After ~100g H_2O Rinse: 640.7 Total TS4: 209.1	Empty Wt: 427.5 After Acetone Rinse: 546.5 After Hexane Rinse: 650.9 Total TS5: 223.4	Initial Wt: Final Wt: 5 Gain: % Spent:
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1					

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-3
Trap ID:	A4
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178567
Acetone Batch No.:	166960

Impinger Box ID:

Train Loaded By: DL
Train Recovered By: DL
Recovery Witnessed By: —
Date: MAY 3 4, 18

CWTR = 1 + 2 + 3 + 4:

WCBDA=5:

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21840
Sample Batch No.: 18-21840-SVOC-

Test No.: BLANK 2
Test Date: MAY 31, 18
Test Location:

Sample ID 36	Sample ID 37	Sample ID 38	Sample ID 39	Sample ID 40	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 430.6	Colour: WHITE	Initial Wt: 410.7	Impinger #1 Empty	Empty Wt: 430.5	Initial Wt:
After Acetone/ Hexane Rinse: 575.6	FOLD IN FOIL	1 Final Wt: 410.7	Empty Wt: 645.3	After Acetone Rinse: 576.2	Final Wt:
Total TS1: 145.0	SEAL AND LABEL CONTAINER TS2	Gain: 0	Final Wt: 645.3	After Hexane Rinse: 852.1	5 Gain:
MARK FLUID LEVEL	SEAL TRAP	Colour: WHITE	2 Gain: 0	Total TS5: 221.6	% Spent:
SEAL AND LABEL CONTAINER TS1	WRAP IN FOIL		Colour:		
	LABEL AS CONTAINER TS3		Impinger #2 Ethylene Glycol		
			Empty Wt: 603.8		
			Initial Wt: 710.4		
			Final Wt: 710.4		
			3 Gain: 0		
			Colour:		
			Impinger #3 Empty		
			Empty Wt: 657.4		
			Final Wt: 657.4		
			4 Gain: 0		
			Colour:		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	A-1
Trap ID:	1
HPLC Batch No.:	ACS
Ethylene Gylcol Batch No.:	174107
Hexane Batch No.:	178807
Acetone Batch No.:	166960

Container TS4 Weights	
Empty Wt:	423.6
With Imp Soln:	530.1
Imp Volume:	106.5
After ~100g H_2O Rinse:	636.5
Total TS4:	212.9

Impinger Box ID:

Train Loaded By: DT
Train Recovered By: BT
Recovery Witnessed By:
Date: MAY 31, 18

CWTR = 1 + 2 + 3 + 4:	
WCBDA=5:	

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

APPENDIX 15

SVOC Analytical Report
(67 pages)

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104490		Mississauga, ON L5J 2Y4
Date of Revised Report	14-Jun-18		Canada
Date of Sample Receipt	4-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **PCDD/F by EPA M23**

***** REVISED REPORT *****

This report supersedes all prior reports for the above-noted workorder and test. The report has been revised as follows:
On further review it was found that the result for 1,2,3,6,7,8-HxCDF was incorrect in cases where other selected compounds were being reported from DB-225 second-column confirmation data.

These sample extracts received column solid phase extraction cleanup with Florisil as well as activated carbon prior to analysis by GC/HRMS.

There were peaks observed in the parent octachlorodiphenylether mass that coeluted with HxCDF targets. However, the extract has received cleanup steps designed to exclude diphenylethers. In addition, in cases where peaks did not coelute with a HxCDF peak, no peak was observed in the HxCDF mass, as would be expected for an octachlorodiphenylether. No bias to HxCDF data is expected.

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.
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Sample Analysis summary Report

Sample Name	18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)	18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)	18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)	18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)	18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)	18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)
ALS Sample ID	L2104490-1	L2104490-2	L2104490-3	L2104490-4	L2104490-5	L2104490-6
Sample Size	1	1	1	1	1	1
Sample size units	Train	Train	Train	Train	Train	Train
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	31-May-18	31-May-18	1-Jun-18	31-May-18	31-May-18	1-Jun-18
Extraction Date	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
2,3,7,8-TCDD	<4.6	<4.9	<6.9	<2.2	<3.6	<3.8
1,2,3,7,8-PeCDD	<12	<8.2	<9.9	<1.6	13.4	<10
1,2,3,4,7,8-HxCDD	35.8	32.7	<25	<1.7	44.9	47.4
1,2,3,6,7,8-HxCDD	87.3	77.1	78.0	<1.6	107	97.4
1,2,3,7,8,9-HxCDD	32.3	33.6	32.2	<1.7	40.3	37.7
1,2,3,4,6,7,8-HpCDD	698	630	657	6.19	721	774
OCDD	706	743	728	216	1160	1230
2,3,7,8-TCDF	8.85	4.90	5.15	<1.2	<2.2	<4.5
1,2,3,7,8-PeCDF	13.2	12.4	8.99	<2.2	8.23	11.4
2,3,4,7,8-PeCDF	23.5	16.6	17.7	<1.1	19.8	20.0
1,2,3,4,7,8-HxCDF	27.3	30.8	20.0	<1.7	31.1	32.5
1,2,3,6,7,8-HxCDF	29.2	23.7	25.0	<1.6	33.1	36.8
2,3,4,6,7,8-HxCDF	46.4	42.4	39.3	<1.7	59.4	64.4
1,2,3,7,8,9-HxCDF	6.33	<3.5	4.83	<3.1	<4.0	<2.4
1,2,3,4,6,7,8-HpCDF	133	137	118	<1.6	167	174
1,2,3,4,7,8,9-HpCDF	24.7	22.6	23.9	<2.1	36.1	36.7
OCDF	72.5	57.6	<61	4.19	83.8	98.7
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	91	89	90	94	90	91
13C12-1,2,3,4,7,8-HxCDD	98	104	98	100	100	101
13C12-2,3,4,7,8-PeCDF	99	98	100	101	95	104
13C12-1,2,3,4,7,8-HxCDF	92	93	90	93	92	93
13C12-1,2,3,4,7,8,9-HpCDF	101	101	103	102	102	104
Extraction Standards						
13C12-2,3,7,8-TCDD	51	52	45	69	58	65
13C12-1,2,3,7,8-PeCDD	78	65	66	92	73	88
13C12-1,2,3,6,7,8-HxCDD	66	56	58	74	59	72
13C12-1,2,3,4,6,7,8-HpCDD	80	67	65	85	68	84
13C12-OCDD	89	75	72	93	70	91
13C12-2,3,7,8-TCDF	57	62	57	76	67	77
13C12-1,2,3,7,8-PeCDF	91	79	78	91	84	100
13C12-1,2,3,6,7,8-HxCDF	75	58	61	72	63	78
13C12-1,2,3,4,6,7,8-HpCDF	80	69	66	87	69	85
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	75	76	75	77	76	74
Homologue Group Totals	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
Total-TCDD	505	373	407	<2.2	160	163
Total-PeCDD	566	653	544	<1.6	681	710
Total-HxCDD	1680	1580	1560	<1.7	2060	2120
Total-HpCDD	1450	1280	1380	6.19	1440	1550
Total-TCDF	229	155	56.3	<1.2	20.7	63.8
Total-PeCDF	187	199	147	<1.1	154	289
Total-HxCDF	256	210	194	<2.0	372	387
Total-HpCDF	200	160	176	<1.0	308	325
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	43.6	38.0	34.2	0.128	60.8	48.2
Mid Point PCDD/F TEQ (WHO 2005)	57.9	48.8	50.1	3.17	63.1	60.7
Upper Bound PCDD/F TEQ (WHO 2005)	60.2	51.5	53.6	5.79	65.0	62.7

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Sample Analysis summary Report

Sample Name	18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)	18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)
ALS Sample ID	L2104490-7	L2104490-8
Sample Size	1	1
Sample size units	Train	Train
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	1-Jun-18	31-May-18
Extraction Date	4-Jun-18	4-Jun-18
Target Analytes	**pg**	**pg**
2,3,7,8-TCDD	<4.4	<2.4
1,2,3,7,8-PeCDD	<9.2	<1.8
1,2,3,4,7,8-HxCDD	41.8	<1.6
1,2,3,6,7,8-HxCDD	104	<1.5
1,2,3,7,8,9-HxCDD	46.4	<1.6
1,2,3,4,6,7,8-HpCDD	804	6.21
OCDD	1450	214
2,3,7,8-TCDF	4.90	<1.3
1,2,3,7,8-PeCDF	<10	<1.3
2,3,4,7,8-PeCDF	21.0	<1.3
1,2,3,4,7,8-HxCDF	36.8	<1.6
1,2,3,6,7,8-HxCDF	42.1	<1.5
2,3,4,6,7,8-HxCDF	70.1	<1.6
1,2,3,7,8,9-HxCDF	3.93	<3.7
1,2,3,4,6,7,8-HpCDF	184	<0.99
1,2,3,4,7,8,9-HpCDF	35.0	<1.8
OCDF	107	<1.2
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	92	90
13C12-1,2,3,4,7,8-HxCDD	96	96
13C12-2,3,4,7,8-PeCDF	97	100
13C12-1,2,3,4,7,8-HxCDF	98	95
13C12-1,2,3,4,7,8,9-HpCDF	103	107
Extraction Standards		
13C12-2,3,7,8-TCDD	77	67
13C12-1,2,3,7,8-PeCDD	100	89
13C12-1,2,3,6,7,8-HxCDD	80	73
13C12-1,2,3,4,6,7,8-HpCDD	85	83
13C12-OCDD	89	88
13C12-2,3,7,8-TCDF	93	73
13C12-1,2,3,7,8-PeCDF	113	87
13C12-1,2,3,6,7,8-HxCDF	86	75
13C12-1,2,3,4,6,7,8-HpCDF	88	83
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	80	74
Homologue Group Totals	**pg**	**pg**
Total-TCDD	252	<2.4
Total-PeCDD	774	<1.8
Total-HxCDD	2160	<1.6
Total-HpCDD	1620	10.6
Total-TCDF	98.6	<1.3
Total-PeCDF	269	<1.3
Total-HxCDF	445	<1.9
Total-HpCDF	279	<1.3
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	52.0	0.126
Mid Point PCDD/F TEQ (WHO 2005)	63.7	3.37
Upper Bound PCDD/F TEQ (WHO 2005)	65.9	6.22

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Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2786749-1	WG2786749-2
Sample Size	1	1
Sample size units	Train	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	4-Jun-18	4-Jun-18
Target Analytes	**pg**	**% Rec**
2,3,7,8-TCDD	<3.2	110
1,2,3,7,8-PeCDD	2.25	107
1,2,3,4,7,8-HxCDD	2.53	103
1,2,3,6,7,8-HxCDD	<3.3	106
1,2,3,7,8,9-HxCDD	<2.1	113
1,2,3,4,6,7,8-HpCDD	<7.2	103
OCDD	211	97
2,3,7,8-TCDF	<1.5	95
1,2,3,7,8-PeCDF	<2.3	102
2,3,4,7,8-PeCDF	<1.9	105
1,2,3,4,7,8-HxCDF	2.79	95
1,2,3,6,7,8-HxCDF	<2.3	100
2,3,4,6,7,8-HxCDF	<2.2	98
1,2,3,7,8,9-HxCDF	3.91	99
1,2,3,4,6,7,8-HpCDF	3.59	98
1,2,3,4,7,8,9-HpCDF	<1.7	97
OCDF	<4.7	94
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	63	37
13C12-1,2,3,7,8-PeCDD	84	63
13C12-1,2,3,6,7,8-HxCDD	68	44
13C12-1,2,3,4,6,7,8-HpCDD	84	52
13C12-OCDD	88	55
13C12-2,3,7,8-TCDF	70	40
13C12-1,2,3,7,8-PeCDF	81	57
13C12-1,2,3,6,7,8-HxCDF	66	42
13C12-1,2,3,4,6,7,8-HpCDF	87	52
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	79	68
Homologue Group Totals	**pg**	
Total-TCDD	<3.2	
Total-PeCDD	2.25	
Total-HxCDD	2.53	
Total-HpCDD	<2.5	
Total-TCDF	<1.5	
Total-PeCDF	<1.0	
Total-HxCDF	6.70	
Total-HpCDF	3.59	
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	3.27	
Mid Point PCDD/F TEQ (WHO 2005)	6.55	
Upper Bound PCDD/F TEQ (WHO 2005)	8.34	

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-1	Extraction Date	4-Jun-18
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	5

Approved:
T.Patterson
--e-signature--
07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A07	1-180611DS004
Run Date	06-Jun-18 19:24	11-Jun-18 15:53
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 D85MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	28.21	<4.6	4.6	M,U	2.4	50						
1,2,3,7,8-PeCDD	1	32.17	<12	2.5	M,J,R	12	250						
1,2,3,4,7,8-HxCDD	0.1	34.18	35.8	3.7	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.22	87.3	3.6	J		250						
1,2,3,7,8,9-HxCDD	0.1							22.31	32.3	4.0	M,J		250
1,2,3,4,6,7,8-HpCDD	0.01	35.82	698	3.7			250						
OCDD	0.0003	37.32	706	2.9	B		500						
2,3,7,8-TCDF	0.1	27.31	8.85	4.2	M,J		50						
1,2,3,7,8-PeCDF	0.03	31.25	13.2	3.4	J		250						
2,3,4,7,8-PeCDF	0.3							19.05	23.5	1.0	J		250
1,2,3,4,7,8-HxCDF	0.1	33.69	27.3	3.0	J,B		250						
1,2,3,6,7,8-HxCDF	0.1	33.77	29.2	2.8	J		250						
2,3,4,6,7,8-HxCDF	0.1	34.09	46.4	3.0	M,J		250						
1,2,3,7,8,9-HxCDF	0.1							23.24	6.33	2.2	M,J,B		250
1,2,3,4,6,7,8-HpCDF	0.01	35.26	133	1.8	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.08	24.7	2.3	M,J		250						
OCDF	0.0003	37.42	72.5	1.6	J		500						
Field Spike Standards	**pg**		**% Rec**	**Limits**					**% Rec**				
37Cl4-2,3,7,8-TCDD	800	28.21	91	70-130									
13C12-1,2,3,4,7,8-HxCDD	8000	34.17	98	70-130	R								
13C12-2,3,4,7,8-PeCDF	8000	31.96	99	70-130									
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	92	70-130									
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.07	101	70-130									
Extraction Standards													
13C12-2,3,7,8-TCDD	10000	28.20	51	40-130									
13C12-1,2,3,7,8-PeCDD	10000	32.16	78	40-130									
13C12-1,2,3,6,7,8-HxCDD	10000	34.22	66	40-130									
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.82	80	25-130									
13C12-OCDD	20000	37.32	89	25-130									
13C12-2,3,7,8-TCDF	10000	27.28	57	40-130									
13C12-1,2,3,7,8-PeCDF	10000			40-130				17.00	91				
13C12-1,2,3,6,7,8-HxCDF	10000			40-130				20.36	75				
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.26	80	25-130									
Cleanup Standard	**pg**												
13C12-1,2,3,7,8,9-HxCDF	10000	34.49	75	40-130									

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	7	505	4.6		50
Total-PeCDD	5	566	2.5		250
Total-HxCDD	6	1680	3.8		250
Total-HpCDD	2	1450	3.7		250
Total-TCDF	10	229	4.2		50
Total-PeCDF	7	187	3.4		250
Total-HxCDF	8	256	3.5		250
Total-HpCDF	3	200	2.3		250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	43.6
Mid Point PCDD/F TEQ (WHO 2005)	57.9
Upper Bound PCDD/F TEQ (WHO 2005)	60.2

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration -- elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-2	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA M23	Sample Size	1 Train	*T.Patterson*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A08	1-180611DS005
Run Date	06-Jun-18 20:06	11-Jun-18 16:31
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<4.9	4.9	U		50						
1,2,3,7,8-PeCDD	1	32.19	<8.2	3.9	M,J,R	8.2	250						
1,2,3,4,7,8-HxCDD	0.1	34.20	32.7	4.6	M,J		250						
1,2,3,6,7,8-HxCDD	0.1	34.24	77.1	4.4	J		250						
1,2,3,7,8,9-HxCDD	0.1							22.32	33.6	4.4	J		250
1,2,3,4,6,7,8-HpCDD	0.01	35.84	630	3.5			250						
OCDD	0.0003	37.34	743	3.0	B		500						
2,3,7,8-TCDF	0.1							15.25	4.90	3.1	M,J		50
1,2,3,7,8-PeCDF	0.03	31.27	12.4	5.7	M,J		250						
2,3,4,7,8-PeCDF	0.3							19.05	16.6	1.9	M,J		250
1,2,3,4,7,8-HxCDF	0.1							20.20	30.8	2.7	J		250
1,2,3,6,7,8-HxCDF	0.1	33.78	23.7	4.4	M,J		250						
2,3,4,6,7,8-HxCDF	0.1	34.11	42.4	4.7	M,J		250						
1,2,3,7,8,9-HxCDF	0.1							23.21	<3.5	3.5	M,U	3.0	250
1,2,3,4,6,7,8-HpCDF	0.01	35.29	137	2.5	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.10	22.6	3.3	M,J		250						
OCDF	0.0003	37.43	57.6	1.6	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**
37Cl4-2,3,7,8-TCDD	800	28.23	89	70-130		
13C12-1,2,3,4,7,8-HxCDD	8000	34.18	104	70-130		
13C12-2,3,4,7,8-PeCDF	8000	31.97	98	70-130		
13C12-1,2,3,4,7,8-HxCDF	8000	33.70	93	70-130		
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.08	101	70-130		
Extraction Standards						
13C12-2,3,7,8-TCDD	10000	28.20	52	40-130		
13C12-1,2,3,7,8-PeCDD	10000	32.17	65	40-130		
13C12-1,2,3,6,7,8-HxCDD	10000	34.24	56	40-130		
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.83	67	25-130		
13C12-OCDD	20000	37.33	75	25-130		
13C12-2,3,7,8-TCDF	10000			40-130	15.24	62
13C12-1,2,3,7,8-PeCDF	10000			40-130	17.00	79
13C12-1,2,3,6,7,8-HxCDF	10000			40-130	20.35	58
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.28	69	25-130		
Cleanup Standard	**pg**					
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	76	40-130		

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	3	373	4.9	50
Total-PeCDD	6	653	3.9	250
Total-HxCDD	6	1580	4.8	250
Total-HpCDD	2	1280	3.5	250
Total-TCDF	8	155	3.0	50
Total-PeCDF	8	199	5.7	250
Total-HxCDF	5	210	5.6	250
Total-HpCDF	2	160	3.3	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	38.0
Mid Point PCDD/F TEQ (WHO 2005)	48.8
Upper Bound PCDD/F TEQ (WHO 2005)	51.5

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)**	Sampling Date	1-Jun-18	
ALS Sample ID	L2104490-3	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA M23	Sample Size	1 Train	*T.Patterson*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A09	1-180611DS006
Run Date	06-Jun-18 20:48	11-Jun-18 17:08
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<6.9	6.9	U		50						
1,2,3,7,8-PeCDD	1	32.18	<9.9	1.9	M,J,R	9.9	250						
1,2,3,4,7,8-HxCDD	0.1	34.18	<25	14	M,J,R	25	250						
1,2,3,6,7,8-HxCDD	0.1	34.23	78.0	13	M,J		250						
1,2,3,7,8,9-HxCDD	0.1							22.31	32.2	3.9	J		250
1,2,3,4,6,7,8-HpCDD	0.01	35.83	657	4.6			250						
OCDD	0.0003	37.33	728	3.4	B		500						
2,3,7,8-TCDF	0.1							15.24	5.15	3.2	M,J		50
1,2,3,7,8-PeCDF	0.03	31.26	8.99	3.2	M,J		250						
2,3,4,7,8-PeCDF	0.3							19.05	17.7	1.7	M,J		250
1,2,3,4,7,8-HxCDF	0.1	33.70	20.0	4.0	M,J,B		250						
1,2,3,6,7,8-HxCDF	0.1	33.77	25.0	3.7	M,J		250						
2,3,4,6,7,8-HxCDF	0.1	34.10	39.3	4.0	M,J		250						
1,2,3,7,8,9-HxCDF	0.1							23.21	4.83	2.8	M,J,B		250
1,2,3,4,6,7,8-HpCDF	0.01	35.28	118	2.2	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.08	23.9	2.8	J		250						
OCDF	0.0003	37.42	<61	2.2	M,J,R	61	500						

Field Spike Standards	**pg**		**% Rec**	**Limits**			**% Rec**
37Cl4-2,3,7,8-TCDD	800	28.21	90	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.18	98	70-130	R		
13C12-2,3,4,7,8-PeCDF	8000	31.96	100	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	90	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.08	103	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	10000	28.20	45	40-130			
13C12-1,2,3,7,8-PeCDD	10000	32.17	66	40-130			
13C12-1,2,3,6,7,8-HxCDD	10000	34.23	58	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.82	65	25-130			
13C12-OCDD	20000	37.32	72	25-130			
13C12-2,3,7,8-TCDF	10000	27.28	57	40-130			15.24 57
13C12-1,2,3,7,8-PeCDF	10000	31.28	78	40-130			17.00 78
13C12-1,2,3,6,7,8-HxCDF	10000	32.96	61	40-130			20.36 61
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.26	66	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	75	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	4	407	6.9	50
Total-PeCDD	4	544	1.9	250
Total-HxCDD	5	1560	14	250
Total-HpCDD	2	1380	4.6	250
Total-TCDF	6	56.3	4.4	50
Total-PeCDF	7	147	3.2	250
Total-HxCDF	9	194	4.7	250
Total-HpCDF	3	176	2.8	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	34.2
Mid Point PCDD/F TEQ (WHO 2005)	50.1
Upper Bound PCDD/F TEQ (WHO 2005)	53.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)**	Sampling Date	31-May-18		Approved:
ALS Sample ID	L2104490-4	Extraction Date	4-Jun-18		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		07-Jun-2018
Sample Matrix	Stack	Split Ratio	5		

Run Information	**Run 1**
Filename	5-180606A10
Run Date	06-Jun-18 21:30
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<2.2	2.2	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<1.6	1.6	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.7	1.7	U		250
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<1.6	1.6	U		250
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<1.7	1.7	U		250
1,2,3,4,6,7,8-HpCDD	0.01	35.82	6.19	2.0	M,J		250
OCDD	0.0003	37.33	216	1.4	J,B		500
2,3,7,8-TCDF	0.1	NotFnd	<1.2	1.2	U		50
1,2,3,7,8-PeCDF	0.03	31.26	<2.2	1.1	J,R	2.2	250
2,3,4,7,8-PeCDF	0.3	NotFnd	<1.1	1.1	U		250
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<1.7	1.7	U		250
1,2,3,6,7,8-HxCDF	0.1	33.78	<1.6	1.6	M,U		250
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<1.7	1.7	U		250
1,2,3,7,8,9-HxCDF	0.1	34.51	<3.1	2.0	M,J,R	3.1	250
1,2,3,4,6,7,8-HpCDF	0.01	35.26	<1.6	0.80	M,J,R	1.6	250
1,2,3,4,7,8,9-HpCDF	0.01	36.08	<2.1	1.0	M,J,R	2.1	250
OCDF	0.0003	37.41	4.19	1.1	M,J		500

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	800	28.21	94	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	34.17	100	70-130
13C12-2,3,4,7,8-PeCDF	8000	31.96	101	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	93	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.07	102	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	28.20	69	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.16	92	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.22	74	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.82	85	25-130
13C12-OCDD	20000	37.32	93	25-130
13C12-2,3,7,8-TCDF	10000	27.28	76	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.25	91	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.76	72	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.26	87	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.50	77	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**Flags**	**LQL**
Total-TCDD	0	<2.2	2.2	U	50
Total-PeCDD	0	<1.6	1.6	U	250
Total-HxCDD	0	<1.7	1.7	U	250
Total-HpCDD	1	6.19	2.0		250
Total-TCDF	0	<1.2	1.2	U	50
Total-PeCDF	0	<1.1	1.1	U	250
Total-HxCDF	0	<2.0	2.0	U	250
Total-HpCDF	0	<1.0	1.0	U	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.128
Mid Point PCDD/F TEQ (WHO 2005)	3.17
Upper Bound PCDD/F TEQ (WHO 2005)	5.79

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-5	Extraction Date	4-Jun-18
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	5

Approved:
T.Patterson
--e-signature--
07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A11	1-180611DS007
Run Date	06-Jun-18 22:12	11-Jun-18 17:46
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.6	3.6	U		50						
1,2,3,7,8-PeCDD	1	32.18	13.4	2.8	J,B		250						
1,2,3,4,7,8-HxCDD	0.1	34.18	44.9	3.7	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.24	107	3.6	J		250						
1,2,3,7,8,9-HxCDD	0.1							22.33	40.3	3.5	J		250
1,2,3,4,6,7,8-HpCDD	0.01	35.83	721	4.3			250						
OCDD	0.0003	37.33	1160	4.2	B		500						
2,3,7,8-TCDF	0.1							15.27	<2.2	2.2	M,U	1.6	50
1,2,3,7,8-PeCDF	0.03	31.26	8.23	4.3	J		250						
2,3,4,7,8-PeCDF	0.3							19.07	19.8	1.4	M,J		250
1,2,3,4,7,8-HxCDF	0.1	33.70	31.1	2.6	J		250						
1,2,3,6,7,8-HxCDF	0.1	33.77	33.1	2.4	J		250						
2,3,4,6,7,8-HxCDF	0.1	34.11	59.4	2.6	M,J		250						
1,2,3,7,8,9-HxCDF	0.1							23.27	<4.0	2.6	M,J,R	4.0	250
1,2,3,4,6,7,8-HpCDF	0.01	35.28	167	1.7	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.10	36.1	2.2	J		250						
OCDF	0.0003	37.43	83.8	1.5	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**	
37Cl4-2,3,7,8-TCDD	800	28.21	90	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.18	100	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.96	95	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	92	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.08	102	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	10000	28.20	58	40-130			
13C12-1,2,3,7,8-PeCDD	10000	32.17	73	40-130			
13C12-1,2,3,6,7,8-HxCDD	10000	34.23	59	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.82	68	25-130			
13C12-OCDD	20000	37.32	70	25-130			
13C12-2,3,7,8-TCDF	10000			40-130		15.26	67
13C12-1,2,3,7,8-PeCDF	10000			40-130		17.02	84
13C12-1,2,3,6,7,8-HxCDF	10000			40-130		20.37	63
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.26	69	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	76	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	2	160	3.6	50
Total-PeCDD	7	681	2.8	250
Total-HxCDD	7	2060	3.9	250
Total-HpCDD	2	1440	4.3	250
Total-TCDF	2	20.7	3.0	50
Total-PeCDF	6	154	4.3	250
Total-HxCDF	9	372	3.1	250
Total-HpCDF	4	308	2.2	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	60.8
Mid Point PCDD/F TEQ (WHO 2005)	63.1
Upper Bound PCDD/F TEQ (WHO 2005)	65.0

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)**	Sampling Date	1-Jun-18	
ALS Sample ID	L2104490-6	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA M23	Sample Size	1 Train	*T.Patterson*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A12	1-1B0611DS008
Run Date	06-Jun-18 22:53	11-Jun-18 18:23
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	28.17	<3.8	3.8	M,U		50						
1,2,3,7,8-PeCDD	1	32.18	<10	1.9	M,J,R	10	250						
1,2,3,4,7,8-HxCDD	0.1	34.18	47.4	2.1	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.24	97.4	2.0	M,J		250						
1,2,3,7,8,9-HxCDD	0.1							22.30	37.7	3.6	J		250
1,2,3,4,6,7,8-HpCDD	0.01	35.83	774	3.1			250						
OCDD	0.0003	37.33	1230	3.2	B		500						
2,3,7,8-TCDF	0.1							15.27	<4.5	2.9	M,J,R	4.5	50
1,2,3,7,8-PeCDF	0.03	31.26	11.4	2.2	M,J		250						
2,3,4,7,8-PeCDF	0.3							19.05	20.0	0.90	M,J		250
1,2,3,4,7,8-HxCDF	0.1	33.70	32.5	3.5	J		250						
1,2,3,6,7,8-HxCDF	0.1	33.77	36.8	3.2	M,J		250						
2,3,4,6,7,8-HxCDF	0.1	34.11	64.4	3.5	M,J		250						
1,2,3,7,8,9-HxCDF	0.1							NotFnd	<2.4	2.4	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.28	174	1.5	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.10	36.7	2.0	J		250						
OCDF	0.0003	37.42	98.7	1.7	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**
37Cl4-2,3,7,8-TCDD	800	28.21	91	70-130		
13C12-1,2,3,4,7,8-HxCDD	8000	34.18	101	70-130		
13C12-2,3,4,7,8-PeCDF	8000	31.96	104	70-130		
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	93	70-130		
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.08	104	70-130		
Extraction Standards						
13C12-2,3,7,8-TCDD	10000	28.20	65	40-130		
13C12-1,2,3,7,8-PeCDD	10000	32.17	88	40-130		
13C12-1,2,3,6,7,8-HxCDD	10000	34.23	72	40-130		
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.82	84	25-130		
13C12-OCDD	20000	37.32	91	25-130		
13C12-2,3,7,8-TCDF	10000			40-130	15.24	77
13C12-1,2,3,7,8-PeCDF	10000			40-130	17.00	100
13C12-1,2,3,6,7,8-HxCDF	10000			40-130	20.36	78
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.26	85	25-130		
Cleanup Standard	**pg**					
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	74	40-130		

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	4	163	3.8	50
Total-PeCDD	5	710	1.9	250
Total-HxCDD	7	2120	2.2	250
Total-HpCDD	2	1550	3.1	250
Total-TCDF	4	63.8	2.4	50
Total-PeCDF	9	289	2.2	250
Total-HxCDF	8	387	4.1	250
Total-HpCDF	4	325	2.0	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	48.2
Mid Point PCDD/F TEQ (WHO 2005)	60.7
Upper Bound PCDD/F TEQ (WHO 2005)	62.7

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)**	Sampling Date	1-Jun-18	
ALS Sample ID	L2104490-7	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA M23	Sample Size	1 Train	*T.Patterson*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	07-Jun-2018

Run Information	**Run 1**	**Run 2**
Filename	5-180606A13	1-180611DS009
Run Date	06-Jun-18 23:35	11-Jun-18 19:01
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H	HRMS-1 DB225USP652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<4.4	4.4	U		50						
1,2,3,7,8-PeCDD	1	32.17	<9.2	2.1	M,J,R	9.2	250						
1,2,3,4,7,8-HxCDD	0.1	34.18	41.8	2.3	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.23	104	2.2	J		250						
1,2,3,7,8,9-HxCDD	0.1	34.35	46.4	2.4	J		250						
1,2,3,4,6,7,8-HpCDD	0.01	35.82	804	4.1			250						
OCDD	0.0003	37.32	1450	2.5	B		500						
2,3,7,8-TCDF	0.1							15.27	4.90	2.1	J		50
1,2,3,7,8-PeCDF	0.03	31.26	<10	2.7	M,J,R	10	250						
2,3,4,7,8-PeCDF	0.3							19.05	21.0	1.5	J		250
1,2,3,4,7,8-HxCDF	0.1	33.69	36.8	2.0	J		250						
1,2,3,6,7,8-HxCDF	0.1	33.76	42.1	1.9	J		250						
2,3,4,6,7,8-HxCDF	0.1	34.09	70.1	2.1	J		250						
1,2,3,7,8,9-HxCDF	0.1							23.22	3.93	2.0	M,J,B		250
1,2,3,4,6,7,8-HpCDF	0.01	35.26	184	1.7	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	36.08	35.0	2.2	J		250						
OCDF	0.0003	37.41	107	1.5	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**
37Cl-2,3,7,8-TCDD	800	28.21	92	70-130		
13C12-1,2,3,4,7,8-HxCDD	8000	34.16	96	70-130		
13C12-2,3,4,7,8-PeCDF	8000	31.95	97	70-130		
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	98	70-130		
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.07	103	70-130		
Extraction Standards						
13C12-2,3,7,8-TCDD	10000	28.18	77	40-130		
13C12-1,2,3,7,8-PeCDD	10000	32.16	100	40-130		
13C12-1,2,3,6,7,8-HxCDD	10000	34.22	80	40-130		
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.81	85	25-130		
13C12-OCDD	20000	37.31	89	25-130		
13C12-2,3,7,8-TCDF	10000			40-130	15.24	93
13C12-1,2,3,7,8-PeCDF	10000			40-130	17.01	113
13C12-1,2,3,6,7,8-HxCDF	10000			40-130	20.36	86
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.25	88	25-130		
Cleanup Standard	**pg**					
13C12-1,2,3,7,8,9-HxCDF	10000	34.49	80	40-130		

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	4	252	4.4	50
Total-PeCDD	6	774	2.1	250
Total-HxCDD	7	2160	2.4	250
Total-HpCDD	2	1620	4.1	250
Total-TCDF	8	98.6	2.6	50
Total-PeCDF	9	269	2.7	250
Total-HxCDF	9	445	2.4	250
Total-HpCDF	3	279	2.2	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	52.0
Mid Point PCDD/F TEQ (WHO 2005)	63.7
Upper Bound PCDD/F TEQ (WHO 2005)	65.9

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)**	Sampling Date	31-May-18		Approved:
ALS Sample ID	L2104490-8	Extraction Date	4-Jun-18		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		07-Jun-2018
Sample Matrix	Stack	Split Ratio	5		

Run Information	**Run 1**
Filename	5-180606A14
Run Date	07-Jun-18 00:17
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<2.4	2.4	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<1.8	1.8	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.6	1.6	U		250
1,2,3,6,7,8-HxCDD	0.1	34.22	<1.5	1.5	M,U	1.4	250
1,2,3,7,8,9-HxCDD	0.1	34.36	<1.6	1.6	M,U	1.3	250
1,2,3,4,6,7,8-HpCDD	0.01	35.82	6.21	2.0	J		250
OCDD	0.0003	37.32	214	2.2	J,B		500
2,3,7,8-TCDF	0.1	NotFnd	<1.3	1.3	U		50
1,2,3,7,8-PeCDF	0.03	31.25	<1.3	1.3	M,U	1.2	250
2,3,4,7,8-PeCDF	0.3	NotFnd	<1.3	1.3	U		250
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<1.6	1.6	U		250
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.5	1.5	U		250
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<1.6	1.6	U		250
1,2,3,7,8,9-HxCDF	0.1	34.51	<3.7	1.9	M,J,R	3.7	250
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<0.99	0.99	U		250
1,2,3,4,7,8,9-HpCDF	0.01	36.08	<1.8	1.3	M,J,R	1.8	250
OCDF	0.0003	37.40	<1.2	1.1	M,J,R	1.2	500
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	28.21	90	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.16	96	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.96	100	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.69	95	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.07	107	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	10000	28.18	67	40-130			
13C12-1,2,3,7,8-PeCDD	10000	32.16	89	40-130			
13C12-1,2,3,6,7,8-HxCDD	10000	34.22	73	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.81	83	25-130			
13C12-OCDD	20000	37.31	88	25-130			
13C12-2,3,7,8-TCDF	10000	27.28	73	40-130			
13C12-1,2,3,7,8-PeCDF	10000	31.23	87	40-130			
13C12-1,2,3,6,7,8-HxCDF	10000	33.75	75	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.25	83	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.49	74	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<2.4	2.4	U	50
Total-PeCDD	0	<1.8	1.8	U	250
Total-HxCDD	0	<1.6	1.6	U	250
Total-HpCDD	2	10.6	2.0		250
Total-TCDF	0	<1.3	1.3	U	50
Total-PeCDF	0	<1.3	1.3	U	250
Total-HxCDF	0	<1.9	1.9	U	250
Total-HpCDF	0	<1.3	1.3	U	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.126
Mid Point PCDD/F TEQ (WHO 2005)	3.37
Upper Bound PCDD/F TEQ (WHO 2005)	6.22

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		Approved:
ALS Sample ID	WG2786749-1	Extraction Date	4-Jun-18		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Blank	Percent Moisture	n/a		07-Jun-2018
Sample Matrix	QC	Split Ratio	5		

Run Information	**Run 1**
Filename	5-180606A05
Run Date	06-Jun-18 18:00
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-5 DB5MSUSP662625H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.2	3.2	U		50
1,2,3,7,8-PeCDD	1	32.19	2.25	1.4	M,J		250
1,2,3,4,7,8-HxCDD	0.1	34.20	2.53	1.5	M,J		250
1,2,3,6,7,8-HxCDD	0.1	34.24	<3.3	1.4	M,J,R	3.3	250
1,2,3,7,8,9-HxCDD	0.1	34.36	<2.1	1.5	M,J,R	2.1	250
1,2,3,4,6,7,8-HpCDD	0.01	35.84	<7.2	2.5	M,J,R	7.2	250
OCDD	0.0003	37.34	211	2.5	J		500
2,3,7,8-TCDF	0.1	NotFnd	<1.5	1.5	U		50
1,2,3,7,8-PeCDF	0.03	31.27	<2.3	1.0	M,J,R	2.3	250
2,3,4,7,8-PeCDF	0.3	31.99	<1.9	1.0	M,J,R	1.9	250
1,2,3,4,7,8-HxCDF	0.1	33.71	2.79	2.2	M,J		250
1,2,3,6,7,8-HxCDF	0.1	33.78	<2.3	2.1	M,J,R	2.3	250
2,3,4,6,7,8-HxCDF	0.1	34.12	<2.2	2.2	M,U	1.7	250
1,2,3,7,8,9-HxCDF	0.1	34.51	3.91	2.6	M,J		250
1,2,3,4,6,7,8-HpCDF	0.01	35.29	3.59	1.3	M,J		250
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<1.7	1.7	U		250
OCDF	0.0003	37.44	<4.7	1.3	M,J,R	4.7	500
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	NotFnd	0	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	NotFnd	0	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.98	0	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	NotFnd	0	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.11	0	70-130	R		
Extraction Standards							
13C12-2,3,7,8-TCDD	10000	28.20	63	40-130			
13C12-1,2,3,7,8-PeCDD	10000	32.17	84	40-130			
13C12-1,2,3,6,7,8-HxCDD	10000	34.24	68	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.83	84	25-130			
13C12-OCDD	20000	37.33	88	25-130			
13C12-2,3,7,8-TCDF	10000	27.29	70	40-130			
13C12-1,2,3,7,8-PeCDF	10000	31.26	81	40-130			
13C12-1,2,3,6,7,8-HxCDF	10000	33.77	66	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.28	87	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	79	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	0	<3.2	3.2	U	50
Total-PeCDD	1	2.25	1.4		250
Total-HxCDD	1	2.53	1.5		250
Total-HpCDD	0	<2.5	2.5	U	250
Total-TCDF	0	<1.5	1.5	U	50
Total-PeCDF	0	<1.0	1.0	U	250
Total-HxCDF	2	6.70	2.6		250
Total-HpCDF	1	3.59	1.7		250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	3.27
Mid Point PCDD/F TEQ (WHO 2005)	6.55
Upper Bound PCDD/F TEQ (WHO 2005)	8.34

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		Approved:
ALS Sample ID	WG2786749-2	Extraction Date	4-Jun-18		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	n/a	--e-signature--
Analysis Type	LCS	Percent Moisture	n/a		07-Jun-2018
Sample Matrix	QC	Split Ratio	5		

Run Information	**Run 1**
Filename	5-180606A02
Run Date	06-Jun-18 15:54
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-5 DB5MSUSP662625H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	1000	28.23	110	70-130	
1,2,3,7,8-PeCDD	5000	32.18	107	70-130	
1,2,3,4,7,8-HxCDD	5000	34.19	103	70-130	
1,2,3,6,7,8-HxCDD	5000	34.24	106	70-130	
1,2,3,7,8,9-HxCDD	5000	34.36	113	70-130	
1,2,3,4,6,7,8-HpCDD	5000	35.84	103	70-130	
OCDD	10000	37.34	97	70-130	
2,3,7,8-TCDF	1000	27.32	95	70-130	
1,2,3,7,8-PeCDF	5000	31.27	102	70-130	
2,3,4,7,8-PeCDF	5000	31.98	105	70-130	
1,2,3,4,7,8-HxCDF	5000	33.71	95	70-130	
1,2,3,6,7,8-HxCDF	5000	33.78	100	70-130	
2,3,4,6,7,8-HxCDF	5000	34.10	98	70-130	
1,2,3,7,8,9-HxCDF	5000	34.51	99	70-130	
1,2,3,4,6,7,8-HpCDF	5000	35.29	98	70-130	
1,2,3,4,7,8,9-HpCDF	5000	36.10	97	70-130	
OCDF	10000	37.43	94	70-130	
Field Spike Standards	**pg**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	800	28.20	1	0	
13C12-1,2,3,4,7,8-HxCDD	8000	NotFnd	0	0	
13C12-2,3,4,7,8-PeCDF	8000	31.98	1	0	
13C12-1,2,3,4,7,8-HxCDF	8000	NotFnd	0	0	
13C12-1,2,3,4,7,8,9-HpCDF	8000	36.10	1	0	R
Extraction Standards					
13C12-2,3,7,8-TCDD	10000	28.21	37	40-130	
13C12-1,2,3,7,8-PeCDD	10000	32.18	63	40-130	
13C12-1,2,3,6,7,8-HxCDD	10000	34.24	44	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.83	52	25-130	
13C12-OCDD	20000	37.33	55	25-130	
13C12-2,3,7,8-TCDF	10000	27.29	40	40-130	
13C12-1,2,3,7,8-PeCDF	10000	31.26	57	40-130	
13C12-1,2,3,6,7,8-HxCDF	10000	33.77	42	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.28	52	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	10000	34.51	68	40-130	

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

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1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104490		Mississauga, ON L5J 2Y4
Date of Report	12-Jun-28		Canada
Date of Sample Receipt	4-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **Toxic PCB Congeners by GC/HRMS (EPA 1668C)**

For the laboratory control sample, the recoveries of 13C12-PCB-169 and 13C12-PCB-189 were above the method control limits. The native target data are not biased as a result.

SK 12-Jun-18

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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Sample Analysis summary Report

Sample Name	18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)	18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)	18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)	18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)	18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)	18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)
ALS Sample ID	L2104490-1	L2104490-2	L2104490-3	L2104490-4	L2104490-5	L2104490-6
Sample Size	1	1	1	1	1	1
Sample size units	stack	stack	stack	stack	stack	stack
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	31-May-18	31-May-18	1-Jun-18	31-May-18	31-May-18	1-Jun-18
Extraction Date	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
PCB-81	105	<60	<14	<5.2	22.9	19.8
PCB-77	234	343	65.4	10.2	99.7	111
PCB-123	<810	<530	<130	8.71	<150	<110
PCB-118	9530	5910	1450	138	1740	2140
PCB-114	274	182	40.6	<4.9	54.9	55.7
PCB-105	3390	2170	442	57.8	517	650
PCB-126	<27	<15	<7.7	<5.1	<5.7	<18
PCB-167	<55	<22	<11	<2.8	<8.4	<11
PCB-156	252	127	23.5	<8.4	35.9	<47
PCB-157	60.0	26.0	<5.2	<3.0	<13	<17
PCB-169	<13	<5.0	<3.6	<3.1	<9.7	<4.2
PCB-189	18.2	<8.8	<5.2	<1.1	<22	<18
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-95	75	81	84	73	79	71
13C12-PCB-153	75	77	76	75	79	75
Extraction Standards						
13C12-PCB-81	79	83	70	62	77	67
13C12-PCB-77	95	96	85	71	79	82
13C12-PCB-123	107	112	87	73	95	99
13C12-PCB-118	98	110	90	65	84	86
13C12-PCB-114	103	111	93	70	89	94
13C12-PCB-105	101	110	91	70	80	94
13C12-PCB-126	100	97	89	74	88	90
13C12-PCB-167	115	118	98	76	93	97
13C12-PCB-156	109	115	99	77	92	95
13C12-PCB-157	108	108	93	75	90	93
13C12-PCB-169	115	115	102	81	95	100
13C12-PCB-189	126	127	111	91	106	109
Cleanup Standards						
13C12-PCB-111	67	70	67	48	55	73
Toxic Equivalency (WHO 2005)						
Lower Bound PCB TEQ	0.461	0.287	0.0652	0.00716	0.0873	0.102
Mid Point PCB TEQ	2.23	1.90	0.898	0.356	0.669	2.03
Upper Bound PCB TEQ	3.58	1.97	0.952	0.612	0.954	2.03

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Sample Analysis summary Report

Sample Name	18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)	18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)
ALS Sample ID	L2104490-7	L2104490-8
Sample Size	1	1
Sample size units	stack	stack
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	1-Jun-18	31-May-18
Extraction Date	4-Jun-18	4-Jun-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**
PCB-81	<35	<8.8
PCB-77	195	43.3
PCB-123	<290	<17
PCB-118	2910	233
PCB-114	82.3	<9.5
PCB-105	1060	<110
PCB-126	<11	<3.0
PCB-167	27.0	<4.7
PCB-156	95.1	18.3
PCB-157	26.4	<6.8
PCB-169	<8.2	<3.7
PCB-189	<22	<1.7
Field Spikes	**% Rec**	**% Rec**
13C12-PCB-95	64	75
13C12-PCB-153	78	73
Extraction Standards		
13C12-PCB-81	71	54
13C12-PCB-77	108	54
13C12-PCB-123	131	62
13C12-PCB-118	133	60
13C12-PCB-114	132	62
13C12-PCB-105	134	63
13C12-PCB-126	121	67
13C12-PCB-167	112	67
13C12-PCB-156	112	62
13C12-PCB-157	105	66
13C12-PCB-169	111	67
13C12-PCB-189	120	77
Cleanup Standards		
13C12-PCB-111	96	48
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.146	0.0119
Mid Point PCB TEQ	0.961	0.223
Upper Bound PCB TEQ	1.51	0.430

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Sample Analysis summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2786749-1	WG2786749-2
Sample Size	1	1
Sample size units	stack	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	4-Jun-18	4-Jun-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**% Rec**
PCB-81	<5.3	103
PCB-77	<6.7	112
PCB-123	<3.4	111
PCB-118	<31	97
PCB-114	<3.0	104
PCB-105	20.6	108
PCB-126	<3.1	111
PCB-167	<2.3	98
PCB-156	<2.5	102
PCB-157	<2.5	98
PCB-169	<2.6	102
PCB-189	<2.0	99
Field Spikes	**% Rec**	**% Rec**
13C12-PCB-95	NS	NS
13C12-PCB-153	NS	NS
Extraction Standards		
13C12-PCB-81	59	99
13C12-PCB-77	61	107
13C12-PCB-123	78	125
13C12-PCB-118	69	113
13C12-PCB-114	75	122
13C12-PCB-105	75	125
13C12-PCB-126	81	138
13C12-PCB-167	79	139
13C12-PCB-156	76	137
13C12-PCB-157	77	141
13C12-PCB-169	80	146
13C12-PCB-189	91	162
Cleanup Standards		
13C12-PCB-111	53	61
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.000618	
Mid Point PCB TEQ	0.197	
Upper Bound PCB TEQ	0.392	

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-1	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS010
Run Date	06-Jun-18 19:00
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.91	105	3.9	J
PCB-77	0.0001	7.04	234	3.7	J
PCB-123	0.00003	7.31	<810	11	M,1.
PCB-118	0.00003	7.39	9530	22	
PCB-114	0.00003	7.55	274	24	M,J
PCB-105	0.00003	7.77	3390	24	
PCB-126	0.1	NotFnd	<27	27	U
PCB-167	0.00003	8.56	<55	3.3	M,J,R
PCB-156	0.00003	8.92	252	3.5	M,J
PCB-157	0.00003	9.00	60.0	3.4	M,J
PCB-169	0.03	9.53	<13	3.8	M,J,R,1.
PCB-189	0.00003	10.10	18.2	2.9	J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.16	75	70-130
13C12-PCB-153	8000	7.68	75	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.89	79	10-145
13C12-PCB-77	10000	7.03	95	10-145
13C12-PCB-123	10000	7.33	107	10-145
13C12-PCB-118	10000	7.38	98	10-145
13C12-PCB-114	10000	7.54	103	10-145
13C12-PCB-105	10000	7.77	101	10-145
13C12-PCB-126	10000	8.27	100	10-145
13C12-PCB-167	10000	8.56	115	10-145
13C12-PCB-156	10000	8.91	109	10-145
13C12-PCB-157	10000	8.99	108	10-145
13C12-PCB-169	10000	9.51	115	10-145
13C12-PCB-189	10000	10.09	126	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.01	105	5-145
13C12-PCB-111	10000	6.81	67	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.461
Mid Point PCB TEQ	2.23
Upper Bound PCB TEQ	3.58

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-2	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS011
Run Date	06-Jun-18 19:18
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.91	<60	7.0	J,R
PCB-77	0.0001	7.04	343	7.0	
PCB-123	0.00003	7.31	<530	12	M,1.
PCB-118	0.00003	7.39	5910	11	
PCB-114	0.00003	7.55	182	11	M,J
PCB-105	0.00003	7.78	2170	12	
PCB-126	0.1	8.29	<15	13	M,J,R
PCB-167	0.00003	8.58	<22	4.3	M,J,R,1.
PCB-156	0.00003	8.92	127	4.7	M,J
PCB-157	0.00003	9.00	26.0	4.9	M,J
PCB-169	0.03	9.54	<5.0	5.0	U
PCB-189	0.00003	10.10	<8.8	3.2	J,R

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.16	81	70-130
13C12-PCB-153	8000	7.69	77	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.89	83	10-145
13C12-PCB-77	10000	7.03	96	10-145
13C12-PCB-123	10000	7.33	112	10-145
13C12-PCB-118	10000	7.38	110	10-145
13C12-PCB-114	10000	7.54	111	10-145
13C12-PCB-105	10000	7.77	110	10-145
13C12-PCB-126	10000	8.29	97	10-145
13C12-PCB-167	10000	8.56	118	10-145
13C12-PCB-156	10000	8.92	115	10-145
13C12-PCB-157	10000	8.99	108	10-145
13C12-PCB-169	10000	9.53	115	10-145
13C12-PCB-189	10000	10.10	127	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.01	121	5-145
13C12-PCB-111	10000	6.81	70	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.287
Mid Point PCB TEQ	1.90
Upper Bound PCB TEQ	1.97

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)**	Sampling Date	1-Jun-18		
ALS Sample ID	L2104490-3	Extraction Date	4-Jun-18		Approved:
Analysis Method	EPA 1668C	Sample Size	1	stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS012
Run Date	06-Jun-18 19:36
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.92	<14	7.8	M,J,R
PCB-77	0.0001	7.05	65.4	7.0	J
PCB-123	0.00003	7.32	<130	4.0	M,J,1.
PCB-118	0.00003	7.39	1450	3.6	
PCB-114	0.00003	7.56	40.6	3.6	M,J
PCB-105	0.00003	7.79	442	3.8	M
PCB-126	0.1	8.29	<7.7	4.1	J,R
PCB-167	0.00003	8.57	<11	3.3	M,J,1.
PCB-156	0.00003	8.93	23.5	3.5	M,J
PCB-157	0.00003	9.00	<5.2	3.6	M,J,R
PCB-169	0.03	NotFnd	<3.6	3.6	U
PCB-189	0.00003	10.11	<5.2	2.1	J,R

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.17	84	70-130
13C12-PCB-153	8000	7.70	76	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.90	70	10-145
13C12-PCB-77	10000	7.05	85	10-145
13C12-PCB-123	10000	7.33	87	10-145
13C12-PCB-118	10000	7.38	90	10-145
13C12-PCB-114	10000	7.55	93	10-145
13C12-PCB-105	10000	7.77	91	10-145
13C12-PCB-126	10000	8.29	89	10-145
13C12-PCB-167	10000	8.57	98	10-145
13C12-PCB-156	10000	8.93	99	10-145
13C12-PCB-157	10000	8.99	93	10-145
13C12-PCB-169	10000	9.53	102	10-145
13C12-PCB-189	10000	10.10	111	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.03	107	5-145
13C12-PCB-111	10000	6.82	67	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0652
Mid Point PCB TEQ	0.898
Upper Bound PCB TEQ	0.952

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-4	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS013
Run Date	06-Jun-18 19:54
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<5.2	5.2	U
PCB-77	0.0001	7.03	10.2	5.3	M,J
PCB-123	0.00003	7.31	8.71	5.6	M,J
PCB-118	0.00003	7.37	138	4.4	J
PCB-114	0.00003	NotFnd	<4.9	4.9	U
PCB-105	0.00003	7.77	57.8	5.2	M,J,B
PCB-126	0.1	NotFnd	<5.1	5.1	U
PCB-167	0.00003	8.53	<2.8	2.8	M,U,1.
PCB-156	0.00003	8.90	<8.4	2.9	M,J,R
PCB-157	0.00003	NotFnd	<3.0	3.0	U
PCB-169	0.03	9.54	<3.1	3.1	M,J,R
PCB-189	0.00003	NotFnd	<1.1	1.1	U

Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000	6.15	73	70-130	
13C12-PCB-153	8000	7.68	75	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	10000	6.87	62	10-145	
13C12-PCB-77	10000	7.02	71	10-145	
13C12-PCB-123	10000	7.31	73	10-145	R
13C12-PCB-118	10000	7.37	65	10-145	
13C12-PCB-114	10000	7.53	70	10-145	
13C12-PCB-105	10000	7.75	70	10-145	
13C12-PCB-126	10000	8.27	74	10-145	
13C12-PCB-167	10000	8.55	76	10-145	
13C12-PCB-156	10000	8.90	77	10-145	
13C12-PCB-157	10000	8.98	75	10-145	
13C12-PCB-169	10000	9.51	81	10-145	
13C12-PCB-189	10000	10.07	91	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.00	80	5-145	
13C12-PCB-111	10000	6.80	48	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00716
Mid Point PCB TEQ	0.356
Upper Bound PCB TEQ	0.612

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-5	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS014
Run Date	06-Jun-18 20:12
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.92	22.9	3.5	J
PCB-77	0.0001	7.05	99.7	3.9	J
PCB-123	0.00003	7.32	<150	5.4	M,J,1.
PCB-118	0.00003	7.40	1740	4.6	M
PCB-114	0.00003	7.55	54.9	5.3	M,J
PCB-105	0.00003	7.78	517	5.8	M
PCB-126	0.1	NotFnd	<5.7	5.7	U
PCB-167	0.00003	8.57	<8.4	3.8	M,J,R,1.
PCB-156	0.00003	8.93	35.9	3.9	M,J
PCB-157	0.00003	9.00	<13	3.9	J,R
PCB-169	0.03	9.54	<9.7	4.2	M,J,R
PCB-189	0.00003	10.10	<22	4.2	J,R

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.17	79	70-130
13C12-PCB-153	8000	7.69	79	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.89	77	10-145
13C12-PCB-77	10000	7.04	79	10-145
13C12-PCB-123	10000	7.34	95	10-145
13C12-PCB-118	10000	7.39	84	10-145
13C12-PCB-114	10000	7.54	89	10-145
13C12-PCB-105	10000	7.78	80	10-145
13C12-PCB-126	10000	8.28	88	10-145
13C12-PCB-167	10000	8.56	93	10-145
13C12-PCB-156	10000	8.92	92	10-145
13C12-PCB-157	10000	9.00	90	10-145
13C12-PCB-169	10000	9.52	95	10-145
13C12-PCB-189	10000	10.09	106	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.02	101	5-145
13C12-PCB-111	10000	6.82	55	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0873
Mid Point PCB TEQ	0.669
Upper Bound PCB TEQ	0.954

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)**	Sampling Date	1-Jun-18	
ALS Sample ID	L2104490-6	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS015
Run Date	06-Jun-18 20:30
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.91	19.8	7.4	J
PCB-77	0.0001	7.05	111	6.9	J
PCB-123	0.00003	7.32	<110	10	M,J,R,1.
PCB-118	0.00003	7.40	2140	9.1	M
PCB-114	0.00003	7.55	55.7	9.9	M,J
PCB-105	0.00003	7.78	650	10	M
PCB-126	0.1	8.29	<18	11	J,R
PCB-167	0.00003	8.57	<11	3.8	M,J,R,1.
PCB-156	0.00003	8.93	<47	4.0	M,J,R
PCB-157	0.00003	8.99	<17	4.0	M,J,R
PCB-169	0.03	9.53	<4.2	4.2	M,U,1.
PCB-189	0.00003	10.10	<18	3.2	J,R

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.16	71	70-130
13C12-PCB-153	8000	7.69	75	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.89	67	10-145
13C12-PCB-77	10000	7.04	82	10-145
13C12-PCB-123	10000	7.33	99	10-145
13C12-PCB-118	10000	7.38	86	10-145
13C12-PCB-114	10000	7.54	94	10-145
13C12-PCB-105	10000	7.78	94	10-145
13C12-PCB-126	10000	8.28	90	10-145
13C12-PCB-167	10000	8.56	97	10-145
13C12-PCB-156	10000	8.91	95	10-145
13C12-PCB-157	10000	8.99	93	10-145
13C12-PCB-169	10000	9.52	100	10-145
13C12-PCB-189	10000	10.09	109	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.02	101	5-145
13C12-PCB-111	10000	6.82	73	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.102
Mid Point PCB TEQ	2.03
Upper Bound PCB TEQ	2.03

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)**	Sampling Date	1-Jun-18	
ALS Sample ID	L2104490-7	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS016
Run Date	06-Jun-18 20:48
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.92	<35	7.2	J,R
PCB-77	0.0001	7.05	195	5.1	J
PCB-123	0.00003	7.32	<290	9.4	M,J,1.
PCB-118	0.00003	7.40	2910	8.7	M
PCB-114	0.00003	7.56	82.3	9.0	M,J
PCB-105	0.00003	7.79	1060	9.2	M
PCB-126	0.1	8.29	<11	11	M,U
PCB-167	0.00003	8.57	27.0	4.4	M,J
PCB-156	0.00003	8.93	95.1	4.7	M,J
PCB-157	0.00003	9.01	26.4	4.9	M,J
PCB-169	0.03	9.55	<8.2	5.1	J,R
PCB-189	0.00003	10.11	<22	3.3	J,R

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.17	64	70-130
13C12-PCB-153	8000	7.70	78	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.90	71	10-145
13C12-PCB-77	10000	7.05	108	10-145
13C12-PCB-123	10000	7.33	131	10-145
13C12-PCB-118	10000	7.38	133	10-145
13C12-PCB-114	10000	7.55	132	10-145
13C12-PCB-105	10000	7.77	134	10-145
13C12-PCB-126	10000	8.29	121	10-145
13C12-PCB-167	10000	8.57	112	10-145
13C12-PCB-156	10000	8.93	112	10-145
13C12-PCB-157	10000	8.99	105	10-145
13C12-PCB-169	10000	9.53	111	10-145
13C12-PCB-189	10000	10.10	120	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.03	140	5-145
13C12-PCB-111	10000	6.83	96	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.146
Mid Point PCB TEQ	0.961
Upper Bound PCB TEQ	1.51

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)**	Sampling Date	31-May-18	
ALS Sample ID	L2104490-8	Extraction Date	4-Jun-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS009
Run Date	06-Jun-18 18:42
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<8.8	8.8	U
PCB-77	0.0001	7.04	43.3	11	J
PCB-123	0.00003	7.31	<17	3.1	M,J,1.
PCB-118	0.00003	7.39	233	2.9	M,J
PCB-114	0.00003	7.55	<9.5	3.0	M,J,R
PCB-105	0.00003	7.78	<110	3.0	M,J,R
PCB-126	0.1	NotFnd	<3.0	3.0	U
PCB-167	0.00003	8.56	<4.7	3.1	M,J,1.
PCB-156	0.00003	8.92	18.3	3.5	J
PCB-157	0.00003	9.00	<6.8	3.4	J,R
PCB-169	0.03	NotFnd	<3.7	3.7	U
PCB-189	0.00003	NotFnd	<1.7	1.7	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.16	75	70-130
13C12-PCB-153	8000	7.69	73	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	10000	6.89	54	10-145
13C12-PCB-77	10000	7.03	54	10-145
13C12-PCB-123	10000	7.33	62	10-145
13C12-PCB-118	10000	7.38	60	10-145
13C12-PCB-114	10000	7.54	62	10-145
13C12-PCB-105	10000	7.77	63	10-145
13C12-PCB-126	10000	8.29	67	10-145
13C12-PCB-167	10000	8.56	67	10-145
13C12-PCB-156	10000	8.92	62	10-145
13C12-PCB-157	10000	8.99	66	10-145
13C12-PCB-169	10000	9.53	67	10-145
13C12-PCB-189	10000	10.09	77	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.01	63	5-145
13C12-PCB-111	10000	6.81	48	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0119
Mid Point PCB TEQ	0.223
Upper Bound PCB TEQ	0.430

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG27B6749-1	Extraction Date	4-Jun-18		Approved:
Analysis Method	EPA 1668C	Sample Size	1	stack	*A.Byrne*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS006
Run Date	06-Jun-18 17:47
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<5.3	5.3	U
PCB-77	0.0001	7.04	<6.7	6.1	M,J,R
PCB-123	0.00003	NotFnd	<3.4	3.4	U
PCB-118	0.00003	7.38	<31	2.7	J,R
PCB-114	0.00003	NotFnd	<3.0	3.0	U
PCB-105	0.00003	7.77	20.6	3.2	M,J
PCB-126	0.1	NotFnd	<3.1	3.1	U
PCB-167	0.00003	NotFnd	<2.3	2.3	U
PCB-156	0.00003	NotFnd	<2.5	2.5	U
PCB-157	0.00003	NotFnd	<2.5	2.5	U
PCB-169	0.03	NotFnd	<2.6	2.6	U
PCB-189	0.00003	NotFnd	<2.0	2.0	U

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-95	8000	NS	70-130
13C12-PCB-153	8000	NS	70-130

Extraction Standards	**pg**	**Ret. Time**	**% Rec**	**Limits**	
13C12-PCB-81	10000	6.88	59	10-145	
13C12-PCB-77	10000	7.02	61	10-145	
13C12-PCB-123	10000	7.31	78	10-145	R
13C12-PCB-118	10000	7.38	69	10-145	
13C12-PCB-114	10000	7.53	75	10-145	
13C12-PCB-105	10000	7.75	75	10-145	
13C12-PCB-126	10000	8.27	81	10-145	
13C12-PCB-167	10000	8.55	79	10-145	
13C12-PCB-156	10000	8.90	76	10-145	
13C12-PCB-157	10000	8.98	77	10-145	
13C12-PCB-169	10000	9.51	80	10-145	
13C12-PCB-189	10000	10.08	91	10-145	

Cleanup Standards	**pg**	**% Rec**	**Limits**
13C12-PCB-2B	10000	45	5-145
13C12-PCB-111	10000	53	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.000618
Mid Point PCB TEQ	0.197
Upper Bound PCB TEQ	0.392

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG2786749-2	Extraction Date	4-Jun-18		Approved:
Analysis Method	EPA 1668C	Sample Size	1	n/a	*A.Byrne*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		11-Jun-2018

Run Information	**Run 1**
Filename	1-180606DS002
Run Date	06-Jun-18 16:35
Final Volume	25 uL
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS-1 DB5MSUSP684257H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-81	5000	6.90	103	60-135	
PCB-77	5000	7.05	112	60-135	
PCB-123	5000	7.34	111	60-135	
PCB-118	5000	7.40	97	60-135	
PCB-114	5000	7.55	104	60-135	
PCB-105	5000	7.78	108	60-135	
PCB-126	5000	8.30	111	60-135	
PCB-167	5000	8.57	98	60-135	
PCB-156	5000	8.93	102	60-135	
PCB-157	5000	9.01	98	60-135	
PCB-169	5000	9.54	102	60-135	
PCB-189	5000	10.10	99	60-135	
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000		NS	70-130	
13C12-PCB-153	8000		NS	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	10000	6.89	99	40-145	
13C12-PCB-77	10000	7.04	107	40-145	
13C12-PCB-123	10000	7.34	125	40-145	
13C12-PCB-118	10000	7.39	113	40-145	
13C12-PCB-114	10000	7.55	122	40-145	
13C12-PCB-105	10000	7.78	125	40-145	
13C12-PCB-126	10000	8.30	138	40-145	
13C12-PCB-167	10000	8.56	139	40-145	
13C12-PCB-156	10000	8.92	137	40-145	
13C12-PCB-157	10000	9.00	141	40-145	
13C12-PCB-169	10000	9.53	146	40-145	
13C12-PCB-189	10000	10.10	162	40-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	54	15-145	
13C12-PCB-111	10000	6.82	61	40-145	

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104490		Mississauga, ON L5J 2Y4
Date of Report	12-Jun-18		Canada
Date of Sample Receipt	4-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **CB by LRGC/MS - Isotope dilution**

The Method Blank (and Field Blank) samples contained low levels of 1,4-dichlorobenzene. This was a contaminant in the media used.
BR 11-Jun-18

Certified by: L. Wrona
Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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Sample Analysis Summary Report

Sample Name	Method Blank		18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)		18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)		18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)		18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)	
ALS Sample ID	WG2786749-1		L2104490-1		L2104490-2		L2104490-3		L2104490-4	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	QC		Stack		Stack		Stack		Stack	
Sampling Date	n/a		31-May-18		31-May-18		1-Jun-18		31-May-18	
Extraction Date	4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	<10	U	2000		2000		1850		<10	U
1,3-Dichlorobenzene	<10	U	248		258		230		<10	U
1,4-Dichlorobenzene	12.3		106	B	103	B	159		11.5	B
1,2-Dichlorobenzene	<10	U	137		151		143		<10	U
1,3,5-Trichlorobenzene	<10	U	24.8	M	29	M	24.5	M	<10	U
1,2,4-Trichlorobenzene	<10	U	63.1		66.9		60.3		<10	U
1,2,3-Trichlorobenzene	<10	U	27.2		19.8		23.4		<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<10	U	19.1		18.6		16.7		<10	U
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U
Pentachlorobenzene	<10	U	20.2		<10	U	<10	U	<10	U
Hexachlorobenzene	<10	U	41.7	R	<10	U	<10	U	<10	U
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	NS		90		91		93		91	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	37		40		37		41		36	
13C6-1,4-Dichlorobenzene	57		61		64		68		65	
13C6-1,2,3-Trichlorobenzene	61		65		65		70		69	
13C6-1,2,3,4-Tetrachlorobenzene	50		53		54		60		58	
13C6-Pentachlorobenzene	70		78		72		82		79	
13C6-Hexachlorobenzene	74		79		73		84		82	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this compound was not spiked in.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)		18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)		18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)		18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)		Laboratory Control Sample
ALS Sample ID	L2104490-5		L2104490-6		L2104490-7		L2104490-8		WG2786749-2
Sample Size	1		1		1		1		1
Sample units	sample		sample		sample		sample		n/a
Moisture Content	n/a		n/a		n/a		n/a		n/a
Matrix	Stack		Stack		Stack		Stack		QC
Sampling Date	31-May-18		1-Jun-18		1-Jun-18		31-May-18		n/a
Extraction Date	4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**
Chlorobenzene	2300		2060		2120		<10	U	NS
1,3-Dichlorobenzene	259		247		258		<10	U	133
1,4-Dichlorobenzene	120	B	322		242		11.5	B	91
1,2-Dichlorobenzene	154		144		155		<10	U	102
1,3,5-Trichlorobenzene	25.3		23.9	M	28.4	M	<10	U	95
1,2,4-Trichlorobenzene	60.5		61		64.7		<10	U	95
1,2,3-Trichlorobenzene	21.8		16.9		23		<10	U	91
1,2,3,5/1,2,4,5-Tetrachlorobenzene	15.1		16.3		18.5		<10	U	10
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	105
Pentachlorobenzene	<10	U	<10	U	<10	U	<10	U	104
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	100
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	91		90		93		90		NS
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**
13C6-Chlorobenzene	41		37		42		43		58
13C6-1,4-Dichlorobenzene	66		66		67		68		74
13C6-1,2,3-Trichlorobenzene	68		68		70		73		89
13C6-1,2,3,4-Tetrachlorobenzene	57		56		58		60		61
13C6-Pentachlorobenzene	72		75		79		79		80
13C6-Hexachlorobenzene	69		77		80		79		80

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
NS	Indicates that this compound was not spiked in.

ALS Life Sciences

Sample Analysis Report

Sample Name	**Method Blank**		Sampling Date	n/a
ALS Sample ID	WG2786749-1		Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS			
Analysis Type	sample			
Sample Matrix	QC			
Sample Size	1	sample		
Percent Moisture	n/a			
Split Ratio	5			

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060805.D
Run Date	6/8/2018 11:08
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	6.81	12.3	
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene			NS
Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.63	37
13C6-1,4-Dichlorobenzene	250	6.81	57
13C6-1,2,3-Trichlorobenzene	250	9.12	61
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	50
13C6-Pentachlorobenzene	250	12.13	70
13C6-Hexachlorobenzene	250	13.74	74

U	Indicates that this compound was not detected above the MDL.
NS	Indicates that this compound was not spiked in.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-1	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060809.D
Run Date	6/8/2018 12:40
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.59	2000	
1,3-Dichlorobenzene	6.74	248	
1,4-Dichlorobenzene	6.81	106	B
1,2-Dichlorobenzene	7.09	137	
1,3,5-Trichlorobenzene	8.22	24.8	M
1,2,4-Trichlorobenzene	8.73	63.1	
1,2,3-Trichlorobenzene	9.13	27.2	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.31	19.1	
1,2,3,4-Tetrachlorobenzene	10.81	<10	U
Pentachlorobenzene	12.13	20.2	
Hexachlorobenzene	13.75	41.7	R

Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	500	10.11	90	

Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.59	40	M
13C6-1,4-Dichlorobenzene	250	6.81	61	
13C6-1,2,3-Trichlorobenzene	250	9.13	65	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	53	
13C6-Pentachlorobenzene	250	12.12	78	
13C6-Hexachlorobenzene	250	13.74	79	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-2	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060810.D
Run Date	6/8/2018 13:03
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.62	2000	
1,3-Dichlorobenzene	6.74	258	
1,4-Dichlorobenzene	6.82	103	B
1,2-Dichlorobenzene	7.10	151	
1,3,5-Trichlorobenzene	8.23	29	M
1,2,4-Trichlorobenzene	8.73	66.9	
1,2,3-Trichlorobenzene	9.13	19.8	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.31	18.6	
1,2,3,4-Tetrachlorobenzene	10.81	<10	U
Pentachlorobenzene	12.12	<10	U
Hexachlorobenzene	13.74	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	500	10.11	91

Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.62	37
13C6-1,4-Dichlorobenzene	250	6.82	64
13C6-1,2,3-Trichlorobenzene	250	9.13	65
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	54
13C6-Pentachlorobenzene	250	12.12	72
13C6-Hexachlorobenzene	250	13.74	73

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-3	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060811.D
Run Date	6/8/2018 13:26
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.61	1850	
1,3-Dichlorobenzene		6.75	230	
1,4-Dichlorobenzene		6.83	159	
1,2-Dichlorobenzene		7.10	143	
1,3,5-Trichlorobenzene		8.23	24.5	M
1,2,4-Trichlorobenzene		8.73	60.3	
1,2,3-Trichlorobenzene		9.13	23.4	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.31	16.7	
1,2,3,4-Tetrachlorobenzene		10.81	<10	U
Pentachlorobenzene		12.13	<10	U
Hexachlorobenzene		13.74	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	500	10.11	93	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.61	41	
13C6-1,4-Dichlorobenzene	250	6.83	68	
13C6-1,2,3-Trichlorobenzene	250	9.13	70	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	60	
13C6-Pentachlorobenzene	250	12.13	82	
13C6-Hexachlorobenzene	250	13.74	84	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-4	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060807.D
Run Date	6/8/2018 11:54
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	6.84	11.5	B
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	500	10.11	91
Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.61	36
13C6-1,4-Dichlorobenzene	250	6.83	65
13C6-1,2,3-Trichlorobenzene	250	9.13	69
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	58
13C6-Pentachlorobenzene	250	12.12	79
13C6-Hexachlorobenzene	250	13.74	82

U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-5	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060812.D
Run Date	6/8/2018 13:49
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.63	2300	
1,3-Dichlorobenzene	6.75	259	
1,4-Dichlorobenzene	6.83	120	B
1,2-Dichlorobenzene	7.10	154	
1,3,5-Trichlorobenzene	8.23	25.3	
1,2,4-Trichlorobenzene	8.73	60.5	
1,2,3-Trichlorobenzene	9.13	21.8	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.31	15.1	
1,2,3,4-Tetrachlorobenzene	10.81	<10	U
Pentachlorobenzene	12.13	<10	U
Hexachlorobenzene	13.74	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	500	10.11	91

Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.63	41
13C6-1,4-Dichlorobenzene	250	6.83	66
13C6-1,2,3-Trichlorobenzene	250	9.13	68
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	57
13C6-Pentachlorobenzene	250	12.12	72
13C6-Hexachlorobenzene	250	13.74	69

U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-6	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060813.D
Run Date	6/8/2018 14:12
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.61	2060	
1,3-Dichlorobenzene	6.75	247	
1,4-Dichlorobenzene	6.82	322	
1,2-Dichlorobenzene	7.10	144	
1,3,5-Trichlorobenzene	8.23	23.9	M
1,2,4-Trichlorobenzene	8.73	61	
1,2,3-Trichlorobenzene	9.13	16.9	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.31	16.3	
1,2,3,4-Tetrachlorobenzene	10.81	<10	U
Pentachlorobenzene	12.13	<10	U
Hexachlorobenzene	13.74	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	500	10.11	90	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.60	37	R
13C6-1,4-Dichlorobenzene	250	6.82	66	
13C6-1,2,3-Trichlorobenzene	250	9.13	68	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	56	
13C6-Pentachlorobenzene	250	12.12	75	
13C6-Hexachlorobenzene	250	13.74	77	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-7	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060814.D
Run Date	6/8/2018 14:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.60	2120	
1,3-Dichlorobenzene	6.75	258	
1,4-Dichlorobenzene	6.83	242	
1,2-Dichlorobenzene	7.10	155	
1,3,5-Trichlorobenzene	8.23	28.4	M
1,2,4-Trichlorobenzene	8.73	64.7	
1,2,3-Trichlorobenzene	9.13	23	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.31	18.5	
1,2,3,4-Tetrachlorobenzene	10.81	<10	U
Pentachlorobenzene	12.13	<10	U
Hexachlorobenzene	13.75	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	500	10.11	93

Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.60	42
13C6-1,4-Dichlorobenzene	250	6.82	67
13C6-1,2,3-Trichlorobenzene	250	9.13	70
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	58
13C6-Pentachlorobenzene	250	12.13	79
13C6-Hexachlorobenzene	250	13.74	80

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-8	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060808.D
Run Date	6/8/2018 12:17
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	6.75	<10	U
1,4-Dichlorobenzene	6.83	11.5	B
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	500	10.11	90

Extraction Standards			**%Rec**
13C6-Chlorobenzene	250	4.61	43
13C6-1,4-Dichlorobenzene	250	6.83	68
13C6-1,2,3-Trichlorobenzene	250	9.13	73
13C6-1,2,3,4-Tetrachlorobenzene	250	10.80	60
13C6-Pentachlorobenzene	250	12.13	79
13C6-Hexachlorobenzene	250	13.74	79

U Indicates that this compound was not detected above the MDL.

B Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2786749-2	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
11-Jun-2018

Run Information	**Run 1**
Filename	18060803.D
Run Date	6/8/2018 10:23
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	250	6.81	133	
1,4-Dichlorobenzene	250	6.88	91	
1,2-Dichlorobenzene	250	7.14	102	
1,3,5-Trichlorobenzene	250	8.24	95	
1,2,4-Trichlorobenzene	250	8.75	95	
1,2,3-Trichlorobenzene	250	9.13	91	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	500	10.33	105	
1,2,3,4-Tetrachlorobenzene	250	10.81	108	
Pentachlorobenzene	250	12.13	104	
Hexachlorobenzene	250	13.75	100	
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene			NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.65	58	
13C6-1,4-Dichlorobenzene	250	6.87	74	
13C6-1,2,3-Trichlorobenzene	250	9.13	89	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.81	61	
13C6-Pentachlorobenzene	250	12.13	80	
13C6-Hexachlorobenzene	250	13.74	80	

NS Indicates that this compound was not spiked in.

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104490		Mississauga, ON L5J 2Y4
Date of Report	14-Jun-18		Canada
Date of Sample Receipt	1-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

The recoveries of select labelled extraction standards are below typical control limits. As a result, the sample data may be biased low, as evidenced by the laboratory control sample and field standard recoveries.

SK 14-Jun-18

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)		18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)		18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)		18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)	
ALS Sample ID	WG2786749-1		L2104490-1		L2104490-2		L2104490-3		L2104490-4	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	QC		Stack		Stack		Stack		Stack	
Sampling Date	n/a		31-May-18		31-May-18		1-Jun-18		31-May-18	
Extraction Date	4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
2-Chlorophenol	<100	U	105	M,R	<100	U	108	R	<100	U
3-Chlorophenol	<100	U	115		<100	U	<100	U	<100	U
4-Chlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,6-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,4/2,5-Dichlorophenol	<100	U	125	R	<100	U	<100	U	<100	U
3,5-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
3,4-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,4,6-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3,6-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,4,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3,4-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
3,4,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
2,3,4,5-Tetrachlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
Pentachlorophenol	<100	U	<100	U	<100	U	<100	U	<100	U
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2-Fluorophenol	37	M	46		50		44		49	
d5-Phenol	44	M	44	M	51	M,R	43	M	50	M
d4-2-Chlorophenol	81	R	67	R	70	R	66	R	71	R
2,4,6-Tribromophenol	54		67		69		80		71	
13C-Pentachlorophenol	52		62		60		77		68	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	NS		53		53		53		58	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
NS	Indicates that this compound was not spiked in.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)		18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)		18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)		18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)		Laboratory Control Sample	
ALS Sample ID	L2104490-5		L2104490-6		L2104490-7		L2104490-8		WG2786749-2	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		%	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC	
Sampling Date	31-May-18		1-Jun-18		1-Jun-18		31-May-18		n/a	
Extraction Date	4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18		n/a	
Target Analytes	**n/a**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
2-Chlorophenol	<100	U	<100	U	121	R	<100	U	62	M
3-Chlorophenol	<100	U	<100	U	<100	U	<100	U	59	
4-Chlorophenol	<100	U	<100	U	<100	U	<100	U	62	
2,6-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	71	
2,4/2,5-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	65	
3,5-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	70	
2,3-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	92	
3,4-Dichlorophenol	<100	U	<100	U	<100	U	<100	U	66	
2,4,6-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	67	
2,3,6-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	65	
2,3,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	59	M
2,4,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	64	
2,3,4-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	66	
3,4,5-Trichlorophenol	<100	U	<100	U	<100	U	<100	U	66	
2,3,5,6/2,3,4,6-Tetrachlorophenol	<100	U	<100	U	<100	U	<100	U	77	M
2,3,4,5-Tetrachlorophenol	<100	U	<100	U	<100	U	<100	U	68	
Pentachlorophenol	<100	U	<100	U	<100	U	<100	U	98	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2-Fluorophenol	62	M	51		48		55		45	
d5-Phenol	66	M	51	M,R	45		54	M	46	M
d4-2-Chlorophenol	82	R	75	R	75	R	87	R	106	R
2,4,6-Tribromophenol	61		73		79		84		72	
13C-Pentachlorophenol	25		67		62		109		88	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	27		57		56		62		NS	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
NS	Indicates that this compound was not spiked in.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2786749-1	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	XAD		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061314.D
Run Date	6/13/2018 13:21
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USPR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	NotFnd	<100	U
3-Chlorophenol	NotFnd	<100	U
4-Chlorophenol	8.39	<100	U
2,6-Dichlorophenol	9.38	<100	U
2,4/2,5-Dichlorophenol	NotFnd	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	9.87	<100	U
3,4-Dichlorophenol	10.12	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	10.99	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.11	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.59	<100	U

Extraction Standards			**% Rec**		
2-Fluorophenol	1000	6.36	37	M	
d5-Phenol	1000	6.46	44	M	
d4-2-Chlorophenol	1000	8.04	81		R
2,4,6-Tribromophenol	1000	12.93	54		
13C-Pentachlorophenol	1000	13.59	52		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-1	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061316.D
Run Date	6/13/2018 14:08
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USPR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.03	105	M R
3-Chlorophenol	8.31	115	
4-Chlorophenol	8.37	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.54	125	R
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	9.86	<100	U
3,4-Dichlorophenol	10.14	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	10.88	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	11.01	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	11.51	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.12	<100	U
2,3,4,5-Tetrachlorophenol	12.48	<100	U
Pentachlorophenol	NotFnd	<100	U

Extraction Standards			**% Rec**
2-Fluorophenol	1000	6.32	46
d5-Phenol	1000	6.43	44 M
d4-2-Chlorophenol	1000	8.02	67
2,4,6-Tribromophenol	1000	12.93	67
13C-Pentachlorophenol	1000	13.58	62

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	53

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-2	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061317.D
Run Date	6/13/2018 14:31
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USPR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.04	<100	U
3-Chlorophenol	8.32	<100	U
4-Chlorophenol	8.38	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.55	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	NotFnd	<100	U
3,4-Dichlorophenol	NotFnd	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	11.51	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.12	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.59	<100	U

Extraction Standards			**% Rec**		
2-Fluorophenol	1000	6.36	50		
d5-Phenol	1000	6.45	51	M	R
d4-2-Chlorophenol	1000	8.03	70		R
2,4,6-Tribromophenol	1000	12.93	69		
13C-Pentachlorophenol	1000	13.59	60		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	53

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-3	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061318.D
Run Date	6/13/2018 14:54
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USPR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.03	108	R
3-Chlorophenol	8.31	<100	U
4-Chlorophenol	8.37	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.54	<100	U
3,5-Dichlorophenol	9.66	<100	U
2,3-Dichlorophenol	NotFnd	<100	U
3,4-Dichlorophenol	10.14	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.22	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.59	<100	U

Extraction Standards			**% Rec**	
2-Fluorophenol	1000	6.31	44	
d5-Phenol	1000	6.41	43	M
d4-2-Chlorophenol	1000	8.01	66	R
2,4,6-Tribromophenol	1000	12.93	80	
13C-Pentachlorophenol	1000	13.59	77	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	53

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-4	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061319.D
Run Date	6/13/2018 15:17
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USPR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.02	<100	U
3-Chlorophenol	NotFnd	<100	U
4-Chlorophenol	8.37	<100	U
2,6-Dichlorophenol	NotFnd	<100	U
2,4/2,5-Dichlorophenol	9.52	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	9.84	<100	U
3,4-Dichlorophenol	10.12	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	NotFnd	<100	U

Extraction Standards			**% Rec**		
2-Fluorophenol	1000	6.34	49		
d5-Phenol	1000	6.44	50	M	
d4-2-Chlorophenol	1000	8.02	71		R
2,4,6-Tribromophenol	1000	12.93	71		
13C-Pentachlorophenol	1000	13.59	68		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	58

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-5	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061320.D
Run Date	6/13/2018 15:40
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-4
Column	HP-5MS USR 326446H

Target Analytes	**Ret. Time**	**Concentration n/a**	**Flags**
2-Chlorophenol	8.03	<100	U
3-Chlorophenol	8.33	<100	U
4-Chlorophenol	8.40	<100	U
2,6-Dichlorophenol	NotFnd	<100	U
2,4/2,5-Dichlorophenol	9.55	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	9.87	<100	U
3,4-Dichlorophenol	NotFnd	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.12	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.58	<100	U

Extraction Standards			**% Rec**	
2-Fluorophenol	1000	6.41	62	M
d5-Phenol	1000	6.51	66	M
d4-2-Chlorophenol	1000	8.04	82	R
2,4,6-Tribromophenol	1000	12.93	61	
13C-Pentachlorophenol	1000	13.58	25	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.67	27

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-6	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061321.D
Run Date	6/13/2018 16:03
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR 326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.04	<100	U
3-Chlorophenol	8.32	<100	U
4-Chlorophenol	8.38	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.55	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	NotFnd	<100	U
3,4-Dichlorophenol	NotFnd	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	11.51	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.12	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.59	<100	U

Extraction Standards			**% Rec**		
2-Fluorophenol	1000	6.36	51		
d5-Phenol	1000	6.45	51	M	R
d4-2-Chlorophenol	1000	8.03	75		R
2,4,6-Tribromophenol	1000	12.93	73		
13C-Pentachlorophenol	1000	13.59	67		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	57

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-7	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061322.D
Run Date	6/13/2018 16:26
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR 326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.03	121	R
3-Chlorophenol	8.31	<100	U
4-Chlorophenol	8.37	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.54	<100	U
3,5-Dichlorophenol	9.67	<100	U
2,3-Dichlorophenol	9.87	<100	U
3,4-Dichlorophenol	10.14	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.12	<100	U
2,3,4,5-Tetrachlorophenol	NotFnd	<100	U
Pentachlorophenol	13.59	<100	U

Extraction Standards			**% Rec**	
2-Fluorophenol	1000	6.31	48	
d5-Phenol	1000	6.42	45	
d4-2-Chlorophenol	1000	8.02	75	R
2,4,6-Tribromophenol	1000	12.93	79	
13C-Pentachlorophenol	1000	13.59	62	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	56

U — Indicates that this compound was not detected above the LOR.

R — Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-8	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061323.D
Run Date	6/13/2018 16:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR 326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.02	<100	U
3-Chlorophenol	NotFnd	<100	U
4-Chlorophenol	8.37	<100	U
2,6-Dichlorophenol	9.37	<100	U
2,4/2,5-Dichlorophenol	9.55	<100	U
3,5-Dichlorophenol	9.66	<100	U
2,3-Dichlorophenol	9.84	<100	U
3,4-Dichlorophenol	10.12	<100	U
2,4,6-Trichlorophenol	10.47	<100	U
2,3,6-Trichlorophenol	NotFnd	<100	U
2,3,5-Trichlorophenol	NotFnd	<100	U
2,4,5-Trichlorophenol	NotFnd	<100	U
2,3,4-Trichlorophenol	NotFnd	<100	U
3,4,5-Trichlorophenol	NotFnd	<100	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<100	U
2,3,4,5-Tetrachlorophenol	12.61	<100	U
Pentachlorophenol	13.57	<100	U

Extraction Standards			**% Rec**	
2-Fluorophenol	1000	6.32	55	
d5-Phenol	1000	6.42	54	M
d4-2-Chlorophenol	1000	8.02	87	R
2,4,6-Tribromophenol	1000	12.93	84	
13C-Pentachlorophenol	1000	13.59	109	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.65	62

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2786749-2	Extraction Date	4-Jun-18
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 %		
Percent Moisture	n/a		
Split Ratio	10		

Approved:
S. Jin
--e-signature--
14-Jun-2018

Run Information	**Run 1**
Filename	18061312.D
Run Date	6/13/2018 12:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	%Rec
Instrument	MSD-4
Column	HP-5MS USR 326446H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
2-Chlorophenol	1000	8.03	62	M
3-Chlorophenol	1000	8.31	59	
4-Chlorophenol	1000	8.37	62	
2,6-Dichlorophenol	1000	9.35	71	
2,4/2,5-Dichlorophenol	2000	9.54	65	
3,5-Dichlorophenol	1000	9.67	70	
2,3-Dichlorophenol	1000	9.86	92	
3,4-Dichlorophenol	1000	10.10	66	
2,4,6-Trichlorophenol	1000	10.47	67	
2,3,6-Trichlorophenol	1000	10.88	65	
2,3,5-Trichlorophenol	1000	10.94	59	M
2,4,5-Trichlorophenol	1000	11.01	64	
2,3,4-Trichlorophenol	1000	11.40	66	
3,4,5-Trichlorophenol	1000	11.52	66	
2,3,5,6/2,3,4,6-Tetrachlorophenol	2000	12.12	77	M
2,3,4,5-Tetrachlorophenol	1000	12.61	68	
Pentachlorophenol	1000	13.58	98	
Extraction Standards			**% Rec**	
2-Fluorophenol	1000	6.31	45	
d5-Phenol	1000	6.41	46	M
d4-2-Chlorophenol	1000	8.02	106	R
2,4,6-Tribromophenol	1000	12.93	72	
13C-Pentachlorophenol	1000	13.58	88	
Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	24	NotFnd		

M	Indicates that a peak has been manually integrated.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2104490		Mississauga, ON L5J 2Y4
Date of Report	12-Jun-18		Canada
Date of Sample Receipt	4-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

The result for d12-benzo(a)anthracene in sample "18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)" (lab id L2104490-7) was marginally above the method acceptance criterion. Native results calculated by Isotope Dilution are inherently recovery corrected so no impact to overall data quality is expected.

The results for 1-methylnapthalene in the Laboratory Control Sample were marginally above the method acceptance criterion. Levels in the client samples may be similarly biased.

BR 11-Jun-18

Certified by: L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank	18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)	18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)	18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)	18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)
ALS Sample ID	WG2786749-1	L2104490-1	L2104490-2	L2104490-3	L2104490-4
Sample Size	1	1	1	1	1
Sample units	sample	sample	sample	sample	sample
Moisture Content	n/a	n/a	n/a	n/a	n/a
Matrix	QC	Stack	Stack	Stack	Stack
Sampling Date	n/a	31-May-18	31-May-18	1-Jun-18	31-May-18
Extraction Date	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18	4-Jun-18

Target Analytes	ng/sample		ng/sample		ng/sample		ng/sample		ng/sample	
Naphthalene	70.5		2000		213	B	116	B	70.8	B
2-Methylnaphthalene	<10	U	259		42.9	R	24.4		10.8	
1-Methylnaphthalene	13.6	M	196		81.6	B	74.3	B	65.8	B
Acenaphthylene	<10	U	39.5	M	<10	U	15.4	M	<10	U
Acenaphthene	<10	U	46.1		10.2	M	<10	U	<10	U
Fluorene	<10	U	99.2		27.9		18.3	M	<10	U
Phenanthrene	13.7	M,R	232		223		104	B	19.0	M,B
Anthracene	<10	U	21.0	M,R	17.7	M,R	11.1	M	<10	U
Fluoranthene	<10	U	46.6	R	46.6		26.7	R	10.8	R
Pyrene	11.5	R	59.5	R,B	49.2	B	37.2	R,B	14.8	R,B
Benzo(a)Anthracene	<10	U	<10	U	<10	U	<10	U	<10	U
Chrysene/Triphenylene	<10	U	18.8		<10	U	<10	U	<10	U
Benzo(b)Fluoranthene	<10	U	<10	U	18.0	M,R	<10	U	<10	U
Benzo(k)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(e)Pyrene	<10	U	11.8	M,R	37.7	R	34.7	M,R	<10	U
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	<10	U
Perylene	<10	U	<10	U	<10	U	<10	U	<10	U
Indeno(1,2,3-cd)Pyrene	15.0		13.0	R,B	29.2	R,B	28.0	R,B	17.6	R,B
Dibenzo(a,h/a,c)Anthracene	21.2	R	16.0	R,B	<10	U	<10	U	27.9	R,B
Benzo(g,h,i)Perylene	16.3	R	22.6	B	192		213		22.1	B
Additional Analytes										
Tetralin	496	R	452	R	174	M,R	354	M,R	326	R
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U	<10	U
Biphenyl	<10	U	100	R	33.4	R	27.1	R	<10	U
o-Terphenyl	<10	U	33.6		<10	U	<10	U	<10	U
1-Methylphenanthrene	13.1	R	30.3	R,B	43.0	R,B	18.4	R,B	16.7	R,B
9-Methylphenanthrene	<10	U	28.1		30.5		13.2		<10	U
2-methylanthracene	<10	U	36.6	R	52.0		18.9	R	<10	U
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U	<10	U
m-terphenyl	<10	U	33.4		10.7	R	<10	U	<10	U
p-terphenyl	<10	U	18.5	R	<10	U	<10	U	<10	U
Benzo(a)fluorene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(b)fluorene	<10	U	<10	U	<10	U	<10	U	<10	U
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U	<10	U	<10	U
3-Methylcholanthrene	<50	U	<50	U	<50	U	<50	U	<50	U
Picene	<50	U	<50	U	<50	U	<50	U	<50	U
Dibenzo(a,e)pyrene	<50	U	<50	U	<50	U	<50	U	<50	U
Coronene	<50	U	<50	U	250	M	253	M	<50	U
Field Sampling Standards	% Rec		% Rec		% Rec		% Rec		% Rec	
1-Methylnaphthalene-D10			123	M,R	113	M	119	M,R	124	
Fluorene D10			127		127		129		129	
Terphenyl D14(Surr.)			135		140		140		142	R
Extraction Standards	% Rec		% Rec		% Rec		% Rec		% Rec	
Naphthalene D8	75	R	76	R	79	R	89	R	82	R
2-Methylnaphthalene-D10	76		79		83		92		83	
Acenaphthylene D8	83		90		92		106		88	
Phenanthrene D10	68		63		64		74		70	
Anthracene-D10	69		68		64		80		71	
Fluoranthene D10	83	R	79	R	80	R	90	R	85	R
Benz(a)Anthracene-D12	146	M	139		137		145		148	M
Chrysene D12	89		84		84		91		91	
Benzo(b)Fluoranthene-D12	97		104		101		115		107	
Benzo(k)Fluoranthene-D12	75		82		81	R	90		89	
Benzo(a)Pyrene D12	103		105		103		118		112	
Perylene D12	92		101		105		122		114	
Indeno(1,2,3,cd)Pyrene-D12	81		83	M	83	M	111	M	92	
Dibenz(a,h)Anthracene-D14	67	M	64	M	61		81		70	
Benzo(g,h,i)Perylene D12	61		60		56		75		67	

U Indicates that this compound was not detected above the LOD.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)		18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)		18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)		18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)		Laboratory Control Sample	
ALS Sample ID	L2104490-5		L2104490-6		L2104490-7		L2104490-8		WG2786749-2	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		n/a	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC	
Sampling Date	31-May-18		1-Jun-18		1-Jun-18		31-May-18		n/a	
Extraction Date	4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18		4-Jun-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**%**	
Naphthalene	587		129	B	512	B	65.7	R,B	130	
2-Methylnaphthalene	147		24.3	R	127		<10	U	119	
1-Methylnaphthalene	139		71.2	B	135	B	66.1	B	152	M
Acenaphthylene	24.7	M	15.2	M	34.9	M	<10	U	108	
Acenaphthene	23.7	R	<10	U	26.3	M	<10	U	121	
Fluorene	58.1		25.0		61.1		<10	U	117	
Phenanthrene	242		166		194		<10	U	115	
Anthracene	15.5	M,R	12.8	M,R	14.6	M,R	<10	U	115	
Fluoranthene	43.0	R	44.4	R	55.6		79.1	R	113	
Pyrene	62.9	B	75.0	R,B	107	R,B	126	R	116	
Benzo(a)Anthracene	<10	U	<10	U	<10	U	14.0	R	94	
Chrysene/Triphenylene	<10	U	<10	U	<10	U	17.0		116	
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	98	
Benzo(k)Fluoranthene	<10	U	10.1	R	24.7	M,R	<10	U	117	
Benzo(e)Pyrene	39.5	M,R	50.1	M,R	35.2	R	19.2	M,R	108	
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	103	
Perylene	<10	U	<10	U	<10	U	<10	U	114	
Indeno(1,2,3-cd)Pyrene	27.1	B	32.8	R,B	13.9	M,R,B	21.6	B	95	
Dibenzo(a,h/a,c)Anthracene	<10	U	<10	U	<10	U	28.3	M,R,B	114	
Benzo(g,h,i)Perylene	149	B	177		100	R,B	52.2	R,B	109	
Additional Analytes										
Tetralin	178	R	314	R	312	M,R	407	R		
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U		
Biphenyl	117	R	40.8	R	67.7	R	<10	U		
o-Terphenyl	<10	U	<10	U	<10	U	<10	U		
1-Methylphenanthrene	35.7	R,B	22.7	R,B	26.0	R,B	<10	U		
9-Methylphenanthrene	24.7		23.6		24.9		<10	U		
2-methylanthracene	32.7		31.7		29.7	R	<10	U		
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U		
m-terphenyl	<10	U	<10	U	<10	U	<10	U		
p-terphenyl	<10	U	<10	U	<10	U	<10	U		
Benzo(a)fluorene	<10	U	<10	U	<10	U	<10	U		
Benzo(b)fluorene	<10	U	<10	U	<10	U	<10	U		
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U	<10	U		
3-Methylcholanthrene	<50	U	<50	U	<50	U	<50	U		
Picene	<50	U	<50	U	<50	U	<50	U		
Dibenzo(a,e)pyrene	<50	U	<50	U	<50	U	<50	U		
Coronene	114	M	141	M	88.6	M	<50	U		
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**			
1-Methylnaphthalene-D10	127	M,R	122	M,R	119	M,R	124			
Fluorene D10	131		129		126		124			
Terphenyl D14(Surr.)	146		137		142		152			
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	85	R	81	R	84	R	88	R	90	
2-Methylnaphthalene-D10	86		84		87		89		91	
Acenaphthylene D8	98		96		99		100		95	
Phenanthrene D10	69		69		69		79		78	
Anthracene-D10	72		75		71		81		78	
Fluoranthene D10	86	R	83	R	87	R	91	R	89	R
Benz(a)Anthracene-D12	143		132		151		136		146	
Chrysene D12	91		80		90		92		98	
Benzo(b)Fluoranthene-D12	110		104		113		114		100	
Benzo(k)Fluoranthene-D12	87		83		91		91		83	
Benzo(a)Pyrene D12	107		106		115		112		106	
Perylene D12	104		106		114		107		96	
Indeno(1,2,3,cd)Pyrene-D12	85	M	91	M	93	M	96		83	
Dibenz(a,h)Anthracene-D14	61		68		74	M	76		68	
Benzo(g,h,i)Perylene D12	59		64		65		73		64	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2786749-1	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060606.D
Run Date	6/6/2018 16:31
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USN695247H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	70.5	
2-Methylnaphthalene	NotFnd	<10	U
1-Methylnaphthalene	10.00	13.6	M
Acenaphthylene	11.34	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	NotFnd	<10	U
Phenanthrene	14.15	13.7	M R
Anthracene	14.23	<10	U
Fluoranthene	16.22	<10	U
Pyrene	16.61	11.5	R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	21.32	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	15.0	
Dibenzo(a,h/a,c)Anthracene	23.98	21.2	R
Benzo(g,h,i)Perylene	24.31	16.3	R
Additional Analytes			
Tetralin	8.37	496	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	NotFnd	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.12	13.1	R
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	75	R	50-150
2-Methylnaphthalene-D10	500	9.78	76		50-150
Acenaphthylene D8	500	11.33	83		50-150
Phenanthrene D10	500	14.11	68		50-150
Anthracene-D10	500	14.20	69		50-150
Fluoranthene D10	500	16.19	83	R	50-150
Benz(a)Anthracene-D12	500	19.00	146	M	50-150
Chrysene D12	500	19.07	89		50-150
Benzo(b)Fluoranthene-D12	500	21.22	97		50-150
Benzo(k)Fluoranthene-D12	500	21.28	75		50-150
Benzo(a)Pyrene D12	500	21.83	103		50-150
Perylene D12	500	21.99	92		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	81		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	67	M	50-150
Benzo(g,h,i)Perylene D12	500	24.26	61		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(1 THRU 5) TEST#1 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-1	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060613.D
Run Date	6/7/2018 9:21
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USN695247H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	2000	
2-Methylnaphthalene	9.82	259	
1-Methylnaphthalene	10.00	196	
Acenaphthylene	11.34	39.5 M	
Acenaphthene	11.67	46.1	
Fluorene	12.54	99.2	
Phenanthrene	14.15	232	
Anthracene	14.23	21.0 M	R
Fluoranthene	16.22	46.6	R
Pyrene	16.61	59.5	R B
Benzo(a)Anthracene	19.04	<10	U
Chrysene/Triphenalyn	19.11	18.8	
Benzo(b)Fluoranthene	21.27	<10	U
Benzo(k)Fluoranthene	21.31	<10	U
Benzo(e)Pyrene	21.77	11.8 M	R
Benzo(a)Pyrene	21.88	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	13.0	R B
Dibenzo(a,h/a,c)Anthracene	23.97	16.0	R B
Benzo(g,h,i)Perylene	24.30	22.6	B
Additional Analytes			
Tetralin	8.37	452	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	100	R
o-Terphenyl	14.95	33.6	
1-Methylphenanthrene	15.12	30.3	R B
9-Methylphenanthrene	15.20	28.1	
2-methylanthracene	15.23	36.6	R
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.80	33.4	
p-terphenyl	17.10	18.5	R
Benzo(a)fluorene	17.31	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	122.8 M	R
Fluorene D10	300	12.49	127	
Terphenyl D14(Surr.)	300	17.06	135	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	76	R	50-150
2-Methylnaphthalene-D10	500	9.77	79		50-150
Acenaphthylene D8	500	11.33	90		50-150
Phenanthrene D10	500	14.11	63		50-150
Anthracene-D10	500	14.19	68		50-150
Fluoranthene D10	500	16.18	79	R	50-150
Benz(a)Anthracene-D12	500	19.00	139		50-150
Chrysene D12	500	19.07	84		50-150
Benzo(b)Fluoranthene-D12	500	21.22	104		50-150
Benzo(k)Fluoranthene-D12	500	21.27	82		50-150
Benzo(a)Pyrene D12	500	21.83	105		50-150
Perylene D12	500	21.99	101		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	83 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	64 M		50-150
Benzo(g,h,i)Perylene D12	500	24.26	60		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(6 THRU 10) TEST#2 (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-2	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060614.D
Run Date	6/7/2018 9:57
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USN695247H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	213	B
2-Methylnaphthalene	9.82	42.9	R
1-Methylnaphthalene	10.00	81.6	B
Acenaphthylene	11.34	<10	U
Acenaphthene	11.67	10.2 M	
Fluorene	12.54	27.9	
Phenanthrene	14.15	223	
Anthracene	14.23	17.7 M	R
Fluoranthene	16.22	46.6	
Pyrene	16.61	49.2	B
Benzo(a)Anthracene	19.04	<10	U
Chrysene/Triphenalyn	19.12	<10	U
Benzo(b)Fluoranthene	21.30	18.0 M	R
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	21.77	37.7	R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	29.2	R B
Dibenzo(a,h/a,c)Anthracene	23.97	<10	U
Benzo(g,h,i)Perylene	24.30	192	
Additional Analytes			
Tetralin	8.37	174 M	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	33.4	R
o-Terphenyl	14.95	<10	U
1-Methylphenanthrene	15.12	43.0	R B
9-Methylphenanthrene	15.19	30.5	
2-methylanthracene	15.23	52.0	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.80	10.7	R
p-terphenyl	17.10	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.79	250 M	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	113 M	
Fluorene D10	300	12.49	127	
Terphenyl D14(Surr.)	300	17.06	140	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	79	R	50-150
2-Methylnaphthalene-D10	500	9.77	83		50-150
Acenaphthylene D8	500	11.33	92		50-150
Phenanthrene D10	500	14.11	64		50-150
Anthracene-D10	500	14.19	64		50-150
Fluoranthene D10	500	16.18	80	R	50-150
Benz(a)Anthracene-D12	500	19.00	137		50-150
Chrysene D12	500	19.07	84		50-150
Benzo(b)Fluoranthene-D12	500	21.22	101		50-150
Benzo(k)Fluoranthene-D12	500	21.28	81	R	50-150
Benzo(a)Pyrene D12	500	21.83	103		50-150
Perylene D12	500	21.99	105		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	83 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	61		50-150
Benzo(g,h,i)Perylene D12	500	24.26	56		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(11 THRU 15) TEST#3 (#1 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-3	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060615.D
Run Date	6/7/2018 10:34
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USN695247H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	116	B
2-Methylnaphthalene	9.82	24.4	
1-Methylnaphthalene	10.00	74.3	B
Acenaphthylene	11.33	15.4 M	
Acenaphthene	11.67	<10 U	
Fluorene	12.54	18.3 M	
Phenanthrene	14.15	104	B
Anthracene	14.23	11.1 M	
Fluoranthene	16.22	26.7	R
Pyrene	16.61	37.2	R B
Benzo(a)Anthracene	NotFnd	<10 U	
Chrysene/Triphenalyn	NotFnd	<10 U	
Benzo(b)Fluoranthene	NotFnd	<10 U	
Benzo(k)Fluoranthene	NotFnd	<10 U	
Benzo(e)Pyrene	21.77	34.7 M	R
Benzo(a)Pyrene	21.87	<10 U	
Perylene	NotFnd	<10 U	
Indeno(1,2,3-cd)Pyrene	23.90	28.0	R B
Dibenzo(a,h/a,c)Anthracene	NotFnd	<10 U	
Benzo(g,h,i)Perylene	24.30	213	
Additional Analytes			
Tetralin	8.37	354 M	R B
2-Chloronaphthalene	NotFnd	<10 U	
Biphenyl	10.66	27.1	R
o-Terphenyl	14.95	<10 U	
1-Methylphenanthrene	15.11	18.4	R B
9-Methylphenanthrene	15.20	13.2	
2-methylanthracene	15.23	18.9	R
9,10-dimethylanthracene	NotFnd	<10 U	
m-terphenyl	16.81	<10 U	
p-terphenyl	17.09	<10 U	
Benzo(a)fluorene	NotFnd	<10 U	
Benzo(b)fluorene	NotFnd	<10 U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10 U	
3-Methylcholanthrene	NotFnd	<50 U	
Picene	NotFnd	<50 U	
Dibenzo(a,e)pyrene	NotFnd	<50 U	
Coronene	26.79	253 M	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.93	118.9 M	R
Fluorene D10	300	12.49	129	
Terphenyl D14(Surr.)	300	17.06	140	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	89	R	50-150
2-Methylnaphthalene-D10	500	9.77	92		50-150
Acenaphthylene D8	500	11.33	106		50-150
Phenanthrene D10	500	14.11	74		50-150
Anthracene-D10	500	14.19	80		50-150
Fluoranthene D10	500	16.18	90	R	50-150
Benz(a)Anthracene-D12	500	18.99	145		50-150
Chrysene D12	500	19.07	91		50-150
Benzo(b)Fluoranthene-D12	500	21.22	115		50-150
Benzo(k)Fluoranthene-D12	500	21.27	90		50-150
Benzo(a)Pyrene D12	500	21.83	118		50-150
Perylene D12	500	21.98	122		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	111 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	81		50-150
Benzo(g,h,i)Perylene D12	500	24.26	75		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(16 THRU 20) BLANK (#1 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-4	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060611.D
Run Date	6/6/2018 19:34
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USN695247H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	70.8	B
2-Methylnaphthalene	9.83	10.8	
1-Methylnaphthalene	10.00	65.8	B
Acenaphthylene	11.34	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	12.54	<10	U
Phenanthrene	14.15	19.0 M	B
Anthracene	14.23	<10	U
Fluoranthene	16.22	10.8	R
Pyrene	16.61	14.8	R B
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenalyn	19.13	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	21.77	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	17.6	R B
Dibenzo(a,h/a,c)Anthracene	23.97	27.9	R B
Benzo(g,h,i)Perylene	24.31	22.1	B
Additional Analytes			
Tetralin	8.38	326	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.12	16.7	R B
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	123.5	
Fluorene D10	300	12.49	129	
Terphenyl D14(Surr.)	300	17.07	142	R

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	82	R	50-150
2-Methylnaphthalene-D10	500	9.78	83		50-150
Acenaphthylene D8	500	11.33	88		50-150
Phenanthrene D10	500	14.11	70		50-150
Anthracene-D10	500	14.20	71		50-150
Fluoranthene D10	500	16.19	85	R	50-150
Benz(a)Anthracene-D12	500	19.00	148 M		50-150
Chrysene D12	500	19.07	91		50-150
Benzo(b)Fluoranthene-D12	500	21.23	107		50-150
Benzo(k)Fluoranthene-D12	500	21.28	89		50-150
Benzo(a)Pyrene D12	500	21.83	112		50-150
Perylene D12	500	21.99	114		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.87	92		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	70		50-150
Benzo(g,h,i)Perylene D12	500	24.26	67		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(21 THRU 25) TEST#1 (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-5	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060616.D
Run Date	6/7/2018 11:11
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USD321416H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	587	
2-Methylnaphthalene	9.82	147	
1-Methylnaphthalene	10.00	139	
Acenaphthylene	11.34	24.7 M	
Acenaphthene	11.67	23.7	R
Fluorene	12.54	58.1	
Phenanthrene	14.15	242	
Anthracene	14.23	15.5 M	R
Fluoranthene	16.21	43.0	R
Pyrene	16.60	62.9	B
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenalyn	19.12	<10	U
Benzo(b)Fluoranthene	21.26	<10	U
Benzo(k)Fluoranthene	21.31	<10	U
Benzo(e)Pyrene	21.78	39.5 M	R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.91	27.1	B
Dibenzo(a,h/a,c)Anthracene	23.98	<10	U
Benzo(g,h,i)Perylene	24.31	149	B
Additional Analytes			
Tetralin	8.37	178	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	117	R
o-Terphenyl	14.95	<10	U
1-Methylphenanthrene	15.12	35.7	R B
9-Methylphenanthrene	15.20	24.7	
2-methylanthracene	15.23	32.7	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.80	<10	U
p-terphenyl	17.06	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.79	114 M	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	127 M	R
Fluorene D10	300	12.49	131	
Terphenyl D14(Surr.)	300	17.06	146	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	85	R	50-150
2-Methylnaphthalene-D10	500	9.77	86		50-150
Acenaphthylene D8	500	11.33	98		50-150
Phenanthrene D10	500	14.11	69		50-150
Anthracene-D10	500	14.20	72		50-150
Fluoranthene D10	500	16.19	86	R	50-150
Benz(a)Anthracene-D12	500	19.00	143		50-150
Chrysene D12	500	19.07	91		50-150
Benzo(b)Fluoranthene-D12	500	21.22	110		50-150
Benzo(k)Fluoranthene-D12	500	21.27	87		50-150
Benzo(a)Pyrene D12	500	21.83	107		50-150
Perylene D12	500	21.99	104		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.87	85 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	61		50-150
Benzo(g,h,i)Perylene D12	500	24.26	59		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(26 THRU 30) TEST#2 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-6	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060617.D
Run Date	6/7/2018 11:47
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USD321416H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	129	B
2-Methylnaphthalene	9.82	24.3	R
1-Methylnaphthalene	10.00	71.2	B
Acenaphthylene	11.33	15.2 M	
Acenaphthene	11.67	<10	U
Fluorene	12.54	25.0	
Phenanthrene	14.15	166	
Anthracene	14.23	12.8 M	R
Fluoranthene	16.22	44.4	R
Pyrene	16.61	75.0	R B
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenalyn	19.12	<10	U
Benzo(b)Fluoranthene	21.27	<10	U
Benzo(k)Fluoranthene	21.30	10.1	R
Benzo(e)Pyrene	21.77	50.1 M	R
Benzo(a)Pyrene	21.87	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	32.8	R B
Dibenzo(a,h/a,c)Anthracene	23.97	<10	U
Benzo(g,h,i)Perylene	24.30	177	
Additional Analytes			
Tetralin	8.37	314	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	40.8	R
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.12	22.7	R B
9-Methylphenanthrene	15.19	23.6	
2-methylanthracene	15.23	31.7	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.80	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.80	141 M	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	122.3 M	R
Fluorene D10	300	12.49	129	
Terphenyl D14(Surr.)	300	17.06	137	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.59	81	R	50-150
2-Methylnaphthalene-D10	500	9.77	84		50-150
Acenaphthylene D8	500	11.33	96		50-150
Phenanthrene D10	500	14.11	69		50-150
Anthracene-D10	500	14.19	75		50-150
Fluoranthene D10	500	16.18	83	R	50-150
Benz(a)Anthracene-D12	500	18.99	132		50-150
Chrysene D12	500	19.07	80		50-150
Benzo(b)Fluoranthene-D12	500	21.22	104		50-150
Benzo(k)Fluoranthene-D12	500	21.27	83		50-150
Benzo(a)Pyrene D12	500	21.83	106		50-150
Perylene D12	500	21.98	106		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	91 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	68		50-150
Benzo(g,h,i)Perylene D12	500	24.26	64		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(31 THRU 35) TEST#3 (#2 APC OUTLET)**	Sampling Date	1-Jun-18
ALS Sample ID	L2104490-7	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060618.D
Run Date	6/7/2018 12:24
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USD321416H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	512	B
2-Methylnaphthalene	9.82	127	
1-Methylnaphthalene	10.00	135	B
Acenaphthylene	11.34	34.9 M	
Acenaphthene	11.67	26.3 M	
Fluorene	12.54	61.1	
Phenanthrene	14.15	194	
Anthracene	14.23	14.6 M	R
Fluoranthene	16.22	55.6	
Pyrene	16.61	107	R B
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenalyn	19.12	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	21.30	24.7 M	R
Benzo(e)Pyrene	21.77	35.2	R
Benzo(a)Pyrene	21.88	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	13.9 M	R B
Dibenzo(a,h/a,c)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.30	100	R B
Additional Analytes			
Tetralin	8.37	312 M	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.66	67.7	R
o-Terphenyl	14.95	<10	U
1-Methylphenanthrene	15.12	26.0	R B
9-Methylphenanthrene	15.19	24.9	
2-methylanthracene	15.23	29.7	R
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.80	<10	U
p-terphenyl	17.10	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.79	88.6 M	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	300	9.94	118.5 M	R
Fluorene D10	300	12.49	126	
Terphenyl D14(Surr.)	300	17.06	142	

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	84	R	50-150
2-Methylnaphthalene-D10	500	9.77	87		50-150
Acenaphthylene D8	500	11.33	99		50-150
Phenanthrene D10	500	14.11	69		50-150
Anthracene-D10	500	14.19	71		50-150
Fluoranthene D10	500	16.18	87	R	50-150
Benz(a)Anthracene-D12	500	18.99	151		50-150
Chrysene D12	500	19.07	90		50-150
Benzo(b)Fluoranthene-D12	500	21.22	113		50-150
Benzo(k)Fluoranthene-D12	500	21.27	91		50-150
Benzo(a)Pyrene D12	500	21.83	115		50-150
Perylene D12	500	21.99	114		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.86	93 M		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	74 M		50-150
Benzo(g,h,i)Perylene D12	500	24.26	65		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21840-SVOC-(36 THRU 40) BLANK (#2 APC OUTLET)**	Sampling Date	31-May-18
ALS Sample ID	L2104490-8	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060612.D
Run Date	6/7/2018 8:44
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USD321416H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.63	65.7	R B
2-Methylnaphthalene	9.82	<10	U
1-Methylnaphthalene	10.00	66.1	B
Acenaphthylene	NotFnd	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	NotFnd	<10	U
Phenanthrene	NotFnd	<10	U
Anthracene	NotFnd	<10	U
Fluoranthene	16.19	79.1	R
Pyrene	16.58	126	R
Benzo(a)Anthracene	19.04	14.0	R
Chrysene/Triphenalyn	19.12	17.0	
Benzo(b)Fluoranthene	21.27	<10	U
Benzo(k)Fluoranthene	21.32	<10	U
Benzo(e)Pyrene	21.77	19.2 M	R
Benzo(a)Pyrene	21.87	<10	U
Perylene	22.03	<10	U
Indeno(1,2,3-cd)Pyrene	23.90	21.6	B
Dibenzo(a,h/a,c)Anthracene	23.97	28.3 M	R B
Benzo(g,h,i)Perylene	24.30	52.2	R B
Additional Analytes			
Tetralin	8.38	407	R B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	NotFnd	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	23.97	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	300	9.94	124.3
Fluorene D10	300	12.49	124
Terphenyl D14(Surr.)	300	17.06	152

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.60	88	R	50-150
2-Methylnaphthalene-D10	500	9.77	89		50-150
Acenaphthylene D8	500	11.33	100		50-150
Phenanthrene D10	500	14.11	79		50-150
Anthracene-D10	500	14.19	81		50-150
Fluoranthene D10	500	16.18	91	R	50-150
Benz(a)Anthracene-D12	500	19.00	136		50-150
Chrysene D12	500	19.07	92		50-150
Benzo(b)Fluoranthene-D12	500	21.22	114		50-150
Benzo(k)Fluoranthene-D12	500	21.28	91		50-150
Benzo(a)Pyrene D12	500	21.83	112		50-150
Perylene D12	500	21.99	107		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.87	96		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	76		50-150
Benzo(g,h,i)Perylene D12	500	24.26	73		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2786749-2	Extraction Date	4-Jun-18
Analysis Method	PAH by CARB 429		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2786749

Approved:
Yuliya Sharun
--e-signature--
07-Jun-2018

Run Information	**Run 1**
Filename	18060604.D
Run Date	6/6/2018 15:18
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-1
Column	HP-5MS USD321416H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	500	8.63	130		50-150
2-Methylnaphthalene	500	9.83	119		50-150
1-Methylnaphthalene	500	10.00	152	M	50-150
Acenaphthylene	500	11.34	108		50-150
Acenaphthene	500	11.67	121		50-150
Fluorene	500	12.54	117		50-150
Phenanthrene	500	14.15	115		50-150
Anthracene	500	14.23	115		50-150
Fluoranthene	500	16.21	113		50-150
Pyrene	500	16.60	116		50-150
Benzo(a)Anthracene	500	19.04	94		50-150
Chrysene/Triphenalyn	500	19.13	116		50-150
Benzo(b)Fluoranthene	500	21.26	98		50-150
Benzo(k)Fluoranthene	500	21.31	117		50-150
Benzo(e)Pyrene	500	21.78	108		50-150
Benzo(a)Pyrene	500	21.88	103		50-150
Perylene	500	22.04	114		50-150
Indeno(1,2,3-cd)Pyrene	500	23.90	95		50-150
Dibenzo(a,h/a,c)Anthracene	500	23.97	114		50-150
Benzo(g,h,i)Perylene	500	24.31	109		50-150

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	8.61	89.5		30-150
2-Methylnaphthalene-D10	500	9.78	90.5		30-150
Acenaphthylene D8	500	11.33	94.8		30-150
Phenanthrene D10	500	14.12	77.8		50-150
Anthracene-D10	500	14.20	77.7		50-150
Fluoranthene D10	500	16.19	88.6	R	50-150
Benz(a)Anthracene-D12	500	19.00	145.7		50-150
Chrysene D12	500	19.07	98.4		50-150
Benzo(b)Fluoranthene-D12	500	21.22	100.1		50-150
Benzo(k)Fluoranthene-D12	500	21.28	83.3		50-150
Benzo(a)Pyrene D12	500	21.83	105.7		30-150
Perylene D12	500	21.99	95.7		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	23.87	82.9		50-150
Dibenz(a,h)Anthracene-D14	500	23.92	67.9		50-150
Benzo(g,h,i)Perylene D12	500	24.27	63.6		50-150

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

APPENDIX 16

Acid Gas Recovery Data Sheets
(8 pages)

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 29, 18
Test No.:	1
Test Location:	UNIT 1 APC OUTLET

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	652.2
Initial Wt:	752.8
Final Wt:	868.9
1 Gain:	116.1
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	690.8
Initial Wt:	792.3
Final Wt:	830.8
2 Gain:	38.5
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	620.5
Final Wt:	625.2
3 Gain:	4.7
Colour:	clear

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	979.6
Final Wt:	996.0
4 Gain:	16.4

CWTR = 1+2+3:	159.3 ✓
WCBDA= 4:	16.4

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.3
With Imp. 1,2,3 Soln:	634.8
Imp. 1,2,3 Volume:	352.5
After Rinse:	713.5
Total TS3:	431.2

SAMPLE ID: 18-21840-M26A- 1

#1

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 29, 18
Test No.:	2
Test Location:	UNIT 1 OUTLET

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	576.4
Initial Wt:	695.1
Final Wt:	918.4
1 Gain:	133.3
Colour:	clear

Impinger #2 0.1 N H_2SO4	
Empty Wt:	657.7
Initial Wt:	757.9
Final Wt:	789.2
2 Gain:	31.3
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	588.0
Final Wt:	590.0
3 Gain:	2.0
Colour:	clear

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	852.0
Final Wt:	863.6
4 Gain:	11.6

CWTR = 1+2+3:	166.6 ✓
WCBDA= 4:	11.6

CONTAINER TS3 WEIGHTS	
Empty Wt:	283.1
With Imp. 1,2,3 Soln:	650.3
Imp. 1,2,3 Volume:	367.2
After Rinse:	760.5
Total TS3:	477.4

SAMPLE ID: 18-21840-M26A- 2

#5

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 29, 18
Test No.:	3
Test Location:	UNIT 1 OUTLET

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	652.2
Initial Wt:	755.4
Final Wt:	869.3
1 Gain:	113.9
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	690.3
Initial Wt:	794.1
Final Wt:	818.1
2 Gain:	24.0
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	620.5
Final Wt:	626.0
3 Gain:	5.5
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.8
With Imp. 1,2,3 Soln:	622.6
Imp. 1,2,3 Volume:	339.8
After Rinse:	726.0
Total TS3:	443.2

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	996.0
Final Wt:	1009.1
4 Gain:	13.1

CWTR = 1+2+3:	143.4 ✓
WCBDA= 4:	13.1

SAMPLE ID: 18-21840-M26A- 3

#1

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	1
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	578.6
Initial Wt:	680.3
Final Wt:	803.4
1 Gain:	123.1
Colour:	clear

Impinger #2 0.1 N H_2SO4	
Empty Wt:	659.2
Initial Wt:	759.7
Final Wt:	789.3
2 Gain:	29.6
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	589.1
Final Wt:	592.5
3 Gain:	3.4
Colour:	clear

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	863.6
Final Wt:	873.5
4 Gain:	9.9

CWTR = 1+2+3:	156.1 ✓
WCBDA= 4:	9.9

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.6
With Imp. 1,2,3 Soln:	635.4
Imp. 1,2,3 Volume:	352.8
After Rinse:	738.9
Total TS3:	456.3

SAMPLE ID: 18-21840-M26A- 4

#5

Train Loaded By: DT

Train Recovered By: DT

Recovery Witnessed By:

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	2
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	654.3
Initial Wt:	754.7
Final Wt:	886.0
1 Gain:	131.3
Colour:	clear

Impinger #2 0.1 N H_2SO4	
Empty Wt:	693.8
Initial Wt:	795.1
Final Wt:	819.9
2 Gain:	24.8
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	622.1
Final Wt:	625.0
3 Gain:	2.9
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.9
With Imp. 1,2,3 Soln:	640.5
Imp. 1,2,3 Volume:	357.6
After Rinse:	747.7
Total TS3:	464.8

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	1009.1
Final Wt:	1018.7
4 Gain:	9.6

CWTR = 1+2+3:	159.0 ✓
WCBDA= 4:	9.6

SAMPLE ID: 18-21840-M26A- 5

#1

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	—

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAR 30, 18
Test No.:	3
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	578.5
Initial Wt:	678.1
Final Wt:	809.7
1 Gain:	131.6
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	659.8
Initial Wt:	761.0
Final Wt:	788.4
2 Gain:	27.4
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	590.1
Final Wt:	593.0
3 Gain:	2.9
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.9
With Imp. 1,2,3 Soln:	633.7
Imp. 1,2,3 Volume:	350.8
After Rinse:	786.3
Total TS3:	503.4

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	859.3
Final Wt:	871.6
4 Gain:	12.3

CWTR = 1+2+3:	161.9 ✓
WCBDA= 4:	12.3

SAMPLE ID: 18-21840-M26A- 6

FS

Train Loaded By:	DT
Train Recovered By:	RS
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	BLANK 1
Test Location:	

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	
Final Wt:	
3 Gain:	
Colour:	

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.8
With Imp. 1,2,3 Soln:	482.9
Imp. 1,2,3 Volume:	200.1
After Rinse:	~~644~~ 731.6
Total TS3:	448.8

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 18-21840-M26A- BLANK 1

Train Loaded By:	ST
Train Recovered By:	ST
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21840
Date:	MAY 30, 18
Test No.:	BLANK 2
Test Location:	

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	
Final Wt:	
3 Gain:	
Colour:	

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.7
With Imp. 1,2,3 Soln:	482.7
Imp. 1,2,3 Volume:	200.0
After Rinse:	738.5
Total TS3:	455.8

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 18-21840-M26A- BLANK 2

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	—

APPENDIX 17

VOST Analytical Reports
(6 pages)

ALS Environmental
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2105278		Mississauga, ON L5J 2Y4
Date of Report	18-Jun-18		Canada
Date of Sample Receipt	4-Jun-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 COVANTA

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only

The results for Trichlorotrifluoroethane; 1,3-Butadiene; Isopropylbenzene; Dichlorodifluoromethane; Ethylene Dibromide; 1,3,5-trimethylbenzene are semi-quantitative due to being outside the normal volatility range for method 0030/0031.

All samples contained large amounts of water and saturated tenax in the first tube of each pair, the glass wool was removed from the tubes and replaced before desorbing.

There were significant and variable levels of methylene chloride and toluene in most samples and all field and trip blanks. Since the need for dilution is assessed using the first of each series of runs, the levels of these targets have exceeded the calibration range in some cases.

The recovery of the interal standard is below the method control limit for some samples, however, the surrogate and field standard recoveries are within limits. Sample data are not expected to be biased as a result, except as noted.

For the sample 18-21840-VOST-(14A,14B) TEST#3 TRIP BLANK (#1 APC OUTLET), the recoveries of the internal standards are low and the recovery of the field standard is high. The reported results may be elevated as a result.
S. Kennedy 18-Jun-18

The following synonyms are noted:

Mesitylene	has been reported as:	1,3,5-Trimethylbenzene
Tetrachloroethylene	has been reported as:	Tetrachloroethene
Cumene	has been reported as:	Isopropylbenzene
1,1,2-Trichloroethylene	has been reported as:	Trichloroethene

Certified by: _____
Whitney Davis
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-VOST-(1A,1B) TEST#1 PAIR#1 (#1 APC OUTLET)		18-21840-VOST-(2A,2B) TEST#1 PAIR#2 (#1 APC OUTLET)		18-21840-VOST-(3A,3B) TEST#1 PAIR#3 (#1 APC OUTLET)		18-21840-VOST-(5A,5B) TEST#2 PAIR#1 (#1 APC OUTLET)		18-21840-VOST-(6A,6B) TEST#2 PAIR#2 (#1 APC OUTLET)		18-21840-VOST-(7A,7B) TEST#2 PAIR#3 (#1 APC OUTLET)	
ALS Sample ID	L2105278-1		L2105278-2		L2105278-3		L2105278-5		L2105278-6		L2105278-7	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	31-May-18		31-May-18		31-May-18		31-May-18		31-May-18		31-May-18	
Extraction Date	13-Jun-18		14-Jun-18		14-Jun-18		14-Jun-18		14-Jun-18		14-Jun-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	0.091		0.078		0.122		<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.277		0.196		0.162		0.362		<0.1	U	0.1	
Methylene Chloride	0.477		0.716		0.114		0.488		0.158		<0.1	U
trans,1,2-Dichloroethene	0.036		<0.01	U	<0.01	U	0.011		<0.01	U	<0.01	U
2-Butanone	0.053		0.057		0.065		0.033		0.018		0.019	
Chloroform	0.025		0.026		0.027		0.017		0.011		0.012	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	0.086		0.05		0.491		0.215		0.072		0.062	
1,2-Dichloroethane	<0.01	U	<0.01	U	0.017		<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	0.012		0.012		0.011		0.01		<0.01	U	<0.01	U
Toluene	0.19		0.333		<0.05	U	0.427		0.179		0.225	
Tetrachloroethene	0.033		0.035		0.031		0.041		0.026		0.025	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	0.023		<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	0.05		<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	0.022		<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	0.022		<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	0.152		<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Trichlortrifluoroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,3-Butadiene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	52.8		89.8		93.9		135.7		94.1		122.4	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	102.1		119.8		114.6	R	79.5	R	75.6		75.3	
d8-Toluene(SURR)	99.5		108.6		96.4		111.0		110.9		103.3	
4-Bromofluorobenzene(SURR)	107.4		109.3		95.0		115.7		107.9		120.4	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	50.7		84.0		85.6		78.8		87.9		81.9	
1,4-Difluorobenzene	55.0		70.8		76.4		63.4		73.6		63.8	
d5-Chlorobenzene	54.4		62.1		80.2		49.9	L	64.6		56.4	

U Indicates that this compound was not detected above the RL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

L Indicates this value is below the control limit.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-VOST-(9A,9B) TEST#2 FIELD BLANK (#1 APC OUTLET)		18-21840-VOST-(10A,10B) TEST#3 PAIR#1 (#1 APC OUTLET)		18-21840-VOST-(11A,11B) TEST#3 PAIR#2 (#1 APC OUTLET)		18-21840-VOST-(12A,12B) TEST#3 PAIR#3 (#1 APC OUTLET)		18-21840-VOST-(14A,14B) TEST#3 TRIP BLANK (#1 APC OUTLET)		18-21840-VOST-(16A,16B) TEST#1 PAIR#1 (#2 APC OUTLET)	
ALS Sample ID	L2105278-9		L2105278-10		L2105278-11		L2105278-12		L2105278-14		L2105278-15	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	31-May-18		1-Jun-18		1-Jun-18		1-Jun-18		1-Jun-18		31-May-18	
Extraction Date	13-Jun-18		14-Jun-18		14-Jun-18		14-Jun-18		13-Jun-18		14-Jun-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	0.032		<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.018	
Acetone	<0.1	U	<0.1	U	0.146		<0.1	U	0.192		0.105	
Methylene Chloride	1.053	E	0.237		0.183		0.491		1.704	E	1.335	E
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	0.017		<0.01	U	<0.01	U	<0.01	U
2-Butanone	0.017		0.014		0.232		<0.01	U	0.026		0.036	
Chloroform	<0.01	U	0.017		0.026		<0.01	U	<0.01	U	0.013	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	0.063		<0.01	U	<0.01	U	<0.01	U
Benzene	<0.05	U	0.072		0.216		0.055		0.073		0.086	
1,2-Dichloroethane	<0.01	U	<0.01	U	0.01		<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	0.011		<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	<0.01	U	<0.01	U	0.012		<0.01	U	<0.01	U	<0.01	U
Toluene	2.142	E	0.224		0.95		0.718		5.27	E	0.161	
Tetrachloroethene	<0.01	U	0.038		0.077		0.038		<0.01	U	0.043	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	0.044		<0.01	U	<0.01	U	0.013	
M&P-Xylene	<0.03	U	<0.03	U	0.263		<0.03	U	<0.03	U	0.034	
O-Xylene	<0.01	U	<0.01	U	0.088		<0.01	U	<0.01	U	0.013	
Styrene	<0.02	U	<0.02	U	0.021	R	<0.02	U	<0.02	U	0.022	
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	0.107	
Trichlortrifluoroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,3-Butadiene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	90.0		111.9		106.2		125.0		180.0		121.1	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	109.5		75.3		71.6		58.4		146.2		80.0	
d8-Toluene(SURR)	97.8		112.7		115.3		107.8		102.5		108.4	
4-Bromofluorobenzene(SURR)	100.1		119.8		106.4		144.7		106.4		115.2	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	57.0		76.9		64.4		75.0		18.9	L	66.0	
1,4-Difluorobenzene	56.7		63.4		57.8		51.1		15.7	L	52.1	
d5-Chlorobenzene	61.3		43.3	L	44.6	L	37.3	L	16.5	L	48.1	L

U Indicates that this compound was not detected above the RL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

L Indicates this value is below the control limit.

E Indicates Estimated value. Instrument response exceeds instrument calibration range of 1.0 ug.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-VOST-(17A,17B) TEST#1 PAIR#2 (#2 APC OUTLET)		18-21840-VOST-(18A,18B) TEST#1 PAIR#3 (#2 APC OUTLET)		18-21840-VOST-(30A,30B) TEST#1 FIELD BLANK (#2 APC OUTLET)		18-21840-VOST-(20A,20B) TEST#2 PAIR#1 (#2 APC OUTLET)		18-21840-VOST-(21A,21B) TEST#2 PAIR#2 (#2 APC OUTLET)		18-21840-VOST-(22A,22B) TEST#2 PAIR#3 (#2 APC OUTLET)	
ALS Sample ID	L2105278-16		L2105278-17		L2105278-19		L2105278-20		L2105278-21		L2105278-22	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	31-May-18		31-May-18		31-May-18		31-May-18		31-May-18		31-May-18	
Extraction Date	15-Jun-18		15-Jun-18		13-Jun-18		15-Jun-18		15-Jun-18		15-Jun-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	0.143		0.555		0.295		<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.42		0.22		<0.1	U	0.30		0.20		<0.1	U
Methylene Chloride	0.60		0.95		0.84		0.93		0.79		1.90	E
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
2-Butanone	0.29		<0.01	U	<0.01	U	0.07		0.04		0.03	
Chloroform	0.03		0.03		<0.01	U	0.02		0.01		0.01	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	0.09		0.08		<0.05	U	0.11		0.13		0.08	
1,2-Dichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	0.01		<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	0.12		0.14		0.11		0.13		0.11		0.09	
Tetrachloroethene	0.05		0.05		<0.01	U	0.04		0.05		0.04	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Trichlortrifluoroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,3-Butadiene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	119.0		117.5		96.6		97.1		107.5		100.9	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	133.8		96.9	M	103.7		113.7	M	112.9		94.4	
d8-Toluene(SURR)	109.2		108.7		99.9		111.2		111.2		113.7	
4-Bromofluorobenzene(SURR)	99.0		105.2		123.5		89.0		99.5		101.2	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	150.3		44.7	L	53.6		120.2		125.8		127.3	
1,4-Difluorobenzene	138.6		34.0	L	53.5		119.5		116.4		114.6	
d5-Chlorobenzene	129.5		34.0	L	51.1		107.5		97.3		96.6	

U Indicates that this compound was not detected above the RL.

M Indicates that a peak has been manually integrated.

L Indicates this value is below the control limit.

E Indicates Estimated value. Instrument response exceeds instrument calibration range of 1.0 ug.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21840-VOST-(24A,24B) TEST#3 PAIR#1 (#2 APC OUTLET)		18-21840-VOST-(25A,25B) TEST#3 PAIR#2 (#2 APC OUTLET)		18-21840-VOST-(27A,27B) TEST#3 PAIR#4 (#2 APC OUTLET)		18-21840-VOST-(29A,29B) TEST#3 FIELD BLANK (#2 APC OUTLET)	
ALS Sample ID	L2105278-24		L2105278-25		L2105278-27		L2105278-28	
Sample Size	1		1		1		1	
Sample units	sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST	
Sampling Date	1-Jun-18		1-Jun-18		1-Jun-18		1-Jun-18	
Extraction Date	15-Jun-18		15-Jun-18		15-Jun-18		13-Jun-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	0.02		<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.130		0.17		0.16		0.15	
Methylene Chloride	1.94	E	0.26		1.96	E	1.52	E
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	0.02		<0.01	U
2-Butanone	0.04		0.06		0.03		<0.01	U
Chloroform	0.01		0.01		0.02		<0.01	U
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	0.05		<0.05	U	0.07		<0.05	U
1,2-Dichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Trichloroethene	0.01		<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	0.17		0.07		0.15		0.13	
Tetrachloroethene	0.03		0.03		0.02		<0.01	U
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	0.06		<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Trichlortrifluoroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,3-Butadiene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	97.8		113.2		121.6		108.7	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	101.6		99.1		119.6		103.9	
d8-Toluene(SURR)	117.9		116.7		109.8		100.8	
4-Bromofluorobenzene(SURR)	108.5		102.1		114.1		117.4	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	114.9		117.0		120.3		50.2	
1,4-Difluorobenzene	93.0		105.5		107.3		52.5	
d5-Chlorobenzene	74.2		82.0		82.3		46.8	L

U Indicates that this compound was not detected above the RL.

L Indicates this value is below the control limit.

E Indicates Estimated value. Instrument response exceeds instrument calibration range of 1.0 ug.

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank		Laboratory Control Sample	Laboratory Control Sample
ALS Sample ID	WG2795588-1		WG2795588-2		WG2795588-3	WG2795588-4
Sample Size	1		1		1	1
Sample units	sample		sample		n/a	n/a
Matrix	QC		QC		QC	QC
Sampling Date	n/a		n/a		n/a	n/a
Extraction Date	14-Jun-18		15-Jun-18		14-Jun-18	15-Jun-18
Target Analytes	**ug/sample**		**ug/sample**		**% Rec**	**% Rec**
Dichlorodifluoromethane	<0.02	U	<0.02	U	86.7	91.3
Vinyl Chloride	<0.02	U	<0.02	U	86.1	96.5
Bromomethane	<0.09	U	<0.09	U	68.0	95.0
Trichlorofluoromethane	<0.02	U	<0.02	U	95.7	93.2
1,1-Dichloroethene	<0.01	U	<0.01	U	90.0	99.7
Acetone	<0.1	U	<0.1	U	68.6	108.8
Methylene Chloride	<0.1	U	<0.1	U	92.2	88.1
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	64.6	87.7
2-Butanone	<0.01	U	<0.01	U	69.3	109.7
Chloroform	<0.01	U	<0.01	U	57.1	81.9
1,1,1-Trichloroethane	<0.01	U	<0.01	U	60.8	67.8
Carbon Tetrachloride	<0.01	U	<0.01	U	83.3	100.5
Benzene	<0.05	U	<0.05	U	91.2	96.4
1,2-Dichloroethane	<0.01	U	<0.01	U	65.0	86.4
Trichloroethene	<0.01	U	<0.01	U	103.4	112.5
1,2-Dichloropropane	<0.01	U	<0.01	U	86.7	96.8
Bromodichloromethane	<0.01	U	<0.01	U	87.9	106.9
Toluene	<0.05	U	<0.05	U	84.1	91.3
Tetrachloroethene	<0.01	U	<0.01	U	89.8	97.3
Chlorodibromomethane	<0.01	U	<0.01	U	72.6	89.1
Ethylene Dibromide	<0.02	U	<0.02	U	68.1	84.6
Ethylbenzene	<0.01	U	<0.01	U	92.4	95.6
M&P-Xylene	<0.03	U	<0.03	U	90.8	94.1
O-Xylene	<0.01	U	<0.01	U	90.5	93.5
Styrene	<0.02	U	<0.02	U	83.9	87.2
Bromoform	<0.01	U	<0.01	U	71.5	93.1
Isopropylbenzene	<0.02	U	<0.02	U	92.8	95.5
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	83.8	91.5
Trichlorotrifluoroethane	<0.01	U	<0.01	U	NS	NS
1,3-Butadiene	<0.01	U	<0.01	U	NS	NS
Field Standard	**% Rec**		**% Rec**		**% Rec**	**% Rec**
d10-Ethylbenzene(SPK)	64.2		58.6		94.5	93.9
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**	**% Rec**
d4-1,2-Dichloroethane(SURR)	132.6		133.6		58.2	76.2
d8-Toluene(SURR)	113.9		120.3		94.1	97.0
4-Bromofluorobenzene(SURR)	92.5		90.7		122.3	114.1
Internal Standards	**% Rec**		**% Rec**		**% Rec**	**% Rec**
Bromochloromethane	63.4		72.9		63.0	72.5
1,4-Difluorobenzene	66		76.9		73.1	79.7
d5-Chlorobenzene	57.4		61.1		83.0	84.2

U Indicates that this compound was not detected above the RL.
M Indicates that a peak has been manually integrated.

NS indicates that compound was not spiked

APPENDIX 18

Aldehydes Recovery Data Sheets
(8 pages)

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	1
Test Location:	UNIT #1
Test Date:	MAY 31, 18

Impingers 1, 2, 3 & 4

Sample ID: 18-21840-M430-1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.6
Initial Mass:	108.5
Final Mass:	110.5
Gain:	2.0

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.6
Mass with impingers:	171.5
With DNPH rinse:	195.4
With Toluene rinse:	188.6
Total sample:	76.0

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	91.6
Initial Mass:	110.0
Final Mass:	111.7
Gain:	1.7

Impinger 2 (15 ml DNPH/4ml Toluene)	
~~Initial Mass:~~ MT	88.2
~~Final Mass:~~ INIT	106.2
~~Gain:~~ FIN	106.2
GAIN	0.0

Impinger 4 (Silica Gel)	
Initial Mass:	121.4
Final Mass:	123.7
Gain:	2.3

Total Moisture Gain:	6.0 ✓

Note: Load and recover train away from acetone

Train Loaded By:	DJ
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAY 31, 18

B

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	2
Test Location:	UNIT 1
Test Date:	MAY 31, 18

Impingers 1, 2, 3 & 4

Sample ID: 18-2184O-M430-2

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.6
Initial Mass:	117.2
Final Mass:	120.3
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.7
Mass with impingers:	168.3
With DNPH rinse:	178.3
With Toluene rinse:	180.3
Total sample:	67.6

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.2
Initial Mass:	119.2
Final Mass:	119.5
Gain:	0.3

Impinger 2 (15 ml DNPH/4ml Toluene)	
~~Initial~~ Mass:	97.9
~~Final~~ Mass:	~~115.8~~ 116.6
~~Gain~~:	116.5
	-0.1

MT INIT FINAL GAIN

Impinger 4 (Silica Gel)	
Initial Mass:	119.5
Final Mass:	122.0
Gain:	2.5

Total Moisture Gain: 5.8 ✓

Note: Load and recover train away from acetone

Train Loaded By:	
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	MAY 31, 18

C

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	3
Test Location:	UNIT 1
Test Date:	JUNE 1, 18

Impingers 1, 2, 3 & 4

18-
Sample ID: 21840-M430-3

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.9
Initial Mass:	116.8
Final Mass:	119.3
Gain:	2.7

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	113.0
Mass with impingers:	166.7
With DNPH rinse:	176.6
With Toluene rinse:	189.2
Total sample:	76.2

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.6
Initial Mass:	118.2
Final Mass:	118.5
Gain:	0.3

Impinger 2 (15 ml DNPH/4ml Toluene)		
Initial Mass:	99.1	116.4
Final Mass:	~~116.4~~	116.5
Gain:		0.1

Impinger 4 (Silica Gel)	
Initial Mass:	121.7
Final Mass:	123.6
Gain:	1.9

Total Moisture Gain:	5.0 ✓

Note: Load and recover train away from acetone

Train Loaded By:	RM
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	JUNE 1, 18

C

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	1
Test Location:	UNIT 2
Test Date:	MAY 31, 18

Impingers 1, 2, 3 & 4

Sample ID:	19-21840-M430-4

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.3
Initial Mass:	118.6
Final Mass:	120.9
Gain:	2.3

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.8
Mass with impingers:	169.2
With DNPH rinse:	176.7
With Toluene rinse:	178.1
Total sample:	65.3

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.6
Initial Mass:	117.9
Final Mass:	123.4
Gain:	5.5

Impinger 2 (15 ml DNPH/4ml Toluene)	
MT ~~Initial~~ Mass:	97.2
INIT ~~Final~~ Mass:	115.9
FIN ~~Gain~~:	110.3
GAIN	-5.6

Impinger 4 (Silica Gel)	
Initial Mass:	108.5
Final Mass:	110.4
Gain:	1.9

Total Moisture Gain:	4.1

✓

Note: Load and recover train away from acetone

Train Loaded By:	D DU
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAY 31, 18

A

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	2
Test Location:	UNIT 2
Test Date:	MAY 31 2018

Impingers 1, 2, 3 & 4

Sample ID: 18-21840-M430-5

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.9
Initial Mass:	117.6
Final Mass:	119.6
Gain:	2.0

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	172.8
Mass with impingers:	167.0
With DNPH rinse:	178.8
With Toluene rinse:	181.4
Total sample:	68.6

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	90.0
Initial Mass:	110.0
Final Mass:	110.3
Gain:	0.3

Impinger 2 (15 ml DNPH/4ml Toluene)	
Initial Mass:	~~126.0~~ 106.0
Final Mass:	106.0
Gain:	~~106.0~~ 0.0

Impinger 4 (Silica Gel)	
Initial Mass:	120.0
Final Mass:	122.1
Gain:	2.1

Total Moisture Gain:	4.4 ✓

Note: Load and recover train away from acetone

Train Loaded By:	DJ
Train Recovered By:	DJ/BT
Recovery Witnessed By:	
Date:	MAY 31, 18

D

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	3
Test Location:	UNIT 2
Test Date:	JUNE 1, 18

Impingers 1, 2, 3 & 4

Sample ID: 18-21840-M430- 6

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.5
Initial Mass:	116.7
Final Mass:	119.1
Gain:	2.4

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.8
Mass with impingers:	166.8
With DNPH rinse:	181.0
With Toluene rinse:	183.0
Total sample:	70.2

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	91.0
Initial Mass:	108.7
Final Mass:	109.0
Gain:	0.3

Impinger 2 (15 ml DNPH/4ml Toluene)	
Initial Mass:	107.6
Final Mass:	107.8
Gain:	0.2

Impinger 4 (Silica Gel)	
Initial Mass:	121.7
Final Mass:	123.6
Gain:	1.9

Total Moisture Gain:	4.8 ✓

Note: Load and recover train away from acetone

Train Loaded By:	DH
Train Recovered By:	DF
Recovery Witnessed By:	
Date:	JUNE 1, 18

D

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	BLANK 1
Test Location:	
Test Date:	MAY 31 / 18

Impingers 1, 2, 3 & 4

Sample ID: 18-21840-M430-BLANK 1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.8
Mass with impingers:	168.9
With DNPH rinse:	174.8
With Toluene rinse:	176.4
Total sample:	63.6

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 2 (15 ml DNPH/4ml Toluene)	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	
Final Mass:	
Gain:	

Total Moisture Gain:	

Note: Load and recover train away from acetone

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	MAY 31, 18

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21840
Test No.:	BLANK 2
Test Location:	
Test Date:	MAY 31, 18

Impingers 1, 2, 3 & 4

Sample ID: 18-21840-M430-BLANK 2

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	112.8
Mass with impingers:	170.1
With DNPH rinse:	178.1
With Toluene rinse:	179.9
Total sample:	67.1

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 2 (15 ml DNPH/4ml Toluene)	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	
Final Mass:	
Gain:	

Total Moisture Gain:	

Note: Load and recover train away from acetone

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	MAY 31, 18

APPENDIX 19

Aldehydes Analytical Reports
(15 pages)

ALS Environmental

25-Jun-2018

Lynne Wrona
ALS
1435 Norjohn Court
Unit 1
Burlington, Ontario L7L0E6

Tel: (905) 331-3111
Fax:

Re: L2105254 Work Order: **1806182**

Dear Lynne,

ALS Environmental received 10 samples on 06-Jun-2018 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 25-Jun-18

Client: ALS
Project: L2105254
Work Order: 1806182

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1806182-01	L2105254-1 18-21840-M430-1	Other		5/31/2018	6/6/2018 09:30	☐
1806182-02	L2105254-2 18-21840-M430-2	Other		5/31/2018	6/6/2018 09:30	☐
1806182-03	L2105254-3 18-21840-M430-3	Other		6/1/2018	6/6/2018 09:30	☐
1806182-04	L2105254-4 18-21840-M430-Blank 1	Other		5/31/2018	6/6/2018 09:30	☐
1806182-05	L2105254-5 18-21840-M430-4	Other		5/31/2018	6/6/2018 09:30	☐
1806182-06	L2105254-6 18-21840-M430-5	Other		5/31/2018	6/6/2018 09:30	☐
1806182-07	L2105254-7 18-21840-M430-6	Other		6/1/2018	6/6/2018 09:30	☐
1806182-08	L2105254-8 18-21840-M430-Blank 2	Other		5/31/2018	6/6/2018 09:30	☐
1806182-09	L2105254-9 18-21840-M430-Trip Spike	Other		6/1/2018	6/6/2018 09:30	☐
1806182-10	Trip Blank	Other			6/6/2018 09:30	☐

Client:	ALS
Project:	L2105254
Work Order:	1806182

Case Narrative

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

ALS is an EPA recognized NLLAP laboratory for lead paint, soil, and dust wipe analyses under its AIHA-LAP accreditation.

Sample volumes:
1806182-01A: 11 mL
1806182-02A: 10 mL
1806182-03A: 23 mL
1806182-04A: 14 mL
1806182-05A: 9 mL
1806182-06A: 11 mL
1806182-07A: 11 mL
1806182-08A: 14 mL
1806182-09A: 43 mL
1806182-10A: 42 mL

Reporting limits for all targets were elevated due to higher sample volumes.

Dilutions were required to separate acetone and acrolein which further elevated the reporting limit for acrolein.

A trip spike was received from the field but was prepared by ALS Burlington using the wrong derivatization media. Therefore recovery data for this QC sample is unavailable.

Results for sample number L2105254-9 18-21840-M430-Trip Spike are unavailable.

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-1 18-21840-M430-1
Lab ID: 1806182-01
Collection Date: 5/31/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.2	µg/sample	1	6/14/2018
Acrolein	ND		11	µg/sample	1	6/14/2018
formaldehyde	**9.9**		**2.2**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-2 18-21840-M430-2
Lab ID: 1806182-02
Collection Date: 5/31/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.0	µg/sample	1	6/14/2018
Acrolein	ND		10	µg/sample	1	6/14/2018
formaldehyde	**11**		**2.0**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-3 18-21840-M430-3
Lab ID: 1806182-03
Collection Date: 6/1/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		4.6	µg/sample	1	6/14/2018
Acrolein	ND		23	µg/sample	1	6/14/2018
formaldehyde	**8.7**		**4.6**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-4 18-21840-M430-Blank 1
Lab ID: 1806182-04
Collection Date: 5/31/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.8	µg/sample	1	6/14/2018
Acrolein	ND		14	µg/sample	1	6/14/2018
formaldehyde	**9.0**		**2.8**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Sample ID: L2105254-5 18-21840-M430-4
Collection Date: 5/31/2018

Work Order: 1806182
Lab ID: 1806182-05
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.8	µg/sample	1	6/14/2018
Acrolein	ND		9.0	µg/sample	1	6/14/2018
formaldehyde	**8.2**		**1.8**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client:	ALS		
Project:	L2105254	**Work Order:**	1806182
Sample ID:	L2105254-6 18-21840-M430-5	**Lab ID:**	1806182-06
Collection Date:	5/31/2018	**Matrix:**	OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.2	µg/sample	1	6/14/2018
Acrolein	ND		11	µg/sample	1	6/14/2018
formaldehyde	**9.9**		**2.2**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-7 18-21840-M430-6
Lab ID: 1806182-07
Collection Date: 6/1/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.2	µg/sample	1	6/14/2018
Acrolein	ND		11	µg/sample	1	6/14/2018
formaldehyde	**9.3**		**2.2**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Work Order: 1806182
Sample ID: L2105254-8 18-21840-M430-Blank 2
Lab ID: 1806182-08
Collection Date: 5/31/2018
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		2.8	µg/sample	1	6/14/2018
Acrolein	ND		14	µg/sample	1	6/14/2018
formaldehyde	**10**		**2.8**	**µg/sample**	1	6/14/2018

Note:

ALS Environmental

Date: *25-Jun-18*

Client: ALS
Project: L2105254
Sample ID: Trip Blank
Collection Date:

Work Order: 1806182
Lab ID: 1806182-10
Matrix: OTHER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **6/14/2018**	Analyst: **MHW**
Acetaldehyde	ND		8.4	µg/sample	1	6/14/2018
Acrolein	ND		8.4	µg/sample	1	6/14/2018
formaldehyde	ND		8.4	µg/sample	1	6/14/2018

Note:

ALS Environmental

Client: ALS
Work Order: 1806182
Project: L2105254

Date: 25-Jun-18

QC BATCH REPORT

Batch ID: **51353** Instrument ID **HPLC2** Method: **CARB430**

MBLK Sample ID **MBLK-51353-51353** Units: **µg/sample** Analysis Date: **6/14/2018**
Client ID: Run ID: **HPLC2_180614B** SeqNo: **1770169** Prep Date: **6/14/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	ND	0.20								
Acrolein	ND	0.20								
formaldehyde	ND	0.20								

LCS Sample ID **LCS-51353-51353** Units: **µg/sample** Analysis Date: **6/14/2018**
Client ID: Run ID: **HPLC2_180614B** SeqNo: **1770170** Prep Date: **6/14/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
formaldehyde	1.521	0.20	2	0	76	70-130		0		

LCSD Sample ID **LCSD-51353-51353** Units: **µg/sample** Analysis Date: **6/14/2018**
Client ID: Run ID: **HPLC2_180614B** SeqNo: **1770181** Prep Date: **6/14/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
formaldehyde	1.651	0.20	2	0	82.6	70-130	1.521	8.2	20	

The following samples were analyzed in this batch:

1806182-01A	1806182-02A	1806182-03A
1806182-04A	1806182-05A	1806182-06A
1806182-07A	1806182-08A	1806182-09A
1806182-10A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ALS
Project: L2105254
WorkOrder: 1806182

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/sample	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-BURLINGTON** Date/Time Received: **06-Jun-18 09:30**

Work Order: **1806182** Received by: **SNH**

Checklist completed by Joe Ribar (eSignature) 06-Jun-18 (Date) Reviewed by: Shawn Smythe (eSignature) 18-Jun-18 (Date)

Matrices: aqueous
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	9.2c		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

APPENDIX 20

SVOC and VOST Proof Data
(13 pages)

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	25-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **CB by LRGC/MS - Isotope dilution**

No targets were detected in the proof
Glassware is approved for collection of samples for analysis of chlorobenenes

Certified by: _____
Steve Kennedy
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.
This report shall not be reproduced, except in full, without the written permission of ALS Canada Ltd.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2757020-1		L2078545-42	
Sample Size	1		1	
Sample units	sample		sample	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	24-Apr-18		24-Apr-18	
Target Analytes	**ng/sample**		**ng/sample**	
Chlorobenzene	<8	U	<8	U
1,3-Dichlorobenzene	<8	U	<8	U
1,4-Dichlorobenzene	<8	U	<8	U
1,2-Dichlorobenzene	<8	U	<8	U
1,3,5-Trichlorobenzene	<8	U	<8	U
1,2,4-Trichlorobenzene	<8	U	<8	U
1,2,3-Trichlorobenzene	<8	U	<8	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<8	U	<8	U
1,2,3,4-Tetrachlorobenzene	<8	U	<8	U
Pentachlorobenzene	<8	U	<8	U
Hexachlorobenzene	<8	U	<8	U
Extraction Standards	**%Rec**		**%Rec**	
13C6-Chlorobenzene	75.0		56.7	
13C6-1,4-Dichlorobenzene	73.0		63.0	
13C6-1,2,3-Trichlorobenzene	71.6		61.1	
13C6-1,2,3,4-Tetrachlorobenzene	61.4		53.5	
13C6-Pentachlorobenzene	82.5		72.0	
13C6-Hexachlorobenzene	81.5		73.4	

U Indicates that this compound was not detected above the LOD.

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	27-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Target analytes not detected
Glassware is approved for collection of samples for analysis of chlorophenols

Certified by: Steve Kennedy
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.
This report shall not be reproduced, except in full, without the written permission of ALS Canada Ltd.

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2757020-1		L2078545-42	
Sample Size	1		1	
Sample units	sample		sample	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	24-Apr-18		24-Apr-18	
Target Analytes	**ng/sample**		**ng/sample**	
2-Chlorophenol	<40	U	<40	U
3-Chlorophenol	<40	U	<40	U
4-Chlorophenol	<40	U	<40	U
2,6-Dichlorophenol	<40	U	<40	U
2,4/2,5-Dichlorophenol	<40	U	<40	U
3,5-Dichlorophenol	<40	U	<40	U
2,3-Dichlorophenol	<40	U	<40	U
3,4-Dichlorophenol	<40	U	<40	U
2,4,6-Trichlorophenol	<40	U	<40	U
2,3,6-Trichlorophenol	<40	U	<40	U
2,3,5-Trichlorophenol	<40	U	<40	U
2,4,5-Trichlorophenol	<40	U	<40	U
2,3,4-Trichlorophenol	<40	U	<40	U
3,4,5-Trichlorophenol	<40	U	<40	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<40	U	<40	U
2,3,4,5-Tetrachlorophenol	<40	U	<40	U
Pentachlorophenol	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**	
2-Fluorophenol	103	M	106	M
d5-Phenol	110	M,R	108	M,R
d4-2-Chlorophenol	110		108	
2,4,6-Tribromophenol	106		106	
13C-Pentachlorophenol	120		119	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	27-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **PCDD/F by EPA M23**

Low levels of OCDD observed in proof and in blank as an EMPC
Glassware is approved for collection of samples for PCDD/F analysis
SK 27-Apr-18

L. Wrona

Lynne Wrona
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.
This report shall not be reproduced, except in full, without the written permission of ALS Canada Ltd.

ALS Life Sciences

Sample Analysis summary Report

Sample Name	Method Blank	GLASSWARE PROOF
ALS Sample ID	WG2757020-1	L2078545-42
Sample Size	1	1
Sample size units	Proof	Proof
Percent Moisture	n/a	n/a
Sample Matrix	QC	Media Prep
Sampling Date	n/a	n/a
Extraction Date	24-Apr-18	24-Apr-18
Target Analytes	**pg**	**pg**
2,3,7,8-TCDD	<5.1	<2.6
1,2,3,7,8-PeCDD	<2.7	<1.7
1,2,3,4,7,8-HxCDD	<3.8	<1.8
1,2,3,6,7,8-HxCDD	<3.7	<1.8
1,2,3,7,8,9-HxCDD	<3.8	<1.8
1,2,3,4,6,7,8-HpCDD	<3.4	<1.7
OCDD	<4.7	2.39
2,3,7,8-TCDF	<5.1	<2.8
1,2,3,7,8-PeCDF	<2.7	<1.5
2,3,4,7,8-PeCDF	<2.6	<1.4
1,2,3,4,7,8-HxCDF	<2.5	<1.5
1,2,3,6,7,8-HxCDF	<2.4	<1.4
2,3,4,6,7,8-HxCDF	<2.5	<1.5
1,2,3,7,8,9-HxCDF	<2.9	<1.7
1,2,3,4,6,7,8-HpCDF	<1.1	<0.68
1,2,3,4,7,8,9-HpCDF	<1.4	<0.86
OCDF	<3.6	<2.4
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	70	98
13C12-1,2,3,7,8-PeCDD	65	97
13C12-1,2,3,6,7,8-HxCDD	52	82
13C12-1,2,3,4,6,7,8-HpCDD	59	83
13C12-OCDD	59	91
13C12-2,3,7,8-TCDF	67	96
13C12-1,2,3,7,8-PeCDF	68	98
13C12-1,2,3,6,7,8-HxCDF	55	83
13C12-1,2,3,4,6,7,8-HpCDF	74	96
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	NS	NS
Homologue Group Totals	**pg**	**pg**
Total-TCDD	<5.1	<2.6
Total-PeCDD	<2.7	<1.7
Total-HxCDD	<3.8	<1.8
Total-HpCDD	<3.4	<1.7
Total-TCDF	<5.1	<2.8
Total-PeCDF	<2.7	<1.5
Total-HxCDF	<2.9	<1.7
Total-HpCDF	<1.4	<0.86
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.00	0.000717
Mid Point PCDD/F TEQ (WHO 2005)	5.70	3.11
Upper Bound PCDD/F TEQ (WHO 2005)	11.4	6.23

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	25-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

No targets were positively identified in the proof
Glassware is approved for collection of samples for PAH analysis

Certified by:

Steve Kennedy
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2757020-1		L2078545-42	
Sample Size	1		1	
Sample units	sample		sample	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	24-Apr-18		24-Apr-18	
Target Analytes	**ng/sample**		**ng/sample**	
Naphthalene	<8.0	U	<8.0	U
2-Methylnaphthalene	<8.0	U	<8.0	U
1-Methylnaphthalene	<8.0	U	<8.0	U
Acenaphthylene	<8.0	U	<8.0	U
Acenaphthene	<8.0	U	<8.0	U
Fluorene	<8.0	U	<8.0	U
Phenanthrene	<8.0	U	<8.0	U
Anthracene	<8.0	U	<8.0	U
Fluoranthene	<8.0	U	<8.0	U
Pyrene	<8.0	U	<8.0	U
Benzo(a)Anthracene	<8.0	U	<8.0	U
Chrysene/Triphenylene	<8.0	U	<8.0	U
Benzo(b)Fluoranthene	<8.0	U	<8.0	U
Benzo(k)Fluoranthene	<8.0	U	<8.0	U
Benzo(e)Pyrene	<8.0	U	<8.0	U
Benzo(a)Pyrene	<8.0	U	<8.0	U
Perylene	<8.0	U	<8.0	U
Indeno(1,2,3-cd)Pyrene	<8.0	U	<8.0	U
Dibenzo(a,h/a,c)Anthracene	<8.0	U	<8.0	U
Benzo(g,h,i)Perylene	<8.0	U	8.12	M,R
Additional Analytes				
Tetralin	<8.0	U	<8.0	U
2-Chloronaphthalene	<8.0	U	<8.0	U
Biphenyl	<8.0	U	<8.0	U
o-Terphenyl	<8.0	U	<8.0	U
1-Methylphenanthrene	<8.0	U	<8.0	U
9-Methylphenanthrene	<8.0	U	<8.0	U
2-methylanthracene	<8.0	U	<8.0	U
9,10-dimethylanthracene	<8.0	U	<8.0	U
m-terphenyl	<8.0	U	<8.0	U
p-terphenyl	<8.0	U	<8.0	U
Benzo(a)fluorene	<8.0	U	<8.0	U
Benzo(b)fluorene	<8.0	U	<8.0	U
7,12-Dimethylbenzo(a)anthracene	<8.0	U	<8.0	U
3-Methylcholanthrene	<40	U	<40	U
Picene	<40	U	<40	U
Dibenzo(a,e)pyrene	<40	U	<40	U
Coronene	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**	
Naphthalene D8	89.9		78.7	
2-Methylnaphthalene-D10	91.2		79.3	
Acenaphthylene D8	86.7		75.1	
Phenanthrene D10	83.8		76.6	
Anthracene-D10	80.0		68.7	
Fluoranthene D10	90.0		77.6	
Benz(a)Anthracene-D12	89.1		80.7	
Chrysene D12	88.1		72.5	
Benzo(b)Fluoranthene-D12	90.2		75.5	
Benzo(k)Fluoranthene-D12	85.1		77.9	
Benzo(a)Pyrene D12	86.9		73.8	
Perylene D12	83.9		77.3	
Indeno(1,2,3,cd)Pyrene-D12	72.2	M	62.0	M
Dibenz(a,h)Anthracene-D14	71.4	M	57.8	
Benzo(g,h,i)Perylene D12	72.5		60.0	

U Indicates that this compound was not detected above the LOD.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	30-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **PCB Congeners by EPA 1668C**

Certified by:

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Life Sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF
ALS Sample ID	L2078545-42
Sample Size	1
Sample size units	Proof
Percent Moisture	n/a
Sample Matrix	Media Prep
Sampling Date	n/a
Extraction Date	24-Apr-18

Target Analytes	pg
PCB-081	<1.2
PCB-077	<1.3
PCB-123	<1.6
PCB-118	10.1
PCB-114	<1.5
PCB-105	<4.5
PCB-126	<1.5
PCB-167	<0.63
PCB-156/157	<1.4
PCB-169	<0.71
PCB-189	<0.82

Extraction Standards	% Rec
13C12-PCB-081	106
13C12-PCB-077	102
13C12-PCB-123	105
13C12-PCB-118	105
13C12-PCB-114	106
13C12-PCB-105	104
13C12-PCB-126	107
13C12-PCB-167	99
13C12-PCB-156/157	98
13C12-PCB-169	106
13C12-PCB-189	97

ALS Life sciences

Quality Control Summary Report

Sample Name	Method Blank
ALS Sample ID	WG2757020-1
Sample Size	1
Sample size units	Proof
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	24-Apr-18

Target Analytes	pg
PCB-081	<1.2
PCB-077	<1.3
PCB-123	<1.4
PCB-118	<1.3
PCB-114	<1.3
PCB-105	<1.3
PCB-126	<1.3
PCB-167	<0.56
PCB-156/157	<0.84
PCB-169	<0.57
PCB-189	<0.70
Extraction Standards	**% Rec**
13C12-PCB-081	77
13C12-PCB-077	73
13C12-PCB-123	75
13C12-PCB-118	76
13C12-PCB-114	77
13C12-PCB-105	78
13C12-PCB-126	78
13C12-PCB-167	71
13C12-PCB-156/157	74
13C12-PCB-169	77
13C12-PCB-189	71

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2078545		Mississauga, ON
Date of Report	30-Apr-18		LYJ 2Y4
Date of Sample Receipt	11-Apr-18	**Client Contact:**	Chris Belore
		Client Project ID:	21840 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only

Target analytes not detected
Media are approved for collection of samples for VOST analysis.

Certified by

Steve Kennedy
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.
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ALS Environmental

Sample Analysis Summary Report

Sample Name	VOST PROOF (1/3)		VOST PROOF (2/3)		VOST PROOF (3/3)		Method Blank	
ALS Sample ID	L2078545-78		L2078545-79		L2078545-80		WG2761103-1	
Sample Size	1		1		1		1	
Sample units	sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a	
Matrix	Media Prep		Media Prep		Media Prep		QC	
Sampling Date	n/a		n/a		n/a		n/a	
Extraction Date	30-Apr-18		30-Apr-18		30-Apr-18		30-Apr-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	<0.1	U	<0.1	U	<0.1	U	<0.1	U
Methylene Chloride	<0.1	U	<0.1	U	<0.1	U	<0.1	U
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
2-Butanone	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chloroform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,2-Dichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Dibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Trichlorotrifluoroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	112.4		119.6		84.5		115.1	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	149.3		148.4		137.1		145.5	
d8-Toluene(SURR)	103.7		107.1		107.4		104.1	
4-Bromofluorobenzene(SURR)	125.6		116.8		118.4		123	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	125.3		121.6		104.9		114	
1,4-Difluorobenzene	133.2		134.3		122.4		124	
d5-Chlorobenzene	126.7		119.8		111.1		115.7	

U Indicates that this compound was not detected above the RL.

APPENDIX 21

ORTECH Equipment Calibration Data
(32 pages)

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2018
Probe/Pitot ID	S1
MII Number	B03761
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.33	0.130	0.180	0.849	0.0013
(0.25")	9.43	0.215	0.300	0.846	0.0046
	11.59	0.325	0.450	0.849	0.0013
	13.79	0.460	0.630	0.854	0.0034
	15.35	0.570	0.780	0.854	0.0037
			Mean	0.851	0.0028
Without Nozzle	7.04	0.120	0.168	0.845	0.0072
	8.98	0.195	0.270	0.849	0.0025
	11.23	0.305	0.415	0.857	0.0049
	13.57	0.445	0.610	0.854	0.0018
	15.01	0.545	0.745	0.855	0.0030
			Mean	0.852	0.0039

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2018
Probe/Pitot ID	S4
Mil Number	B03765
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	**93-T62-SP-012**

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.61	0.140	0.195	0.847	0.0031
(0.25")	9.54	0.220	0.305	0.849	0.0011
	11.50	0.320	0.440	0.852	0.0024
	13.94	0.470	0.650	0.850	0.0000
	15.88	0.610	0.840	0.852	0.0018
			Mean	0.850	0.0017
Without Nozzle	7.47	0.135	0.190	0.842	0.0075
	9.65	0.225	0.310	0.851	0.0015
	11.86	0.340	0.470	0.850	0.0001
	14.09	0.480	0.660	0.852	0.0023
	16.01	0.620	0.850	0.854	0.0036
			Mean	0.850	0.0030

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2018
Probe/Pitot ID	S8
Mil Number	B03769
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	**93-T62-SP-012**

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.74	0.145	0.205	0.841	0.0003
(0.25")	9.86	0.235	0.330	0.843	0.0032
	11.94	0.345	0.490	0.839	0.0016
	14.38	0.500	0.715	0.836	0.0045
	16.27	0.640	0.900	0.843	0.0026
			Mean	0.840	0.0024
Without Nozzle	7.47	0.135	0.190	0.842	0.0014
	9.43	0.215	0.300	0.846	0.0022
	11.50	0.320	0.450	0.843	0.0011
	13.94	0.470	0.660	0.843	0.0005
	15.75	0.600	0.840	0.845	0.0008
			Mean	0.844	0.0012

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 22, 2018
Probe/Pitot ID	PM 10 2.5
MII Number	COE 20132
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Nozzle Size inches	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
NA	7.47	0.135	0.190	0.842	0.0021
	9.32	0.210	0.295	0.843	0.0013
	11.41	0.315	0.440	0.846	0.0011
	13.64	0.450	0.630	0.845	0.0001
	15.55	0.585	0.815	0.847	0.0022
			Mean	0.845	0.0014

Note: Pitots must always be used in the orientation that they are calibrated in.

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 1
Date	March 15, 2018
Barometric Pressure	29.56
System Leak Check	< .001 cfm @ 24 "Hg

MII NUMBERS	
DGM	COE 20094
Gasometer	A01463
Barometer	COE 20028

Calibrated By	A. Saikaley
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.90	22.90	62.00	2.916	19.0	436.105	439.041	2.936	67	0.75	67	0.993	6
85.30	23.00	62.30	2.931	20.0	439.041	441.973	2.932	67	0.75	67	0.996	6
84.90	22.90	62.00	2.916	20.0	441.973	444.901	2.928	67.5	0.75	67	0.993	6
84.60	21.60	63.00	2.963	20.0	445.035	448.016	2.981	67.5	1.9	67	0.989	4
85.00	21.60	63.40	2.982	20.0	448.016	450.992	2.976	68	1.9	67	0.997	4
84.80	21.50	63.30	2.978	20.0	450.992	453.960	2.968	67.5	1.9	67	0.998	4
82.10	18.20	63.90	3.006	20.0	454.076	457.075	2.999	68	3.4	67	0.994	3
84.90	20.90	64.00	3.011	20.0	457.075	460.065	2.990	68.5	3.4	68	0.999	3
84.90	20.90	64.00	3.011	20.0	460.065	463.060	2.995	68.5	3.4	68	0.998	3

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.995
BEFORE	0.972

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Team 1**
MII	**COE 20094**
Date	**Mar 15, 2018**
Calibrated By	**A. Saikaley**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	33	32	0.0
70		70	0.0
100		99	1.0
200		200	0.0
250		251	-0.4
300		300	0.0
400		400	0.0
500		500	0.0
600		600	0.0
700		700	0.0
800		799	0.1
900		899	0.1
1000		999	0.1
1100		1100	0.0
1200		1199	0.1
1250		1249	0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. O the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	March 15, 2018	Calibrated By	A. Saikaley
Manometer Number	Team 1	Signature	
Manometer MII Number	COE 20094	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.841	NA	0.837	-0.5
0-1.0	0.530		0.539	1.7
	0.270		0.281	3.9
	8.00		8.01	0.1
1.0-10.0	5.22		5.26	0.8
	2.60		2.62	0.8

Percent Difference = (Ref. Manometer - Instrument Reading) x 100
Ref. Manometer

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 2
Date	March 15, 2018
Barometric Pressure	29.62
System Leak Check	< 0.001 cfm @ 21 "Hg

MII NUMBERS	
DGM	COE 20092
Gasometer	A01463
Barometer	COE20028

Calibrated By	A. Saikaley
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.70	24.60	60.10	2.827	20.0	34.630	37.505	2.875	69	0.7	68	0.983	6
84.90	24.80	60.10	2.827	20.0	37.505	40.380	2.875	67.5	0.71	66	0.981	6
84.50	23.60	60.90	2.865	20.0	40.380	43.292	2.912	67.5	0.73	67	0.981	6
85.00	22.80	62.20	2.926	20.0	43.393	46.375	2.982	68.5	1.8	67	0.978	4
85.00	22.80	62.20	2.926	20.0	46.375	49.346	2.971	68.5	1.8	67	0.981	4
84.90	22.40	62.50	2.940	20.0	49.346	52.334	2.988	69	1.8	68	0.981	4
84.90	22.00	62.90	2.959	20.0	52.466	55.459	2.993	69.5	3.3	68	0.983	3
84.80	21.40	63.40	2.982	20.0	55.459	58.482	3.023	69.5	3.3	68	0.981	3
84.90	21.60	63.30	2.978	20.0	58.482	61.500	3.018	70	3.3	69	0.982	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.981
BEFORE	0.992

ORTECH Environmental

Manometer Calibration Data

Date	March 15, 2018	Calibrated By	A. Saikaley
Manometer Number	Team 2	Signature	
Manometer MII Number	COE 20092	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.278	NA	0.285	2.5
0-1.0	0.511		0.518	1.4
	0.792		0.798	0.8
	2.70		2.74	1.5
1.0-10.0	5.59		5.62	0.5
	8.11		8.16	0.6

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 2
MII	COE 20092
Date	March 15, 2018
Calibrated By	A. Saikaley
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	28	32	0.0
70		70	0.0
100		100	0.0
200		200	0.0
250		251	-0.4
300		301	-0.3
400		400	0.0
500		499	0.2
600		600	0.0
700		700	0.0
800		799	0.1
900		899	0.1
1000		1000	0.0
1100		1100	0.0
1200		1200	0.0
1250		1249	0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 3
Date	March 15, 2018
Barometric Pressure	29.62
System Leak Check	< 0.001 cfm @ 27 "Hg

MII NUMBERS	
DGM	COE 20093
Gasometer	A01463
Barometer	COE 20028

Calibrated By	A. Saikaley
signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.80	21.90	62.90	2.959	20.0	20.811	23.783	2.972	70	0.84	72	0.997	6
85.00	22.00	63.00	2.963	20.0	23.783	26.761	2.978	70	0.84	73	0.997	6
84.90	22.10	62.80	2.954	20.0	26.761	29.738	2.977	71.5	0.84	75	0.997	6
83.10	21.90	61.20	2.879	20.0	29.814	32.710	2.896	72.5	1.9	77	0.998	4
84.90	23.80	61.10	2.874	20.0	32.710	35.610	2.900	74	1.9	79	0.998	4
85.00	23.80	61.20	2.879	20.0	35.610	38.518	2.908	75.5	1.9	80	0.999	4
85.00	22.70	62.30	2.931	20.0	38.781	41.745	2.964	77	3.4	81	0.997	3
84.90	22.50	62.40	2.935	20.0	41.745	44.706	2.961	76	3.4	80	0.998	3
84.80	22.30	62.50	2.940	20.0	44.706	47.684	2.978	78	3.4	83	0.998	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.998
BEFORE	0.999

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 3
MII	COE 20093
Date	March 15, 2018
Calibrated By	A. Saikaley
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	70		0.0
100	100		0.0
200	201		-0.5
250	251		-0.4
300	301		-0.3
400	399		0.3
500	500		0.0
600	600		0.0
700	702		-0.3
800	801		-0.1
900	902		-0.2
1000	1002		-0.2
1100	1102		-0.2
1200	1202		-0.2
1250	1252		-0.2

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Manometer Calibration Data

Date	March 15, 2018	Calibrated By	A. Saikaley
Manometer Number	Team 3	Signature	
Manometer MII Number	COE 20093	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Back Leg

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.761	NA	0.767	0.8
0-1.0	0.471		0.486	3.1
	0.251		0.262	4.2
	8.55		8.54	-0.1
1.0-10.0	5.42		5.43	0.2
	2.82		2.84	0.7

Percent Difference = (Ref. Manometer - Instrument Reading) x 100
Ref. Manometer

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 4
Date	Mar 12 2018
Barometric Pressure	29.56
System Leak Check	< 0.001 cfm @ 24 "Hg

MII NUMBERS	
DGM	COE 20090
Gasometer	A01463
Barometer	COE20028

Calibrated By	A. Saikaley
signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.70	23.90	60.80	2.860	20.0	51.795	54.695	2.900	65.5	0.73	66	0.980	6
84.80	23.40	61.40	2.888	20.0	54.695	57.611	2.916	66.5	0.74	66	0.986	6
84.90	23.70	61.20	2.879	20.0	57.611	60.515	2.904	67.5	0.74	67	0.989	6
84.80	22.70	62.10	2.921	20.0	60.689	63.631	2.942	68	1.8	67	0.988	4
85.00	22.80	62.20	2.926	20.0	63.631	66.581	2.950	68.5	1.8	68	0.988	4
84.80	22.80	62.00	2.916	20.0	66.581	69.516	2.935	68.5	1.8	68	0.990	4
85.00	20.00	65.00	3.058	20.0	69.709	72.780	3.071	69	3.4	68	0.989	3
85.00	20.10	64.90	3.053	20.0	72.780	75.839	3.059	68.5	3.4	68	0.991	3
84.90	19.90	65.00	3.058	20.0	75.839	78.904	3.065	68.5	3.4	68	0.990	3

DGMCF AVERAGE 0.988

BEFORE 0.98

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Omega DP 116
MII	COE 20090
Date	March 12, 2018
Calibrated By	A. Saikaley
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	70		0.0
100	100		0.0
200	201		-0.5
250	252		-0.8
300	301		-0.3
400	400		0.0
500	500		0.0
600	600		0.0
700	701		-0.1
800	801		-0.1
900	901		-0.1
1000	1001		-0.1
1100	1102		-0.2
1200	1202		-0.2
1250	1251		-0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	Mar 12 2018	Calibrated By	A. Saikaley
Manometer Number	Team 4	Signature	
Manometer MII Number	COE 20090	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.840	NA	0.832	-1.0
0-1.0	0.500		0.494	-1.2
	0.233		0.238	2.1
	8.20		8.240	0.5
1.0-10.0	5.99		6.000	0.2
	3.11		3.130	0.6

$$\text{Percent Difference} = \frac{\text{(Ref. Manometer - Instrument Reading)}}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	Vost 2
Date	June 11, 2018
Barometric Pressure	29.70
System Leak Check	NDL @ 21 "Hg

MII NUMBERS	
DGM	A10117
Gasometer	A01463
Barometer	COE20028

Calibrated By	Dillon Berimbau
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
78.4	49.20	29.20	1.374	22.0	8909.310	8949.930	1.434	32.0	5.8	32.0	0.976	20	2.0
81.20	52.10	29.10	1.369	22.0	8949.930	8990.540	1.434	33.0	5.8	33.0	0.976	20	2.0
81.70	52.70	29.00	1.364	22.0	8990.540	9031.150	1.434	33.0	5.8	33.0	0.973	20	2.0
61.30	46.70	14.60	0.687	22.0	9096.180	9116.360	0.713	32.0	2.3	32.0	0.991	20	1.0
63.00	47.30	15.70	0.739	21.8	8799.210	8820.870	0.765	30.0	3.0	30.0	0.985	20	1.1
47.30	31.80	15.50	0.729	21.8	8820.870	8842.350	0.759	31.0	3.0	31.0	0.984	20	1.1
66.40	58.30	8.10	0.381	22.0	8878.700	8889.850	0.394	31.0	1.2	31.0	0.994	20	0.6
45.50	38.10	7.40	0.348	22.0	9118.150	9128.370	0.361	31.0	1.2	31.0	0.991	20	0.5
52.10	44.80	7.30	0.343	22.0	9031.950	9042.190	0.362	33.0	1.2	33.0	0.982	20	0.5

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	
2 Lpm	0.975
1Lpm	0.987
0.5 Lpm	0.989

Revision June 5, 2007

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03-J005**
Trendicator Type	**Nutech**
MII	**A10117**
Date	**June 5, 2018**
Calibrated By	**Dillon Berimbau**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	Tredicator Display Value		Percent Difference
	Before Adjustment (°C)	After Adjustment (°C)	(%)
0	0	NA	0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	125		0.0
150	150		0.0
200	200		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	**03-J004**
Meter Number	**Vost 4**
Date	**June 10, 2018**
Barometric Pressure	**29.32**
System Leak Check	**0.01 lpm @ 21 "Hg**

MII NUMBERS	
DGM	**A11542**
Gasometer	**A01463**
Barometer	**COE 20028**

Calibrated By	**Dillon Berimbau**
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

DGMCF= $\frac{\text{Vstd } ft^3}{\text{Vdgm } ft^3}$ $\frac{\text{Tdgm } °F+460}{\text{Tstd } °F+460}$ $\frac{\text{Pbar (in. Hg)}}{\text{(Pbar in. Hg+DGMPressure/13.6)}}$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
80.00	50.70	29.30	1.378	22.0	8815.58	8856.73	1.453	31.0	2.1	31.0	0.972	20	2.1
79.80	52.80	27.00	1.270	22.0	9004.34	9042.28	1.340	31.0	1.9	31.0	0.972	20	1.9
69.90	40.00	29.90	1.406	22.0	8907.98	8949.50	1.466	31.0	1.9	31.0	0.984	21	2.0
78.30	64.30	14.00	0.659	21.5	8734.15	8753.40	0.680	27.0	0.8	27.0	0.985	20	1.0
64.30	49.30	15.00	0.706	21.8	8753.44	8774.24	0.735	29.0	0.9	29.0	0.982	20	1.0
49.30	34.10	15.20	0.715	21.8	8774.24	8795.13	0.738	30.0	0.9	30.0	0.994	20	1.0
48.00	40.30	7.70	0.362	22.0	8989.55	9000.13	0.374	31.0	0.4	31.0	0.998	20	0.5
63.60	56.00	7.60	0.357	22.0	8967.80	8978.46	0.376	31.0	0.4	31.0	0.978	20	0.5
56.00	48.40	7.60	0.357	22.0	8978.46	8988.92	0.369	31.0	0.4	31.0	0.996	20	0.5

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	
2Lpm	0.976
1Lpm	0.987
0.5Lpm	0.991

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03-J005**
Trendicator Type	**Nutech**
MII	**A11542**
Date	**June 10, 2018**
Calibrated By	**Dillon Berimbau**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	Tredicator Display Value		Percent Difference
	Before Adjustment (°C)	After Adjustment (°C)	(%)
0	0	NA	0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	125		0.0
150	151		-0.7
200	200		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 1	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	0.991				
High	93.3	A2	92.45	B2	C				
Mid	51.3	A4	51	B4		50.8	D4	0.3	E4
Low	30.1	A3	30.2	B3		29.8	D3	1.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.1	-0.1
Mid	30.2	30.7	-0.5

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 1	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	0.991				
High	93.3	A2	92.45	B2	C				
Mid	51.3	A4	51	B4		50.8	D4	0.3	E4
Low	30.1	A3	30.2	B3		29.8	D3	1.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span* 100
Zero	0.1	0.4	-0.3
Mid	30.67	30.6	0.1

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 1	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 %full scale setting
Mid Gas Value (ppm)	45-55 %full scale setting
High Gas Value (ppm)	80-90 %full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	0.991				
High	93.3	A2	92.45	B2	C				
Mid	51.3	A4	51	B4		50.8	D4	0.3	E4
Low	30.1	A3	30.2	B3		29.8	D3	1.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5% repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.4	0.6	-0.2
Mid	30.55	31.7	-1.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 2	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.03	B1	0.989	C				
High	93.3	A2	92.35	B2						
Mid	51.3	A4	51.58	B4			50.8	D4	1.6	E4
Low	30.1	A3	29.4	B3			29.8	D3	-1.3	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.03	0	0.03
Mid	29.4	29.4	0.0

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 2	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.03	B1	0.989	C				
High	93.3	A2	92.35	B2						
Mid	51.3	A4	51.58	B4			50.8	D4	1.6	E4
Low	30.1	A3	29.4	B3			29.8	D3	-1.3	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.41	30.0	-0.6

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21840	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Quench Inlet Unit 2	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 %full scale setting
Mid Gas Value (ppm)	45-55 %full scale setting
High Gas Value (ppm)	80-90 %full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.03	B1	0.989				
High	93.3	A2	92.35	B2	C				
Mid	51.3	A4	51.58	B4		50.8	D4	1.6	E4
Low	30.1	A3	29.4	B3		29.8	D3	-1.3	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.16	-0.16
Mid	30.0	29.1	0.9

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29 , 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 1	Test	1

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.02	B1	0.998					
High	31.1	A2	31.06	B2		C				
Mid	17.1	A4	17.2	B4			17.1	D4	0.8	E4
Low	10.1	A3	10.2	B3			10.1	D3	1.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span* 100
Zero	0.02	0.22	-0.4
Mid	10.2	9.5	1.4

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29 , 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 1	Test	2

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0	A1	0.02	B1	0.998		
High	31.1	A2	31.06	B2	C		
Mid	17.1	A4	17.2	B4		17.1 D4	0.8 E4
Low	10.1	A3	10.2	B3		10.1 D3	1.2 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.22	0.09	0.26
Mid	9.5	9.4	0.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29 , 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 1	Test	3

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.02	B1	0.998					
High	31.1	A2	31.06	B2		C				
Mid	17.1	A4	17.2	B4			17.1	D4	0.8	E4
Low	10.1	A3	10.2	B3			10.1	D3	1.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span* 100
Zero	0.09	0.04	0.1
Mid	9.4	9.3	0.3

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 2	Test	1

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0.28 B1	0.991 C		
High	31.1 A2	31.1 B2			
Mid	17.1 A4	17.33 B4		16.9 D4	2.2 E4
Low	10.1 A3	10.1 B3		10.0 D3	0.9 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span* 100
Zero	0.28	0.19	0.18
Mid	10.1	9.6	1.1

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 2	Test	2

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/A X100	
Zero	0	A1	0.28	B1	0.991				
High	31.1	A2	31.1	B2	C				
Mid	17.1	A4	17.33	B4		16.9	D4	2.2	E4
Low	10.1	A3	10.1	B3		10.0	D3	0.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.19	0	0.38
Mid	9.57	9.6	0.0

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21754	Date:	May 29, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Outlet Unit 2	Test	3

THC Full Scale Setting	**50**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C' based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal. Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0.28	B1	0.991					
High	31.1	A2	31.1	B2		C				
Mid	17.1	A4	17.33	B4			16.9	D4	2.2	E4
Low	10.1	A3	10.1	B3			10.0	D3	0.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span* 100
Zero	0	0	0
Mid	9.6	9.5	0.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

APPENDIX 22

Particulate and Metals Test Emission Calculations
(24 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet Unit 1
Test No.:	1 - Metals and Particulate
Date:	May 29, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.981
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	3.459 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	16.54 m/s
BAROMETRIC PRESSURE (Station)	100.779 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.314 Kpa
OXYGEN CONCENTRATION	8.42 %
CARBON DIOXIDE CONCENTRATION	10.89 %
CARBON MONOXIDE CONCENTRATION	24.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.44 m^3/s
DRY REF GAS FLOWRATE	14.35 Rm^3/s
DRY ADJ GAS FLOWRATE	18.09 Rm^3/s
WET REF GAS FLOWRATE	17.13 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0.9 mg
	-FILTER	2.5 mg
	-TOTAL	3.4 mg
DRY REF GAS VOLUME SAMPLED		3.459 m^3
PARTICULATE CONC. - ACTUAL		0.577 mg/m^3
PARTICULATE CONC. - DRY REF		0.983 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.780 mg/m^3
PARTICULATE CONC. - WET REF		0.824 mg/m^3
PARTICULATE EMISSION RATE		0.014102 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.5		
DGMCF	0.981	**Probe (mg)**	0.9		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	468.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	23.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.47 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.42
CO2%	10.89
COppm	24.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	152.15	0.67	292	67	78	77	1.65	4.0		17.36	
	2.5	154.04	0.71	283	66	79	77	1.8	4.0		17.76	105.7
	5	155.89	0.71	284	63	79	77	1.8	4.0		17.77	99.9
2	7.5	157.74	0.74	284	61	79	77	1.9	4.0		18.15	99.9
	10	159.62	0.71	284	59	80	77	1.8	4.0		17.77	99.5
	12.5	161.44	0.71	284	58	80	77	1.85	4.0		17.77	98.2
3	15	163.30	0.71	284	58	81	78	1.85	4.0		17.77	100.4
	17.5	165.16	0.71	284	58	81	78	1.85	4.0		17.77	100.2
	20	167.02	0.71	284	58	81	78	1.85	4.0		17.77	100.2
4	22.5	168.87	0.72	285	58	81	78	1.85	4.0		17.91	99.7
	25	170.74	0.69	285	59	82	78	1.8	4.0		17.53	100.1
	27.5	172.61	0.67	285	59	82	78	1.7	4.0		17.28	102.1
5	30	174.40	0.64	285	58	83	78	1.6	4.0		16.89	99.2
	32.5	176.16	0.65	285	58	83	78	1.7	4.0		17.02	99.7
	35	177.96	0.65	285	58	83	79	1.7	4.0		17.02	101.2
6	37.5	179.76	0.62	285	58	83	79	1.65	4.0		16.62	101.1
	40	181.52	0.61	285	58	84	79	1.6	4.0		16.49	101.2
	42.5	183.26	0.61	285	58	84	79	1.6	4.0		16.49	100.8
7	45	184.99	0.6	285	58	84	79	1.5	4.0		16.35	100.2
	47.5	186.71	0.61	285	58	84	79	1.6	4.0		16.49	100.4
	50	188.45	0.61	285	59	85	80	1.6	4.0		16.49	100.8
8	52.5	190.21	0.64	285	58	85	80	1.65	4.0		16.89	101.7
	55	191.98	0.62	284	58	85	80	1.6	4.0		16.61	99.9
	57.5	193.72	0.62	285	58	85	80	1.6	4.0		16.62	99.7
9	60	195.46	0.62	284	58	85	81	1.6	4.0		16.61	99.8
	62.5	197.21	0.62	284	58	86	81	1.6	4.0		16.61	100.2
	65	198.97	0.62	284	58	86	81	1.6	4.0		16.61	100.6
10	67.5	200.69	0.62	283	58	86	81	1.65	4.0		16.60	98.4
	70	202.47	0.62	284	57	86	81	1.6	4.0		16.61	101.7
	72.5	204.24	0.62	282	57	86	82	1.65	4.0		16.59	101.2
11	75	206.01	0.62	283	56	86	82	1.65	4.0		16.60	101.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.5		
DGMCF	0.981	**Probe (mg)**	0.9		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	468.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	23.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.47 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.42
CO2%	10.89
COppm	24.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	207.77	0.53	283	55	87	82	1.35	3.5		15.35	100.5
	80	209.40	0.53	284	55	87	82	1.35	3.5		15.36	100.5
12	82.5	211.02	0.55	282	55	87	82	1.4	3.5		15.62	100.0
	85	212.66	0.54	284	53	87	83	1.4	3.5		15.50	99.2
	87.5	214.30	0.54	282	52	87	83	1.4	3.5		15.48	100.2
	90	215.96								0.47		101.3
1	0	216.43	0.67	284	61	86	83	1.8	5.0		17.27	
	2.5	218.32	0.69	282	52	86	83	1.85	5.0		17.50	103.8
	5	220.21	0.71	284	49	86	83	1.8	5.0		17.77	102.2
2	7.5	222.05	0.71	284	48	86	83	1.8	5.0		17.77	98.2
	10	223.92	0.72	284	48	86	83	1.9	5.0		17.90	99.8
	12.5	225.85	0.7	284	48	86	83	1.8	5.0		17.65	102.3
3	15	227.71	0.71	284	48	86	83	1.8	5.0		17.77	100.0
	17.5	229.55	0.71	284	48	86	83	1.8	5.0		17.77	98.2
	20	231.42	0.7	284	48	86	83	1.8	5.0		17.65	99.8
4	22.5	233.29	0.65	284	48	87	83	1.7	5.0		17.01	100.5
	25	235.10	0.67	284	48	87	83	1.8	5.0		17.27	100.8
	27.5	236.92	0.65	258	48	88	83	1.8	5.0		16.71	99.9
5	30	238.76	0.6	284	48	87	83	1.55	4.5		16.34	100.6
	32.5	240.51	0.59	284	48	87	83	1.55	4.5		16.20	101.4
	35	242.26	0.59	284	48	87	83	1.55	4.5		16.20	102.3
6	37.5	243.98	0.6	284	48	87	83	1.55	4.5		16.34	100.5
	40	245.70	0.6	284	49	87	83	1.55	4.5		16.34	99.7
	42.5	247.43	0.52	284	49	87	83	1.35	4.0		15.21	100.3
7	45	249.06	0.56	284	49	87	83	1.4	4.0		15.79	101.4
	47.5	250.71	0.56	284	49	87	83	1.4	4.0		15.79	99.0
	50	252.38	0.56	284	49	87	83	1.4	4.0		15.79	100.2
8	52.5	254.04	0.55	284	49	87	83	1.4	4.0		15.64	99.6
	55	255.69	0.58	284	49	87	83	1.5	4.0		16.06	99.9
	57.5	257.40	0.58	284	49	87	83	1.5	4.0		16.06	100.8
9	60	259.10	0.56	284	49	87	84	1.4	4.0		15.79	100.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.5		
DGMCF	0.981	**Probe (mg)**	0.9		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	468.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	23.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.47 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.42
CO2%	10.89
COppm	24.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	260.75	0.56	283	49	87	83	1.4	4.0		15.77	**98.9**
	65	262.40	0.55	283	49	87	83	1.45	4.0		15.63	**98.9**
10	67.5	264.08	0.55	283	49	87	84	1.45	4.5		15.63	**101.6**
	70	265.75	0.59	282	49	87	84	1.55	5.0		16.18	**100.9**
	72.5	267.49	0.57	282	50	87	84	1.5	5.0		15.90	**101.5**
11	75	269.19	0.57	281	50	87	84	1.5	5.0		15.89	**100.9**
	77.5	270.89	0.51	282	50	87	84	1.3	4.5		15.04	**100.8**
	80	272.52	0.5	281	50	87	84	1.3	4.5		14.89	**102.2**
12	82.5	274.11	0.45	282	51	87	84	1.1	4.5		14.13	**100.6**
	85	275.64	0.45	281	51	87	84	1.1	4.5		14.12	**102.1**
	87.5	277.14	0.45	282	51	87	84	1.1	4.5		14.13	**100.0**
	90	278.69										**103.4**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet Unit 1
Test No.:	2 - Metals and Particulate
Date:	May 29, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.981
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	3.288 m^3
AVGERGE ISOKINETICITY	100.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.5 °C
AVERAGE GAS MOISTURE BY VOLUME	15.5 %
AVERAGE GAS VELOCITY	15.65 m/s
BAROMETRIC PRESSURE (Station)	100.779 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.314 Kpa
OXYGEN CONCENTRATION	8.4 %
CARBON DIOXIDE CONCENTRATION	10.95 %
CARBON MONOXIDE CONCENTRATION	26.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	23.13 m^3/s
DRY REF GAS FLOWRATE	13.69 Rm^3/s
DRY ADJ GAS FLOWRATE	17.29 Rm^3/s
WET REF GAS FLOWRATE	16.22 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1 mg
	-FILTER	3.8 mg
	-TOTAL	4.8 mg
DRY REF GAS VOLUME SAMPLED		3.288 m^3
PARTICULATE CONC. - ACTUAL		0.864 mg/m^3
PARTICULATE CONC. - DRY REF		1.460 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.156 mg/m^3
PARTICULATE CONC. - WET REF		1.233 mg/m^3
PARTICULATE EMISSION RATE		0.019985 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3.8		
DGMCF	0.981	**Probe (mg)**	1		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	416.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.5 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.4
CO2%	10.95
COppm	26.0

Measured H2O
15.5 %

				Temperatures								
Point	**Time**	**DGM Reading**	**ΔP "H2O**	**Stack °F**	**Imp. Out °F**	**DGM Out °F**	**DGM In °F**	**ΔH "H2O**	**Vacuum "Hg**	**Leak Check Volume**	**Velocity m/s**	**Isokinetic %**
1	0	279.22	0.6	279	76	82	82	1.7	3.5		16.26	
	2.5	281.03	0.66	282	71	82	81	1.7	3.5		17.09	**104.5**
	5	282.83	0.66	282	54	82	81	1.7	3.5		17.09	**99.4**
2	7.5	284.68	0.66	282	65	82	81	1.7	3.5		17.09	**102.2**
	10	286.49	0.68	282	67	83	81	1.8	3.5		17.34	**99.9**
	12.5	288.33	0.67	282	67	83	81	1.7	3.5		17.22	**100.0**
3	15	290.14	0.67	282	67	83	81	1.7	3.5		17.22	**99.1**
	17.5	291.98	0.65	282	67	83	81	1.7	3.5		16.96	**100.7**
	20	293.78	0.65	283	67	83	81	1.7	3.5		16.97	**100.1**
4	22.5	295.59	0.62	282	63	84	81	1.6	3.5		16.56	**100.7**
	25	297.33	0.62	283	63	84	81	1.6	3.5		16.57	**98.9**
	27.5	299.08	0.63	283	62	84	81	1.65	3.5		16.71	**99.6**
5	30	300.86	0.56	282	60	84	81	1.45	3.5		15.74	**100.5**
	32.5	302.53	0.56	283	58	84	81	1.45	3.5		15.75	**99.9**
	35	304.20	0.55	283	57	84	81	1.4	3.5		15.61	**99.9**
6	37.5	305.85	0.5	283	56	84	81	1.3	3.5		14.88	**99.6**
	40	307.43	0.49	283	55	84	81	1.3	3.5		14.73	**100.0**
	42.5	308.99	0.5	283	54	85	81	1.3	3.5		14.88	**99.8**
7	45	310.58	0.54	283	54	85	81	1.4	3.5		15.47	**100.6**
	47.5	312.23	0.55	283	53	85	81	1.4	3.5		15.61	**100.4**
	50	313.88	0.54	283	53	85	81	1.4	3.5		15.47	**99.5**
8	52.5	315.54	0.55	283	52	85	81	1.4	3.5		15.61	**101.0**
	55	317.19	0.55	283	53	85	81	1.4	3.5		15.61	**99.5**
	57.5	318.84	0.55	283	53	85	81	1.4	0.5		15.61	**99.5**
9	60	320.47	0.54	282	54	86	81	1.4	3.5		15.46	**98.3**
	62.5	322.12	0.56	281	54	86	82	1.45	3.5		15.73	**100.3**
	65	323.78	0.56	281	54	86	82	1.45	3.5		15.73	**98.9**
10	67.5	325.48	0.52	281	54	86	82	1.35	3.5		15.16	**101.3**
	70	327.09	0.52	282	54	86	82	1.3	3.5		15.17	**99.5**
	72.5	328.72	0.53	282	55	86	82	1.3	3.5		15.31	**100.8**
11	75	330.32	0.48	281	55	86	82	1.2	3.0		14.56	**98.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3.8		
DGMCF	0.981	**Probe (mg)**	1		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	416.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.5 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.4
CO2%	10.95
COppm	26.0

Measured H2O
15.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	331.85	0.49	282	55	86	82	1.25	3.0		14.72	98.4
	80	333.40	0.47	282	56	86	82	1.2	2.0		14.42	98.8
12	82.5	334.93	0.47	282	55	86	82	1.2	2.0		14.42	99.5
	85	336.48	0.47	282	55	86	82	1.2	2.0		14.42	100.8
	87.5	338.00	0.51	281	49	86	82	1.3	2.0		15.01	98.9
	90	339.63								0.5		101.7
1	0	340.13	0.71	281	58	81	85	1.9	4.0		17.71	
	2.5	342.02	0.71	284	50	85	82	1.9	4.0		17.75	100.3
	5	343.92	0.71	285	47	85	82	1.9	4.0		17.76	101.0
2	7.5	345.81	0.7	285	46	86	82	1.9	4.0		17.63	100.5
	10	347.68	0.69	286	47	85	82	1.8	4.0		17.52	100.1
	12.5	349.53	0.69	286	47	85	82	1.8	4.0		17.52	99.8
3	15	351.38	0.71	285	48	86	82	1.9	4.0		17.76	99.8
	17.5	353.26	0.68	285	48	85	82	1.8	4.0		17.38	99.9
	20	355.12	0.66	285	48	86	82	1.75	4.0		17.12	101.0
4	22.5	356.94	0.61	285	49	86	82	1.6	4.0		16.46	100.3
	25	358.68	0.61	285	49	86	83	1.6	4.0		16.46	99.6
	27.5	360.43	0.61	285	49	86	83	1.6	4.0		16.46	100.1
5	30	362.16	0.6	285	49	86	83	1.6	4.0		16.32	99.0
	32.5	364.00	0.57	285	49	86	83	1.45	4.0		15.91	106.2
	35	365.63	0.57	285	50	86	83	1.5	4.0		15.91	96.5
6	37.5	367.30	0.52	285	50	87	83	1.35	4.0		15.20	98.8
	40	368.96	0.52	285	50	86	83	1.25	4.0		15.20	102.7
	42.5	370.52	0.51	285	51	86	83	1.35	4.0		15.05	96.6
7	45	372.12	0.58	285	52	87	83	1.5	4.0		16.05	100.1
	47.5	373.77	0.53	285	53	87	83	1.2	4.0		15.34	96.7
	50	375.34	0.59	285	55	86	83	1.6	4.0		16.19	96.2
8	52.5	377.02	0.58	285	56	87	83	1.5	4.0		16.05	97.7
	55	378.74	0.58	285	57	86	83	1.5	4.0		16.05	100.8
	57.5	380.43	0.59	285	58	87	83	1.55	4.0		16.19	99.1
9	60	382.14	0.63	285	59	87	83	1.7	4.0		16.73	99.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 1
Date:	May 29, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3.8		
DGMCF	0.981	**Probe (mg)**	1		
Barometric Pressure	29.76 "Hg	**CWTR (g)**	416.9		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.5 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.4
CO2%	10.95
COppm	26.0

Measured H2O
15.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	383.92	0.6	284	60	87	83	1.6	4.0		16.31	**100.2**
	65	385.67	0.58	284	61	87	83	1.5	4.0		16.04	**100.8**
10	67.5	387.38	0.59	283	62	87	88	1.55	4.0		16.17	**100.2**
	70	389.10	0.64	282	63	8	83	1.7	4.0		16.83	**99.4**
	72.5	390.88	0.58	282	65	87	83	1.55	4.0		16.02	**106.9**
11	75	392.63	0.3	282	66	87	83	0.57	4.0		11.52	**102.4**
	77.5	393.91	0.26	282	66	87	83	0.35	4.0		10.72	**103.9**
	80	395.03	0.24	282	65	87	83	0.32	4.0		10.30	**97.6**
12	82.5	396.10	0.24	282	65	87	83	0.31	4.0		10.30	**97.0**
	85	397.20	0.25	282	63	87	84	0.36	4.0		10.52	**99.7**
	87.5	398.42	0.25	282	63	87	83	0.36	4.0		10.52	**108.3**
	90	399.60										**104.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 Particulate & Metals
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	0.988
NOZZLE DIAMETER	5.97 mm
DRY REF GAS VOLUME SAMPLED	3.132 m^3
AVGERGE ISOKINETICITY	102.7 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.8 %
AVERAGE GAS VELOCITY	17.37 m/s
BAROMETRIC PRESSURE (Station)	100.508 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.043 Kpa
OXYGEN CONCENTRATION	7.91 %
CARBON DIOXIDE CONCENTRATION	11.20 %
CARBON MONOXIDE CONCENTRATION	20.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.67 m^3/s
DRY REF GAS FLOWRATE	14.88 Rm^3/s
DRY ADJ GAS FLOWRATE	19.53 Rm^3/s
WET REF GAS FLOWRATE	17.90 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.9 mg
	-FILTER	2.8 mg
	-TOTAL	5.7 mg
DRY REF GAS VOLUME SAMPLED		3.132 m^3
PARTICULATE CONC. - ACTUAL		1.055 mg/m^3
PARTICULATE CONC. - DRY REF		1.820 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.387 mg/m^3
PARTICULATE CONC. - WET REF		1.514 mg/m^3
PARTICULATE EMISSION RATE		0.027088 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	May 30, 2018	**Operator:**	JG

Pitot Factor	0.84	**Filter (mg)**	2.8		
DGMCF	0.988	**Probe (mg)**	2.9		
Barometric Pressure	29.68 "Hg	**CWTR (g)**	445.6		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	19.7		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.87 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.20
COppm	20.7

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	195.46	0.61	285	68	76	76	1.2	5.0		16.31	
	2.5	196.40	0.61	285	68	79	76	1	5.0		16.31	66.0
	5	197.58	0.63	285	68	77	76	1.1	5.0		16.57	82.6
2	7.5	199.06	0.63	285	54	77	76	1.1	5.0		16.57	**102.2**
	10	200.55	0.61	285	53	77	84	1.2	5.0		16.31	**102.8**
	12.5	202.05	0.61	285	53	77	86	1.2	5.0		16.31	**104.5**
3	15	203.55	0.77	285	53	77	89	1.4	5.0		18.32	**104.3**
	17.5	205.17	0.78	285	52	77	91	1.51	5.0		18.44	**100.0**
	20	206.88	0.72	288	51	78	93	1.4	5.0		17.75	**104.7**
4	22.5	208.58	0.72	287	50	78	94	1.3	5.0		17.74	**108.2**
	25	210.17	0.7	288	51	78	95	1.4	5.0		17.51	**101.1**
	27.5	211.79	0.67	287	49	79	96	1.3	5.0		17.12	**104.4**
5	30	213.40	0.72	287	49	79	96	1.4	5.0		17.74	**105.8**
	32.5	215.04	0.68	287	48	79	97	1.4	5.0		17.24	**104.0**
	35	216.67	0.72	287	48	80	97	1.4	5.0		17.74	**106.2**
6	37.5	218.26	0.68	287	48	80	97	1.4	5.0		17.24	**100.6**
	40	219.90	0.68	287	48	80	98	1.4	5.0		17.24	**106.8**
	42.5	221.54	0.67	287	47	80	98	1.4	5.0		17.12	**106.7**
7	45	223.12	0.62	287	47	81	98	1.2	5.0		16.46	**103.6**
	47.5	224.68	0.62	287	47	81	98	1.2	5.0		16.46	**106.1**
	50	226.17	0.6	287	47	81	98	1.2	5.0		16.20	**101.4**
8	52.5	227.79	0.69	287	47	81	98	1.3	5.0		17.37	112.0
	55	229.28	0.67	286	47	81	98	1.3	5.0		17.10	**96.1**
	57.5	230.90	0.67	286	47	81	98	1.3	5.0		17.10	**106.0**
9	60	232.50	0.81	286	47	83	97	1.6	5.5		18.81	**104.7**
	62.5	234.22	0.78	286	47	81	97	1.5	5.0		18.45	**102.3**
	65	235.93	0.78	286	47	81	99	1.5	5.0		18.45	**103.8**
10	67.5	237.66	0.81	286	47	82	98	1.6	5.0		18.81	**104.9**
	70	239.36	0.82	286	47	81	98	1.65	5.0		18.92	**101.1**
	72.5	241.13	0.82	286	48	82	98	1.65	5.0		18.92	**104.8**
11	75	242.91	0.9	286	48	82	98	1.8	5.5		19.82	**105.3**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	May 30, 2018	**Operator:**	JG

Pitot Factor	0.84	**Filter (mg)**	2.8		
DGMCF	0.988	**Probe (mg)**	2.9		
Barometric Pressure	29.68 "Hg	**CWTR (g)**	445.6		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	19.7		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.87 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.20
COppm	20.7

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	244.78	0.86	286	48	82	98	1.6	5.5		19.38	**105.6**
	80	246.62	0.9	286	48	82	98	1.8	5.5		19.82	**106.2**
12	82.5	248.49	0.85	286	49	82	98	1.75	5.5		19.27	**105.6**
	85	250.30	0.85	286	49	82	98	1.75	5.5		19.27	**105.2**
	87.5	252.11	0.85	287	49	82	98	1.65	5.5		19.28	**105.2**
	90	253.91								0.87		**104.6**
1	0	254.78	0.6	287	59	80	80	1.1	5.0		16.20	
	2.5	256.31	0.62	287	56	80	81	1.1	5.0		16.46	**107.7**
	5	257.75	0.62	287	53	80	85	1.2	5.0		16.46	**99.6**
2	7.5	259.23	0.58	287	52	80	88	1.1	5.0		15.92	**102.0**
	10	260.69	0.57	287	52	80	92	1.1	5.0		15.79	**103.7**
	12.5	262.16	0.58	287	52	80	94	1.1	5.0		15.92	**105.0**
3	15	263.61	0.65	285	52	80	95	1.1	5.0		16.84	**102.4**
	17.5	265.13	0.61	287	54	81	98	1.2	5.0		16.33	**101.3**
	20	266.67	0.63	283	53	81	97	1.25	5.0		16.55	**105.6**
4	22.5	268.23	0.64	283	51	81	98	1.25	5.0		16.68	**105.1**
	25	269.79	0.62	283	51	81	98	1.25	5.0		16.42	**104.2**
	27.5	271.35	0.63	283	50	82	99	1.25	5.0		16.55	**105.9**
5	30	272.91	0.65	283	50	82	99	1.3	5.0		16.81	**104.8**
	32.5	274.50	0.65	283	50	82	99	1.3	5.0		16.81	**105.2**
	35	275.30	0.67	282	53	82	99	1.4	5.0		17.06	52.9
6	37.5	276.91	0.55	284	51	81	85	1	5.0		15.48	**104.9**
	40	278.35	0.57	282	51	81	87	1	5.0		15.73	**105.0**
	42.5	279.73	0.6	282	52	81	90	1.1	5.0		16.14	**98.5**
7	45	281.20	0.6	282	52	81	92	1.1	5.0		16.14	**102.0**
	47.5	282.72	0.62	283	52	82	93	1.2	5.0		16.42	**105.3**
	50	284.22	0.61	283	52	81	94	1.2	5.0		16.29	**102.2**
8	52.5	285.78	0.67	283	53	82	95	1.3	5.0		17.07	**107.1**
	55	287.36	0.69	283	53	82	95	1.3	5.0		17.32	**103.3**
	57.5	288.98	0.69	283	53	82	95	1.3	5.0		17.32	**104.4**
9	60	290.56	0.58	283	55	82	96	1.1	5.0		15.88	**101.8**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	May 30, 2018	**Operator:**	JG

Pitot Factor	0.84	**Filter (mg)**	2.8		
DGMCF	0.988	**Probe (mg)**	2.9		
Barometric Pressure	29.68 "Hg	**CWTR (g)**	445.6		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	19.7		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.87 ft°	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.20
COppm	20.7

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	292.10	0.58	283	55	82	96	1.1	5.0		15.88	**108.1**
	65	293.58	0.58	283	55	82	96	1.1	5.0		15.88	**103.9**
10	67.5	295.07	0.75	283	53	82	96	1.5	5.5		18.06	**104.6**
	70	296.70	0.75	284	50	83	96	1.5	5.5		18.07	**100.7**
	72.5	298.41	0.76	284	48	83	96	1.5	5.5		18.19	**105.6**
11	75	300.12	0.83	284	47	83	96	1.7	5.5		19.01	**104.9**
	77.5	301.90	0.83	285	47	83	96	1.7	5.5		19.02	**104.6**
	80	303.70	0.83	285	46	83	96	1.7	5.5		19.02	**105.8**
12	82.5	305.50	0.84	285	46	83	97	1.7	5.5		19.14	**105.8**
	85	307.30	0.84	285	46	83	97	1.7	5.5		19.14	**105.1**
	87.5	309.10	0.84	286	46	83	98	1.7	5.5		19.15	**105.1**
	90	310.89										**104.5**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet Unit 2
Test No.:	1 - Metals and Particulate
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.998
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	3.333 m^3
AVGERGE ISOKINETICITY	99.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.4 ^oC
AVERAGE GAS MOISTURE BY VOLUME	16.4 %
AVERAGE GAS VELOCITY	16.24 m/s
BAROMETRIC PRESSURE (Station)	100.576 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	98.185 Kpa
OXYGEN CONCENTRATION	7.83 %
CARBON DIOXIDE CONCENTRATION	11.18 %
CARBON MONOXIDE CONCENTRATION	9.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.00 m^3/s
DRY REF GAS FLOWRATE	13.94 Rm^3/s
DRY ADJ GAS FLOWRATE	18.41 Rm^3/s
WET REF GAS FLOWRATE	16.69 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.4 mg
	-FILTER	3 mg
	-TOTAL	4.4 mg
DRY REF GAS VOLUME SAMPLED		3.333 m^3
PARTICULATE CONC. - ACTUAL		0.767 mg/m^3
PARTICULATE CONC. - DRY REF		1.320 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.000 mg/m^3
PARTICULATE CONC. - WET REF		1.103 mg/m^3
PARTICULATE EMISSION RATE		0.018407 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3		
DGMCF	0.998	**Probe (mg)**	1.4		
Barometric Pressure	29.7 "Hg	**CWTR (g)**	460.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	20.7		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.55 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.18
COppm	9.7

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	132.72	0.48	286	72	77	77	1.2	3.0		14.65	
	2.5	134.24	0.48	282	62	77	78	1.2	3.0		14.61	**101.9**
	5	135.68	0.48	284	60	77	78	1.2	3.0		14.63	**96.1**
2	7.5	137.13	0.47	284	59	78	78	1.2	3.0		14.47	**96.9**
	10	138.58	0.47	281	59	78	79	1.25	3.0		14.44	**97.9**
	12.5	140.02	0.47	282	59	78	80	1.3	3.0		14.45	**96.9**
3	15	141.50	0.53	281	59	78	81	1.45	3.0		15.34	**99.6**
	17.5	143.05	0.53	281	59	78	82	1.45	3.0		15.34	**98.1**
	20	144.61	0.53	282	59	78	82	1.45	3.0		15.35	**98.7**
4	22.5	146.18	0.54	282	58	79	83	1.5	3.0		15.49	**99.4**
	25	147.76	0.54	285	58	79	84	1.5	3.0		15.52	**98.9**
	27.5	149.36	0.53	285	58	79	84	1.45	3.0		15.38	**100.3**
5	30	150.94	0.54	286	58	79	85	1.5	3.0		15.53	**99.9**
	32.5	152.53	0.55	289	58	80	85	1.55	3.0		15.71	**99.6**
	35	154.14	0.54	289	58	80	85	1.5	3.0		15.56	**100.1**
6	37.5	155.74	0.52	289	58	80	86	1.45	3.0		15.27	**100.3**
	40	157.34	0.52	290	58	80	86	1.45	3.0		15.28	**102.1**
	42.5	158.92	0.53	290	58	81	86	1.45	3.0		15.43	**100.9**
7	45	160.50	0.51	291	58	81	87	1.4	3.0		15.15	**99.9**
	47.5	162.02	0.5	291	58	81	87	1.4	3.0		15.00	**97.9**
	50	163.56	0.5	291	58	82	87	1.4	3.0		15.00	**100.2**
8	52.5	165.09	0.56	290	58	82	87	1.55	3.0		15.86	**99.5**
	55	166.71	0.56	291	58	82	88	1.55	3.0		15.87	**99.5**
	57.5	168.33	0.54	290	58	82	88	1.5	3.0		15.58	**99.4**
9	60	169.94	0.63	290	58	82	88	1.75	3.0		16.82	**100.6**
	62.5	171.65	0.64	290	57	82	88	1.75	3.0		16.96	**98.9**
	65	173.39	0.64	291	58	83	88	1.75	3.0		16.97	**99.9**
10	67.5	175.13	0.68	291	58	83	88	1.85	3.0		17.49	**99.9**
	70	176.90	0.69	291	58	83	88	1.9	3.5		17.62	**98.6**
	72.5	178.71	0.7	291	58	83	88	1.9	3.5		17.75	**100.1**
11	75	180.53	0.7	291	58	83	88	1.9	3.5		17.75	**99.9**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3		
DGMCF	0.998	**Probe (mg)**	1.4		
Barometric Pressure	29.7 "Hg	**CWTR (g)**	460.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	20.7		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.55 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.18
COppm	9.7

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	182.35	0.7	291	58	83	88	1.9	3.5		17.75	99.9
	80	184.16	0.71	290	58	83	88	1.95	4.0		17.86	99.4
12	82.5	186.00	0.71	290	57	84	88	1.95	4.0		17.86	100.3
	85	187.84	0.69	290	57	84	88	1.9	4.0		17.61	100.2
	87.5	189.65	0.69	290	58	84	88	1.9	4.0		17.61	99.9
	90	191.45								0.55		99.4
1	0	192.00	0.66	288	70	84	84	1.85	4.0		17.20	
	2.5	193.77	0.7	290	60	84	84	1.9	4.0		17.73	100.1
	5	195.58	0.7	291	56	84	84	1.9	4.0		17.75	99.6
2	7.5	197.39	0.69	291	55	83	84	1.9	4.0		17.62	99.6
	10	199.19	0.68	291	54	83	84	1.9	4.0		17.49	99.9
	12.5	200.98	0.71	291	54	83	84	1.95	4.0		17.87	100.1
3	15	202.81	0.71	291	54	83	85	1.95	4.0		17.87	100.1
	17.5	204.63	0.72	291	54	83	85	2	4.0		18.00	99.5
	20	206.48	0.7	291	53	83	85	1.95	4.0		17.75	100.4
4	22.5	208.29	0.64	291	53	83	85	1.75	4.0		16.97	99.7
	25	210.02	0.66	291	54	83	85	1.8	4.0		17.23	99.6
	27.5	211.77	0.66	291	54	83	86	1.8	4.0		17.23	99.2
5	30	213.53	0.62	291	54	83	86	1.7	4.0		16.70	99.7
	32.5	215.23	0.62	291	54	83	86	1.7	4.0		16.70	99.3
	35	216.94	0.62	291	54	83	86	1.7	4.0		16.70	99.9
6	37.5	218.65	0.58	291	54	83	87	1.6	4.0		16.15	99.9
	40	220.31	0.55	291	54	83	87	1.55	4.0		15.73	100.1
	42.5	221.93	0.55	291	55	83	87	1.55	4.0		15.73	100.3
7	45	223.54	0.58	290	55	83	87	1.6	4.0		16.14	99.7
	47.5	225.22	0.58	290	54	83	87	1.6	4.0		16.14	101.3
	50	226.89	0.58	290	55	83	87	1.6	4.0		16.14	100.7
8	52.5	228.54	0.58	290	55	84	88	1.6	4.0		16.14	99.5
	55	230.19	0.56	290	55	84	88	1.55	4.0		15.86	99.3
	57.5	231.81	0.56	289	55	84	88	1.55	4.0		15.85	99.2
9	60	233.44	0.54	289	55	84	88	1.5	4.0		15.56	99.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	3		
DGMCF	0.998	**Probe (mg)**	1.4		
Barometric Pressure	29.7 "Hg	**CWTR (g)**	460.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	20.7		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.55 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.18
COppm	9.7

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	235.03	0.56	288	55	84	88	1.55	4.0		15.84	**99.1**
	65	236.65	0.56	288	56	84	88	1.55	4.0		15.84	**99.1**
10	67.5	238.28	0.54	287	56	84	89	1.5	4.0		15.54	**99.7**
	70	239.88	0.56	286	56	84	89	1.55	4.0		15.82	**99.5**
	72.5	241.51	0.6	287	56	85	89	1.7	4.0		16.38	**99.5**
11	75	243.19	0.58	287	56	85	89	1.65	4.0		16.11	**99.0**
	77.5	244.87	0.58	287	57	85	89	1.65	4.0		16.11	**100.7**
	80	246.54	0.58	287	57	85	89	1.65	4.0		16.11	**100.1**
12	82.5	248.21	0.55	281	57	85	89	1.55	4.0		15.62	**100.1**
	85	249.83	0.54	281	58	85	89	1.55	4.0		15.48	**99.3**
	87.5	251.45	0.54	281	58	85	89	1.55	4.0		15.48	**100.2**
	90	253.08										**100.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet Unit 2
Test No.:	2 - Metals and Particulate
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.998
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	3.372 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	16.49 m/s
BAROMETRIC PRESSURE (Station)	100.339 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	97.948 Kpa
OXYGEN CONCENTRATION	7.61 %
CARBON DIOXIDE CONCENTRATION	11.35 %
CARBON MONOXIDE CONCENTRATION	10.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.37 m^3/s
DRY REF GAS FLOWRATE	14.00 Rm^3/s
DRY ADJ GAS FLOWRATE	18.79 Rm^3/s
WET REF GAS FLOWRATE	16.91 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.4 mg
	-FILTER	2.3 mg
	-TOTAL	4.7 mg
DRY REF GAS VOLUME SAMPLED		3.372 m^3
PARTICULATE CONC. - ACTUAL		0.801 mg/m^3
PARTICULATE CONC. - DRY REF		1.394 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.038 mg/m^3
PARTICULATE CONC. - WET REF		1.154 mg/m^3
PARTICULATE EMISSION RATE		0.019511 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.3		
DGMCF	0.998	**Probe (mg)**	2.4		
Barometric Pressure	29.63 "Hg	**CWTR (g)**	492.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	22.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.4 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.35
COppm	10.3

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	253.98	0.56	285	78	81	82	1.55	3.0		15.85	
	2.5	255.56	0.56	283	68	82	82	1.55	3.0		15.83	**97.9**
	5	257.18	0.56	282	64	82	82	1.55	3.0		15.82	**100.1**
2	7.5	258.83	0.56	281	61	82	82	1.55	3.0		15.81	**101.9**
	10	260.46	0.56	282	59	82	83	1.55	3.0		15.82	**100.6**
	12.5	262.07	0.56	283	58	82	84	1.55	3.0		15.83	**99.4**
3	15	263.68	0.58	281	57	82	85	1.65	3.0		16.09	**99.3**
	17.5	265.33	0.58	282	57	82	85	1.65	3.0		16.10	**99.8**
	20	266.99	0.56	285	56	82	86	1.55	3.0		15.85	**100.5**
4	22.5	268.63	0.56	283	56	83	87	1.55	3.0		15.83	**101.1**
	25	270.23	0.63	288	56	83	87	1.75	3.0		16.84	**98.4**
	27.5	271.94	0.61	288	56	83	88	1.7	3.0		16.58	**99.5**
5	30	273.64	0.6	288	56	84	88	1.7	3.0		16.44	**100.4**
	32.5	275.33	0.58	288	56	84	88	1.6	3.0		16.16	**100.6**
	35	276.99	0.59	289	56	84	88	1.6	3.0		16.31	**100.4**
6	37.5	278.63	0.56	289	56	84	88	1.55	3.0		15.89	**98.4**
	40	280.25	0.56	290	56	84	89	1.55	3.0		15.90	**99.8**
	42.5	281.89	0.56	290	56	85	90	1.55	3.0		15.90	**101.0**
7	45	283.50	0.56	290	57	85	90	1.6	3.0		15.90	**99.0**
	47.5	285.13	0.56	290	57	85	90	1.6	3.0		15.90	**100.2**
	50	286.79	0.56	290	56	85	90	1.6	3.0		15.90	**102.1**
8	52.5	288.43	0.58	290	56	85	90	1.7	3.0		16.18	**100.8**
	55	290.10	0.6	290	56	85	91	1.7	3.0		16.46	**100.9**
	57.5	291.79	0.58	290	57	85	91	1.7	3.0		16.18	**100.3**
9	60	293.47	0.58	291	57	86	91	1.7	3.0		16.19	**101.4**
	62.5	295.15	0.63	291	57	86	91	1.8	3.0		16.88	**101.4**
	65	296.89	0.66	290	57	86	91	1.9	3.0		17.26	**100.8**
10	67.5	298.68	0.71	291	57	86	91	2	3.0		17.92	**101.3**
	70	300.52	0.71	291	57	86	91	2	3.0		17.92	**100.5**
	72.5	302.38	0.71	291	58	87	92	2	3.0		17.92	**101.5**
11	75	304.22	0.71	291	58	87	91	2	3.0		17.92	**100.3**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.3		
DGMCF	0.998	**Probe (mg)**	2.4		
Barometric Pressure	29.63 "Hg	**CWTR (g)**	492.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	22.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.4 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.35
COppm	10.3

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	306.07	0.72	290	58	87	91	2	3.0		18.03	**100.9**
	80	307.92	0.73	290	58	87	91	2	3.0		18.16	**100.1**
12	82.5	309.78	0.73	290	58	87	91	2	3.0		18.16	**100.0**
	85	311.64	0.73	290	59	87	91	2	3.0		18.16	**100.0**
	87.5	313.49	0.74	289	59	87	91	2.05	3.0		18.27	**99.5**
	90	315.37								0.4		**100.3**
1	0	315.77	0.76	285	72	88	88	2.1	3.5		18.46	
	2.5	317.67	0.76	291	65	88	89	2.1	3.5		18.54	**100.0**
	5	319.53	0.71	292	62	88	89	2.05	3.5		17.93	**98.2**
2	7.5	321.36	0.71	292	60	88	89	2	3.5		17.93	**100.0**
	10	323.20	0.73	292	60	88	89	2.05	3.5		18.18	**100.5**
	12.5	325.05	0.73	292	60	88	90	2.05	3.5		18.18	**99.7**
3	15	326.91	0.71	292	61	88	90	2.05	3.5		17.93	**100.1**
	17.5	328.76	0.71	292	61	88	91	2.05	3.5		17.93	**101.0**
	20	330.61	0.71	292	61	88	91	2.05	3.5		17.93	**100.9**
4	22.5	332.45	0.67	292	61	88	91	1.9	3.5		17.42	**100.4**
	25	334.25	0.68	291	62	88	91	1.9	3.5		17.54	**101.0**
	27.5	336.05	0.66	291	61	88	92	1.9	3.5		17.28	**100.2**
5	30	337.85	0.63	291	60	88	92	1.8	3.5		16.88	**101.6**
	32.5	339.58	0.59	291	60	88	92	1.7	3.5		16.33	**99.9**
	35	341.28	0.59	291	60	89	92	1.7	3.5		16.33	**101.5**
6	37.5	343.00	0.55	290	60	88	92	1.6	3.5		15.76	**102.6**
	40	344.66	0.54	290	61	88	93	1.6	3.5		15.62	**102.5**
	42.5	346.29	0.54	291	61	89	93	1.55	3.5		15.63	**101.5**
7	45	347.91	0.53	290	61	89	94	1.5	3.5		15.47	**100.8**
	47.5	349.52	0.56	290	61	89	94	1.55	3.5		15.90	**101.0**
	50	351.17	0.54	290	62	89	94	1.55	3.5		15.62	**100.7**
8	52.5	352.77	0.55	289	62	89	94	1.6	3.5		15.75	**99.4**
	55	354.42	0.55	289	62	90	95	1.6	3.5		15.75	**101.6**
	57.5	356.08	0.55	289	63	90	95	1.6	3.5		15.75	**102.0**
9	60	357.72	0.56	289	63	90	95	1.6	3.5		15.89	**100.8**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet Unit 2
Date:	May 30, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	2.3		
DGMCF	0.998	**Probe (mg)**	2.4		
Barometric Pressure	29.63 "Hg	**CWTR (g)**	492.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	22.4		
Nozzle	0.2544 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.4 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.35
COppm	10.3

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	359.35	0.53	288	63	90	95	1.5	3.5		15.45	**99.2**
	65	360.94	0.54	287	63	90	95	1.55	3.5		15.58	**99.4**
10	67.5	362.57	0.54	287	62	90	95	1.55	3.5		15.58	**100.9**
	70	364.19	0.54	282	60	91	95	1.55	3.5		15.53	**100.3**
	72.5	365.82	0.54	282	59	91	95	1.55	3.5		15.53	**100.5**
11	75	367.45	0.5	282	59	91	95	1.5	3.5		14.95	**100.5**
	77.5	369.04	0.52	283	59	91	95	1.5	3.5		15.25	**101.9**
	80	370.63	0.5	283	59	90	94	1.4	3.5		14.96	**99.9**
12	82.5	372.18	0.5	284	59	90	94	1.4	3.5		14.97	**99.5**
	85	373.75	0.49	283	59	90	94	1.4	3.5		14.81	**100.9**
	87.5	375.29	0.5	281	59	90	94	1.4	3.5		14.94	**99.9**
	90	376.87										**101.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - Particulate & Metals
Date:	May 31, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.995
NOZZLE DIAMETER	6.45 mm
DRY REF GAS VOLUME SAMPLED	3.320 m^3
AVGERGE ISOKINETICITY	99.8 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.8 %
AVERAGE GAS VELOCITY	16.30 m/s
BAROMETRIC PRESSURE (Station)	99.898 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	97.508 Kpa
OXYGEN CONCENTRATION	7.63 %
CARBON DIOXIDE CONCENTRATION	11.20 %
CARBON MONOXIDE CONCENTRATION	21.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.09 m^3/s
DRY REF GAS FLOWRATE	13.91 Rm^3/s
DRY ADJ GAS FLOWRATE	18.65 Rm^3/s
WET REF GAS FLOWRATE	16.73 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.2 mg
	-FILTER	2.6 mg
	-TOTAL	3.8 mg
DRY REF GAS VOLUME SAMPLED		3.320 m^3
PARTICULATE CONC. - ACTUAL		0.661 mg/m^3
PARTICULATE CONC. - DRY REF		1.144 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.854 mg/m^3
PARTICULATE CONC. - WET REF		0.952 mg/m^3
PARTICULATE EMISSION RATE		0.015924 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	2.6		
DGMCF	0.995	**Probe (mg)**	1.2		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	472.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	21.3		
Nozzle	0.254 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.42 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.63
CO2%	11.20
COppm	21.5

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	722.41	0.27	283	65	76	75	0.45	2.0		11.01	
	2.5	723.54	0.54	283	62	77	77	1.3	2.0		15.57	**100.9**
	5	725.00	0.57	283	47	76	76	1.5	2.0		16.00	**92.1**
2	7.5	726.62	0.58	281	45	76	76	1.5	2.0		16.12	**99.8**
	10	728.24	0.58	281	45	76	76	1.5	2.0		16.12	**98.8**
	12.5	729.94	0.57	281	44	76	76	1.5	2.0		15.98	**103.6**
3	15	731.58	0.58	281	45	76	76	1.5	2.0		16.12	**100.8**
	17.5	733.21	0.57	281	46	76	76	1.4	2.0		15.98	**99.4**
	20	734.81	0.57	281	45	76	76	1.45	2.0		15.98	**98.4**
4	22.5	736.43	0.56	281	45	76	76	1.4	2.0		15.84	**99.6**
	25	738.04	0.56	282	45	76	76	1.4	2.0		15.85	**99.9**
	27.5	739.35	0.55	283	45	76	76	1.4	2.0		15.71	**81.3**
5	30	741.05	0.54	283	48	76	76	1.4	2.0		15.57	**106.5**
	32.5	742.68	0.54	282	46	77	76	1.4	2.0		15.56	**103.1**
	35	744.28	0.54	282	46	76	76	1.35	2.0		15.56	**101.0**
6	37.5	745.88	0.56	282	45	76	76	1.4	2.0		15.85	**101.1**
	40	747.46	0.56	283	46	76	76	1.45	2.0		15.86	**98.1**
	42.5	749.05	0.57	284	46	77	76	1.45	2.0		16.01	**98.8**
7	45	750.67	0.57	284	46	77	76	1.45	2.0		16.01	**99.7**
	47.5	752.30	0.56	284	46	77	76	1.4	2.0		15.87	**100.3**
	50	753.94	0.59	284	46	77	76	1.5	2.0		16.29	**101.8**
8	52.5	755.57	0.57	284	46	77	76	1.45	2.0		16.01	**98.6**
	55	757.20	0.57	285	46	77	76	1.45	2.0		16.02	**100.3**
	57.5	758.85	0.58	285	46	77	76	1.45	2.0		16.16	**101.6**
9	60	760.48	0.56	285	44	77	76	1.45	2.0		15.88	**99.5**
	62.5	762.05	0.61	285	44	77	76	1.55	2.0		16.57	**97.6**
	65	763.72	0.6	285	45	77	76	1.5	2.0		16.43	**99.5**
10	67.5	765.42	0.63	285	44	77	76	1.55	2.0		16.84	**102.1**
	70	767.11	0.62	285	44	77	76	1.6	2.0		16.71	**99.0**
	72.5	768.81	0.68	286	44	77	76	1.75	2.0		17.51	**100.4**
11	75	770.58	0.66	286	44	77	76	1.7	2.0		17.25	**100.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	2.6		
DGMCF	0.995	**Probe (mg)**	1.2		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	472.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	21.3		
Nozzle	0.254 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.42 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.63
CO2%	11.20
COppm	21.5

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	772.36	0.65	286	44	78	76	1.6	2.0		17.12	**102.0**
	80	774.09	0.68	285	44	77	76	1.75	2.0		17.50	**99.8**
12	82.5	775.87	0.68	285	44	78	77	1.75	2.0		17.50	**100.5**
	85	777.66	0.67	285	44	78	77	1.7	2.0		17.37	**100.8**
	87.5	779.42	0.65	285	44	78	77	1.65	2.0		17.11	**99.9**
	90	781.17								0.42		**100.8**
1	0	781.59	0.7	285	66	78	77	1.8	3.0		17.75	
	2.5	783.40	0.74	285	47	78	77	1.9	3.0		18.25	**100.5**
	5	785.19	0.72	285	47	78	77	1.9	3.0		18.00	**96.7**
2	7.5	787.05	0.71	285	46	79	78	1.85	3.0		17.88	**101.9**
	10	788.91	0.69	285	46	78	78	1.75	3.0		17.62	**102.4**
	12.5	790.70	0.68	285	47	78	78	1.75	3.0		17.50	**100.0**
3	15	792.50	0.68	285	48	79	78	1.75	3.0		17.50	**101.3**
	17.5	794.27	0.66	286	48	78	78	1.7	3.0		17.25	**99.5**
	20	796.04	0.66	286	48	79	78	1.7	3.0		17.25	**101.2**
4	22.5	797.79	0.67	285	49	79	78	1.7	3.0		17.37	**99.9**
	25	799.55	0.67	285	50	78	78	1.7	3.0		17.37	**99.7**
	27.5	801.32	0.61	285	51	79	78	1.55	3.0		16.57	**100.3**
5	30	803.03	0.62	285	51	79	78	1.6	3.0		16.71	**101.5**
	32.5	804.71	0.58	285	51	79	78	1.5	3.0		16.16	**98.9**
	35	806.38	0.57	285	52	79	78	1.45	3.0		16.02	**101.6**
6	37.5	808.00	0.55	285	51	79	78	1.4	3.0		15.74	**99.4**
	40	809.60	0.52	285	52	79	78	1.3	3.0		15.30	**99.9**
	42.5	811.16	0.53	285	52	79	78	1.3	3.0		15.45	**100.2**
7	45	812.68	0.54	285	52	79	78	1.35	3.0		15.59	**96.7**
	47.5	814.26	0.54	285	52	79	78	1.35	3.0		15.59	**99.6**
	50	815.84	0.57	285	52	79	79	1.45	3.0		16.02	**99.6**
8	52.5	817.50	0.58	285	52	79	78	1.5	3.0		16.16	**101.8**
	55	819.16	0.57	285	52	80	78	1.45	3.0		16.02	**101.0**
	57.5	820.78	0.57	285	53	80	78	1.45	3.0		16.02	**99.3**
9	60	822.40	0.57	285	53	80	79	1.45	3.0		16.02	**99.3**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	2.6		
DGMCF	0.995	**Probe (mg)**	1.2		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	472.5		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	21.3		
Nozzle	0.254 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.42 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.63
CO2%	11.20
COppm	21.5

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	824.02	0.57	284	53	80	78	1.45	3.0		16.01	**99.2**
	65	825.65	0.58	284	53	80	79	1.5	3.0		16.15	**99.9**
10	67.5	827.29	0.59	284	53	81	79	1.5	3.0		16.29	**99.5**
	70	828.94	0.6	282	53	81	79	1.55	3.0		16.40	**99.2**
	72.5	830.63	0.58	282	53	81	79	1.5	3.0		16.13	**100.6**
11	75	832.28	0.56	282	54	81	79	1.4	3.0		15.85	**99.9**
	77.5	833.90	0.56	282	54	80	79	1.4	3.0		15.85	**99.8**
	80	835.51	0.56	282	53	81	79	1.45	3.0		15.85	**99.3**
12	82.5	837.13	0.55	282	54	81	79	1.4	3.0		15.70	**99.8**
	85	838.74	0.56	282	54	80	79	1.4	3.0		15.85	**100.1**
	87.5	840.34	0.56	282	55	81	79	1.4	3.0		15.85	**98.7**
	90	841.96										**99.8**

APPENDIX 23

Particle Size Distribution Test Emission Calculations
(12 pages)

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 30, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 1

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.981
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.70
Static Pressure ("H_2O)	-9.90
Oxygen Content (%)	7.88
Carbon Dioxide Content (%)	11.25
Carbon Monoxide Content (PPM)	19.1
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.6 l/min*
Cyclone Qs_{actual}	0.58 ft^3/min	16.4 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.5 Rft^{3}*	1.148 Rm^{3}*
Average Cyclone I Cut Diameter		10.36 µm
Average Cyclone IV Cut Diameter		2.41 µm
Average Isokineticity		98.1 %
Stack Gas Physical Parameters		
B_{ws}	16.4 % v/v	
Average m	219.8 (dimensionless)	
M_d	30.12 lbs/lbs mole	
M_w	28.13 lbs/lbs mole	
Average T_s	285 °F	140 °C
Average U_s	56.6 ft/s	17.3 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	54129 ACFM	25.5 m^3/s
Wet Reference Q_s	37793 SCFM*	17.8 Rm^3/s*
Dry Reference Q_s	31611 SCFM*	14.9 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.70 mg/Rm^3*	0.010 g/s
Total Part. (b)	5.14 mg/Rm^3*	0.077 g/s
PM_{10} Part. (b)	5.05 mg/Rm^3*	0.075 g/s
$PM_{2.5}$ Part. (b)	4.97 mg/Rm^3*	0.074 g/s
Cond. Part.	4.44 mg/Rm^3*	0.066 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	489.1	652.4	757.8	938.0	
final volume or weight (ml or mg)	648.0	649.7	754.6	950.1	
gain in volume or weight (ml or mg)	158.9	-2.7	-3.2	12.1	0.0
				TOTAL	165.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	<0.1	<0.1	0.5	5.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 30, 2018	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
2	1	0.00	10.21	0.30	0.76	0.35	284	76	75	0.38	4.0	60.1	10.24	2.36	94.9
	2	10.2	10.63	3.88	0.74	0.35	285	78	75	0.38	4.0	59.3	10.23	2.36	96.4
	3	20.8	10.35	7.62	0.70	0.35	285	79	76	0.38	4.0	57.7	10.27	2.38	98.6
	4	31.2	9.92	11.25	0.71	0.35	285	80	76	0.38	4.0	58.1	10.30	2.39	97.5
	5	41.1	9.63	14.72	0.68	0.35	286	82	77	0.38	4.0	56.9	10.56	2.49	96.3
	6	50.7	9.16	17.98	0.58	0.35	286	82	78	0.38	4.0	52.5	10.41	2.43	106.4
		59.9		21.15											
1	1	0.00	10.28	21.15	0.78	0.35	285	79	78	0.38	4.0	60.9	10.25	2.37	93.6
	2	10.3	10.69	24.77	0.78	0.35	286	81	78	0.38	4.0	60.9	10.44	2.44	91.4
	3	21.0	10.42	28.45	0.68	0.35	286	79	78	0.38	4.0	56.9	10.40	2.43	98.4
	4	31.4	9.92	32.05	0.65	0.35	284	82	79	0.38	4.0	55.6	10.46	2.45	99.6
	5	41.3	9.63	35.46	0.57	0.35	283	83	79	0.38	4.0	52.0	10.46	2.45	106.3
	6	50.9	9.16	38.77	0.50	0.35	282	84	80	0.38	4.0	48.7	10.29	2.38	116.0
		60.1		42.00											
Averages					**0.68**		**285**	**79**		**0.38**		**56.6**	**10.36**	**2.41**	**98.1**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 30, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 1

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.981
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.63
Static Pressure ("H_2O)	-9.90
Oxygen Content (%)	8.14
Carbon Dioxide Content (%)	10.93
Carbon Monoxide Content (PPM)	24.8
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.6 l/min*
Cyclone Qs_{actual}	0.58 ft^3/min	16.5 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.7 Rft^3*	1.153 Rm^3*
Average Cyclone I Cut Diameter		10.35 µm
Average Cyclone IV Cut Diameter		2.41 µm
Average Isokineticity		101.6 %
Stack Gas Physical Parameters		
B_{ws}	16.3 % v/v	
Average m	219.8 (dimensionless)	
M_d	30.07 lbs/lbs mole	
M_w	28.11 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	55.4 ft/s	16.9 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52947 ACFM	25.0 m^3/s
Wet Reference Q_s	36911 SCFM*	17.4 Rm^3/s*
Dry Reference Q_s	30908 SCFM*	14.6 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.61 mg/Rm^3*	0.0089 g/s
Total Part. (b)	5.20 mg/Rm^3*	0.076 g/s
PM_{10} Part. (b)	5.12 mg/Rm^3*	0.075 g/s
$PM_{2.5}$ Part. (b)	4.86 mg/Rm^3*	0.071 g/s
Cond. Part.	4.59 mg/Rm^3*	0.067 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	475.7	676.0	663.3	852.8	
final volume or weight (ml or mg)	621.3	686.5	661.7	863.1	
gain in volume or weight (ml or mg)	145.6	10.5	-1.6	10.3	0.0
				TOTAL	164.8

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.1	0.3	<0.1	0.2	5.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 30, 2018	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
2	1	0.00	10.75	42.64	0.77	0.35	285	82	79	0.38	4.0	60.6	10.16	2.33	95.4
	2	10.8	10.75	46.50	0.73	0.35	285	82	79	0.38	4.0	59.0	10.31	2.40	96.0
	3	21.5	10.04	50.28	0.70	0.35	285	83	80	0.38	4.0	57.8	10.29	2.38	98.4
	4	31.5	9.82	53.83	0.63	0.35	285	84	81	0.38	4.0	54.8	10.30	2.39	103.5
	5	41.4	9.19	57.30	0.56	0.35	285	84	81	0.38	4.0	51.7	10.37	2.42	108.8
	6	50.6	8.61	60.52	0.50	0.35	284	85	81	0.38	4.0	48.8	10.31	2.39	115.9
		59.2		63.56											
1	1	0.00	10.61	63.56	0.68	0.35	284	86	82	0.38	4.0	56.9	10.17	2.34	101.3
	2	10.6	10.47	67.39	0.69	0.35	283	86	83	0.38	4.0	57.3	10.27	2.38	99.1
	3	21.1	10.19	71.12	0.71	0.35	282	82	83	0.38	4.0	58.1	11.72	2.98	81.1
	4	31.3	10.26	74.12	0.66	0.35	283	88	88	0.38	4.0	56.0	9.46	2.06	113.8
	5	41.5	10.04	78.25	0.60	0.35	284	88	84	0.38	4.0	53.5	10.41	2.43	104.4
	6	51.6	9.27	81.77	0.53	0.35	284	89	85	0.38	4.0	50.2	10.44	2.45	110.5
		60.8		85.01											
Averages					**0.65**		**284**	**83**		**0.38**		**55.4**	**10.35**	**2.41**	**101.6**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 30, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 1

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.981
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.56
Static Pressure ("H_2O)	-9.80
Oxygen Content (%)	8.07
Carbon Dioxide Content (%)	10.92
Carbon Monoxide Content (PPM)	22.4
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.6 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.6 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.7 Rft^3*	1.152 Rm^3*
Average Cyclone I Cut Diameter		10.24 µm
Average Cyclone IV Cut Diameter		2.37 µm
Average Isokineticity		100.8 %
Stack Gas Physical Parameters		
B_{ws}	17.0 % v/v	
Average m	219.1 (dimensionless)	
M_d	30.07 lbs/lbs mole	
M_w	28.02 lbs/lbs mole	
Average T_s	283 °F	140 °C
Average U_s	56.2 ft/s	17.1 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53761 ACFM	25.4 m^3/s
Wet Reference Q_s	37436 SCFM*	17.7 Rm^3/s*
Dry Reference Q_s	31088 SCFM*	14.7 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.35 mg/Rm^3*	0.0051 g/s
Total Part. (b)	4.69 mg/Rm^3*	0.069 g/s
PM_{10} Part. (b)	4.60 mg/Rm^3*	0.068 g/s
$PM_{2.5}$ Part. (b)	4.52 mg/Rm^3*	0.066 g/s
Cond. Part.	4.34 mg/Rm^3*	0.064 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	489.1	649.7	754.6	950.1	
final volume or weight (ml or mg)	653.5	649.8	754.6	958.6	
gain in volume or weight (ml or mg)	164.4	0.1	0.0	8.5	0.0
				TOTAL	173.0

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.1	<0.1	<0.1	<0.1	5.0

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 30, 2018	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
2	1	0.00	10.27	85.16	0.75	0.35	282	88	85	0.38	4.5	59.8	10.35	2.41	93.6
	2	10.3	10.35	88.76	0.75	0.35	283	89	86	0.38	4.5	59.9	10.27	2.38	94.7
	3	20.6	10.50	92.43	0.73	0.35	284	90	86	0.38	4.5	59.1	10.29	2.39	95.9
	4	31.1	10.12	96.15	0.69	0.35	284	91	87	0.38	4.5	57.5	10.40	2.43	97.1
	5	41.2	9.65	99.69	0.62	0.35	289	94	90	0.38	4.5	54.7	10.16	2.34	106.3
	6	50.9	9.07	103.20	0.62	0.35	289	94	90	0.38	4.5	54.7	9.95	2.26	109.6
		60.0		106.60											
1	1	0.00	10.93	106.60	0.77	0.35	283	91	88	0.38	4.5	60.7	10.24	2.37	93.9
	2	10.9	10.65	110.51	0.75	0.35	282	92	88	0.38	4.5	59.8	10.39	2.43	93.1
	3	21.6	10.42	114.24	0.67	0.35	282	92	89	0.38	4.5	56.6	10.00	2.27	103.9
	4	32.0	9.89	118.10	0.58	0.35	281	92	89	0.38	4.5	52.6	10.41	2.43	105.5
	5	41.9	9.32	121.56	0.52	0.35	280	93	89	0.38	4.5	49.8	10.15	2.33	115.3
	6	51.2	8.81	124.94	0.52	0.35	281	93	89	0.38	4.5	49.8	10.30	2.39	113.0
		60.0		128.07											
Averages					**0.66**		**283**	**90**		**0.38**		**56.2**	**10.24**	**2.37**	**100.8**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 29, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 2

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.995
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.77
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	7.74
Carbon Dioxide Content (%)	11.43
Carbon Monoxide Content (PPM)	13.7
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.8 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.6 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.7 Rft^3*	1.180 Rm^3*
Average Cyclone I Cut Diameter		10.26 µm
Average Cyclone IV Cut Diameter		2.36 µm
Average Isokineticity		108.1 %
Stack Gas Physical Parameters		
B_{ws}	15.6 % v/v	
Average m	220.3 (dimensionless)	
M_d	30.14 lbs/lbs mole	
M_w	28.25 lbs/lbs mole	
Average T_s	285 °F	140 °C
Average U_s	52.5 ft/s	16.0 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	50195 ACFM	23.7 m^3/s
Wet Reference Q_s	35267 SCFM*	16.6 Rm^3/s*
Dry Reference Q_s	29783 SCFM*	14.1 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.42 mg/Rm^3*	0.0060 g/s
Total Part. (b)	8.65 mg/Rm^3*	0.12 g/s
PM_{10} Part. (b)	8.56 mg/Rm^3*	0.12 g/s
$PM_{2.5}$ Part. (b)	8.48 mg/Rm^3*	0.12 g/s
Cond. Part.	8.22 mg/Rm^3*	0.12 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	475.8	675.1	669.8	832.1	
final volume or weight (ml or mg)	626.2	675.1	666.2	845.1	
gain in volume or weight (ml or mg)	150.4	0.0	-3.6	13.0	0.0
				TOTAL	159.8

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	0.1	0.2	<0.1	9.7

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 29, 2018	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.46	65.00	0.64	0.35	285	80	81	0.38	3.0	54.9	10.38	2.41	102.0
	2	10.5	10.46	68.63	0.64	0.35	284	79	82	0.38	3.0	54.8	10.31	2.38	102.8
	3	20.9	10.30	72.29	0.62	0.35	284	80	79	0.38	3.0	54.0	10.33	2.39	104.2
	4	31.2	9.90	75.88	0.58	0.35	284	80	80	0.38	3.0	52.2	9.99	2.26	113.0
	5	41.1	9.73	79.50	0.55	0.35	284	81	80	0.38	3.0	50.8	10.20	2.34	112.7
	6	50.9	9.39	82.96	0.54	0.35	284	82	81	0.38	3.5	50.4	10.23	2.35	113.2
		60.3		86.29											
2	1	0.00	10.46	86.29	0.67	0.35	285	82	80	0.38	3.5	56.2	10.17	2.33	102.7
	2	10.5	10.54	90.03	0.65	0.35	286	82	81	0.38	3.5	55.3	10.31	2.38	102.3
	3	21.0	10.14	93.73	0.59	0.35	285	82	81	0.38	3.5	52.7	10.37	2.41	106.4
	4	31.1	9.73	97.26	0.53	0.35	285	82	81	0.38	3.5	49.9	10.15	2.32	115.7
	5	40.9	9.56	100.75	0.52	0.35	285	82	81	0.38	3.5	49.5	10.30	2.38	114.4
	6	50.4	9.30	104.11	0.52	0.35	283	82	81	0.38	3.5	49.4	10.38	2.41	112.9
		59.7		107.34											
Averages					**0.59**		**285**		**81**	**0.38**		**52.5**	**10.26**	**2.36**	**108.1**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 29, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 2

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.995
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.76
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	7.73
Carbon Dioxide Content (%)	11.39
Carbon Monoxide Content (PPM)	16.5
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.8 l/min*
Cyclone Qs_{actual}	0.58 ft^3/min	16.6 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.5 Rft^{3*}	1.176 Rm^{3*}
Average Cyclone I Cut Diameter		10.27 µm
Average Cyclone IV Cut Diameter		2.36 µm
Average Isokineticity		102.4 %
Stack Gas Physical Parameters		
B_{ws}	15.7 % v/v	
Average m	220.3 (dimensionless)	
M_d	30.13 lbs/lbs mole	
M_w	28.23 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	55.5 ft/s	16.9 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53044 ACFM	25.0 m^3/s
Wet Reference Q_s	37219 SCFM*	17.6 Rm^3/s*
Dry Reference Q_s	31375 SCFM*	14.8 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.34 mg/Rm^{3*}	0.0050 g/s
Total Part. (b)	5.53 mg/Rm^{3*}	0.082 g/s
PM_{10} Part. (b)	5.44 mg/Rm^{3*}	0.081 g/s
$PM_{2.5}$ Part. (b)	5.36 mg/Rm^{3*}	0.079 g/s
Cond. Part.	5.19 mg/Rm^{3*}	0.077 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.5	649.6	759.2	927.0	
final volume or weight (ml or mg)	639.1	650.5	757.8	938.0	
gain in volume or weight (ml or mg)	150.6	0.9	-1.4	11.0	0.0
				TOTAL	161.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	<0.1	<0.1	<0.1	6.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 29, 2018	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.69	7.41	0.74	0.35	286	79	79	0.38	4.0	59.1	10.09	2.30	98.7
	2	10.7	10.53	11.25	0.74	0.35	286	80	80	0.38	4.0	59.1	10.27	2.37	96.4
	3	21.2	10.03	14.95	0.67	0.35	286	80	80	0.38	4.0	56.2	10.15	2.32	102.9
	4	31.3	9.51	18.53	0.62	0.35	285	79	79	0.38	4.0	54.0	10.19	2.34	106.3
	5	40.8	9.42	21.90	0.59	0.35	285	80	80	0.38	4.0	52.7	10.28	2.37	107.6
	6	50.2	9.42	25.20	0.52	0.35	285	80	80	0.38	4.0	49.5	10.20	2.34	116.0
		59.6		28.54											
2	1	0.00	10.45	28.54	0.68	0.35	285	80	80	0.38	4.0	56.6	10.13	2.31	102.3
	2	10.4	10.45	32.28	0.69	0.35	285	80	80	0.38	4.0	57.0	10.21	2.34	100.5
	3	20.9	10.28	35.98	0.72	0.35	285	81	80	0.38	4.0	58.2	10.36	2.40	96.4
	4	31.2	9.95	39.55	0.68	0.35	285	81	80	0.38	4.0	56.6	10.47	2.45	97.6
	5	41.1	9.69	42.95	0.63	0.35	285	80	80	0.38	4.0	54.5	10.42	2.43	102.1
	6	50.8	9.60	46.28	0.58	0.35	285	80	80	0.38	4.0	52.3	10.49	2.46	105.5
		60.4		49.55											
Averages					**0.66**		**285**	**80**		**0.38**		**55.5**	**10.27**	**2.36**	**102.4**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	May 29, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 2

Project No.: 21840
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.995
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.74
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	7.86
Carbon Dioxide Content (%)	11.30
Carbon Monoxide Content (PPM)	13.7
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.8 l/min*
Cyclone Qs_{actual}	0.58 ft^3/min	16.4 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.4 Rft^3*	1.172 Rm^3*
Average Cyclone I Cut Diameter		10.35 µm
Average Cyclone IV Cut Diameter		2.40 µm
Average Isokineticity		101.5 %
Stack Gas Physical Parameters		
B_{ws}	15.1 % v/v	
Average m	220.8 (dimensionless)	
M_d	30.12 lbs/lbs mole	
M_w	28.29 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	55.3 ft/s	16.9 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52860 ACFM	24.9 m^3/s
Wet Reference Q_s	37060 SCFM*	17.5 Rm^3/s*
Dry Reference Q_s	31452 SCFM*	14.8 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.43 mg/Rm^3*	0.0063 g/s
Total Part. (b)	4.86 mg/Rm^3*	0.072 g/s
PM_{10} Part. (b)	4.78 mg/Rm^3*	0.071 g/s
$PM_{2.5}$ Part. (b)	4.69 mg/Rm^3*	0.070 g/s
Cond. Part.	4.44 mg/Rm^3*	0.066 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	476.1	675.6	666.2	845.1	
final volume or weight (ml or mg)	624.6	675.0	663.8	853.4	
gain in volume or weight (ml or mg)	148.5	-0.6	-2.4	8.3	0.0
				TOTAL	153.8

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.1	<0.1	0.1	0.2	5.2

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: May 29, 2018	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21840
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.20	49.66	0.78	0.35	286	79	79	0.38	3.0	60.6	10.34	2.40	93.1
	2	10.2	10.28	53.23	0.73	0.35	286	79	79	0.38	3.0	58.6	10.20	2.34	98.2
	3	20.5	10.50	56.90	0.69	0.35	286	79	79	0.38	3.0	57.0	10.58	2.49	95.9
	4	31.0	10.20	60.46	0.64	0.35	285	79	79	0.38	3.0	54.9	10.28	2.37	103.6
	5	41.2	9.82	64.06	0.58	0.35	285	79	78	0.38	3.0	52.2	10.20	2.34	110.0
	6	51.0	9.42	67.56	0.52	0.35	285	79	79	0.38	3.0	49.5	10.34	2.39	114.0
		60.4		70.86											
2	1	0.00	10.64	70.86	0.66	0.35	285	80	79	0.38	3.0	55.7	10.13	2.31	104.2
	2	10.6	10.64	74.70	0.68	0.35	285	79	79	0.38	3.0	56.6	10.45	2.44	98.2
	3	21.3	10.13	78.37	0.70	0.35	285	80	80	0.38	3.0	57.4	10.38	2.41	97.6
	4	31.4	9.74	81.90	0.66	0.35	285	80	80	0.38	3.0	55.7	10.40	2.42	100.4
	5	41.2	9.50	85.29	0.63	0.35	285	81	80	0.38	3.0	54.4	10.51	2.46	101.2
	6	50.7	8.92	88.55	0.55	0.35	286	81	80	0.38	3.0	50.9	10.39	2.42	110.1
		59.6		91.66											
Averages					**0.65**		**285**	**79**		**0.38**		**55.3**	**10.35**	**2.40**	**101.5**

APPENDIX 24

Acid Gases Test Emission Calculations
(12 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 - M26A
Date:	May 29, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.988
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.236 m^3
AVGERGE ISOKINETICITY	101.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	17.17 m/s
BAROMETRIC PRESSURE (Station)	100.745 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.280 Kpa
OXYGEN CONCENTRATION	8.41 %
CARBON DIOXIDE CONCENTRATION	10.90 %
CARBON MONOXIDE CONCENTRATION	29.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.37 m^3/s
DRY REF GAS FLOWRATE	14.85 Rm^3/s
DRY ADJ GAS FLOWRATE	18.74 Rm^3/s
WET REF GAS FLOWRATE	17.73 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.236 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 1
Date:	May 29, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.988	**Probe (mg)**	0		
Barometric Pressure	29.75 "Hg	**CWTR (g)**	159.3		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	16.4		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.41
CO2%	10.90
COppm	29.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	59.62	0.52	284	68	78	79	1.4	4.0		15.20	
2	5	62.87	0.52	284	56	86	80	1.4	4.0		15.20	**100.8**
3	10	66.14	0.56	284	55	90	81	1.6	4.0		15.77	**100.6**
4	15	69.58	0.65	285	55	95	80	1.8	4.5		17.00	**101.5**
5	20	73.30	0.65	286	55	97	81	1.8	4.5		17.01	**101.7**
6	25	76.96	0.64	286	59	84	82	1.8	4.5		16.88	**99.8**
7	30	80.73	0.6	286	56	91	83	1.7	4.5		16.34	**104.8**
8	35	84.30	0.67	286	57	97	82	1.9	4.5		17.27	**101.7**
9	40	88.05	0.77	286	57	100	83	2.2	5.0		18.52	**100.7**
10	45	92.05	0.79	286	59	102	85	2.2	5.0		18.75	**99.9**
11	50	96.24	0.8	286	61	103	85	2.3	5.0		18.87	**102.9**
12	55	100.47	0.83	285	64	104	85	2.3	5.0		19.21	**103.2**
	60	104.72										**101.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 - M26A
Date:	May 29, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.988
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.250 m^3
AVGERGE ISOKINETICITY	102.8 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.3 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	17.15 m/s
BAROMETRIC PRESSURE (Station)	100.813 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.348 Kpa
OXYGEN CONCENTRATION	8.22 %
CARBON DIOXIDE CONCENTRATION	11.05 %
CARBON MONOXIDE CONCENTRATION	18.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.34 m^3/s
DRY REF GAS FLOWRATE	14.86 Rm^3/s
DRY ADJ GAS FLOWRATE	19.03 Rm^3/s
WET REF GAS FLOWRATE	17.74 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.250 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 1
Date:	May 29, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.988	**Probe (mg)**	0		
Barometric Pressure	29.77 "Hg	**CWTR (g)**	166.6		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	11.6		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.22
CO2%	11.05
COppm	18.1

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	105.30	0.58	280	65	82	82	1.6	5.0		16.00	
2	5	108.82	0.58	283	60	87	83	1.6	5.0		16.03	**102.6**
3	10	112.33	0.68	283	62	92	83	1.9	5.0		17.36	**101.9**
4	15	116.17	0.66	284	68	94	83	1.9	5.0		17.11	**102.6**
5	20	119.98	0.66	285	64	96	83	1.8	5.0		17.12	**103.2**
6	25	123.74	0.67	285	61	97	83	1.85	5.0		17.25	**101.7**
7	30	127.53	0.58	285	59	98	83	1.7	5.0		16.05	**101.7**
8	35	131.13	0.64	286	56	99	84	1.8	5.0		16.87	**103.7**
9	40	134.85	0.69	286	55	99	84	2	5.0		17.52	**101.9**
10	45	138.78	0.71	286	55	98	84	2	5.0		17.77	**103.7**
11	50	142.69	0.74	286	55	97	84	2.1	5.0		18.14	**101.8**
12	55	146.70	0.78	285	56	97	82	2.2	5.0		18.61	**102.4**
	60	150.96										**106.1**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 - M26A
Date:	May 29, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.988
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.186 m^3
AVGERGE ISOKINETICITY	100.3 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.7 °C
AVERAGE GAS MOISTURE BY VOLUME	15.2 %
AVERAGE GAS VELOCITY	16.45 m/s
BAROMETRIC PRESSURE (Station)	100.779 Kpa
STATIC PRESSURE	-2.465 Kpa
ABSOLUTE GAS PRESSURE	98.314 Kpa
OXYGEN CONCENTRATION	8.41 %
CARBON DIOXIDE CONCENTRATION	10.99 %
CARBON MONOXIDE CONCENTRATION	33.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.31 m^3/s
DRY REF GAS FLOWRATE	14.44 Rm^3/s
DRY ADJ GAS FLOWRATE	18.22 Rm^3/s
WET REF GAS FLOWRATE	17.04 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.186 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - M26A	**Test Location:**	APC Outlet No. 1
Date:	May 29, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.988	**Probe (mg)**	0		
Barometric Pressure	29.76 "Hg	**OWTR (g)**	143.4		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	13.1		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.41
CO2%	10.99
COppm	33.0

Measured H2O
15.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	151.35	0.54	280	68	79	79	1.5	4.0		15.40	
2	5	154.73	0.54	283	60	81	81	1.5	4.0		15.44	101.6
3	10	158.05	0.58	283	59	88	80	1.6	4.0		16.00	99.6
4	15	161.54	0.62	283	61	92	80	1.7	4.0		16.54	100.5
5	20	165.12	0.62	284	64	93	80	1.7	4.5		16.55	99.4
6	25	168.78	0.6	284	64	95	85	1.7	4.5		16.28	101.6
7	30	172.35	0.54	284	62	96	83	1.5	4.5		15.45	100.1
8	35	175.75	0.56	284	60	97	82	1.6	4.5		15.73	100.5
9	40	179.22	0.65	284	60	98	83	1.8	4.5		16.95	100.7
10	45	182.94	0.68	284	61	98	83	1.9	4.5		17.33	100.1
11	50	186.75	0.72	284	64	98	83	2	4.5		17.84	100.3
12	55	190.65	0.73	284	67	97	84	2	5.0		17.96	99.8
	60	194.58										99.8

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 - M26A
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.995
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.210 m^3
AVGERGE ISOKINETICITY	100.1 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.4 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	17.01 m/s
BAROMETRIC PRESSURE (Station)	100.610 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	98.219 Kpa
OXYGEN CONCENTRATION	7.8 %
CARBON DIOXIDE CONCENTRATION	11.28 %
CARBON MONOXIDE CONCENTRATION	10.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.13 m^3/s
DRY REF GAS FLOWRATE	14.76 Rm^3/s
DRY ADJ GAS FLOWRATE	19.54 Rm^3/s
WET REF GAS FLOWRATE	17.53 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.210 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 2
Date:	May 30, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.995	**Probe (mg)**	0		
Barometric Pressure	29.71 "Hg	**CWTR (g)**	156.1		
Static Pressure	-9.600 "H_2O	**WCEDA (g)**	9.9		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.8
CO2%	11.28
COppm	10.1

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	592.07	0.75	285	63	77	76	2	2.0		18.24	
2	5	595.91	0.75	287	58	77	76	2	2.0		18.26	**99.9**
3	10	599.73	0.74	287	61	77	76	2	2.0		18.14	**99.5**
4	15	603.54	0.69	287	65	77	76	2	2.0		17.52	**100.0**
5	20	607.29	0.65	287	59	77	77	1.7	2.0		17.00	**101.9**
6	25	610.85	0.59	286	54	78	76	1.55	2.0		16.19	**99.5**
7	30	614.26	0.59	286	51	77	77	1.55	2.0		16.19	**99.9**
8	35	617.64	0.62	286	50	78	77	1.65	2.0		16.59	**99.0**
9	40	621.13	0.63	287	50	77	77	1.7	2.0		16.74	**99.7**
10	45	624.67	0.64	287	50	79	77	1.7	2.0		16.87	**100.5**
11	50	628.23	0.59	287	51	78	77	1.55	2.0		16.20	**100.1**
12	55	631.67	0.59	287	50	79	77	1.55	2.0		16.20	**100.8**
	60	635.12										**101.0**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - M26A
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.995
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.189 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	16.72 m/s
BAROMETRIC PRESSURE (Station)	100.542 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	98.151 Kpa
OXYGEN CONCENTRATION	7.94 %
CARBON DIOXIDE CONCENTRATION	11.03 %
CARBON MONOXIDE CONCENTRATION	8.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.70 m^3/s
DRY REF GAS FLOWRATE	14.44 Rm^3/s
DRY ADJ GAS FLOWRATE	18.91 Rm^3/s
WET REF GAS FLOWRATE	17.23 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.189 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 2
Date:	May 30, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.995	**Probe (mg)**	0		
Barometric Pressure	29.69 "Hg	**CWTR (g)**	159		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	9.6		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft˘	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.94
CO2%	11.03
COppm	8.3

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	635.63	0.54	286	65	78	78	1.4	2.0		15.51	
2	5	638.95	0.53	286	50	78	78	1.4	2.0		15.37	**101.8**
3	10	642.17	0.65	286	48	78	78	1.75	2.0		17.02	**99.7**
4	15	645.75	0.66	286	48	79	78	1.8	2.0		17.15	**100.2**
5	20	649.38	0.6	286	48	79	78	1.6	2.0		16.35	**100.7**
6	25	652.86	0.57	287	49	79	78	1.5	2.0		15.95	**101.2**
7	30	656.19	0.58	287	48	78	78	1.5	2.0		16.09	**99.4**
8	35	659.53	0.61	286	49	78	79	1.6	2.0		16.49	**98.9**
9	40	662.98	0.66	285	49	80	78	1.8	2.0		17.14	**99.5**
10	45	666.62	0.68	285	49	79	78	1.8	2.0		17.40	**100.8**
11	50	670.29	0.72	284	50	80	79	1.95	2.0		17.89	**100.2**
12	55	674.12	0.75	284	50	80	79	2	2.0		18.26	**101.4**
	60	678.06										**102.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - M26A
Date:	May 30, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.995
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	1.211 m^3
AVGERGE ISOKINETICITY	101.0 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.2 °C
AVERAGE GAS MOISTURE BY VOLUME	16.4 %
AVERAGE GAS VELOCITY	17.02 m/s
BAROMETRIC PRESSURE (Station)	100.440 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	98.050 Kpa
OXYGEN CONCENTRATION	7.79 %
CARBON DIOXIDE CONCENTRATION	11.32 %
CARBON MONOXIDE CONCENTRATION	10.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.15 m^3/s
DRY REF GAS FLOWRATE	14.64 Rm^3/s
DRY ADJ GAS FLOWRATE	19.39 Rm^3/s
WET REF GAS FLOWRATE	17.51 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.211 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - M26A	**Test Location:**	APC Outlet No. 2
Date:	May 30, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.995	**Probe (mg)**	0		
Barometric Pressure	29.66 "Hg	**CWTR (g)**	161.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	12.3		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.79
CO2%	11.32
COppm	10.0

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	678.55	0.73	284	65	80	79	2	2.0		18.02	
2	5	682.29	0.74	286	58	80	80	2	2.0		18.17	**98.6**
3	10	686.20	0.76	287	62	80	80	2	2.0		18.42	**102.4**
4	15	690.13	0.72	287	59	80	80	1.95	2.0		17.93	**101.6**
5	20	693.97	0.65	287	56	80	80	1.7	2.0		17.04	**102.0**
6	25	697.80	0.6	286	55	80	80	1.6	2.0		16.36	**107.0**
7	30	701.04	0.61	287	55	81	80	1.65	2.0		16.51	**94.2**
8	35	704.57	0.6	289	56	81	81	1.6	2.0		16.39	**101.7**
9	40	707.96	0.63	286	55	81	80	1.7	2.0		16.76	**98.5**
10	45	711.56	0.63	285	55	81	80	1.7	2.0		16.75	**102.0**
11	50	715.08	0.58	285	55	81	80	1.5	2.0		16.07	**99.7**
12	55	718.54	0.56	285	56	82	80	1.5	2.0		15.79	**102.1**
	60	721.95										**102.3**

APPENDIX 25

SVOC Test Emission Calculations
(18 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	1 - SVOC
Date:	May 31, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.84
DGM CORRECTION FACTOR		0.981
NOZZLE DIAMETER		5.97 mm
DRY REF GAS VOLUME SAMPLED		4.022 m^3
AVGERGE ISOKINETICITY		100.3 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE		139.1 °C
AVERAGE GAS MOISTURE BY VOLUME		16.6 %
AVERAGE GAS VELOCITY		17.13 m/s
BAROMETRIC PRESSURE (Station)		99.898 Kpa
STATIC PRESSURE		-2.365 Kpa
ABSOLUTE GAS PRESSURE		97.533 Kpa
OXYGEN CONCENTRATION		8.01 %
CARBON DIOXIDE CONCENTRATION		11.04 %
CARBON MONOXIDE CONCENTRATION		24.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE		25.32 m^3/s
DRY REF GAS FLOWRATE		14.70 Rm^3/s
DRY ADJ GAS FLOWRATE		19.14 Rm^3/s
WET REF GAS FLOWRATE		17.63 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.022 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C(77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C(77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	May 31, 2018	**Operator:**	TT

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	577		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	11.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.35 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.01
CO2%	11.04
COppm	24.8

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	528.16	0.76	281	67	77	75	1.4	4.5		18.20	
	5	531.39	0.74	282	52	76	75	1.35	5.0		17.97	100.1
2	10	534.61	0.78	282	52	76	75	1.4	5.0		18.45	101.3
	15	537.91	0.79	282	51	76	75	1.4	5.0		18.57	101.1
3	20	541.21	0.73	283	51	77	75	1.3	5.0		17.86	100.4
	25	544.39	0.74	282	51	77	75	1.3	5.0		17.97	100.6
4	30	547.61	0.72	283	51	77	75	1.25	5.0		17.74	101.1
	35	550.71	0.7	283	51	77	75	1.25	5.0		17.49	98.8
5	40	553.84	0.65	282	51	77	75	1.1	5.0		16.84	101.1
	45	556.83	0.66	282	51	77	75	1.15	5.0		16.97	100.2
6	50	559.83	0.56	283	52	77	75	0.91	4.5		15.64	99.7
	55	562.56	0.56	282	52	77	75	0.93	4.5		15.63	98.6
7	60	565.32	0.63	282	51	77	76	1.1	5.0		16.58	99.6
	65	568.20	0.66	283	51	77	76	1.2	5.0		16.98	97.9
8	70	571.19	0.64	282	50	78	76	1.1	5.0		16.71	99.4
	75	574.22	0.66	283	51	78	76	1.15	5.0		16.98	102.1
9	80	577.26	0.67	283	50	78	76	1.15	5.0		17.11	101.0
	85	580.28	0.67	283	50	78	76	1.15	5.0		17.11	99.5
10	90	583.34	0.67	281	51	78	76	1.15	5.0		17.09	100.9
	95	586.37	0.67	280	51	78	76	1.15	5.0		17.08	99.7
11	100	589.41	0.67	281	51	78	77	1.15	5.0		17.09	100.0
	105	592.49	0.63	282	51	79	77	1.1	5.0		16.58	101.3
12	110	595.42	0.65	283	52	79	77	1.15	5.0		16.85	99.3
	115	598.41	0.67	281	52	79	77	1.2	5.0		17.09	99.9
	120	601.45								0.35		99.9
1	0	601.80	0.78	282	56	79	77	1.4	5.5		18.45	
	5	605.10	0.76	282	49	79	77	1.4	6.0		18.21	100.6
2	10	608.44	0.8	283	47	79	77	1.5	6.0		18.70	103.2
	15	611.79	0.81	284	46	79	77	1.5	6.0		18.83	101.0
3	20	615.16	0.8	283	46	79	77	1.5	6.0		18.70	101.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	May 31, 2018	**Operator:**	TT

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	577		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	11.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.35 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.01
CO2%	11.04
COppm	24.8

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	618.54	0.77	283	46	80	77	1.4	6.0		18.34	**101.9**
4	30	621.84	0.72	284	47	80	77	1.25	5.5		17.75	**101.2**
	35	624.99	0.7	283	47	80	77	1.2	5.5		17.49	**100.0**
5	40	628.12	0.62	283	48	81	77	1.1	5.0		16.46	**100.7**
	45	631.04	0.62	283	49	81	77	1.1	5.0		16.46	**99.7**
6	50	633.98	0.62	283	49	81	78	1.1	5.0		16.46	**100.4**
	55	636.88	0.5	283	49	81	78	0.8	4.5		14.78	**98.9**
7	60	639.47	0.64	283	50	82	78	1.15	5.0		16.72	**98.3**
	65	642.40	0.65	283	49	82	78	1.2	5.5		16.85	**98.3**
8	70	645.40	0.65	283	49	82	78	1.2	5.5		16.85	**99.8**
	75	648.49	0.67	284	42	83	79	1.2	5.5		17.12	**102.8**
9	80	651.56	0.69	284	50	83	79	1.25	5.5		17.38	**100.5**
	85	654.66	0.69	284	49	83	79	1.25	5.5		17.38	**100.0**
10	90	657.80	0.69	281	50	83	79	1.25	5.5		17.34	**101.3**
	95	660.92	0.68	281	50	83	80	1.2	5.5		17.22	**100.5**
11	100	664.02	0.56	282	50	83	80	0.95	5.0		15.63	**100.5**
	105	666.81	0.56	282	51	84	80	0.95	5.0		15.63	**99.6**
12	110	669.61	0.55	281	52	84	80	0.93	5.0		15.48	**99.9**
	115	672.37	0.56	280	52	84	80	0.95	5.0		15.61	**99.3**
	120	675.16										**99.4**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	2 - SVOC
Date:	May 31, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	0.981
NOZZLE DIAMETER	5.97 mm
DRY REF GAS VOLUME SAMPLED	4.021 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	137.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.5 %
AVERAGE GAS VELOCITY	17.05 m/s
BAROMETRIC PRESSURE (Station)	99.695 Kpa
STATIC PRESSURE	-2.365 Kpa
ABSOLUTE GAS PRESSURE	97.330 Kpa
OXYGEN CONCENTRATION	8.04 %
CARBON DIOXIDE CONCENTRATION	10.95 %
CARBON MONOXIDE CONCENTRATION	23.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.19 m^3/s
DRY REF GAS FLOWRATE	14.65 Rm^3/s
DRY ADJ GAS FLOWRATE	19.03 Rm^3/s
WET REF GAS FLOWRATE	17.56 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.021 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	May 31, 2018	**Operator:**	TT

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.44 "Hg	**CWTR (g)**	567.6		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	17.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.39 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.04
CO2%	10.95
COppm	23.2

Measured H2O
16.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	679.18	0.76	282	78	82	80	1.4	6.0		18.23	
	5	682.37	0.83	282	60	82	80	1.55	8.0		19.05	97.8
2	10	685.76	0.83	282	55	83	81	1.55	8.0		19.05	99.5
	15	689.25	0.83	282	53	83	81	1.5	8.0		19.05	102.2
3	20	692.65	0.84	283	51	84	81	1.5	8.0		19.18	99.6
	25	696.17	0.8	282	51	84	81	1.5	8.0		18.71	102.5
4	30	699.52	0.75	282	51	84	81	1.4	8.0		18.11	99.9
	35	702.83	0.75	282	51	85	81	1.35	8.0		18.11	101.9
5	40	706.12	0.64	283	51	85	82	1.15	7.0		16.74	101.2
	45	709.14	0.67	283	52	85	81	1.2	7.0		17.13	100.4
6	50	712.22	0.52	283	52	85	82	0.87	6.0		15.09	100.2
	55	714.93	0.51	283	52	86	82	0.85	6.0		14.95	99.9
7	60	717.62	0.66	283	52	86	82	1.2	7.5		17.00	100.1
	65	720.60	0.68	283	51	86	83	1.25	7.5		17.26	97.5
8	70	723.76	0.68	283	50	86	82	1.25	7.5		17.26	101.8
	75	726.87	0.71	283	50	86	83	1.3	8.0		17.63	100.3
9	80	730.04	0.71	283	50	87	83	1.3	8.0		17.63	99.9
	85	733.26	0.69	282	50	87	83	1.3	8.0		17.37	101.4
10	90	736.38	0.69	282	51	87	83	1.3	8.0		17.37	99.6
	95	739.53	0.69	281	51	87	83	1.3	8.0		17.36	100.6
11	100	742.81	0.68	281	52	87	84	1.25	8.0		17.23	104.7
	105	745.94	0.68	281	52	87	84	1.25	8.0		17.23	100.5
12	110	749.09	0.7	281	52	87	84	1.3	8.0		17.49	101.1
	115	752.27	0.71	281	52	87	84	1.3	8.0		17.61	100.7
	120	755.44								0.39		99.6
1	0	755.83	0.77	281	67	87	87	1.5	8.5		18.34	
	5	759.23	0.77	281	53	86	87	1.45	8.5		18.34	102.4
2	10	762.56	0.77	282	52	87	84	1.45	8.5		18.35	100.4
	15	765.98	0.76	281	53	87	84	1.4	8.0		18.22	103.3
3	20	769.30	0.75	281	54	87	84	1.4	8.0		18.10	100.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	May 31, 2018	**Operator:**	TT

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.44 "Hg	**CWTR (g)**	567.6		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	17.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.39 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.04
CO2%	10.95
COppm	23.2

Measured H2O
16.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	772.62	0.73	281	54	87	84	1.35	8.0		17.86	**101.5**
4	30	775.82	0.69	281	54	87	84	1.3	8.0		17.36	**99.2**
	35	778.98	0.68	281	54	87	84	1.3	8.0		17.23	**100.7**
5	40	782.30	0.6	280	54	87	84	1.05	7.0		16.18	**106.6**
	45	785.23	0.62	280	55	87	84	1.1	7.0		16.45	**100.0**
6	50	788.19	0.56	280	55	88	84	0.98	7.0		15.63	**99.4**
	55	791.04	0.56	280	55	88	85	0.98	7.0		15.63	**100.6**
7	60	793.90	0.61	280	55	88	84	1.1	7.0		16.31	**100.9**
	65	796.84	0.61	280	54	88	85	1.1	7.0		16.31	**99.5**
8	70	799.79	0.61	279	54	88	85	1.1	7.0		16.30	**99.7**
	75	802.75	0.63	278	54	88	85	1.15	7.0		16.55	**100.0**
9	80	805.79	0.66	277	54	88	85	1.2	7.5		16.93	**101.0**
	85	808.84	0.66	277	54	88	85	1.2	7.5		16.93	**98.9**
10	90	812.00	0.57	277	55	89	85	1	7.0		15.74	**102.5**
	95	814.81	0.57	276	55	89	85	1	7.0		15.73	**98.0**
11	100	817.71	0.49	272	59	92	88	0.84	6.5		14.54	**101.0**
	105	820.37	0.49	271	55	89	85	0.83	6.5		14.53	**99.1**
12	110	823.01	0.49	270	54	88	85	0.85	6.5		14.52	**98.8**
	115	825.65	0.49	268	55	88	85	0.85	6.5		14.50	**98.8**
	120	828.32										**99.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	3 - SVOC
Date:	June 1, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	0.981
NOZZLE DIAMETER	5.97 mm
DRY REF GAS VOLUME SAMPLED	4.141 m^3
AVGERGE ISOKINETICITY	102.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.0 %
AVERAGE GAS VELOCITY	17.39 m/s
BAROMETRIC PRESSURE (Station)	99.797 Kpa
STATIC PRESSURE	-2.365 Kpa
ABSOLUTE GAS PRESSURE	97.431 Kpa
OXYGEN CONCENTRATION	8.07 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	15.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.69 m^3/s
DRY REF GAS FLOWRATE	14.84 Rm^3/s
DRY ADJ GAS FLOWRATE	19.24 Rm^3/s
WET REF GAS FLOWRATE	17.89 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.141 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 1, 2018	**Operator:**	DU

Pitot Factor	0.84	**Filter (mg)**	0		
DGM CF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.47 "Hg	**CWTR (g)**	611.6		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	12.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.22 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.07
CO2%	11.01
COppm	15.6

Measured H2O
17.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	29.02	0.85	282	66	77	75	1.6	5.0		19.29	
	5	32.44	0.85	280	52	77	75	1.6	5.0		19.26	100.7
2	10	35.89	0.86	282	48	78	75	1.6	5.0		19.40	101.4
	15	39.33	0.86	283	46	78	76	1.6	5.0		19.41	100.6
3	20	42.80	0.79	282	45	79	76	1.5	5.5		18.60	101.4
	25	46.17	0.79	282	46	79	76	1.5	5.5		18.60	102.6
4	30	49.54	0.67	282	46	80	77	1.2	5.0		17.13	102.6
	35	52.67	0.65	282	46	81	77	1.2	5.0		16.87	103.2
5	40	55.76	0.53	281	47	81	77	0.9	4.5		15.22	103.3
	45	58.50	0.52	281	48	82	77	0.9	4.5		15.08	101.3
6	50	61.17	0.52	281	49	82	78	0.95	4.5		15.08	99.6
	55	63.96	0.52	282	49	83	78	0.9	4.5		15.09	104.0
7	60	66.65	0.65	281	49	84	79	1.2	5.5		16.86	100.2
	65	69.74	0.65	281	49	84	79	1.2	5.5		16.86	102.8
8	70	72.86	0.68	281	49	84	80	1.2	5.5		17.24	103.8
	75	76.00	0.67	281	48	84	80	1.2	5.5		17.11	102.0
9	80	79.14	0.69	281	49	85	80	1.2	5.5		17.37	102.8
	85	82.26	0.7	281	48	85	81	1.2	5.5		17.49	100.5
10	90	85.39	0.69	281	49	85	81	1.2	5.5		17.37	100.1
	95	88.52	0.72	281	49	85	81	1.2	5.5		17.74	100.8
11	100	91.63	0.62	281	49	85	81	1.1	5.5		16.46	98.0
	105	94.65	0.63	282	51	86	81	1.1	5.0		16.61	102.5
12	110	97.64	0.63	282	51	86	82	1.1	5.0		16.61	100.7
	115	100.65	0.65	282	51	86	82	1.2	5.0		16.87	101.3
	120	103.68								0.22		100.4
1	0	103.90	0.8	281	58	80	85	1.5	6.0		18.70	
	5	107.29	0.81	282	51	85	82	1.5	6.0		18.83	101.5
2	10	110.69	0.82	282	51	86	82	1.5	6.0		18.95	101.1
	15	114.09	0.83	282	51	86	83	1.6	6.0		19.06	100.4
3	20	117.55	0.81	282	51	87	83	1.6	6.0		18.83	101.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 1, 2018	**Operator:**	DU

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.981	**Probe (mg)**	0		
Barometric Pressure	29.47 "Hg	**CWTR (g)**	611.6		
Static Pressure	-9.500 "H_2O	**WCBDA (g)**	12.4		
Nozzle	0.235 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.22 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.07
CO2%	11.01
COppm	15.6

Measured H2O
17.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	121.05	0.77	282	51	87	83	1.5	6.0		18.36	103.8
4	30	124.50	0.73	282	52	87	83	1.4	6.0		17.88	104.9
	35	127.85	0.75	282	52	88	83	1.4	6.0		18.12	104.6
5	40	131.16	0.67	283	52	88	84	1.3	6.0		17.14	101.9
	45	134.48	0.67	282	53	88	84	1.3	6.0		17.13	108.0
6	50	137.67	0.58	282	53	88	84	1	5.0		15.93	103.7
	55	140.60	0.58	282	54	89	85	1	5.0		15.93	102.3
7	60	143.45	0.67	282	54	89	85	1.3	6.0		17.13	99.4
	65	146.63	0.64	282	54	89	85	1.3	6.0		16.74	103.2
8	70	149.84	0.67	282	54	90	85	1.3	6.0		17.13	106.6
	75	153.02	0.64	282	54	90	85	1.3	6.0		16.74	103.1
9	80	156.24	0.7	280	55	90	86	1.3	6.0		17.48	106.9
	85	159.44	0.69	281	55	90	86	1.3	6.0		17.37	101.3
10	90	162.65	0.7	281	55	91	86	1.3	6.0		17.49	102.4
	95	165.93	0.69	281	55	91	87	1.3	6.0		17.37	103.8
11	100	169.18	0.66	281	55	91	87	1.3	6.0		16.99	103.5
	105	172.40	0.67	280	56	91	87	1.2	6.0		17.10	104.9
12	110	175.56	0.69	280	55	91	87	1.2	6.0		17.36	102.0
	115	178.70	0.69	281	56	91	87	1.2	6.0		17.37	99.9
	120	181.84										100.0

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 - SVOC
Date:	May 31, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.998
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	4.543 m^3
AVGERGE ISOKINETICITY	98.0 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.4 °C
AVERAGE GAS MOISTURE BY VOLUME	16.9 %
AVERAGE GAS VELOCITY	16.70 m/s
BAROMETRIC PRESSURE (Station)	99.898 Kpa
STATIC PRESSURE	-2.390 Kpa
ABSOLUTE GAS PRESSURE	97.508 Kpa
OXYGEN CONCENTRATION	7.65 %
CARBON DIOXIDE CONCENTRATION	11.20 %
CARBON MONOXIDE CONCENTRATION	22.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.67 m^3/s
DRY REF GAS FLOWRATE	14.15 Rm^3/s
DRY ADJ GAS FLOWRATE	18.94 Rm^3/s
WET REF GAS FLOWRATE	17.04 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.543 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	JB

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	661.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	16.6		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.38 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.65
CO2%	11.20
COppm	22.2

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	377.36	0.68	287	74	77	77	1.8	4.5		17.50	
	5	380.77	0.67	287	53	77	78	1.8	4.5		17.37	94.3
2	10	384.25	0.71	287	52	77	78	1.9	4.5		17.88	96.8
	15	387.83	0.74	288	52	78	79	2	4.5		18.27	96.7
3	20	391.50	0.7	288	51	78	79	1.95	4.5		17.77	97.0
	25	395.13	0.69	288	52	78	80	1.9	4.5		17.64	98.7
4	30	398.76	0.64	288	52	79	80	1.75	4.5		16.99	99.3
	35	402.25	0.63	288	52	79	81	1.75	4.5		16.86	99.0
5	40	405.70	0.59	288	52	79	82	1.6	4.5		16.31	98.5
	45	409.04	0.61	288	53	79	83	1.7	4.5		16.59	98.4
6	50	412.39	0.55	289	53	80	84	1.55	5.0		15.76	97.0
	55	415.66	0.56	289	53	80	84	1.5	5.0		15.90	99.6
7	60	418.88	0.58	289	53	80	85	1.6	5.0		16.19	97.2
	65	422.14	0.56	289	53	81	85	1.6	5.0		15.90	96.6
8	70	425.43	0.61	289	53	81	85	1.7	5.0		16.60	99.1
	75	428.80	0.61	290	53	81	85	1.7	5.0		16.61	97.3
9	80	432.19	0.63	290	54	82	85	1.75	5.0		16.88	97.9
	85	435.64	0.63	290	54	82	85	1.75	5.0		16.88	98.0
10	90	439.13	0.61	289	54	82	85	1.7	5.0		16.60	99.1
	95	442.56	0.59	287	54	82	85	1.65	5.0		16.30	98.9
11	100	445.94	0.51	287	55	82	85	1.4	5.0		15.16	99.0
	105	449.08	0.53	288	55	82	86	1.5	5.0		15.46	98.9
12	110	452.22	0.52	288	56	82	86	1.5	5.0		15.31	97.0
	115	455.39	0.5	288	56	83	87	1.4	5.0		15.02	98.8
	120	458.51								0.38		99.0
1	0	458.89	0.6	286	67	83	83	1.7	5.0		16.43	
	5	462.20	0.63	286	59	83	84	1.8	5.0		16.83	96.2
2	10	465.65	0.62	286	57	83	84	1.8	5.0		16.70	97.8
	15	469.14	0.6	287	57	83	84	1.65	5.0		16.44	99.7
3	20	472.51	0.61	287	58	82	84	1.7	5.0		16.58	97.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	JB

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.5 "Hg	**CWTR (g)**	661.9		
Static Pressure	-9.600 "H_2O	**WCBDA (g)**	16.6		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.38 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.65
CO2%	11.20
COppm	22.2

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	475.89	0.6	288	57	82	85	1.7	5.0		16.45	97.5
4	30	479.27	0.61	287	55	83	85	1.7	5.0		16.58	98.2
	35	482.65	0.61	289	54	83	86	1.7	5.0		16.60	97.3
5	40	486.03	0.61	289	54	83	86	1.7	5.0		16.60	97.3
	45	489.42	0.61	289	54	83	86	1.7	5.0		16.60	97.6
6	50	492.82	0.59	289	54	83	87	1.7	5.0		16.32	97.9
	55	496.21	0.62	289	54	84	87	1.75	5.0		16.73	99.2
7	60	499.65	0.57	289	55	84	87	1.6	5.0		16.04	98.1
	65	502.97	0.56	290	56	84	87	1.6	5.0		15.91	98.7
8	70	506.26	0.6	290	56	84	88	1.7	5.0		16.47	98.7
	75	509.63	0.61	290	56	85	88	1.7	5.0		16.61	97.6
9	80	513.01	0.66	290	57	85	88	1.9	5.5		17.28	97.0
	85	516.58	0.64	289	57	85	88	1.8	5.5		17.00	98.6
10	90	520.09	0.66	289	57	85	88	1.85	5.5		17.27	98.3
	95	523.66	0.67	289	57	85	87	1.9	5.5		17.40	98.5
11	100	527.25	0.71	289	57	85	87	2	6.0		17.91	98.4
	105	530.92	0.71	289	58	85	87	2	6.0		17.91	97.8
12	110	534.59	0.68	289	58	85	89	1.9	6.0		17.52	97.8
	115	538.22	0.68	288	58	85	90	1.9	6.0		17.51	98.6
	120	541.86										98.7

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - SVOC
Date:	May 31, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.998
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	4.713 m^3
AVGERGE ISOKINETICITY	98.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.8 °C
AVERAGE GAS MOISTURE BY VOLUME	16.6 %
AVERAGE GAS VELOCITY	17.16 m/s
BAROMETRIC PRESSURE (Station)	99.831 Kpa
STATIC PRESSURE	-2.216 Kpa
ABSOLUTE GAS PRESSURE	97.615 Kpa
OXYGEN CONCENTRATION	7.91 %
CARBON DIOXIDE CONCENTRATION	11.12 %
CARBON MONOXIDE CONCENTRATION	10.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.35 m^3/s
DRY REF GAS FLOWRATE	14.60 Rm^3/s
DRY ADJ GAS FLOWRATE	19.16 Rm^3/s
WET REF GAS FLOWRATE	17.51 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.713 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F) and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.48 "Hg	**CWTR (g)**	672.5		
Static Pressure	-8.900 "H_2O	**WCBDA (g)**	17.1		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.45 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.12
COppm	10.3

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	682.94	0.81	287	55	76	77	2.2	6.0		19.08	
	5	686.73	0.77	288	53	76	76	2.2	6.0		18.62	95.7
2	10	690.60	0.78	288	52	76	77	2.1	6.0		18.74	100.4
	15	694.41	0.76	289	52	77	78	2.1	6.0		18.51	98.1
3	20	698.20	0.79	288	52	77	79	2.2	6.0		18.86	98.7
	25	702.08	0.8	289	53	77	80	2.2	6.0		18.99	99.0
4	30	705.99	0.73	289	53	78	81	2.1	6.5		18.14	99.1
	35	709.79	0.74	289	53	78	82	2	6.5		18.26	100.6
5	40	713.52	0.67	289	54	79	83	1.9	6.0		17.38	98.0
	45	717.18	0.69	290	54	79	83	1.9	6.0		17.65	100.8
6	50	720.78	0.62	290	55	80	84	1.75	6.0		16.73	97.8
	55	724.26	0.61	291	55	80	84	1.7	5.5		16.60	99.5
7	60	727.68	0.65	291	55	81	85	1.8	5.5		17.14	98.7
	65	731.24	0.63	290	54	81	85	1.9	6.0		16.86	99.3
8	70	734.70	0.62	289	54	81	86	1.7	5.5		16.71	98.0
	75	738.12	0.63	289	54	81	85	1.8	5.5		16.85	97.5
9	80	741.58	0.61	289	55	82	86	1.8	6.0		16.58	97.9
	85	745.03	0.62	289	54	82	86	1.8	6.0		16.71	99.0
10	90	748.50	0.62	289	55	82	86	1.8	6.0		16.71	98.8
	95	751.97	0.63	288	54	82	86	1.8	6.0		16.84	98.8
11	100	755.45	0.67	288	52	83	86	1.9	6.0		17.36	98.2
	105	759.09	0.63	288	51	83	86	1.8	6.0		16.84	99.6
12	110	762.52	0.59	288	51	83	86	1.8	6.0		16.29	96.7
	115	766.02	0.56	288	51	83	86	1.55	5.5		15.87	102.0
	120	769.26								0.45		96.9
1	0	769.71	0.78	289	54	82	83	2.2	7.0		18.75	
	5	773.56	0.72	289	52	82	83	2.05	6.5		18.01	98.1
2	10	777.35	0.73	289	53	82	83	1.9	6.0		18.14	100.5
	15	781.09	0.73	290	54	82	83	2	6.0		18.15	98.5
3	20	784.58	0.7	289	54	82	84	2.1	6.5		17.76	92.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	May 31, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.48 "Hg	**CWTR (g)**	672.5		
Static Pressure	-8.900 "H_2O	**WCBDA (g)**	17.1		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.45 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.12
COppm	10.3

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	788.33	0.7	289	54	82	84	1.95	6.0		17.76	100.8
4	30	791.99	0.64	288	55	82	85	1.8	6.0		16.97	98.3
	35	795.52	0.66	288	55	82	85	1.85	6.0		17.23	99.0
5	40	799.07	0.61	289	55	82	85	1.75	6.0		16.58	98.0
	45	802.50	0.59	289	54	82	86	1.7	6.0		16.31	98.6
6	50	805.85	0.54	289	54	82	86	1.5	5.5		15.60	97.8
	55	809.08	0.54	289	55	82	86	1.5	5.5		15.60	98.5
7	60	812.31	0.56	289	55	83	87	1.6	6.0		15.89	98.5
	65	815.58	0.59	289	54	83	87	1.7	6.0		16.31	97.8
8	70	818.95	0.63	289	54	83	87	1.8	6.0		16.85	98.2
	75	822.42	0.63	290	54	83	86	1.85	6.5		16.86	97.8
9	80	825.94	0.66	290	54	83	86	1.9	6.5		17.26	99.4
	85	829.53	0.67	291	54	83	86	1.95	7.0		17.40	99.1
10	90	833.15	0.6	291	55	83	86	1.7	6.5		16.47	99.2
	95	836.57	0.63	289	55	83	86	1.8	6.5		16.85	99.0
11	100	840.02	0.58	289	56	83	86	1.7	6.5		16.17	97.4
	105	843.42	0.59	289	56	83	86	1.7	6.5		16.31	100.0
12	110	846.82	0.57	289	56	83	86	1.65	6.0		16.03	99.1
	115	850.19	0.57	289	56	83	87	1.65	6.0		16.03	100.0
	120	853.54										99.3

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - SVOC
Date:	June 1, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.998
NOZZLE DIAMETER	6.54 mm
DRY REF GAS VOLUME SAMPLED	4.709 m^3
AVGERGE ISOKINETICITY	99.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.7 °C
AVERAGE GAS MOISTURE BY VOLUME	17.4 %
AVERAGE GAS VELOCITY	17.16 m/s
BAROMETRIC PRESSURE (Station)	99.763 Kpa
STATIC PRESSURE	-2.216 Kpa
ABSOLUTE GAS PRESSURE	97.547 Kpa
OXYGEN CONCENTRATION	7.99 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	10.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.36 m^3/s
DRY REF GAS FLOWRATE	14.45 Rm^3/s
DRY ADJ GAS FLOWRATE	18.84 Rm^3/s
WET REF GAS FLOWRATE	17.51 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.709 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C(77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C(77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	June 1, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGM CF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.46 "Hg	**CWTR (g)**	712.8		
Static Pressure	-8.900 "H_2O	**WCBDA (g)**	18.2		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.45 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.99
CO2%	11.01
COppm	10.9

Measured H2O
17.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	854.40	0.7	289	57	82	82	2	5.0		17.80	
	5	858.07	0.63	289	54	82	82	1.75	5.0		16.89	99.5
2	10	861.48	0.74	290	52	82	83	2.05	5.5		18.32	97.4
	15	865.27	0.77	289	49	82	85	2.1	5.5		18.67	100.0
3	20	869.08	0.77	289	49	82	86	2.1	5.8		18.67	98.3
	25	872.88	0.77	290	49	83	87	2.1	5.8		18.68	97.9
4	30	876.64	0.75	290	50	83	87	2.1	5.8		18.44	96.8
	35	880.41	0.73	290	50	83	88	2.1	6.0		18.19	98.3
5	40	884.19	0.71	290	50	84	89	2	6.0		17.94	99.8
	45	887.89	0.72	290	50	84	89	2.1	6.0		18.07	98.9
6	50	891.64	0.61	290	51	85	89	1.8	5.0		16.63	99.5
	55	895.12	0.62	290	51	85	90	1.8	5.2		16.77	100.2
7	60	898.58	0.66	290	51	86	90	1.9	5.5		17.30	98.7
	65	902.15	0.66	290	52	86	91	2	6.0		17.30	98.7
8	70	905.77	0.68	290	52	86	91	2	6.0		17.56	100.0
	75	909.40	0.66	291	48	86	91	2	6.0		17.31	98.8
9	80	913.03	0.68	290	47	86	91	2	6.0		17.56	100.3
	85	916.68	0.69	290	47	86	91	2	6.0		17.69	99.3
10	90	920.31	0.68	289	47	86	91	2	6.0		17.55	98.1
	95	923.97	0.66	289	48	86	91	2	6.0		17.29	99.5
11	100	927.64	0.57	289	48	87	92	1.6	5.0		16.06	101.3
	105	930.95	0.55	289	50	87	92	1.65	5.0		15.78	98.0
12	110	934.27	0.56	289	50	87	92	1.65	5.0		15.92	100.1
	115	937.59	0.56	289	50	88	93	1.65	5.0		15.92	99.2
	120	940.92								0.45		99.3
1	0	941.37	0.78	289	56	88	90	2.25	6.5		18.79	
	5	945.21	0.79	289	51	88	91	2.3	6.5		18.91	97.5
2	10	949.17	0.79	289	51	88	91	2.3	6.5		18.91	99.8
	15	953.12	0.78	289	52	88	91	2.3	6.5		18.79	99.5
3	20	957.05	0.76	289	52	88	91	2.25	6.5		18.55	99.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	June 1, 2018	**Operator:**	AS

Pitot Factor	0.85	**Filter (mg)**	0		
DGMCF	0.998	**Probe (mg)**	0		
Barometric Pressure	29.46 "Hg	**CWTR (g)**	712.8		
Static Pressure	-8.900 "H_2O	**WCBDA (g)**	18.2		
Nozzle	0.2574 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.45 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.99
CO2%	11.01
COppm	10.9

Measured H2O
17.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	960.99	0.75	289	52	88	91	2.15	6.5		18.43	101.2
4	30	964.84	0.67	289	52	88	91	2	6.0		17.42	99.5
	35	968.53	0.67	289	53	89	92	2	6.0		17.42	100.9
5	40	972.20	0.63	288	53	89	93	1.9	6.0		16.88	100.2
	45	975.81	0.63	288	53	89	94	1.85	6.0		16.88	101.4
6	50	979.36	0.58	288	53	89	94	1.7	5.5		16.19	99.6
	55	982.80	0.58	288	54	89	95	1.7	5.5		16.19	100.6
7	60	986.21	0.57	288	54	90	95	1.7	5.5		16.05	99.6
	65	989.62	0.57	288	54	91	96	1.7	5.5		16.05	100.4
8	70	993.01	0.62	288	55	91	98	1.85	6.0		16.74	99.6
	75	996.55	0.57	288	54	91	96	1.7	6.0		16.05	99.6
9	80	999.99	0.6	289	51	91	96	1.75	6.0		16.48	101.1
	85	1003.46	0.59	288	51	91	96	1.75	6.0		16.33	99.5
10	90	1006.92	0.62	287	51	92	97	1.85	6.0		16.73	100.0
	95	1010.48	0.63	287	51	92	97	1.9	6.0		16.87	100.1
11	100	1014.07	0.51	287	52	93	97	1.55	5.5		15.18	100.2
	105	1017.34	0.5	287	53	93	97	1.45	5.5		15.03	101.2
12	110	1020.54	0.52	287	53	93	97	1.55	5.5		15.32	100.0
	115	1023.81	0.52	287	54	93	97	1.55	5.5		15.32	100.2
	120	1027.08										100.2

APPENDIX 26

ORTECH Total Hydrocarbon CEM Data
(4 pages)

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 BH Outlet
May 29, 2018

Test No. 1			Test No. 2			Test No. 3		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:00	2.3		17:08	0.8		18:14	0.8	
16:01	15.2		17:09	0.7		18:15	1.2	
16:02	3.5		17:10	1.0		18:16	1.0	
16:03	2.4		17:11	1.0		18:17	1.0	
16:04	5.1		17:12	1.0		18:18	0.9	
16:05	4.5		17:13	0.9		18:19	1.1	
16:06	2.7		17:14	0.8		18:20	1.0	
16:07	1.9		17:15	0.7		18:21	1.2	
16:08	1.6		17:16	0.8		18:22	0.6	
16:09	1.2	4.0	17:17	0.5	0.8	18:23	0.4	0.9
16:10	1.4	3.9	17:18	0.7	0.8	18:24	0.5	0.9
16:11	1.7	2.6	17:19	0.6	0.8	18:25	0.6	0.8
16:12	5.7	2.8	17:20	0.6	0.8	18:26	0.5	0.8
16:13	3.2	2.9	17:21	0.5	0.7	18:27	0.5	0.7
16:14	1.5	2.5	17:22	0.6	0.7	18:28	0.3	0.7
16:15	1.2	2.2	17:23	0.5	0.6	18:29	0.5	0.6
16:16	1.4	2.1	17:24	0.6	0.6	18:30	0.6	0.6
16:17	0.9	2.0	17:25	0.6	0.6	18:31	0.4	0.5
16:18	1.1	1.9	17:26	0.6	0.6	18:32	0.4	0.5
16:19	0.8	1.9	17:27	0.5	0.6	18:33	0.4	0.5
16:20	0.8	1.8	17:28	0.5	0.6	18:34	0.2	0.4
16:21	0.7	1.7	17:29	0.5	0.5	18:35	0.3	0.4
16:22	2.3	1.4	17:30	0.3	0.5	18:36	1.0	0.4
16:23	1.3	1.2	17:31	0.5	0.5	18:37	0.6	0.5
16:24	0.6	1.1	17:32	0.5	0.5	18:38	0.6	0.5
16:25	1.5	1.1	17:33	0.5	0.5	18:39	0.4	0.5
16:26	0.9	1.1	17:34	0.3	0.5	18:40	0.6	0.5
16:27	0.6	1.1	17:35	0.4	0.5	18:41	0.5	0.5
16:28	0.7	1.0	17:36	0.5	0.5	18:42	0.3	0.5
16:29	0.4	1.0	17:37	0.5	0.5	18:43	0.5	0.5
16:30	0.5	1.0	17:38	0.5	0.5	18:44	0.3	0.5
16:31	0.5	0.9	17:39	0.5	0.5	18:45	0.5	0.5
16:32	0.2	0.7	17:40	0.5	0.5	18:46	0.4	0.5
16:33	0.0	0.6	17:41	0.4	0.5	18:47	0.5	0.5
16:34	0.3	0.6	17:42	0.3	0.5	18:48	0.5	0.5
16:35	0.0	0.4	17:43	0.5	0.4	18:49	0.3	0.4
16:36	0.5	0.4	17:44	0.6	0.5	18:50	0.3	0.4
16:37	1.0	0.4	17:45	0.3	0.5	18:51	0.3	0.4
16:38	2.0	0.5	17:46	0.5	0.5	18:52	0.4	0.4
16:39	1.6	0.6	17:47	1.1	0.5	18:53	0.2	0.4
16:40	1.2	0.7	17:48	0.7	0.5	18:54	0.3	0.4
16:41	1.0	0.8	17:49	0.5	0.5	18:55	0.2	0.3
16:42	1.0	0.9	17:50	0.7	0.6	18:56	0.2	0.3
16:43	0.7	0.9	17:51	0.6	0.6	18:57	0.8	0.4
16:44	0.7	1.0	17:52	0.4	0.6	18:58	0.7	0.4
16:45	1.0	1.1	17:53	0.4	0.6	18:59	0.3	0.4
16:46	0.7	1.1	17:54	0.6	0.6	19:00	0.6	0.4
16:47	0.7	1.1	17:55	0.5	0.6	19:01	0.6	0.4
16:48	0.9	1.0	17:56	0.5	0.6	19:02	0.3	0.4
16:49	0.8	0.9	17:57	0.5	0.5	19:03	0.2	0.4
16:50	0.7	0.8	17:58	0.4	0.5	19:04	0.3	0.4
16:51	0.5	0.8	17:59	0.4	0.5	19:05	0.5	0.4
16:52	0.6	0.7	18:00	0.7	0.5	19:06	0.5	0.5
16:53	0.6	0.7	18:01	0.5	0.5	19:07	0.3	0.4
16:54	0.6	0.7	18:02	0.2	0.5	19:08	0.4	0.4
16:55	0.5	0.7	18:03	0.4	0.5	19:09	0.3	0.4
16:56	0.6	0.7	18:04	0.4	0.5	19:10	0.3	0.4
16:57	0.5	0.6	18:05	0.5	0.5	19:11	0.5	0.4
16:58	0.4	0.6	18:06	0.3	0.4	19:12	0.4	0.4
16:59	0.7	0.6	18:07	0.3	0.4	19:13	0.4	0.4
17:00	0.4	0.5	18:08	0.3	0.4	19:14	0.1	0.4
Min	0.0	0.4	Min	0.2	0.4	Min	0.1	0.3
Max	15.2	4.0	Max	1.1	0.8	Max	1.2	0.9
Avg	1.5	1.2	Avg	0.5	0.5	Avg	0.5	0.5

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 BH Outlet
May 29, 2018

Test No. 1			Test No. 2			Test No. 3		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:00	1.2		17:08	0.1		18:14	1.7	
16:01	0.9		17:09	0.2		18:15	1.4	
16:02	1.2		17:10	0.0		18:16	2.4	
16:03	0.6		17:11	0.4		18:17	0.7	
16:04	0.6		17:12	0.2		18:18	1.1	
16:05	0.6		17:13	0.7		18:19	0.7	
16:06	0.3		17:14	2.2		18:20	1.3	
16:07	0.0		17:15	0.9		18:21	1.4	
16:08	0.0		17:16	1.2		18:22	1.0	
16:09	0.1	0.5	17:17	0.7	0.7	18:23	1.1	1.3
16:10	0.0	0.4	17:18	0.5	0.7	18:24	1.1	1.2
16:11	0.1	0.3	17:19	0.2	0.7	18:25	1.0	1.2
16:12	0.7	0.3	17:20	0.8	0.8	18:26	1.4	1.1
16:13	5.5	0.8	17:21	0.3	0.8	18:27	3.4	1.3
16:14	6.5	1.4	17:22	0.4	0.8	18:28	1.3	1.4
16:15	5.3	1.8	17:23	0.3	0.7	18:29	2.1	1.5
16:16	5.9	2.4	17:24	0.1	0.5	18:30	5.1	1.9
16:17	6.0	3.0	17:25	0.0	0.4	18:31	2.9	2.0
16:18	6.4	3.6	17:26	0.0	0.3	18:32	3.0	2.2
16:19	5.7	4.2	17:27	0.0	0.3	18:33	2.5	2.4
16:20	5.3	4.7	17:28	0.0	0.2	18:34	2.6	2.5
16:21	0.2	4.7	17:29	0.0	0.2	18:35	2.0	2.6
16:22	0.0	4.7	17:30	0.0	0.1	18:36	2.7	2.7
16:23	0.0	4.1	17:31	0.0	0.1	18:37	2.0	2.6
16:24	0.1	3.5	17:32	0.0	0.0	18:38	2.5	2.7
16:25	0.0	3.0	17:33	0.0	0.0	18:39	3.2	2.8
16:26	0.0	2.4	17:34	0.1	0.0	18:40	2.6	2.6
16:27	0.0	1.8	17:35	0.0	0.0	18:41	2.9	2.6
16:28	0.0	1.1	17:36	0.0	0.0	18:42	2.1	2.5
16:29	1.5	0.7	17:37	0.0	0.0	18:43	2.4	2.5
16:30	0.0	0.2	17:38	0.1	0.0	18:44	2.2	2.5
16:31	0.0	0.2	17:39	0.8	0.1	18:45	2.0	2.5
16:32	0.0	0.2	17:40	0.0	0.1	18:46	2.4	2.4
16:33	0.0	0.2	17:41	2.4	0.3	18:47	2.0	2.4
16:34	0.0	0.2	17:42	0.0	0.3	18:48	2.1	2.4
16:35	0.0	0.2	17:43	1.7	0.5	18:49	2.2	2.3
16:36	0.0	0.2	17:44	0.0	0.5	18:50	1.8	2.2
16:37	0.2	0.2	17:45	0.0	0.5	18:51	1.4	2.1
16:38	1.2	0.3	17:46	0.0	0.5	18:52	1.9	2.0
16:39	1.1	0.3	17:47	0.0	0.5	18:53	0.9	1.9
16:40	1.2	0.4	17:48	1.4	0.6	18:54	0.7	1.7
16:41	1.0	0.5	17:49	0.0	0.5	18:55	0.7	1.6
16:42	1.0	0.6	17:50	0.0	0.5	18:56	0.8	1.4
16:43	0.7	0.6	17:51	3.6	0.7	18:57	0.5	1.3
16:44	0.8	0.7	17:52	0.1	0.7	18:58	0.1	1.1
16:45	0.4	0.8	17:53	0.6	0.6	18:59	0.2	0.9
16:46	0.3	0.8	17:54	0.0	0.6	19:00	0.0	0.7
16:47	0.3	0.8	17:55	0.2	0.6	19:01	0.1	0.6
16:48	1.9	0.9	17:56	0.2	0.6	19:02	0.0	0.4
16:49	0.8	0.8	17:57	0.2	0.6	19:03	0.0	0.3
16:50	0.4	0.8	17:58	0.0	0.5	19:04	0.1	0.2
16:51	0.2	0.7	17:59	0.0	0.5	19:05	0.0	0.2
16:52	0.3	0.6	18:00	0.5	0.5	19:06	0.6	0.2
16:53	0.1	0.5	18:01	0.0	0.2	19:07	0.0	0.1
16:54	0.1	0.5	18:02	0.0	0.2	19:08	0.2	0.1
16:55	0.2	0.5	18:03	0.8	0.2	19:09	0.0	0.1
16:56	0.3	0.5	18:04	0.1	0.2	19:10	0.0	0.1
16:57	0.1	0.4	18:05	0.0	0.2	19:11	0.0	0.1
16:58	0.1	0.3	18:06	0.0	0.2	19:12	0.0	0.1
16:59	0.0	0.2	18:07	0.0	0.1	19:13	0.0	0.1
17:00	0.0	0.1	18:08	0.2	0.2	19:14	0.0	0.1
Min	0.0	0.1	Min	0.0	0.0	Min	0.0	0.1
Max	6.5	4.7	Max	3.6	0.8	Max	5.1	2.8
Avg	1.1	1.2	Avg	0.4	0.4	Avg	1.4	1.5

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 Quench Inlet
May 29, 2018

	Test No. 1		Test No. 2		Test No. 3	
	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry
08:45	0.7		1.0		0.2	
08:46	0.9		1.6		0.1	
08:47	1.3		0.9		1.5	
08:48	0.9		0.2		0.2	
08:49	1.4		0.0		1.8	
08:50	1.1		2.8		1.5	
08:51	1.1		0.0		1.8	
08:52	1.1		1.7		2.3	
08:53	1.4		0.9		0.2	
08:54	1.3	1.1	0.0	0.9	0.9	1.0
08:55	1.8	1.2	0.2	0.8	0.6	1.1
08:56	1.4	1.3	0.0	0.7	0.8	1.1
08:57	1.1	1.3	0.0	0.6	2.1	1.2
08:58	0.9	1.3	0.0	0.6	0.9	1.3
08:59	0.9	1.2	0.5	0.6	2.3	1.3
09:00	1.0	1.2	0.0	0.3	0.3	1.2
09:01	0.7	1.2	0.0	0.3	2.0	1.2
09:02	1.4	1.2	1.8	0.3	1.8	1.2
09:03	1.0	1.1	4.1	0.7	0.9	1.3
09:04	0.7	1.1	2.6	0.9	0.8	1.3
09:05	0.6	1.0	2.5	1.1	0.5	1.2
09:06	0.9	0.9	2.5	1.4	0.0	1.2
09:07	0.0	0.8	1.8	1.6	0.4	1.0
09:08	0.0	0.7	2.2	1.8	0.2	0.9
09:09	0.4	0.7	2.6	2.0	0.3	0.7
09:10	0.1	0.6	1.3	2.1	0.5	0.7
09:11	0.3	0.5	0.9	2.2	0.8	0.6
09:12	0.2	0.4	1.0	2.1	1.3	0.6
09:13	0.5	0.4	0.8	1.8	0.7	0.6
09:14	0.4	0.3	1.2	1.7	2.3	0.7
09:15	0.3	0.3	0.7	1.5	0.0	0.7
09:16	0.6	0.3	0.4	1.3	0.8	0.7
09:17	0.4	0.3	1.2	1.2	0.0	0.7
09:18	0.3	0.3	0.0	1.0	0.5	0.7
09:19	0.2	0.3	0.0	0.7	1.0	0.8
09:20	0.5	0.4	0.1	0.6	0.9	0.8
09:21	0.2	0.3	1.4	0.7	2.0	0.9
09:22	0.6	0.4	1.1	0.7	2.1	1.0
09:23	0.1	0.4	1.0	0.7	0.7	1.0
09:24	0.8	0.4	1.5	0.7	0.4	0.8
09:25	0.0	0.4	0.5	0.7	1.2	0.9
09:26	0.2	0.3	0.0	0.7	0.0	0.9
09:27	0.7	0.4	0.9	0.7	1.4	1.0
09:28	0.0	0.3	1.2	0.8	0.3	1.0
09:29	0.3	0.3	0.6	0.8	0.6	0.9
09:30	0.6	0.3	0.7	0.9	0.4	0.9
09:31	0.3	0.4	0.5	0.8	0.6	0.8
09:32	1.0	0.4	0.8	0.8	0.4	0.6
09:33	0.0	0.4	0.3	0.7	0.7	0.6
09:34	0.0	0.3	0.9	0.6	0.5	0.6
09:35	0.1	0.3	0.9	0.7	1.0	0.6
09:36	0.5	0.4	0.4	0.7	1.7	0.8
09:37	0.0	0.3	0.0	0.6	0.0	0.6
09:38	1.3	0.4	0.0	0.5	0.0	0.6
09:39	0.0	0.4	0.1	0.5	0.6	0.6
09:40	0.0	0.3	0.3	0.4	0.6	0.6
09:41	0.6	0.4	0.3	0.4	0.1	0.6
09:42	0.6	0.3	0.6	0.4	0.2	0.5
09:43	0.0	0.3	1.6	0.5	0.4	0.5
09:44	0.2	0.3	1.6	0.6	0.9	0.5
09:45	0.1	0.3	1.1	0.6	0.1	0.5
Min	0.0	0.3	0.0	0.3	0.0	0.5
Max	1.8	1.3	4.1	2.2	2.3	1.3
Avg	0.6	0.6	0.9	0.9	0.8	0.8

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 Quench Inlet
May 29, 2018

	Test No. 1		Test No. 2		Test No. 3	
	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry
08:45	1.8		09:56	0.0	11:09	1.3	
08:46	3.7		09:57	0.0	11:10	1.3	
08:47	2.4		09:58	0.0	11:11	0.3	
08:48	2.5		09:59	0.0	11:12	0.4	
08:49	1.6		10:00	0.8	11:13	0.0	
08:50	1.8		10:01	0.3	11:14	0.1	
08:51	0.4		10:02	0.2	11:15	0.0	
08:52	0.4		10:03	1.1	11:16	0.0	
08:53	0.0		10:04	0.5	11:17	0.0	
08:54	0.1	1.5	10:05	0.1	0.3	11:18	0.0	0.3
08:55	0.0	1.3	10:06	1.0	0.4	11:19	0.0	0.2
08:56	0.0	0.9	10:07	0.5	0.4	11:20	0.0	0.1
08:57	0.0	0.7	10:08	0.7	0.5	11:21	0.0	0.0
08:58	0.0	0.4	10:09	0.6	0.6	11:22	2.3	0.2
08:59	0.0	0.3	10:10	1.4	0.6	11:23	0.0	0.2
09:00	0.0	0.1	10:11	0.6	0.7	11:24	0.0	0.2
09:01	0.0	0.0	10:12	0.6	0.7	11:25	0.0	0.2
09:02	0.7	0.1	10:13	1.5	0.7	11:26	0.1	0.2
09:03	2.6	0.3	10:14	2.4	0.9	11:27	0.0	0.2
09:04	0.2	0.3	10:15	1.5	1.1	11:28	0.0	0.2
09:05	0.6	0.4	10:16	0.7	1.0	11:29	0.1	0.2
09:06	0.0	0.4	10:17	1.2	1.1	11:30	2.4	0.5
09:07	0.0	0.4	10:18	0.3	1.1	11:31	0.4	0.5
09:08	0.7	0.5	10:19	0.4	1.0	11:32	1.1	0.4
09:09	0.0	0.5	10:20	1.0	1.0	11:33	2.5	0.7
09:10	0.0	0.5	10:21	0.6	1.0	11:34	4.9	1.2
09:11	0.0	0.5	10:22	0.7	1.0	11:35	3.3	1.5
09:12	3.6	0.8	10:23	1.0	1.0	11:36	1.5	1.6
09:13	0.5	0.6	10:24	1.0	0.8	11:37	2.2	1.8
09:14	0.5	0.6	10:25	0.2	0.7	11:38	2.7	2.1
09:15	0.0	0.5	10:26	0.2	0.7	11:39	1.5	2.3
09:16	0.9	0.6	10:27	0.0	0.5	11:40	5.2	2.5
09:17	0.4	0.7	10:28	0.2	0.5	11:41	1.0	2.6
09:18	8.5	1.4	10:29	0.0	0.5	11:42	5.3	3.0
09:19	0.4	1.5	10:30	0.4	0.4	11:43	2.6	3.0
09:20	1.5	1.6	10:31	0.3	0.4	11:44	2.4	2.8
09:21	0.9	1.7	10:32	1.0	0.4	11:45	5.6	3.0
09:22	0.0	1.4	10:33	1.1	0.4	11:46	2.1	3.1
09:23	1.8	1.5	10:34	0.8	0.4	11:47	4.0	3.2
09:24	0.3	1.5	10:35	2.3	0.6	11:48	3.0	3.3
09:25	0.0	1.5	10:36	1.2	0.7	11:49	4.8	3.6
09:26	0.0	1.4	10:37	1.6	0.9	11:50	1.3	3.2
09:27	2.3	1.6	10:38	1.0	1.0	11:51	2.1	3.3
09:28	0.0	0.7	10:39	1.3	1.1	11:52	1.7	3.0
09:29	0.0	0.7	10:40	0.5	1.1	11:53	2.4	3.0
09:30	0.0	0.5	10:41	0.7	1.2	11:54	2.1	2.9
09:31	0.0	0.4	10:42	0.8	1.1	11:55	1.2	2.5
09:32	0.0	0.5	10:43	0.9	1.1	11:56	1.6	2.4
09:33	0.0	0.3	10:44	0.8	1.1	11:57	7.5	2.8
09:34	0.3	0.3	10:45	1.7	1.1	11:58	3.2	2.8
09:35	4.8	0.7	10:46	0.6	1.0	11:59	2.8	2.6
09:36	0.0	0.7	10:47	0.2	0.9	12:00	3.5	2.8
09:37	0.0	0.5	10:48	0.3	0.8	12:01	2.0	2.8
09:38	2.2	0.7	10:49	0.5	0.7	12:02	4.1	3.1
09:39	0.4	0.8	10:50	5.2	1.2	12:03	1.2	2.9
09:40	1.2	0.9	10:51	3.3	1.4	12:04	3.0	3.0
09:41	0.0	0.9	10:52	1.3	1.5	12:05	0.3	2.9
09:42	0.0	0.9	10:53	1.8	1.6	12:06	0.5	2.8
09:43	0.0	0.9	10:54	2.6	1.8	12:07	2.3	2.3
09:44	0.0	0.9	10:55	1.8	1.8	12:08	1.9	2.2
09:45	0.0	0.4	10:56	1.6	1.9	12:09	0.2	1.9
Min	0.0	0.0	Min	0.0	0.3	Min	0.0	0.0
Max	8.5	1.7	Max	5.2	1.9	Max	7.5	3.6
Avg	0.8	0.8	Avg	0.9	0.9	Avg	1.8	1.9

APPENDIX 27

Dispersion Modelling Results
for the Spring 2018 Testing Program
(17 pages)

TECHNICAL MEMORANDUM

DATE July 16, 2018 **Project No.** 181033225

TO Amanda Huxter
Covanta Durham York Renewable Energy LP

CC Anthony Ciccone

FROM Katie Armstrong **EMAIL ksarmstrong@golder.com**

CALPUFF MODELLING FOR MAY 2018 VOLUNTARY SOURCE TESTING AT DURHAM YORK ENERGY CENTRE

1.0 INTRODUCTION

Covanta Durham York Renewable Energy LP (Covanta) operates the Durham York Energy Centre (DYEC) under the multi-media Environmental Compliance Approval (ECA) 7306-8FDKNX, as amended. The ECA application was supported with an Emission Summary and Dispersion Modelling (ESDM) Report prepared by Golder Associates Ltd (Golder) using the CALPUFF dispersion model version 6.263, with results compared to Ministry of Environment, Conservation and Parks (MOECP) Point of Impingement (POI) standards listed in Schedule 3 of Ontario Regulation (O.Reg.) 419/05 as of 2011.

Condition 7, Testing, Monitoring and Auditing, of the current ECA requires annual source testing be completed at the DYEC for over 100 different contaminants. According to Schedule "E" Source Testing Procedures, of the ECA, a source testing report is required that includes the following:

> *8. (7) the results of dispersion calculations in accordance with the O.Reg. 419/05, indicating the maximum concentration of the test contaminants, at the point of impingement.*
>
> *8. (8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the test contaminants.*

This memorandum summarizes the modelling results for the Voluntary May 2017 source testing program using the same CALPUFF model and other input data sets used in the ESDM Report, however, the results are compared to O.Reg. 419/05 limits last updated April 2018.

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2.0 EMISSION RATES

Voluntary source testing was completed by Ortech Environmental in May 2018 (Sampling dates were May 29, 30, 31 and June 1) for each of the two combustion train units and results were provided to Golder on a mass per time basis. Three tests were completed for each unit and averaged. The average emission rates for each unit were then summed together to provide the total stack emission rate of each contaminant to be modelled. Where source testing results indicated that the measured concentration is below the detection limit, the full detection limit was used as the emission rate for conservatism.

Emission rates for which source testing data was available were converted to grams per second (g/s) and are provided in an updated Site-wide Emission Inventory included in Appendix A. This emission inventory includes emissions from silo filling and diesel generator testing taken from the ESDM report, in addition to source test emissions from the main stack.

In response to clarifications provided by the MOECP of December 9, 2016, two different emission rates were calculated for Total Particulate Matter:

1. Filterable fraction emission rate only; and
2. Total Particulate Matter (Sum of condensable and filterable fractions).

As source testing for the condensable fraction of total particulate matter is not required pursuant to Schedule “D”: of the ECA, the condensable content of PM_{10} was used.

3.0 MODELLING

As part of the ECA application, the MOECP approved the use of the CALPUFF modelling software and CALMET meteorological data to demonstrate compliance with Ontario Regulation 419/05 Schedule 3 standards at the DYEC. As a result, the same modelling approach has been taken for this update. The following models and pre- and post-processors were used in the assessment:

- CALMET diagnostic meteorological model (v. 5.8, level 070623);
- CALPUFF dispersion model (v. 6.263, level 080827);
- CALPOST post processor (v. 6.221, Level 080724);
- BPIP building downwash pre-processor (v. 04274);
- POSTUTIL post processor (v.1.64, Level 101025).

These model versions are consistent with those used in the original ESDM report. Dispersion Modelling inputs are described in the following subsections.

3.1 Model Domain

The CALPUFF Model domain used in this assessment is the same as the domain used in the previous Environmental Assessment (EA) and ESDM Report. It extends 40 km by 30 Km and is centred approximately 5 km north of the Site. This domain covers more than the air quality study area but will ensure that plumes are tracked beyond the furthest receptor locations to ensure the worst-case ground level concentrations are considered at all receptors.

3.2 Meteorology, Land Use and Terrain Data

The meteorology and terrain data used in this assessment is the same as the meteorology and terrain data used in the EA and ESDM Report.

3.3 Receptors

The receptors used in this assessment are the same as the receptors used in the ESDM Report. They include gridded ground level receptors to meet the requirements of O.Reg. 419/05 in addition to 400 discrete receptors to represent locations of interest. They include hospitals, nursing homes, schools, daycares, Senior citizen centres, the nearest residential receptors, specific watersheds and water bodies and parks.

3.4 Building Downwash

The buildings used in this assessment to represent building downwash are the same as the buildings used in the ESDM Report. Building wake effects were considered in this assessment using the U.S. EPA's Building Profile Input Program (BPIP-ISC). The inputs into this pre-processor include the coordinates and heights of the buildings and stacks. The output data from BPIP is used in the building wake effect calculations. No changes were made to the BPIP input or output file for this assessment.

3.5 Deposition

CALPUFF has the capability to account for wet and dry deposition of substances that would reduce ground level concentrations at POIs. However, the deposition algorithm has not been implemented for conservatism and to maintain consistency with the ESDM report and previous EA for maximum POI predictions.

3.6 Thermal Internal Boundary Layer

CALPUFF contains an option to account for sub-grid coastal influences on plume dispersion such as the development of a thermal internal boundary layer (TIBL). Given the proximity of the proposed Facility to Lake Ontario (approximately 500m) and the grid size (250m), variations in coastline location within the grid cells near the proposed facility were accounted for in the dispersion modelling. To achieve this, a digitized sub-grid coastline, extending to the boundaries of the air quality study area was included as an additional input. This is consistent with the approach used in the ESDM report.

3.7 Averaging Times and Conversions

CALPUFF can predict 1-hour average values. Many of the relevant Schedule 3 standards are based on a 24-hour averaging time, which is also provided by CALPUFF. Several of the modelled contaminants have averaging periods less than 1 hour. For these contaminants, the 1 hour average concentration was converted using the conversion factors listed in Table 4-1 of Air Dispersion Modelling Guidance for Ontario (ADMGO). For example, the hourly concentrations can be converted to a 10-min average by multiplying the hour value by 1.65. This is consistent with the approach used in the ESDM report.

In 2016, a number of O.Reg 419/05 standards were updated or modified to include Point of Impingement (POI) limits based on an annual averaging period. CALPUFF can predict annual average values, therefore the CALPOST input file was modified to provide this output in addition to outputs for the 1 hour, 24 hour and 30 day averaging periods already provided.

3.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary Particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling of particulate matter. To model the chemical transformation of emitted NO, NO_2 and SO_2 into HNO_3, NO_3 and SO_4, CALPUFFs RIVAD/ARM3 mechanism was used. The flag MCHEM is set to 1 for model runs used to produce concentrations of particulate matter. This setting requires the input of monthly background ozone concentrations. The monthly background ozone data used in the modelling of secondary particulate matter is consistent with that used in the EA and is summarised below in Table 1.

Table 1: Background Ozone Concentrations used for Chemical Transformation Modelling

Month	Ozone Concentrations (ppb)
January	13.70
February	18.50
March	24.22
April	11.09
May	32.29
June	33.63
July	16.32
August	21.33
September	12.63
October	15.39
November	17.10
December	20.91

Chemical transformations were only modelled to calculate additional concentrations of particulate matter that is created as part of secondary transformations. Reported concentrations of NO_2 and SO_2 do not include the effects of depletion due to chemical transformation. The flag MCHEM is set to 0 for model runs used to produce concentrations of all other contaminants. This is consistent with the approach used in the ESDM report

3.9 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are summarized in the Table2. The model options used are consistent with those used in the ESDM report. In the ESDM report, Exhibit 9 indicated that Puff splitting was used, however this was a typographical error and this option was not actually used in the modelling. To maintain consistency with the ESDM report, puff splitting was not modelled for this assessment.

Table 2: CALPUFF Options and Flags

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MGAUSS	1	1	Vertical distribution used in the near field
MCTADJ	3	3	Terrain adjustment method (3 used for partial plume path adjustment)
MCTSG	0	0	Subgrid-Scale complex terrain flag
MSLUG	0	0	Near-field puffs modelled as elongated
MTRANS	1	1	Transitional Plume Rise modelled
MTIP	1	1	Stack-tip downwash
MBDW	2	2	Method used to simulate building downwash 1 = ISC method; 2 = PRIME method
MSHEAR	0	0	Vertical wind shear modelled above stack top
MSPLIT	0*	0	Puff splitting allowed 0 = No; 1 = Yes ** NB: Value of "1" reported in ESDM Report but value of "0" actually used in ESDM Report modelling*
MCHEM	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	Chemical Transformation Scheme 0 = chemical transformation not modeled 1 = transformation rates computed internally (MESOPUFF II scheme)
MAQCHEM	0	0	Aqueous phase transformation flag (only used if MCHEM =1 or 3)
MWET	0	0	Wet removal modelled 0 = NO; 1 = Yes
MDRY	0	0	Dry deposition modelled 0 = NO; 1 = Yes
MTILT	0	0	Gravitational settling (plume tilt) modelled
MDISP	2	2	Methods used to compute dispersion coefficients 2 = (dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.)

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MTURBVW	3	3	Sigma measurements used (Used only if MDISP = 1or 5)
MDISP2	3	3	Back-up method used to compute dispersion when measured turbulence data are missing (Used only if MDISP=1 or 5)
MTAULY	0	0	Method used for Lagrangian timescale for Sigma-y (used only if MDISP=1,2 or MSIDP2=1,2)
MTAUADV	0	0	Method used for Advective-Decay timescale for Turbulence (used only if MDISP=2 or MDISP2=2)
MCTURB	1	1	Method used to compute turbulence sigma-v & sigma-w using micrometeorological variables (Used only if MDISP = 2 or MDISP2 = 2)
MROUGH	0	0	PG sigma y,z adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion
MTINV	0	0	Strength of temp inversion provided in PROFILE.DAT extended records
MPDF	1	1	Probability Distribution Function used for dispersion under convective conditions 0 = NO; 1 = Yes
MSGTIBL	1	1	Sub-grid TIBL module used for shore line
MBCON	0	0	Boundary conditions (concentration) modeled
MFOG	0	0	Configure for FOG Model output
MREG	0	0	Test options specified to see if they conform to regulatory values

3.10 Source Parameters

Stack Exhaust temperature and flow rate were updated to match the stack characteristics at the time of source testing. All other source parameters are consistent with those used in the ESDM Report. The source parameters modelled are provided in Table 3, below:

Table 3: Modelled Source Parameters

Source ID	Stack Height [m]	Stack Diameter [m]	Exit velocity [m/s]	Exhaust Temperature [K]
STCK1	87.6 (No Change)	1.7 (No Change)	21.88 (UPDATED)	413.7 (UPDATED)

The ESDM Report includes an additional modelling scenario which include 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.

4.0 MODELLING RESULTS

Modelling was completed for emissions from the main stack only, using a unit emission rate to generate dispersion factors in µg/m³ per g/s for 10-minute, ½ - hour, 1 hour, 24 hour, 30 day and annual averaging periods. The resulting dispersion factors are presented in Table 4, below:

Table 4: Modelling Dispersion Factors

Averaging Period	10-min	½- hr	1-hr	24-hr	30-day	Annual
Dispersion Factor [µg/m³ per g/s]	32.94	23.96	19.97	1.03	0.12	0.03

The average emission rate for each contaminant presented in Appendix A was multiplied by the applicable dispersion factor above to calculate the maximum point of impingement concentration for emissions from the main stack. The modelled POI concentrations were compared to the Schedule 3 standards listed in O.Reg. 419/05 and in the case of $PM_{2.5}$ and PM_{10}, the MOECP AAQC.

The MOECP has recently updated the list of standards and guidelines for facilities to assess their emissions against, namely the Air Contaminants Benchmark (ACB) List, dated April 2018, which includes standards and guidelines (Benchmark 1) and screening levels (Benchmark 2). The ACB List is required to be used to assess point of impingement (POI) concentrations of contaminants released into the air.

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are considered to be 'Contaminants with No MOECP POI Limits'. Where applicable, predicted POI concentrations of Contaminants with No MOECP POI Limits were screened against the Benchmark 2 screening levels in the ACB List or the de minimus limit.

The modelled concentrations of all compounds assessed were below their relevant MOECP standards. The Emission Summary Table has been updated and is included in Appendix B. It has been modified to include reference to the new ACB List and to meet the requirements of the updated MOECP guidance document "Procedure for preparing an Emission Summary and Dispersion Modelling Report" (PIBs 3614e04.1, March 2018).

The contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 21% of the relevant limit.

5.0 SUMMARY OF MODELLING UPDATES

The dispersion modelling for the DYEC was updated to reflect data obtained from Voluntary May 2017 source testing. A summary of the changes made to the modelling are provided in Table 5, below.

Table 5: ECA Concordance Table

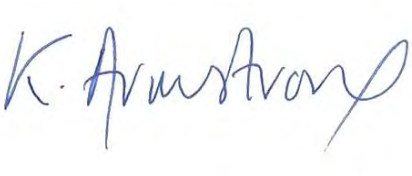
Modelling Inputs	Changes from ESDM Report
Emission Rates	Updated to use May 2018 Source Testing Data. List of contaminants assessed expanded to include all contaminants for which source testing data was performed.
Model and Model Version	No Change
Meteorology and Terrain data	No Change
Receptors	No Change
Building Downwash	No Change
Deposition	No Change
Chemical Transformations	No Change
Thermal Internal Boundary Layer	No Change
Averaging Times and Conversions	CALPOST input file was modified to generate annual averaging to account for new O.Reg. 419/05 standards introduced in 2016 that include annual averaging periods.
Dispersion Modelling Options	No Change
Background Air Quality Concentrations	Ozone background data used in secondary particulate modelling updated to match EA.
Emission Summary Table	Updated to include new O.Reg. 419/05 standards introduced after the ECA was approved and contaminants that were not included in the ESDM report but for which source testing data was available.

6.0 CONCLUSIONS

This assessment was completed to document compliance with Condition 8(7) and 8(8) of Schedule E of the ECA for the DYEC. The results of this assessment demonstrate that the Facility is operating in compliance with the POI limits listed in s.20 of O. Reg. 419/05.

7.0 CLOSURE

We trust this memorandum meets your needs at this time. Should you have any questions please contact the undersigned.





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https://golderassociates.sharepoint.com/sites/28322g/deliverables/may st/final/18103322-tm-rev0 17july2018 covanta updated modelling memo.docx

APPENDIX A

Site-Wide Emission Inventory

Appendix A
Site-Wide Emission Inventory

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - May 2018 Source Testing Conditions	49.66	141	1.7	87.6	(680538, 4860346)	1 – methylnaphthalene	90-12-0	7.84E-07	1,24, annual	ST	Above-Average	100%
							1,1,2-Trichloroethane	79-00-5	1.46E-05	1,24, annual	ST	Above-Average	100%
							1,2,3,4-tetrachlorobenzene	634-66-2	6.73E-08	1,24, annual	ST	Above-Average	100%
							1,2,3-trichlorobenzene	87-61-6	1.49E-07	1,24, annual	ST	Above-Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	4.23E-07	1,24, annual	ST	Above-Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.17E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichlorobenzene	95-50-1	9.90E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichloroethane	107-06-2	1.49E-05	1,24, annual	ST	Above-Average	100%
							1,2-Dichloropropane	78-87-5	1.44E-05	1,24, annual	ST	Above-Average	100%
							1,3,5-trichlorobenzene	108-70-3	1.75E-07	1,24, annual	ST	Above-Average	100%
							1,3-Butadiene	106-99-0	1.44E-05	1,24, annual	ST	Above-Average	100%
							1,3-Dichlorobenzene	541-73-1	1.68E-06	1,24, annual	ST	Above-Average	100%
							1,4-Dichlorobenzene	106-46-7	1.15E-06	1,24, annual	ST	Above-Average	100%
							1-Methylphenanthrene	832-69-9	1.99E-07	1,24, annual	ST	Above-Average	100%
							2 – methylnaphthalene	91-57-6	7.05E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,5-tetrachlorophenol	4901-51-3	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3,4-trichlorophenol	15950-66-0	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3,5,6-tetrachlorophenol	935-95-5	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3,5-trichlorophenol	933-78-8	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3,6-trichlorophenol	933-75-5	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,3-dichlorophenol	576-24-9	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,4,5-trichlorophenol	95-95-4	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,4,6-Trichlorophenol	88-06-2	6.73E-07	1,24, annual	ST	Above-Average	100%
							2,4-Dichlorophenol	120-83-2	7.03E-07	1,24, annual	ST	Above-Average	100%
							2,6-dichlorophenol	87-65-0	6.73E-07	1,24, annual	ST	Above-Average	100%
							2-Butanone	78-93-3	4.52E-05	1,24, annual	ST	Above-Average	100%
							2-Chloronaphthalene	91-58-7	6.73E-08	1,24, annual	ST	Above-Average	100%
							2-Methylanthracene	613-12-7	2.28E-07	1,24, annual	ST	Above-Average	100%
							2-monochlorophenol	95-57-8	7.10E-07	1,24, annual	ST	Above-Average	100%
							3,4,5-trichlorophenol	609-19-8	6.73E-07	1,24, annual	ST	Above-Average	100%
							3,4-dichlorophenol	95-77-2	6.73E-07	1,24, annual	ST	Above-Average	100%
							3,5-dichlorophenol	591-35-5	6.73E-07	1,24, annual	ST	Above-Average	100%
							3-Methylchloranthene	56-49-5	3.36E-07	1,24, annual	ST	Above-Average	100%
							3-monochlorophenol	108-43-0	6.91E-07	1,24, annual	ST	Above-Average	100%
							4-monochlorophenol	106-48-9	6.73E-07	1,24, annual	ST	Above-Average	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	6.73E-08	1,24, annual	ST	Above-Average	100%
							9,10-Dimethylanthracene	781-43-1	6.73E-08	1,24, annual	ST	Above-Average	100%
							9-Methylphenanthrene	883-20-5	1.63E-07	1,24, annual	ST	Above-Average	100%
							Acenaphthene	83-32-9	1.43E-07	1,24, annual	ST	Above-Average	9%
							Acenaphthylene	208-96-8	1.56E-07	1,24, annual	ST	Above-Average	5%
							Acetaldehyde	75-07-0	2.40E-03	1,24, annual	ST	Above-Average	100%
							Acetone	67-64-1	2.66E-04	1,24, annual	ST	Above-Average	100%
							Acrolein	107-02-8	1.20E-02	1,24, annual	ST	Above-Average	100%
							Ammonia	7664-41-7	2.48E-02	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Anthracene	120-12-7	1.05E-07	1,24, annual	ST	Above-Average	21%
							Antimony	7440-36-0	3.19E-06	1,24, annual	ST	Above-Average	100%
							Arsenic	7440-38-2	1.74E-06	1,24, annual	ST	Above-Average	100%
							Barium	7440-39-3	9.91E-05	1,24, annual	ST	Above-Average	100%
							Benzene	71-43-2	1.63E-04	1,24, annual	ST	Above-Average	39%
							Benzo(a)anthracene	56-55-3	6.73E-08	1,24, annual	ST	Above-Average	25%
							Benzo(a)fluorene	238-84-6	6.73E-08	1,24, annual	ST	Above-Average	100%
							Benzo(a)pyrene	50-32-8	6.73E-08	1,24, annual	ST	Above-Average	44%
							Benzo(b)fluoranthene	205-99-2	7.70E-08	1,24, annual	ST	Above-Average	17%
							Benzo(b)fluorene	243-17-4	6.73E-08	1,24, annual	ST	Above-Average	100%
							Benzo(e)pyrene	192-97-2	2.31E-07	1,24, annual	ST	Above-Average	100%
							Benzo(g,h,i)perylene	191-24-2	9.56E-07	1,24, annual	ST	Above-Average	100%
							Benzo(k)fluoranthene	207-08-9	8.25E-08	1,24, annual	ST	Above-Average	54%
							Beryllium	7440-41-7	1.71E-06	1,24, annual	ST	Above-Average	100%
							Biphenyl	92-51-3	4.28E-07	1,24, annual	ST	Above-Average	100%
							Bromodichloromethane	75-27-4	1.53E-05	1,24, annual	ST	Above-Average	100%
							Bromoform	75-25-2	1.44E-05	1,24, annual	ST	Above-Average	100%
							Bromomethane	74-83-9	1.30E-04	1,24, annual	ST	Above-Average	100%
							Cadmium	7440-43-9	4.69E-06	1,24, annual	ST	Above-Average	100%
							Carbon Monoxide	630-08-0	6.24E-01	1,24, annual	ST	Above-Average	71%
							Carbon tetrachloride	56-23-5	1.89E-05	1,24, annual	ST	Above-Average	100%
							Chlorobenzene	108-90-7	1.38E-05	1,24, annual	ST	Above-Average	100%
							Chloroform	67-66-3	2.60E-05	1,24, annual	ST	Above-Average	100%
							Chromium (hexavalent)	18540-29-9	6.98E-05	1,24, annual	ST	Above-Average	100%
							Chrysene	218-01-9	7.80E-08	1,24, annual	ST	Above-Average	13%
							Cobalt	7440-48-4	6.34E-06	1,24, annual	ST	Above-Average	100%
							Copper	7440-50-8	4.80E-05	1,24, annual	ST	Above-Average	100%
							Coronene	191-07-1	1.02E-06	1,24, annual	ST	Above-Average	100%
							Cumene (Isopropylbenzene)	98-82-8	2.88E-05	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,c)anthracene	215-58-7	7.46E-08	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,e)pyrene	192-65-4	3.36E-07	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,h)anthracene	53-70-3	7.46E-08	1,24, annual	ST	Above-Average	40%
							Dibromochloromethane	124-48-1	1.44E-05	1,24, annual	ST	Above-Average	100%
							Dichlorodifluoromethane	75-71-8	1.14E-04	1,24, annual	ST	Above-Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.50E-05	1,24, annual	ST	Above-Average	100%
							Dichloromethane	75-09-2	1.09E-03	1,24, annual	ST	Above-Average	100%
							Dioxins, Furans and Dioxin- like PCBs	N/A	0.0004 µg TEQ/s	1,24, annual	ST	Above-Average	100%
							Ethylbenzene	100-41-4	1.85E-05	1,24, annual	ST	Above-Average	100%
							Ethylene Dibromide	106-93-4	2.88E-05	1,24, annual	ST	Above-Average	100%
							Fluoranthene	206-44-0	2.93E-07	1,24, annual	ST	Above-Average	18%
							Fluorides	7664-39-3	3.90E-03	1,24, annual	ST	Above-Average	100%
							Fluorine	86-73-7	3.26E-07	1,24, annual	ST	Above-Average	100%
							Formaldehyde	50-00-0	9.11E-03	1,24, annual	ST	Above-Average	100%
							Hexachlorobenzene	118-74-1	1.06E-07	1,24, annual	ST	Above-Average	100%
							Hydrogen Chloride	7647-01-0	1.54E-01	1,24, annual	ST	Above-Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.61E-07	1,24, annual	ST	Above-Average	54%
							Lead	7439-92-1	1.38E-05	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							M&P-Xylene	179601-23-1	6.49E-05	1,24, annual	ST	Above-Average	100%
							Mercury	7439-97-6	1.83E-05	1,24, annual	ST	Above-Average	100%
							Mesitylene (1,3,5-Trimethylbenzene)	108-67-8	4.58E-05	1,24, annual	ST	Above-Average	100%
							Molybdenum	7439-98-7	1.99E-04	1,24, annual	ST	Above-Average	100%
							m-Terphenyl	92-06-8	9.67E-08	1,24, annual	ST	Above-Average	100%
							Naphthalene	91-20-3	4.10E-06	1,24, annual	ST	Above-Average	9%
							Nickel	7440-02-0	2.02E-04	1,24, annual	ST	Above-Average	100%
							Nitrogen Oxides	10102-44-0	4.12E+00	1,24, annual	ST	Above-Average	44%
							Nitrogen Oxides	10102-44-0	4.12E+00	1,24, annual	ST	Above-Average	44%
							O-terphenyl	84-15-1	9.60E-08	1,24, annual	ST	Above-Average	100%
							O-Xylene	95-47-6	2.22E-05	1,24, annual	ST	Above-Average	100%
							Pentachlorobenzene	608-93-5	7.97E-08	1,24, annual	ST	Above-Average	100%
							Pentachlorophenol	87-86-5	6.73E-07	1,24, annual	ST	Above-Average	100%
							Perylene	198-55-0	6.73E-08	1,24, annual	ST	Above-Average	100%
							Phenanthrene	85-01-8	1.30E-06	1,24, annual	ST	Above-Average	9%
							Picene	213-46-7	3.36E-07	1,24, annual	ST	Above-Average	100%
							PM10 (Condensable and Filterable)	N/A	1.63E-01	1,24, annual	ST	Above-Average	100%
							PM10 (Filterable Only)	N/A	1.14E-02	1,24, annual	ST	Above-Average	100%
							PM2.5 (Condensable and Filterable)	N/A	1.60E-01	1,24, annual	ST	Above-Average	100%
							PM2.5 (Filterable Only)	N/A	8.01E-03	1,24, annual	ST	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	3.40E-10	1,24, annual	ST	Above-Average	100%
							p-Terphenyl	92-94-4	7.76E-08	1,24, annual	ST	Above-Average	100%
							Pyrene	129-00-0	4.30E-07	1,24, annual	ST	Above-Average	26%
							Selenium	7782-49-2	8.53E-06	1,24, annual	ST	Above-Average	100%
							Silver	7440-22-4	2.90E-06	1,24, annual	ST	Above-Average	100%
							Styrene	100-42-5	3.25E-05	1,24, annual	ST	Above-Average	100%
							Sulphur Dioxide	7446-09-5	7.50E-04	1,24, annual	ST	Above-Average	4%
							Tetrachloroethene	127-18-4	5.62E-05	1,24, annual	ST	Above-Average	100%
							Tetralin	119-64-2	2.01E-06	1,24, annual	ST	Above-Average	100%
							Thallium	7440-28-0	1.71E-06	1,24, annual	ST	Above-Average	100%
							Toluene	108-88-3	3.60E-04	1,24, annual	ST	Above-Average	80%
							Total Chromium (and compounds)	7440-47-3	6.98E-05	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Condensable and Filterable)	N/A	1.90E-01	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Filterable Only)	N/A	3.83E-02	1,24, annual	ST	Above-Average	100%
							trans,1,2-Dichloroethene	156-60-5	1.81E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	1.44E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethene	86-42-0	1.46E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	5.62E-05	1,24, annual	ST	Above-Average	100%
							Trichlorofluoromethane	75-69-4	2.98E-05	1,24, annual	ST	Above-Average	100%
							Trichlorotrifluoroethane	76-13-1	1.44E-05	1,24, annual	ST	Above-Average	100%
							Triphenylene	217-59-4	7.80E-08	1,24, annual	ST	Above-Average	100%
							Vanadium	7440-62-2	2.07E-06	1,24, annual	ST	Above-Average	100%
							Vinyl chloride	75-01-4	2.88E-05	1,24, annual	ST	Above-Average	100%
							Xylenes, m-, p- and o-	1330-20-7	8.71E-05	1,24, annual	ST	Above-Average	58%
							Zinc	7440-66-6	2.62E-04	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
2	Silo Filling	0.31	Ambient	0.10	5.4864	(680551,4860359)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	4.8768	(680513,4860332)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	3.9624	(680517,4860333)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	12.4	(680537,4860391)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
3	Stand-by generator	1.16	265.85	0.2	3	(680475,4860419)	Carbon Monoxide	630-08-0	2.56E-01	½	EF	Marginal	29%
							Nitrogen Oxides	10102-44-0	1.12E+00	½	EF	Marginal	12%
							Sulphur Dioxide	7446-09-5	1.88E-02	½	EF	Above-Average	96%
							Total Particulate Matter	N/A	3.25E-02	½	EF	Above-Average	43%
							Filterable TSP	N/A	2.03E-02	½	EF	Above-Average	100%
							PM_{10}	N/A	1.88E-02	½	EF	Above-Average	30%
							$PM_{2.5}$	N/A	1.88E-02	½	EF	Above-Average	30%
							Sulphuric Acid	7664-93-9	2.88E-04	½	EC	Above-Average	100%
							Benzene	71-43-2	2.54E-04	½	EF	Marginal	61%
							Toluene	108-88-3	9.21E-05	½	EF	Marginal	20%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	½	EF	Marginal	42%
							Propylene	115-07-1	9.14E-04	½	EF	Marginal	100%
							Formaldehyde	50-00-0	2.58E-05	½	EF	Marginal	<1%
							Acetaldehyde	75-07-0	8.26E-06	½	EF	Marginal	<1%
							Acrolein	107-02-8	2.58E-06	½	EF	Marginal	<1%
							Naphthalene	91-20-3	4.26E-05	½	EF	Marginal	91%
							Acenaphthylene	208-96-8	3.02E-06	½	EF	Marginal	95%
							Acenaphthene	83-32-9	1.53E-06	½	EF	Marginal	91%
							Fluorene	86-73-7	4.19E-06	½	EF	Marginal	100%
							Phenanthrene	85-01-8	1.34E-05	½	EF	Marginal	91%
							Anthracene	120-12-7	4.03E-07	½	EF	Marginal	79%
							Fluoranthene	206-44-0	1.32E-06	½	EF	Marginal	82%
							Pyrene	129-00-0	1.22E-06	½	EF	Marginal	74%
							Benzo(a)anthracene	56-55-3	2.04E-07	½	EF	Marginal	75%
							Chrysene	218-01-9	5.01E-07	½	EF	Marginal	87%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	½	EF	Marginal	83%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	½	EF	Marginal	46%
							Benzo(a)pyrene	50-32-8	8.42E-08	½	EF	Marginal	56%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	½	EF	Marginal	46%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	½	EF	Marginal	60%
							Benzo(ghi)perylene	191-24-2	1.82E-07	½	EF	Marginal	100%

APPENDIX B

Emission Summary Table

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MOECC POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MOECC Limit [%]	Notes	Version of Date of ACB List
1 – methylnaphthalene	90-12-0	7.84E-07	Calpuff	8.09E-07	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2,4 – Trichlorobenzene	120-82-1	4.23E-07	Calpuff	4.37E-07	24-hour	400	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
1,2,4,5-Tetrachlorobenzene	95-94-3	1.17E-07	Calpuff	1.21E-07	24-hour	1	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2-Dichlorobenzene	95-50-1	9.90E-07	Calpuff	1.98E-05	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
2 – methylnaphthalene	91-57-6	7.05E-07	Calpuff	7.29E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
2,3,4,6-Tetrachlorophenol	58-90-2	6.73E-07	Calpuff	6.95E-07	24-hour	0.75	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4,6-Trichlorophenol	88-06-2	6.73E-07	Calpuff	6.95E-07	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4-Dichlorophenol	120-83-2	7.03E-07	Calpuff	7.26E-07	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
3-Methylchloranthene	56-49-5	3.36E-07	Calpuff	3.47E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
7,12-Dimethylbenz(a)anthracene	57-97-6	6.73E-08	Calpuff	6.95E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
Acenaphthene	83-32-9	1.43E-07	Calpuff	1.47E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acenaphthylene	208-96-8	1.56E-07	Calpuff	1.61E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acetaldehyde	75-07-0	2.40E-03	Calpuff	2.48E-03	24-hour	500	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Acetaldehyde	75-07-0	2.40E-03	Calpuff	2.48E-03	24-hour	5000	—	Sch. 6	URT	—	<1%	—	
Acrolein	107-02-8	1.20E-02	Calpuff	1.24E-02	24-hour	0.4	Health	Sch. 3	Standard	B1	3%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	1.20E-02	Calpuff	2.39E-01	1-hour	4.5	Health	Sch. 3	Standard	B1	5%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	1.20E-02	Calpuff	1.24E-02	24-hour	4	Health	Sch. 6	URT	—	<1%	—	Apr-18
Ammonia	7664-41-7	2.48E-02	Calpuff	2.56E-02	24-hour	100	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Ammonia	7664-41-7	2.48E-02	Calpuff	2.56E-02	24-hour	1000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Anthracene	120-12-7	1.05E-07	Calpuff	1.08E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Antimony	7440-36-0	3.19E-06	Calpuff	3.29E-06	24-hour	25	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Arsenic	7440-38-2	1.74E-06	Calpuff	1.79E-06	24-hour	0.3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Barium	7440-39-3	9.91E-05	Calpuff	1.02E-04	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Benzene	71-43-2	1.63E-04	Calpuff	5.39E-06	Annual	0.45	Health	Sch. 3	Standard	B1	<1%	Note 19, Table 2, 3 URT - Note 4, Table 4	Apr-18
Benzene	71-43-2	1.63E-04	Calpuff	1.68E-04	24-hour	100	Health	Sch. 6	URT/DAV	B1	<1%	—	
Benzene	71-43-2	1.63E-04	Calpuff	5.39E-06	Annual	4.5	Health	—	AAV	—	<1%	—	Apr-18
Benzo(a)anthracene	56-55-3	6.73E-08	Calpuff	6.95E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)fluorene	238-84-6	6.73E-08	Calpuff	6.95E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)pyrene	50-32-8	6.73E-08	Calpuff	2.23E-09	Annual	0.00001	Health	Sch. 3	Standard	B1	<1%	Note 7, 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Benzo(a)pyrene	50-32-8	6.73E-08	Calpuff	6.95E-08	24-hour	0.005	Health	Sch. 6	URT	—	<1%	—	Apr-18
Benzo(a)pyrene	50-32-8	6.73E-08	Calpuff	2.23E-09	Annual	0.0001	Health	—	AAV	—	<1%	—	Apr-18
Benzo(b)fluoranthene	205-99-2	7.70E-08	Calpuff	7.96E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(b)fluorene	243-17-4	6.73E-08	Calpuff	6.95E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(e)pyrene	192-97-2	2.31E-07	Calpuff	2.38E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(g,h,i)perylene	191-24-2	9.56E-07	Calpuff	9.87E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(k)fluoranthene	207-08-9	8.25E-08	Calpuff	8.52E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Beryllium	7440-41-7	1.71E-06	Calpuff	1.76E-06	24-hour	0.01	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Biphenyl	92-51-3	4.28E-07	Calpuff	4.42E-07	24-hour	175	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromodichloromethane	75-27-4	1.53E-05	Calpuff	1.58E-05	24-hour	350	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromoform	75-25-2	1.44E-05	Calpuff	1.49E-05	24-hour	55	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Bromomethane	74-83-9	1.30E-04	Calpuff	1.34E-04	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Cadmium	7440-43-9	4.69E-06	Calpuff	4.84E-06	24-hour	0.025	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Cadmium	7440-43-9	4.69E-06	Calpuff	4.84E-06	24-hour	0.25	Health	Sch. 6	URT	—	<1%	—	Apr-18
Carbon Monoxide	630-08-0	6.24E-01	Calpuff	1.49E+01	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	Note 9	Apr-18
Carbon tetrachloride	56-23-5	1.89E-05	Calpuff	1.95E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Carbon tetrachloride	56-23-5	1.89E-05	Calpuff	1.95E-05	24-hour	24	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chlorobenzene	108-90-7	1.38E-05	Calpuff	2.75E-04	1-hour	3500	Health	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chlorobenzene	108-90-7	1.38E-05	Calpuff	4.54E-04	10-minute	4500	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chloroform	67-66-3	2.60E-05	Calpuff	2.69E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Chloroform	67-66-3	2.60E-05	Calpuff	2.69E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chromium (hexavalent)	18540-29-9	6.98E-05	Calpuff	2.31E-06	Annual	0.00014	Health	Sch. 3	Standard	B1	2%	Notes 11, 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Chromium (hexavalent)	18540-29-9	6.98E-05	Calpuff	7.21E-05	24-hour	0.07	Health	Sch. 6	URT	—	<1%	—	
Chrysene	218-01-9	7.80E-08	Calpuff	8.06E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Cobalt	7440-48-4	6.34E-06	Calpuff	6.55E-06	24-hour	0.1	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Copper	7440-50-8	4.80E-05	Calpuff	4.96E-05	24-hour	50	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Dibenzo(a,c)anthracene	215-58-7	7.46E-08	Calpuff	7.70E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dibenzo(a,h)anthracene	53-70-3	7.46E-08	Calpuff	7.70E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dichlorodifluoromethane	75-71-8	1.14E-04	Calpuff	1.18E-04	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.50E-05	Calpuff	1.55E-05	24-hour	165	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.50E-05	Calpuff	1.55E-05	24-hour	1650	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dichloromethane	75-09-2	1.09E-03	Calpuff	1.12E-03	24-hour	220	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloromethane	75-09-2	1.09E-03	Calpuff	1.12E-03	24-hour	22000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dioxins, Furans and Dioxin- like PCBs	N/A	0.0004 µg TEQ/s	Calpuff	0.0004 pg TEQ/m³	24-hour	0.1 pg TEQ/m³	Health	Sch. 3	Guideline	B1	<1%	Note 8, 8a, Table 1URT - Note 4, Table 4	Apr-18
Ethylbenzene	100-41-4	1.85E-05	Calpuff	1.91E-05	24-hour	1000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.85E-05	Calpuff	6.10E-04	10-minute	1900	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.85E-05	Calpuff	1.91E-05	24-hour	14000	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MOECC POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MOECC Limit [%]	Notes	Version of Date of ACB List
Ethylene Dibromide	106-93-4	2.88E-05	Calpuff	2.97E-05	24-hour	3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Fluoranthene	206-44-0	2.93E-07	Calpuff	3.03E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.03E-03	24-hour	0.86	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.59E-04	30-day	0.34	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.03E-03	24-hour	1.74	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.59E-04	30-day	0.69	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.03E-03	24-hour	3.44	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.90E-03	Calpuff	4.59E-04	30-day	1.38	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorine	86-73-7	3.26E-07	Calpuff	3.36E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Formaldehyde	50-00-0	9.11E-03	Calpuff	9.41E-03	24-hour	65	Odour & Irritation	Sch. 3	Standard	B1	<1%	—	Apr-18
Hexachlorobenzene	118-74-1	1.06E-07	Calpuff	1.09E-07	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Hydrogen Chloride	7647-01-0	1.54E-01	Calpuff	1.59E-01	24-hour	20	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Hydrogen Chloride	7647-01-0	1.54E-01	Calpuff	1.59E-01	24-hour	200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Indeno(1,2,3 – cd)pyrene	193-39-5	1.61E-07	Calpuff	1.66E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Lead	7439-92-1	1.38E-05	Calpuff	1.42E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	1.38E-05	Calpuff	1.62E-06	30-day	0.2	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	1.38E-05	Calpuff	1.42E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	Note 2URT - Note 4, Table 4	Apr-18
Mercury	7439-97-6	1.83E-05	Calpuff	1.89E-05	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Molybdenum	7439-98-7	1.99E-04	Calpuff	2.06E-04	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Naphthalene	91-20-3	4.10E-06	Calpuff	4.24E-06	24-hour	22.5	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Naphthalene	91-20-3	4.10E-06	Calpuff	1.35E-04	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Nickel	7440-02-0	2.02E-04	Calpuff	6.68E-06	Annual	0.04	Health	Sch. 3	Standard	B1	<1%	Note 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Nickel	7440-02-0	2.02E-04	Calpuff	2.08E-04	24-hour	2	Health	Sch. 6	URT	—	<1%	—	Apr-18
Nickel	7440-02-0	2.02E-04	Calpuff	6.68E-06	Annual	0.4	Health	—	AAV	—	<1%	—	Apr-18
Nitrogen Oxides	10102-44-0	4.12E+00	Calpuff	4.26E+00	24-hour	200	Health	Sch. 3	Standard	B1	2%	Notes 2, 17	Apr-18
Nitrogen Oxides	10102-44-0	4.12E+00	Calpuff	8.23E+01	1-hour	400	Health	Sch. 3	Standard	B1	21%	Notes 2, 17	Apr-18
O-terphenyl	84-15-1	9.60E-08	Calpuff	9.92E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
PM_{10} (Condensable and Filterable)	N/A	1.63E-01	Calpuff	4.07E-01	24-hour	50	—	—	AAQC	—	<1%	—	Apr-18
PM_{10} (Filterable Only)	N/A	1.14E-02	Calpuff	2.51E-01	24-hour	50	—	—	AAQC	—	<1%	—	Apr-18
$PM_{2.5}$ (Condensable and Filterable)	N/A	1.60E-01	Calpuff	4.04E-01	24-hour	30	—	—	AAQC	—	1%	—	Apr-18
$PM_{2.5}$ (Filterable Only)	N/A	8.01E-03	Calpuff	2.47E-01	24-hour	30	—	—	AAQC	—	<1%	—	Apr-18
Pentachlorobenzene	608-93-5	7.97E-08	Calpuff	8.23E-08	24-hour	80	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Pentachlorophenol	87-86-5	6.73E-07	Calpuff	6.95E-07	24-hour	20	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Perylene	198-55-0	6.73E-08	Calpuff	6.95E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Phenanthrene	85-01-8	1.30E-06	Calpuff	1.34E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Pyrene	129-00-0	4.30E-07	Calpuff	4.44E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Selenium	7782-49-2	8.53E-06	Calpuff	8.81E-06	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Silver	7440-22-4	2.90E-06	Calpuff	2.99E-06	24-hour	1	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Sulphur Dioxide	7446-09-5	7.50E-04	Calpuff	7.75E-04	24-hour	275	Health	Sch. 3	Standard	B1	<1%	ffective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Sulphur Dioxide	7446-09-5	7.50E-04	Calpuff	1.50E-02	1-hour	690	Health	Sch. 3	Standard	B1	<1%	ffective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	5.62E-05	Calpuff	5.80E-05	24-hour	360	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	5.62E-05	Calpuff	5.80E-05	24-hour	3600	Health	Sch. 6	URT	—	<1%	—	
Tetralin	119-64-2	2.01E-06	Calpuff	2.08E-06	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Thallium	7440-28-0	1.71E-06	Calpuff	1.76E-06	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Toluene	108-88-3	3.60E-04	Calpuff	3.72E-04	24-hour	2000	Not Applicable	Sch. 3	Guideline	B1	<1%	To be updated - Note 5	Apr-18
Total Chromium (and compounds)	7440-47-3	6.98E-05	Calpuff	7.21E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 11aURT - Note 4, Table 4	Apr-18
Total Chromium (and compounds)	7440-47-3	6.98E-05	Calpuff	7.21E-05	24-hour	5	Health	Sch. 6	URT	—	<1%	—	Apr-18
Total Particulate Matter (Condensable and Filterable)	N/A	1.90E-01	Calpuff	4.35E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Total Particulate Matter (Filterable only)	N/A	3.83E-02	Calpuff	2.78E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Trichloroethane, 1,1,1 -	71-55-6	1.44E-05	Calpuff	1.49E-05	24-hour	115000	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Trichloroethene	86-42-0	1.46E-05	Calpuff	1.51E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	5.62E-05	Calpuff	5.80E-05	24-hour	12	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	5.62E-05	Calpuff	5.80E-05	24-hour	1200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Trichlorofluoromethane	75-69-4	2.98E-05	Calpuff	3.08E-05	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Vanadium	7440-62-2	2.07E-06	Calpuff	2.14E-06	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Vinyl chloride	75-01-4	2.88E-05	Calpuff	2.97E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Vinyl chloride	75-01-4	2.88E-05	Calpuff	2.97E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Xylenes, m-, p- and o-	1330-20-7	8.71E-05	Calpuff	9.00E-05	24-hour	730	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	8.71E-05	Calpuff	2.87E-03	10-minute	3000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	8.71E-05	Calpuff	9.00E-05	24-hour	7300	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Zinc	7440-66-6	2.62E-04	Calpuff	2.71E-04	24-hour	120	Particulate	Sch. 3	Standard	B1	<1%	—	Apr-18

APPENDIX 28

DYEC CEMS 1-Hour Average Data
(4 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
Date	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
29-May-18	8:00	8.71	0.19	25		0		113		1		0	9
29-May-18	9:00	8.35	0.20	27		0		110		1		0	8
29-May-18	10:00	8.46	0.20	21		0		109		1		0	8
29-May-18	11:00	8.34	0.20	17	22.5	0		114		1		0	8
29-May-18	12:00	8.45	0.19	18	20.8	0		110		2		0	8
29-May-18	13:00	8.44	0.20	24	20.0	0		109		2		0	8
29-May-18	14:00	8.37	0.20	28	21.8	0		110		2		0	8
29-May-18	15:00	8.39	0.20	20	22.5	0		109		2		0	8
29-May-18	16:00	8.45	0.20	22	23.5	0		112		2		0	8
29-May-18	17:00	8.52	0.19	26	24.0	0		107		2		0	8
29-May-18	18:00	8.35	0.20	19	21.8	0		114		2		0	8
29-May-18	19:00	8.49	0.19	22	22.3	0		108		2		0	8
29-May-18	20:00	8.32	0.20	23	22.5	0		110		1		0	8
29-May-18	21:00	8.64	0.19	22	21.5	0		108		2		0	8
29-May-18	22:00	8.25	0.20	18	21.3	0		110		2		0	8
29-May-18	23:00	8.21	0.20	23	21.5	0		104		2		0	8
30-May-18	0:00	8.93	0.19	27	22.5	0		111		2		0	9
30-May-18	1:00	8.58	0.19	28	24.0	0		111		2		0	8
30-May-18	2:00	8.43	0.19	9	21.8	0		107		2		0	8
30-May-18	3:00	8.36	0.20	10	18.5	0		108		2		0	8
30-May-18	4:00	8.35	0.20	13	15.0	0		101		1		0	8
30-May-18	5:00	7.53	0.21	23	13.8	0		110		2		0	7
30-May-18	6:00	7.73	0.21	27	18.3	0		99		2		0	8
30-May-18	7:00	8.01	0.20	24	21.8	0	0.0	111	109	2	1.8	0	8
30-May-18	8:00	8.10	0.20	16	22.5	0	0.0	110	109	2	1.8	0	8
30-May-18	9:00	7.84	0.20	16	20.8	0	0.0	108	109	2	1.8	0	8
30-May-18	10:00	7.82	0.20	14	17.5	0	0.0	110	109	2	1.9	0	8
30-May-18	11:00	8.03	0.20	20	16.5	0	0.0	108	109	2	1.9	0	8
30-May-18	12:00	8.03	0.20	18	17.0	0	0.0	110	109	2	1.9	0	8
30-May-18	13:00	8.07	0.20	16	17.0	0	0.0	110	109	2	1.9	0	8
30-May-18	14:00	8.49	0.19	26	20.0	0	0.0	108	109	2	1.9	0	8
30-May-18	15:00	7.68	0.20	21	20.3	0	0.0	107	108	2	1.9	0	7
30-May-18	16:00	8.08	0.20	19	20.5	0	0.0	107	108	2	1.9	0	8
30-May-18	17:00	7.95	0.20	19	21.3	0	0.0	111	108	2	1.9	0	8
30-May-18	18:00	8.25	0.19	24	20.8	0	0.0	112	108	2	1.9	0	8
30-May-18	19:00	8.12	0.20	20	20.5	0	0.0	109	108	1	1.9	0	8
30-May-18	20:00	8.34	0.19	26	22.3	0	0.0	104	108	2	1.9	0	8
30-May-18	21:00	7.95	0.20	27	24.3	0	0.0	109	108	2	1.9	0	8
30-May-18	22:00	8.06	0.20	17	22.5	0	0.0	110	108	2	1.9	0	8
30-May-18	23:00	7.95	0.20	15	21.3	0	0.0	110	108	2	1.9	0	8
31-May-18	0:00	7.90	0.20	21	20.0	0	0.0	109	108	2	1.9	0	8
31-May-18	1:00	8.18	0.19	27	20.0	0	0.0	110	108	2	1.9	0	8
31-May-18	2:00	8.34	0.19	19	20.5	0	0.0	112	108	2	1.9	0	8
31-May-18	3:00	8.14	0.20	15	20.5	0	0.0	108	108	1	1.9	0	8
31-May-18	4:00	8.18	0.20	12	18.3	0	0.0	104	109	2	1.9	0	8
31-May-18	5:00	8.37	0.19	23	17.3	0	0.0	114	109	2	1.9	0	8
31-May-18	6:00	7.95	0.20	21	17.8	0	0.0	109	109	2	1.9	0	8
31-May-18	7:00	7.81	0.20	19	18.8	0	0.0	111	109	2	1.9	0	8
31-May-18	8:00	7.85	0.20	21	21.0	0	0.0	106	109	2	1.9	0	8
31-May-18	9:00	7.69	0.20	15	19.0	0	0.0	111	109	2	1.9	0	8
31-May-18	10:00	7.88	0.20	17	18.0	0	0.0	110	109	2	1.9	0	8
31-May-18	11:00	7.94	0.20	35	22.0	0	0.0	109	109	2	1.9	0	8
31-May-18	12:00	8.38	0.19	24	22.8	0	0.0	115	109	2	1.9	0	8
31-May-18	13:00	8.23	0.20	27	25.8	0	0.0	105	109	3	2.0	0	8
31-May-18	14:00	8.08	0.20	12	24.5	0	0.0	109	109	3	2.0	0	8
31-May-18	15:00	8.22	0.20	16	19.8	0	0.0	110	109	3	2.0	0	8
31-May-18	16:00	7.88	0.20	16	17.8	0	0.0	109	109	2	2.0	0	8
31-May-18	17:00	8.24	0.19	22	16.5	0	0.0	110	109	2	2.0	0	8
31-May-18	18:00	8.07	0.20	23	19.3	0	0.0	114	109	2	2.0	0	8
31-May-18	19:00	7.92	0.20	24	21.3	0	0.0	108	109	2	2.1	0	8
31-May-18	20:00	8.00	0.20	17	21.5	0	0.0	108	110	2	2.1	0	8
31-May-18	21:00	8.59	0.19	33	24.3	0	0.0	112	110	2	2.1	0	8
31-May-18	22:00	8.62	0.19	37	27.8	0	0.0	109	110	2	2.1	0	8
31-May-18	23:00	8.95	0.18	24	27.8	0	0.0	111	110	2	2.1	0	8
1-Jun-18	0:00	8.11	0.20	14	27.0	0	0.0	108	110	2	2.1	0	8
1-Jun-18	1:00	8.13	0.20	15	22.5	0	0.0	113	110	2	2.1	0	8
1-Jun-18	2:00	8.03	0.20	17	17.5	0	0.0	107	110	2	2.1	0	8
1-Jun-18	3:00	8.32	0.20	21	16.8	0	0.0	109	110	1	2.1	0	8
1-Jun-18	4:00	8.10	0.20	19	18.0	0	0.0	99	109	2	2.1	0	8
1-Jun-18	5:00	8.02	0.20	23	20.0	0	0.0	110	109	2	2.1	0	8
1-Jun-18	6:00	8.15	0.20	20	20.8	0	0.0	107	109	2	2.1	0	8
1-Jun-18	7:00	7.97	0.20	15	19.3	0	0.0	115	109	2	2.1	0	8

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
1-Jun-18	8:00	8.06	0.20	12	17.5	0	0.0	108	109	2	2.1	0	8
1-Jun-18	9:00	9.46	0.18	15	15.5	2	0.1	115	110	3	2.1	0	9
1-Jun-18	10:00	8.59	0.19	13	13.8	1	0.1	110	110	3	2.2	0	8
1-Jun-18	11:00	7.92	0.20	12	13.0	0	0.1	109	110	2	2.2	0	8
1-Jun-18	12:00	8.22	0.20	12	13.0	0	0.1	108	109	2	2.2	0	8
1-Jun-18	13:00	8.18	0.20	12	12.3	0	0.1	109	109	2	2.1	0	8
1-Jun-18	14:00	7.86	0.20	9	11.3	0	0.1	110	110	2	2.1	0	8
1-Jun-18	15:00	8.09	0.20	18	12.8	0	0.1	112	110	2	2.0	0	8
1-Jun-18	16:00	8.10	0.20	14	13.3	0	0.1	108	110	2	2.0	0	8
1-Jun-18	17:00	7.84	0.20	10	12.8	0	0.1	111	110	2	2.0	0	8
1-Jun-18	18:00	7.83	0.20	12	13.5	0	0.1	114	110	2	2.0	0	8
	Min	7.53	0.18	9	11.3	0	0.0	99	108	1	1.8	0	7
	Max	9.46	0.21	37	27.8	2	0.1	115	110	3	2.2	0	9
	Avg	8.19	0.20	20	19.7	0.04	0.02	109	109	2	2.0	0	8
	Std Dev	0.31	0.005	5.8	3.6	0.2	0.05	3.03	0.5	0.4	0.1	-	0.2

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
Date	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
29-May-18	8:00	7.77	0.20	14		0		109		4		0	8
29-May-18	9:00	7.79	0.20	10		0		110		4		0	8
29-May-18	10:00	7.69	0.21	12		0		109		4		0	8
29-May-18	11:00	7.75	0.20	12	12.0	0		107		4		0	8
29-May-18	12:00	7.72	0.21	11	11.3	0		112		5		0	8
29-May-18	13:00	7.78	0.20	12	11.8	0		106		5		0	8
29-May-18	14:00	7.75	0.20	14	12.3	0		110		4		0	8
29-May-18	15:00	7.53	0.21	14	12.8	0		109		4		0	7
29-May-18	16:00	7.80	0.20	13	13.3	0		113		5		0	8
29-May-18	17:00	8.01	0.20	12	13.3	0		109		5		0	8
29-May-18	18:00	7.87	0.21	11	12.5	0		106		5		0	8
29-May-18	19:00	7.42	0.21	11	11.8	0		109		5		0	7
29-May-18	20:00	8.26	0.20	9	10.8	0		114		5		0	8
29-May-18	21:00	7.99	0.20	16	11.8	0		110		4		0	8
29-May-18	22:00	7.62	0.21	11	11.8	0		110		4		0	8
29-May-18	23:00	7.82	0.20	10	11.5	0		111		5		0	8
30-May-18	0:00	8.37	0.19	8	11.3	0		109		5		0	8
30-May-18	1:00	8.01	0.20	8	9.3	0		108		4		0	8
30-May-18	2:00	7.79	0.20	14	10.0	0		102		4		0	8
30-May-18	3:00	7.88	0.20	9	9.8	0		113		4		0	8
30-May-18	4:00	7.86	0.20	9	10.0	0		104		3		0	8
30-May-18	5:00	8.00	0.20	15	11.8	0		119		4		0	7
30-May-18	6:00	8.13	0.20	9	10.5	0		95		5		1	8
30-May-18	7:00	7.71	0.20	8	10.3	0	0.0	116	109	4	4.4	0	7
30-May-18	8:00	7.77	0.20	8	10.0	0	0.0	112	109	4	4.4	0	8
30-May-18	9:00	7.89	0.20	8	8.3	0	0.0	112	109	4	4.4	0	8
30-May-18	10:00	7.72	0.20	9	8.3	0	0.0	107	109	4	4.4	0	8
30-May-18	11:00	7.87	0.20	9	8.5	0	0.0	108	109	3	4.3	0	8
30-May-18	12:00	7.69	0.21	8	8.5	0	0.0	114	109	4	4.3	0	8
30-May-18	13:00	7.76	0.20	9	8.8	0	0.0	110	110	4	4.3	0	8
30-May-18	14:00	7.46	0.21	7	8.3	0	0.0	103	109	4	4.3	0	7
30-May-18	15:00	7.63	0.20	11	8.8	0	0.0	107	109	4	4.3	0	8
30-May-18	16:00	7.55	0.20	7	8.5	0	0.0	112	109	4	4.2	0	8
30-May-18	17:00	7.48	0.20	10	8.8	0	0.0	105	109	4	4.2	0	7
30-May-18	18:00	7.49	0.20	9	9.3	0	0.0	109	109	4	4.1	0	8
30-May-18	19:00	7.59	0.20	7	8.3	0	0.0	110	109	4	4.1	0	8
30-May-18	20:00	8.19	0.19	8	8.5	0	0.0	110	109	3	4.0	0	8
30-May-18	21:00	7.79	0.20	11	8.8	0	0.0	109	109	3	4.0	0	8
30-May-18	22:00	7.37	0.20	12	9.5	0	0.0	107	109	3	3.9	0	7
30-May-18	23:00	7.76	0.20	10	10.3	0	0.0	111	109	4	3.9	0	8
31-May-18	0:00	7.88	0.20	18	12.8	0	0.0	109	109	4	3.8	0	8
31-May-18	1:00	7.50	0.20	13	13.3	0	0.0	109	109	4	3.8	0	8
31-May-18	2:00	7.79	0.20	10	12.8	0	0.0	112	109	3	3.8	0	8
31-May-18	3:00	7.77	0.20	10	12.8	0	0.0	110	109	4	3.8	0	8
31-May-18	4:00	7.93	0.20	13	11.5	0	0.0	101	109	3	3.8	0	8
31-May-18	5:00	7.84	0.20	21	13.5	0	0.0	118	109	3	3.8	0	8
31-May-18	6:00	7.29	0.21	13	14.3	0	0.0	88	109	4	3.7	1	8
31-May-18	7:00	7.46	0.21	18	16.3	0	0.0	117	109	4	3.7	0	7
31-May-18	8:00	7.55	0.20	21	18.3	0	0.0	105	108	3	3.7	0	7
31-May-18	9:00	7.57	0.20	18	17.5	0	0.0	111	108	3	3.6	0	8
31-May-18	10:00	7.47	0.20	17	18.5	0	0.0	110	109	3	3.6	0	7
31-May-18	11:00	7.55	0.20	18	18.5	0	0.0	108	109	3	3.6	0	7
31-May-18	12:00	7.80	0.20	23	19.0	0	0.0	108	108	4	3.6	0	8
31-May-18	13:00	7.83	0.20	28	21.5	0	0.0	109	108	5	3.6	0	8
31-May-18	14:00	8.02	0.20	26	23.8	0	0.0	109	109	4	3.6	0	8
31-May-18	15:00	7.79	0.20	23	25.0	0	0.0	112	109	4	3.6	0	8
31-May-18	16:00	7.56	0.20	36	28.3	0	0.0	106	108	4	3.6	0	7
31-May-18	17:00	8.09	0.20	36	30.3	0	0.0	106	109	4	3.6	0	8
31-May-18	18:00	8.08	0.19	24	29.8	0	0.0	111	109	4	3.6	0	8
31-May-18	19:00	7.89	0.19	19	28.8	0	0.0	114	109	4	3.6	0	8
31-May-18	20:00	8.44	0.19	14	23.3	0	0.0	107	109	4	3.7	0	8
31-May-18	21:00	8.55	0.19	22	19.8	0	0.0	110	109	4	3.7	0	9
31-May-18	22:00	7.97	0.20	13	17.0	0	0.0	109	109	3	3.7	0	8
31-May-18	23:00	8.27	0.19	15	16.0	0	0.0	109	109	3	3.7	0	8
1-Jun-18	0:00	8.05	0.20	17	16.8	0	0.0	110	109	4	3.7	0	8
1-Jun-18	1:00	8.43	0.19	11	14.0	0	0.0	112	109	4	3.7	0	8
1-Jun-18	2:00	8.24	0.19	12	13.8	0	0.0	110	109	4	3.7	0	8
1-Jun-18	3:00	8.11	0.20	9	12.3	0	0.0	110	109	4	3.7	0	8
1-Jun-18	4:00	8.52	0.19	11	10.8	0	0.0	105	109	4	3.8	0	8
1-Jun-18	5:00	8.33	0.19	9	10.3	0	0.0	117	109	3	3.8	0	8
1-Jun-18	6:00	8.19	0.20	10	9.8	0	0.0	108	110	4	3.8	1	8
1-Jun-18	7:00	8.07	0.20	9	9.8	0	0.0	118	110	4	3.8	0	8

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
1-Jun-18	8:00	8.12	0.20	8	9.0	0	0.0	105	110	4	3.8	0	8
1-Jun-18	9:00	8.08	0.20	8	8.8	0	0.0	114	110	3	3.8	0	8
1-Jun-18	10:00	7.81	0.20	9	8.5	0	0.0	110	110	3	3.8	0	8
1-Jun-18	11:00	7.76	0.20	9	8.5	0	0.0	109	110	3	3.8	0	7
1-Jun-18	12:00	8.02	0.20	10	9.0	0	0.0	106	110	4	3.8	0	8
1-Jun-18	13:00	7.94	0.20	10	9.5	0	0.0	113	110	4	3.8	0	8
1-Jun-18	14:00	8.00	0.20	12	10.3	0	0.0	105	110	4	3.8	0	8
1-Jun-18	15:00	8.14	0.20	8	10.0	0	0.0	107	110	4	3.8	0	8
1-Jun-18	16:00	8.00	0.20	10	10.0	0	0.0	113	110	4	3.8	0	8
1-Jun-18	17:00	7.88	0.20	9	9.8	0	0.0	110	110	4	3.8	0	8
1-Jun-18	18:00	7.74	0.20	10	9.3	0	0.0	110	110	4	3.8	0	8
	Min	7.29	0.19	7	8.3	0	0.0	88	108	3	3.6	0	7
	Max	8.55	0.21	36	30.3	0	0.0	119	110	5	4.4	1	9
	Avg	7.86	0.20	13	13.0	0	0.0	109	109	4	3.8	0.04	8
	Std Dev	0.27	0.005	5.9	5.4	0.0	0.0	4.50	0.5	0.6	0.2	0.2	0.4