Report No. 21936

Report:

Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre
2019 Voluntary Compliance Emission Testing Program

Date: November 25, 2019



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Durham York Energy Centre
2019 Voluntary Compliance Emission Testing Program

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1	September 23, 2019	None
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3	November 25, 2019	Mislabeled appendices

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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 June 25 and June 28, 2019. The voluntary emission testing program was performed at the request of the Regions of Durham and York. The facility had an agreement with the Regions of Durham and York to conduct emission testing twice per year for the first three years of operation. The current test program is the fourth voluntary test program conducted at the facility.

Ontario Ministry of the 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". A list of the test programs conducted by ORTECH to date is provided below:

Test Program	Test Date	ORTECH Report No.
2015 Compliance	September/October 2015	21546
2016 Voluntary	May 2016	21656
2016 Compliance	October/November 2016	21698
2017 Voluntary	May 2017	21754
2017 Compliance	October 2017	21800
2018 Voluntary	May/June 2018	21840
2018 Compliance	September 2018	21880
2019 Voluntary	June 2019	21936

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 Summer of 2018, 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 (June 25 to June 28, 2019) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on June 25, 2019 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)*	-	-	-	366	-
Average Combustion Zone Temp. (°C)*	-	-	-	1264	-
Steam (tonnes/day)*	-	-	-	801	-
MSW Combusted (tonnes/day)*	-	-	-	200	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	498	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4174	-
Filterable Particulate (mg/Rm^3) (1)	<0.51	<0.81	0.54	<0.62	9
PM_{10} with Condensable (mg/Rm^3) (1)	5.50	<4.05	<3.71	<4.42	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	5.23	<3.84	<3.51	<4.20	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.46	<0.43	<0.46	<0.45	-
Ammonia (mg/Rm^3) (1)	0.47	0.40	0.42	0.43	-
Cadmium (µg/Rm^3) (1)	0.088	0.088	0.14	0.10	7
Lead (µg/Rm^3) (1)	0.59	0.63	0.54	0.59	50
Mercury (µg/Rm^3) (1)	0.66	0.22	0.17	0.35	15
Antimony (µg/Rm^3) (1)	0.10	0.075	0.11	0.097	-
Arsenic (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Barium (µg/Rm^3) (1)	2.68	2.22	2.47	2.46	-
Beryllium (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Chromium (µg/Rm^3) (1)	1.37	1.46	0.79	1.21	-
Cobalt (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Copper (µg/Rm^3) (1)	1.13	1.17	0.60	0.97	-
Molybdenum (µg/Rm^3) (1)	8.51	8.08	4.77	7.12	-
Nickel (µg/Rm^3) (1)	1.66	1.66	1.17	1.50	-
Selenium (µg/Rm^3) (1)	<0.23	<0.23	<0.21	<0.22	-
Silver (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Thallium (µg/Rm^3) (1)	0.017	<0.045	<0.041	<0.034	-
Vanadium (µg/Rm^3) (1)	<0.023	<0.023	<0.021	<0.022	-
Zinc (µg/Rm^3) (1)	8.82	5.98	9.09	7.96	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.30	<7.42	<2.93	<4.55	60
Total Chlorobenzenes (ng/Rm^3) (1)	<586	<499	<626	<570	-
Total Chlorophenols (ng/Rm^3) (1)	<702	<683	NR	<693	-
Total PAHs (ng/Rm^3) (1)	<705	<605	<477	<596	-
VOCs (µg/Rm^3) (1)	<171	<299	<147	<206	-
Aldehydes (µg/Rm^3) (1)	<275	<381	<312	<321	-
Total VOCs (µg/Rm^3) (1) (4)	<446	<680	<459	<527	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	3.1	1.4	0.9	1.8	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).

NR No result. The field spike was not detected and the extraction standard had poor recoveries. The results could not be reliably quantified by the analytical laboratory.

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)*	-	-	-	366	-
Average Combustion Zone Temp. (°C)*	-	-	-	1258	-
Steam (tonnes/day)*	-	-	-	798	-
MSW Combusted (tonnes/day)*	-	-	-	200	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	617	-
Carbon Injection (kg/day)*	-	-	-	127	-
Lime Injection (kg/day)*	-	-	-	4404	-
Filterable Particulate (mg/Rm^3) (1)	<0.46	<0.29	0.38	<0.38	9
PM_{10} with Condensable (mg/Rm^3) (1)	10.3	<6.37	5.97	<7.56	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	10.1	<6.11	5.84	<7.34	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.47	<0.44	<0.44	<0.45	-
Ammonia (mg/Rm^3) (1)	0.79	0.55	0.55	0.63	-
Cadmium (µg/Rm^3) (1)	0.094	0.10	0.050	0.083	7
Lead (µg/Rm^3) (1)	0.59	0.45	0.35	0.46	50
Mercury (µg/Rm^3) (1)	0.11	<0.094	0.092	<0.097	15
Antimony (µg/Rm^3) (1)	0.061	0.067	0.051	0.060	-
Arsenic (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Barium (µg/Rm^3) (1)	2.10	2.66	2.38	2.38	-
Beryllium (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Chromium (µg/Rm^3) (1)	1.23	0.97	0.68	0.96	-
Cobalt (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Copper (µg/Rm^3) (1)	0.75	0.94	1.30	1.00	-
Molybdenum (µg/Rm^3) (1)	6.76	5.07	4.88	5.57	-
Nickel (µg/Rm^3) (1)	1.58	1.49	0.99	1.35	-
Selenium (µg/Rm^3) (1)	1.06	<0.22	<0.22	<0.50	-
Silver (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Thallium (µg/Rm^3) (1)	0.012	<0.045	<0.044	<0.034	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.022	<0.022	<0.022	-
Zinc (µg/Rm^3) (1)	7.78	6.33	6.91	7.01	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<2.80	<2.91	<8.02	<4.58	60
Total Chlorobenzenes (ng/Rm^3) (1)	<697	<570	<458	<575	-
Total Chlorophenols (ng/Rm^3) (1)	<699	<704	<732	<711	-
Total PAHs (ng/Rm^3) (1)	<308	<299	<779	<462	-
VOCs (µg/Rm^3) (1)	<125	<83.4	<60.2	<89.4	-
Aldehydes (µg/Rm^3) (1)	<292	<378	<226	<299	-
Total VOCs (µg/Rm^3) (1) (4)	<417	<461	<286	<388	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.5	0.5	0.5	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)	8.5	13.1	17.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.7	1.9	2.1	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	110	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.03	0.1	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.0	12.2	19.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	3.5	4.2	5.0	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	110	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.02	0.2	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 June 2019 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 778 tonnes of steam per day for each Boiler (approximately 96.4% 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 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 June 25 and June 28, 2019. The voluntary emission testing program was performed at the request of the Regions of Durham and York. The facility had an agreement with the Regions of Durham and York to conduct emission testing twice per year for the first three years of operation. The current test program is the fourth voluntary test program conducted at the facility.

Ontario Ministry of the 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 eighth comprehensive Schedule E source testing program conducted at the facility. A list of the test programs conducted by ORTECH to date is provided below:

Test Program	Test Date	ORTECH Report No.
2015 Compliance	September/October 2015	21546
2016 Voluntary	May 2016	21656
2016 Compliance	October/November 2016	21698
2017 Voluntary	May 2017	21754
2017 Compliance	October 2017	21800
2018 Voluntary	May/June 2018	21840
2018 Compliance	September 2018	21880
2019 Voluntary	June 2019	21936

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 May 10, 2019. 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 June 25 and June 28, 2019.

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 Summer of 2018, 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 (June 25 to June 28, 2019) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on June 25, 2019 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 impinger was initially empty to collect moisture
- The second and third impingers initially contained 100 mL each of 5% nitric acid/10% hydrogen peroxide solution to collect metals
- The fourth impinger was initially empty
- The fifth and sixth impingers initially contained 100 mL each of 4% potassium permanganate/10% sulphuric acid solution to collect mercury
- The seventh 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, 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 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 Summer 2018, 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. 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 June 25, 2019 at 00:00 to June 28, 2019 at 23:00, 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 June 25, 2019. 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 four 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 fifth and sixth 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 fifth and sixth 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). 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/or 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 8.2% 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 89-103%, except for silver in the front half sample (69%). 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 92-102%. 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 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.

Molybdenum and nickel were observed by the analytical laboratory in the method blank at levels greater than the limit of reporting. Lead and silver were also observed by the analytical laboratory in the reagent blank at levels 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 1.4% 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 93-96% 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 93-98% 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 5.9%, 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 108% 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 99% for hydrogen chloride, 93% for hydrogen fluoride and 99% 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.

Acrolein, acetaldehyde and formaldehyde were not detected in the blank samples in quantities greater than the reported detection limit. Formaldehyde was detected in one of the test samples in quantities slightly greater than the detection limit. Acetaldehyde and acrolein were not detected in any of the test samples in quantities greater than the detection limit.

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 field spike standards were between 85-122% which indicates good extraction efficiency and provides a high degree of confidence in the results obtained from the dioxin and furan test trains.

Per the chlorphenol analytical report, overall suppression was observed as low peak areas for the train samples. The laboratory QC samples, spiked with the same standards and processed in the same manner, do not show the same reduction in peak area. The suppression is even observed for 5a-androstane, used as an internal standard, but chemically unrelated to the chlorophenols. As a result, the detection limits have been elevated by a factor of five. It's important to note than none of the compounds were detected in any of the test samples in quantities greater than the reported detection limit. This resulted in emission data being five times higher than previous testing programs.

Also per the chlorophenol report, the sample for Test No. 3 at Boiler No. 1 appeared to have selective losses for some of the labelled extraction standards, in particular the d4-2-Chlorophenol and the 2,4,6-tribromophenol. In addition, the d5-phenol, which does not apply to this test, was not recovered at all. Only the 13C6-pentachlorophenol was adequately recovered. The losses may be related to volatility or extraction efficiency. Due to the losses only pentachlorphenol was reported for this sample.

Per the PAH analytical report, there was a coeluting interference affecting the fluorine-d10 field sampling standard for Test No. 1 at Boiler No. 2 which resulted in an elevated recovery. Also, the recoveries of select labelled extractions standard for Test No. 2 at Boiler No. 2 were below the method control limit. However, this is not expected to bias the data.

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 59-138%.

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 (June 25 to June 28, 2019) by the DYEC CEMS. Total hydrocarbon concentrations were also measured at the BH Outlet and Quench Inlet by ORTECH on June 25, 2019.

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)	141	140
Moisture by Volume (%)	17.2	16.6
Velocity (m/s)	17.9	17.6
Static Pressure (kPa)	-1.99	-1.94
Absolute Pressure (kPa)	97.9	97.8
Carbon Dioxide by Volume (%)**	10.9	10.8
Oxygen by Volume (%)**	8.26	8.29

* Excludes the isokinetic Acid Gases tests as testing was conducted on a single traverse of 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)	26.4	26.0
Dry Reference Flowrate (Rm^3/s)**	15.2	15.1
Dry Adjusted Flowrate (Rm^3/s)***	19.4	19.2
Wet Reference Flowrate (Rm^3/s)**	18.4	18.1

* Excludes the isokinetic Acid Gases tests as testing was conducted on a single traverse of 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)	<0.45	<0.28
Dry Reference Conc. (mg/Rm^3)*	<0.79	<0.48
Dry Adjusted Conc. (mg/Rm^3)**	<0.62	<0.38
Wet Reference Conc. (mg/Rm^3)*	<0.66	<0.40
Emission Rate (mg/s)	<12.1	<7.40

* 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 (<0.62 mg/Rm^3, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (<0.38 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 1.3 mg and 0.3 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 0.3 mg and 2.4 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)	<0.72	<1.65	<0.55	<1.48
Dry Reference Conc. (mg/Rm^3)*	<1.25	<2.84	<0.97	<2.55
Dry Adjusted Conc. (mg/Rm^3)**	<0.97	<2.23	<0.75	<2.01
Wet Reference Conc. (mg/Rm^3)*	<1.03	<2.38	<0.80	<2.14
Emission Rate (mg/s)	<18.7	<41.8	<14.4	<37.6

* 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)	1.57	2.65	0.95	1.28
Dry Reference Conc. (mg/Rm^3)*	2.75	4.57	1.66	2.20
Dry Adjusted Conc. (mg/Rm^3)**	2.15	3.60	1.30	1.73
Wet Reference Conc. (mg/Rm^3)*	2.26	3.83	1.37	1.85
Emission Rate (mg/s)	40.6	67.4	24.6	32.4

* 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 0.7 mg for the inorganic fraction and 1.1 mg for the organic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was 0.4 mg for the inorganic fraction and 1.1 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)	<3.24	<5.58	<3.07	<5.41
Dry Reference Conc. (mg/Rm^3)*	<5.66	<9.61	<5.38	<9.32
Dry Adjusted Conc. (mg/Rm^3)**	<4.42	<7.56	<4.20	<7.34
Wet Reference Conc. (mg/Rm^3)*	<4.66	<8.06	<4.43	<7.82
Emission Rate (mg/s)	<83.9	<142	<79.6	<137

* 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)	3.50	2.99	<0.33	<0.34	0.32	0.47
Dry Reference Conc. (mg/Rm^3)*	6.01	5.16	<0.57	<0.58	0.54	0.81
Dry Adjusted Conc. (mg/Rm^3)**	4.73	4.00	<0.45	<0.45	0.43	0.63
Wet Reference Conc. (mg/Rm^3)*	5.06	4.29	<0.48	<0.48	0.46	0.68
Emission Rate (mg/s)	89.1	78.3	<8.51	<8.78	8.03	12.3
Dry Adjusted Conc. (ppm)**	3.17	2.69	<0.55	<0.55	0.61	0.91

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

Hydrogen fluoride, hydrogen chloride 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. Oxygen was 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 June 25, 2019 at 00:00 to June 28, 2019 at 23:00 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)	-	8.87	8.89
	Carbon Monoxide (mg/Rm^3, 4-hr)*	≤ 40	17.3	19.0
	Sulphur Dioxide (mg/Rm^3, 24-hr)*	≤ 35	0.1	0.2
	Nitrogen Oxides (mg/Rm^3, 24-hr)*	≤ 121	110	111
	Hydrogen Chloride (mg/Rm^3, 24-hr)*	≤ 9	2.1	5.0
	Total Hydrocarbons (mg/Rm^3, 1-hr)*	-	0	1
Quench Inlet	Oxygen (%, 1-hr)	≥ 6	9	8

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

Total hydrocarbon concentration data was measured by ORTECH on June 25, 2019 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)*	-	0.7	1.0
	Total Hydrocarbons (10-minute)**	-	0.7	1.0
Quench Inlet	Total Hydrocarbons (1-minute)*	-	1.8	0.5
	Total Hydrocarbons (10-minute)**	50	1.7	0.5

* 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)	0.076	0.062
Dry Reference Conc. (µg/Rm^3)*	0.13	0.11
Dry Adjusted Conc. (µg/Rm^3)**	0.10	0.083
Wet Reference Conc. (µg/Rm^3)*	0.11	0.089
Emission Rate (mg/s)	0.0020	0.0016

* 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)	0.43	0.35
Dry Reference Conc. (µg/Rm^3)*	0.75	0.60
Dry Adjusted Conc. (µg/Rm^3)**	0.59	0.46
Wet Reference Conc. (µg/Rm^3)*	0.62	0.50
Emission Rate (mg/s)	0.011	0.0091

* 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, with the exception of Boiler No. 2 BH Outlet Test No. 2, 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)	0.26	<0.072
Dry Reference Conc. (µg/Rm^3)*	0.44	<0.13
Dry Adjusted Conc. (µg/Rm^3)**	0.35	<0.097
Wet Reference Conc. (µg/Rm^3)*	0.37	<0.10
Emission Rate (mg/s)	0.0067	<0.0019

* 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)	<0.028	<0.034
Dry Reference Conc. (ng/Rm^3)*	<0.049	<0.058
Dry Adjusted Conc. (ng/Rm^3)**	<0.038	<0.046
Wet Reference Conc. (ng/Rm^3)*	<0.041	<0.048
Emission Rate (ng/s)	<0.75	<0.88

* 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)	<0.017	<0.036
Dry Reference Conc. (ng/Rm^3)*	<0.029	<0.061
Dry Adjusted Conc. (ng/Rm^3)**	<0.023	<0.048
Wet Reference Conc. (ng/Rm^3)*	<0.024	<0.051
Emission Rate (ng/s)	<0.45	<0.92

* 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 significant when compared to the amounts detected in the test trains since most of the congener group were at or below the reportable detection limit. 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)	2.12	2.39
Dry Reference Conc. (pg TEQ/Rm^3)*	3.68	4.11
Dry Adjusted Conc. (pg TEQ/Rm^3)**	2.87	3.25
Wet Reference Conc. (pg TEQ/Rm^3)*	3.04	3.41
Emission Rate (ng TEQ/s)	0.057	0.062

* 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)*	<4.55	<4.58

* 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)	<420	<422
Dry Reference Conc. (ng/Rm^3)*	<730	<727
Dry Adjusted Conc. (ng/Rm^3)**	<570	<575
Wet Reference Conc. (ng/Rm^3)*	<603	<602
Emission Rate (µg/s)	<11.2	<11.1

* 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.

Per the chlorphenol analytical report, overall suppression was observed as low peak areas for the train samples. The laboratory QC samples, spiked with the same standards and processed in the same manner, do not show the same reduction in peak area. The suppression is also observed for 5a-androstane, used as an internal standard, but chemically unrelated to the chlorophenols. As a result, the detection limits have been elevated by a factor of five. It's important to note than none of the compounds were detected in any of the test samples in quantities greater than the reported detection limit. This resulted in emission data being approximately five times higher than previous testing programs.

Also the sample for Test No. 3 at Boiler No. 1 appeared to have selective losses for some of the labelled extraction standards, in particular the d4-2-Chlorophenol and the 2,4,6-tribromophenol. Only 13C6-pentachlorophenol was adequately recovered. The losses may be related to volatility or extraction efficiency. Due to the losses only pentachlorphenol was reported for this sample.

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)	<510 (1)	<523
Dry Reference Conc. (ng/Rm^3)*	<885 (1)	<899
Dry Adjusted Conc. (ng/Rm^3)**	<693 (1)	<711
Wet Reference Conc. (ng/Rm^3)*	<731 (1)	<745
Emission Rate (µg/s)	<13.7 (1)	<13.7

* at 25°C and 1 atmosphere

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

(1) average of Test No. 1 and Test No. 2 only

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)	<439	<340
Dry Reference Conc. (ng/Rm^3)*	<762	<583
Dry Adjusted Conc. (ng/Rm^3)**	<596	<462
Wet Reference Conc. (ng/Rm^3)*	<630	<484
Emission Rate (µg/s)	<11.7	<8.81

* 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.

Acrolein, acetaldehyde and formaldehyde were not detected in the blank samples in quantities greater than the reported detection limit. Formaldehyde was detected in one of the test samples in quantities slightly greater than the detection limit. Acetaldehyde and acrolein were not detected in any of the test samples in quantities greater than the detection limit.

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)	<79.4	<62.7	<79.4	<93.8	<79.4	<62.7
Dry Reference Conc. (µg/Rm^3)*	<138	<108	<138	<162	<138	<108
Dry Adjusted Conc. (µg/Rm^3)**	<107	<85.5	<107	<128	<107	<85.5
Wet Reference Conc. (µg/Rm^3)*	<114	<89.5	<114	<134	<114	<89.5
Emission Rate (mg/s)	<2.18	<1.65	<2.18	<2.47	<2.18	<1.65

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

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)	<151	<65.6
Dry Reference Conc. (µg/Rm^3)*	<261	<113
Dry Adjusted Conc. (µg/Rm^3)**	<206	<89.4
Wet Reference Conc. (µg/Rm^3)*	<216	<93.5
Emission Rate (mg/s)	<4.04	<1.74

* 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)*	<675	<491
Dry Adjusted Conc. (µg/Rm^3)**	<527	<388
Emission Rate (mg/s)	<10.6	<7.51

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

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 June 2019 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 (6% of the 1-hour standard with meteorological anomaly removal), all other contaminants were less than 2% of the relevant standard with meteorological anomaly removal.

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)
- 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 June 25, 2019 at 00:00 to June 28, 2019 at 23:00 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.

ORTECH a Kontrol Energy Company

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
June 25, 2019	380	0	0	1273	1254	806	803	198	203	536	618	126	127	4171	4357
June 26, 2019	351	0	0	1282	1258	807	803	207	205	482	609	125	127	4174	4592
June 27, 2019	373	0	0	1248	1263	809	806	200	197	505	673	126	127	4176	4302
June 28, 2019	361	0	0	1252	1256	782	778	196	195	470	569	126	127	4174	4364
Average	366	0	0	1264	1258	801	798	200	200	498	617	126	127	4174	4404

* 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 778 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 for comparison with 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 Summer 2018 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 prior to the compliance testing program. Since the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the 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 June 25, 2019 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)*	-	-	-	366	-
Average Combustion Zone Temp. (°C)*	-	-	-	1264	-
Steam (tonnes/day)*	-	-	-	801	-
MSW Combusted (tonnes/day)*	-	-	-	200	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	498	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4174	-
Filterable Particulate (mg/Rm^3) (1)	<0.51	<0.81	0.54	<0.62	9
PM_{10} with Condensable (mg/Rm^3) (1)	5.50	<4.05	<3.71	<4.42	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	5.23	<3.84	<3.51	<4.20	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.46	<0.43	<0.46	<0.45	-
Ammonia (mg/Rm^3) (1)	0.47	0.40	0.42	0.43	-
Cadmium (µg/Rm^3) (1)	0.088	0.088	0.14	0.10	7
Lead (µg/Rm^3) (1)	0.59	0.63	0.54	0.59	50
Mercury (µg/Rm^3) (1)	0.66	0.22	0.17	0.35	15
Antimony (µg/Rm^3) (1)	0.10	0.075	0.11	0.097	-
Arsenic (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Barium (µg/Rm^3) (1)	2.68	2.22	2.47	2.46	-
Beryllium (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Chromium (µg/Rm^3) (1)	1.37	1.46	0.79	1.21	-
Cobalt (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Copper (µg/Rm^3) (1)	1.13	1.17	0.60	0.97	-
Molybdenum (µg/Rm^3) (1)	8.51	8.08	4.77	7.12	-
Nickel (µg/Rm^3) (1)	1.66	1.66	1.17	1.50	-
Selenium (µg/Rm^3) (1)	<0.23	<0.23	<0.21	<0.22	-
Silver (µg/Rm^3) (1)	<0.046	<0.045	<0.041	<0.044	-
Thallium (µg/Rm^3) (1)	0.017	<0.045	<0.041	<0.034	-
Vanadium (µg/Rm^3) (1)	<0.023	<0.023	<0.021	<0.022	-
Zinc (µg/Rm^3) (1)	8.82	5.98	9.09	7.96	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.30	<7.42	<2.93	<4.55	60
Total Chlorobenzenes (ng/Rm^3) (1)	<586	<499	<626	<570	-
Total Chlorophenols (ng/Rm^3) (1)	<702	<683	NR	<693	-
Total PAHs (ng/Rm^3) (1)	<705	<605	<477	<596	-
VOCs (µg/Rm^3) (1)	<171	<299	<147	<206	-
Aldehydes (µg/Rm^3) (1)	<275	<381	<312	<321	-
Total VOCs (µg/Rm^3) (1) (4)	<446	<680	<459	<527	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	3.1	1.4	0.9	1.8	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).

NR No result. The field spike was not detected and the extraction standard had poor recoveries. The results could not be reliably quantified by the analytical laboratory.

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)*	-	-	-	366	-
Average Combustion Zone Temp. (°C)*	-	-	-	1258	-
Steam (tonnes/day)*	-	-	-	798	-
MSW Combusted (tonnes/day)*	-	-	-	200	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	617	-
Carbon Injection (kg/day)*	-	-	-	127	-
Lime Injection (kg/day)*	-	-	-	4404	-
Filterable Particulate (mg/Rm^3) (1)	<0.46	<0.29	0.38	<0.38	9
PM_{10} with Condensable (mg/Rm^3) (1)	10.1	<6.37	5.97	<7.56	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	10.3	<6.11	5.84	<7.34	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.47	<0.44	<0.44	<0.45	-
Ammonia (mg/Rm^3) (1)	0.79	0.55	0.55	0.63	-
Cadmium (µg/Rm^3) (1)	0.094	0.10	0.050	0.083	7
Lead (µg/Rm^3) (1)	0.59	0.45	0.35	0.46	50
Mercury (µg/Rm^3) (1)	0.11	<0.094	0.092	<0.097	15
Antimony (µg/Rm^3) (1)	0.061	0.067	0.051	0.060	-
Arsenic (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Barium (µg/Rm^3) (1)	2.10	2.66	2.38	2.38	-
Beryllium (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Chromium (µg/Rm^3) (1)	1.23	0.97	0.68	0.96	-
Cobalt (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Copper (µg/Rm^3) (1)	0.75	0.94	1.30	1.00	-
Molybdenum (µg/Rm^3) (1)	6.76	5.07	4.88	5.57	-
Nickel (µg/Rm^3) (1)	1.58	1.49	0.99	1.35	-
Selenium (µg/Rm^3) (1)	1.06	<0.22	<0.22	<0.50	-
Silver (µg/Rm^3) (1)	<0.044	<0.045	<0.044	<0.044	-
Thallium (µg/Rm^3) (1)	0.012	<0.045	<0.044	<0.034	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.022	<0.022	<0.022	-
Zinc (µg/Rm^3) (1)	7.78	6.33	6.91	7.01	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<2.80	<2.91	<8.02	<4.58	60
Total Chlorobenzenes (ng/Rm^3) (1)	<697	<570	<458	<575	-
Total Chlorophenols (ng/Rm^3) (1)	<699	<704	<732	<711	-
Total PAHs (ng/Rm^3) (1)	<308	<299	<779	<462	-
VOCs (µg/Rm^3) (1)	<125	<83.4	<60.2	<89.4	-
Aldehydes (µg/Rm^3) (1)	<292	<378	<226	<299	-
Total VOCs (µg/Rm^3) (1) (4)	<417	<461	<286	<388	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.5	0.5	0.5	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)	8.5	13.1	17.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.7	1.9	2.1	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	110	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.03	0.1	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.0	12.2	19.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	3.5	4.2	5.0	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	110	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.02	0.2	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

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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 Start	Sampling Period Finish	Sampling Time* min
1	June 25, 2019	9:02	12:26	180
2	June 25, 2019	13:28	16:38	180
3	June 26, 2019	14:01	17:10	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 26, 2019	8:56	10:59	120
2	June 26, 2019	12:43	14:47	120
3	June 26, 2019	16:27	18:30	120

Acid Gases Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 25, 2019	8:58	9:58	60
2	June 25, 2019	10:49	11:49	60
3	June 25, 2019	12:21	13:21	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 27, 2019	9:53	14:02	240
2	June 27, 2019	14:40	18:49	240
3	June 28, 2019	10:50	14:58	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	June 26, 2019	11:37	12:37	60
2	June 27, 2019	16:22	17:22	60
3	June 27, 2019	17:25	18:25	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	June 27, 2019	9:51	10:11	20
	2	June 27, 2019	10:16	10:36	20
	3	June 27, 2019	10:41	11:01	20
	4	June 27, 2019	11:06	11:26	20
2	1	June 27, 2019	12:50	13:10	20
	2	June 27, 2019	13:15	13:35	20
	3	June 27, 2019	13:39	13:59	20
	4	June 27, 2019	14:05	14:25	20
3	1	June 27, 2019	14:31	14:52	20
	2	June 27, 2019	14:57	15:17	20
	3	June 27, 2019	15:22	15:42	20
	4	June 27, 2019	15:46	16:06	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	June 25, 2019	16:32	17:32	60
BH Outlet	2	June 25, 2019	17:43	18:43	60
BH Outlet	3	June 25, 2019	18:53	19:53	60
Quench Inlet	1	June 25, 2019	10:32	11:32	60
Quench Inlet	2	June 25, 2019	11:40	12:40	60
Quench Inlet	3	June 25, 2019	12:52	13:52	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	0.849	1.001	6.39	3.401	97.7
2	0.849	1.001	6.39	3.495	99.0
3	0.849	0.999	6.39	3.797	99.3

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	0.848	1.001	4.51	1.178	101.0
2	0.848	1.001	4.51	1.150	98.2
3	0.848	1.001	4.51	1.166	103.1

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.845	0.999	6.35	1.190	99.5
2	0.845	0.999	6.35	1.210	100.8
3	0.845	0.999	6.35	1.184	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	0.845	1.001	6.35	4.778	100.4
2	0.851	0.999	6.35	4.830	100.3
3	0.845	1.001	6.35	4.686	100.7

* 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. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	141	15.7	17.2	-1.82	97.2	10.8	8.32
2	141	16.5	17.6	-1.82	97.5	10.7	8.36
3	141	17.4	19.3	-2.14	97.6	10.9	8.23
Average	141	16.5	18.0	-1.93	97.5	10.8	8.30

Particle Size Distribution Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	141	17.5	17.7	-1.99	97.7	11.0	8.07
2	143	17.9	17.8	-1.99	97.7	10.9	8.34
3	141	17.6	17.1	-2.14	97.7	10.8	8.31
Average	142	17.7	17.5	-2.04	97.7	10.9	8.24

Acid Gases Trains **

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	142	15.2	18.0	-1.82	97.2	10.6	8.60
2	142	15.5	18.1	-1.82	97.2	10.8	8.38
3	143	15.7	17.8	-1.82	97.4	10.7	8.34
Average	142	15.5	17.9	-1.82	97.3	10.7	8.44

Semi-Volatile Organics Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	142	17.2	18.0	-1.99	98.5	10.9	8.41
2	142	17.5	18.4	-1.99	98.4	11.0	8.15
3	141	17.5	17.7	-2.07	98.4	11.1	8.18
Average	141	17.4	18.0	-2.02	98.4	11.0	8.25

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically on a single traverse 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	25.5	14.8	18.9	17.6
2	26.0	15.0	19.0	18.0
3	28.5	16.3	20.8	19.7
Average	26.7	15.4	19.6	18.5

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	26.1	15.0	19.4	18.2
2	26.3	14.9	18.9	18.2
3	25.3	14.5	18.4	17.6
Average	25.9	14.8	18.9	18.0

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	26.5	15.5	19.3	18.3
2	26.7	15.5	19.7	18.4
3	26.3	15.3	19.4	18.1
Average	26.5	15.4	19.4	18.3

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	26.7	15.4	19.5	18.6
2	27.1	15.6	20.1	18.9
3	26.2	15.1	19.4	18.3
Average	26.6	15.4	19.6	18.6

* At 25°C and 1 atmosphere

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

*** Sampling was conducted isokinetically on a single traverse 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 Probe Rinse mg	Main Filter mg	Total mg	Dry Gas Volume Sampled Rm^3*	Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Particulate Emission Rate mg/s
1	2.1	<0.1	<2.2	3.401	<0.38	<0.65	<0.51	<0.55	<9.59
2	3.5	<0.1	<3.6	3.495	<0.60	<1.03	<0.81	<0.86	<15.5
3	2.0	0.6	2.6	3.797	0.39	0.69	0.54	0.57	11.1
Average					<0.45	<0.79	<0.62	<0.66	<12.1
Blank	0.3	1.3							

* 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	2.6	1.178	1.27	2.21	1.70	1.82	33.1
2	<0.5	1.150	<0.25	<0.43	<0.34	<0.36	<6.48
3	<0.3	1.166	<0.15	<0.26	<0.20	<0.21	<3.73
Average			<0.55	<0.97	<0.75	<0.80	<14.4
Blank	<2.6						

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	3.0	1.178	1.46	2.55	1.97	2.10	38.2
2	<0.8	1.150	<0.39	<0.70	<0.55	<0.57	<10.4
3	<0.6	1.166	<0.29	<0.51	<0.40	<0.42	<7.46
Average			<0.72	<1.25	<0.97	<1.03	<18.7
Blank	<3.1						

* 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	Total Collected	Dry Volume Sampled	Inorganic Condensable Particulate Concentration				Emission Rate
			Actual	Dry Reference	Dry Adjusted	Wet Reference	
No.	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	3.5	1.178	1.71	2.97	2.29	2.45	44.6
2	2.9	1.150	1.43	2.52	1.99	2.06	37.6
3	3.2	1.166	1.57	2.74	2.16	2.26	39.8
Average			1.57	2.75	2.15	2.26	40.6
Blank	0.7						

Organic Condensable Particulate

Test	Total Collected	Dry Volume Sampled	Organic Condensable Particulate Concentration				Emission Rate
			Actual	Dry Reference	Dry Adjusted	Wet Reference	
No.	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	1.9	1.178	0.93	1.61	1.24	1.33	24.2
2	2.2	1.150	1.08	1.91	1.51	1.57	28.5
3	1.7	1.166	0.84	1.46	1.15	1.20	21.1
Average			0.95	1.66	1.30	1.37	24.6
Blank	1.1						

* 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 Rm³*	Hydrogen Chloride Concentration Actual mg/m³	Dry Reference mg/Rm³*	Dry Adjusted mg/Rm³**	Wet Reference mg/Rm³*	HCl Emission Rate mg/s
1	6.49	1.190	3.18	5.45	4.29	4.59	80.9
2	7.85	1.210	3.78	6.49	5.10	5.46	96.2
3	7.20	1.184	3.54	6.08	4.78	5.12	90.2
Average			3.50	6.01	4.73	5.06	89.1
Blank	<0.679						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm³*	Hydrogen Fluoride Concentration Actual mg/m³	Dry Reference mg/Rm³*	Dry Adjusted mg/Rm³**	Wet Reference mg/Rm³*	HF Emission Rate mg/s
1	<0.695	1.190	<0.34	<0.58	<0.46	<0.49	<8.66
2	<0.667	1.210	<0.32	<0.55	<0.43	<0.46	<8.17
3	<0.695	1.184	<0.34	<0.59	<0.46	<0.49	<8.71
Average			<0.33	<0.57	<0.45	<0.48	<8.51
Blank	<0.463						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm³*	Ammonia Concentration Actual mg/m³	Dry Reference mg/Rm³*	Dry Adjusted mg/Rm³**	Wet Reference mg/Rm³*	Ammonia Emission Rate mg/s
1	0.705	1.190	0.34	0.59	0.47	0.50	8.79
2	0.610	1.210	0.29	0.50	0.40	0.42	7.48
3	0.626	1.184	0.31	0.53	0.42	0.45	7.84
Average			0.32	0.54	0.43	0.46	8.03
Blank	<0.293						

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 June 25 to June 28, 2019

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.76	8.27	8.87
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	8	13	28
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	8.5	13.1	17.3
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0.02	2
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0.03	0.1
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	97	110	120
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	109	110	110
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	1	2	4
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	1.7	1.9	2.1
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 June 25, 2019

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0.3	0.7	5.1
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.5	0.7	1.0
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.5	0.6	0.8
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.7	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	2.1	3.1	5.1
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.8	1.4	2.3
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.5	0.9	1.7
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		1.8	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	2.4	2.9	4.2
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	1.1	1.4	1.7
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0.5	0.9	1.1
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		1.7	

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.34	0.10	0.45
Arsenic	<1	<0.2	<0.20
Barium	9.80	1.86	11.7
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.28	0.10	0.38
Chromium	5.14	0.82	5.96
Cobalt	<0.2	<0.1	<0.20
Copper	1.50	3.39	4.89
Lead	1.92	0.65	2.57
Mercury *	<0.015	2.86	2.86
Molybdenum	36.8	0.16	37.0
Nickel	5.64	1.59	7.23
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	0.072	0.072
Vanadium	<1	<0.1	<0.10
Zinc	28.2	10.1	38.3
Total			<113

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.33	<0.1	0.33
Arsenic	<1	<0.2	<0.20
Barium	8.30	1.54	9.84
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.32	0.071	0.39
Chromium	5.23	1.25	6.48
Cobalt	<0.2	<0.1	<0.20
Copper	2.94	2.26	5.20
Lead	2.11	0.66	2.77
Mercury *	<0.015	0.98	0.98
Molybdenum	35.6	0.19	35.8
Nickel	6.28	1.05	7.33
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	17.1	9.37	26.5
Total			<97.7

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.54	<0.1	0.54
Arsenic	<1	<0.2	<0.20
Barium	10.4	1.56	12.0
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.55	0.11	0.66
Chromium	3.19	0.63	3.82
Cobalt	<0.2	<0.1	<0.20
Copper	1.65	1.25	2.90
Lead	1.80	0.82	2.62
Mercury *	<0.015	0.80	0.80
Molybdenum	23.1	<0.1	23.1
Nickel	4.93	0.76	5.69
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	35.4	8.64	44.0
Total			<98.2

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.45	0.076	0.13	0.10	0.11	0.0019
Arsenic	<0.20	<0.034	<0.059	<0.046	<0.049	<0.00087
Barium	11.7	1.99	3.43	2.68	2.88	0.051
Beryllium	<0.20	<0.034	<0.059	<0.046	<0.049	<0.00087
Cadmium	0.38	0.065	0.11	0.088	0.094	0.0017
Chromium	5.96	1.02	1.75	1.37	1.47	0.026
Cobalt	<0.20	<0.034	<0.059	<0.046	<0.049	<0.00087
Copper	4.89	0.83	1.44	1.13	1.21	0.021
Lead	2.57	0.44	0.76	0.59	0.64	0.011
Mercury	2.86	0.49	0.84	0.66	0.71	0.012
Molybdenum	37.0	6.31	10.9	8.51	9.14	0.16
Nickel	7.23	1.23	2.13	1.66	1.79	0.031
Selenium	<1.00	<0.17	<0.29	<0.23	<0.25	<0.0044
Silver	<0.20	<0.034	<0.059	<0.046	<0.049	<0.00087
Thallium	0.072	0.012	0.021	0.017	0.018	0.00031
Vanadium	<0.10	<0.017	<0.029	<0.023	<0.025	<0.00044
Zinc	38.3	6.54	11.3	8.82	9.47	0.17
Total	<113	<19.3	<33.3	<26.1	<28.0	<0.49

Dry Gas Volume Sampled (Rm³*) :	3.401
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**) :	18.9
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

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

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.33	0.055	0.096	0.075	0.080	0.0014
Arsenic	<0.20	<0.033	<0.057	<0.045	<0.048	<0.00086
Barium	9.84	1.62	2.82	2.22	2.35	0.042
Beryllium	<0.20	<0.033	<0.057	<0.045	<0.048	<0.00086
Cadmium	0.39	0.064	0.11	0.088	0.093	0.0017
Chromium	6.48	1.07	1.85	1.46	1.55	0.028
Cobalt	<0.20	<0.033	<0.057	<0.045	<0.048	<0.00086
Copper	5.20	0.86	1.49	1.17	1.24	0.022
Lead	2.77	0.46	0.79	0.63	0.66	0.012
Mercury	0.98	0.16	0.28	0.22	0.23	0.0042
Molybdenum	35.8	5.91	10.2	8.08	8.53	0.15
Nickel	7.33	1.21	2.10	1.66	1.75	0.031
Selenium	<1.00	<0.17	<0.29	<0.23	<0.24	<0.0043
Silver	<0.20	<0.033	<0.057	<0.045	<0.048	<0.00086
Thallium	<0.20	<0.033	<0.057	<0.045	<0.048	<0.00086
Vanadium	<0.10	<0.017	<0.029	<0.023	<0.024	<0.00043
Zinc	26.5	4.37	7.57	5.98	6.31	0.11
Total	<97.7	<16.1	<28.0	<22.1	<23.3	<0.42

Dry Gas Volume Sampled (Rm³*) :	3.495
Actual Flowrate (m³/s) :	26.0
Dry Reference Flowrate (Rm³/s*) :	15.0
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	18.0

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.54	0.081	0.14	0.11	0.12	0.0023
Arsenic	<0.20	<0.030	<0.053	<0.041	<0.044	<0.00086
Barium	12.0	1.80	3.15	2.47	2.61	0.051
Beryllium	<0.20	<0.030	<0.053	<0.041	<0.044	<0.00086
Cadmium	0.66	0.099	0.17	0.14	0.14	0.0028
Chromium	3.82	0.58	1.01	0.79	0.83	0.016
Cobalt	<0.20	<0.030	<0.053	<0.041	<0.044	<0.00086
Copper	2.90	0.44	0.76	0.60	0.63	0.012
Lead	2.62	0.39	0.69	0.54	0.57	0.011
Mercury	0.80	0.12	0.21	0.17	0.17	0.0034
Molybdenum	23.1	3.48	6.08	4.77	5.03	0.099
Nickel	5.69	0.86	1.50	1.17	1.24	0.024
Selenium	<1.00	<0.15	<0.26	<0.21	<0.22	<0.0043
Silver	<0.20	<0.030	<0.053	<0.041	<0.044	<0.00086
Thallium	<0.20	<0.030	<0.053	<0.041	<0.044	<0.00086
Vanadium	<0.10	<0.015	<0.026	<0.021	<0.022	<0.00043
Zinc	44.0	6.63	11.6	9.09	9.60	0.19
Total	<98.2	<14.8	<25.9	<20.3	<21.4	<0.42

Dry Gas Volume Sampled (Rm³*) :	3.797
Actual Flowrate (m³/s) :	28.5
Dry Reference Flowrate (Rm³/s*) :	16.3
Dry Adjusted Flowrate (Rm³/s**) :	20.8
Wet Reference Flowrate (Rm³/s*) :	19.7

* 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. 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	0.076	0.055	0.081	0.071	19.5
Arsenic	<0.034	<0.033	<0.030	<0.032	6.4
Barium	1.99	1.62	1.80	1.81	10.1
Beryllium	<0.034	<0.033	<0.030	<0.032	6.4
Cadmium	0.065	0.064	0.099	0.076	26.1
Chromium	1.02	1.07	0.58	0.89	30.5
Cobalt	<0.034	<0.033	<0.030	<0.032	6.4
Copper	0.83	0.86	0.44	0.71	33.4
Lead	0.44	0.46	0.39	0.43	7.6
Mercury	0.49	0.16	0.12	0.26	78.4
Molybdenum	6.31	5.91	3.48	5.23	29.3
Nickel	1.23	1.21	0.86	1.10	19.2
Selenium	<0.17	<0.17	<0.15	<0.16	6.4
Silver	<0.034	<0.033	<0.030	<0.032	6.4
Thallium	0.012	<0.033	<0.030	<0.025	44.7
Vanadium	<0.017	<0.017	<0.015	<0.016	6.4
Zinc	6.54	4.37	6.63	5.85	21.9
Total	<19.3	<16.1	<14.8	<16.7	13.9

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

Metal	Dry Reference Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*	%
Antimony	0.13	0.096	0.14	0.12	19.7
Arsenic	<0.059	<0.057	<0.053	<0.056	5.7
Barium	3.43	2.82	3.15	3.13	9.8
Beryllium	<0.059	<0.057	<0.053	<0.056	5.7
Cadmium	0.11	0.11	0.17	0.13	26.9
Chromium	1.75	1.85	1.01	1.54	30.1
Cobalt	<0.059	<0.057	<0.053	<0.056	5.7
Copper	1.44	1.49	0.76	1.23	32.9
Lead	0.76	0.79	0.69	0.75	7.1
Mercury	0.84	0.28	0.21	0.44	77.8
Molybdenum	10.9	10.2	6.08	9.06	28.7
Nickel	2.13	2.10	1.50	1.91	18.6
Selenium	<0.29	<0.29	<0.26	<0.28	5.7
Silver	<0.059	<0.057	<0.053	<0.056	5.7
Thallium	0.021	<0.057	<0.053	<0.044	44.9
Vanadium	<0.029	<0.029	<0.026	<0.028	5.7
Zinc	11.3	7.57	11.6	10.1	22.0
Total	<33.3	<28.0	<25.9	<29.0	13.2

* 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	0.10	0.075	0.11	0.097	19.4
Arsenic	<0.046	<0.045	<0.041	<0.044	5.8
Barium	2.68	2.22	2.47	2.46	9.4
Beryllium	<0.046	<0.045	<0.041	<0.044	5.8
Cadmium	0.088	0.088	0.14	0.10	26.6
Chromium	1.37	1.46	0.79	1.21	30.3
Cobalt	<0.046	<0.045	<0.041	<0.044	5.8
Copper	1.13	1.17	0.60	0.97	33.1
Lead	0.59	0.63	0.54	0.59	7.4
Mercury	0.66	0.22	0.17	0.35	77.5
Molybdenum	8.51	8.08	4.77	7.12	28.8
Nickel	1.66	1.66	1.17	1.50	18.8
Selenium	<0.23	<0.23	<0.21	<0.22	5.8
Silver	<0.046	<0.045	<0.041	<0.044	5.8
Thallium	0.017	<0.045	<0.041	<0.034	45.2
Vanadium	<0.023	<0.023	<0.021	<0.022	5.8
Zinc	8.82	5.98	9.09	7.96	21.6
Total	<26.1	<22.1	<20.3	<22.8	13.0

** 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.11	0.080	0.12	0.10	19.6
Arsenic	<0.049	<0.048	<0.044	<0.047	6.4
Barium	2.88	2.35	2.61	2.61	10.3
Beryllium	<0.049	<0.048	<0.044	<0.047	6.4
Cadmium	0.094	0.093	0.14	0.11	26.1
Chromium	1.47	1.55	0.83	1.28	30.5
Cobalt	<0.049	<0.048	<0.044	<0.047	6.4
Copper	1.21	1.24	0.63	1.03	33.3
Lead	0.64	0.66	0.57	0.62	7.6
Mercury	0.71	0.23	0.17	0.37	78.5
Molybdenum	9.14	8.53	5.03	7.57	29.3
Nickel	1.79	1.75	1.24	1.59	19.2
Selenium	<0.25	<0.24	<0.22	<0.23	6.4
Silver	<0.049	<0.048	<0.044	<0.047	6.4
Thallium	0.018	<0.048	<0.044	<0.036	44.6
Vanadium	<0.025	<0.024	<0.022	<0.023	6.4
Zinc	9.47	6.31	9.60	8.46	22.0
Total	<28.0	<23.3	<21.4	<24.2	14.0

* 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	0.0019	0.0014	0.0023	0.0019	23.2
Arsenic	<0.00087	<0.00086	<0.00086	<0.00086	0.8
Barium	0.051	0.042	0.051	0.048	10.6
Beryllium	<0.00087	<0.00086	<0.00086	<0.00086	0.8
Cadmium	0.0017	0.0017	0.0028	0.0020	32.6
Chromium	0.026	0.028	0.016	0.023	26.1
Cobalt	<0.00087	<0.00086	<0.00086	<0.00086	0.8
Copper	0.021	0.022	0.012	0.019	29.0
Lead	0.011	0.012	0.011	0.011	3.5
Mercury	0.012	0.0042	0.0034	0.0067	74.5
Molybdenum	0.16	0.15	0.099	0.14	24.5
Nickel	0.031	0.031	0.024	0.029	14.0
Selenium	<0.0044	<0.0043	<0.0043	<0.0043	0.8
Silver	<0.00087	<0.00086	<0.00086	<0.00086	0.8
Thallium	0.00031	<0.00086	<0.00086	<0.00068	46.5
Vanadium	<0.00044	<0.00043	<0.00043	<0.00043	0.8
Zinc	0.17	0.11	0.19	0.16	24.8
Total	<0.49	<0.42	<0.42	<0.44	9.4

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	0.071	0.12	0.097	0.10	0.0019
Arsenic	<0.032	<0.056	<0.044	<0.047	<0.00086
Barium	1.81	3.13	2.46	2.61	0.048
Beryllium	<0.032	<0.056	<0.044	<0.047	<0.00086
Cadmium	0.076	0.13	0.10	0.11	0.0020
Chromium	0.89	1.54	1.21	1.28	0.023
Cobalt	<0.032	<0.056	<0.044	<0.047	<0.00086
Copper	0.71	1.23	0.97	1.03	0.019
Lead	0.43	0.75	0.59	0.62	0.011
Mercury	0.26	0.44	0.35	0.37	0.0067
Molybdenum	5.23	9.06	7.12	7.57	0.14
Nickel	1.10	1.91	1.50	1.59	0.029
Selenium	<0.16	<0.28	<0.22	<0.23	<0.0043
Silver	<0.032	<0.056	<0.044	<0.047	<0.00086
Thallium	<0.025	<0.044	<0.034	<0.036	<0.00068
Vanadium	<0.016	<0.028	<0.022	<0.023	<0.00043
Zinc	5.85	10.1	7.96	8.46	0.16
Total	<16.7	<29.0	<22.8	<24.2	<0.44

* 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	0.29	0.29
Arsenic	<1	<0.2	<0.20
Barium	9.95	1.01	11.0
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.1
Chromium	2.58	0.35	2.93
Cobalt	<0.2	<0.1	<0.20
Copper	1.46	0.72	2.18
Lead	0.60	1.09	1.69
Mercury *	<0.015	0.17	0.17
Molybdenum	22.2	<0.1	22.2
Nickel	3.51	0.25	3.76
Selenium	<2	<1	<1
Silver	<0.2	<0.1	<0.2
Thallium	<0.2	<0.05	<0.2
Vanadium	<1	<0.1	<1.0
Zinc	<6	<3	<6
Total			<53.2

* 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 pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	<7.4	<0.00089	<0.0015	<0.0012	<0.0013	<0.024
Pentachlorodibenzo-p-dioxins	15.3	0.0018	0.0032	0.0025	0.0027	0.049
Hexachlorodibenzo-p-dioxins	68.6	0.0083	0.014	0.011	0.012	0.22
Heptachlorodibenzo-p-dioxins	138	0.017	0.029	0.023	0.024	0.44
Octachlorodibenzo-p-dioxin	164	0.020	0.034	0.027	0.028	0.53
Total	<393	<0.047	<0.082	<0.065	<0.068	<1.27

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	12.8	0.0015	0.0027	0.0021	0.0022	0.041
Pentachlorodibenzofurans	<5.1	<0.00062	<0.0011	<0.00084	<0.00088	<0.016
Hexachlorodibenzofurans	12.7	0.0015	0.0027	0.0021	0.0022	0.041
Heptachlorodibenzofurans	10.3	0.0012	0.0022	0.0017	0.0018	0.033
Octachlorodibenzofuran	38.0	0.0046	0.0080	0.0063	0.0066	0.12
Total	<78.9	<0.0095	<0.017	<0.013	<0.014	<0.25

Dry Gas Volume Sampled (Rm³*) :	4.778
Actual Flowrate (m³/s) :	26.7
Dry Reference Flowrate (Rm³/s*) :	15.4
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.6

* 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 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 pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	28.0	0.0033	0.0058	0.0045	0.0048	0.090
Pentachlorodibenzo-p-dioxins	22.4	0.0027	0.0046	0.0036	0.0038	0.072
Hexachlorodibenzo-p-dioxins	<7.3	<0.00087	<0.0015	<0.0012	<0.0012	<0.024
Heptachlorodibenzo-p-dioxins	37.4	0.0045	0.0077	0.0060	0.0064	0.12
Octachlorodibenzo-p-dioxin	<59	<0.0070	<0.012	<0.0095	<0.010	<0.19
Total	<154	<0.018	<0.032	<0.025	<0.026	<0.50

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzofurans	114	0.014	0.024	0.018	0.019	0.37
Pentachlorodibenzofurans	85.0	0.010	0.018	0.014	0.015	0.27
Hexachlorodibenzofurans	18.3	0.0022	0.0038	0.0029	0.0031	0.059
Heptachlorodibenzofurans	43.1	0.0051	0.0089	0.0069	0.0074	0.14
Octachlorodibenzofuran	11.8	0.0014	0.0024	0.0019	0.0020	0.038
Total	272	0.032	0.056	0.044	0.047	0.88

Dry Gas Volume Sampled (Rm^3*) :	4.830
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
Wet Reference Flowrate (Rm^3/s*) :	18.9

* 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 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 pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	<7.0	<0.00086	<0.0015	<0.0012	<0.0012	<0.023
Pentachlorodibenzo-p-dioxins	4.67	0.00057	0.0010	0.00078	0.00082	0.015
Hexachlorodibenzo-p-dioxins	54.5	0.0067	0.012	0.0091	0.0096	0.18
Heptachlorodibenzo-p-dioxins	32.5	0.0040	0.0069	0.0054	0.0057	0.10
Octachlorodibenzo-p-dioxin	55.0	0.0068	0.012	0.0091	0.0097	0.18
Total	<154	<0.019	<0.033	<0.026	<0.027	<0.50

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	<6.1	<0.00075	<0.0013	<0.0010	<0.0011	<0.020
Pentachlorodibenzofurans	6.22	0.00077	0.0013	0.0010	0.0011	0.020
Hexachlorodibenzofurans	12.2	0.0015	0.0026	0.0020	0.0021	0.039
Heptachlorodibenzofurans	32.8	0.0040	0.0070	0.0054	0.0058	0.11
Octachlorodibenzofuran	13.2	0.0016	0.0028	0.0022	0.0023	0.043
Total	<70.5	<0.0087	<0.015	<0.012	<0.012	<0.23

Dry Gas Volume Sampled (Rm³*) :	4.686
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	18.3

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

Dioxins

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	<0.00089	0.0033	<0.00086	<0.0017	83.7
Pentachlorodibenzo-p-dioxins	0.0018	0.0027	0.00057	0.0017	62.2
Hexachlorodibenzo-p-dioxins	0.0083	<0.00087	0.0067	<0.0053	73.9
Heptachlorodibenzo-p-dioxins	0.017	0.0045	0.0040	0.0084	85.8
Octachlorodibenzo-p-dioxin	0.020	<0.0070	0.0068	<0.011	66.5
Total	<0.047	<0.018	<0.019	<0.028	59.0

Furans

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzofurans	0.0015	0.014	<0.00075	<0.0053	136
Pentachlorodibenzofurans	<0.00062	0.010	0.00077	<0.0038	142
Hexachlorodibenzofurans	0.0015	0.0022	0.0015	0.0017	22.1
Heptachlorodibenzofurans	0.0012	0.0051	0.0040	0.0035	57.8
Octachlorodibenzofuran	0.0046	0.0014	0.0016	0.0025	70.0
Total	<0.0095	0.032	<0.0087	<0.017	79.9

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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	<0.0015	0.0058	<0.0015	<0.0029	83.8
Pentachlorodibenzo-p-dioxins	0.0032	0.0046	0.0010	0.0029	62.3
Hexachlorodibenzo-p-dioxins	0.014	<0.0015	0.012	<0.0092	73.8
Heptachlorodibenzo-p-dioxins	0.029	0.0077	0.0069	0.015	85.7
Octachlorodibenzo-p-dioxin	0.034	<0.012	0.012	<0.019	66.4
Total	<0.082	<0.032	<0.033	<0.049	58.9

Furans

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.0027	0.024	<0.0013	<0.0092	136
Pentachlorodibenzofurans	<0.0011	0.018	0.0013	<0.0067	142
Hexachlorodibenzofurans	0.0027	0.0038	0.0026	0.0030	22.2
Heptachlorodibenzofurans	0.0022	0.0089	0.0070	0.0060	57.9
Octachlorodibenzofuran	0.0080	0.0024	0.0028	0.0044	69.9
Total	<0.017	0.056	<0.015	<0.029	80.0

* 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	<0.0012	0.0045	<0.0012	<0.0023	83.2
Pentachlorodibenzo-p-dioxins	0.0025	0.0036	0.00078	0.0023	61.9
Hexachlorodibenzo-p-dioxins	0.011	<0.0012	0.0091	<0.0072	74.2
Heptachlorodibenzo-p-dioxins	0.023	0.0060	0.0054	0.011	86.6
Octachlorodibenzo-p-dioxin	0.027	<0.0095	0.0091	<0.015	67.4
Total	<0.065	<0.025	<0.026	<0.038	59.9

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	0.0021	0.018	<0.0010	<0.0071	136
Pentachlorodibenzofurans	<0.00084	0.014	0.0010	<0.0052	142
Hexachlorodibenzofurans	0.0021	0.0029	0.0020	0.0024	21.6
Heptachlorodibenzofurans	0.0017	0.0069	0.0054	0.0047	57.4
Octachlorodibenzofuran	0.0063	0.0019	0.0022	0.0035	70.9
Total	<0.013	0.044	<0.012	<0.023	79.4

* 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	%
Tetrachlorodibenzo-p-dioxins	<0.0013	0.0048	<0.0012	<0.0024	83.7
Pentachlorodibenzo-p-dioxins	0.0027	0.0038	0.00082	0.0024	62.2
Hexachlorodibenzo-p-dioxins	0.012	<0.0012	0.0096	<0.0076	73.9
Heptachlorodibenzo-p-dioxins	0.024	0.0064	0.0057	0.012	85.9
Octachlorodibenzo-p-dioxin	0.028	<0.010	0.0097	<0.016	66.6
Total	<0.068	<0.026	<0.027	<0.041	59.1

Furans

Congener Group	Wet Reference Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	%
Tetrachlorodibenzofurans	0.0022	0.019	<0.0011	<0.0076	136
Pentachlorodibenzofurans	<0.00088	0.015	0.0011	<0.0055	142
Hexachlorodibenzofurans	0.0022	0.0031	0.0021	0.0025	22.1
Heptachlorodibenzofurans	0.0018	0.0074	0.0058	0.0050	57.8
Octachlorodibenzofuran	0.0066	0.0020	0.0023	0.0036	70.1
Total	<0.014	0.047	<0.012	<0.024	79.9

* 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	<0.024	0.090	<0.023	<0.046	85.1
Pentachlorodibenzo-p-dioxins	0.049	0.072	0.015	0.046	63.3
Hexachlorodibenzo-p-dioxins	0.22	<0.024	0.18	<0.14	73.8
Heptachlorodibenzo-p-dioxins	0.44	0.12	0.10	0.22	85.9
Octachlorodibenzo-p-dioxin	0.53	<0.19	0.18	<0.30	66.6
Total	<1.27	<0.50	<0.50	<0.75	59.1

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	0.041	0.37	<0.020	<0.14	137
Pentachlorodibenzofurans	<0.016	0.27	0.020	<0.10	143
Hexachlorodibenzofurans	0.041	0.059	0.039	0.046	23.7
Heptachlorodibenzofurans	0.033	0.14	0.11	0.093	58.5
Octachlorodibenzofuran	0.12	0.038	0.043	0.068	70.1
Total	<0.25	0.88	<0.23	<0.45	81.3

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 ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	<0.0017	<0.0029	<0.0023	<0.0024	<0.046
Pentachlorodibenzo-p-dioxins	0.0017	0.0029	0.0023	0.0024	0.046
Hexachlorodibenzo-p-dioxins	<0.0053	<0.0092	<0.0072	<0.0076	<0.14
Heptachlorodibenzo-p-dioxins	0.0084	0.015	0.011	0.012	0.22
Octachlorodibenzo-p-dioxin	<0.011	<0.019	<0.015	<0.016	<0.30
Total	<0.028	<0.049	<0.038	<0.041	<0.75

Furans

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	<0.0053	<0.0092	<0.0071	<0.0076	<0.14
Pentachlorodibenzofurans	<0.0038	<0.0067	<0.0052	<0.0055	<0.10
Hexachlorodibenzofurans	0.0017	0.0030	0.0024	0.0025	0.046
Heptachlorodibenzofurans	0.0035	0.0060	0.0047	0.0050	0.093
Octachlorodibenzofuran	0.0025	0.0044	0.0035	0.0036	0.068
Total	<0.017	<0.029	<0.023	<0.024	<0.45

* 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	<8.5	<7.6
Pentachlorodibenzo-p-dioxins	<5.0	<3.8
Hexachlorodibenzo-p-dioxins	<4.2	<4.8
Heptachlorodibenzo-p-dioxins	5.21	<2.4
Octachlorodibenzo-p-dioxin	<24	<2.8
Total	<46.9	<21.4

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<6.7	<5.0
Pentachlorodibenzofurans	<4.2	<3.6
Hexachlorodibenzofurans	<6.0	<3.8
Heptachlorodibenzofurans	<3.4	<3.8
Octachlorodibenzofuran	13.0	<3.1
Total	<33.3	<19.3

"<" 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<7.4	<0.89	<1.55	<1.22	<1.28	<0.024
12378-pentachlorodibenzo-p-dioxin	<5.5	<0.66	<1.15	<0.91	<0.95	<0.018
123478-hexachlorodibenzo-p-dioxin	<6.8	<0.82	<1.42	<1.12	<1.18	<0.022
123678-hexachlorodibenzo-p-dioxin	<5.3	<0.64	<1.11	<0.88	<0.92	<0.017
123789-hexachlorodibenzo-p-dioxin	<6.5	<0.78	<1.36	<1.07	<1.13	<0.021
1234678-heptachlorodibenzo-p-dioxin	73.9	8.92	15.5	12.2	12.8	0.24
Octachlorodibenzo-p-dioxin	164	19.8	34.3	27.1	28.4	0.53
2378-tetrachlorodibenzofuran	<5.2	<0.63	<1.09	<0.86	<0.90	<0.017
12378-pentachlorodibenzofuran	<5.1	<0.62	<1.07	<0.84	<0.88	<0.016
23478-pentachlorodibenzofuran	<5.8	<0.70	<1.21	<0.96	<1.01	<0.019
123478-hexachlorodibenzofuran	<7.0	<0.85	<1.47	<1.16	<1.21	<0.023
123678-hexachlorodibenzofuran	<5.8	<0.70	<1.21	<0.96	<1.01	<0.019
234678-hexachlorodibenzofuran	<6.8	<0.82	<1.42	<1.12	<1.18	<0.022
123789-hexachlorodibenzofuran	<9.9	<1.20	<2.07	<1.64	<1.72	<0.032
1234678-heptachlorodibenzofuran	<31	<3.74	<6.49	<5.12	<5.37	<0.10
1234789-heptachlorodibenzofuran	10.3	1.24	2.16	1.70	1.78	0.033
Octachlorodibenzofuran	38.0	4.59	7.95	6.28	6.58	0.12
PCB 81	<17	<2.05	<3.56	<2.81	<2.95	<0.055
PCB 77	278	33.6	58.2	45.9	48.2	0.90
PCB 123	<110	<13.3	<23.0	<18.2	<19.1	<0.35
PCB 118	8030	969	1681	1327	1391	25.9
PCB 114	206	24.9	43.1	34.0	35.7	0.66
PCB 105	2490	301	521	412	431	8.03
PCB 126	<10	<1.21	<2.09	<1.65	<1.73	<0.032
PCB 167	73.8	8.91	15.4	12.2	12.8	0.24
PCB 156/157	209	25.2	43.7	34.5	36.2	0.67
PCB 169	<4.8	<0.58	<1.00	<0.79	<0.83	<0.015
PCB 189	<4.3	<0.52	<0.90	<0.71	<0.75	<0.014
Total Dioxins & Furans Only	<394	<47.6	<82.5	<65.2	<68.3	<1.27
Total PCBs Only	<11433	<1380	<2393	<1890	<1981	<36.8
Total Dioxins & Furans and PCBs	<11827	<1428	<2475	<1955	<2049	<38.1

Dry Gas Volume Sampled (Rm³*) :	4.778
Actual Flowrate (m³/s) :	26.7
Dry Reference Flowrate (Rm³/s*) :	15.4
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.6

* 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<11	<1.31	<2.28	<1.77	<1.88	<0.036
12378-pentachlorodibenzo-p-dioxin	<5.9	<0.70	<1.22	<0.95	<1.01	<0.019
123478-hexachlorodibenzo-p-dioxin	<7.3	<0.87	<1.51	<1.17	<1.25	<0.024
123678-hexachlorodibenzo-p-dioxin	7.03	0.84	1.46	1.13	1.20	0.023
123789-hexachlorodibenzo-p-dioxin	<7.1	<0.85	<1.47	<1.14	<1.21	<0.023
1234678-heptachlorodibenzo-p-dioxin	<44	<5.24	<9.11	<7.07	<7.52	<0.14
Octachlorodibenzo-p-dioxin	<59	<7.03	<12.2	<9.48	<10.1	<0.19
2378-tetrachlorodibenzofuran	18.7	2.23	3.87	3.00	3.20	0.060
12378-pentachlorodibenzofuran	10.5	1.25	2.17	1.69	1.79	0.034
23478-pentachlorodibenzofuran	40.6	4.84	8.41	6.52	6.94	0.13
123478-hexachlorodibenzofuran	18.3	2.18	3.79	2.94	3.13	0.059
123678-hexachlorodibenzofuran	<14	<1.67	<2.90	<2.25	<2.39	<0.045
234678-hexachlorodibenzofuran	<18	<2.15	<3.73	<2.89	<3.08	<0.058
123789-hexachlorodibenzofuran	<15	<1.79	<3.11	<2.41	<2.56	<0.048
1234678-heptachlorodibenzofuran	31.6	3.77	6.54	5.08	5.40	0.10
1234789-heptachlorodibenzofuran	<5.2	<0.62	<1.08	<0.84	<0.89	<0.017
Octachlorodibenzofuran	11.8	1.41	2.44	1.90	2.02	0.038
PCB 81	<11	<1.31	<2.28	<1.77	<1.88	<0.036
PCB 77	127	15.1	26.3	20.4	21.7	0.41
PCB 123	<51	<6.08	<10.6	<8.20	<8.72	<0.16
PCB 118	3940	470	816	633	673	12.7
PCB 114	100	11.9	20.7	16.1	17.1	0.32
PCB 105	1050	125	217	169	179	3.39
PCB 126	<11	<1.31	<2.28	<1.77	<1.88	<0.036
PCB 167	<23	<2.74	<4.76	<3.70	<3.93	<0.074
PCB 156/157	87.0	10.4	18.0	14.0	14.9	0.28
PCB 169	6.20	0.74	1.28	1.00	1.06	0.020
PCB 189	<3.8	<0.45	<0.79	<0.61	<0.65	<0.012
Total Dioxins & Furans Only	<325	<38.7	<67.3	<52.2	<55.5	<1.05
Total PCBs Only	<5410	<645	<1120	<869	<925	<17.5
Total Dioxins & Furans and PCBs	<5735	<684	<1187	<922	<980	<18.5

Dry Gas Volume Sampled (Rm³*) :	4.830
Actual Flowrate (m³/s) :	27.1
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	20.1
Wet Reference Flowrate (Rm³/s*) :	18.9

* 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 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<7.0	<0.86	<1.49	<1.16	<1.23	<0.023
12378-pentachlorodibenzo-p-dioxin	<4.6	<0.57	<0.98	<0.76	<0.81	<0.015
123478-hexachlorodibenzo-p-dioxin	<4.9	<0.60	<1.05	<0.81	<0.86	<0.016
123678-hexachlorodibenzo-p-dioxin	<3.8	<0.47	<0.81	<0.63	<0.67	<0.012
123789-hexachlorodibenzo-p-dioxin	<4.7	<0.58	<1.00	<0.78	<0.83	<0.015
1234678-heptachlorodibenzo-p-dioxin	32.5	4.00	6.94	5.40	5.72	0.10
Octachlorodibenzo-p-dioxin	55.0	6.76	11.7	9.14	9.68	0.18
2378-tetrachlorodibenzofuran	<6.1	<0.75	<1.30	<1.01	<1.07	<0.020
12378-pentachlorodibenzofuran	<5.1	<0.63	<1.09	<0.85	<0.90	<0.016
23478-pentachlorodibenzofuran	<6.2	<0.76	<1.32	<1.03	<1.09	<0.020
123478-hexachlorodibenzofuran	<6.3	<0.77	<1.34	<1.05	<1.11	<0.020
123678-hexachlorodibenzofuran	<5.6	<0.69	<1.20	<0.93	<0.99	<0.018
234678-hexachlorodibenzofuran	<4.8	<0.59	<1.02	<0.80	<0.85	<0.015
123789-hexachlorodibenzofuran	<6.9	<0.85	<1.47	<1.15	<1.21	<0.022
1234678-heptachlorodibenzofuran	25.5	3.14	5.44	4.24	4.49	0.082
1234789-heptachlorodibenzofuran	<5.3	<0.65	<1.13	<0.88	<0.93	<0.017
Octachlorodibenzofuran	13.2	1.62	2.82	2.19	2.32	0.043
PCB 81	<17	<2.09	<3.63	<2.82	<2.99	<0.055
PCB 77	402	49.4	85.8	66.8	70.8	1.30
PCB 123	128	15.7	27.3	21.3	22.5	0.41
PCB 118	8660	1065	1848	1438	1525	27.9
PCB 114	224	27.5	47.8	37.2	39.4	0.72
PCB 105	2600	320	555	432	458	8.38
PCB 126	<18	<2.21	<3.84	<2.99	<3.17	<0.058
PCB 167	67.8	8.34	14.5	11.3	11.9	0.22
PCB 156/157	190	23.4	40.5	31.6	33.5	0.61
PCB 169	<5.80	<0.71	<1.24	<0.96	<1.02	<0.019
PCB 189	<2.70	<0.33	<0.58	<0.45	<0.48	<0.0087
Total Dioxins & Furans Only	<198	<24.3	<42.1	<32.8	<34.8	<0.64
Total PCBs Only	<12315	<1515	<2628	<2046	<2169	<39.7
Total Dioxins & Furans and PCBs	<12513	<1539	<2670	<2078	<2203	<40.3

Dry Gas Volume Sampled (Rm³*) :	4.686
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	18.3

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

Specific Isomer	Actual Concentration Test No. 1 pg/m³	Test No. 2 pg/m³	Test No. 3 pg/m³	Average pg/m³	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.89	<1.31	<0.86	<1.02	24.6
12378-pentachlorodibenzo-p-dioxin	<0.66	<0.70	<0.57	<0.64	11.0
123478-hexachlorodibenzo-p-dioxin	<0.82	<0.87	<0.60	<0.76	18.6
123678-hexachlorodibenzo-p-dioxin	<0.64	0.84	<0.47	<0.65	28.6
123789-hexachlorodibenzo-p-dioxin	<0.78	<0.85	<0.58	<0.74	19.1
1234678-heptachlorodibenzo-p-dioxin	8.92	<5.24	4.00	<6.05	42.3
Octachlorodibenzo-p-dioxin	19.8	<7.03	6.76	<11.2	66.5
2378-tetrachlorodibenzofuran	<0.63	2.23	<0.75	<1.20	74.1
12378-pentachlorodibenzofuran	<0.62	1.25	<0.63	<0.83	43.7
23478-pentachlorodibenzofuran	<0.70	4.84	<0.76	<2.10	113
123478-hexachlorodibenzofuran	<0.85	2.18	<0.77	<1.27	62.5
123678-hexachlorodibenzofuran	<0.70	<1.67	<0.69	<1.02	55.2
234678-hexachlorodibenzofuran	<0.82	<2.15	<0.59	<1.19	70.8
123789-hexachlorodibenzofuran	<1.20	<1.79	<0.85	<1.28	37.2
1234678-heptachlorodibenzofuran	<3.74	3.77	3.14	<3.55	10.1
1234789-heptachlorodibenzofuran	1.24	<0.62	<0.65	<0.84	41.9
Octachlorodibenzofuran	4.59	1.41	1.62	2.54	70.0
PCB 81	<2.05	<1.31	<2.09	<1.82	24.2
PCB 77	33.6	15.1	49.4	32.7	52.5
PCB 123	<13.3	<6.08	15.7	<11.7	42.9
PCB 118	969	470	1065	835	38.3
PCB 114	24.9	11.9	27.5	21.4	39.0
PCB 105	301	125	320	248	43.2
PCB 126	<1.21	<1.31	<2.21	<1.58	35.1
PCB 167	8.91	<2.74	8.34	<6.66	51.2
PCB 156/157	25.2	10.4	23.4	19.7	41.2
PCB 169	<0.58	0.74	<0.71	<0.68	12.6
PCB 189	<0.52	<0.45	<0.33	<0.43	21.8
Total Dioxins & Furans Only	<47.6	<38.7	<24.3	<36.9	31.9
Total PCBs Only	<1380	<645	<1515	<1180	39.7
Total Dioxins & Furans and PCBs	<1428	<684	<1539	<1217	38.2

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 Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<1.55	<2.28	<1.49	<1.77	24.7
12378-pentachlorodibenzo-p-dioxin	<1.15	<1.22	<0.98	<1.12	11.0
123478-hexachlorodibenzo-p-dioxin	<1.42	<1.51	<1.05	<1.33	18.6
123678-hexachlorodibenzo-p-dioxin	<1.11	1.46	<0.81	<1.13	28.7
123789-hexachlorodibenzo-p-dioxin	<1.36	<1.47	<1.00	<1.28	19.1
1234678-heptachlorodibenzo-p-dioxin	15.5	<9.11	6.94	<10.5	42.2
Octachlorodibenzo-p-dioxin	34.3	<12.2	11.7	<19.4	66.4
2378-tetrachlorodibenzofuran	<1.09	3.87	<1.30	<2.09	74.2
12378-pentachlorodibenzofuran	<1.07	2.17	<1.09	<1.44	43.9
23478-pentachlorodibenzofuran	<1.21	8.41	<1.32	<3.65	113
123478-hexachlorodibenzofuran	<1.47	3.79	<1.34	<2.20	62.6
123678-hexachlorodibenzofuran	<1.21	<2.90	<1.20	<1.77	55.3
234678-hexachlorodibenzofuran	<1.42	<3.73	<1.02	<2.06	70.9
123789-hexachlorodibenzofuran	<2.07	<3.11	<1.47	<2.22	37.3
1234678-heptachlorodibenzofuran	<6.49	6.54	5.44	<6.16	10.1
1234789-heptachlorodibenzofuran	2.16	<1.08	<1.13	<1.45	41.8
Octachlorodibenzofuran	7.95	2.44	2.82	4.40	69.9
PCB 81	<3.56	<2.28	<3.63	<3.15	24.1
PCB 77	58.2	26.3	85.8	56.8	52.5
PCB 123	<23.0	<10.6	27.3	<20.3	42.9
PCB 118	1681	816	1848	1448	38.3
PCB 114	43.1	20.7	47.8	37.2	38.9
PCB 105	521	217	555	431	43.1
PCB 126	<2.09	<2.28	<3.84	<2.74	35.1
PCB 167	15.4	<4.76	14.5	<11.6	51.1
PCB 156/157	43.7	18.0	40.5	34.1	41.1
PCB 169	<1.00	1.28	<1.24	<1.18	12.7
PCB 189	<0.90	<0.79	<0.58	<0.75	21.8
Total Dioxins & Furans Only	<82.5	<67.3	<42.1	<64.0	31.9
Total PCBs Only	<2393	<1120	<2628	<2047	39.6
Total Dioxins & Furans and PCBs	<2475	<1187	<2670	<2111	38.2

* 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.22	<1.77	<1.16	<1.38	24.1
12378-pentachlorodibenzo-p-dioxin	<0.91	<0.95	<0.76	<0.87	11.1
123478-hexachlorodibenzo-p-dioxin	<1.12	<1.17	<0.81	<1.04	18.8
123678-hexachlorodibenzo-p-dioxin	<0.88	1.13	<0.63	<0.88	28.4
123789-hexachlorodibenzo-p-dioxin	<1.07	<1.14	<0.78	<1.00	19.2
1234678-heptachlorodibenzo-p-dioxin	12.2	<7.07	5.40	<8.23	43.2
Octachlorodibenzo-p-dioxin	27.1	<9.48	9.14	<15.2	67.4
2378-tetrachlorodibenzofuran	<0.86	3.00	<1.01	<1.63	73.6
12378-pentachlorodibenzofuran	<0.84	1.69	<0.85	<1.13	43.2
23478-pentachlorodibenzofuran	<0.96	6.52	<1.03	<2.84	113
123478-hexachlorodibenzofuran	<1.16	2.94	<1.05	<1.71	62.0
123678-hexachlorodibenzofuran	<0.96	<2.25	<0.93	<1.38	54.6
234678-hexachlorodibenzofuran	<1.12	<2.89	<0.80	<1.60	70.3
123789-hexachlorodibenzofuran	<1.64	<2.41	<1.15	<1.73	36.8
1234678-heptachlorodibenzofuran	<5.12	5.08	4.24	<4.81	10.4
1234789-heptachlorodibenzofuran	1.70	<0.84	<0.88	<1.14	42.8
Octachlorodibenzofuran	6.28	1.90	2.19	3.46	70.9
PCB 81	<2.81	<1.77	<2.82	<2.47	24.6
PCB 77	45.9	20.4	66.8	44.4	52.3
PCB 123	<18.2	<8.20	21.3	<15.9	43.0
PCB 118	1327	633	1438	1133	38.5
PCB 114	34.0	16.1	37.2	29.1	39.2
PCB 105	412	169	432	337	43.4
PCB 126	<1.65	<1.77	<2.99	<2.14	34.7
PCB 167	12.2	<3.70	11.3	<9.05	51.5
PCB 156/157	34.5	14.0	31.6	26.7	41.6
PCB 169	<0.79	1.00	<0.96	<0.92	11.9
PCB 189	<0.71	<0.61	<0.45	<0.59	22.4
Total Dioxins & Furans Only	<65.2	<52.2	<32.8	<50.1	32.5
Total PCBs Only	<1890	<869	<2046	<1602	39.9
Total Dioxins & Furans and PCBs	<1955	<922	<2078	<1652	38.5

* 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 Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<1.28	<1.88	<1.23	<1.46	24.6
12378-pentachlorodibenzo-p-dioxin	<0.95	<1.01	<0.81	<0.92	11.1
123478-hexachlorodibenzo-p-dioxin	<1.18	<1.25	<0.86	<1.10	18.7
123678-hexachlorodibenzo-p-dioxin	<0.92	1.20	<0.67	<0.93	28.6
123789-hexachlorodibenzo-p-dioxin	<1.13	<1.21	<0.83	<1.06	19.2
1234678-heptachlorodibenzo-p-dioxin	12.8	<7.52	5.72	<8.68	42.4
Octachlorodibenzo-p-dioxin	28.4	<10.1	9.68	<16.1	66.6
2378-tetrachlorodibenzofuran	<0.90	3.20	<1.07	<1.72	74.1
12378-pentachlorodibenzofuran	<0.88	1.79	<0.90	<1.19	43.8
23478-pentachlorodibenzofuran	<1.01	6.94	<1.09	<3.01	113
123478-hexachlorodibenzofuran	<1.21	3.13	<1.11	<1.82	62.6
123678-hexachlorodibenzofuran	<1.01	<2.39	<0.99	<1.46	55.2
234678-hexachlorodibenzofuran	<1.18	<3.08	<0.85	<1.70	70.8
123789-hexachlorodibenzofuran	<1.72	<2.56	<1.21	<1.83	37.2
1234678-heptachlorodibenzofuran	<5.37	5.40	4.49	<5.09	10.2
1234789-heptachlorodibenzofuran	1.78	<0.89	<0.93	<1.20	42.0
Octachlorodibenzofuran	6.58	2.02	2.32	3.64	70.1
PCB 81	<2.95	<1.88	<2.99	<2.61	24.2
PCB 77	48.2	21.7	70.8	46.9	52.4
PCB 123	<19.1	<8.72	22.5	<16.8	42.9
PCB 118	1391	673	1525	1197	38.3
PCB 114	35.7	17.1	39.4	30.7	38.9
PCB 105	431	179	458	356	43.1
PCB 126	<1.73	<1.88	<3.17	<2.26	35.0
PCB 167	12.8	<3.93	11.9	<9.55	51.2
PCB 156/157	36.2	14.9	33.5	28.2	41.2
PCB 169	<0.83	1.06	<1.02	<0.97	12.6
PCB 189	<0.75	<0.65	<0.48	<0.62	21.9
Total Dioxins & Furans Only	<68.3	<55.5	<34.8	<52.9	32.0
Total PCBs Only	<1981	<925	<2169	<1691	39.7
Total Dioxins & Furans and PCBs	<2049	<980	<2203	<1744	38.2

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

Specific Isomer	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.024	<0.036	<0.023	<0.027	26.2
12378-pentachlorodibenzo-p-dioxin	<0.018	<0.019	<0.015	<0.017	12.6
123478-hexachlorodibenzo-p-dioxin	<0.022	<0.024	<0.016	<0.020	20.1
123678-hexachlorodibenzo-p-dioxin	<0.017	0.023	<0.012	<0.017	30.2
123789-hexachlorodibenzo-p-dioxin	<0.021	<0.023	<0.015	<0.020	20.6
1234678-heptachlorodibenzo-p-dioxin	0.24	<0.14	0.10	<0.16	42.6
Octachlorodibenzo-p-dioxin	0.53	<0.19	0.18	<0.30	66.6
2378-tetrachlorodibenzofuran	<0.017	0.060	<0.020	<0.032	75.6
12378-pentachlorodibenzofuran	<0.016	0.034	<0.016	<0.022	45.3
23478-pentachlorodibenzofuran	<0.019	0.13	<0.020	<0.057	114
123478-hexachlorodibenzofuran	<0.023	0.059	<0.020	<0.034	64.1
123678-hexachlorodibenzofuran	<0.019	<0.045	<0.018	<0.027	56.8
234678-hexachlorodibenzofuran	<0.022	<0.058	<0.015	<0.032	72.2
123789-hexachlorodibenzofuran	<0.032	<0.048	<0.022	<0.034	38.8
1234678-heptachlorodibenzofuran	<0.10	0.10	0.082	<0.095	11.5
1234789-heptachlorodibenzofuran	0.033	<0.017	<0.017	<0.022	42.0
Octachlorodibenzofuran	0.12	0.038	0.043	0.068	70.1
PCB 81	<0.055	<0.036	<0.055	<0.048	23.0
PCB 77	0.90	0.41	1.30	0.87	51.1
PCB 123	<0.35	<0.16	0.41	<0.31	41.7
PCB 118	25.9	12.7	27.9	22.2	37.2
PCB 114	0.66	0.32	0.72	0.57	37.8
PCB 105	8.03	3.39	8.38	6.60	42.2
PCB 126	<0.032	<0.036	<0.058	<0.042	33.5
PCB 167	0.24	<0.074	0.22	<0.18	50.5
PCB 156/157	0.67	0.28	0.61	0.52	40.4
PCB 169	<0.015	0.020	<0.019	<0.018	13.0
PCB 189	<0.014	<0.012	<0.0087	<0.012	22.8
Total Dioxins & Furans Only	<1.27	<1.05	<0.64	<0.99	32.7
Total PCBs Only	<36.8	<17.5	<39.7	<31.3	38.6
Total Dioxins & Furans and PCBs	<38.1	<18.5	<40.3	<32.3	37.1

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 pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.02	<1.77	<1.38	<1.46	<0.027
12378-pentachlorodibenzo-p-dioxin	<0.64	<1.12	<0.87	<0.92	<0.017
123478-hexachlorodibenzo-p-dioxin	<0.76	<1.33	<1.04	<1.10	<0.020
123678-hexachlorodibenzo-p-dioxin	<0.65	<1.13	<0.88	<0.93	<0.017
123789-hexachlorodibenzo-p-dioxin	<0.74	<1.28	<1.00	<1.06	<0.020
1234678-heptachlorodibenzo-p-dioxin	<6.05	<10.5	<8.23	<8.68	<0.16
Octachlorodibenzo-p-dioxin	<11.2	<19.4	<15.2	<16.1	<0.30
2378-tetrachlorodibenzofuran	<1.20	<2.09	<1.63	<1.72	<0.032
12378-pentachlorodibenzofuran	<0.83	<1.44	<1.13	<1.19	<0.022
23478-pentachlorodibenzofuran	<2.10	<3.65	<2.84	<3.01	<0.057
123478-hexachlorodibenzofuran	<1.27	<2.20	<1.71	<1.82	<0.034
123678-hexachlorodibenzofuran	<1.02	<1.77	<1.38	<1.46	<0.027
234678-hexachlorodibenzofuran	<1.19	<2.06	<1.60	<1.70	<0.032
123789-hexachlorodibenzofuran	<1.28	<2.22	<1.73	<1.83	<0.034
1234678-heptachlorodibenzofuran	<3.55	<6.16	<4.81	<5.09	<0.095
1234789-heptachlorodibenzofuran	<0.84	<1.45	<1.14	<1.20	<0.022
Octachlorodibenzofuran	2.54	4.40	3.46	3.64	0.068
PCB 81	<1.82	<3.15	<2.47	<2.61	<0.048
PCB 77	32.7	56.8	44.4	46.9	0.87
PCB 123	<11.7	<20.3	<15.9	<16.8	<0.31
PCB 118	835	1448	1133	1197	22.2
PCB 114	21.4	37.2	29.1	30.7	0.57
PCB 105	248	431	337	356	6.60
PCB 126	<1.58	<2.74	<2.14	<2.26	<0.042
PCB 167	<6.66	<11.6	<9.05	<9.55	<0.18
PCB 156/157	19.7	34.1	26.7	28.2	0.52
PCB 169	<0.68	<1.18	<0.92	<0.97	<0.018
PCB 189	<0.43	<0.75	<0.59	<0.62	<0.012
Total Dioxins & Furans Only	<36.9	<64.0	<50.1	<52.9	<0.99
Total PCBs Only	<1180	<2047	<1602	<1691	<31.3
Total Dioxins & Furans and PCBs	<1217	<2111	<1652	<1744	<32.3

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

Specific Isomer	Blank Train pg	Laboratory Blank pg
2378-tetrachlorodibenzo-p-dioxin	<8.5	<7.6
12378-pentachlorodibenzo-p-dioxin	<5.0	<3.8
123478-hexachlorodibenzo-p-dioxin	<4.2	<4.8
123678-hexachlorodibenzo-p-dioxin	<3.3	<3.8
123789-hexachlorodibenzo-p-dioxin	<4.0	<4.6
1234678-heptachlorodibenzo-p-dioxin	5.21	<2.4
Octachlorodibenzo-p-dioxin	<24	<2.8
2378-tetrachlorodibenzofuran	<6.7	<5.0
12378-pentachlorodibenzofuran	<4.2	<3.6
23478-pentachlorodibenzofuran	<3.8	<3.2
123478-hexachlorodibenzofuran	<4.3	<2.7
123678-hexachlorodibenzofuran	<3.6	<2.2
234678-hexachlorodibenzofuran	<4.2	<2.6
123789-hexachlorodibenzofuran	<6.0	<3.8
1234678-heptachlorodibenzofuran	<4.8	<2.6
1234789-heptachlorodibenzofuran	<3.4	<2.8
Octachlorodibenzofuran	13.0	<3.1
PCB 81	<5.6	<6.4
PCB 77	<6.1	<6.6
PCB 123	<6.0	<6.2
PCB 118	13.0	<12
PCB 114	<6.0	<6.1
PCB 105	<5.9	<5.7
PCB 126	<6.5	<6.4
PCB 167	<2.9	<2.5
PCB 156/157	<4.3	6.62
PCB 169	<3.4	<2.9
PCB 189	<2.9	<3.4
Total Dioxins & Furans Only	<108	<61.4
Total PCBs Only	<62.6	<64.8
Total Dioxins & Furans and PCBs	<171	<126

"<" 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	1.00000	<0.89	<1.31	<0.86	<1.02
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.66	<0.70	<0.57	<0.64
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.082	<0.087	<0.060	<0.076
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.064	0.084	<0.047	<0.065
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.078	<0.085	<0.058	<0.074
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.089	<0.052	0.040	<0.061
Octachlorodibenzo-p-dioxin	0.00030	0.0059	<0.0021	0.0020	<0.0034
2378-tetrachlorodibenzofuran	0.10000	<0.063	0.22	<0.075	<0.12
12378-pentachlorodibenzofuran	0.03000	<0.018	0.038	<0.019	<0.025
23478-pentachlorodibenzofuran	0.30000	<0.21	1.45	<0.23	<0.63
123478-hexachlorodibenzofuran	0.10000	<0.085	0.22	<0.077	<0.13
123678-hexachlorodibenzofuran	0.10000	<0.070	<0.17	<0.069	<0.10
234678-hexachlorodibenzofuran	0.10000	<0.082	<0.21	<0.059	<0.12
123789-hexachlorodibenzofuran	0.10000	<0.12	<0.18	<0.085	<0.13
1234678-heptachlorodibenzofuran	0.01000	<0.037	0.038	0.031	<0.035
1234789-heptachlorodibenzofuran	0.01000	0.012	<0.0062	<0.0065	<0.0084
Octachlorodibenzofuran	0.00030	0.0014	0.00042	0.00049	0.00076
PCB 81	0.00030	<0.00062	<0.00039	<0.00063	<0.00055
PCB 77	0.00010	0.0034	0.0015	0.0049	0.0033
PCB 123	0.00003	<0.00040	<0.00018	0.00047	<0.00035
PCB 118	0.00003	0.029	0.014	0.032	0.025
PCB 114	0.00003	0.00075	0.00036	0.00083	0.00064
PCB 105	0.00003	0.0090	0.0038	0.0096	0.0075
PCB 126	0.10000	<0.12	<0.13	<0.22	<0.16
PCB 167	0.00003	0.00027	<0.000082	0.00025	<0.00020
PCB 156/157	0.00003	0.00076	0.00031	0.00070	0.00059
PCB 169	0.03000	<0.017	0.022	<0.021	<0.020
PCB 189	0.00003	<0.000016	<0.000014	<0.000010	<0.000013
Total Dioxins & Furans Only		<2.58	<4.86	<2.28	<3.24
Total PCBs Only		<0.18	<0.17	<0.29	<0.22
Total Dioxins & Furans and PCBs		<2.76	<5.03	<2.58	<3.46

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	1.00000	<1.55	<2.28	<1.49	<1.77
12378-pentachlorodibenzo-p-dioxin	1.00000	<1.15	<1.22	<0.98	<1.12
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.14	<0.15	<0.10	<0.13
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.11	0.15	<0.081	<0.11
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.14	<0.15	<0.10	<0.13
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.15	<0.091	0.069	<0.11
Octachlorodibenzo-p-dioxin	0.00030	0.010	<0.0037	0.0035	<0.0058
2378-tetrachlorodibenzofuran	0.10000	<0.11	0.39	<0.13	<0.21
12378-pentachlorodibenzofuran	0.03000	<0.032	0.065	<0.033	<0.043
23478-pentachlorodibenzofuran	0.30000	<0.36	2.52	<0.40	<1.09
123478-hexachlorodibenzofuran	0.10000	<0.15	0.38	<0.13	<0.22
123678-hexachlorodibenzofuran	0.10000	<0.12	<0.29	<0.12	<0.18
234678-hexachlorodibenzofuran	0.10000	<0.14	<0.37	<0.10	<0.21
123789-hexachlorodibenzofuran	0.10000	<0.21	<0.31	<0.15	<0.22
1234678-heptachlorodibenzofuran	0.01000	<0.065	0.065	0.054	<0.062
1234789-heptachlorodibenzofuran	0.01000	0.022	<0.011	<0.011	<0.015
Octachlorodibenzofuran	0.00030	0.0024	0.00073	0.00085	0.0013
PCB 81	0.00030	<0.0011	<0.00068	<0.0011	<0.00095
PCB 77	0.00010	0.0058	0.0026	0.0086	0.0057
PCB 123	0.00003	<0.00069	<0.00032	0.00082	<0.00061
PCB 118	0.00003	0.050	0.024	0.055	0.043
PCB 114	0.00003	0.0013	0.00062	0.0014	0.0011
PCB 105	0.00003	0.016	0.0065	0.017	0.013
PCB 126	0.10000	<0.21	<0.23	<0.38	<0.27
PCB 167	0.00003	0.00046	<0.00014	0.00043	<0.00035
PCB 156/157	0.00003	0.0013	0.00054	0.0012	0.0010
PCB 169	0.03000	<0.030	0.039	<0.037	<0.035
PCB 189	0.00003	<0.000027	<0.000024	<0.000017	<0.000023
Total Dioxins & Furans Only		<4.47	<8.44	<3.96	<5.62
Total PCBs Only		<0.32	<0.30	<0.51	<0.38
Total Dioxins & Furans and PCBs		<4.78	<8.74	<4.47	<6.00

* 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	1.00000	<1.22	<1.77	<1.16	<1.38
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.91	<0.95	<0.76	<0.87
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.11	<0.12	<0.081	<0.10
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.088	0.11	<0.063	<0.088
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.11	<0.11	<0.078	<0.100
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.12	<0.071	0.054	<0.082
Octachlorodibenzo-p-dioxin	0.00030	0.0081	<0.0028	0.0027	<0.0046
2378-tetrachlorodibenzofuran	0.10000	<0.086	0.30	<0.10	<0.16
12378-pentachlorodibenzofuran	0.03000	<0.025	0.051	<0.025	<0.034
23478-pentachlorodibenzofuran	0.30000	<0.29	1.96	<0.31	<0.85
123478-hexachlorodibenzofuran	0.10000	<0.12	0.29	<0.10	<0.17
123678-hexachlorodibenzofuran	0.10000	<0.096	<0.22	<0.093	<0.14
234678-hexachlorodibenzofuran	0.10000	<0.11	<0.29	<0.080	<0.16
123789-hexachlorodibenzofuran	0.10000	<0.16	<0.24	<0.11	<0.17
1234678-heptachlorodibenzofuran	0.01000	<0.051	0.051	0.042	<0.048
1234789-heptachlorodibenzofuran	0.01000	0.017	<0.0084	<0.0088	<0.011
Octachlorodibenzofuran	0.00030	0.0019	0.00057	0.00066	0.0010
PCB 81	0.00030	<0.00084	<0.00053	<0.00085	<0.00074
PCB 77	0.00010	0.0046	0.0020	0.0067	0.0044
PCB 123	0.00003	<0.00055	<0.00025	0.00064	<0.00048
PCB 118	0.00003	0.040	0.019	0.043	0.034
PCB 114	0.00003	0.0010	0.00048	0.0011	0.00087
PCB 105	0.00003	0.012	0.0051	0.013	0.010
PCB 126	0.10000	<0.17	<0.18	<0.30	<0.21
PCB 167	0.00003	0.00037	<0.00011	0.00034	<0.00027
PCB 156/157	0.00003	0.0010	0.00042	0.00095	0.00080
PCB 169	0.03000	<0.024	0.030	<0.029	<0.028
PCB 189	0.00003	<0.000021	<0.000018	<0.000013	<0.000018
Total Dioxins & Furans Only		<3.53	<6.55	<3.09	<4.39
Total PCBs Only		<0.25	<0.23	<0.39	<0.29
Total Dioxins & Furans and PCBs		<3.78	<6.79	<3.48	<4.68

* 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	1.00000	0.61	0.88	0.58	0.69
12378-pentachlorodibenzo-p-dioxin	1.00000	0.45	0.47	0.38	0.44
123478-hexachlorodibenzo-p-dioxin	0.10000	0.056	0.059	0.041	0.052
123678-hexachlorodibenzo-p-dioxin	0.10000	0.044	0.11	0.032	0.063
123789-hexachlorodibenzo-p-dioxin	0.10000	0.054	0.057	0.039	0.050
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.12	0.035	0.054	0.070
Octachlorodibenzo-p-dioxin	0.00030	0.0081	0.0014	0.0027	0.0041
2378-tetrachlorodibenzofuran	0.10000	0.043	0.30	0.051	0.13
12378-pentachlorodibenzofuran	0.03000	0.013	0.051	0.013	0.025
23478-pentachlorodibenzofuran	0.30000	0.14	1.96	0.15	0.75
123478-hexachlorodibenzofuran	0.10000	0.058	0.29	0.052	0.13
123678-hexachlorodibenzofuran	0.10000	0.048	0.11	0.047	0.069
234678-hexachlorodibenzofuran	0.10000	0.056	0.14	0.040	0.080
123789-hexachlorodibenzofuran	0.10000	0.082	0.12	0.057	0.087
1234678-heptachlorodibenzofuran	0.01000	0.026	0.051	0.042	0.040
1234789-heptachlorodibenzofuran	0.01000	0.017	0.0042	0.0044	0.0085
Octachlorodibenzofuran	0.00030	0.0019	0.00057	0.00066	0.0010
PCB 81	0.00030	0.00042	0.00027	0.00042	0.00037
PCB 77	0.00010	0.0046	0.0020	0.0067	0.0044
PCB 123	0.00003	0.00027	0.00012	0.00064	0.00034
PCB 118	0.00003	0.040	0.019	0.043	0.034
PCB 114	0.00003	0.0010	0.000482	0.0011	0.00087
PCB 105	0.00003	0.012	0.0051	0.013	0.010
PCB 126	0.10000	0.083	0.088	0.15	0.11
PCB 167	0.00003	0.00037	0.000055	0.00034	0.00025
PCB 156/157	0.00003	0.0010	0.00042	0.00095	0.00080
PCB 169	0.03000	0.012	0.030	0.014	0.019
PCB 189	0.00003	0.000011	0.0000092	0.0000067	0.0000088
Total Dioxins & Furans Only		1.84	4.66	1.59	2.70
Total PCBs Only		0.15	0.15	0.23	0.18
Total Dioxins & Furans and PCBs		1.99	4.80	1.82	2.87

* 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	1.000	<1.22	<1.77	<1.16	<1.38
12378-pentachlorodibenzo-p-dioxin	0.500	<0.45	<0.47	<0.38	<0.44
123478-hexachlorodibenzo-p-dioxin	0.100	<0.11	<0.12	<0.081	<0.10
123678-hexachlorodibenzo-p-dioxin	0.100	<0.088	0.11	<0.063	<0.088
123789-hexachlorodibenzo-p-dioxin	0.100	<0.11	<0.11	<0.078	<0.10
1234678-heptachlorodibenzo-p-dioxin	0.010	0.12	<0.071	0.054	<0.082
Octachlorodibenzo-p-dioxin	0.001	0.027	<0.0095	0.0091	<0.015
2378-tetrachlorodibenzofuran	0.100	<0.086	0.30	<0.10	<0.16
12378-pentachlorodibenzofuran	0.050	<0.042	0.084	<0.042	<0.056
23478-pentachlorodibenzofuran	0.500	<0.48	3.26	<0.51	<1.42
123478-hexachlorodibenzofuran	0.100	<0.12	0.29	<0.10	<0.17
123678-hexachlorodibenzofuran	0.100	<0.096	<0.22	<0.093	<0.14
234678-hexachlorodibenzofuran	0.100	<0.11	<0.29	<0.080	<0.16
123789-hexachlorodibenzofuran	0.100	<0.16	<0.24	<0.11	<0.17
1234678-heptachlorodibenzofuran	0.010	<0.051	0.051	0.042	<0.048
1234789-heptachlorodibenzofuran	0.010	0.017	<0.0084	<0.0088	<0.011
Octachlorodibenzofuran	0.001	0.0063	0.0019	0.0022	0.0035
Total Dioxins & Furans		<3.30	<7.42	<2.93	<4.55
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	1.00000	<1.28	<1.88	<1.23	<1.46
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.95	<1.01	<0.81	<0.92
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.12	<0.12	<0.086	<0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.092	0.12	<0.067	<0.093
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.11	<0.12	<0.083	<0.11
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.13	<0.075	0.057	<0.087
Octachlorodibenzo-p-dioxin	0.00030	0.0085	<0.0030	0.0029	<0.0048
2378-tetrachlorodibenzofuran	0.10000	<0.090	0.32	<0.11	<0.17
12378-pentachlorodibenzofuran	0.03000	<0.027	0.054	<0.027	<0.036
23478-pentachlorodibenzofuran	0.30000	<0.30	2.08	<0.33	<0.90
123478-hexachlorodibenzofuran	0.10000	<0.12	0.31	<0.11	<0.18
123678-hexachlorodibenzofuran	0.10000	<0.10	<0.24	<0.099	<0.15
234678-hexachlorodibenzofuran	0.10000	<0.12	<0.31	<0.085	<0.17
123789-hexachlorodibenzofuran	0.10000	<0.17	<0.26	<0.12	<0.18
1234678-heptachlorodibenzofuran	0.01000	<0.054	0.054	0.045	<0.051
1234789-heptachlorodibenzofuran	0.01000	0.018	<0.0089	<0.0093	<0.012
Octachlorodibenzofuran	0.00030	0.0020	0.00060	0.00070	0.0011
PCB 81	0.00030	<0.00088	<0.00056	<0.00090	<0.00078
PCB 77	0.00010	0.0048	0.0022	0.0071	0.0047
PCB 123	0.00003	<0.00057	<0.00026	0.00068	<0.00050
PCB 118	0.00003	0.042	0.020	0.046	0.036
PCB 114	0.00003	0.0011	0.00051	0.0012	0.00092
PCB 105	0.00003	0.013	0.0054	0.014	0.011
PCB 126	0.10000	<0.17	<0.19	<0.32	<0.23
PCB 167	0.00003	0.00038	<0.00012	0.00036	<0.00029
PCB 156/157	0.00003	0.0011	0.00045	0.0010	0.00085
PCB 169	0.03000	<0.025	0.032	<0.031	<0.029
PCB 189	0.00003	<0.000022	<0.000019	<0.000014	<0.000019
Total Dioxins & Furans Only		<3.70	<6.97	<3.27	<4.64
Total PCBs Only		<0.26	<0.25	<0.42	<0.31
Total Dioxins & Furans and PCBs		<3.96	<7.22	<3.69	<4.95

* 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	1.00000	<0.024	<0.036	<0.023	<0.027
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.018	<0.019	<0.015	<0.017
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.0022	<0.0024	<0.0016	<0.0020
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.0017	0.0023	<0.0012	<0.0017
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.0021	<0.0023	<0.0015	<0.0020
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.0024	<0.0014	0.0010	<0.0016
Octachlorodibenzo-p-dioxin	0.00030	0.00016	<0.000057	0.000053	<0.000090
2378-tetrachlorodibenzofuran	0.10000	<0.0017	0.0060	<0.0020	<0.0032
12378-pentachlorodibenzofuran	0.03000	<0.00049	0.0010	<0.00049	<0.00067
23478-pentachlorodibenzofuran	0.30000	<0.0056	0.039	<0.0060	<0.017
123478-hexachlorodibenzofuran	0.10000	<0.0023	0.0059	<0.0020	<0.0034
123678-hexachlorodibenzofuran	0.10000	<0.0019	<0.0045	<0.0018	<0.0027
234678-hexachlorodibenzofuran	0.10000	<0.0022	<0.0058	<0.0015	<0.0032
123789-hexachlorodibenzofuran	0.10000	<0.0032	<0.0048	<0.0022	<0.0034
1234678-heptachlorodibenzofuran	0.01000	<0.0010	0.0010	0.00082	<0.00095
1234789-heptachlorodibenzofuran	0.01000	0.00033	<0.00017	<0.00017	<0.00022
Octachlorodibenzofuran	0.00030	0.000037	0.000011	0.000013	0.000020
PCB 81	0.00030	<0.000016	<0.000011	<0.000016	<0.000015
PCB 77	0.00010	0.000090	0.000041	0.00013	0.000087
PCB 123	0.00003	<0.000011	<0.0000049	0.000012	<0.0000093
PCB 118	0.00003	0.00078	0.00038	0.00084	0.00067
PCB 114	0.00003	0.000020	0.0000097	0.000022	0.000017
PCB 105	0.00003	0.00024	0.00010	0.00025	0.00020
PCB 126	0.10000	<0.0032	<0.0036	<0.0058	<0.0042
PCB 167	0.00003	0.0000071	<0.0000022	0.0000066	<0.0000053
PCB 156/157	0.00003	0.000020	0.0000084	0.000018	0.000016
PCB 169	0.03000	<0.00046	0.00060	<0.00056	<0.00054
PCB 189	0.00003	<0.00000042	<0.00000037	<0.00000026	<0.00000035
Total Dioxins & Furans Only		<0.069	<0.13	<0.060	<0.087
Total PCBs Only		<0.0049	<0.0047	<0.0077	<0.0057
Total Dioxins & Furans and PCBs		<0.074	<0.14	<0.068	<0.093

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	<1.02	<1.77	<1.38	<1.46	<0.027
12378-pentachlorodibenzo-p-dioxin	<0.64	<1.12	<0.87	<0.92	<0.017
123478-hexachlorodibenzo-p-dioxin	<0.076	<0.13	<0.10	<0.11	<0.0020
123678-hexachlorodibenzo-p-dioxin	<0.065	<0.11	<0.088	<0.093	<0.0017
123789-hexachlorodibenzo-p-dioxin	<0.074	<0.13	<0.10	<0.11	<0.0020
1234678-heptachlorodibenzo-p-dioxin	<0.061	<0.11	<0.082	<0.087	<0.0016
Octachlorodibenzo-p-dioxin	<0.0034	<0.0058	<0.0046	<0.0048	<0.000090
2378-tetrachlorodibenzofuran	<0.12	<0.21	<0.16	<0.17	<0.0032
12378-pentachlorodibenzofuran	<0.025	<0.043	<0.034	<0.036	<0.00067
23478-pentachlorodibenzofuran	<0.63	<1.09	<0.85	<0.90	<0.017
123478-hexachlorodibenzofuran	<0.13	<0.22	<0.17	<0.18	<0.0034
123678-hexachlorodibenzofuran	<0.10	<0.18	<0.14	<0.15	<0.0027
234678-hexachlorodibenzofuran	<0.12	<0.21	<0.16	<0.17	<0.0032
123789-hexachlorodibenzofuran	<0.13	<0.22	<0.17	<0.18	<0.0034
1234678-heptachlorodibenzofuran	<0.035	<0.062	<0.048	<0.051	<0.00095
1234789-heptachlorodibenzofuran	<0.0084	<0.015	<0.011	<0.012	<0.00022
Octachlorodibenzofuran	0.00076	0.0013	0.0010	0.0011	0.000020
PCB 81	<0.00055	<0.00095	<0.00074	<0.00078	<0.000015
PCB 77	0.0033	0.0057	0.0044	0.0047	0.000087
PCB 123	<0.00035	<0.00061	<0.00048	<0.00050	<0.0000093
PCB 118	0.025	0.043	0.034	0.036	0.00067
PCB 114	0.00064	0.0011	0.00087	0.00092	0.000017
PCB 105	0.0075	0.013	0.010	0.011	0.00020
PCB 126	<0.16	<0.27	<0.21	<0.23	<0.0042
PCB 167	<0.00020	<0.00035	<0.00027	<0.00029	<0.0000053
PCB 156/157	0.00059	0.0010	0.00080	0.00085	0.000016
PCB 169	<0.020	<0.035	<0.028	<0.029	<0.00054
PCB 189	<0.000013	<0.000023	<0.000018	<0.000019	<0.00000035
Total Dioxins & Furans Only	<3.24	<5.62	<4.39	<4.64	<0.087
Total PCBs Only	<0.22	<0.38	<0.29	<0.31	<0.0057
Total Dioxins & Furans and PCBs	<3.46	<6.00	<4.68	<4.95	<0.093

* 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 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	0.51	0.89	0.69	0.73	0.014
12378-pentachlorodibenzo-p-dioxin	0.32	0.56	0.44	0.46	0.0086
123478-hexachlorodibenzo-p-dioxin	0.038	0.066	0.052	0.055	0.0010
123678-hexachlorodibenzo-p-dioxin	0.046	0.081	0.063	0.067	0.0012
123789-hexachlorodibenzo-p-dioxin	0.037	0.064	0.050	0.053	0.00098
1234678-heptachlorodibenzo-p-dioxin	0.052	0.090	0.070	0.074	0.0014
Octachlorodibenzo-p-dioxin	0.0030	0.0052	0.0041	0.0043	0.000080
2378-tetrachlorodibenzofuran	0.097	0.17	0.13	0.14	0.0026
12378-pentachlorodibenzofuran	0.019	0.033	0.025	0.027	0.00050
23478-pentachlorodibenzofuran	0.56	0.97	0.75	0.80	0.015
123478-hexachlorodibenzofuran	0.10	0.17	0.13	0.14	0.0027
123678-hexachlorodibenzofuran	0.051	0.088	0.069	0.073	0.0014
234678-hexachlorodibenzofuran	0.059	0.10	0.080	0.085	0.0016
123789-hexachlorodibenzofuran	0.064	0.11	0.087	0.092	0.0017
1234678-heptachlorodibenzofuran	0.029	0.051	0.040	0.042	0.00078
1234789-heptachlorodibenzofuran	0.0063	0.011	0.0085	0.0090	0.00017
Octachlorodibenzofuran	0.00076	0.0013	0.0010	0.0011	0.000020
PCB 81	0.00027	0.00047	0.00037	0.00039	0.0000073
PCB 77	0.0033	0.0057	0.0044	0.0047	0.000087
PCB 123	0.0003	0.00044	0.00034	0.00036	0.0000067
PCB 118	0.025	0.043	0.034	0.036	0.00067
PCB 114	0.00064	0.0011	0.00087	0.00092	0.000017
PCB 105	0.0075	0.013	0.010	0.011	0.00020
PCB 126	0.079	0.14	0.11	0.11	0.0021
PCB 167	0.00019	0.00032	0.00025	0.00027	0.0000049
PCB 156/157	0.00059	0.0010	0.00080	0.00085	0.000016
PCB 169	0.014	0.024	0.019	0.020	0.00037
PCB 189	0.0000065	0.000011	0.0000088	0.0000093	0.00000017
Total Dioxins & Furans Only	1.99	3.46	2.70	2.86	0.053
Total PCBs Only	0.13	0.23	0.18	0.19	0.0035
Total Dioxins & Furans and PCBs	2.12	3.68	2.87	3.04	0.057

* 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 ng	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
Monochlorobenzene	2400	290	502	397	416	7.74
1,3-Dichlorobenzene	418	50.5	87.5	69.1	72.4	1.35
1,4-Dichlorobenzene	250	30.2	52.3	41.3	43.3	0.81
1,2-Dichlorobenzene	263	31.7	55.0	43.5	45.6	0.85
Total Dichlorobenzene	931	112	195	154	161	3.00
1,3,5-trichlorobenzene	27.3	3.30	5.71	4.51	4.73	0.088
1,2,4-trichlorobenzene	109	13.2	22.8	18.0	18.9	0.35
1,2,3-trichlorobenzene	30.9	3.73	6.47	5.11	5.35	0.10
Total Trichlorobenzene	167	20.2	35.0	27.6	29.0	0.54
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	16.6	2.00	3.47	2.74	2.88	0.054
1,2,3,4-tetrachlorobenzene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Total Tetrachlorobenzene	<26.6	<3.21	<5.57	<4.40	<4.61	<0.086
Pentachlorobenzene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Hexachlorobenzene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Total Chlorobenzenes	<3545	<428	<742	<586	<614	<11.4

Dry Gas Volume Sampled (Rm^3*) :	4.778
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* 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 ng	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
Monochlorobenzene	2020	241	418	325	345	6.52
1,3-Dichlorobenzene	407	48.5	84.3	65.4	69.6	1.31
1,4-Dichlorobenzene	225	26.8	46.6	36.2	38.5	0.73
1,2-Dichlorobenzene	248	29.6	51.3	39.9	42.4	0.80
Total Dichlorobenzene	880	105	182	141	150	2.84
1,3,5-trichlorobenzene	28.1	3.35	5.82	4.52	4.80	0.091
1,2,4-trichlorobenzene	102	12.2	21.1	16.4	17.4	0.33
1,2,3-trichlorobenzene	26.3	3.13	5.45	4.23	4.49	0.085
Total Trichlorobenzene	156	18.6	32.4	25.1	26.7	0.51
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	17.6	2.10	3.64	2.83	3.01	0.057
1,2,3,4-tetrachlorobenzene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Total Tetrachlorobenzene	<27.6	<3.29	<5.71	<4.43	<4.72	<0.089
Pentachlorobenzene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Hexachlorobenzene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Total Chlorobenzenes	<3104	<370	<643	<499	<530	<10.0

Dry Gas Volume Sampled (Rm^3*) :	4.830
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
Wet Reference Flowrate (Rm^3/s*) :	18.9

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	2570	316	548	427	453	8.28
1,3-Dichlorobenzene	435	53.5	92.8	72.3	76.6	1.40
1,4-Dichlorobenzene	248	30.5	52.9	41.2	43.7	0.80
1,2-Dichlorobenzene	303	37.3	64.7	50.3	53.4	0.98
Total Dichlorobenzene	986	121	210	164	174	3.18
1,3,5-trichlorobenzene	28.0	3.44	5.98	4.65	4.93	0.090
1,2,4-trichlorobenzene	107	13.2	22.8	17.8	18.8	0.34
1,2,3-trichlorobenzene	27.2	3.35	5.80	4.52	4.79	0.088
Total Trichlorobenzene	162	19.9	34.6	26.9	28.6	0.52
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	19.2	2.36	4.10	3.19	3.38	0.062
1,2,3,4-tetrachlorobenzene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Total Tetrachlorobenzene	<29.2	<3.59	<6.23	<4.85	<5.14	<0.094
Pentachlorobenzene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Hexachlorobenzene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Total Chlorobenzenes	<3767	<463	<804	<626	<663	<12.1

Dry Gas Volume Sampled (Rm³*) :	4.686
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	18.3

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

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Monochlorobenzene	290	241	316	282	13.5
1,3-Dichlorobenzene	50.5	48.5	53.5	50.8	5.0
1,4-Dichlorobenzene	30.2	26.8	30.5	29.2	7.0
1,2-Dichlorobenzene	31.7	29.6	37.3	32.9	12.1
Total Dichlorobenzene	112	105	121	113	7.3
1,3,5-trichlorobenzene	3.30	3.35	3.44	3.36	2.2
1,2,4-trichlorobenzene	13.2	12.2	13.2	12.8	4.5
1,2,3-trichlorobenzene	3.73	3.13	3.35	3.40	8.9
Total Trichlorobenzene	20.2	18.6	19.9	19.6	4.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.00	2.10	2.36	2.15	8.6
1,2,3,4-tetrachlorobenzene	<1.21	<1.19	<1.23	<1.21	1.6
Total Tetrachlorobenzene	<3.21	<3.29	<3.59	<3.36	6.0
Pentachlorobenzene	<1.21	<1.19	<1.23	<1.21	1.6
Hexachlorobenzene	<1.21	<1.19	<1.23	<1.21	1.6
Total Chlorobenzenes	<428	<370	<463	<420	11.2

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

Specific Isomer	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	502	418	548	490	13.5
1,3-Dichlorobenzene	87.5	84.3	92.8	88.2	4.9
1,4-Dichlorobenzene	52.3	46.6	52.9	50.6	6.9
1,2-Dichlorobenzene	55.0	51.3	64.7	57.0	12.1
Total Dichlorobenzene	195	182	210	196	7.2
1,3,5-trichlorobenzene	5.71	5.82	5.98	5.84	2.3
1,2,4-trichlorobenzene	22.8	21.1	22.8	22.3	4.4
1,2,3-trichlorobenzene	6.47	5.45	5.80	5.91	8.8
Total Trichlorobenzene	35.0	32.4	34.6	34.0	4.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.47	3.64	4.10	3.74	8.6
1,2,3,4-tetrachlorobenzene	<2.09	<2.07	<2.13	<2.10	1.5
Total Tetrachlorobenzene	<5.57	<5.71	<6.23	<5.84	6.0
Pentachlorobenzene	<2.09	<2.07	<2.13	<2.10	1.5
Hexachlorobenzene	<2.09	<2.07	<2.13	<2.10	1.5
Total Chlorobenzenes	<742	<643	<804	<730	11.2

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	397	325	427	383	13.7
1,3-Dichlorobenzene	69.1	65.4	72.3	68.9	5.0
1,4-Dichlorobenzene	41.3	36.2	41.2	39.6	7.4
1,2-Dichlorobenzene	43.5	39.9	50.3	44.5	11.9
Total Dichlorobenzene	154	141	164	153	7.3
1,3,5-trichlorobenzene	4.51	4.52	4.65	4.56	1.7
1,2,4-trichlorobenzene	18.0	16.4	17.8	17.4	5.0
1,2,3-trichlorobenzene	5.11	4.23	4.52	4.62	9.7
Total Trichlorobenzene	27.6	25.1	26.9	26.6	4.9
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.74	2.83	3.19	2.92	8.1
1,2,3,4-tetrachlorobenzene	<1.65	<1.61	<1.66	<1.64	1.8
Total Tetrachlorobenzene	<4.40	<4.43	<4.85	<4.56	5.5
Pentachlorobenzene	<1.65	<1.61	<1.66	<1.64	1.8
Hexachlorobenzene	<1.65	<1.61	<1.66	<1.64	1.8
Total Chlorobenzenes	<586	<499	<626	<570	11.4

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	416	345	453	405	13.5
1,3-Dichlorobenzene	72.4	69.6	76.6	72.9	4.9
1,4-Dichlorobenzene	43.3	38.5	43.7	41.8	7.0
1,2-Dichlorobenzene	45.6	42.4	53.4	47.1	12.0
Total Dichlorobenzene	161	150	174	162	7.2
1,3,5-trichlorobenzene	4.73	4.80	4.93	4.82	2.1
1,2,4-trichlorobenzene	18.9	17.4	18.8	18.4	4.5
1,2,3-trichlorobenzene	5.35	4.49	4.79	4.88	9.0
Total Trichlorobenzene	29.0	26.7	28.6	28.1	4.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.88	3.01	3.38	3.09	8.5
1,2,3,4-tetrachlorobenzene	<1.73	<1.71	<1.76	<1.73	1.5
Total Tetrachlorobenzene	<4.61	<4.72	<5.14	<4.82	5.8
Pentachlorobenzene	<1.73	<1.71	<1.76	<1.73	1.5
Hexachlorobenzene	<1.73	<1.71	<1.76	<1.73	1.5
Total Chlorobenzenes	<614	<530	<663	<603	11.2

* 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 Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	7.74	6.52	8.28	7.51	12.0
1,3-Dichlorobenzene	1.35	1.31	1.40	1.35	3.3
1,4-Dichlorobenzene	0.81	0.73	0.80	0.78	5.6
1,2-Dichlorobenzene	0.85	0.80	0.98	0.88	10.4
Total Dichlorobenzene	3.00	2.84	3.18	3.01	5.6
1,3,5-trichlorobenzene	0.088	0.091	0.090	0.090	1.6
1,2,4-trichlorobenzene	0.35	0.33	0.34	0.34	3.3
1,2,3-trichlorobenzene	0.10	0.085	0.088	0.091	8.6
Total Trichlorobenzene	0.54	0.51	0.52	0.52	3.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.054	0.057	0.062	0.057	7.3
1,2,3,4-tetrachlorobenzene	<0.032	<0.032	<0.032	<0.032	0.1
Total Tetrachlorobenzene	<0.086	<0.089	<0.094	<0.090	4.7
Pentachlorobenzene	<0.032	<0.032	<0.032	<0.032	0.1
Hexachlorobenzene	<0.032	<0.032	<0.032	<0.032	0.1
Total Chlorobenzenes	<11.4	<10.0	<12.1	<11.2	9.6

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

Specific Isomer	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
Monochlorobenzene	282	490	383	405	7.51
1,3-Dichlorobenzene	50.8	88.2	68.9	72.9	1.35
1,4-Dichlorobenzene	29.2	50.6	39.6	41.8	0.78
1,2-Dichlorobenzene	32.9	57.0	44.5	47.1	0.88
Total Dichlorobenzene	113	196	153	162	3.01
1,3,5-trichlorobenzene	3.36	5.84	4.56	4.82	0.090
1,2,4-trichlorobenzene	12.8	22.3	17.4	18.4	0.34
1,2,3-trichlorobenzene	3.40	5.91	4.62	4.88	0.091
Total Trichlorobenzene	19.6	34.0	26.6	28.1	0.52
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.15	3.74	2.92	3.09	0.057
1,2,3,4-tetrachlorobenzene	<1.21	<2.10	<1.64	<1.73	<0.032
Total Tetrachlorobenzene	<3.36	<5.84	<4.56	<4.82	<0.090
Pentachlorobenzene	<1.21	<2.10	<1.64	<1.73	<0.032
Hexachlorobenzene	<1.21	<2.10	<1.64	<1.73	<0.032
Total Chlorobenzenes	<420	<730	<570	<603	<11.2

* 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	11.3	<10
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<31.3	<30.0
1,3,5-trichlorobenzene	<10	<10
1,2,4-trichlorobenzene	<10	<10
1,2,3-trichlorobenzene	<10	
Total Trichlorobenzene	<30.0	<20.0
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	<111	<100

"<" 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 ng	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	<250	<30.2	<52.3	<41.3	<43.3	<0.81
3-monochlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
4-monochlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
Total Monochlorophenols	<750	<90.5	<157	<124	<130	<2.42
2,6-dichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,4 & 2,5-dichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
3,5-dichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,3-dichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
3,4-dichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
Total Dichlorophenols	<1250	<151	<262	<207	<217	<4.03
2,4,6-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,3,6-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,3,5-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,4,5-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,3,4-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
3,4,5-trichlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
Total Trichlorophenols	<1500	<181	<314	<248	<260	<4.83
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
2,3,4,5-tetrachlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
Total Tetrachlorophenols	<500	<60.4	<105	<82.6	<86.6	<1.61
Pentachlorophenol	<250	<30.2	<52.3	<41.3	<43.3	<0.81
Total Chlorophenols	<4250	<513	<889	<702	<736	<13.7

Dry Gas Volume Sampled (Rm^3*) :	4.778
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* 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 ng	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	<250	<29.8	<51.8	<40.2	<42.7	<0.81
3-monochlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
4-monochlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
Total Monochlorophenols	<750	<89.4	<155	<121	<128	<2.42
2,6-dichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,4 & 2,5-dichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
3,5-dichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,3-dichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
3,4-dichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
Total Dichlorophenols	<1250	<149	<259	<201	<214	<4.04
2,4,6-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,3,6-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,3,5-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,4,5-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,3,4-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
3,4,5-trichlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
Total Trichlorophenols	<1500	<179	<311	<241	<256	<4.84
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
2,3,4,5-tetrachlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
Total Tetrachlorophenols	<500	<59.6	<104	<80.3	<85.4	<1.61
Pentachlorophenol	<250	<29.8	<51.8	<40.2	<42.7	<0.81
Total Chlorophenols	<4250	<507	<880	<683	<726	<13.7

Dry Gas Volume Sampled (Rm³*) :	4.830
Actual Flowrate (m³/s) :	27.1
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	20.1
Wet Reference Flowrate (Rm³/s*) :	18.9

* 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 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 ng	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	NR	-	-	-	-	-
3-monochlorophenol	NR	-	-	-	-	-
4-monochlorophenol	NR	-	-	-	-	-
Total Monochlorophenols	NR	-	-	-	-	-
2,6-dichlorophenol	NR	-	-	-	-	-
2,4 & 2,5-dichlorophenol	NR	-	-	-	-	-
3,5-dichlorophenol	NR	-	-	-	-	-
2,3-dichlorophenol	NR	-	-	-	-	-
3,4-dichlorophenol	NR	-	-	-	-	-
Total Dichlorophenols	NR	-	-	-	-	-
2,4,6-trichlorophenol	NR	-	-	-	-	-
2,3,6-trichlorophenol	NR	-	-	-	-	-
2,3,5-trichlorophenol	NR	-	-	-	-	-
2,4,5-trichlorophenol	NR	-	-	-	-	-
2,3,4-trichlorophenol	NR	-	-	-	-	-
3,4,5-trichlorophenol	NR	-	-	-	-	-
Total Trichlorophenols	NR	-	-	-	-	-
2,3,5,6/2,3,4,6-tetrachlorophenol	NR	-	-	-	-	-
2,3,4,5-tetrachlorophenol	NR	-	-	-	-	-
Total Tetrachlorophenols	NR	-	-	-	-	-
Pentachlorophenol	<250	<30.7	<53.4	<41.5	<44.0	<0.81
Total Chlorophenols	NR	-	-	-	-	-

Dry Gas Volume Sampled (Rm³*) :	4.686
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	18.3

* 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.
"NR" indicates No Result. The field spike was not detected and the extraction standard had poor recoveries. The results could not be reliably quantified by the analytical laboratory.

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

Specific Isomer	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m^3	ng/m^3	ng/m^3	ng/m^3	%
2-monochlorophenol	<30.2	<29.8	-	<30.0	0.9
3-monochlorophenol	<30.2	<29.8	-	<30.0	0.9
4-monochlorophenol	<30.2	<29.8	-	<30.0	0.9
Total Monochlorophenols	<90.5	<89.4	-	<90.0	0.9
2,6-dichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,4 & 2,5-dichlorophenol	<30.2	<29.8	-	<30.0	0.9
3,5-dichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,3-dichlorophenol	<30.2	<29.8	-	<30.0	0.9
3,4-dichlorophenol	<30.2	<29.8	-	<30.0	0.9
Total Dichlorophenols	<151	<149	-	<150	0.9
2,4,6-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,3,6-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,3,5-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,4,5-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
2,3,4-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
3,4,5-trichlorophenol	<30.2	<29.8	-	<30.0	0.9
Total Trichlorophenols	<181	<179	-	<180	0.9
2,3,5,6/2,3,4,6-tetrachlorophenol	<30.2	<29.8	-	<30.0	0.9
2,3,4,5-tetrachlorophenol	<30.2	<29.8	-	<30.0	0.9
Total Tetrachlorophenols	<60.4	<59.6	-	<60.0	0.9
Pentachlorophenol	<30.2	<29.8	<30.7	<30.2	1.6
Total Chlorophenols	<513	<507	-	<510	0.9

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	<52.3	<51.8	-	<52.0	0.8
3-monochlorophenol	<52.3	<51.8	-	<52.0	0.8
4-monochlorophenol	<52.3	<51.8	-	<52.0	0.8
Total Monochlorophenols	<157	<155	-	<156	0.8
2,6-dichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,4 & 2,5-dichlorophenol	<52.3	<51.8	-	<52.0	0.8
3,5-dichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,3-dichlorophenol	<52.3	<51.8	-	<52.0	0.8
3,4-dichlorophenol	<52.3	<51.8	-	<52.0	0.8
Total Dichlorophenols	<262	<259	-	<260	0.8
2,4,6-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,3,6-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,3,5-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,4,5-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
2,3,4-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
3,4,5-trichlorophenol	<52.3	<51.8	-	<52.0	0.8
Total Trichlorophenols	<314	<311	-	<312	0.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<52.3	<51.8	-	<52.0	0.8
2,3,4,5-tetrachlorophenol	<52.3	<51.8	-	<52.0	0.8
Total Tetrachlorophenols	<105	<104	-	<104	0.8
Pentachlorophenol	<52.3	<51.8	<53.4	<52.5	1.5
Total Chlorophenols	<889	<880	-	<885	0.8

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<41.3	<40.2	-	<40.7	2.0
3-monochlorophenol	<41.3	<40.2	-	<40.7	2.0
4-monochlorophenol	<41.3	<40.2	-	<40.7	2.0
Total Monochlorophenols	<124	<121	-	<122	2.0
2,6-dichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,4 & 2,5-dichlorophenol	<41.3	<40.2	-	<40.7	2.0
3,5-dichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,3-dichlorophenol	<41.3	<40.2	-	<40.7	2.0
3,4-dichlorophenol	<41.3	<40.2	-	<40.7	2.0
Total Dichlorophenols	<207	<201	-	<204	2.0
2,4,6-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,3,6-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,3,5-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,4,5-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
2,3,4-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
3,4,5-trichlorophenol	<41.3	<40.2	-	<40.7	2.0
Total Trichlorophenols	<248	<241	-	<244	2.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<41.3	<40.2	-	<40.7	2.0
2,3,4,5-tetrachlorophenol	<41.3	<40.2	-	<40.7	2.0
Total Tetrachlorophenols	<82.6	<80.3	-	<81.5	2.0
Pentachlorophenol	<41.3	<40.2	<41.5	<41.0	1.8
Total Chlorophenols	<702	<683	-	<693	2.0

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<43.3	<42.7	-	<43.0	1.0
3-monochlorophenol	<43.3	<42.7	-	<43.0	1.0
4-monochlorophenol	<43.3	<42.7	-	<43.0	1.0
Total Monochlorophenols	<130	<128	-	<129	1.0
2,6-dichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,4 & 2,5-dichlorophenol	<43.3	<42.7	-	<43.0	1.0
3,5-dichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,3-dichlorophenol	<43.3	<42.7	-	<43.0	1.0
3,4-dichlorophenol	<43.3	<42.7	-	<43.0	1.0
Total Dichlorophenols	<217	<214	-	<215	1.0
2,4,6-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,3,6-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,3,5-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,4,5-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
2,3,4-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
3,4,5-trichlorophenol	<43.3	<42.7	-	<43.0	1.0
Total Trichlorophenols	<260	<256	-	<258	1.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<43.3	<42.7	-	<43.0	1.0
2,3,4,5-tetrachlorophenol	<43.3	<42.7	-	<43.0	1.0
Total Tetrachlorophenols	<86.6	<85.4	-	<86.0	1.0
Pentachlorophenol	<43.3	<42.7	<44.0	<43.4	1.5
Total Chlorophenols	<736	<726	-	<731	1.0

* 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	<0.81	<0.81	-	<0.81	0.1
3-monochlorophenol	<0.81	<0.81	-	<0.81	0.1
4-monochlorophenol	<0.81	<0.81	-	<0.81	0.1
Total Monochlorophenols	<2.42	<2.42	-	<2.42	0.1
2,6-dichlorophenol	<0.81	<0.81	-	<0.81	0.1
2,4 & 2,5-dichlorophenol	<0.81	<0.81	-	<0.81	0.1
3,5-dichlorophenol	<0.81	<0.81	-	<0.81	0.1
2,3-dichlorophenol	<0.81	<0.81	-	<0.81	0.1
3,4-dichlorophenol	<0.81	<0.81	-	<0.81	0.1
Total Dichlorophenols	<4.03	<4.04	-	<4.03	0.1
2,4,6-trichlorophenol	0.81	0.81	-	<0.81	0.1
2,3,6-trichlorophenol	<0.81	<0.81	-	<0.81	0.1
2,3,5-trichlorophenol	<0.81	<0.81	-	<0.81	0.1
2,4,5-trichlorophenol	<0.81	<0.81	-	<0.81	0.1
2,3,4-trichlorophenol	<0.81	<0.81	-	<0.81	0.1
3,4,5-trichlorophenol	<0.81	<0.81	-	<0.81	0.1
Total Trichlorophenols	<4.83	<4.84	-	<4.84	0.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.81	<0.81	-	<0.81	0.1
2,3,4,5-tetrachlorophenol	<0.81	<0.81	-	<0.81	0.1
Total Tetrachlorophenols	<1.61	<1.61	-	<1.61	0.1
Pentachlorophenol	<0.81	<0.81	<0.81	<0.81	0.1
Total Chlorophenols	<13.7	<13.7	-	<13.7	0.1

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	<30.0	<52.0	<40.7	<43.0	<0.81
3-monochlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
4-monochlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
Total Monochlorophenols	<90.0	<156	<122	<129.1	<2.42
2,6-dichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,4 & 2,5-dichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
3,5-dichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,3-dichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
3,4-dichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
Total Dichlorophenols	<150	<260	<204	<215	<4.03
2,4,6-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,3,6-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,3,5-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,4,5-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,3,4-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
3,4,5-trichlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
Total Trichlorophenols	<180	<312	<244	<258	<4.84
2,3,5,6/2,3,4,6-tetrachlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
2,3,4,5-tetrachlorophenol	<30.0	<52.0	<40.7	<43.0	<0.81
Total Tetrachlorophenols	<60.0	<104	<81.5	<86.0	<1.61
Pentachlorophenol	<30.2	<52.5	<41.0	<43.4	<0.81
Total Chlorophenols	<510	<885	<693	<731	<13.71

* 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	<250	<250
3-monochlorophenol	<250	<250
4-monochlorophenol	<250	<250
Total Monochlorophenols	<750	<750
2,6-dichlorophenol	<250	<250
2,4 & 2,5-dichlorophenol	<250	<250
3,5-dichlorophenol	<250	<250
2,3-dichlorophenol	<250	<250
3,4-dichlorophenol	<250	<250
Total Dichlorophenols	<1250	<1250
2,4,6-trichlorophenol	<250	<250
2,3,6-trichlorophenol	<250	<250
2,3,5-trichlorophenol	<250	<250
2,4,5-trichlorophenol	<250	<250
2,3,4-trichlorophenol	<250	<250
3,4,5-trichlorophenol	<250	<250
Total Trichlorophenols	<1500	<1500
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<250
2,3,4,5-tetrachlorophenol	<250	<250
Total Tetrachlorophenols	<500	<500
Pentachlorophenol	<250	<250
Total Chlorophenols	<4250	<4250

"<" 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	156	18.8	32.6	25.8	27.0	0.50
Acenaphthylene	204	24.6	42.7	33.7	35.4	0.66
Anthracene	54.4	6.57	11.4	8.99	9.43	0.18
Benzo(a)Anthracene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(b)Fluoranthene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(k)Fluoranthene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(a)fluorene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(b)fluorene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(g,h,i)Perylene	17.5	2.11	3.66	2.89	3.03	0.056
Benzo(a)Pyrene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Benzo(e)Pyrene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Biphenyl	103	12.4	21.6	17.0	17.8	0.33
2-Chloronaphthalene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Chrysene/Triphenylene	10.5	1.27	2.20	1.74	1.82	0.034
Coronene	<50	<6.04	<10.5	<8.26	<8.66	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Dibenzo(a,e)pyrene	<50	<6.04	<10.5	<8.26	<8.66	<0.16
9,10-dimethylanthracene	15.7	1.90	3.29	2.60	2.72	0.051
7,12-Dimethylbenzo(a)anthracene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Fluoranthene	125	15.1	26.2	20.7	21.7	0.40
Fluorene	160	19.3	33.5	26.4	27.7	0.52
Indeno(1,2,3-cd)Pyrene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
2-methylanthracene	159	19.2	33.3	26.3	27.6	0.51
3-Methylcholanthrene	<50	<6.04	<10.5	<8.26	<8.66	<0.16
1-Methylnaphthalene	142	17.1	29.7	23.5	24.6	0.46
2-Methylnaphthalene	259	31.3	54.2	42.8	44.9	0.83
1-Methylphenanthrene	115	13.9	24.1	19.0	19.9	0.37
9-Methylphenanthrene	68.6	8.28	14.4	11.3	11.9	0.22
Naphthalene	1050	127	220	174	182	3.38
Perylene	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Phenanthrene	925	112	194	153	160	2.98
Picene	<50	<6.04	<10.5	<8.26	<8.66	<0.16
Pyrene	94.5	11.4	19.8	15.6	16.4	0.30
Tetralin	252	30.4	52.7	41.7	43.7	0.81
m-terphenyl	14.8	1.79	3.10	2.45	2.56	0.048
o-Terphenyl	10.7	1.29	2.24	1.77	1.85	0.034
p-terphenyl	<10	<1.21	<2.09	<1.65	<1.73	<0.032
Total	<4267	<515	<893	<705	<739	<13.8

Dry Gas Volume Sampled (Rm³*) :	4.778
Actual Flowrate (m³/s) :	26.7
Dry Reference Flowrate (Rm³/s*) :	15.4
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.6

* 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	105	12.5	21.7	16.9	17.9	0.34
Acenaphthylene	306	36.5	63.4	49.2	52.3	0.99
Anthracene	24.8	2.96	5.13	3.99	4.24	0.080
Benzo(a)Anthracene	37.3	4.45	7.72	5.99	6.37	0.12
Benzo(b)Fluoranthene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(k)Fluoranthene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(a)fluorene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(b)fluorene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(g,h,i)Perylene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(a)Pyrene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Benzo(e)Pyrene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Biphenyl	69.7	8.31	14.4	11.2	11.9	0.23
2-Chloronaphthalene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Chrysene/Triphenylene	27.7	3.30	5.73	4.45	4.73	0.089
Coronene	<50	<5.96	<10.4	<8.03	<8.54	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Dibenzo(a,e)pyrene	<50	<5.96	<10.4	<8.03	<8.54	<0.16
9,10-dimethylanthracene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
7,12-Dimethylbenzo(a)anthracene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Fluoranthene	103	12.3	21.3	16.6	17.6	0.33
Fluorene	163	19.4	33.7	26.2	27.9	0.53
Indeno(1,2,3-cd)Pyrene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
2-methylanthracene	298	35.5	61.7	47.9	50.9	0.96
3-Methylcholanthrene	<50	<5.96	<10.4	<8.03	<8.54	<0.16
1-Methylnaphthalene	49.0	5.84	10.1	7.87	8.37	0.16
2-Methylnaphthalene	85.8	10.2	17.8	13.8	14.7	0.28
1-Methylphenanthrene	106	12.6	21.9	17.0	18.1	0.34
9-Methylphenanthrene	66.3	7.90	13.7	10.7	11.3	0.21
Naphthalene	543	64.7	112	87.3	92.8	1.75
Perylene	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Phenanthrene	979	117	203	157	167	3.16
Picene	<50	<5.96	<10.4	<8.03	<8.54	<0.16
Pyrene	76.2	9.08	15.8	12.2	13.0	0.25
Tetralin	364	43.4	75.4	58.5	62.2	1.18
m-terphenyl	11.6	1.38	2.40	1.86	1.98	0.037
o-Terphenyl	11.1	1.32	2.30	1.78	1.90	0.036
p-terphenyl	<10	<1.19	<2.07	<1.61	<1.71	<0.032
Total	<3767	<449	<780	<605	<644	<12.2

Dry Gas Volume Sampled (Rm³*) :	4.830
Actual Flowrate (m³/s) :	27.1
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	20.1
Wet Reference Flowrate (Rm³/s*) :	18.9

* 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 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	56.0	6.89	12.0	9.30	9.86	0.18
Acenaphthylene	344	42.3	73.4	57.1	60.6	1.11
Anthracene	15.0	1.84	3.20	2.49	2.64	0.048
Benzo(a)Anthracene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(b)Fluoranthene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(k)Fluoranthene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(a)fluorene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(b)fluorene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(g,h,i)Perylene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(a)Pyrene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Benzo(e)Pyrene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Biphenyl	52.8	6.49	11.3	8.77	9.30	0.17
2-Chloronaphthalene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Chrysene/Triphenylene	16.1	1.98	3.44	2.67	2.83	0.052
Coronene	<50	<6.15	<10.7	<8.31	<8.80	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Dibenzo(a,e)pyrene	<50	<6.15	<10.7	<8.31	<8.80	<0.16
9,10-dimethylanthracene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
7,12-Dimethylbenzo(a)anthracene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Fluoranthene	117	14.4	25.0	19.4	20.6	0.38
Fluorene	87.1	10.7	18.6	14.5	15.3	0.28
Indeno(1,2,3-cd)Pyrene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
2-methylanthracene	198	24.4	42.3	32.9	34.9	0.64
3-Methylcholanthrene	<50	<6.15	<10.7	<8.31	<8.80	<0.16
1-Methylnaphthalene	31.6	3.89	6.74	5.25	5.56	0.10
2-Methylnaphthalene	48.1	5.92	10.3	7.99	8.47	0.15
1-Methylphenanthrene	125	15.4	26.7	20.8	22.0	0.40
9-Methylphenanthrene	58.5	7.19	12.5	9.72	10.3	0.19
Naphthalene	306	37.6	65.3	50.8	53.9	0.99
Perylene	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Phenanthrene	650	79.9	139	108	114	2.09
Picene	<50	<6.15	<10.7	<8.31	<8.80	<0.16
Pyrene	71.8	8.83	15.3	11.9	12.6	0.23
Tetralin	319	39.2	68.1	53.0	56.2	1.03
m-terphenyl	10.1	1.24	2.16	1.68	1.78	0.033
o-Terphenyl	15.5	1.91	3.31	2.57	2.73	0.050
p-terphenyl	<10	<1.23	<2.13	<1.66	<1.76	<0.032
Total	<2872	<353	<613	<477	<506	<9.25

Dry Gas Volume Sampled (Rm³*) :	4.686
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	18.3

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

Compound	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	18.8	12.5	6.89	12.7	46.9
Acenaphthylene	24.6	36.5	42.3	34.5	26.1
Anthracene	6.57	2.96	1.84	3.79	65.2
Benzo(a)Anthracene	<1.21	4.45	<1.23	<2.29	81.2
Benzo(b)Fluoranthene	<1.21	<1.19	<1.23	<1.21	1.6
Benzo(k)Fluoranthene	<1.21	<1.19	<1.23	<1.21	1.6
Benzo(a)fluorene	<1.21	<1.19	<1.23	<1.21	1.6
Benzo(b)fluorene	<1.21	<1.19	<1.23	<1.21	1.6
Benzo(g,h,i)Perylene	2.11	<1.19	<1.23	<1.51	34.5
Benzo(a)Pyrene	<1.21	<1.19	<1.23	<1.21	1.6
Benzo(e)Pyrene	<1.21	<1.19	<1.23	<1.21	1.6
Biphenyl	12.4	8.31	6.49	9.08	33.5
2-Chloronaphthalene	<1.21	<1.19	<1.23	<1.21	1.6
Chrysene/Triphenylene	1.27	3.30	1.98	2.18	47.3
Coronene	<6.04	<5.96	<6.15	<6.05	1.6
Dibenzo(a,c/a,h)Anthracene	<1.21	<1.19	<1.23	<1.21	1.6
Dibenzo(a,e)pyrene	<6.04	<5.96	<6.15	<6.05	1.6
9,10-dimethylanthracene	1.90	<1.19	<1.23	<1.44	27.5
7,12-Dimethylbenzo(a)anthracene	<1.21	<1.19	<1.23	<1.21	1.6
Fluoranthene	15.1	12.3	14.4	13.9	10.5
Fluorene	19.3	19.4	10.7	16.5	30.3
Indeno(1,2,3-cd)Pyrene	<1.21	<1.19	<1.23	<1.21	1.6
2-methylanthracene	19.2	35.5	24.4	26.4	31.7
3-Methylcholanthrene	<6.04	<5.96	<6.15	<6.05	1.6
1-Methylnaphthalene	17.1	5.84	3.89	8.96	79.9
2-Methylnaphthalene	31.3	10.2	5.92	15.8	85.8
1-Methylphenanthrene	13.9	12.6	15.4	14.0	9.8
9-Methylphenanthrene	8.28	7.90	7.19	7.79	7.1
Naphthalene	127	64.7	37.6	76.4	59.8
Perylene	<1.21	<1.19	<1.23	<1.21	1.6
Phenanthrene	112	117	79.9	103	19.4
Picene	<6.04	<5.96	<6.15	<6.05	1.6
Pyrene	11.4	9.08	8.83	9.77	14.5
Tetralin	30.4	43.4	39.2	37.7	17.6
m-terphenyl	1.79	1.38	1.24	1.47	19.2
o-Terphenyl	1.29	1.32	1.91	1.51	23.0
p-terphenyl	<1.21	<1.19	<1.23	<1.21	1.6
Total	<515	<449	<353	<439	18.5

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

Compound	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Acenaphthene	32.6	21.7	12.0	22.1	46.8
Acenaphthylene	42.7	63.4	73.4	59.8	26.2
Anthracene	11.4	5.13	3.20	6.57	65.1
Benzo(a)Anthracene	<2.09	7.72	<2.13	<3.98	81.3
Benzo(b)Fluoranthene	<2.09	<2.07	<2.13	<2.10	1.5
Benzo(k)Fluoranthene	<2.09	<2.07	<2.13	<2.10	1.5
Benzo(a)fluorene	<2.09	<2.07	<2.13	<2.10	1.5
Benzo(b)fluorene	<2.09	<2.07	<2.13	<2.10	1.5
Benzo(g,h,i)Perylene	3.66	<2.07	<2.13	<2.62	34.4
Benzo(a)Pyrene	<2.09	<2.07	<2.13	<2.10	1.5
Benzo(e)Pyrene	<2.09	<2.07	<2.13	<2.10	1.5
Biphenyl	21.6	14.4	11.3	15.8	33.5
2-Chloronaphthalene	<2.09	<2.07	<2.13	<2.10	1.5
Chrysene/Triphenylene	2.20	5.73	3.44	3.79	47.4
Coronene	<10.5	<10.4	<10.7	<10.5	1.5
Dibenzo(a,c/a,h)Anthracene	<2.09	<2.07	<2.13	<2.10	1.5
Dibenzo(a,e)pyrene	<10.5	<10.4	<10.7	<10.5	1.5
9,10-dimethylanthracene	3.29	<2.07	<2.13	<2.50	27.4
7,12-Dimethylbenzo(a)anthracene	<2.09	<2.07	<2.13	<2.10	1.5
Fluoranthene	26.2	21.3	25.0	24.2	10.4
Fluorene	33.5	33.7	18.6	28.6	30.3
Indeno(1,2,3-cd)Pyrene	<2.09	<2.07	<2.13	<2.10	1.5
2-methylanthracene	33.3	61.7	42.3	45.7	31.8
3-Methylcholanthrene	<10.5	<10.4	<10.7	<10.5	1.5
1-Methylnaphthalene	29.7	10.1	6.74	15.5	79.8
2-Methylnaphthalene	54.2	17.8	10.3	27.4	85.8
1-Methylphenanthrene	24.1	21.9	26.7	24.2	9.8
9-Methylphenanthrene	14.4	13.7	12.5	13.5	7.0
Naphthalene	220	112	65.3	132	59.7
Perylene	<2.09	<2.07	<2.13	<2.10	1.5
Phenanthrene	194	203	139	178	19.4
Picene	<10.5	<10.4	<10.7	<10.5	1.5
Pyrene	19.8	15.8	15.3	17.0	14.5
Tetralin	52.7	75.4	68.1	65.4	17.7
m-terphenyl	3.10	2.40	2.16	2.55	19.2
o-Terphenyl	2.24	2.30	3.31	2.62	23.0
p-terphenyl	<2.09	<2.07	<2.13	<2.10	1.5
Total	<893	<780	<613	<762	18.5

* 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	25.8	16.9	9.30	17.3	47.6
Acenaphthylene	33.7	49.2	57.1	46.7	25.5
Anthracene	8.99	3.99	2.49	5.16	66.0
Benzo(a)Anthracene	<1.65	5.99	<1.66	<3.10	80.7
Benzo(b)Fluoranthene	<1.65	<1.61	<1.66	<1.64	1.8
Benzo(k)Fluoranthene	<1.65	<1.61	<1.66	<1.64	1.8
Benzo(a)fluorene	<1.65	<1.61	<1.66	<1.64	1.8
Benzo(b)fluorene	<1.65	<1.61	<1.66	<1.64	1.8
Benzo(g,h,i)Perylene	2.89	<1.61	<1.66	<2.05	35.4
Benzo(a)Pyrene	<1.65	<1.61	<1.66	<1.64	1.8
Benzo(e)Pyrene	<1.65	<1.61	<1.66	<1.64	1.8
Biphenyl	17.0	11.2	8.77	12.3	34.4
2-Chloronaphthalene	<1.65	<1.61	<1.66	<1.64	1.8
Chrysene/Triphenylene	1.74	4.45	2.67	2.95	46.7
Coronene	<8.26	<8.03	<8.31	<8.20	1.8
Dibenzo(a,c/a,h)Anthracene	<1.65	<1.61	<1.66	<1.64	1.8
Dibenzo(a,e)pyrene	<8.26	<8.03	<8.31	<8.20	1.8
9,10-dimethylanthracene	2.60	<1.61	<1.66	<1.95	28.4
7,12-Dimethylbenzo(a)anthracene	<1.65	<1.61	<1.66	<1.64	1.8
Fluoranthene	20.7	16.6	19.4	18.9	11.2
Fluorene	26.4	26.2	14.5	22.4	30.6
Indeno(1,2,3-cd)Pyrene	<1.65	<1.61	<1.66	<1.64	1.8
2-methylanthracene	26.3	47.9	32.9	35.7	31.0
3-Methylcholanthrene	<8.26	<8.03	<8.31	<8.20	1.8
1-Methylnaphthalene	23.5	7.87	5.25	12.2	80.8
2-Methylnaphthalene	42.8	13.8	7.99	21.5	86.7
1-Methylphenanthrene	19.0	17.0	20.8	18.9	9.9
9-Methylphenanthrene	11.3	10.7	9.72	10.6	7.7
Naphthalene	174	87.3	50.8	104	60.7
Perylene	<1.65	<1.61	<1.66	<1.64	1.8
Phenanthrene	153	157	108	139	19.6
Picene	<8.26	<8.03	<8.31	<8.20	1.8
Pyrene	15.6	12.2	11.9	13.3	15.4
Tetralin	41.7	58.5	53.0	51.0	16.8
m-terphenyl	2.45	1.86	1.68	2.00	20.1
o-Terphenyl	1.77	1.78	2.57	2.04	22.6
p-terphenyl	<1.65	<1.61	<1.66	<1.64	1.8
Total	<705	<605	<477	<596	19.2

* 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	27.0	17.9	9.86	18.3	47.0
Acenaphthylene	35.4	52.3	60.6	49.4	26.0
Anthracene	9.43	4.24	2.64	5.44	65.3
Benzo(a)Anthracene	<1.73	6.37	<1.76	<3.29	81.2
Benzo(b)Fluoranthene	<1.73	<1.71	<1.76	<1.73	1.5
Benzo(k)Fluoranthene	<1.73	<1.71	<1.76	<1.73	1.5
Benzo(a)fluorene	<1.73	<1.71	<1.76	<1.73	1.5
Benzo(b)fluorene	<1.73	<1.71	<1.76	<1.73	1.5
Benzo(g,h,i)Perylene	3.03	<1.71	<1.76	<2.17	34.6
Benzo(a)Pyrene	<1.73	<1.71	<1.76	<1.73	1.5
Benzo(e)Pyrene	<1.73	<1.71	<1.76	<1.73	1.5
Biphenyl	17.8	11.9	9.30	13.0	33.7
2-Chloronaphthalene	<1.73	<1.71	<1.76	<1.73	1.5
Chrysene/Triphenylene	1.82	4.73	2.83	3.13	47.3
Coronene	<8.66	<8.54	<8.80	<8.67	1.5
Dibenzo(a,c/a,h)Anthracene	<1.73	<1.71	<1.76	<1.73	1.5
Dibenzo(a,e)pyrene	<8.66	<8.54	<8.80	<8.67	1.5
9,10-dimethylanthracene	2.72	<1.71	<1.76	<2.06	27.6
7,12-Dimethylbenzo(a)anthracene	<1.73	<1.71	<1.76	<1.73	1.5
Fluoranthene	21.7	17.6	20.6	20.0	10.6
Fluorene	27.7	27.9	15.3	23.6	30.4
Indeno(1,2,3-cd)Pyrene	<1.73	<1.71	<1.76	<1.73	1.5
2-methylanthracene	27.6	50.9	34.9	37.8	31.6
3-Methylcholanthrene	<8.66	<8.54	<8.80	<8.67	1.5
1-Methylnaphthalene	24.6	8.37	5.56	12.8	80.0
2-Methylnaphthalene	44.9	14.7	8.47	22.7	85.9
1-Methylphenanthrene	19.9	18.1	22.0	20.0	9.7
9-Methylphenanthrene	11.9	11.3	10.3	11.2	7.2
Naphthalene	182	92.8	53.9	110	59.9
Perylene	<1.73	<1.71	<1.76	<1.73	1.5
Phenanthrene	160	167	114	147	19.5
Picene	<8.66	<8.54	<8.80	<8.67	1.5
Pyrene	16.4	13.0	12.6	14.0	14.7
Tetralin	43.7	62.2	56.2	54.0	17.5
m-terphenyl	2.56	1.98	1.78	2.11	19.3
o-Terphenyl	1.85	1.90	2.73	2.16	22.8
p-terphenyl	<1.73	<1.71	<1.76	<1.73	1.5
Total	<739	<644	<506	<630	18.7

* 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	Test No. 2	Test No. 3	Average	of Variation
	µg/s	µg/s	µg/s	µg/s	%
Acenaphthene	0.50	0.34	0.18	0.34	47.3
Acenaphthylene	0.66	0.99	1.11	0.92	25.4
Anthracene	0.18	0.080	0.048	0.10	65.3
Benzo(a)Anthracene	<0.032	0.12	<0.032	<0.062	82.7
Benzo(b)Fluoranthene	<0.032	<0.032	<0.032	<0.032	0.1
Benzo(k)Fluoranthene	<0.032	<0.032	<0.032	<0.032	0.1
Benzo(a)fluorene	<0.032	<0.032	<0.032	<0.032	0.1
Benzo(b)fluorene	<0.032	<0.032	<0.032	<0.032	0.1
Benzo(g,h,i)Perylene	0.056	<0.032	<0.032	<0.040	34.6
Benzo(a)Pyrene	<0.032	<0.032	<0.032	<0.032	0.1
Benzo(e)Pyrene	<0.032	<0.032	<0.032	<0.032	0.1
Biphenyl	0.33	0.23	0.17	0.24	33.9
2-Chloronaphthalene	<0.032	<0.032	<0.032	<0.032	0.1
Chrysene/Triphenylene	0.034	0.089	0.052	0.058	48.6
Coronene	<0.16	<0.16	<0.16	<0.16	0.1
Dibenzo(a,c/a,h)Anthracene	<0.032	<0.032	<0.032	<0.032	0.1
Dibenzo(a,e)pyrene	<0.16	<0.16	<0.16	<0.16	0.1
9,10-dimethylanthracene	0.051	<0.032	<0.032	<0.038	27.6
7,12-Dimethylbenzo(a)anthracene	<0.032	<0.032	<0.032	<0.032	0.1
Fluoranthene	0.40	0.33	0.38	0.37	9.6
Fluorene	0.52	0.53	0.28	0.44	31.5
Indeno(1,2,3-cd)Pyrene	<0.032	<0.032	<0.032	<0.032	0.1
2-methylanthracene	0.51	0.96	0.64	0.70	33.0
3-Methylcholanthrene	<0.16	<0.16	<0.16	<0.16	0.1
1-Methylnaphthalene	0.46	0.16	0.10	0.24	79.9
2-Methylnaphthalene	0.83	0.28	0.15	0.42	85.8
1-Methylphenanthrene	0.37	0.34	0.40	0.37	8.1
9-Methylphenanthrene	0.22	0.21	0.19	0.21	8.3
Naphthalene	3.38	1.75	0.99	2.04	60.0
Perylene	<0.032	<0.032	<0.032	<0.032	0.1
Phenanthrene	2.98	3.16	2.09	2.75	20.8
Picene	<0.16	<0.16	<0.16	<0.16	0.1
Pyrene	0.30	0.25	0.23	0.26	14.9
Tetralin	0.81	1.18	1.03	1.01	18.2
m-terphenyl	0.048	0.037	0.033	0.039	19.7
o-Terphenyl	0.034	0.036	0.050	0.040	21.3
p-terphenyl	<0.032	<0.032	<0.032	<0.032	0.1
Total	<13.8	<12.2	<9.25	<11.7	19.5

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 1 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	12.7	22.1	17.3	18.3	0.34
Acenaphthylene	34.5	59.8	46.7	49.4	0.92
Anthracene	3.79	6.57	5.16	5.44	0.10
Benzo(a)Anthracene	<2.29	<3.98	<3.10	<3.29	<0.062
Benzo(b)Fluoranthene	<1.21	<2.10	<1.64	<1.73	<0.032
Benzo(k)Fluoranthene	<1.21	<2.10	<1.64	<1.73	<0.032
Benzo(a)fluorene	<1.21	<2.10	<1.64	<1.73	<0.032
Benzo(b)fluorene	<1.21	<2.10	<1.64	<1.73	<0.032
Benzo(g,h,i)Perylene	<1.51	<2.62	<2.05	<2.17	<0.040
Benzo(a)Pyrene	<1.21	<2.10	<1.64	<1.73	<0.032
Benzo(e)Pyrene	<1.21	<2.10	<1.64	<1.73	<0.032
Biphenyl	9.08	15.8	12.3	13.0	0.24
2-Chloronaphthalene	<1.21	<2.10	<1.64	<1.73	<0.032
Chrysene/Triphenylene	2.18	3.79	2.95	3.13	0.058
Coronene	<6.05	<10.5	<8.20	<8.67	<0.16
Dibenzo(a,c/a,h)Anthracene	<1.21	<2.10	<1.64	<1.73	<0.032
Dibenzo(a,e)pyrene	<6.05	<10.5	<8.20	<8.67	<0.16
9,10-dimethylanthracene	<1.44	<2.50	<1.95	<2.06	<0.038
7,12-Dimethylbenzo(a)anthracene	<1.21	<2.10	<1.64	<1.73	<0.032
Fluoranthene	13.9	24.2	18.9	20.0	0.37
Fluorene	16.5	28.6	22.4	23.6	0.44
Indeno(1,2,3-cd)Pyrene	<1.21	<2.10	<1.64	<1.73	<0.032
2-methylanthracene	26.4	45.7	35.7	37.8	0.70
3-Methylcholanthrene	<6.05	<10.50	<8.20	<8.67	<0.16
1-Methylnaphthalene	8.96	15.5	12.2	12.8	0.24
2-Methylnaphthalene	15.8	27.4	21.5	22.7	0.42
1-Methylphenanthrene	14.0	24.2	18.9	20.0	0.37
9-Methylphenanthrene	7.79	13.5	10.6	11.2	0.21
Naphthalene	76.4	132	104	110	2.04
Perylene	<1.21	<2.10	<1.64	<1.73	<0.032
Phenanthrene	103	178	139	147	2.75
Picene	<6.05	<10.5	<8.20	<8.67	<0.16
Pyrene	9.77	17.0	13.3	14.0	0.26
Tetralin	37.7	65.4	51.0	54.0	1.01
m-terphenyl	1.47	2.55	2.00	2.11	0.039
o-Terphenyl	1.51	2.62	2.04	2.16	0.040
p-terphenyl	<1.21	<2.10	<1.64	<1.73	<0.032
Total	<439	<762	<596	<630	<11.7

* 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	10.0	<10
Acenaphthylene	12.4	<10
Anthracene	10.0	<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	<10	<10
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	<10	<10
Biphenyl	43.8	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene	<10	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	<10	<10
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	<10	<10
Fluorene	53.5	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	13.0	<10
2-Methylnaphthalene	13.9	<10
1-Methylphenanthrene	<10	<10
9-Methylphenanthrene	<10	<10
Naphthalene	156	152
Perylene	<10	<10
Phenanthrene	12.7	<10
Picene	<50	<50
Pyrene	<10	<10
Tetralin	150	194
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<905	<856

"<" 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 µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acetaldehyde Emission Rate mg/s
1	<3.6	0.0308	<66.9	<117	<91.6	<96.7	<1.91
2	<5.0	0.0306	<94.0	<163	<127	<135	<2.55
3	<4.0	0.0298	<77.2	<134	<104	<111	<2.09
Average			<79.4	<138	<107	<114	<2.18
Blank	<3.0						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Formaldehyde Concentration: Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Formaldehyde Emission Rate mg/s
1	<3.6	0.0308	<66.9	<117	<91.6	<96.7	<1.91
2	<5.0	0.0306	<94.0	<163	<127	<135	<2.55
3	<4.0	0.0298	<77.2	<134	<104	<111	<2.09
Average			<79.4	<138	<107	<114	<2.18
Blank	<3.0						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acrolein Concentration: Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acrolein Emission Rate mg/s
1	<3.6	0.0308	<66.9	<117	<91.6	<96.7	<1.91
2	<5.0	0.0306	<94.0	<163	<127	<135	<2.55
3	<4.0	0.0298	<77.2	<134	<104	<111	<2.09
Average			<79.4	<138	<107	<114	<2.18
Blank	<3.0						

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 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. 1 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 1A/1B	Run No. 2 Tube 2A/2B	Run No. 3 Tube 3A/3B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.12	0.34	0.83	0.43	84.9	1.29
Benzene	0.053	0.074	0.060	0.062	17.2	0.19
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.024	0.062	0.066	0.051	45.8	0.15
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.017	0.033	<0.01	<0.020	58.9	<0.060
Cumene (Isopropylbenzene)	<0.02	0.023	<0.02	<0.021	8.2	<0.063
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	0.026	<0.022	15.7	<0.066
1,2-Dichloroethane	<0.01	0.014	<0.01	<0.011	20.4	<0.034
trans,1,2-Dichloroethene	0.017	0.014	<0.01	<0.014	25.7	<0.041
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	0.12	0.22	<0.01	<0.12	90.2	<0.36
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.081	0.092	<0.02	<0.064	60.3	<0.19
Methylene Chloride	1.29	1.97	1.19	1.48	28.7	4.45
Styrene	0.054	0.064	<0.02	<0.046	50.1	<0.14
Tetrachloroethene	0.011	0.015	<0.01	<0.012	22.0	<0.036
Toluene	0.69	0.76	0.056	0.50	77.2	1.51
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.05	1.38	0.073	0.83	81.5	2.50
O-Xylene	0.33	0.43	0.019	0.26	82.7	0.77
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<4.18	<5.78	<2.70	<4.22	36.5	<12.6

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0195
Run No. 2	0.0192
Run No. 3	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 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	0.34	1.27	1.10	0.90	55.3	2.70
Benzene	0.096	0.18	0.11	0.13	34.4	0.39
Bromodichloromethane	<0.01	0.038	0.027	<0.025	56.4	<0.075
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.04	0.54	0.39	0.32	79.0	0.97
Carbon Tetrachloride	<0.01	0.030	0.020	<0.020	50.0	<0.060
Chloroform	0.024	0.052	0.037	0.038	37.2	0.11
Cumene (Isopropylbenzene)	0.034	0.051	0.036	0.040	23.0	0.12
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	0.054	0.042	<0.039	44.6	<0.12
1,2-Dichloroethane	0.015	0.022	0.015	0.017	23.3	0.052
trans,1,2-Dichloroethene	0.015	0.035	0.027	0.026	39.2	0.077
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	0.20	0.38	0.28	0.28	32.0	0.85
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.18	0.11	0.089	0.13	38.2	0.39
Methylene Chloride	1.87	1.50	1.80	1.72	11.6	5.17
Styrene	0.10	0.088	0.070	0.086	17.6	0.26
Tetrachloroethene	0.019	0.032	0.031	0.027	26.5	0.082
Toluene	0.66	1.39	1.06	1.03	35.3	3.10
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	<0.02	0.025	0.021	<0.022	12.0	<0.066
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	2.17	1.76	1.35	1.76	23.2	5.28
O-Xylene	0.69	0.56	0.43	0.56	23.7	1.67
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	57.7	<0.040
Total	<6.74	<8.33	<7.14	<7.40	11.2	<22.2

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0194
Run No. 2	0.0189
Run No. 3	0.0204

* 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				Coefficient	Total
	Run No. 1 Tube 9A/9B	Run No. 2 Tube 10A/10B	Run No. 3 Tube 11A/11B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.19	0.75	0.12	0.35	98.2	1.06
Benzene	0.067	0.088	<0.05	<0.068	27.9	<0.21
Bromodichloromethane	<0.01	0.019	0.011	<0.013	37.0	<0.040
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.055	0.25	0.031	0.11	108	0.34
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.021	0.028	0.025	0.025	14.2	0.074
Cumene (Isopropylbenzene)	0.028	0.031	<0.02	<0.026	21.6	<0.079
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	0.010	0.010	<0.01	<0.010	0.0	<0.030
trans,1,2-Dichloroethene	0.013	0.016	0.018	0.016	16.1	0.047
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	0.17	0.20	<0.01	<0.13	80.7	<0.38
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.11	0.070	<0.02	<0.066	67.3	<0.20
Methylene Chloride	1.75	1.31	<0.1	<1.05	81.1	<3.16
Styrene	0.068	0.052	<0.02	<0.047	52.4	<0.14
Tetrachloroethene	0.015	0.018	0.013	0.015	16.4	0.046
Toluene	0.49	0.87	<0.05	<0.47	87.0	<1.41
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.44	1.02	<0.03	<0.83	87.3	<2.48
O-Xylene	0.45	0.32	<0.01	<0.26	86.8	<0.78
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<5.16	<5.33	<0.82	<3.77	67.8	<11.3

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0204
Run No. 2	0.0199
Run No. 3	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. 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	1.29	12.7	22.1	17.4	18.3	0.34
Benzene	0.19	1.85	3.21	2.54	2.66	0.049
Bromodichloromethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Bromoform	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Bromomethane	<0.27	<2.67	<4.64	<3.66	<3.84	<0.071
1,3-Butadiene	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
2-Butanone	0.15	1.51	2.61	2.06	2.16	0.040
Carbon Tetrachloride	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Chloroform	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
Cumene (Isopropylbenzene)	<0.063	<0.62	<1.08	<0.85	<0.90	<0.017
Dibromochloromethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Dichlorodifluoromethane	<0.066	<0.65	<1.13	<0.89	<0.94	<0.017
1,2-Dichloroethane	<0.034	<0.34	<0.58	<0.46	<0.48	<0.0090
trans,1,2-Dichloroethene	<0.041	<0.41	<0.70	<0.56	<0.58	<0.011
1,1-Dichloroethene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
1,2-Dichloropropane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Ethylbenzene	<0.36	<3.53	<6.11	<4.83	<5.06	<0.094
Ethylene Dibromide	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.19	<1.91	<3.31	<2.62	<2.74	<0.051
Methylene Chloride	4.45	44.0	76.4	60.3	63.2	1.18
Styrene	<0.14	<1.37	<2.37	<1.87	<1.96	<0.036
Tetrachloroethene	<0.036	<0.36	<0.62	<0.49	<0.51	<0.0095
Toluene	1.51	14.9	25.9	20.4	21.4	0.40
1,1,1-Trichloroethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0079
Trichlorotrifluoroethane	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
Trichlorofluoromethane	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
M&P-Xylene	2.50	24.7	42.8	33.8	35.5	0.66
O-Xylene	0.77	7.65	13.3	10.5	11.0	0.20
Vinyl Chloride	<0.060	<0.59	<1.03	<0.81	<0.85	<0.016
Total	<12.6	<125	<217	<171	<180	<3.34

Dry Gas Volume Sampled (Rm^3*) :	0.0582
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* 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	2.70	26.5	46.0	36.3	38.1	0.71
Benzene	0.39	3.84	6.66	5.26	5.52	0.10
Bromodichloromethane	<0.075	<0.74	<1.28	<1.01	<1.06	<0.020
Bromoform	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
Bromomethane	<0.27	<2.65	<4.60	<3.63	<3.81	<0.071
1,3-Butadiene	<0.060	<0.59	<1.02	<0.81	<0.85	<0.016
2-Butanone	0.97	9.55	16.6	13.1	13.7	0.26
Carbon Tetrachloride	<0.060	<0.59	<1.02	<0.81	<0.85	<0.016
Chloroform	0.11	1.11	1.93	1.52	1.59	0.030
Cumene (Isopropylbenzene)	0.12	1.19	2.06	1.63	1.71	0.032
Dibromochloromethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
Dichlorodifluoromethane	<0.12	<1.14	<1.98	<1.56	<1.64	<0.030
1,2-Dichloroethane	0.052	0.51	0.89	0.70	0.73	0.014
trans,1,2-Dichloroethene	0.077	0.76	1.31	1.04	1.09	0.020
1,1-Dichloroethene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
1,2-Dichloropropane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
Ethylbenzene	0.85	8.38	14.5	11.5	12.0	0.22
Ethylene Dibromide	<0.060	<0.59	<1.02	<0.81	<0.85	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	0.39	3.80	6.59	5.21	5.46	0.10
Methylene Chloride	5.17	50.8	88.0	69.5	72.9	1.36
Styrene	0.26	2.54	4.40	3.47	3.64	0.068
Tetrachloroethene	0.082	0.81	1.40	1.10	1.16	0.022
Toluene	3.10	30.5	52.8	41.7	43.7	0.81
1,1,1-Trichloroethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0079
Trichlorotrifluoroethane	<0.066	<0.65	<1.12	<0.89	<0.93	<0.017
Trichlorofluoromethane	<0.060	<0.59	<1.02	<0.81	<0.85	<0.016
M&P-Xylene	5.28	51.9	89.9	71.0	74.4	1.38
O-Xylene	1.67	16.4	28.5	22.5	23.6	0.44
Vinyl Chloride	<0.040	<0.39	<0.68	<0.54	<0.56	<0.010
Total	<22.2	<218	<378	<299	<313	<5.83

Dry Gas Volume Sampled (Rm^3*) :	0.0587
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* 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	1.06	10.2	17.7	13.7	14.6	0.28
Benzene	<0.21	<1.97	<3.43	<2.66	<2.83	<0.053
Bromodichloromethane	<0.040	<0.38	<0.67	<0.52	<0.55	<0.010
Bromoform	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Bromomethane	<0.27	<2.60	<4.51	<3.50	<3.72	<0.070
1,3-Butadiene	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
2-Butanone	0.34	3.27	5.68	4.41	4.69	0.089
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Chloroform	0.074	0.71	1.24	0.96	1.02	0.019
Cumene (Isopropylbenzene)	<0.079	<0.76	<1.32	<1.02	<1.09	<0.021
Dibromochloromethane	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Dichlorodifluoromethane	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
trans,1,2-Dichloroethene	0.047	0.45	0.79	0.61	0.65	0.012
1,1-Dichloroethene	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Ethylbenzene	<0.38	<3.67	<6.38	<4.95	<5.27	<0.10
Ethylene Dibromide	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.20	<1.91	<3.33	<2.58	<2.74	<0.052
Methylene Chloride	<3.16	<30.4	<52.7	<40.9	<43.5	<0.82
Styrene	<0.14	<1.35	<2.34	<1.82	<1.93	<0.036
Tetrachloroethene	0.046	0.44	0.77	0.60	0.63	0.012
Toluene	<1.41	<13.6	<23.6	<18.3	<19.4	<0.37
1,1,1-Trichloroethane	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.39	<0.41	<0.0078
Trichlorotrifluoroethane	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
Trichlorofluoromethane	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
M&P-Xylene	<2.48	<23.9	<41.5	<32.2	<34.2	<0.65
O-Xylene	<0.78	<7.50	<13.0	<10.1	<10.8	<0.20
Vinyl Chloride	<0.060	<0.58	<1.00	<0.78	<0.83	<0.016
Total	<11.3	<109	<189	<147	<156	<2.95

Dry Gas Volume Sampled (Rm^3*) :	0.0598
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
Wet Reference Flowrate (Rm^3/s*) :	18.9

* 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	12.7	26.5	10.2	16.5
Benzene	1.85	3.84	<1.97	<2.56
Bromodichloromethane	<0.30	<0.74	<0.38	<0.47
Bromoform	<0.30	<0.29	<0.29	<0.29
Bromomethane	<2.67	<2.65	<2.60	<2.64
1,3-Butadiene	<0.59	<0.59	<0.58	<0.59
2-Butanone	1.51	9.55	3.27	4.78
Carbon Tetrachloride	<0.30	<0.59	<0.29	<0.39
Chloroform	<0.59	1.11	0.71	<0.81
Cumene (Isopropylbenzene)	<0.62	1.19	<0.76	<0.86
Dibromochloromethane	<0.30	<0.29	<0.29	<0.29
Dichlorodifluoromethane	<0.65	<1.14	<0.58	<0.79
1,2-Dichloroethane	<0.34	0.51	<0.29	<0.38
trans,1,2-Dichloroethene	<0.41	0.76	0.45	<0.54
1,1-Dichloroethene	<0.30	<0.29	<0.29	<0.29
1,2-Dichloropropane	<0.30	<0.29	<0.29	<0.29
Ethylbenzene	<3.53	8.38	<3.67	<5.19
Ethylene Dibromide	<0.59	<0.59	<0.58	<0.59
Mesitylene (1,3,5-Trimethylbenzene)	<1.91	3.80	<1.91	<2.54
Methylene Chloride	44.0	50.8	<30.4	<41.7
Styrene	<1.37	2.54	<1.35	<1.75
Tetrachloroethene	<0.36	0.81	0.44	<0.53
Toluene	14.9	30.5	<13.6	<19.7
1,1,1-Trichloroethane	<0.30	<0.29	<0.29	<0.29
Trichloroethene/1,1,2-Trichloroethene	<0.30	<0.29	<0.29	<0.29
Trichlorotrifluoroethane	<0.59	<0.65	<0.58	<0.61
Trichlorofluoromethane	<0.59	<0.59	<0.58	<0.59
M&P-Xylene	24.7	51.9	<23.9	<33.5
O-Xylene	7.65	16.4	<7.50	<10.5
Vinyl Chloride	<0.59	<0.39	<0.58	<0.52
Total	<125	<218	<109	<151

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/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	22.1	46.0	17.7	28.6
Benzene	3.21	6.66	<3.43	<4.43
Bromodichloromethane	<0.52	<1.28	<0.67	<0.82
Bromoform	<0.52	<0.51	<0.50	<0.51
Bromomethane	<4.64	<4.60	<4.51	<4.58
1,3-Butadiene	<1.03	<1.02	<1.00	<1.02
2-Butanone	2.61	16.6	5.68	8.28
Carbon Tetrachloride	<0.52	<1.02	<0.50	<0.68
Chloroform	<1.03	1.93	1.24	<1.40
Cumene (Isopropylbenzene)	<1.08	2.06	<1.32	<1.49
Dibromochloromethane	<0.52	<0.51	<0.50	<0.51
Dichlorodifluoromethane	<1.13	<1.98	<1.00	<1.37
1,2-Dichloroethane	<0.58	0.89	<0.50	<0.66
trans,1,2-Dichloroethene	<0.70	1.31	0.79	<0.93
1,1-Dichloroethene	<0.52	<0.51	<0.50	<0.51
1,2-Dichloropropane	<0.52	<0.51	<0.50	<0.51
Ethylbenzene	<6.11	14.5	<6.38	<9.01
Ethylene Dibromide	<1.03	<1.02	<1.00	<1.02
Mesitylene (1,3,5-Trimethylbenzene)	<3.31	6.59	<3.33	<4.41
Methylene Chloride	76.4	88.0	<52.7	<72.4
Styrene	<2.37	4.40	<2.34	<3.03
Tetrachloroethene	<0.62	1.40	0.77	<0.93
Toluene	25.9	52.8	<23.6	<34.1
1,1,1-Trichloroethane	<0.52	<0.51	<0.50	<0.51
Trichloroethene/1,1,2-Trichloroethene	<0.52	<0.51	<0.50	<0.51
Trichlorotrifluoroethane	<1.03	<1.12	<1.00	<1.05
Trichlorofluoromethane	<1.03	<1.02	<1.00	<1.02
M&P-Xylene	42.8	89.9	<41.5	<58.1
O-Xylene	13.3	28.5	<13.0	<18.3
Vinyl Chloride	<1.03	<0.68	<1.00	<0.90
Total	<217	<378	<189	<261

* 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/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	17.4	36.3	13.7	22.5
Benzene	2.54	5.26	<2.66	<3.48
Bromodichloromethane	<0.41	<1.01	<0.52	<0.64
Bromoform	<0.41	<0.40	<0.39	<0.40
Bromomethane	<3.66	<3.63	<3.50	<3.60
1,3-Butadiene	<0.81	<0.81	<0.78	<0.80
2-Butanone	2.06	13.1	4.41	6.52
Carbon Tetrachloride	<0.41	<0.81	<0.39	<0.53
Chloroform	<0.81	1.52	0.96	<1.10
Cumene (Isopropylbenzene)	<0.85	1.63	<1.02	<1.17
Dibromochloromethane	<0.41	<0.40	<0.39	<0.40
Dichlorodifluoromethane	<0.89	<1.56	<0.78	<1.08
1,2-Dichloroethane	<0.46	0.70	<0.39	<0.52
trans,1,2-Dichloroethene	<0.56	1.04	0.61	<0.73
1,1-Dichloroethene	<0.41	<0.40	<0.39	<0.40
1,2-Dichloropropane	<0.41	<0.40	<0.39	<0.40
Ethylbenzene	<4.83	11.5	<4.95	<7.09
Ethylene Dibromide	<0.81	<0.81	<0.78	<0.80
Mesitylene (1,3,5-Trimethylbenzene)	<2.62	5.21	<2.58	<3.47
Methylene Chloride	60.3	69.5	<40.9	<56.9
Styrene	<1.87	3.47	<1.82	<2.39
Tetrachloroethene	<0.49	1.10	0.60	<0.73
Toluene	20.4	41.7	<18.3	<26.8
1,1,1-Trichloroethane	<0.41	<0.40	<0.39	<0.40
Trichloroethene/1,1,2-Trichloroethene	<0.41	<0.40	<0.39	<0.40
Trichlorotrifluoroethane	<0.81	<0.89	<0.78	<0.83
Trichlorofluoromethane	<0.81	<0.81	<0.78	<0.80
M&P-Xylene	33.8	71.0	<32.2	<45.7
O-Xylene	10.5	22.5	<10.1	<14.4
Vinyl Chloride	<0.81	<0.54	<0.78	<0.71
Total	<171	<299	<147	<206

* 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/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	18.3	38.1	14.6	23.7
Benzene	2.66	5.52	<2.83	<3.67
Bromodichloromethane	<0.43	<1.06	<0.55	<0.68
Bromoform	<0.43	<0.42	<0.41	<0.42
Bromomethane	<3.84	<3.81	<3.72	<3.79
1,3-Butadiene	<0.85	<0.85	<0.83	<0.84
2-Butanone	2.16	13.7	4.69	6.85
Carbon Tetrachloride	<0.43	<0.85	<0.41	<0.56
Chloroform	<0.85	1.59	1.02	<1.16
Cumene (Isopropylbenzene)	<0.90	1.71	<1.09	<1.23
Dibromochloromethane	<0.43	<0.42	<0.41	<0.42
Dichlorodifluoromethane	<0.94	<1.64	<0.83	<1.13
1,2-Dichloroethane	<0.48	0.73	<0.41	<0.54
trans,1,2-Dichloroethene	<0.58	1.09	0.65	<0.77
1,1-Dichloroethene	<0.43	<0.42	<0.41	<0.42
1,2-Dichloropropane	<0.43	<0.42	<0.41	<0.42
Ethylbenzene	<5.06	12.0	<5.27	<7.45
Ethylene Dibromide	<0.85	<0.85	<0.83	<0.84
Mesitylene (1,3,5-Trimethylbenzene)	<2.74	5.46	<2.74	<3.65
Methylene Chloride	63.2	72.9	<43.5	<59.9
Styrene	<1.96	3.64	<1.93	<2.51
Tetrachloroethene	<0.51	1.16	0.63	<0.77
Toluene	21.4	43.7	<19.4	<28.2
1,1,1-Trichloroethane	<0.43	<0.42	<0.41	<0.42
Trichloroethene/1,1,2-Trichloroethene	<0.43	<0.42	<0.41	<0.42
Trichlorotrifluoroethane	<0.85	<0.93	<0.83	<0.87
Trichlorofluoromethane	<0.85	<0.85	<0.83	<0.84
M&P-Xylene	35.5	74.4	<34.2	<48.0
O-Xylene	11.0	23.6	<10.8	<15.1
Vinyl Chloride	<0.85	<0.56	<0.83	<0.75
Total	<180	<313	<156	<216

* 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	0.34	0.71	0.28	0.44
Benzene	0.049	0.10	<0.053	<0.068
Bromodichloromethane	<0.0079	<0.020	<0.010	<0.013
Bromoform	<0.0079	<0.0079	<0.0078	<0.0079
Bromomethane	<0.071	<0.071	<0.070	<0.071
1,3-Butadiene	<0.016	<0.016	<0.016	<0.016
2-Butanone	0.040	0.26	0.089	0.128
Carbon Tetrachloride	<0.0079	<0.016	<0.0078	<0.010
Chloroform	<0.016	0.030	0.019	<0.022
Cumene (Isopropylbenzene)	<0.017	0.032	<0.021	<0.023
Dibromochloromethane	<0.0079	<0.0079	<0.0078	<0.0079
Dichlorodifluoromethane	<0.017	<0.030	<0.016	<0.021
1,2-Dichloroethane	<0.0090	0.014	<0.0078	<0.010
trans,1,2-Dichloroethene	<0.011	0.020	0.012	<0.014
1,1-Dichloroethene	<0.0079	<0.0079	<0.0078	<0.0079
1,2-Dichloropropane	<0.0079	<0.0079	<0.0078	<0.0079
Ethylbenzene	<0.094	0.22	<0.10	<0.14
Ethylene Dibromide	<0.016	<0.016	<0.016	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.051	0.10	<0.052	<0.068
Methylene Chloride	1.18	1.36	<0.82	<1.12
Styrene	<0.036	0.068	<0.036	<0.047
Tetrachloroethene	<0.0095	0.022	0.012	<0.014
Toluene	0.40	0.81	<0.37	<0.53
1,1,1-Trichloroethane	<0.0079	<0.0079	<0.0078	<0.0079
Trichloroethene/1,1,2-Trichloroethene	<0.0079	<0.0079	<0.0078	<0.0079
Trichlorotrifluoroethane	<0.016	<0.017	<0.016	<0.016
Trichlorofluoromethane	<0.016	<0.016	<0.016	<0.016
M&P-Xylene	0.66	1.38	<0.65	<0.90
O-Xylene	0.20	0.44	<0.20	<0.28
Vinyl Chloride	<0.016	<0.010	<0.016	<0.014
Total	<3.34	<5.83	<2.95	<4.04

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	16.5	28.6	22.5	23.7	0.44
Benzene	<2.56	<4.43	<3.48	<3.67	<0.068
Bromodichloromethane	<0.47	<0.82	<0.64	<0.68	<0.013
Bromoform	<0.29	<0.51	<0.40	<0.42	<0.0079
Bromomethane	<2.64	<4.58	<3.60	<3.79	<0.071
1,3-Butadiene	<0.59	<1.02	<0.80	<0.84	<0.016
2-Butanone	4.78	8.28	6.52	6.85	0.128
Carbon Tetrachloride	<0.39	<0.68	<0.53	<0.56	<0.010
Chloroform	<0.81	<1.40	<1.10	<1.16	<0.022
Cumene (Isopropylbenzene)	<0.86	<1.49	<1.17	<1.23	<0.023
Dibromochloromethane	<0.29	<0.51	<0.40	<0.42	<0.0079
Dichlorodifluoromethane	<0.79	<1.37	<1.08	<1.13	<0.021
1,2-Dichloroethane	<0.38	<0.66	<0.52	<0.54	<0.010
trans,1,2-Dichloroethene	<0.54	<0.93	<0.73	<0.77	<0.014
1,1-Dichloroethene	<0.29	<0.51	<0.40	<0.42	<0.0079
1,2-Dichloropropane	<0.29	<0.51	<0.40	<0.42	<0.0079
Ethylbenzene	<5.19	<9.01	<7.09	<7.45	<0.14
Ethylene Dibromide	<0.59	<1.02	<0.80	<0.84	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<2.54	<4.41	<3.47	<3.65	<0.068
Methylene Chloride	<41.7	<72.4	<56.9	<59.9	<1.12
Styrene	<1.75	<3.03	<2.39	<2.51	<0.047
Tetrachloroethene	<0.53	<0.93	<0.73	<0.77	<0.014
Toluene	<19.7	<34.1	<26.8	<28.2	<0.53
1,1,1-Trichloroethane	<0.29	<0.51	<0.40	<0.42	<0.0079
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.51	<0.40	<0.42	<0.0079
Trichlorotrifluoroethane	<0.61	<1.05	<0.83	<0.87	<0.016
Trichlorofluoromethane	<0.59	<1.02	<0.80	<0.84	<0.016
M&P-Xylene	<33.5	<58.1	<45.7	<48.0	<0.90
O-Xylene	<10.5	<18.3	<14.4	<15.1	<0.28
Vinyl Chloride	<0.52	<0.90	<0.71	<0.75	<0.014
Total	<151	<261	<206	<216	<4.04

* 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 25A/25B µg	Field Blank 2 Tube 29A/29B µg	Field Blank 3 Tube 30A/30B µg	Trip Blank µg	Method Blank µg
Acetone	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05	<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	<0.02	<0.02	<0.02	<0.02	<0.02
2-Butanone	<0.01	<0.01	<0.01	<0.01	<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	<0.02	<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	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.02	<0.02	<0.02	<0.02	<0.02
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	<0.75	<0.75	<0.75	<0.75	<0.75

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 Start	Sampling Period Finish	Sampling Time* min
1	June 25, 2019	10:46	13:56	180
2	June 26, 2019	8:30	11:43	180
3	June 26, 2019	12:59	16:08	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 25, 2019	9:10	11:14	120
2	June 25, 2019	13:17	15:22	120
3	June 25, 2019	16:20	18:24	120

Acid Gases Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 26, 2019	8:29	9:29	60
2	June 26, 2019	10:20	11:20	60
3	June 26, 2019	12:39	13:39	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	June 27, 2019	8:22	12:37	240
2	June 27, 2019	12:55	17:07	240
3	June 28, 2019	9:38	13:56	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	June 27, 2019	10:40	11:40	60
2	June 27, 2019	11:55	12:55	60
3	June 27, 2019	17:30	18:30	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	June 27, 2019	8:31	8:51	20
	2	June 27, 2019	8:57	9:17	20
	3	June 27, 2019	9:21	9:41	20
	4	June 27, 2019	9:47	10:07	20
2	1	June 27, 2019	13:06	13:26	20
	2	June 27, 2019	13:37	13:57	20
	3	June 27, 2019	14:06	14:26	20
	4	June 27, 2019	14:33	14:53	20
3	1	June 27, 2019	15:09	15:29	20
	2	June 27, 2019	15:35	15:55	20
	3	June 27, 2019	16:15	16:35	20
	4	June 27, 2019	16:45	17:05	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	June 25, 2019	16:32	17:32	60
BH Outlet	2	June 25, 2019	17:43	18:43	60
BH Outlet	3	June 25, 2019	18:53	19:53	60
Quench Inlet	1	June 25, 2019	10:32	11:32	60
Quench Inlet	2	June 25, 2019	11:40	12:40	60
Quench Inlet	3	June 25, 2019	12:52	13:52	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	1.004	6.35	3.557	99.3
2	0.851	1.004	6.35	3.484	98.5
3	0.851	1.004	6.35	3.471	99.7

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	0.848	0.990	4.51	1.141	98.8
2	0.848	0.990	4.51	1.188	103.6
3	0.848	0.990	4.51	1.159	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	0.845	0.990	6.35	1.198	100.8
2	0.845	0.990	6.35	1.214	101.8
3	0.845	0.990	6.35	1.221	102.4

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	0.851	1.004	6.43	4.791	99.2
2	0.849	1.004	6.40	4.799	99.1
3	0.849	1.004	6.40	4.603	98.8

* 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. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	142	16.1	18.1	-1.94	97.2	10.7	8.26
2	140	16.3	17.7	-1.97	97.8	10.9	8.19
3	139	17.4	17.7	-1.97	97.8	11.0	8.07
Average	140	16.6	17.8	-1.96	97.6	10.9	8.17

Particle Size Distribution Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	15.9	17.2	-1.94	97.1	10.6	8.40
2	140	15.2	16.9	-1.94	97.3	10.7	8.22
3	142	17.0	17.4	-1.94	97.4	10.7	8.31
Average	141	16.0	17.2	-1.94	97.3	10.7	8.31

Acid Gases Trains **

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	16.8	18.0	-1.97	97.8	10.7	8.25
2	141	16.6	18.0	-1.97	97.8	11.0	8.13
3	141	17.3	18.2	-1.97	97.8	11.1	8.09
Average	141	16.9	18.1	-1.97	97.8	10.9	8.16

Semi-Volatile Organics Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	141	17.2	17.8	-1.89	98.6	10.8	8.36
2	140	17.3	18.0	-1.89	98.5	10.6	8.42
3	140	17.1	17.3	-1.94	98.5	10.7	8.37
Average	140	17.2	17.7	-1.91	98.6	10.7	8.38

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically on a single traverse 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	26.7	15.5	19.8	18.4
2	26.2	15.3	19.6	18.3
3	26.1	15.0	19.5	18.2
Average	26.3	15.3	19.6	18.3

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	25.4	14.8	18.7	17.6
2	25.0	14.7	18.8	17.3
3	25.7	14.7	18.7	17.8
Average	25.4	14.7	18.7	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	26.6	15.4	19.7	18.5
2	26.7	15.4	19.9	18.5
3	26.9	15.4	20.0	18.7
Average	26.7	15.4	19.9	18.6

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	26.3	15.2	19.3	18.4
2	26.6	15.5	19.5	18.7
3	25.5	14.9	18.8	17.9
Average	26.1	15.2	19.2	18.3

* At 25°C and 1 atmosphere

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

*** Sampling was conducted isokinetically on a single traverse 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	2.0	<0.1	<2.1	3.557	<0.34	<0.59	<0.46	<0.50	<9.14
2	1.2	<0.1	<1.3	3.484	<0.22	<0.37	<0.29	<0.31	<5.70
3	1.2	0.5	1.7	3.471	0.28	0.49	0.38	0.40	7.37
Average					<0.28	<0.48	<0.38	<0.40	<7.40
Blank	2.4	0.3							

* 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. 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	2.8	1.141	1.43	2.45	1.94	2.06	36.3
2	<2.8	1.188	<1.39	<2.36	<1.84	<2.00	<34.6
3	3.3	1.159	1.63	2.85	2.24	2.35	41.9
Average			<1.48	<2.55	<2.01	<2.14	<37.6
Blank	2.1						

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	3.2	1.141	1.63	2.80	2.22	2.36	41.5
2	<3.2	1.188	<1.58	<2.69	<2.10	<2.29	<39.6
3	3.5	1.159	1.73	3.02	2.37	2.49	44.4
Average			<1.65	<2.84	<2.23	<2.38	<41.8
Blank	2.3						

* 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. 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	9.5	1.141	4.85	8.33	6.59	7.00	123
2	3.0	1.188	1.48	2.53	1.97	2.15	37.1
3	3.3	1.159	1.63	2.85	2.24	2.35	41.9
Average			2.65	4.57	3.60	3.83	67.4
Blank	0.4						

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	2.2	1.141	1.12	1.93	1.53	1.62	28.5
2	3.5	1.188	1.73	2.95	2.30	2.50	43.3
3	2.0	1.159	0.99	1.73	1.36	1.43	25.4
Average			1.28	2.20	1.73	1.85	32.4
Blank	1.1						

* 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	5.76	1.198	2.80	4.81	3.74	4.02	73.4
2	6.44	1.214	3.09	5.30	4.13	4.44	81.0
3	6.54	1.221	3.08	5.36	4.13	4.42	80.6
Average			2.99	5.16	4.00	4.29	78.3
Blank	<0.669						

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	<0.716	1.198	<0.35	<0.60	<0.47	<0.50	<9.13
2	<0.681	1.214	<0.33	<0.56	<0.44	<0.47	<8.57
3	<0.702	1.221	<0.33	<0.57	<0.44	<0.47	<8.65
Average			<0.34	<0.58	<0.45	<0.48	<8.78
Blank	<0.456						

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	1.22	1.198	0.59	1.02	0.79	0.85	15.6
2	0.852	1.214	0.41	0.70	0.55	0.59	10.7
3	0.875	1.221	0.41	0.72	0.55	0.59	10.8
Average			0.47	0.81	0.63	0.68	12.3
Blank	<0.288						

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 June 25 to June 28, 2019

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.88	8.32	8.96
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	7	12	21
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	8.0	12.2	19.0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0.15	4
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0.02	0.2
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	89	110	123
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	110	110	111
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	1	4	8
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	3.5	4.2	5.0
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0.08	1
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	8

Data measured by the ORTECH CEMS on June 25, 2019

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0.8	1.0	1.8
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.8	0.9	1.3
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.8	1.0	1.3
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		1.0	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0.2	0.6	1.4
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.1	0.5	1.3
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.5	1.0
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.5	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	0.4	0.6	0.9
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	0.2	0.5	0.9
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0.2	0.5	0.7
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		0.5	

* 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	0.28	<0.1	0.28
Arsenic	<1	<0.2	<0.20
Barium	8.19	1.36	9.55
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.26	0.16	0.43
Chromium	4.89	0.72	5.61
Cobalt	<0.2	<0.1	<0.20
Copper	1.45	1.96	3.41
Lead	1.83	0.87	2.70
Mercury *	<0.015	0.48	0.48
Molybdenum	30.6	0.12	30.7
Nickel	6.11	1.09	7.20
Selenium	<2	4.82	4.82
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	0.056	0.056
Vanadium	<1	<0.1	<0.10
Zinc	29.9	5.46	35.4
Total			<102

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.30	<0.1	0.30
Arsenic	<1	<0.2	<0.20
Barium	10.3	1.57	11.9
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.40	0.072	0.47
Chromium	3.02	1.29	4.31
Cobalt	<0.2	<0.1	<0.20
Copper	2.20	2.01	4.21
Lead	1.51	0.51	2.02
Mercury *	<0.015	<0.42	<0.42
Molybdenum	22.4	0.22	22.6
Nickel	5.31	1.33	6.64
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	20.5	7.74	28.2
Total			<83.2

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.23	<0.1	0.23
Arsenic	<1	<0.2	<0.20
Barium	9.26	1.48	10.7
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.16	0.061	0.22
Chromium	2.47	0.58	3.05
Cobalt	<0.2	<0.1	<0.20
Copper	2.25	3.61	5.86
Lead	1.10	0.46	1.56
Mercury *	<0.015	0.41	0.41
Molybdenum	21.9	0.13	22.0
Nickel	3.75	0.72	4.47
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	19.9	11.3	31.2
Total			<81.9

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.28	0.045	0.078	0.061	0.066	0.0012
Arsenic	<0.20	<0.033	<0.056	<0.044	<0.047	<0.00087
Barium	9.55	1.56	2.68	2.10	2.26	0.042
Beryllium	<0.20	<0.033	<0.056	<0.044	<0.047	<0.00087
Cadmium	0.43	0.070	0.12	0.094	0.10	0.0019
Chromium	5.61	0.92	1.58	1.23	1.33	0.024
Cobalt	<0.20	<0.033	<0.056	<0.044	<0.047	<0.00087
Copper	3.41	0.56	0.96	0.75	0.81	0.015
Lead	2.70	0.44	0.76	0.59	0.64	0.012
Mercury	0.48	0.079	0.14	0.11	0.11	0.0021
Molybdenum	30.7	5.01	8.64	6.76	7.28	0.13
Nickel	7.20	1.18	2.02	1.58	1.71	0.031
Selenium	4.82	0.79	1.36	1.06	1.14	0.021
Silver	<0.20	<0.033	<0.056	<0.044	<0.047	<0.00087
Thallium	0.056	0.0091	0.016	0.012	0.013	0.00024
Vanadium	<0.10	<0.016	<0.028	<0.022	<0.024	<0.00044
Zinc	35.4	5.77	9.94	7.78	8.37	0.15
Total	<101.5	<16.6	<28.5	<22.3	<24.0	<0.44

Dry Gas Volume Sampled (Rm^3*) :	3.557
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	18.4

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.30	0.050	0.086	0.067	0.072	0.0013
Arsenic	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00088
Barium	11.9	1.99	3.41	2.66	2.85	0.052
Beryllium	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00088
Cadmium	0.47	0.078	0.13	0.10	0.11	0.0021
Chromium	4.31	0.72	1.24	0.97	1.03	0.019
Cobalt	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00088
Copper	4.21	0.71	1.21	0.94	1.01	0.018
Lead	2.02	0.34	0.58	0.45	0.48	0.0089
Mercury	<0.42	<0.070	<0.12	<0.094	<0.10	<0.0018
Molybdenum	22.6	3.79	6.49	5.07	5.43	0.099
Nickel	6.64	1.11	1.91	1.49	1.59	0.029
Selenium	<1.00	<0.17	<0.29	<0.22	<0.24	<0.0044
Silver	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00088
Thallium	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00088
Vanadium	<0.10	<0.017	<0.029	<0.022	<0.024	<0.00044
Zinc	28.2	4.73	8.11	6.33	6.78	0.12
Total	<83.2	<13.9	<23.9	<18.6	<20.0	<0.37

Dry Gas Volume Sampled (Rm³*) :	3.484
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.3
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.23	0.038	0.067	0.051	0.055	0.0010
Arsenic	<0.20	<0.033	<0.058	<0.044	<0.047	<0.00086
Barium	10.7	1.78	3.09	2.38	2.55	0.046
Beryllium	<0.20	<0.033	<0.058	<0.044	<0.047	<0.00086
Cadmium	0.22	0.037	0.064	0.050	0.053	0.00097
Chromium	3.05	0.51	0.88	0.68	0.72	0.013
Cobalt	<0.20	<0.033	<0.058	<0.044	<0.047	<0.00086
Copper	5.86	0.97	1.69	1.30	1.39	0.025
Lead	1.56	0.26	0.45	0.35	0.37	0.0067
Mercury	0.41	0.068	0.12	0.092	0.098	0.0018
Molybdenum	22.0	3.65	6.35	4.88	5.23	0.095
Nickel	4.47	0.74	1.29	0.99	1.06	0.019
Selenium	<1.00	<0.17	<0.29	<0.22	<0.24	<0.0043
Silver	<0.20	<0.033	<0.058	<0.044	<0.047	<0.00086
Thallium	<0.20	<0.033	<0.058	<0.044	<0.047	<0.00086
Vanadium	<0.10	<0.017	<0.029	<0.022	<0.024	<0.00043
Zinc	31.2	5.17	8.99	6.91	7.41	0.13
Total	<81.9	<13.6	<23.6	<18.1	<19.4	<0.35

Dry Gas Volume Sampled (Rm³*) :	3.471
Actual Flowrate (m³/s) :	26.1
Dry Reference Flowrate (Rm³/s*) :	15.0
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.2

* 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	0.045	0.050	0.038	0.045	13.3
Arsenic	<0.033	<0.034	<0.033	<0.033	1.3
Barium	1.56	1.99	1.78	1.78	12.1
Beryllium	<0.033	<0.034	<0.033	<0.033	1.3
Cadmium	0.070	0.078	0.037	0.062	35.3
Chromium	0.92	0.72	0.51	0.71	28.7
Cobalt	<0.033	<0.034	<0.033	<0.033	1.3
Copper	0.56	0.71	0.97	0.74	28.2
Lead	0.44	0.34	0.26	0.35	26.5
Mercury	0.079	<0.070	0.068	<0.072	7.5
Molybdenum	5.01	3.79	3.65	4.15	18.1
Nickel	1.18	1.11	0.74	1.01	23.3
Selenium	0.79	<0.17	<0.17	<0.37	95.9
Silver	<0.033	<0.034	<0.033	<0.033	1.3
Thallium	0.0091	<0.034	<0.033	<0.025	55.4
Vanadium	<0.016	<0.017	<0.017	<0.017	1.3
Zinc	5.77	4.73	5.17	5.22	10.0
Total	<16.6	<13.9	<13.6	<14.7	11.1

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

Metal	Dry Reference Concentration				Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.078	0.086	0.067	0.077	12.6
Arsenic	<0.056	<0.057	<0.058	<0.057	1.3
Barium	2.68	3.41	3.09	3.06	11.8
Beryllium	<0.056	<0.057	<0.058	<0.057	1.3
Cadmium	0.12	0.13	0.064	0.11	34.7
Chromium	1.58	1.24	0.88	1.23	28.3
Cobalt	<0.056	<0.057	<0.058	<0.057	1.3
Copper	0.96	1.21	1.69	1.29	28.9
Lead	0.76	0.58	0.45	0.60	26.1
Mercury	0.14	<0.12	0.12	<0.13	7.3
Molybdenum	8.64	6.49	6.35	7.16	17.9
Nickel	2.02	1.91	1.29	1.74	22.7
Selenium	1.36	<0.29	<0.29	<0.64	95.8
Silver	<0.056	<0.057	<0.058	<0.057	1.3
Thallium	0.016	<0.057	<0.058	<0.044	55.5
Vanadium	<0.028	<0.029	<0.029	<0.029	1.3
Zinc	9.94	8.11	8.99	9.01	10.2
Total	<28.5	<23.9	<23.6	<25.3	11.0

* 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	0.061	0.067	0.051	0.060	13.3
Arsenic	<0.044	<0.045	<0.044	<0.044	0.9
Barium	2.10	2.66	2.38	2.38	11.7
Beryllium	<0.044	<0.045	<0.044	<0.044	0.9
Cadmium	0.094	0.10	0.050	0.083	35.3
Chromium	1.23	0.97	0.68	0.96	29.1
Cobalt	<0.044	<0.045	<0.044	<0.044	0.9
Copper	0.75	0.94	1.30	1.00	27.9
Lead	0.59	0.45	0.35	0.46	26.9
Mercury	0.11	<0.094	0.092	<0.097	8.0
Molybdenum	6.76	5.07	4.88	5.57	18.6
Nickel	1.58	1.49	0.99	1.35	23.5
Selenium	1.06	<0.22	<0.22	<0.50	96.3
Silver	<0.044	<0.045	<0.044	<0.044	0.9
Thallium	0.012	<0.045	<0.044	<0.034	55.2
Vanadium	<0.022	<0.022	<0.022	<0.022	0.9
Zinc	7.78	6.33	6.91	7.01	10.4
Total	<22.3	<18.6	<18.1	<19.7	11.6

** 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.066	0.072	0.055	0.064	13.3
Arsenic	<0.047	<0.048	<0.047	<0.048	0.7
Barium	2.26	2.85	2.55	2.55	11.5
Beryllium	<0.047	<0.048	<0.047	<0.048	0.7
Cadmium	0.10	0.11	0.053	0.089	35.4
Chromium	1.33	1.03	0.72	1.03	29.3
Cobalt	<0.047	<0.048	<0.047	<0.048	0.7
Copper	0.81	1.01	1.39	1.07	27.7
Lead	0.64	0.48	0.37	0.50	27.2
Mercury	0.11	<0.10	0.098	<0.10	8.3
Molybdenum	7.28	5.43	5.23	5.98	18.9
Nickel	1.71	1.59	1.06	1.45	23.6
Selenium	1.14	<0.24	<0.24	<0.54	96.6
Silver	<0.047	<0.048	<0.047	<0.048	0.7
Thallium	0.013	<0.048	<0.047	<0.036	55.1
Vanadium	<0.024	<0.024	<0.024	<0.024	0.7
Zinc	8.37	6.78	7.41	7.52	10.7
Total	<24.0	<20.0	<19.4	<21.1	11.9

* 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	0.0012	0.0013	0.0010	0.0012	13.6
Arsenic	<0.00087	<0.00088	<0.00086	<0.00087	0.8
Barium	0.042	0.052	0.046	0.047	11.3
Beryllium	<0.00087	<0.00088	<0.00086	<0.00087	0.8
Cadmium	0.0019	0.0021	0.00097	0.0016	35.6
Chromium	0.024	0.019	0.013	0.019	29.8
Cobalt	<0.00087	<0.00088	<0.00086	<0.00087	0.8
Copper	0.015	0.018	0.025	0.020	27.2
Lead	0.012	0.0089	0.0067	0.0091	27.7
Mercury	0.0021	<0.0018	0.0018	<0.0019	8.8
Molybdenum	0.13	0.099	0.095	0.11	19.4
Nickel	0.031	0.029	0.019	0.027	24.1
Selenium	0.021	<0.0044	<0.0043	<0.0099	97.0
Silver	<0.00087	<0.00088	<0.00086	<0.00087	0.8
Thallium	0.00024	<0.00088	<0.00086	<0.00066	54.8
Vanadium	<0.00044	<0.00044	<0.00043	<0.00044	0.8
Zinc	0.15	0.12	0.13	0.14	11.1
Total	<0.44	<0.37	<0.35	<0.39	12.4

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 2 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	0.045	0.077	0.060	0.064	0.0012
Arsenic	<0.033	<0.057	<0.044	<0.048	<0.00087
Barium	1.78	3.06	2.38	2.55	0.047
Beryllium	<0.033	<0.057	<0.044	<0.048	<0.00087
Cadmium	0.062	0.11	0.083	0.089	0.0016
Chromium	0.71	1.23	0.96	1.03	0.019
Cobalt	<0.033	<0.057	<0.044	<0.048	<0.00087
Copper	0.74	1.29	1.00	1.07	0.020
Lead	0.35	0.60	0.46	0.50	0.0091
Mercury	<0.072	<0.13	<0.097	<0.10	<0.0019
Molybdenum	4.15	7.16	5.57	5.98	0.11
Nickel	1.01	1.74	1.35	1.45	0.027
Selenium	<0.37	<0.64	<0.50	<0.54	<0.0099
Silver	<0.033	<0.057	<0.044	<0.048	<0.00087
Thallium	<0.025	<0.044	<0.034	<0.036	<0.00066
Vanadium	<0.017	<0.029	<0.022	<0.024	<0.00044
Zinc	5.22	9.01	7.01	7.52	0.14
Total	<14.7	<25.3	<19.7	<21.1	<0.39

* 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	<0.1	<0.2
Arsenic	<1	<0.2	<0.2
Barium	10.1	1.01	11.1
Beryllium	<0.2	<0.1	<0.2
Cadmium	<0.1	<0.05	<0.1
Chromium	2.45	0.41	2.86
Cobalt	<0.2	<0.1	<0.2
Copper	1.58	0.81	2.39
Lead	0.58	0.98	1.56
Mercury *	<0.015	0.16	0.16
Molybdenum	22.3	<0.1	22.3
Nickel	3.45	0.34	3.79
Selenium	<2	<1	<1
Silver	<0.2	<0.1	<0.2
Thallium	<0.2	<0.05	<0.2
Vanadium	<1	<0.1	<0.1
Zinc	<6	<3	<6
Total			<52.6

* 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 pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	14.3	0.0017	0.0030	0.0024	0.0025	0.045
Pentachlorodibenzo-p-dioxins	5.35	0.00065	0.0011	0.00088	0.00092	0.017
Hexachlorodibenzo-p-dioxins	57.9	0.0070	0.012	0.0095	0.010	0.18
Heptachlorodibenzo-p-dioxins	<3.4	<0.00041	<0.00071	<0.00056	<0.00059	<0.011
Octachlorodibenzo-p-dioxin	57.9	0.0070	0.012	0.0095	0.010	0.18
Total	<139	<0.017	<0.029	<0.023	<0.024	<0.44

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	<5.3	<0.00064	<0.0011	<0.00087	<0.00091	<0.017
Pentachlorodibenzofurans	23.7	0.0029	0.0049	0.0039	0.0041	0.075
Hexachlorodibenzofurans	9.53	0.0011	0.0020	0.0016	0.0016	0.030
Heptachlorodibenzofurans	23.5	0.0028	0.0049	0.0039	0.0041	0.075
Octachlorodibenzofuran	9.89	0.0012	0.0021	0.0016	0.0017	0.031
Total	<71.9	<0.0087	<0.015	<0.012	<0.012	<0.23

Dry Gas Volume Sampled (Rm³*) :	4.791
Actual Flowrate (m³/s) :	26.3
Dry Reference Flowrate (Rm³/s*) :	15.2
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	18.4

* 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 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 pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	30.9	0.0038	0.0064	0.0051	0.0053	0.10
Pentachlorodibenzo-p-dioxins	37.7	0.0046	0.0079	0.0062	0.0065	0.12
Hexachlorodibenzo-p-dioxins	82.1	0.010	0.017	0.014	0.014	0.27
Heptachlorodibenzo-p-dioxins	71.3	0.0087	0.015	0.012	0.012	0.23
Octachlorodibenzo-p-dioxin	58.6	0.0071	0.012	0.0097	0.010	0.19
Total	281	0.034	0.058	0.046	0.048	0.91

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzofurans	18.9	0.0023	0.0039	0.0031	0.0033	0.061
Pentachlorodibenzofurans	42.4	0.0051	0.0088	0.0070	0.0073	0.14
Hexachlorodibenzofurans	34.9	0.0042	0.0073	0.0058	0.0060	0.11
Heptachlorodibenzofurans	27.1	0.0033	0.0056	0.0045	0.0047	0.088
Octachlorodibenzofuran	9.18	0.0011	0.0019	0.0015	0.0016	0.030
Total	132	0.016	0.028	0.022	0.023	0.43

Dry Gas Volume Sampled (Rm^3*) :	4.799
Actual Flowrate (m^3/s) :	26.6
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.7

* 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. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	15.1	0.0019	0.0033	0.0026	0.0027	0.049
Pentachlorodibenzo-p-dioxins	38.7	0.0049	0.0084	0.0067	0.0070	0.13
Hexachlorodibenzo-p-dioxins	105	0.013	0.023	0.018	0.019	0.34
Heptachlorodibenzo-p-dioxins	119	0.015	0.026	0.020	0.022	0.39
Octachlorodibenzo-p-dioxin	119	0.015	0.026	0.020	0.022	0.39
Total	397	0.050	0.086	0.068	0.072	1.28

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzofurans	140	0.018	0.030	0.024	0.025	0.45
Pentachlorodibenzofurans	221	0.028	0.048	0.038	0.040	0.72
Hexachlorodibenzofurans	137	0.017	0.030	0.024	0.025	0.44
Heptachlorodibenzofurans	114	0.014	0.025	0.020	0.021	0.37
Octachlorodibenzofuran	36.9	0.0047	0.0080	0.0064	0.0067	0.12
Total	649	0.082	0.14	0.11	0.12	2.10

Dry Gas Volume Sampled (Rm^3*) :	4.603
Actual Flowrate (m^3/s) :	25.5
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
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 27
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0017	0.0038	0.0019	0.0025	45.4
Pentachlorodibenzo-p-dioxins	0.00065	0.0046	0.0049	0.0034	70.2
Hexachlorodibenzo-p-dioxins	0.0070	0.010	0.013	0.010	31.4
Heptachlorodibenzo-p-dioxins	<0.00041	0.0087	0.015	<0.0081	91.4
Octachlorodibenzo-p-dioxin	0.0070	0.0071	0.015	0.0097	47.8
Total	<0.017	0.034	0.050	<0.034	49.8

Furans

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzofurans	<0.00064	0.0023	0.018	<0.0069	137
Pentachlorodibenzofurans	0.0029	0.0051	0.028	0.012	116
Hexachlorodibenzofurans	0.0011	0.0042	0.017	0.0076	114
Heptachlorodibenzofurans	0.0028	0.0033	0.014	0.0069	96.0
Octachlorodibenzofuran	0.0012	0.0011	0.0047	0.0023	87.5
Total	<0.0087	0.016	0.082	<0.036	114

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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0030	0.0064	0.0033	0.0042	45.2
Pentachlorodibenzo-p-dioxins	0.0011	0.0079	0.0084	0.0058	70.1
Hexachlorodibenzo-p-dioxins	0.012	0.017	0.023	0.017	31.0
Heptachlorodibenzo-p-dioxins	<0.00071	0.015	0.026	<0.014	91.3
Octachlorodibenzo-p-dioxin	0.012	0.012	0.026	0.017	47.3
Total	<0.029	0.058	0.086	<0.058	49.4

Furans

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	<0.0011	0.0039	0.030	<0.012	137
Pentachlorodibenzofurans	0.0049	0.0088	0.048	0.021	116
Hexachlorodibenzofurans	0.0020	0.0073	0.030	0.013	113
Heptachlorodibenzofurans	0.0049	0.0056	0.025	0.012	95.6
Octachlorodibenzofuran	0.0021	0.0019	0.0080	0.0040	87.1
Total	<0.015	0.028	0.14	<0.061	113

* 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	0.0024	0.0051	0.0026	0.0034	45.6
Pentachlorodibenzo-p-dioxins	0.00088	0.0062	0.0067	0.0046	70.2
Hexachlorodibenzo-p-dioxins	0.0095	0.014	0.018	0.014	31.2
Heptachlorodibenzo-p-dioxins	<0.00056	0.012	0.020	<0.011	91.2
Octachlorodibenzo-p-dioxin	0.0095	0.0097	0.020	0.013	47.4
Total	<0.023	0.046	0.068	<0.046	49.6

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	<0.00087	0.0031	0.024	<0.0094	137
Pentachlorodibenzofurans	0.0039	0.0070	0.038	0.016	116
Hexachlorodibenzofurans	0.0016	0.0058	0.024	0.010	113
Heptachlorodibenzofurans	0.0039	0.0045	0.020	0.0093	95.7
Octachlorodibenzofuran	0.0016	0.0015	0.0064	0.0032	87.2
Total	<0.012	0.022	0.11	<0.048	113

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0025	0.0053	0.0027	0.0035	45.2
Pentachlorodibenzo-p-dioxins	0.00092	0.0065	0.0070	0.0048	70.2
Hexachlorodibenzo-p-dioxins	0.010	0.014	0.019	0.014	31.3
Heptachlorodibenzo-p-dioxins	<0.00059	0.012	0.022	<0.011	91.4
Octachlorodibenzo-p-dioxin	0.010	0.010	0.022	0.014	47.7
Total	<0.024	0.048	0.072	<0.048	49.8

Furans

Congener Group	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	<0.00091	0.0033	0.025	<0.0098	137
Pentachlorodibenzofurans	0.0041	0.0073	0.040	0.017	116
Hexachlorodibenzofurans	0.0016	0.0060	0.025	0.011	114
Heptachlorodibenzofurans	0.0041	0.0047	0.021	0.0098	96.0
Octachlorodibenzofuran	0.0017	0.0016	0.0067	0.0033	87.4
Total	<0.012	0.023	0.12	<0.051	114

* 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	0.045	0.10	0.049	0.065	47.1
Pentachlorodibenzo-p-dioxins	0.017	0.12	0.13	0.088	69.9
Hexachlorodibenzo-p-dioxins	0.18	0.27	0.34	0.26	29.7
Heptachlorodibenzo-p-dioxins	<0.011	0.23	0.39	<0.21	90.1
Octachlorodibenzo-p-dioxin	0.18	0.19	0.39	0.25	45.4
Total	<0.44	0.91	1.28	<0.88	48.2

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	<0.017	0.061	0.45	<0.18	136
Pentachlorodibenzofurans	0.075	0.14	0.72	0.31	114
Hexachlorodibenzofurans	0.030	0.11	0.44	0.20	112
Heptachlorodibenzofurans	0.075	0.088	0.37	0.18	94.0
Octachlorodibenzofuran	0.031	0.030	0.12	0.060	85.4
Total	<0.23	0.43	2.10	<0.92	112

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 ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	0.0025	0.0042	0.0034	0.0035	0.065
Pentachlorodibenzo-p-dioxins	0.0034	0.0058	0.0046	0.0048	0.088
Hexachlorodibenzo-p-dioxins	0.010	0.017	0.014	0.014	0.26
Heptachlorodibenzo-p-dioxins	<0.0081	<0.014	<0.011	<0.011	<0.21
Octachlorodibenzo-p-dioxin	0.0097	0.017	0.013	0.014	0.25
Total	<0.034	<0.058	<0.046	<0.048	<0.88

Furans

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	<0.0069	<0.012	<0.0094	<0.0098	<0.18
Pentachlorodibenzofurans	0.012	0.021	0.016	0.017	0.31
Hexachlorodibenzofurans	0.0076	0.013	0.010	0.011	0.20
Heptachlorodibenzofurans	0.0069	0.012	0.0093	0.0098	0.18
Octachlorodibenzofuran	0.0023	0.0040	0.0032	0.0033	0.060
Total	<0.036	<0.061	<0.048	<0.051	<0.92

* 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	<6.2	<7.6
Pentachlorodibenzo-p-dioxins	<3.7	<3.8
Hexachlorodibenzo-p-dioxins	<3.2	<4.8
Heptachlorodibenzo-p-dioxins	2.09	<2.4
Octachlorodibenzo-p-dioxin	<2.0	<2.8
Total	<17.2	<21.4

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<3.6	<5.0
Pentachlorodibenzofurans	<3.9	<3.6
Hexachlorodibenzofurans	5.07	<3.8
Heptachlorodibenzofurans	<2.1	<3.8
Octachlorodibenzofuran	<1.4	<3.1
Total	<16.1	<19.3

"<" 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<7.2	<0.87	<1.50	<1.18	<1.24	<0.023
12378-pentachlorodibenzo-p-dioxin	<4.5	<0.54	<0.94	<0.74	<0.78	<0.014
123478-hexachlorodibenzo-p-dioxin	<5.6	<0.68	<1.17	<0.92	<0.97	<0.018
123678-hexachlorodibenzo-p-dioxin	<4.4	<0.53	<0.92	<0.72	<0.76	<0.014
123789-hexachlorodibenzo-p-dioxin	<5.4	<0.65	<1.13	<0.89	<0.93	<0.017
1234678-heptachlorodibenzo-p-dioxin	<24	<2.90	<5.01	<3.95	<4.14	<0.076
Octachlorodibenzo-p-dioxin	57.9	6.98	12.1	9.52	9.98	0.18
2378-tetrachlorodibenzofuran	<5.3	<0.64	<1.11	<0.87	<0.91	<0.017
12378-pentachlorodibenzofuran	<4.7	<0.57	<0.98	<0.77	<0.81	<0.015
23478-pentachlorodibenzofuran	<3.5	<0.42	<0.73	<0.58	<0.60	<0.011
123478-hexachlorodibenzofuran	<8.3	<1.00	<1.73	<1.36	<1.43	<0.026
123678-hexachlorodibenzofuran	<5.6	<0.68	<1.17	<0.92	<0.97	<0.018
234678-hexachlorodibenzofuran	<6.5	<0.78	<1.36	<1.07	<1.12	<0.021
123789-hexachlorodibenzofuran	<9.5	<1.15	<1.98	<1.56	<1.64	<0.030
1234678-heptachlorodibenzofuran	19.6	2.36	4.09	3.22	3.38	0.062
1234789-heptachlorodibenzofuran	<6.4	<0.77	<1.34	<1.05	<1.10	<0.020
Octachlorodibenzofuran	9.89	1.19	2.06	1.63	1.71	0.031
PCB 81	<15	<1.81	<3.13	<2.47	<2.59	<0.048
PCB 77	177	21.4	36.9	29.1	30.5	0.56
PCB 123	70.4	8.49	14.7	11.6	12.1	0.22
PCB 118	4550	549	950	748	785	14.4
PCB 114	98.7	11.9	20.6	16.2	17.0	0.31
PCB 105	1450	175	303	238	250	4.60
PCB 126	<19	<2.29	<3.97	<3.12	<3.28	<0.060
PCB 167	53.4	6.44	11.1	8.78	9.21	0.17
PCB 156/157	145	17.5	30.3	23.8	25.0	0.46
PCB 169	<17	<2.05	<3.55	<2.79	<2.93	<0.054
PCB 189	<2.2	<0.27	<0.46	<0.36	<0.38	<0.0070
Total Dioxins & Furans Only	<188	<22.7	<39.3	<31.0	<32.5	<0.60
Total PCBs Only	<6598	<796	<1377	<1085	<1138	<20.9
Total Dioxins & Furans and PCBs	<6786	<819	<1416	<1116	<1170	<21.5

Dry Gas Volume Sampled (Rm³*) :	4.791
Actual Flowrate (m³/s) :	26.3
Dry Reference Flowrate (Rm³/s*) :	15.2
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	18.4

* 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 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<6.9	<0.84	<1.44	<1.14	<1.19	<0.022
12378-pentachlorodibenzo-p-dioxin	<3.8	<0.46	<0.79	<0.63	<0.66	<0.012
123478-hexachlorodibenzo-p-dioxin	<4.9	<0.59	<1.02	<0.81	<0.85	<0.016
123678-hexachlorodibenzo-p-dioxin	<5.5	<0.67	<1.15	<0.91	<0.95	<0.018
123789-hexachlorodibenzo-p-dioxin	<5.2	<0.63	<1.08	<0.86	<0.90	<0.017
1234678-heptachlorodibenzo-p-dioxin	36.4	4.42	7.58	6.03	6.29	0.12
Octachlorodibenzo-p-dioxin	58.6	7.12	12.2	9.71	10.1	0.19
2378-tetrachlorodibenzofuran	<4.6	<0.56	<0.96	<0.76	<0.79	<0.015
12378-pentachlorodibenzofuran	6.56	0.80	1.37	1.09	1.13	0.021
23478-pentachlorodibenzofuran	5.54	0.67	1.15	0.92	0.96	0.018
123478-hexachlorodibenzofuran	7.64	0.93	1.59	1.27	1.32	0.025
123678-hexachlorodibenzofuran	9.53	1.16	1.99	1.58	1.65	0.031
234678-hexachlorodibenzofuran	<5.3	<0.64	<1.10	<0.88	<0.92	<0.017
123789-hexachlorodibenzofuran	<7.2	<0.87	<1.50	<1.19	<1.24	<0.023
1234678-heptachlorodibenzofuran	21.6	2.62	4.50	3.58	3.73	0.070
1234789-heptachlorodibenzofuran	5.43	0.66	1.13	0.90	0.94	0.018
Octachlorodibenzofuran	9.18	1.11	1.91	1.52	1.59	0.030
PCB 81	<24	<2.91	<5.00	<3.98	<4.15	<0.078
PCB 77	<47	<5.71	<9.79	<7.78	<8.12	<0.15
PCB 123	<16	<1.94	<3.33	<2.65	<2.76	<0.052
PCB 118	965	117	201	160	167	3.12
PCB 114	23.8	2.89	4.96	3.94	4.11	0.077
PCB 105	310	37.6	64.6	51.3	53.5	1.00
PCB 126	<9.1	<1.10	<1.90	<1.51	<1.57	<0.029
PCB 167	10.8	1.31	2.25	1.79	1.87	0.035
PCB 156/157	37.7	4.58	7.86	6.24	6.51	0.12
PCB 169	<3.9	<0.47	<0.81	<0.65	<0.67	<0.013
PCB 189	<2.5	<0.30	<0.52	<0.41	<0.43	<0.0081
Total Dioxins & Furans Only	<204	<24.8	<42.5	<33.8	<35.2	<0.66
Total PCBs Only	<1450	<176	<302	<240	<250	<4.68
Total Dioxins & Furans and PCBs	<1654	<201	<345	<274	<286	<5.34

Dry Gas Volume Sampled (Rm^3*) :	4.799
Actual Flowrate (m^3/s) :	26.6
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.7

* 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 pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<8.6	<1.09	<1.87	<1.48	<1.56	<0.028
12378-pentachlorodibenzo-p-dioxin	<5.9	<0.75	<1.28	<1.02	<1.07	<0.019
123478-hexachlorodibenzo-p-dioxin	<8.4	<1.07	<1.82	<1.45	<1.52	<0.027
123678-hexachlorodibenzo-p-dioxin	14.0	1.78	3.04	2.41	2.53	0.045
123789-hexachlorodibenzo-p-dioxin	12.8	1.62	2.78	2.20	2.31	0.041
1234678-heptachlorodibenzo-p-dioxin	66.8	8.48	14.5	11.5	12.1	0.22
Octachlorodibenzo-p-dioxin	119	15.1	25.9	20.5	21.5	0.39
2378-tetrachlorodibenzofuran	24.8	3.15	5.39	4.27	4.48	0.080
12378-pentachlorodibenzofuran	30.4	3.86	6.60	5.23	5.50	0.098
23478-pentachlorodibenzofuran	31.0	3.94	6.73	5.34	5.61	0.10
123478-hexachlorodibenzofuran	35.0	4.44	7.60	6.03	6.33	0.11
123678-hexachlorodibenzofuran	<25	<3.17	<5.43	<4.30	<4.52	<0.081
234678-hexachlorodibenzofuran	26.8	3.40	5.82	4.61	4.85	0.087
123789-hexachlorodibenzofuran	<15	<1.90	<3.26	<2.58	<2.71	<0.049
1234678-heptachlorodibenzofuran	87.7	11.1	19.1	15.1	15.9	0.28
1234789-heptachlorodibenzofuran	14.0	1.78	3.04	2.41	2.53	0.045
Octachlorodibenzofuran	36.9	4.68	8.02	6.35	6.67	0.12
PCB 81	<25	<3.17	<5.43	<4.30	<4.52	<0.081
PCB 77	479	60.8	104	82.5	86.6	1.55
PCB 123	311	39.5	67.6	53.5	56.2	1.01
PCB 118	15900	2018	3454	2738	2875	51.5
PCB 114	<370	<47.0	<80.4	<63.7	<66.9	<1.20
PCB 105	4550	578	988	783	823	14.7
PCB 126	<22	<2.79	<4.78	<3.79	<3.98	<0.071
PCB 167	121	15.4	26.3	20.8	21.9	0.39
PCB 156/157	<300	<38.1	<65.2	<51.7	<54.3	<0.97
PCB 169	<12	<1.52	<2.61	<2.07	<2.17	<0.039
PCB 189	<5.0	<0.63	<1.09	<0.86	<0.90	<0.016
Total Dioxins & Furans Only	<562	<71.4	<122	<96.8	<102	<1.82
Total PCBs Only	<22095	<2805	<4800	<3804	<3996	<71.5
Total Dioxins & Furans and PCBs	<22657	<2876	<4922	<3901	<4097	<73.3

Dry Gas Volume Sampled (Rm³*) :	4.603
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	18.8
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. 2 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	pg/m^3	pg/m^3	pg/m^3	pg/m^3	%
2378-tetrachlorodibenzo-p-dioxin	<0.87	<0.84	<1.09	<0.93	14.9
12378-pentachlorodibenzo-p-dioxin	<0.54	<0.46	<0.75	<0.58	25.4
123478-hexachlorodibenzo-p-dioxin	<0.68	<0.59	<1.07	<0.78	32.4
123678-hexachlorodibenzo-p-dioxin	<0.53	<0.67	1.78	<0.99	68.9
123789-hexachlorodibenzo-p-dioxin	<0.65	<0.63	1.62	<0.97	58.6
1234678-heptachlorodibenzo-p-dioxin	<2.90	4.42	8.48	<5.26	54.8
Octachlorodibenzo-p-dioxin	6.98	7.12	15.1	9.74	47.8
2378-tetrachlorodibenzofuran	<0.64	<0.56	3.15	<1.45	102
12378-pentachlorodibenzofuran	<0.57	0.80	3.86	<1.74	106
23478-pentachlorodibenzofuran	<0.42	0.67	3.94	<1.68	117
123478-hexachlorodibenzofuran	<1.00	0.93	4.44	<2.12	94.6
123678-hexachlorodibenzofuran	<0.68	1.16	<3.17	<1.67	79.4
234678-hexachlorodibenzofuran	<0.78	<0.64	3.40	<1.61	96.5
123789-hexachlorodibenzofuran	<1.15	<0.87	<1.90	<1.31	40.8
1234678-heptachlorodibenzofuran	2.36	2.62	11.1	5.37	92.9
1234789-heptachlorodibenzofuran	<0.77	0.66	1.78	<1.07	57.5
Octachlorodibenzofuran	1.19	1.11	4.68	2.33	87.5
PCB 81	<1.81	<2.91	<3.17	<2.63	27.5
PCB 77	21.4	<5.71	60.8	<29.3	96.9
PCB 123	8.49	<1.94	39.5	<16.6	121
PCB 118	549	117	2018	895	111
PCB 114	11.9	2.89	<47.0	<20.6	113
PCB 105	175	37.6	578	263	107
PCB 126	<2.29	<1.10	<2.79	<2.06	42.0
PCB 167	6.44	1.31	15.4	7.70	92.3
PCB 156/157	17.5	4.58	<38.1	<20.1	84.3
PCB 169	<2.05	<0.47	<1.52	<1.35	59.5
PCB 189	<0.27	<0.30	<0.63	<0.40	50.6
Total Dioxins & Furans Only	<22.7	<24.8	<71.4	<39.6	69.5
Total PCBs Only	<796	<176	<2805	<1259	109
Total Dioxins & Furans and PCBs	<819	<201	<2876	<1299	108

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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	pg/Rm^3*	pg/Rm^3*	pg/Rm^3*	pg/Rm^3*	%
2378-tetrachlorodibenzo-p-dioxin	<1.50	<1.44	<1.87	<1.60	14.5
12378-pentachlorodibenzo-p-dioxin	<0.94	<0.79	<1.28	<1.00	25.0
123478-hexachlorodibenzo-p-dioxin	<1.17	<1.02	<1.82	<1.34	32.0
123678-hexachlorodibenzo-p-dioxin	<0.92	<1.15	3.04	<1.70	68.5
123789-hexachlorodibenzo-p-dioxin	<1.13	<1.08	2.78	<1.66	58.2
1234678-heptachlorodibenzo-p-dioxin	<5.01	7.58	14.5	<9.04	54.4
Octachlorodibenzo-p-dioxin	12.1	12.2	25.9	16.7	47.3
2378-tetrachlorodibenzofuran	<1.11	<0.96	5.39	<2.48	101
12378-pentachlorodibenzofuran	<0.98	1.37	6.60	<2.98	105
23478-pentachlorodibenzofuran	<0.73	1.15	6.73	<2.87	117
123478-hexachlorodibenzofuran	<1.73	1.59	7.60	<3.64	94.2
123678-hexachlorodibenzofuran	<1.17	1.99	<5.43	<2.86	79.0
234678-hexachlorodibenzofuran	<1.36	<1.10	5.82	<2.76	96.1
123789-hexachlorodibenzofuran	<1.98	<1.50	<3.26	<2.25	40.4
1234678-heptachlorodibenzofuran	4.09	4.50	19.1	9.21	92.5
1234789-heptachlorodibenzofuran	<1.34	1.13	3.04	<1.84	57.1
Octachlorodibenzofuran	2.06	1.91	8.02	4.00	87.1
PCB 81	<3.13	<5.00	<5.43	<4.52	27.1
PCB 77	36.9	<9.79	104	<50.3	96.5
PCB 123	14.7	<3.33	67.6	<28.5	120
PCB 118	950	201	3454	1535	111
PCB 114	20.6	4.96	<80.4	<35.3	113
PCB 105	303	64.6	988	452	106
PCB 126	<3.97	<1.90	<4.78	<3.55	41.9
PCB 167	11.1	2.25	26.3	13.2	91.9
PCB 156/157	30.3	7.86	<65.2	<34.4	83.9
PCB 169	<3.55	<0.81	<2.61	<2.32	59.8
PCB 189	<0.46	<0.52	<1.09	<0.69	50.2
Total Dioxins & Furans Only	<39.3	<42.5	<122	<68.0	69.0
Total PCBs Only	<1377	<302	<4800	<2160	109
Total Dioxins & Furans and PCBs	<1416	<345	<4922	<2228	107

* 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 Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<1.18	<1.14	<1.48	<1.27	14.5
12378-pentachlorodibenzo-p-dioxin	<0.74	<0.63	<1.02	<0.80	25.0
123478-hexachlorodibenzo-p-dioxin	<0.92	<0.81	<1.45	<1.06	32.0
123678-hexachlorodibenzo-p-dioxin	<0.72	<0.91	2.41	<1.35	68.6
123789-hexachlorodibenzo-p-dioxin	<0.89	<0.86	2.20	<1.32	58.3
1234678-heptachlorodibenzo-p-dioxin	<3.95	6.03	11.5	<7.16	54.5
Octachlorodibenzo-p-dioxin	9.52	9.71	20.5	13.2	47.4
2378-tetrachlorodibenzofuran	<0.87	<0.76	4.27	<1.97	101
12378-pentachlorodibenzofuran	<0.77	1.09	5.23	<2.36	105
23478-pentachlorodibenzofuran	<0.58	0.92	5.34	<2.28	117
123478-hexachlorodibenzofuran	<1.36	1.27	6.03	<2.89	94.3
123678-hexachlorodibenzofuran	<0.92	1.58	<4.30	<2.27	79.1
234678-hexachlorodibenzofuran	<1.07	<0.88	4.61	<2.19	96.2
123789-hexachlorodibenzofuran	<1.56	<1.19	<2.58	<1.78	40.5
1234678-heptachlorodibenzofuran	3.22	3.58	15.1	7.30	92.6
1234789-heptachlorodibenzofuran	<1.05	0.90	2.41	<1.45	57.2
Octachlorodibenzofuran	1.63	1.52	6.35	3.17	87.2
PCB 81	<2.47	<3.98	<4.30	<3.58	27.4
PCB 77	29.1	<7.78	82.5	<39.8	96.7
PCB 123	11.6	<2.65	53.5	<22.6	120
PCB 118	748	160	2738	1215	111
PCB 114	16.2	3.94	<63.7	<28.0	113
PCB 105	238	51.3	783	358	106
PCB 126	<3.12	<1.51	<3.79	<2.81	41.8
PCB 167	8.78	1.79	20.8	10.5	92.0
PCB 156/157	23.8	6.24	<51.7	<27.2	84.0
PCB 169	<2.79	<0.65	<2.07	<1.84	59.5
PCB 189	<0.36	<0.41	<0.86	<0.55	50.3
Total Dioxins & Furans Only	<31.0	<33.8	<96.8	<53.8	69.1
Total PCBs Only	<1085	<240	<3804	<1710	109
Total Dioxins & Furans and PCBs	<1116	<274	<3901	<1764	108

* 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 Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<1.24	<1.19	<1.56	<1.33	14.8
12378-pentachlorodibenzo-p-dioxin	<0.78	<0.66	<1.07	<0.83	25.4
123478-hexachlorodibenzo-p-dioxin	<0.97	<0.85	<1.52	<1.11	32.3
123678-hexachlorodibenzo-p-dioxin	<0.76	<0.95	2.53	<1.41	68.9
123789-hexachlorodibenzo-p-dioxin	<0.93	<0.90	2.31	<1.38	58.5
1234678-heptachlorodibenzo-p-dioxin	<4.14	6.29	12.1	<7.50	54.8
Octachlorodibenzo-p-dioxin	9.98	10.1	21.5	13.9	47.7
2378-tetrachlorodibenzofuran	<0.91	<0.79	4.48	<2.06	102
12378-pentachlorodibenzofuran	<0.81	1.13	5.50	<2.48	106
23478-pentachlorodibenzofuran	<0.60	0.96	5.61	<2.39	117
123478-hexachlorodibenzofuran	<1.43	1.32	6.33	<3.03	94.5
123678-hexachlorodibenzofuran	<0.97	1.65	<4.52	<2.38	79.4
234678-hexachlorodibenzofuran	<1.12	<0.92	4.85	<2.29	96.4
123789-hexachlorodibenzofuran	<1.64	<1.24	<2.71	<1.86	40.8
1234678-heptachlorodibenzofuran	3.38	3.73	15.9	7.66	92.8
1234789-heptachlorodibenzofuran	<1.10	0.94	2.53	<1.52	57.5
Octachlorodibenzofuran	1.71	1.59	6.67	3.32	87.4
PCB 81	<2.59	<4.15	<4.52	<3.75	27.3
PCB 77	30.5	<8.12	86.6	<41.8	96.9
PCB 123	12.1	<2.76	56.2	<23.7	120
PCB 118	785	167	2875	1276	111
PCB 114	17.0	4.11	<66.9	<29.3	113
PCB 105	250	53.5	823	375	106
PCB 126	<3.28	<1.57	<3.98	<2.94	42.1
PCB 167	9.21	1.87	21.9	11.0	92.2
PCB 156/157	25.0	6.51	<54.3	<28.6	84.2
PCB 169	<2.93	<0.67	<2.17	<1.92	59.7
PCB 189	<0.38	<0.43	<0.90	<0.57	50.6
Total Dioxins & Furans Only	<32.5	<35.2	<102	<56.4	69.4
Total PCBs Only	<1138	<250	<3996	<1795	109
Total Dioxins & Furans and PCBs	<1170	<286	<4097	<1851	108

* 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 Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.023	<0.022	<0.028	<0.024	12.6
12378-pentachlorodibenzo-p-dioxin	<0.014	<0.012	<0.019	<0.015	23.1
123478-hexachlorodibenzo-p-dioxin	<0.018	<0.016	<0.027	<0.020	30.0
123678-hexachlorodibenzo-p-dioxin	<0.014	<0.018	0.045	<0.026	66.6
123789-hexachlorodibenzo-p-dioxin	<0.017	<0.017	0.041	<0.025	56.2
1234678-heptachlorodibenzo-p-dioxin	<0.076	0.12	0.22	<0.14	52.7
Octachlorodibenzo-p-dioxin	0.18	0.19	0.39	0.25	45.4
2378-tetrachlorodibenzofuran	<0.017	<0.015	0.080	<0.037	100
12378-pentachlorodibenzofuran	<0.015	0.021	0.098	<0.045	104
23478-pentachlorodibenzofuran	<0.011	0.018	0.10	<0.043	115
123478-hexachlorodibenzofuran	<0.026	0.025	0.11	<0.055	92.6
123678-hexachlorodibenzofuran	<0.018	0.031	<0.081	<0.043	77.3
234678-hexachlorodibenzofuran	<0.021	<0.017	0.087	<0.041	94.5
123789-hexachlorodibenzofuran	<0.030	<0.023	<0.049	<0.034	38.5
1234678-heptachlorodibenzofuran	0.062	0.070	0.28	0.14	90.8
1234789-heptachlorodibenzofuran	<0.020	0.018	0.045	<0.028	55.2
Octachlorodibenzofuran	0.031	0.030	0.12	0.060	85.4
PCB 81	<0.048	<0.078	<0.081	<0.069	26.7
PCB 77	0.56	<0.15	1.55	<0.75	95.3
PCB 123	0.22	<0.052	1.01	<0.43	119
PCB 118	14.4	3.12	51.5	23.0	110
PCB 114	0.31	0.077	<1.20	<0.53	112
PCB 105	4.60	1.00	14.7	6.78	105
PCB 126	<0.060	<0.029	<0.071	<0.054	40.4
PCB 167	0.17	0.035	0.39	0.20	90.7
PCB 156/157	0.46	0.12	<0.97	<0.52	82.6
PCB 169	<0.054	<0.013	<0.039	<0.035	59.6
PCB 189	<0.0070	<0.0081	<0.016	<0.010	48.3
Total Dioxins & Furans Only	<0.60	<0.66	<1.82	<1.03	67.2
Total PCBs Only	<20.9	<4.68	<71.5	<32.4	108
Total Dioxins & Furans and PCBs	<21.5	<5.34	<73.3	<33.4	106

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 pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.93	<1.60	<1.27	<1.33	<0.024
12378-pentachlorodibenzo-p-dioxin	<0.58	<1.00	<0.80	<0.83	<0.015
123478-hexachlorodibenzo-p-dioxin	<0.78	<1.34	<1.06	<1.11	<0.020
123678-hexachlorodibenzo-p-dioxin	<0.99	<1.70	<1.35	<1.41	<0.026
123789-hexachlorodibenzo-p-dioxin	<0.97	<1.66	<1.32	<1.38	<0.025
1234678-heptachlorodibenzo-p-dioxin	<5.26	<9.04	<7.16	<7.50	<0.14
Octachlorodibenzo-p-dioxin	9.74	16.7	13.2	13.9	0.25
2378-tetrachlorodibenzofuran	<1.45	<2.48	<1.97	<2.06	<0.037
12378-pentachlorodibenzofuran	<1.74	<2.98	<2.36	<2.48	<0.045
23478-pentachlorodibenzofuran	<1.68	<2.87	<2.28	<2.39	<0.043
123478-hexachlorodibenzofuran	<2.12	<3.64	<2.89	<3.03	<0.055
123678-hexachlorodibenzofuran	<1.67	<2.86	<2.27	<2.38	<0.043
234678-hexachlorodibenzofuran	<1.61	<2.76	<2.19	<2.29	<0.041
123789-hexachlorodibenzofuran	<1.31	<2.25	<1.78	<1.86	<0.034
1234678-heptachlorodibenzofuran	5.37	9.21	7.30	7.66	0.14
1234789-heptachlorodibenzofuran	<1.07	<1.84	<1.45	<1.52	<0.028
Octachlorodibenzofuran	2.33	4.00	3.17	3.32	0.060
PCB 81	<2.63	<4.52	<3.58	<3.75	<0.069
PCB 77	<29.3	<50.3	<39.8	<41.8	<0.75
PCB 123	<16.6	<28.5	<22.6	<23.7	<0.43
PCB 118	895	1535	1215	1276	23.0
PCB 114	<20.6	<35.3	<28.0	<29.3	<0.53
PCB 105	263	452	358	375	6.78
PCB 126	<2.06	<3.55	<2.81	<2.94	<0.054
PCB 167	7.70	13.2	10.5	11.0	0.20
PCB 156/157	<20.1	<34.4	<27.2	<28.6	<0.52
PCB 169	<1.35	<2.32	<1.84	<1.92	<0.035
PCB 189	<0.40	<0.69	<0.55	<0.57	<0.010
Total Dioxins & Furans Only	<39.6	<68.0	<53.8	<56.4	<1.03
Total PCBs Only	<1259	<2160	<1710	<1795	<32.4
Total Dioxins & Furans and PCBs	<1299	<2228	<1764	<1851	<33.4

* 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 pg	Laboratory Blank pg
2378-tetrachlorodibenzo-p-dioxin	<6.2	<7.6
12378-pentachlorodibenzo-p-dioxin	<3.7	<3.8
123478-hexachlorodibenzo-p-dioxin	<3.2	<4.8
123678-hexachlorodibenzo-p-dioxin	<2.5	<3.8
123789-hexachlorodibenzo-p-dioxin	<3.1	<4.6
1234678-heptachlorodibenzo-p-dioxin	2.09	<2.4
Octachlorodibenzo-p-dioxin	<2.0	<2.8
2378-tetrachlorodibenzofuran	<3.6	<5.0
12378-pentachlorodibenzofuran	<3.9	<3.6
23478-pentachlorodibenzofuran	<3.5	<3.2
123478-hexachlorodibenzofuran	<2.3	<2.7
123678-hexachlorodibenzofuran	<1.9	<2.2
234678-hexachlorodibenzofuran	<2.3	<2.6
123789-hexachlorodibenzofuran	5.07	<3.8
1234678-heptachlorodibenzofuran	<1.4	<2.6
1234789-heptachlorodibenzofuran	<2.1	<2.8
Octachlorodibenzofuran	<1.4	<3.1
PCB 81	<10	<6.4
PCB 77	<11	<6.6
PCB 123	<9.6	<6.2
PCB 118	<9.0	<12
PCB 114	<9.3	<6.1
PCB 105	<8.9	<5.7
PCB 126	<13	<6.4
PCB 167	<3.7	<2.5
PCB 156/157	<5.8	6.62
PCB 169	<4.3	<2.9
PCB 189	<4.5	<3.4
Total Dioxins & Furans Only	<50.3	<61.4
Total PCBs Only	<89.1	<64.8
Total Dioxins & Furans and PCBs	<139	<126

"<" 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	1.00000	<0.87	<0.84	<1.09	<0.93
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.54	<0.46	<0.75	<0.58
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.068	<0.059	<0.11	<0.078
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.053	<0.067	0.18	<0.099
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.065	<0.063	0.16	<0.097
1234678-heptachlorodibenzo-p-dioxin	0.01000	<0.029	0.044	0.085	<0.053
Octachlorodibenzo-p-dioxin	0.00030	0.0021	0.0021	0.0045	0.0029
2378-tetrachlorodibenzofuran	0.10000	<0.064	<0.056	0.31	<0.14
12378-pentachlorodibenzofuran	0.03000	<0.017	0.024	0.12	<0.052
23478-pentachlorodibenzofuran	0.30000	<0.13	0.20	1.18	<0.50
123478-hexachlorodibenzofuran	0.10000	<0.10	0.093	0.44	<0.21
123678-hexachlorodibenzofuran	0.10000	<0.068	0.12	<0.32	<0.17
234678-hexachlorodibenzofuran	0.10000	<0.078	<0.064	0.34	<0.16
123789-hexachlorodibenzofuran	0.10000	<0.11	<0.087	<0.19	<0.13
1234678-heptachlorodibenzofuran	0.01000	0.024	0.026	0.11	0.054
1234789-heptachlorodibenzofuran	0.01000	<0.0077	0.0066	0.018	<0.011
Octachlorodibenzofuran	0.00030	0.00036	0.00033	0.0014	0.00070
PCB 81	0.00030	<0.00054	<0.00087	<0.00095	<0.00079
PCB 77	0.00010	0.0021	<0.00057	0.0061	<0.0029
PCB 123	0.00003	0.00025	<0.000058	0.0012	<0.00050
PCB 118	0.00003	0.016	0.0035	0.061	0.027
PCB 114	0.00003	0.00036	0.000087	<0.0014	<0.00062
PCB 105	0.00003	0.0052	0.0011	0.017	0.0079
PCB 126	0.10000	<0.23	<0.11	<0.28	<0.21
PCB 167	0.00003	0.00019	0.000039	0.00046	0.00023
PCB 156/157	0.00003	0.00052	0.00014	<0.0011	<0.00060
PCB 169	0.03000	<0.062	<0.014	<0.046	<0.040
PCB 189	0.00003	<0.0000080	<0.0000091	<0.000019	<0.000012
Total Dioxins & Furans Only		<2.23	<2.21	<5.41	<3.28
Total PCBs Only		<0.32	<0.13	<0.41	<0.29
Total Dioxins & Furans and PCBs		<2.54	<2.34	<5.82	<3.57

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	1.00000	<1.50	<1.44	<1.87	<1.60
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.94	<0.79	<1.28	<1.00
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.12	<0.10	<0.18	<0.13
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.092	<0.11	0.30	<0.17
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.11	<0.11	0.28	<0.17
1234678-heptachlorodibenzo-p-dioxin	0.01000	<0.050	0.076	0.15	<0.090
Octachlorodibenzo-p-dioxin	0.00030	0.0036	0.0037	0.0078	0.0050
2378-tetrachlorodibenzofuran	0.10000	<0.11	<0.096	0.54	<0.25
12378-pentachlorodibenzofuran	0.03000	<0.029	0.041	0.20	<0.090
23478-pentachlorodibenzofuran	0.30000	<0.22	0.35	2.02	<0.86
123478-hexachlorodibenzofuran	0.10000	<0.17	0.16	0.76	<0.36
123678-hexachlorodibenzofuran	0.10000	<0.12	0.20	<0.54	<0.29
234678-hexachlorodibenzofuran	0.10000	<0.14	<0.11	0.58	<0.28
123789-hexachlorodibenzofuran	0.10000	<0.20	<0.15	<0.33	<0.22
1234678-heptachlorodibenzofuran	0.01000	0.041	0.045	0.19	0.092
1234789-heptachlorodibenzofuran	0.01000	<0.013	0.011	0.030	<0.018
Octachlorodibenzofuran	0.00030	0.00062	0.00057	0.0024	0.0012
PCB 81	0.00030	<0.00094	<0.0015	<0.0016	<0.0014
PCB 77	0.00010	0.0037	<0.00098	0.010	<0.0050
PCB 123	0.00003	0.00044	<0.00010	0.0020	<0.00086
PCB 118	0.00003	0.028	0.0060	0.10	0.046
PCB 114	0.00003	0.00062	0.00015	<0.0024	<0.0011
PCB 105	0.00003	0.0091	0.0019	0.030	0.014
PCB 126	0.10000	<0.40	<0.19	<0.48	<0.35
PCB 167	0.00003	0.00033	0.000068	0.00079	0.00040
PCB 156/157	0.00003	0.00091	0.00024	<0.0020	<0.0010
PCB 169	0.03000	<0.11	<0.024	<0.078	<0.070
PCB 189	0.00003	<0.000014	<0.000016	<0.000033	<0.000021
Total Dioxins & Furans Only		<3.86	<3.79	<9.26	<5.64
Total PCBs Only		<0.55	<0.23	<0.71	<0.49
Total Dioxins & Furans and PCBs		<4.40	<4.02	<9.97	<6.13

* 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	1.00000	<1.18	<1.14	<1.48	<1.27
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.74	<0.63	<1.02	<0.80
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.092	<0.081	<0.14	<0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.072	<0.091	0.24	<0.13
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.089	<0.086	0.22	<0.13
1234678-heptachlorodibenzo-p-dioxin	0.01000	<0.039	0.060	0.12	<0.072
Octachlorodibenzo-p-dioxin	0.00030	0.0029	0.0029	0.0061	0.0040
2378-tetrachlorodibenzofuran	0.10000	<0.087	<0.076	0.43	<0.20
12378-pentachlorodibenzofuran	0.03000	<0.023	0.033	0.16	<0.071
23478-pentachlorodibenzofuran	0.30000	<0.17	0.28	1.60	<0.68
123478-hexachlorodibenzofuran	0.10000	<0.14	0.13	0.60	<0.29
123678-hexachlorodibenzofuran	0.10000	<0.092	0.16	<0.43	<0.23
234678-hexachlorodibenzofuran	0.10000	<0.11	<0.088	0.46	<0.22
123789-hexachlorodibenzofuran	0.10000	<0.16	<0.12	<0.26	<0.18
1234678-heptachlorodibenzofuran	0.01000	0.032	0.036	0.15	0.073
1234789-heptachlorodibenzofuran	0.01000	<0.011	0.0090	0.024	<0.015
Octachlorodibenzofuran	0.00030	0.00049	0.00046	0.0019	0.00095
PCB 81	0.00030	<0.00074	<0.0012	<0.0013	<0.0011
PCB 77	0.00010	0.0029	<0.00078	0.0082	<0.0040
PCB 123	0.00003	0.00035	<0.000080	0.0016	<0.00068
PCB 118	0.00003	0.022	0.0048	0.082	0.036
PCB 114	0.00003	0.00049	0.00012	<0.0019	<0.00084
PCB 105	0.00003	0.0072	0.0015	0.024	0.011
PCB 126	0.10000	<0.31	<0.15	<0.38	<0.28
PCB 167	0.00003	0.00026	0.000054	0.00063	0.00031
PCB 156/157	0.00003	0.00072	0.00019	<0.0015	<0.00082
PCB 169	0.03000	<0.084	<0.019	<0.062	<0.055
PCB 189	0.00003	<0.000011	<0.000012	<0.000026	<0.000016
Total Dioxins & Furans Only		<3.04	<3.01	<7.34	<4.46
Total PCBs Only		<0.43	<0.18	<0.56	<0.39
Total Dioxins & Furans and PCBs		<3.47	<3.19	<7.90	<4.85

* 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	1.00000	0.59	0.57	0.74	0.63
12378-pentachlorodibenzo-p-dioxin	1.00000	0.37	0.31	0.51	0.40
123478-hexachlorodibenzo-p-dioxin	0.10000	0.046	0.041	0.072	0.053
123678-hexachlorodibenzo-p-dioxin	0.10000	0.036	0.046	0.24	0.11
123789-hexachlorodibenzo-p-dioxin	0.10000	0.044	0.043	0.22	0.10
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.020	0.060	0.12	0.065
Octachlorodibenzo-p-dioxin	0.00030	0.0029	0.0029	0.0061	0.0040
2378-tetrachlorodibenzofuran	0.10000	0.044	0.038	0.43	0.17
12378-pentachlorodibenzofuran	0.03000	0.012	0.033	0.16	0.067
23478-pentachlorodibenzofuran	0.30000	0.086	0.28	1.60	0.65
123478-hexachlorodibenzofuran	0.10000	0.068	0.13	0.60	0.27
123678-hexachlorodibenzofuran	0.10000	0.046	0.16	0.22	0.14
234678-hexachlorodibenzofuran	0.10000	0.053	0.044	0.46	0.19
123789-hexachlorodibenzofuran	0.10000	0.078	0.060	0.13	0.089
1234678-heptachlorodibenzofuran	0.01000	0.032	0.036	0.15	0.073
1234789-heptachlorodibenzofuran	0.01000	0.0053	0.0090	0.024	0.013
Octachlorodibenzofuran	0.00030	0.00049	0.00046	0.0019	0.00095
PCB 81	0.00030	0.00037	0.00060	0.00065	0.00054
PCB 77	0.00010	0.0029	0.00039	0.0082	0.0038
PCB 123	0.00003	0.00035	0.000040	0.0016	0.00066
PCB 118	0.00003	0.022	0.0048	0.082	0.036
PCB 114	0.00003	0.00049	0.00012	0.00096	0.00052
PCB 105	0.00003	0.0072	0.0015	0.024	0.011
PCB 126	0.10000	0.16	0.075	0.19	0.14
PCB 167	0.00003	0.00026	0.000054	0.00063	0.00031
PCB 156/157	0.00003	0.00072	0.00019	0.00077	0.00056
PCB 169	0.03000	0.042	0.0097	0.062	0.038
PCB 189	0.00003	0.0000054	0.0000062	0.000026	0.000012
Total Dioxins & Furans Only		1.54	1.86	5.67	3.02
Total PCBs Only		0.23	0.09	0.37	0.23
Total Dioxins & Furans and PCBs		1.77	1.95	6.04	3.25

* 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	1.000	<1.18	<1.14	<1.48	<1.27
12378-pentachlorodibenzo-p-dioxin	0.500	<0.37	<0.31	<0.51	<0.40
123478-hexachlorodibenzo-p-dioxin	0.100	<0.092	<0.081	<0.14	<0.11
123678-hexachlorodibenzo-p-dioxin	0.100	<0.072	<0.091	0.24	<0.13
123789-hexachlorodibenzo-p-dioxin	0.100	<0.089	<0.086	0.22	<0.13
1234678-heptachlorodibenzo-p-dioxin	0.010	<0.039	0.060	0.12	<0.072
Octachlorodibenzo-p-dioxin	0.001	0.0095	0.0097	0.020	0.013
2378-tetrachlorodibenzofuran	0.100	<0.087	<0.076	0.43	<0.20
12378-pentachlorodibenzofuran	0.050	<0.039	0.054	0.26	<0.12
23478-pentachlorodibenzofuran	0.500	<0.29	0.46	2.67	<1.14
123478-hexachlorodibenzofuran	0.100	<0.14	0.13	0.60	<0.29
123678-hexachlorodibenzofuran	0.100	<0.092	0.16	<0.43	<0.23
234678-hexachlorodibenzofuran	0.100	<0.11	<0.088	0.46	<0.22
123789-hexachlorodibenzofuran	0.100	<0.16	<0.12	<0.26	<0.18
1234678-heptachlorodibenzofuran	0.010	0.032	0.036	0.15	0.073
1234789-heptachlorodibenzofuran	0.010	<0.011	0.0090	0.024	<0.015
Octachlorodibenzofuran	0.001	0.0016	0.0015	0.0064	0.0032
Total Dioxins & Furans		<2.80	<2.91	<8.02	<4.58
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	1.00000	<1.24	<1.19	<1.56	<1.33
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.78	<0.66	<1.07	<0.83
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.097	<0.085	<0.15	<0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.076	<0.095	0.25	<0.14
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.093	<0.090	0.23	<0.14
1234678-heptachlorodibenzo-p-dioxin	0.01000	<0.041	0.063	0.12	<0.075
Octachlorodibenzo-p-dioxin	0.00030	0.0030	0.0030	0.0065	0.0042
2378-tetrachlorodibenzofuran	0.10000	<0.091	<0.079	0.45	<0.21
12378-pentachlorodibenzofuran	0.03000	<0.024	0.034	0.16	<0.074
23478-pentachlorodibenzofuran	0.30000	<0.18	0.29	1.68	<0.72
123478-hexachlorodibenzofuran	0.10000	<0.14	0.13	0.63	<0.30
123678-hexachlorodibenzofuran	0.10000	<0.097	0.16	<0.45	<0.24
234678-hexachlorodibenzofuran	0.10000	<0.11	<0.092	0.48	<0.23
123789-hexachlorodibenzofuran	0.10000	<0.16	<0.12	<0.27	<0.19
1234678-heptachlorodibenzofuran	0.01000	0.034	0.037	0.16	0.077
1234789-heptachlorodibenzofuran	0.01000	<0.011	0.0094	0.025	<0.015
Octachlorodibenzofuran	0.00030	0.00051	0.00048	0.0020	0.0010
PCB 81	0.00030	<0.00078	<0.0012	<0.0014	<0.0011
PCB 77	0.00010	0.0031	<0.00081	0.0087	<0.0042
PCB 123	0.00003	0.00036	<0.000083	0.0017	<0.00071
PCB 118	0.00003	0.024	0.0050	0.086	0.038
PCB 114	0.00003	0.00051	0.00012	<0.0020	<0.00088
PCB 105	0.00003	0.0075	0.0016	0.025	0.011
PCB 126	0.10000	<0.33	<0.16	<0.40	<0.29
PCB 167	0.00003	0.00028	0.000056	0.00066	0.00033
PCB 156/157	0.00003	0.00075	0.00020	<0.0016	<0.00086
PCB 169	0.03000	<0.088	<0.020	<0.065	<0.058
PCB 189	0.00003	<0.000011	<0.000013	<0.000027	<0.000017
Total Dioxins & Furans Only		<3.18	<3.14	<7.71	<4.68
Total PCBs Only		<0.45	<0.19	<0.59	<0.41
Total Dioxins & Furans and PCBs		<3.64	<3.33	<8.30	<5.09

* 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	1.00000	<0.023	<0.022	<0.028	<0.024
12378-pentachlorodibenzo-p-dioxin	1.00000	<0.014	<0.012	<0.019	<0.015
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.0018	<0.0016	<0.0027	<0.0020
123678-hexachlorodibenzo-p-dioxin	0.10000	<0.0014	<0.0018	0.0045	<0.0026
123789-hexachlorodibenzo-p-dioxin	0.10000	<0.0017	<0.0017	0.0041	<0.0025
1234678-heptachlorodibenzo-p-dioxin	0.01000	<0.00076	0.0012	0.0022	<0.0014
Octachlorodibenzo-p-dioxin	0.00030	0.000055	0.000057	0.00012	0.000076
2378-tetrachlorodibenzofuran	0.10000	<0.0017	<0.0015	0.0080	<0.0037
12378-pentachlorodibenzofuran	0.03000	<0.00045	0.00064	0.0030	<0.0013
23478-pentachlorodibenzofuran	0.30000	<0.0033	0.0054	0.030	<0.013
123478-hexachlorodibenzofuran	0.10000	<0.0026	0.0025	0.011	<0.0055
123678-hexachlorodibenzofuran	0.10000	<0.0018	0.0031	<0.0081	<0.0043
234678-hexachlorodibenzofuran	0.10000	<0.0021	<0.0017	0.0087	<0.0041
123789-hexachlorodibenzofuran	0.10000	<0.0030	<0.0023	<0.0049	<0.0034
1234678-heptachlorodibenzofuran	0.01000	0.00062	0.00070	0.0028	0.0014
1234789-heptachlorodibenzofuran	0.01000	<0.00020	0.00018	0.00045	<0.00028
Octachlorodibenzofuran	0.00030	0.0000094	0.0000089	0.000036	0.000018
PCB 81	0.00030	<0.000014	<0.000023	<0.000024	<0.000021
PCB 77	0.00010	0.000056	<0.000015	0.00016	<0.000075
PCB 123	0.00003	0.0000067	<0.0000016	0.000030	<0.000013
PCB 118	0.00003	0.00043	0.000094	0.0015	0.00069
PCB 114	0.00003	0.0000094	0.0000023	<0.000036	<0.000016
PCB 105	0.00003	0.00014	0.000030	0.00044	0.00020
PCB 126	0.10000	<0.0060	<0.0029	<0.0071	<0.0054
PCB 167	0.00003	0.0000051	0.0000010	0.000012	0.0000060
PCB 156/157	0.00003	0.000014	0.0000037	<0.000029	<0.000016
PCB 169	0.03000	<0.0016	<0.00038	<0.0012	<0.0011
PCB 189	0.00003	<0.00000021	<0.00000024	<0.00000049	<0.00000031
Total Dioxins & Furans Only		<0.059	<0.059	<0.14	<0.085
Total PCBs Only		<0.0083	<0.0035	<0.011	<0.0075
Total Dioxins & Furans and PCBs		<0.067	<0.062	<0.15	<0.093

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	<0.93	<1.60	<1.27	<1.33	<0.024
12378-pentachlorodibenzo-p-dioxin	<0.58	<1.00	<0.80	<0.83	<0.015
123478-hexachlorodibenzo-p-dioxin	<0.078	<0.13	<0.11	<0.11	<0.0020
123678-hexachlorodibenzo-p-dioxin	<0.099	<0.17	<0.13	<0.14	<0.0026
123789-hexachlorodibenzo-p-dioxin	<0.097	<0.17	<0.13	<0.14	<0.0025
1234678-heptachlorodibenzo-p-dioxin	<0.053	<0.090	<0.072	<0.075	<0.0014
Octachlorodibenzo-p-dioxin	0.0029	0.0050	0.0040	0.0042	0.000076
2378-tetrachlorodibenzofuran	<0.14	<0.25	<0.20	<0.21	<0.0037
12378-pentachlorodibenzofuran	<0.052	<0.090	<0.071	<0.074	<0.0013
23478-pentachlorodibenzofuran	<0.50	<0.86	<0.68	<0.72	<0.013
123478-hexachlorodibenzofuran	<0.21	<0.36	<0.29	<0.30	<0.0055
123678-hexachlorodibenzofuran	<0.17	<0.29	<0.23	<0.24	<0.0043
234678-hexachlorodibenzofuran	<0.16	<0.28	<0.22	<0.23	<0.0041
123789-hexachlorodibenzofuran	<0.13	<0.22	<0.18	<0.19	<0.0034
1234678-heptachlorodibenzofuran	0.054	0.092	0.073	0.077	0.0014
1234789-heptachlorodibenzofuran	<0.011	<0.018	<0.015	<0.015	<0.00028
Octachlorodibenzofuran	0.00070	0.0012	0.00095	0.0010	0.000018
PCB 81	<0.00079	<0.0014	<0.0011	<0.0011	<0.000021
PCB 77	<0.0029	<0.0050	<0.0040	<0.0042	<0.000075
PCB 123	<0.00050	<0.00086	<0.00068	<0.00071	<0.000013
PCB 118	0.027	0.046	0.036	0.038	0.00069
PCB 114	<0.00062	<0.0011	<0.00084	<0.00088	<0.000016
PCB 105	0.0079	0.014	0.011	0.011	0.00020
PCB 126	<0.21	<0.35	<0.28	<0.29	<0.0054
PCB 167	0.00023	0.00040	0.00031	0.00033	0.0000060
PCB 156/157	<0.00060	<0.0010	<0.00082	<0.00086	<0.000016
PCB 169	<0.040	<0.070	<0.055	<0.058	<0.0011
PCB 189	<0.000012	<0.000021	<0.000016	<0.000017	<0.00000031
Total Dioxins & Furans Only	<3.28	<5.64	<4.46	<4.68	<0.085
Total PCBs Only	<0.29	<0.49	<0.39	<0.41	<0.0075
Total Dioxins & Furans and PCBs	<3.57	<6.13	<4.85	<5.09	<0.093

* 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 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	0.47	0.80	0.63	0.66	0.012
12378-pentachlorodibenzo-p-dioxin	0.29	0.50	0.40	0.42	0.0076
123478-hexachlorodibenzo-p-dioxin	0.039	0.067	0.053	0.056	0.0010
123678-hexachlorodibenzo-p-dioxin	0.079	0.14	0.11	0.11	0.0020
123789-hexachlorodibenzo-p-dioxin	0.076	0.13	0.10	0.108	0.0019
1234678-heptachlorodibenzo-p-dioxin	0.048	0.082	0.065	0.068	0.0012
Octachlorodibenzo-p-dioxin	0.0029	0.0050	0.0040	0.0042	0.000076
2378-tetrachlorodibenzofuran	0.12	0.21	0.17	0.18	0.0032
12378-pentachlorodibenzofuran	0.049	0.085	0.067	0.070	0.0013
23478-pentachlorodibenzofuran	0.48	0.83	0.65	0.69	0.012
123478-hexachlorodibenzofuran	0.20	0.34	0.27	0.28	0.0050
123678-hexachlorodibenzofuran	0.10	0.18	0.14	0.15	0.0027
234678-hexachlorodibenzofuran	0.14	0.24	0.19	0.20	0.0035
123789-hexachlorodibenzofuran	0.065	0.11	0.089	0.093	0.0017
1234678-heptachlorodibenzofuran	0.054	0.092	0.073	0.077	0.00139
1234789-heptachlorodibenzofuran	0.0094	0.016	0.013	0.013	0.00024
Octachlorodibenzofuran	0.00070	0.0012	0.00095	0.0010	0.000018
PCB 81	0.00039	0.00068	0.00054	0.00056	0.000010
PCB 77	0.0028	0.0049	0.0038	0.0040	0.000073
PCB 123	0.00049	0.00084	0.00066	0.00070	0.000013
PCB 118	0.027	0.046	0.036	0.038	0.00069
PCB 114	0.00038	0.00066	0.00052	0.00055	0.0000099
PCB 105	0.0079	0.014	0.011	0.011	0.00020
PCB 126	0.10	0.18	0.14	0.15	0.0027
PCB 167	0.00023	0.00040	0.00031	0.00033	0.0000060
PCB 156/157	0.00041	0.00071	0.00056	0.00059	0.000011
PCB 169	0.028	0.048	0.038	0.040	0.00072
PCB 189	0.0000092	0.000016	0.000012	0.000013	0.00000024
Total Dioxins & Furans Only	2.22	3.82	3.02	3.17	0.058
Total PCBs Only	0.17	0.29	0.23	0.24	0.0044
Total Dioxins & Furans and PCBs	2.39	4.11	3.25	3.41	0.062

* 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	3090	373	645	508	533	9.80
1,3-Dichlorobenzene	397	47.9	82.9	65.3	68.5	1.26
1,4-Dichlorobenzene	259	31.2	54.1	42.6	44.7	0.82
1,2-Dichlorobenzene	285	34.4	59.5	46.8	49.1	0.90
Total Dichlorobenzene	941	114	196	155	162	2.99
1,3,5-trichlorobenzene	27.9	3.37	5.82	4.59	4.81	0.089
1,2,4-trichlorobenzene	111	13.4	23.2	18.2	19.1	0.35
1,2,3-trichlorobenzene	24.9	3.00	5.20	4.09	4.29	0.079
Total Trichlorobenzene	164	19.8	34.2	26.9	28.2	0.52
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	16.3	1.97	3.40	2.68	2.81	0.052
1,2,3,4-tetrachlorobenzene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Total Tetrachlorobenzene	<26.3	<3.17	<5.49	<4.32	<4.53	<0.083
Pentachlorobenzene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Hexachlorobenzene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Total Chlorobenzenes	<4241	<512	<885	<697	<731	<13.5

Dry Gas Volume Sampled (Rm³*) :	4.791
Actual Flowrate (m³/s) :	26.3
Dry Reference Flowrate (Rm³/s*) :	15.2
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	18.4

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	2200	267	458	364	380	7.11
1,3-Dichlorobenzene	492	59.7	103	81.5	85.0	1.59
1,4-Dichlorobenzene	207	25.1	43.1	34.3	35.8	0.67
1,2-Dichlorobenzene	208	25.3	43.3	34.5	35.9	0.67
Total Dichlorobenzene	907	110	189	150	157	2.93
1,3,5-trichlorobenzene	30.5	3.70	6.36	5.05	5.27	0.099
1,2,4-trichlorobenzene	194	23.6	40.4	32.1	33.5	0.63
1,2,3-trichlorobenzene	55.0	6.68	11.5	9.11	9.50	0.18
Total Trichlorobenzene	280	33.9	58.2	46.3	48.3	0.90
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	22.5	2.73	4.69	3.73	3.89	0.073
1,2,3,4-tetrachlorobenzene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Total Tetrachlorobenzene	<32.5	<3.95	<6.77	<5.38	<5.61	<0.105
Pentachlorobenzene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Hexachlorobenzene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Total Chlorobenzenes	<3439	<418	<717	<570	<594	<11.1

Dry Gas Volume Sampled (Rm³*) :	4.799
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.7

* 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	1700	216	369	293	307	5.50
1,3-Dichlorobenzene	351	44.6	76.3	60.4	63.5	1.14
1,4-Dichlorobenzene	238	30.2	51.7	41.0	43.0	0.77
1,2-Dichlorobenzene	208	26.4	45.2	35.8	37.6	0.67
Total Dichlorobenzene	797	101	173	137	144	2.58
1,3,5-trichlorobenzene	23.4	2.97	5.08	4.03	4.23	0.076
1,2,4-trichlorobenzene	73.4	9.32	15.9	12.6	13.3	0.24
1,2,3-trichlorobenzene	23.7	3.01	5.15	4.08	4.29	0.077
Total Trichlorobenzene	121	15.3	26.2	20.7	21.8	0.39
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	11.9	1.51	2.59	2.05	2.15	0.039
1,2,3,4-tetrachlorobenzene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Total Tetrachlorobenzene	<21.9	<2.78	<4.76	<3.77	<3.96	<0.071
Pentachlorobenzene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Hexachlorobenzene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Total Chlorobenzenes	<2659	<338	<578	<458	<481	<8.61

Dry Gas Volume Sampled (Rm³*) :	4.603
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	18.8
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 54
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Monochlorobenzene	373	267	216	285	28.1
1,3-Dichlorobenzene	47.9	59.7	44.6	50.7	15.7
1,4-Dichlorobenzene	31.2	25.1	30.2	28.9	11.3
1,2-Dichlorobenzene	34.4	25.3	26.4	28.7	17.3
Total Dichlorobenzene	114	110	101	108	5.9
1,3,5-trichlorobenzene	3.37	3.70	2.97	3.35	11.0
1,2,4-trichlorobenzene	13.4	23.6	9.32	15.4	47.6
1,2,3-trichlorobenzene	3.00	6.68	3.01	4.23	50.1
Total Trichlorobenzene	19.8	33.9	15.3	23.0	42.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	1.97	2.73	1.51	2.07	29.8
1,2,3,4-tetrachlorobenzene	<1.21	<1.21	<1.27	<1.23	2.8
Total Tetrachlorobenzene	<3.17	<3.95	<2.78	<3.30	18.0
Pentachlorobenzene	<1.21	<1.21	<1.27	<1.23	2.8
Hexachlorobenzene	<1.21	<1.21	<1.27	<1.23	2.8
Total Chlorobenzenes	<512	<418	<338	<422	20.6

TABLE 55
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Reference Concentrations for Chlorobenzenes

Specific Isomer	Dry Reference Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	ng/Rm^3*	%
Monochlorobenzene	645	458	369	491	28.7
1,3-Dichlorobenzene	82.9	103	76.3	87.2	15.7
1,4-Dichlorobenzene	54.1	43.1	51.7	49.6	11.6
1,2-Dichlorobenzene	59.5	43.3	45.2	49.3	17.9
Total Dichlorobenzene	196	189	173	186	6.4
1,3,5-trichlorobenzene	5.82	6.36	5.08	5.75	11.1
1,2,4-trichlorobenzene	23.2	40.4	15.9	26.5	47.4
1,2,3-trichlorobenzene	5.20	11.5	5.15	7.27	49.9
Total Trichlorobenzene	34.2	58.2	26.2	39.5	42.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.40	4.69	2.59	3.56	29.8
1,2,3,4-tetrachlorobenzene	<2.09	<2.08	<2.17	<2.11	2.4
Total Tetrachlorobenzene	<5.49	<6.77	<4.76	<5.67	18.0
Pentachlorobenzene	<2.09	<2.08	<2.17	<2.11	2.4
Hexachlorobenzene	<2.09	<2.08	<2.17	<2.11	2.4
Total Chlorobenzenes	<885	<717	<578	<727	21.2

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	508	364	293	388	28.2
1,3-Dichlorobenzene	65.3	81.5	60.4	69.1	16.0
1,4-Dichlorobenzene	42.6	34.3	41.0	39.3	11.2
1,2-Dichlorobenzene	46.8	34.5	35.8	39.0	17.4
Total Dichlorobenzene	155	150	137	147	6.2
1,3,5-trichlorobenzene	4.59	5.05	4.03	4.56	11.2
1,2,4-trichlorobenzene	18.2	32.1	12.6	21.0	47.8
1,2,3-trichlorobenzene	4.09	9.11	4.08	5.76	50.3
Total Trichlorobenzene	26.9	46.3	20.7	31.3	42.6
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.68	3.73	2.05	2.82	30.1
1,2,3,4-tetrachlorobenzene	<1.64	<1.66	<1.72	<1.67	2.5
Total Tetrachlorobenzene	<4.32	<5.38	<3.77	<4.49	18.2
Pentachlorobenzene	<1.64	<1.66	<1.72	<1.67	2.5
Hexachlorobenzene	<1.64	<1.66	<1.72	<1.67	2.5
Total Chlorobenzenes	<697	<570	<458	<575	20.8

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	533	380	307	407	28.3
1,3-Dichlorobenzene	68.5	85.0	63.5	72.3	15.6
1,4-Dichlorobenzene	44.7	35.8	43.0	41.2	11.5
1,2-Dichlorobenzene	49.1	35.9	37.6	40.9	17.6
Total Dichlorobenzene	162	157	144	154	6.0
1,3,5-trichlorobenzene	4.81	5.27	4.23	4.77	10.9
1,2,4-trichlorobenzene	19.1	33.5	13.3	22.0	47.4
1,2,3-trichlorobenzene	4.29	9.50	4.29	6.03	49.9
Total Trichlorobenzene	28.2	48.3	21.8	32.8	42.1
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.81	3.89	2.15	2.95	29.7
1,2,3,4-tetrachlorobenzene	<1.72	<1.73	<1.81	<1.75	2.7
Total Tetrachlorobenzene	<4.53	<5.61	<3.96	<4.70	17.8
Pentachlorobenzene	<1.72	<1.73	<1.81	<1.75	2.7
Hexachlorobenzene	<1.72	<1.73	<1.81	<1.75	2.7
Total Chlorobenzenes	<731	<594	<481	<602	20.8

* 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	9.80	7.11	5.50	7.47	29.1
1,3-Dichlorobenzene	1.26	1.59	1.14	1.33	17.6
1,4-Dichlorobenzene	0.82	0.67	0.77	0.75	10.3
1,2-Dichlorobenzene	0.90	0.67	0.67	0.75	17.8
Total Dichlorobenzene	2.99	2.93	2.58	2.83	7.8
1,3,5-trichlorobenzene	0.089	0.099	0.076	0.088	13.0
1,2,4-trichlorobenzene	0.35	0.63	0.24	0.41	49.3
1,2,3-trichlorobenzene	0.079	0.18	0.077	0.11	51.9
Total Trichlorobenzene	0.52	0.90	0.39	0.60	44.1
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.052	0.073	0.039	0.054	31.7
1,2,3,4-tetrachlorobenzene	<0.032	<0.032	<0.032	<0.032	1.1
Total Tetrachlorobenzene	<0.083	<0.10	<0.071	<0.086	19.9
Pentachlorobenzene	<0.032	<0.032	<0.032	<0.032	1.1
Hexachlorobenzene	<0.032	<0.032	<0.032	<0.032	1.1
Total Chlorobenzenes	<13.5	<11.1	<8.61	<11.1	21.9

TABLE 59
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Emission Data for Chlorobenzenes

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
Monochlorobenzene	285	491	388	407	7.47
1,3-Dichlorobenzene	50.7	87.2	69.1	72.3	1.33
1,4-Dichlorobenzene	28.9	49.6	39.3	41.2	0.75
1,2-Dichlorobenzene	28.7	49.3	39.0	40.9	0.75
Total Dichlorobenzene	108	186	147	154	2.83
1,3,5-trichlorobenzene	3.35	5.75	4.56	4.77	0.088
1,2,4-trichlorobenzene	15.4	26.5	21.0	22.0	0.41
1,2,3-trichlorobenzene	4.23	7.27	5.76	6.03	0.11
Total Trichlorobenzene	23.0	39.5	31.3	32.8	0.60
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.07	3.56	2.82	2.95	0.054
1,2,3,4-tetrachlorobenzene	<1.23	<2.11	<1.67	<1.75	<0.032
Total Tetrachlorobenzene	<3.30	<5.67	<4.49	<4.70	<0.086
Pentachlorobenzene	<1.23	<2.11	<1.67	<1.75	<0.032
Hexachlorobenzene	<1.23	<2.11	<1.67	<1.75	<0.032
Total Chlorobenzenes	<422	<727	<575	<602	<11.1

* 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	10.8	<10
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<30.8	<30.0
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	<111	<110

"<" 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 ng	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	<250	<30.2	<52.2	<41.1	<43.1	<0.79
3-monochlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
4-monochlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
Total Monochlorophenols	<750	<90.5	<157	<123	<129	<2.38
2,6-dichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,4 & 2,5-dichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
3,5-dichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,3-dichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
3,4-dichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
Total Dichlorophenols	<1250	<151	<261	<205	<216	<3.97
2,4,6-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,3,6-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,3,5-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,4,5-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,3,4-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
3,4,5-trichlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
Total Trichlorophenols	<1500	<181	<313	<247	<259	<4.76
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
2,3,4,5-tetrachlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
Total Tetrachlorophenols	<500	<60.3	<104	<82.2	<86.2	<1.59
Pentachlorophenol	<250	<30.2	<52.2	<41.1	<43.1	<0.79
Total Chlorophenols	<4250	<513	<887	<699	<733	<13.5

Dry Gas Volume Sampled (Rm^3*) :	4.791
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	19.3
Wet Reference Flowrate (Rm^3/s*) :	18.4

* 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 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 ng	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	<250	<30.4	<52.1	<41.4	<43.2	<0.81
3-monochlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
4-monochlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
Total Monochlorophenols	<750	<91.1	<156	<124	<130	<2.42
2,6-dichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,4 & 2,5-dichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
3,5-dichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,3-dichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
3,4-dichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
Total Dichlorophenols	<1250	<152	<260	<207	<216	<4.04
2,4,6-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,3,6-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,3,5-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,4,5-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,3,4-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
3,4,5-trichlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
Total Trichlorophenols	<1500	<182	<313	<248	<259	<4.84
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
2,3,4,5-tetrachlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
Total Tetrachlorophenols	<500	<60.7	<104	<82.8	<86.4	<1.61
Pentachlorophenol	<250	<30.4	<52.1	<41.4	<43.2	<0.81
Total Chlorophenols	<4250	<516	<886	<704	<734	<13.7

Dry Gas Volume Sampled (Rm³*) :	4.799
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.7

* 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 ng	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
2-monochlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
3-monochlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
4-monochlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
Total Monochlorophenols	<750	<95.2	<163	<129	<136	<2.43
2,6-dichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,4 & 2,5-dichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
3,5-dichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,3-dichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
3,4-dichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
Total Dichlorophenols	<1250	<159	<272	<215	<226	<4.05
2,4,6-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,3,6-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,3,5-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,4,5-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,3,4-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
3,4,5-trichlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
Total Trichlorophenols	<1500	<190	<326	<258	<271	<4.86
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
2,3,4,5-tetrachlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
Total Tetrachlorophenols	<500	<63.5	<109	<86.1	<90.4	<1.62
Pentachlorophenol	<250	<31.7	<54.3	<43.0	<45.2	<0.81
Total Chlorophenols	<4250	<540	<923	<732	<769	<13.8

Dry Gas Volume Sampled (Rm^3*) :	4.603
Actual Flowrate (m^3/s) :	25.5
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.8
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. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
2-monochlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
3-monochlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
4-monochlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
Total Monochlorophenols	<90.5	<91.1	<95.2	<92.2	2.8
2,6-dichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,4 & 2,5-dichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
3,5-dichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,3-dichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
3,4-dichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
Total Dichlorophenols	<151	<152	<159	<154	2.8
2,4,6-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,3,6-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,3,5-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,4,5-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,3,4-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
3,4,5-trichlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
Total Trichlorophenols	<181	<182	<190	<184	2.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
2,3,4,5-tetrachlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
Total Tetrachlorophenols	<60.3	<60.7	<63.5	<61.5	2.8
Pentachlorophenol	<30.2	<30.4	<31.7	<30.7	2.8
Total Chlorophenols	<513	<516	<540	<523	2.8

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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
3-monochlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
4-monochlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
Total Monochlorophenols	<157	<156	<163	<159	2.4
2,6-dichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,4 & 2,5-dichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
3,5-dichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,3-dichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
3,4-dichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
Total Dichlorophenols	<261	<260	<272	<264	2.4
2,4,6-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,3,6-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,3,5-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,4,5-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,3,4-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
3,4,5-trichlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
Total Trichlorophenols	<313	<313	<326	<317	2.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
2,3,4,5-tetrachlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
Total Tetrachlorophenols	<104	<104	<109	<106	2.4
Pentachlorophenol	<52.2	<52.1	<54.3	<52.9	2.4
Total Chlorophenols	<887	<886	<923	<899	2.4

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
3-monochlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
4-monochlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
Total Monochlorophenols	<123	<124	<129	<126	2.5
2,6-dichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,4 & 2,5-dichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
3,5-dichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,3-dichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
3,4-dichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
Total Dichlorophenols	<205	<207	<215	<209	2.5
2,4,6-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,3,6-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,3,5-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,4,5-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,3,4-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
3,4,5-trichlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
Total Trichlorophenols	<247	<248	<258	<251	2.5
2,3,5,6/2,3,4,6-tetrachlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
2,3,4,5-tetrachlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
Total Tetrachlorophenols	<82.2	<82.8	<86.1	<83.7	2.5
Pentachlorophenol	<41.1	<41.4	<43.0	<41.8	2.5
Total Chlorophenols	<699	<704	<732	<711	2.5

* 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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
3-monochlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
4-monochlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
Total Monochlorophenols	<129	<130	<136	<131	2.7
2,6-dichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,4 & 2,5-dichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
3,5-dichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,3-dichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
3,4-dichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
Total Dichlorophenols	<216	<216	<226	<219	2.7
2,4,6-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,3,6-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,3,5-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,4,5-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,3,4-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
3,4,5-trichlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
Total Trichlorophenols	<259	<259	<271	<263	2.7
2,3,5,6/2,3,4,6-tetrachlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
2,3,4,5-tetrachlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
Total Tetrachlorophenols	<86.2	<86.4	<90.4	<87.7	2.7
Pentachlorophenol	<43.1	<43.2	<45.2	<43.8	2.7
Total Chlorophenols	<733	<734	<769	<745	2.7

* 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 Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
2-monochlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
3-monochlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
4-monochlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
Total Monochlorophenols	<2.38	<2.42	<2.43	<2.41	1.1
2,6-dichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,4 & 2,5-dichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
3,5-dichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,3-dichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
3,4-dichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
Total Dichlorophenols	<3.97	<4.04	<4.05	<4.02	1.1
2,4,6-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,3,6-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,3,5-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,4,5-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,3,4-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
3,4,5-trichlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
Total Trichlorophenols	<4.76	<4.84	<4.86	<4.82	1.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
2,3,4,5-tetrachlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
Total Tetrachlorophenols	<1.59	<1.61	<1.62	<1.61	1.1
Pentachlorophenol	<0.79	<0.81	<0.81	<0.80	1.1
Total Chlorophenols	<13.5	<13.7	<13.8	<13.7	1.1

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	<30.7	<52.9	<41.8	<43.8	<0.80
3-monochlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
4-monochlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
Total Monochlorophenols	<92.2	<159	<126	<131	<2.41
2,6-dichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,4 & 2,5-dichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
3,5-dichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,3-dichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
3,4-dichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
Total Dichlorophenols	<154	<264	<209	<219	<4.02
2,4,6-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,3,6-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,3,5-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,4,5-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,3,4-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
3,4,5-trichlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
Total Trichlorophenols	<184	<317	<251	<263	<4.82
2,3,5,6/2,3,4,6-tetrachlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
2,3,4,5-tetrachlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
Total Tetrachlorophenols	<61.5	<106	<83.7	<87.7	<1.61
Pentachlorophenol	<30.7	<52.9	<41.8	<43.8	<0.80
Total Chlorophenols	<523	<899	<711	<745	<13.7

* 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	<250	<250
3-monochlorophenol	<250	<250
4-monochlorophenol	<250	<250
Total Monochlorophenols	<750	<750
2,6-dichlorophenol	<250	<250
2,4 & 2,5-dichlorophenol	<250	<250
3,5-dichlorophenol	<250	<250
2,3-dichlorophenol	<250	<250
3,4-dichlorophenol	<250	<250
Total Dichlorophenols	<1250	<1250
2,4,6-trichlorophenol	<250	<250
2,3,6-trichlorophenol	<250	<250
2,3,5-trichlorophenol	<250	<250
2,4,5-trichlorophenol	<250	<250
2,3,4-trichlorophenol	<250	<250
3,4,5-trichlorophenol	<250	<250
Total Trichlorophenols	<1500	<1500
2,3,5,6/2,3,4,6-tetrachlorophenol	<250	<250
2,3,4,5-tetrachlorophenol	<250	<250
Total Tetrachlorophenols	<500	<500
Pentachlorophenol	<250	<250
Total Chlorophenols	<4250	<4250

"<" 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	28.3	3.41	5.91	4.65	4.88	0.090
Acenaphthylene	20.5	2.47	4.28	3.37	3.53	0.065
Anthracene	20.8	2.51	4.34	3.42	3.59	0.066
Benzo(a)Anthracene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(b)Fluoranthene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(k)Fluoranthene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(a)fluorene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(b)fluorene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(g,h,i)Perylene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(a)Pyrene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Benzo(e)Pyrene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Biphenyl	50.5	6.09	10.5	8.30	8.71	0.16
2-Chloronaphthalene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Chrysene/Triphenylene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Coronene	<50	<6.03	<10.4	<8.22	<8.62	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Dibenzo(a,e)pyrene	<50	<6.03	<10.4	<8.22	<8.62	<0.16
9,10-dimethylanthracene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
7,12-Dimethylbenzo(a)anthracene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Fluoranthene	32.7	3.94	6.83	5.38	5.64	0.10
Fluorene	105	12.7	21.9	17.3	18.1	0.33
Indeno(1,2,3-cd)Pyrene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
2-methylanthracene	51.4	6.20	10.7	8.45	8.86	0.16
3-Methylcholanthrene	<50	<6.03	<10.4	<8.22	<8.62	<0.16
1-Methylnaphthalene	48.9	5.90	10.2	8.04	8.43	0.16
2-Methylnaphthalene	83.1	10.0	17.3	13.7	14.3	0.26
1-Methylphenanthrene	103	12.4	21.5	16.9	17.8	0.33
9-Methylphenanthrene	13.3	1.60	2.78	2.19	2.29	0.042
Naphthalene	439	53.0	91.6	72.2	75.7	1.39
Perylene	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Phenanthrene	164	19.8	34.2	27.0	28.3	0.52
Picene	<50	<6.03	<10.4	<8.22	<8.62	<0.16
Pyrene	27.6	3.33	5.76	4.54	4.76	0.088
Tetralin	305	36.8	63.7	50.1	52.6	0.97
m-terphenyl	<10	<1.21	<2.09	<1.64	<1.72	<0.032
o-Terphenyl	<10	<1.21	<2.09	<1.64	<1.72	<0.032
p-terphenyl	<10	<1.21	<2.09	<1.64	<1.72	<0.032
Total	<1873	<226	<391	<308	<323	<5.94

Dry Gas Volume Sampled (Rm³*) :	4.791
Actual Flowrate (m³/s) :	26.3
Dry Reference Flowrate (Rm³/s*) :	15.2
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	18.4

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

Compound	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	26.9	3.27	5.61	4.46	4.65	0.087
Acenaphthylene	15.6	1.89	3.25	2.58	2.69	0.050
Anthracene	46.7	5.67	9.73	7.74	8.07	0.15
Benzo(a)Anthracene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(b)Fluoranthene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(k)Fluoranthene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(a)fluorene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(b)fluorene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(g,h,i)Perylene	51.0	6.19	10.6	8.45	8.81	0.16
Benzo(a)Pyrene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Benzo(e)Pyrene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Biphenyl	42.0	5.1	8.8	7.0	7.3	0.14
2-Chloronaphthalene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Chrysene/Triphenylene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Coronene	<50	<6.07	<10.4	<8.28	<8.64	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Dibenzo(a,e)pyrene	<50	<6.07	<10.4	<8.28	<8.64	<0.16
9,10-dimethylanthracene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
7,12-Dimethylbenzo(a)anthracene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Fluoranthene	23.8	2.89	4.96	3.94	4.11	0.077
Fluorene	76.9	9.34	16.0	12.7	13.3	0.25
Indeno(1,2,3-cd)Pyrene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
2-methylanthracene	119	14.4	24.8	19.7	20.6	0.38
3-Methylcholanthrene	<50	<6.07	<10.4	<8.28	<8.64	<0.16
1-Methylnaphthalene	39.0	4.74	8.13	6.46	6.74	0.13
2-Methylnaphthalene	66.7	8.10	13.9	11.0	11.5	0.22
1-Methylphenanthrene	99.5	12.1	20.7	16.5	17.2	0.32
9-Methylphenanthrene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Naphthalene	422	51.2	87.9	69.9	72.9	1.36
Perylene	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Phenanthrene	83.0	10.1	17.3	13.7	14.3	0.27
Picene	<50	<6.07	<10.4	<8.28	<8.64	<0.16
Pyrene	33.0	4.01	6.88	5.47	5.70	0.11
Tetralin	282	34.2	58.8	46.7	48.7	0.91
m-terphenyl	<10	<1.21	<2.08	<1.66	<1.73	<0.032
o-Terphenyl	<10	<1.21	<2.08	<1.66	<1.73	<0.032
p-terphenyl	<10	<1.21	<2.08	<1.66	<1.73	<0.032
Total	<1807	<219	<377	<299	<312	<5.84

Dry Gas Volume Sampled (Rm³*) :	4.799
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.7

* 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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	141	17.9	30.6	24.3	25.5	0.46
Acenaphthylene	237	30.1	51.5	40.8	42.9	0.77
Anthracene	49.2	6.25	10.7	8.47	8.90	0.16
Benzo(a)Anthracene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(b)Fluoranthene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(k)Fluoranthene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(a)fluorene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(b)fluorene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(g,h,i)Perylene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(a)Pyrene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Benzo(e)Pyrene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Biphenyl	73.1	9.28	15.9	12.6	13.2	0.24
2-Chloronaphthalene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Chrysene/Triphenylene	11.4	1.45	2.48	1.96	2.06	0.037
Coronene	<50	<6.35	<10.9	<8.61	<9.04	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Dibenzo(a,e)pyrene	<50	<6.35	<10.9	<8.61	<9.04	<0.16
9,10-dimethylanthracene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
7,12-Dimethylbenzo(a)anthracene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Fluoranthene	217	27.5	47.1	37.4	39.2	0.70
Fluorene	106	13.5	23.0	18.3	19.2	0.34
Indeno(1,2,3-cd)Pyrene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
2-methylanthracene	283	35.9	61.5	48.7	51.2	0.92
3-Methylcholanthrene	<50	<6.35	<10.9	<8.61	<9.04	<0.16
1-Methylnaphthalene	55.6	7.06	12.1	9.57	10.1	0.18
2-Methylnaphthalene	92.6	11.8	20.1	15.9	16.7	0.30
1-Methylphenanthrene	126	16.0	27.4	21.7	22.8	0.41
9-Methylphenanthrene	139	17.6	30.2	23.9	25.1	0.45
Naphthalene	470	59.7	102.1	80.9	85.0	1.52
Perylene	<10	<1.27	<2.17	<1.72	<1.81	<0.032
Phenanthrene	1650	209	358	284	298	5.34
Picene	<50	<6.35	<10.9	<8.61	<9.04	<0.16
Pyrene	173	22.0	37.6	29.8	31.3	0.56
Tetralin	299	38.0	65.0	51.5	54.1	0.97
m-terphenyl	26.7	3.39	5.80	4.60	4.83	0.086
o-Terphenyl	23.6	3.00	5.13	4.06	4.27	0.076
p-terphenyl	10.3	1.31	2.24	1.77	1.86	0.033
Total	<4524	<574	<983	<779	<818	<14.6

Dry Gas Volume Sampled (Rm³*) :	4.603
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	18.8
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 74
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m^3	ng/m^3	ng/m^3	ng/m^3	%
Acenaphthene	3.41	3.27	17.9	8.19	103
Acenaphthylene	2.47	1.89	30.1	11.5	140
Anthracene	2.51	5.67	6.25	4.81	41.8
Benzo(a)Anthracene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(b)Fluoranthene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(k)Fluoranthene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(a)fluorene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(b)fluorene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(g,h,i)Perylene	<1.21	6.19	<1.27	<2.89	99.0
Benzo(a)Pyrene	<1.21	<1.21	<1.27	<1.23	2.8
Benzo(e)Pyrene	<1.21	<1.21	<1.27	<1.23	2.8
Biphenyl	6.09	5.1	9.28	6.82	32.0
2-Chloronaphthalene	<1.21	<1.21	<1.27	<1.23	2.8
Chrysene/Triphenylene	<1.21	<1.21	1.45	<1.29	10.6
Coronene	<6.03	<6.07	<6.35	<6.15	2.8
Dibenzo(a,c/a,h)Anthracene	<1.21	<1.21	<1.27	<1.23	2.8
Dibenzo(a,e)pyrene	<6.03	<6.07	<6.35	<6.15	2.8
9,10-dimethylanthracene	<1.21	<1.21	<1.27	<1.23	2.8
7,12-Dimethylbenzo(a)anthracene	<1.21	<1.21	<1.27	<1.23	2.8
Fluoranthene	3.94	2.89	27.5	11.5	122
Fluorene	12.7	9.34	13.5	11.8	18.5
Indeno(1,2,3-cd)Pyrene	<1.21	<1.21	<1.27	<1.23	2.8
2-methylanthracene	6.20	14.4	35.9	18.9	81.4
3-Methylcholanthrene	<6.03	<6.07	<6.35	<6.15	2.8
1-Methylnaphthalene	5.90	4.74	7.06	5.90	19.7
2-Methylnaphthalene	10.0	8.10	11.8	9.96	18.4
1-Methylphenanthrene	12.4	12.1	16.0	13.5	16.1
9-Methylphenanthrene	1.60	<1.21	17.6	<6.82	137
Naphthalene	53.0	51.2	59.7	54.6	8.1
Perylene	<1.21	<1.21	<1.27	<1.23	2.8
Phenanthrene	19.8	10.1	209	79.8	141
Picene	<6.03	<6.07	<6.35	<6.15	2.8
Pyrene	3.33	4.01	22.0	9.77	108
Tetralin	36.8	34.2	38.0	36.3	5.2
m-terphenyl	<1.21	<1.21	3.39	<1.94	65.0
o-Terphenyl	<1.21	<1.21	3.00	<1.81	57.1
p-terphenyl	<1.21	<1.21	1.31	<1.24	4.5
Total	<226	<219	<574	<340	59.7

TABLE 75
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	Dry Reference Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	5.91	5.61	30.6	14.0	102
Acenaphthylene	4.28	3.25	51.5	19.7	140
Anthracene	4.34	9.73	10.7	8.25	41.5
Benzo(a)Anthracene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(b)Fluoranthene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(k)Fluoranthene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(a)fluorene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(b)fluorene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(g,h,i)Perylene	<2.09	10.6	<2.17	<4.96	98.9
Benzo(a)Pyrene	<2.09	<2.08	<2.17	<2.11	2.4
Benzo(e)Pyrene	<2.09	<2.08	<2.17	<2.11	2.4
Biphenyl	10.5	8.8	15.9	11.7	31.6
2-Chloronaphthalene	<2.09	<2.08	<2.17	<2.11	2.4
Chrysene/Triphenylene	<2.09	<2.08	2.48	<2.22	10.2
Coronene	<10.4	<10.4	<10.9	<10.6	2.4
Dibenzo(a,c/a,h)Anthracene	<2.09	<2.08	<2.17	<2.11	2.4
Dibenzo(a,e)pyrene	<10.4	<10.4	<10.9	<10.6	2.4
9,10-dimethylanthracene	<2.09	<2.08	<2.17	<2.11	2.4
7,12-Dimethylbenzo(a)anthracene	<2.09	<2.08	<2.17	<2.11	2.4
Fluoranthene	6.83	4.96	47.1	19.6	121
Fluorene	21.9	16.0	23.0	20.3	18.5
Indeno(1,2,3-cd)Pyrene	<2.09	<2.08	<2.17	<2.11	2.4
2-methylanthracene	10.7	24.8	61.5	32.3	81.0
3-Methylcholanthrene	<10.4	<10.4	<10.9	<10.6	2.4
1-Methylnaphthalene	10.2	8.13	12.1	10.1	19.5
2-Methylnaphthalene	17.3	13.9	20.1	17.1	18.2
1-Methylphenanthrene	21.5	20.7	27.4	23.2	15.7
9-Methylphenanthrene	2.78	<2.08	30.2	<11.7	137
Naphthalene	91.6	87.9	102.1	93.9	7.8
Perylene	<2.09	<2.08	<2.17	<2.11	2.4
Phenanthrene	34.2	17.3	358	137	141
Picene	<10.4	<10.4	<10.9	<10.6	2.4
Pyrene	5.76	6.88	37.6	16.7	108
Tetralin	63.7	58.8	65.0	62.5	5.2
m-terphenyl	<2.09	<2.08	5.80	<3.32	64.5
o-Terphenyl	<2.09	<2.08	5.13	<3.10	56.7
p-terphenyl	<2.09	<2.08	2.24	<2.14	4.1
Total	<391	<377	<983	<583	59.3

* 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	4.65	4.46	24.3	11.1	102
Acenaphthylene	3.37	2.58	40.8	15.6	140
Anthracene	3.42	7.74	8.47	6.54	41.7
Benzo(a)Anthracene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(b)Fluoranthene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(k)Fluoranthene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(a)fluorene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(b)fluorene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(g,h,i)Perylene	<1.64	8.45	<1.72	<3.94	99.2
Benzo(a)Pyrene	<1.64	<1.66	<1.72	<1.67	2.5
Benzo(e)Pyrene	<1.64	<1.66	<1.72	<1.67	2.5
Biphenyl	8.30	7.0	12.6	9.28	31.7
2-Chloronaphthalene	<1.64	<1.66	<1.72	<1.67	2.5
Chrysene/Triphenylene	<1.64	<1.66	1.96	<1.75	10.3
Coronene	<8.22	<8.28	<8.61	<8.37	2.5
Dibenzo(a,c/a,h)Anthracene	<1.64	<1.66	<1.72	<1.67	2.5
Dibenzo(a,e)pyrene	<8.22	<8.28	<8.61	<8.37	2.5
9,10-dimethylanthracene	<1.64	<1.66	<1.72	<1.67	2.5
7,12-Dimethylbenzo(a)anthracene	<1.64	<1.66	<1.72	<1.67	2.5
Fluoranthene	5.38	3.94	37.4	15.6	121
Fluorene	17.3	12.7	18.3	16.1	18.3
Indeno(1,2,3-cd)Pyrene	<1.64	<1.66	<1.72	<1.67	2.5
2-methylanthracene	8.45	19.7	48.7	25.6	81.1
3-Methylcholanthrene	<8.22	<8.28	<8.61	<8.37	2.5
1-Methylnaphthalene	8.04	6.46	9.57	8.02	19.4
2-Methylnaphthalene	13.7	11.0	15.9	13.6	18.1
1-Methylphenanthrene	16.9	16.5	21.7	18.4	15.7
9-Methylphenanthrene	2.19	<1.66	23.9	<9.26	137
Naphthalene	72.2	69.9	80.9	74.3	7.8
Perylene	<1.64	<1.66	<1.72	<1.67	2.5
Phenanthrene	27.0	13.7	284	108	141
Picene	<8.22	<8.28	<8.61	<8.37	2.5
Pyrene	4.54	5.47	29.8	13.3	108
Tetralin	50.1	46.7	51.5	49.4	5.0
m-terphenyl	<1.64	<1.66	4.60	<2.63	64.6
o-Terphenyl	<1.64	<1.66	4.06	<2.45	56.8
p-terphenyl	<1.64	<1.66	1.77	<1.69	4.2
Total	<308	<299	<779	<462	59.4

* 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	4.88	4.65	25.5	11.7	103
Acenaphthylene	3.53	2.69	42.9	16.4	140
Anthracene	3.59	8.07	8.90	6.85	41.7
Benzo(a)Anthracene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(b)Fluoranthene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(k)Fluoranthene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(a)fluorene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(b)fluorene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(g,h,i)Perylene	<1.72	8.81	<1.81	<4.11	98.8
Benzo(a)Pyrene	<1.72	<1.73	<1.81	<1.75	2.7
Benzo(e)Pyrene	<1.72	<1.73	<1.81	<1.75	2.7
Biphenyl	8.71	7.3	13.2	9.73	32.0
2-Chloronaphthalene	<1.72	<1.73	<1.81	<1.75	2.7
Chrysene/Triphenylene	<1.72	<1.73	2.06	<1.84	10.6
Coronene	<8.62	<8.64	<9.04	<8.77	2.7
Dibenzo(a,c/a,h)Anthracene	<1.72	<1.73	<1.81	<1.75	2.7
Dibenzo(a,e)pyrene	<8.62	<8.64	<9.04	<8.77	2.7
9,10-dimethylanthracene	<1.72	<1.73	<1.81	<1.75	2.7
7,12-Dimethylbenzo(a)anthracene	<1.72	<1.73	<1.81	<1.75	2.7
Fluoranthene	5.64	4.11	39.2	16.3	122
Fluorene	18.1	13.3	19.2	16.9	18.6
Indeno(1,2,3-cd)Pyrene	<1.72	<1.73	<1.81	<1.75	2.7
2-methylanthracene	8.86	20.6	51.2	26.9	81.3
3-Methylcholanthrene	<8.62	<8.64	<9.04	<8.77	2.7
1-Methylnaphthalene	8.43	6.74	10.1	8.41	19.7
2-Methylnaphthalene	14.3	11.5	16.7	14.2	18.4
1-Methylphenanthrene	17.8	17.2	22.8	19.2	16.0
9-Methylphenanthrene	2.29	<1.73	25.1	<9.72	137
Naphthalene	75.7	72.9	85.0	77.9	8.1
Perylene	<1.72	<1.73	<1.81	<1.75	2.7
Phenanthrene	28.3	14.3	298	114	141
Picene	<8.62	<8.64	<9.04	<8.77	2.7
Pyrene	4.76	5.70	31.3	13.9	108
Tetralin	52.6	48.7	54.1	51.8	5.3
m-terphenyl	<1.72	<1.73	4.83	<2.76	64.9
o-Terphenyl	<1.72	<1.73	4.27	<2.57	57.0
p-terphenyl	<1.72	<1.73	1.86	<1.77	4.5
Total	<323	<312	<818	<484	59.7

* 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 Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Acenaphthene	0.090	0.087	0.46	0.21	101
Acenaphthylene	0.065	0.050	0.77	0.29	139
Anthracene	0.066	0.15	0.16	0.13	41.2
Benzo(a)Anthracene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(b)Fluoranthene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(k)Fluoranthene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(a)fluorene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(b)fluorene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(g,h,i)Perylene	<0.032	0.16	<0.032	<0.076	100
Benzo(a)Pyrene	<0.032	<0.032	<0.032	<0.032	1.1
Benzo(e)Pyrene	<0.032	<0.032	<0.032	<0.032	1.1
Biphenyl	0.16	0.14	0.24	0.18	29.7
2-Chloronaphthalene	<0.032	<0.032	<0.032	<0.032	1.1
Chrysene/Triphenylene	<0.032	<0.032	0.037	<0.034	8.4
Coronene	<0.16	<0.16	<0.16	<0.16	1.1
Dibenzo(a,c/a,h)Anthracene	<0.032	<0.032	<0.032	<0.032	1.1
Dibenzo(a,e)pyrene	<0.16	<0.16	<0.16	<0.16	1.1
9,10-dimethylanthracene	<0.032	<0.032	<0.032	<0.032	1.1
7,12-Dimethylbenzo(a)anthracene	<0.032	<0.032	<0.032	<0.032	1.1
Fluoranthene	0.10	0.077	0.70	0.29	120
Fluorene	0.33	0.25	0.34	0.31	16.9
Indeno(1,2,3-cd)Pyrene	<0.032	<0.032	<0.032	<0.032	1.1
2-methylanthracene	0.16	0.38	0.92	0.49	79.3
3-Methylcholanthrene	<0.16	<0.16	<0.16	<0.16	1.1
1-Methylnaphthalene	0.16	0.13	0.18	0.15	17.6
2-Methylnaphthalene	0.26	0.22	0.30	0.26	16.3
1-Methylphenanthrene	0.33	0.32	0.41	0.35	13.8
9-Methylphenanthrene	0.042	<0.032	0.45	<0.17	136
Naphthalene	1.39	1.36	1.52	1.43	5.9
Perylene	<0.032	<0.032	<0.032	<0.032	1.1
Phenanthrene	0.52	0.27	5.34	2.04	140
Picene	<0.16	<0.16	<0.16	<0.16	1.1
Pyrene	0.088	0.11	0.56	0.25	106
Tetralin	0.97	0.91	0.97	0.95	3.5
m-terphenyl	<0.032	<0.032	0.086	<0.050	62.6
o-Terphenyl	<0.032	<0.032	0.076	<0.047	54.7
p-terphenyl	<0.032	<0.032	0.033	<0.032	2.5
Total	<5.94	<5.84	<14.6	<8.81	57.4

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	8.19	14.0	11.1	11.7	0.21
Acenaphthylene	11.5	19.7	15.6	16.4	0.29
Anthracene	4.81	8.25	6.54	6.85	0.13
Benzo(a)Anthracene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(b)Fluoranthene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(k)Fluoranthene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(a)fluorene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(b)fluorene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(g,h,i)Perylene	<2.89	<4.96	<3.94	<4.11	<0.076
Benzo(a)Pyrene	<1.23	<2.11	<1.67	<1.75	<0.032
Benzo(e)Pyrene	<1.23	<2.11	<1.67	<1.75	<0.032
Biphenyl	6.82	11.7	9.28	9.73	0.18
2-Chloronaphthalene	<1.23	<2.11	<1.67	<1.75	<0.032
Chrysene/Triphenylene	<1.29	<2.22	<1.75	<1.84	<0.034
Coronene	<6.15	<10.6	<8.37	<8.77	<0.16
Dibenzo(a,c/a,h)Anthracene	<1.23	<2.11	<1.67	<1.75	<0.032
Dibenzo(a,e)pyrene	<6.15	<10.6	<8.37	<8.77	<0.16
9,10-dimethylanthracene	<1.23	<2.11	<1.67	<1.75	<0.032
7,12-Dimethylbenzo(a)anthracene	<1.23	<2.11	<1.67	<1.75	<0.032
Fluoranthene	11.5	19.6	15.6	16.3	0.29
Fluorene	11.8	20.3	16.1	16.9	0.31
Indeno(1,2,3-cd)Pyrene	<1.23	<2.11	<1.67	<1.75	<0.032
2-methylanthracene	18.9	32.3	25.6	26.9	0.49
3-Methylcholanthrene	<6.15	<10.6	<8.37	<8.77	<0.16
1-Methylnaphthalene	5.90	10.1	8.02	8.41	0.15
2-Methylnaphthalene	9.96	17.1	13.6	14.2	0.26
1-Methylphenanthrene	13.5	23.2	18.4	19.2	0.35
9-Methylphenanthrene	<6.82	<11.7	<9.26	<9.72	<0.17
Naphthalene	54.6	93.9	74.3	77.9	1.43
Perylene	<1.23	<2.11	<1.67	<1.75	<0.032
Phenanthrene	79.8	137	108	114	2.04
Picene	<6.15	<10.57	<8.37	<8.77	<0.16
Pyrene	9.77	16.7	13.3	13.9	0.25
Tetralin	36.3	62.5	49.4	51.8	0.95
m-terphenyl	<1.94	<3.32	<2.63	<2.76	<0.050
o-Terphenyl	<1.81	<3.10	<2.45	<2.57	<0.047
p-terphenyl	<1.24	<2.14	<1.69	<1.77	<0.032
Total	<340	<583	<462	<484	<8.81

* 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	18.4	<10
Acenaphthylene	12.6	<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	<10	<10
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	<10	<10
Biphenyl	10.0	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene	<10	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	<10	<10
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	<10	<10
Fluorene	45.8	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	14.1	<10
2-Methylnaphthalene	14.9	<10
1-Methylphenanthrene	<10	<10
9-Methylphenanthrene	<10	<10
Naphthalene	169	152
Perylene	<10	<10
Phenanthrene	17.5	<10
Picene	<50	<50
Pyrene	<10	<10
Tetralin	210	194
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<952	<856

"<" 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*	Actual µg/m^3	Acetaldehyde Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acetaldehyde Emission Rate mg/s
1	<2.2	0.0316	<40.3	<69.7	<54.9	<57.6	<1.06
2	<4.6	0.0287	<92.7	<160	<126	<132	<2.44
3	<3.4	0.0359	<55.1	<94.6	<75.2	<78.4	<1.47
Average			<62.7	<108	<85.5	<89.5	<1.65
Blank	<3.6						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual µg/m^3	Formaldehyde Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Formaldehyde Emission Rate mg/s
1	7.3	0.0316	133.7	231	182	191	3.52
2	<4.6	0.0287	<92.7	<160	<126	<132	<2.44
3	<3.4	0.0359	<55.1	<94.6	<75.2	<78.4	<1.47
Average			<93.8	<162	<128	<134	<2.47
Blank	<3.6						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual µg/m^3	Acrolein Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acrolein Emission Rate mg/s
1	<2.2	0.0316	<40.3	<69.7	<54.9	<57.6	<1.06
2	<4.6	0.0287	<92.7	<160	<126	<132	<2.44
3	<3.4	0.0359	<55.1	<94.6	<75.2	<78.4	<1.47
Average			<62.7	<108	<85.5	<89.5	<1.65
Blank	<3.6						

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 Run No. 1 Tube 13A/13B	Run No. 2 Tube 14A/14B	Run No. 3 Tube 15A/15B	Average	Coefficient of Variation	Total Collected
	µg	µg	µg	µg	%	µg
Acetone	0.15	0.11	<0.1	<0.12	21.6	<0.35
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	0.26	0.097	<0.09	<0.15	64.8	<0.45
1,3-Butadiene	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.071	0.062	0.017	0.050	57.9	0.15
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.015	0.015	0.018	0.016	10.8	0.048
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	0.020	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	0.010	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.013	<0.01	<0.01	<0.011	15.7	<0.033
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	0.15	0.45	0.45	0.35	49.3	1.06
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	0.016	0.021	<0.016	35.2	<0.047
Toluene	2.02	2.15	1.92	2.03	5.7	6.09
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
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	<3.06	<3.28	<3.00	<3.11	4.7	<9.33

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0204
Run No. 2	0.0196
Run No. 3	0.0189

* 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				Coefficient	Total
	Run No. 1 Tube 17A/17B	Run No. 2 Tube 18A/18B	Run No. 3 Tube 19A/19B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	0.16	<0.12	27.7	<0.36
Benzene	<0.05	<0.05	0.051	<0.050	1.1	<0.15
Bromodichloromethane	<0.01	<0.01	0.011	<0.010	5.6	<0.031
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.014	<0.01	0.045	<0.023	83.3	<0.069
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	0.018	0.030	<0.019	52.1	<0.058
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	0.11	0.11	0.42	0.22	82.6	0.65
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.015	0.025	0.035	0.025	40.0	0.075
Toluene	1.02	1.16	1.87	1.35	33.6	4.06
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
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	<1.75	<1.90	<3.03	<2.22	31.6	<6.67

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0211
Run No. 2	0.0210
Run No. 3	0.0215

* 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				Coefficient	Total
	Run No. 1 Tube 21A/21B	Run No. 2 Tube 22A/22B	Run No. 4 Tube 24A/24B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.017	0.019	0.015	0.017	11.8	0.051
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.016	0.018	0.014	0.016	12.5	0.048
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	<0.1	<0.1	<0.1	<0.10	-	<0.30
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.013	0.015	0.011	0.013	15.4	0.039
Toluene	0.80	0.94	0.73	0.82	12.9	2.46
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	<0.02	<0.02	<0.02	<0.020	-	<0.060
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	<1.52	<1.66	<1.44	<1.54	7.3	<4.61

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0200
Run No. 2	0.0216
Run No. 4	0.0193

* 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 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	<5.96	<4.69	<4.92	<0.091
Benzene	<0.15	<1.47	<2.55	<2.01	<2.10	<0.039
Bromodichloromethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Bromoform	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Bromomethane	<0.45	<4.40	<7.60	<5.99	<6.28	<0.12
1,3-Butadiene	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
2-Butanone	0.15	1.47	2.55	2.01	2.10	0.039
Carbon Tetrachloride	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Chloroform	0.048	0.47	0.81	0.64	0.67	0.012
Cumene (Isopropylbenzene)	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Dibromochloromethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Dichlorodifluoromethane	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
trans,1,2-Dichloroethene	<0.033	<0.32	<0.56	<0.44	<0.46	<0.0085
1,1-Dichloroethene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
1,2-Dichloropropane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Ethylbenzene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Ethylene Dibromide	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Methylene Chloride	1.06	10.4	18.0	14.1	14.8	0.27
Styrene	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Tetrachloroethene	<0.047	<0.46	<0.80	<0.63	<0.66	<0.012
Toluene	6.09	59.7	103	81.4	85.4	1.57
1,1,1-Trichloroethane	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Trichlorotrifluoroethane	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Trichlorofluoromethane	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
M&P-Xylene	<0.090	<0.88	<1.53	<1.20	<1.26	<0.023
O-Xylene	<0.030	<0.29	<0.51	<0.40	<0.42	<0.0077
Vinyl Chloride	<0.060	<0.59	<1.02	<0.80	<0.84	<0.015
Total	<9.33	<91.6	<158	<125	<131	<2.41

Dry Gas Volume Sampled (Rm^3*) :	0.0589
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	19.3
Wet Reference Flowrate (Rm^3/s*) :	18.4

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	<0.36	<3.27	<5.61	<4.46	<4.65	<0.087
Benzene	<0.15	<1.38	<2.37	<1.89	<1.97	<0.037
Bromodichloromethane	<0.031	<0.28	<0.49	<0.39	<0.40	<0.0076
Bromoform	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Bromomethane	<0.27	<2.47	<4.24	<3.37	<3.52	<0.066
1,3-Butadiene	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
2-Butanone	<0.069	<0.63	<1.08	<0.86	<0.90	<0.017
Carbon Tetrachloride	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Chloroform	<0.058	<0.53	<0.91	<0.72	<0.76	<0.014
Cumene (Isopropylbenzene)	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Dibromochloromethane	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Dichlorodifluoromethane	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
1,2-Dichloroethane	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
trans,1,2-Dichloroethene	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
1,1-Dichloroethene	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
1,2-Dichloropropane	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Ethylbenzene	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Ethylene Dibromide	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Methylene Chloride	0.65	5.94	10.2	8.10	8.44	0.16
Styrene	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Tetrachloroethene	0.075	0.69	1.18	0.94	0.98	0.018
Toluene	4.06	37.1	63.7	50.7	52.8	0.99
1,1,1-Trichloroethane	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Trichlorotrifluoroethane	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Trichlorofluoromethane	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
M&P-Xylene	<0.090	<0.82	<1.41	<1.12	<1.17	<0.022
O-Xylene	<0.030	<0.27	<0.47	<0.37	<0.39	<0.0073
Vinyl Chloride	<0.060	<0.55	<0.94	<0.75	<0.78	<0.015
Total	<6.67	<61.1	<105	<83.4	<87.0	<1.63

Dry Gas Volume Sampled (Rm³*) :	0.0636
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.7

* 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 µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	<0.30	<2.87	<4.93	<3.92	<4.08	<0.076
Benzene	<0.15	<1.44	<2.46	<1.96	<2.04	<0.038
Bromodichloromethane	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Bromoform	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Bromomethane	<0.27	<2.58	<4.43	<3.52	<3.68	<0.069
1,3-Butadiene	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
2-Butanone	0.051	0.49	0.84	0.67	0.69	0.013
Carbon Tetrachloride	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Chloroform	0.048	0.46	0.79	0.63	0.65	0.012
Cumene (Isopropylbenzene)	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Dibromochloromethane	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Dichlorodifluoromethane	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
trans,1,2-Dichloroethene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
1,1-Dichloroethene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
1,2-Dichloropropane	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Ethylbenzene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Ethylene Dibromide	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Methylene Chloride	<0.30	<2.87	<4.93	<3.92	<4.08	<0.076
Styrene	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Tetrachloroethene	0.039	0.37	0.64	0.51	0.53	0.0099
Toluene	2.46	23.6	40.4	32.1	33.5	0.63
1,1,1-Trichloroethane	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Trichlorotrifluoroethane	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Trichlorofluoromethane	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
M&P-Xylene	<0.090	<0.86	<1.48	<1.17	<1.23	<0.023
O-Xylene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0076
Vinyl Chloride	<0.060	<0.57	<0.99	<0.78	<0.82	<0.015
Total	<4.61	<44.1	<75.7	<60.2	<62.7	<1.17

Dry Gas Volume Sampled (Rm³*) :	0.0609
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.5
Wet Reference Flowrate (Rm³/s*) :	18.7

* 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	<3.44	<3.27	<2.87	<3.19
Benzene	<1.47	<1.38	<1.44	<1.43
Bromodichloromethane	<0.29	<0.28	<0.29	<0.29
Bromoform	<0.29	<0.27	<0.29	<0.29
Bromomethane	<4.40	<2.47	<2.58	<3.15
1,3-Butadiene	<0.59	<0.55	<0.57	<0.57
2-Butanone	1.47	<0.63	0.49	<0.86
Carbon Tetrachloride	<0.29	<0.27	<0.29	<0.29
Chloroform	0.47	<0.53	0.46	<0.49
Cumene (Isopropylbenzene)	<0.59	<0.55	<0.57	<0.57
Dibromochloromethane	<0.29	<0.27	<0.29	<0.29
Dichlorodifluoromethane	<0.59	<0.55	<0.57	<0.57
1,2-Dichloroethane	<0.29	<0.27	<0.29	<0.29
trans,1,2-Dichloroethene	<0.32	<0.27	<0.29	<0.30
1,1-Dichloroethene	<0.29	<0.27	<0.29	<0.29
1,2-Dichloropropane	<0.29	<0.27	<0.29	<0.29
Ethylbenzene	<0.29	<0.27	<0.29	<0.29
Ethylene Dibromide	<0.59	<0.55	<0.57	<0.57
Mesitylene (1,3,5-Trimethylbenzene)	<0.59	<0.55	<0.57	<0.57
Methylene Chloride	10.4	5.94	<2.87	<6.40
Styrene	<0.59	<0.55	<0.57	<0.57
Tetrachloroethene	<0.46	0.69	0.37	<0.51
Toluene	59.7	37.1	23.6	40.1
1,1,1-Trichloroethane	<0.29	<0.27	<0.29	<0.29
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.27	<0.29	<0.29
Trichlorotrifluoroethane	<0.59	<0.55	<0.57	<0.57
Trichlorofluoromethane	<0.59	<0.55	<0.57	<0.57
M&P-Xylene	<0.88	<0.82	<0.86	<0.86
O-Xylene	<0.29	<0.27	<0.29	<0.29
Vinyl Chloride	<0.59	<0.55	<0.57	<0.57
Total	<91.6	<61.1	<44.1	<65.6

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
	$\mu g/Rm^3$*	$\mu g/Rm^3$*	$\mu g/Rm^3$*	$\mu g/Rm^3$*
Acetone	<5.96	<5.61	<4.93	<5.50
Benzene	<2.55	<2.37	<2.46	<2.46
Bromodichloromethane	<0.51	<0.49	<0.49	<0.50
Bromoform	<0.51	<0.47	<0.49	<0.49
Bromomethane	<7.60	<4.24	<4.43	<5.43
1,3-Butadiene	<1.02	<0.94	<0.99	<0.98
2-Butanone	2.55	<1.08	0.84	<1.49
Carbon Tetrachloride	<0.51	<0.47	<0.49	<0.49
Chloroform	0.81	<0.91	0.79	<0.84
Cumene (Isopropylbenzene)	<1.02	<0.94	<0.99	<0.98
Dibromochloromethane	<0.51	<0.47	<0.49	<0.49
Dichlorodifluoromethane	<1.02	<0.94	<0.99	<0.98
1,2-Dichloroethane	<0.51	<0.47	<0.49	<0.49
trans,1,2-Dichloroethene	<0.56	<0.47	<0.49	<0.51
1,1-Dichloroethene	<0.51	<0.47	<0.49	<0.49
1,2-Dichloropropane	<0.51	<0.47	<0.49	<0.49
Ethylbenzene	<0.51	<0.47	<0.49	<0.49
Ethylene Dibromide	<1.02	<0.94	<0.99	<0.98
Mesitylene (1,3,5-Trimethylbenzene)	<1.02	<0.94	<0.99	<0.98
Methylene Chloride	18.0	10.2	<4.93	<11.0
Styrene	<1.02	<0.94	<0.99	<0.98
Tetrachloroethene	<0.80	1.18	0.64	<0.87
Toluene	103	63.7	40.4	69.2
1,1,1-Trichloroethane	<0.51	<0.47	<0.49	<0.49
Trichloroethene/1,1,2-Trichloroethene	<0.51	<0.47	<0.49	<0.49
Trichlorotrifluoroethane	<1.02	<0.94	<0.99	<0.98
Trichlorofluoromethane	<1.02	<0.94	<0.99	<0.98
M&P-Xylene	<1.53	<1.41	<1.48	<1.47
O-Xylene	<0.51	<0.47	<0.49	<0.49
Vinyl Chloride	<1.02	<0.94	<0.99	<0.98
Total	<158	<105	<75.7	<113

* 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/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	<4.69	<4.46	<3.92	<4.36
Benzene	<2.01	<1.89	<1.96	<1.95
Bromodichloromethane	<0.40	<0.39	<0.39	<0.39
Bromoform	<0.40	<0.37	<0.39	<0.39
Bromomethane	<5.99	<3.37	<3.52	<4.30
1,3-Butadiene	<0.80	<0.75	<0.78	<0.78
2-Butanone	2.01	<0.86	0.67	<1.18
Carbon Tetrachloride	<0.40	<0.37	<0.39	<0.39
Chloroform	0.64	<0.72	0.63	<0.66
Cumene (Isopropylbenzene)	<0.80	<0.75	<0.78	<0.78
Dibromochloromethane	<0.40	<0.37	<0.39	<0.39
Dichlorodifluoromethane	<0.80	<0.75	<0.78	<0.78
1,2-Dichloroethane	<0.40	<0.37	<0.39	<0.39
trans,1,2-Dichloroethene	<0.44	<0.37	<0.39	<0.40
1,1-Dichloroethene	<0.40	<0.37	<0.39	<0.39
1,2-Dichloropropane	<0.40	<0.37	<0.39	<0.39
Ethylbenzene	<0.40	<0.37	<0.39	<0.39
Ethylene Dibromide	<0.80	<0.75	<0.78	<0.78
Mesitylene (1,3,5-Trimethylbenzene)	<0.80	<0.75	<0.78	<0.78
Methylene Chloride	14.1	8.10	<3.92	<8.72
Styrene	<0.80	<0.75	<0.78	<0.78
Tetrachloroethene	<0.63	0.94	0.51	<0.69
Toluene	81.4	50.7	32.1	54.7
1,1,1-Trichloroethane	<0.40	<0.37	<0.39	<0.39
Trichloroethene/1,1,2-Trichloroethene	<0.40	<0.37	<0.39	<0.39
Trichlorotrifluoroethane	<0.80	<0.75	<0.78	<0.78
Trichlorofluoromethane	<0.80	<0.75	<0.78	<0.78
M&P-Xylene	<1.20	<1.12	<1.17	<1.17
O-Xylene	<0.40	<0.37	<0.39	<0.39
Vinyl Chloride	<0.80	<0.75	<0.78	<0.78
Total	<125	<83.4	<60.2	<89.4

* 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/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	<4.92	<4.65	<4.08	<4.55
Benzene	<2.10	<1.97	<2.04	<2.04
Bromodichloromethane	<0.42	<0.40	<0.41	<0.41
Bromoform	<0.42	<0.39	<0.41	<0.41
Bromomethane	<6.28	<3.52	<3.68	<4.49
1,3-Butadiene	<0.84	<0.78	<0.82	<0.81
2-Butanone	2.10	<0.90	0.69	<1.23
Carbon Tetrachloride	<0.42	<0.39	<0.41	<0.41
Chloroform	0.67	<0.76	0.65	<0.69
Cumene (Isopropylbenzene)	<0.84	<0.78	<0.82	<0.81
Dibromochloromethane	<0.42	<0.39	<0.41	<0.41
Dichlorodifluoromethane	<0.84	<0.78	<0.82	<0.81
1,2-Dichloroethane	<0.42	<0.39	<0.41	<0.41
trans,1,2-Dichloroethene	<0.46	<0.39	<0.41	<0.42
1,1-Dichloroethene	<0.42	<0.39	<0.41	<0.41
1,2-Dichloropropane	<0.42	<0.39	<0.41	<0.41
Ethylbenzene	<0.42	<0.39	<0.41	<0.41
Ethylene Dibromide	<0.84	<0.78	<0.82	<0.81
Mesitylene (1,3,5-Trimethylbenzene)	<0.84	<0.78	<0.82	<0.81
Methylene Chloride	14.8	8.44	<4.08	<9.12
Styrene	<0.84	<0.78	<0.82	<0.81
Tetrachloroethene	<0.66	0.98	0.53	<0.72
Toluene	85.4	52.8	33.5	57.2
1,1,1-Trichloroethane	<0.42	<0.39	<0.41	<0.41
Trichloroethene/1,1,2-Trichloroethene	<0.42	<0.39	<0.41	<0.41
Trichlorotrifluoroethane	<0.84	<0.78	<0.82	<0.81
Trichlorofluoromethane	<0.84	<0.78	<0.82	<0.81
M&P-Xylene	<1.26	<1.17	<1.23	<1.22
O-Xylene	<0.42	<0.39	<0.41	<0.41
Vinyl Chloride	<0.84	<0.78	<0.82	<0.81
Total	<131	<87.0	<62.7	<93.5

* 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	<0.091	<0.087	<0.076	<0.085
Benzene	<0.039	<0.037	<0.038	<0.038
Bromodichloromethane	<0.0077	<0.0076	<0.0076	<0.0076
Bromoform	<0.0077	<0.0073	<0.0076	<0.0076
Bromomethane	<0.12	<0.066	<0.069	<0.083
1,3-Butadiene	<0.015	<0.015	<0.015	<0.015
2-Butanone	0.039	<0.017	0.013	<0.023
Carbon Tetrachloride	<0.0077	<0.0073	<0.0076	<0.0076
Chloroform	0.012	<0.014	0.012	<0.013
Cumene (Isopropylbenzene)	<0.015	<0.015	<0.015	<0.015
Dibromochloromethane	<0.0077	<0.0073	<0.0076	<0.0076
Dichlorodifluoromethane	<0.015	<0.015	<0.015	<0.015
1,2-Dichloroethane	<0.0077	<0.0073	<0.0076	<0.0076
trans,1,2-Dichloroethene	<0.0085	<0.0073	<0.0076	<0.0078
1,1-Dichloroethene	<0.0077	<0.0073	<0.0076	<0.0076
1,2-Dichloropropane	<0.0077	<0.0073	<0.0076	<0.0076
Ethylbenzene	<0.0077	<0.0073	<0.0076	<0.0076
Ethylene Dibromide	<0.015	<0.015	<0.015	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.015	<0.015	<0.015	<0.015
Methylene Chloride	0.27	0.16	<0.076	<0.17
Styrene	<0.015	<0.015	<0.015	<0.015
Tetrachloroethene	<0.012	0.018	0.0099	<0.013
Toluene	1.57	0.99	0.63	1.06
1,1,1-Trichloroethane	<0.0077	<0.0073	<0.0076	<0.0076
Trichloroethene/1,1,2-Trichloroethene	<0.0077	<0.0073	<0.0076	<0.0076
Trichlorotrifluoroethane	<0.015	<0.015	<0.015	<0.015
Trichlorofluoromethane	<0.015	<0.015	<0.015	<0.015
M&P-Xylene	<0.023	<0.022	<0.023	<0.023
O-Xylene	<0.0077	<0.0073	<0.0076	<0.0076
Vinyl Chloride	<0.015	<0.015	<0.015	<0.015
Total	<2.41	<1.63	<1.17	<1.74

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	<3.19	<5.50	<4.36	<4.55	<0.085
Benzene	<1.43	<2.46	<1.95	<2.04	<0.038
Bromodichloromethane	<0.29	<0.50	<0.39	<0.41	<0.0076
Bromoform	<0.29	<0.49	<0.39	<0.41	<0.0076
Bromomethane	<3.15	<5.43	<4.30	<4.49	<0.083
1,3-Butadiene	<0.57	<0.98	<0.78	<0.81	<0.015
2-Butanone	<0.86	<1.49	<1.18	<1.23	<0.023
Carbon Tetrachloride	<0.29	<0.49	<0.39	<0.41	<0.0076
Chloroform	<0.49	<0.84	<0.66	<0.69	<0.013
Cumene (Isopropylbenzene)	<0.57	<0.98	<0.78	<0.81	<0.015
Dibromochloromethane	<0.29	<0.49	<0.39	<0.41	<0.0076
Dichlorodifluoromethane	<0.57	<0.98	<0.78	<0.81	<0.015
1,2-Dichloroethane	<0.29	<0.49	<0.39	<0.41	<0.0076
trans,1,2-Dichloroethene	<0.30	<0.51	<0.40	<0.42	<0.0078
1,1-Dichloroethene	<0.29	<0.49	<0.39	<0.41	<0.0076
1,2-Dichloropropane	<0.29	<0.49	<0.39	<0.41	<0.0076
Ethylbenzene	<0.29	<0.49	<0.39	<0.41	<0.0076
Ethylene Dibromide	<0.57	<0.98	<0.78	<0.81	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.57	<0.98	<0.78	<0.81	<0.015
Methylene Chloride	<6.40	<11.0	<8.72	<9.12	<0.17
Styrene	<0.57	<0.98	<0.78	<0.81	<0.015
Tetrachloroethene	<0.51	<0.87	<0.69	<0.72	<0.013
Toluene	40.1	69.2	54.7	57.2	1.06
1,1,1-Trichloroethane	<0.29	<0.49	<0.39	<0.41	<0.0076
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.49	<0.39	<0.41	<0.0076
Trichlorotrifluoroethane	<0.57	<0.98	<0.78	<0.81	<0.015
Trichlorofluoromethane	<0.57	<0.98	<0.78	<0.81	<0.015
M&P-Xylene	<0.86	<1.47	<1.17	<1.22	<0.023
O-Xylene	<0.29	<0.49	<0.39	<0.41	<0.0076
Vinyl Chloride	<0.57	<0.98	<0.78	<0.81	<0.015
Total	<65.6	<113	<89.4	<93.5	<1.74

* 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 25A/25B	Field Blank 2 Tube 29A/29B	Field Blank 3 Tube 30A/30B	Trip Blank	Method Blank
	µg	µg	µg	µg	µg
Acetone	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05	<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	<0.02	<0.02	<0.02	<0.02	<0.02
2-Butanone	<0.01	<0.01	<0.01	<0.01	<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	<0.02	<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	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.02	<0.02	<0.02	<0.02	<0.02
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	<0.75	<0.75	<0.75	<0.75	<0.75

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

Notice of Testing and
ECA No. 7306-8FDKNX
(86 pages)

If you require this information in an accessible format, please contact The Regional Municipality of Durham at 1-800-372-1102 ext. 3560.

Sent via standard mail and email (celeste.dugas@ontario.ca and cathy.grant@ontario.ca)

May 10, 2019

Celeste Dugas, Manager,
York Durham District Office
Ministry of the Environment, Conservation and Parks
230 Westney Road South, Floor 5
Ajax, ON L1S 7J5

and

Catherine Grant, Manager (Acting),
Technology Standards Section
Ministry of the Environment, Conservation and Parks
40 St. Clair Avenue West, Floor 9, Foster Building
Toronto, ON M4V 1M2

Dear Ms. Dugas and Ms. Grant:

RE: Durham York Energy Centre
Voluntary Spring 2019 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 June 24, 2019. 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 2018 Pre-Test Plan for Source Testing as approved by the Ministry of the Environment, Conservation and Parks (MECP) prior to the October 2018 Source Test.

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,

for 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
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
S. Dittman, Supervisor, Technical Services, Waste Management, The Regional Municipality of York

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
	2-monochlorophenol (2-MCP)
Monochlorobenzene (MCB)	3-monochlorophenol (3-MCP)
1,2-Dichlorobenzene (1,2-DCB)	4-monochlorophenol (4-MCP)
1,3-Dichlorobenzene (1,3-DCB)	2,3-dichlorophenol (2,3-DCP)
1,4-Dichlorobenzene (1,4-DCB)	2,4-dichlorophenol (2,4-DCP)
1,2,3-Trichlorobenzene (1,2,3-TCB)	2,5-dichlorophenol (2,5-DCP)
1,2,4-Trichlorobenzene (1,2,4-TCB)	2,6-dichlorophenol (2,6-DCP)
1,3,5-Trichlorobenzene (1,3,5-TCB)	3,4-dichlorophenol (3,4-DCP)
1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB)	3,5-dichlorophenol (3,5-DCP)
1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB)	2,3,4-trichlorophenol (2,3,4-T3CP)
1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB)	2,3,5-trichlorophenol (2,3,5-T3CP)
Pentachlorobenzene (PeCB)	2,3,6-trichlorophenol (2,3,6-T3CP)
Hexachlorobenzene (HxCB)	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

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 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;

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

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:

"**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

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;

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	June 25, 2019
Test Location	APC Outlet No. 1
Operator	DP

Project No.:	21936	
Page	1 of 5	
Probe No.:		
Meter Box No.:	TEAM 1	
Impinger Box No.:	7	

Pitot Factor	0.849	
DGMCF	1.001	
Barometric Pressure	29.25	"Hg
Static Pressure	-7.3	"H2O
Nozzle Size	.2517	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

Particulate Gain

Filter	<0.1	mg
Probe	2.1	mg

Moisture Gain

CWTR	439.5	g
WCBDA	27.2	g

Combustion Gas Concentration

Oxygen	8.32	%
Carbon Dioxide	10.83	%
Carbon Monoxide	17.3	ppm

Measuring Device	MII Numbers
Probe / Pitot	804011 SP4
Trendicator	C06 20094
Control Box	C06 20094
Incline Manometer	C06 20094
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2525
2	.2520
3	.2510
4	.2515
Average:	0.2517

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: June 25/19	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 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	68.58	0.70	0.68	290	250	250	67	61	72	70	1.6	3.0
	2.5	70.28	0.70	0.70	290	252	241	65	181	71	70	1.7	3.0
	5	72.02	0.70	0.68	290	250	245	64	196	72	70	1.7	3
2	7.5	73.76	0.70	0.68	296	251	246	62	200	72	70	1.6	3
	10	75.45	0.70	0.68	290	251	245	61	202	73	70	1.6	3
	12.5	77.15	0.70	0.68	291	252	246	60	202	73	70	1.6	3
3	15	78.85	0.70	0.68	290	251	245	60	205	74	70	1.7	3
	17.5	80.57	0.70	0.68	290	252	246	61	207	75	70	1.7	3
	20	82.28	0.70	0.68	290	252	245	61	208	76	70	1.7	3
4	22.5	84.01	0.70	0.69	285	250	245	60	220	77	70	1.7	3
	25	85.74	0.68	0.68	287	250	245	60	224	79	71	1.7	3
	27.5	87.45	0.68	0.68	289	250	246	60	225	79	71	1.6	3
5	30	89.18	0.65	0.66	285	250	246	60	226	79	71	1.55	3
	32.5	90.84	0.65	0.66	286	250	247	60	226	79	72	1.6	3
	35	92.50	0.65	0.66	289	251	246	59	228	81	72	1.6	3
6	37.5	94.19	0.65	0.67	285	250	246	59	228	81	72	1.6	3
	40	95.88	0.65	0.67	285	251	245	59	228	81	72	1.6	3
	42.5	97.56	0.65	0.66	286	250	245	59	228	81	72	1.6	3
7	45	99.24	0.58	0.63	285	250	246	59	230	83	73	1.4	3
	47.5	100.84	0.58	~~0.68~~ 0.63	285	250	246	59	230	82	73	1.4	3
	50	102.44	0.58	0.63	285	250	247	59	230	82	73	1.4	3

Traverse: 1			
Start Time: 9:02	Initial Leak Check: 0.009	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.: 21936

Operator : DP

Field Data Sheet

Date: June 25/19	Plant:	Covanta DYEC	Test No.: 1	Particulate/Metals	
	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 *
8	52.5	104.02	0.63	0.66	283	250	247	59	229	83	74	1.6	3
	55	105.70	0.63	0.66	283	250	246	58	230	83	74	1.5	3
	57.5	107.37	0.64	0.66	283	250	246	58	230	84	74	1.5	3
9	60	109.03	0.65	0.67	285	250	247	59	231	84	75	1.6	3
	62.5	110.70	0.65	0.67	285	250	246	58	230	84	75	1.6	3
	65	112.40	0.66	0.67	284	251	246	58	230	84	75	1.6	3
10	67.5	114.10	0.74	0.71	285	251	247	58	231	85	75	1.8	3
	70	115.90	0.72	0.70	285	250	246	58	230	85	75	1.8	3
	72.5	117.68	0.70	0.70	284	250	245	57	230	85	75	1.7	3
11	75	119.45	0.75	0.72	284	250	245	57	230	85	75	1.8	3
	77.5	121.28	0.75	0.72	284	250	247	~~88~~ 58	233	86	76	1.8	3
	80	123.1	0.75	0.72	284	250	246	57	234	86	76	1.8	3
12	82.5	124.93	0.77	0.73	283	250	246	57	233	85	76	1.9	3
	85	126.75	0.75	0.72	284	250	247	57	233	85	76	1.9	3
	87.5	128.57	0.75	0.72	284	250	246	58	231	85	76	1.9	3
	90	130.39											

Traverse: 1				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: 10:32	Final Leak Check:	0.007	cfm@ 18	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : OP

Rev: April 28, 2005

ORTECH Environmental

Field Data Sheet

Date: June 23/19	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 ft³ *	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	131.05	0.6	0.64	285	248	249	62	103	79	77	1.5	3.0
	2.5	132.70	0.6	0.64	285	249	250	55	200	80	77	1.5	3.0
	5	134.32	0.62	0.65	285	249	250	51	209	80	77	1.5	3.0
2	7.5	135.98	0.65	0.67	285	250	250	50	209	80	77	1.5	3.0
	10	137.63	0.64	0.66	285	251	249	49	209	80	77	1.5	3.0
	12.5	139.31	0.65	0.67	285	250	250	48	209	80	77	1.6	3.0
3	15	140.99	0.65	0.67	284	250	249	48	210	81	77	1.6	3.0
	17.5	142.69	0.64	0.66	284	250	248	48	209	82	77	1.6	3.0
	20	144.38	0.64	0.66	285	250	249	48	210	82	77	1.6	3.0
4	22.5	146.00	0.63	0.66	285	250	250	48	210	83	77	1.6	3.0
	25	147.66	0.60	0.64	284	250	250	50	210	80	77	1.5	3.0
	27.5	149.29	0.60	0.64	285	250	250	48	206	80	77	1.45	3.0
5	30	150.92	0.60	0.64	285	251	249	47	207	80	77	1.45	3.0
	32.5	152.53	0.61	0.65	284	250	250	47	207	80	77	1.5	3.0
	35	154.16	0.61	~~0.61~~ 0.65	285	250	251	48	209	80	77	1.5	3.0
6	37.5	155.81	0.6	0.64	285	250	250	48	209	80	77	1.5	3.0
	40	157.43	0.6	0.64	285	250	250	48	209	80	77	1.5	3.0
	42.5	159.05	0.6	0.64	286	250	251	48	213	80	77	1.5	3.0
7	45	160.68	0.55	0.61	286	250	250	49	220	80	77	1.3	3.0
	47.5	162.23	0.55	0.61	285	251	249	49	220	80	77	1.3	3.0
	50	163.76	0.55	0.61	285	250	251	49	220	80	77	1.4	3.0

Traverse: 2			
Start Time: 10:47	Initial Leak Check: 0.008	cfm@ 18	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

* pause 11:09
* resume 11:18

Project No.: 21936
Operator : DP

Field Data Sheet

Date: June 20/19	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 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 *
8	52.5	165.39	0.6	0.64	285	250	250	49	221	80	75	1.5	3
	55	166.95	0.62	0.65	285	251	250	50	221	80	76	1.5	3
	57.5	168.57	0.6	0.64	288	250	250	52	228	79	75	1.5	3
9	60	170.19	0.68	0.68	285	250	251	51	228	80	75	1.7	3
	62.5	171.92	0.68	0.68	285	251	249	52	228	80	75	1.6	3
	65	173.63	0.68	0.68	285	250	250	53	230	80	75	1.6	3
10	67.5	175.34	0.71	0.70	285	251	249	54	230	80	75	1.7	3.5
	70	177.10	0.71	0.70	287	250	249	55	230	80	74	1.7	3.5
	72.5	178.86	0.72	0.70	286	251	250	56	230	80	74	1.7	3.5
11	75	180.63	0.75	0.72	285	250	250	55	230	80	74	1.8	3.5
	77.5	182.43	0.75	0.72	285	251	250	55	230	80	75	1.8	3.5
	80	184.22	0.75	0.72	285	250	251	55	230	80	75	1.85	3.5
12	82.5	186.05	0.74	0.71	285	250	250	54	230	80	75	1.8	3.5
	85	187.85	0.75	0.71	285	249	250	55	230	79	74	1.8	3.5
	87.5	189.66	0.75	0.71	285	250	250	55	230	78	74	1.8	3.5
	90	191.46											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 12:26	Final Leak Check: 0.008	cfm@ 22	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : DP

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	June 25, 2019
Test Location	APC Outlet No. 1
Operator	DP

Project No.:	21936	
Page	1 of 5	
Probe No.:		
Meter Box No.:	TEAM 1	
Impinger Box No.:		

Pitot Factor	0.849	
DGMCF	1.001	
Barometric Pressure	29.33	"Hg
Static Pressure	-7.3	"H2O
Nozzle Size	0.2517	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	20.1	mg
Probe	3.5	mg

Moisture Gain

CWTR	483.7	g
WCBDA	25.5	g

Combustion Gas Concentration

Oxygen	8.36	%
Carbon Dioxide	10.68	%
Carbon Monoxide	14.3	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	B04011 SP4
Trendicator	COE 20097
Control Box	COE 20097
Incline Manometer	COE 20097
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements

1	.2525
2	.2520
3	.2510
4	.2515
Average:	.2517

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: June 25/19	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 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	92.64	0.75	0.71	280	247	251	70	81	79	73	1.8	3.5
	2.5	94.41	0.75	0.71	285	250	250	70	180	79	73	1.8	3.5
	5	96.2	0.75	0.71	285	250	250	69	192	77	73	1.8	3.5
2	7.5	98.02	0.75	0.71	285	250	250	69	197	79	73	1.8	3.5
	10	99.82	0.75	0.71	285	251	250	69	199	75	73	1.8	3.5
	12.5	101.63	0.75	0.71	285	250	251	69	198	76	73	1.8	3.5
3	15	103.43	0.70	0.69	286	249	251	67	202	76	73	1.7	3.3
	17.5	105.19	0.69	0.68	286	250	250	65	205	77	73	1.7	3.3
	20	106.94	0.70	0.69	286	252	248	63	203	77	73	1.7	3.3
4	22.5	108.69	0.69	0.68	286	250	247	62	202	77	73	1.7	3.3
	25	110.43	0.69	0.68	286	250	251	59	204	78	73	1.7	3.3
	27.5	112.18	0.69	0.68	286	250	250	58	206	79	73	1.7	3.3
5	30	113.93	0.60	0.64	286	250	248	57	204	79	74	1.45	3.3
	32.5	115.58	0.61	0.64	286	251	250	56	206	80	74	1.45	3.3
	35	117.21	0.62	0.65	285	250	251	56	204	80	74	1.45	3.3
6	37.5	118.83	0.53	0.60	285	248	250	56	204	80	74	1.30	3.3
	40	120.37	0.53	0.60	285	249	248	54	206	81	74	1.30	3.3
	42.5	121.92	0.54	0.61	285	250	250	54	204	81	74	1.30	3.3
7	45	123.45	0.58	0.63	285	252	251	53	204	81	74	1.40	3.3
	47.5	125.04	0.59	0.64	285	252	252	53	204	81	74	1.40	3.3
	50	126.63	0.59	0.64	285	251	251	52	202	82	74	1.40	3.3

Traverse: 1					
Start Time: 13:28	Initial Leak Check:	.009	cfm@	15	"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.: 21936

Operator : DP / JB

Field Data Sheet

Date: June 23/19	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 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 *
8	52.5	128.21	0.60	0.64	286	250	250	51	207	83	75	1.50	3.3
	55	129.83	0.60	0.64	286	250	250	51	206	82	75	1.50	3.3
	57.5	131.46	0.60	0.64	286	250	251	51	206	83	75	1.50	3.3
9	60	133.09	0.60	0.65	285	250	252	51	206	83	75	1.50	3.3
	62.5	134.72	0.63	0.66	285	250	250	51	206	83	75	1.55	3.3
	65	136.40	0.62	0.65	286	249	250	50	206	83	75	1.50	3.3
10	67.5	138.05	0.63	0.66	286	248	250	50	204	83	75	1.55	3.3
	70	139.70	0.63	0.66	286	250	250	50	206	83	75	1.55	3.3
	72.5	141.37	0.63	0.66	286	250	252	50	204	84	76	1.55	3.3
11	75	143.04	0.59	0.64	286	250	250	50	204	84	76	1.45	3.3
	77.5	144.65	0.59	0.64	286	252	250	50	206	84	76	1.45	3.3
	80	146.28	0.60	0.64	286	252	252	50	204	84	76	1.45	3.3
12	82.5	147.91	0.60	0.64	285	250	250	50	206	84	77	1.45	3.3
	85	149.53	0.61	0.65	285	249	250	50	204	84	77	1.50	3.3
	87.5	151.17	0.61	0.65	286	250	249	50	206	84	77	1.50	3.3
	90	152.80											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 14:58	Final Leak Check: .001	cfm@ 16	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : DD/JB

Field Data Sheet

Date: June 20/19	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 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	153.44	0.75	0.72	286	250	250	50	204	80	77	1.85	4.0
	2.5	155.21	0.74	0.71	285	248	251	52	200	81	77	1.85	4.0
	5	157.05	0.74	0.71	285	249	250	51	201	81	78	1.85	4.0
2	7.5	158.88	0.75	0.72	286	250	252	49	204	81	78	1.85	4.0
	10	160.71	0.74	0.71	286	250	250	49	206	81	78	1.85	4.0
	12.5	162.56	0.75	0.72	286	251	250	49	202	81	78	1.85	4.0
3	15	164.38	0.75	0.72	285	250	250	49	209	81	78	1.8	4.0
	17.5	166.2	0.75	0.72	285	250	249	49	209	81	78	1.8	4
	20	168.03	0.75	0.72	286	250	250	49	211	82	78	1.8	4
4	22.5	169.85	0.75	0.72	285	251	250	49	211	82	78	1.8	4
	25	171.68	0.75	0.72	287	250	251	49	215	82	78	1.8	4
	27.5	173.49	0.75	0.72	285	250	250	49	215	82	78	1.8	4
5	30	175.31	0.75	0.72	285	250	250	49	211	82	78	1.8	4
	32.5	177.12	0.76	0.72	287	250	250	50	211	82	78	1.8	4
	35	178.94	0.76	0.72	286	250	251	50	211	82	78	1.8	4
6	37.5	180.76	0.73	0.71	285	250	250	50	211	82	78	1.8	4
	40	182.57	0.74	0.71	288	250	251	50	211	83	78	1.8	4
	42.5	184.37	0.76	0.72	289	250	250	50	211	83	78	1.8	4
7	45	186.18	0.65	0.67	289	250	250	50	212	83	78	1.6	4
	47.5	187.89	0.66	0.67	289	250	250	50	212	83	78	1.6	4
	50	189.60	0.69	0.69	288	250	250	50	211	83	78	1.6	4

Traverse: 2			
Start Time: 15:08	Initial Leak Check: 0.001	cfm@ 16	"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.: 21936

Operator : OP/JB

Field Data Sheet

Date: June 22/19	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 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
	*	*	*		*			*		*	*	*	*
8	52.5	191.32	0.73	0.71	290	250	252	51	210	83	78	1.8	4
	55	193.12	0.72	0.70	290	250	250	51	210	83	78	1.8	4
	57.5	194.92	0.7	0.69	291	251	250	50	210	83	78	1.7	4
9	60	196.69	0.72	0.70	290	250	250	52	211	83	79	1.7	4
	62.5	198.46	0.72	0.70	290	250	251	52	211	83	79	1.7	4
	65	200.25	0.7	0.69	290	251	250	52	210	84	79	1.7	4
10	67.5	202.03	0.79	0.74	290	250	252	53	211	85	79	1.9	4.5
	70	203.90	0.78	0.73	289	250	251	53	212	85	79	1.9	4.5
	72.5	205.79	0.77	0.73	289	250	251	54	212	86	79	1.9	4.5
11	75	207.64	0.8	0.74	289	250	250	54	211	85	79	1.95	4.5
	77.5	209.54	0.79	0.74	288	251	250	53	208	85	79	1.9	4.5
	80	211.41	0.80	0.74	288	250	251	53	208	85	79	1.95	4.5
12	82.5	213.29	0.80	0.74	289	251	250	53	209	85	79	1.95	4.5
	85	215.17	0.8	0.74	289	250	251	52	209	85	79	1.95	4.5
	87.5	217.04	0.81	0.81	289	250	251	52	210	85	79	1.95	4.5
	90	218.91											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 16:38	Final Leak Check: 0.007	cfm@ 19	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : OP

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.:	Particulate/Metals 3	
Test Date	June 26/19	
Test Location	APC Outlet No. 1	
Operator	R	

Project No.:	21936	
Page	1 of 5	
Probe No.:		
Meter Box No.:	Team 4	
Impinger Box No.:		

Pitot Factor	0.849	
DGMCF	0.999	
Barometric Pressure	29.46	"Hg
Static Pressure	-8.6	"H2O
Nozzle Size	0.2517	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

Particulate Gain

Filter	0.6	mg
Probe	2.0	mg

Moisture Gain

CWTR	566.2	g
WCBDA	22.7	g

Combustion Gas Concentration

Oxygen	8.23	%
Carbon Dioxide	10.94	%
Carbon Monoxide	9.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP4
Trendicator	
Control Box	COE 20090
Incline Manometer	"
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	0.2510
2	0.2515
3	0.2520
4	0.2525
Average:	0.2517

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 26/19	Plant:	Covanta DYEC	Test No.:	Particulate/Metals #3	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	85.61	0.70	0.68	280	253	249	77	152	77	77	1.6	5
	2.5	87.40	0.90	0.77	284	259	261	73	195	78	77	2.1	5
	5	89.48	0.86	0.76	285	259	261	70	208	79	77	1.9	5
2	7.5	91.36	0.87	0.76	284	258	257	68	212	81	78	1.9	5
	10	93.25	0.87	0.76	284	258	256	67	224	82	78	1.9	5
	12.5	95.17	0.87	0.76	284	257	251	66	228	83	76	1.9	5
3	15	97.08	0.85	0.76	284	256	253	64	228	84	78	1.9	5
	17.5	99.00	0.81	0.74	287	256	257	62	230	85	79	1.8	5
	20	100.98	0.80	0.73	286	256	257	61	230	85	79	1.8	5
4	22.5	102.72	0.80	0.73	286	256	255	60	229	86	79	1.7	5
	25	104.58	0.80	0.73	286	255	252	59	226	86	79	1.7	5
	27.5	106.43	0.80	0.73	285	255	256	59	228	87	79	1.7	5
5	30	108.30	0.80	0.74	285	256	257	58	229	87	79	1.7	5
	32.5	110.15	0.80	0.74	288	256	256	58	229	88	80	1.7	5
	35	112.00	0.80	0.74	288	256	252	57	227	88	86	1.7	5
6	37.5	113.85	0.78	0.73	287	255	256	57	228	88	81	1.7	5
	40	115.70	0.78	0.73	287	256	258	57	230	88	80	1.7	5
	42.5	117.55	0.76	0.72	287	256	257	57	230	88	81	1.7	5
7	45	119.40	0.78	0.73	286	256	253	57	228	89	81	1.7	5
	47.5	121.25	0.70	0.69	286	256	255	57	229	89	81	1.6	5
	50	123.05	0.70	0.69	286	256	259	57	230	89	81	1.6	5

Traverse: #2 NW				
Start Time: 14:01	Initial Leak Check:	.008	cfm@ 17	"Hg
Finish Time: 15:31	Final Leak Check:	.006	cfm@ 20	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: June 26/19	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 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 *
8	52.5	124.83	0.70	0.69	286	256	258	57	230	89	82	1.6	5
	55	126.58	0.75	0.71	286	256	255	57	229	88	82	1.6	5
	57.5	128.36	0.76	0.72	286	255	253	57	228	88	82	1.6	5
9	60	130.13	0.76	0.72	286	256	258	57	229	88	82	1.6	5
	62.5	131.89	0.82	0.75	286	256	258	57	230	89	82	1.7	5
	65	133.74	0.83	0.75	287	256	256	57	230	89	82	1.8	5
10	67.5	135.63	0.81	0.74	286	256	253	56	229	89	82	1.8	5
	70	137.52	0.90	0.78	286	256	258	56	230	89	83	2.1	5.5
	72.5	139.53	0.88	0.77	287	257	260	56	232	89	83	2.1	5.5
11	75	141.54	0.88	0.77	287	257	258	57	233	89	83	2.1	5.5
	77.5	143.57	0.90	0.78	287	257	254	57	231	89	82	2.1	5.5
	80	145.58	0.88	0.77	286	256	254	57	230	89	83	2.1	5.5
12	82.5	147.61	0.87	0.77	286	257	259	57	231	89	83	2.0	5
	85	149.57	0.90	0.78	285	256	259	57	232	88	83	2.0	5
	87.5	151.54	0.90	0.78	286	257	257	57	232	88	83	2.0	5
	90	153.69											

Traverse:		Traverse:	
Start Time:	Initial Leak Check: cfm@ "Hg	Start Time:	Initial Leak Check: cfm@ "Hg
Finish Time:	Final Leak Check: cfm@ "Hg	Finish Time:	Final Leak Check: cfm@ "Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: Jue 26/19	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 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	154.24	0.95	0.80	288	254	255	64	137	83	83	2.2	5.5
	2.5	156.23	0.95	0.80	286	257	255	56	159	84	82	2.2	5.5
	5	158.30	0.96	0.80	286	257	255	53	160	84	83	2.2	5.5
2	7.5	160.36	0.93	0.79	286	257	255	52	160	85	82	2.2	5.5
	10	162.42	0.93	0.79	286	256	254	52	162	86	83	2.2	5.5
	12.5	164.50	0.91	0.79	286	256	257	52	161	87	83	2.2	5.5
3	15	166.53	0.92	0.79	286	256	257	52	168	87	83	2.1	5.5
	17.5	168.55	0.91	0.79	287	257	254	54	164	88	83	2.1	5.5
	20	170.56	0.93	0.79	287	256	254	53	163	88	83	2.1	5.5
4	22.5	172.56	0.93	0.80	287	257	257	53	179	89	83	2.1	5.5
	25	174.58	0.85	0.76	287	256	256	53	184	89	83	2.0	5.5
	27.5	176.54	0.86	0.76	287	257	254	54	184	89	83	2.0	5.5
5	30	178.49	0.86	0.76	287	257	256	53	186	89	83	2.0	5.5
	32.5	180.44	0.87	0.77	288	256	257	54	185	89	83	2.0	5.5
	35	182.49	0.89	0.78	288	256	256	55	189	90	83	2.0	5.5
6	37.5	184.33	0.80	0.74	288	256	253	55	184	90	83	1.8	5.5
	40	186.23	0.79	0.73	288	256	257	55	182	90	83	1.8	5.5
	42.5	188.11	0.70	0.69	288	256	256	56	181	90	83	1.7	5.0
7	45	189.93	0.70	0.69	288	256	253	56	182	90	83	1.7	5.0
	47.5	191.73	0.82	0.75	288	257	255	55	184	90	~~90~~ 84	1.9	5.5
	50	193.63	0.80	0.74	288	257	257	55	190	90	84	1.9	5.5

Traverse: #1	RW			
Start Time: 15:40	Initial Leak Check: .006	cfm@ 15.5	"Hg	
Finish Time: 17:10	Final Leak Check: .005	cfm@ 15	"Hg	

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: June 26/19	Plant: Covanta DYEC	Test No.: #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 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 *
8	52.5	195.54	0.8	0.74	289	256	255	55	193	91	84	1.9	5.5
	55	197.45	0.8	0.74	289	256	255	55	193	91	84	1.9	5.5
	57.5	199.37	0.8	0.74	289	257	258	55	188	91	84	1.9	5.5
9	60	201.27	0.8	0.74	289	256	256	55	190	91	84	1.9	5.5
	62.5	203.18	0.82	0.75	288	257	254	56	192	91	85	1.9	5.5
	65	205.09	0.8	0.74	288	256	257	56	189	91	85	1.9	5.5
10	67.5	206.99	0.8	0.74	289	256	257	55	189	91	85	1.9	5.5
	70	208.89	0.8	0.74	286	256	254	56	191	91	85	1.9	5.5
	72.5	210.79	0.8	0.74	286	256	257	56	190	90	85	1.9	5.5
11	75	212.[illegible]8	0.8	0.74	286	256	255	57	187	90	85	1.9	5.5
	77.5	214.57	0.8	0.74	286	256	256	58	190	91	85	1.9	5.5
	80	216.47	0.75	0.72	286	256	256	59	189	91	85	1.8	5.5
12	82.5	218.31	0.75	0.72	286	256	255	60	188	91	85	1.8	5.5
	85	220.16	0.75	0.72	286	255	255	61	186	91	85	1.8	5.5
	87.5	222.01	0.75	0.72	286	255	257	82	184	91	85	1.8	5.5
	90	223.85											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"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.: 21936

Operator : RV

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 Particulate/Metals
Test Date	JUNE 25, 2019
Test Location	APC Outlet No. 2
Operator	R

Project No.:	21936
Page	1 of 5
Probe No.:	
Meter Box No.:	~~[illegible]~~ 4 Team 3
Impinger Box No.:	16

Pitot Factor	0.851	
DGMCF	1.004	
Barometric Pressure	29.29	"Hg
Static Pressure	-7.4	"H2O
Nozzle Size	0.2499	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

Particulate Gain

Filter	60.1	mg
Probe	2.0	mg

Moisture Gain

CWTR	474.4	g
WCBDA	26.1	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	10.68	%
Carbon Monoxide	20.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP2
Trendicator	
Control Box	Team 3
Incline Manometer	Team 3
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2510
2	.2490
3	.2500
4	.2495
Average:	~~0.2500~~ 0.2499

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: June ~~23~~ 25/19	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 ft³ *	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	7.93	0.66	0.66	268	254	261	65	200	71	70	1.6	3
	2.5	~~11.2~~ 9.6	0.66	0.66	275	255	259	61	206	70	71	1.6	3
	5	11.26	0.66	0.66	276	254	254	59	210	71	71	1.6	3
2	7.5	12.95	0.65	0.65	276	256	252	58	212	71	71	1.6	3
	10	14.80	0.65	0.65	276	256	251	59	214	71	71	1.6	3
	12.5	16.31	0.65	0.65	276	252	251	59	218	71	71	1.6	3
3	15	18.00	0.70	0.68	276	256	252	61	221	71	72	1.8	3
	17.5	19.66	0.72	0.88	284	255	253	62	222	71	72	1.8	3
	20	21.54	0.69	0.67	284	258	253	62	225	71	72	1.6	3
4	22.5	23.23	0.69	0.67	284	258	254	62	226	72	72	1.6	3
	25	24.93	0.72	0.72	287	251	254	62	227	72	73	1.6	3
	27.5	26.68	0.70	0.68	288	256	254	62	227	72	74	1.6	3
5	30	28.43	0.70	0.67	288	252	254	61	227	72	74	1.6	3
	32.5	30.21	0.70	0.67	288	251	254	61	226	73	75	1.6	3
	35	31.91	0.69	0.67	288	251	253	60	227	73	76	1.6	3
6	37.5	33.64	0.66	0.66	288	255	253	59	227	73	75	1.6	3
	40	35.33	0.68	0.66	289	255	253	58	227	73	77	1.6	3
	42.5	37.03	0.68	0.66	290	254	254	57	228	73	76	1.6	3
7	45	38.72	0.68	0.67	290	257	254	57	228	74	76	1.6	3
	47.5	40.42	0.69	0.67	290	251	254	57	229	74	76	1.6	3
	50	42.09	0.69		290	257	254	57	229	74	77	1.6	3

Traverse: 2		
Start Time: 10:46	Initial Leak Check: .002 cfm@ 21 "Hg	
Finish Time: 12:16	Final Leak Check: .002 cfm@ 18 "Hg	

Traverse:		
Start Time:	Initial Leak Check:	cfm@ "Hg
Finish Time:	Final Leak Check:	cfm@ "Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: JUNE 25, 19	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 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
	*	*	*		*			*		*	*	*	*
8	52.5	43.77	0.7	0.68	291	254	255	56	229	74	77	1.6	3
	55	45.46	0.69	0.67	291	254	254	56	229	74	77	1.6	3
	57.5	47.15	0.7	0.68	290	257	254	55	230	74	77	1.6	3
9	60	48.84	0.75	0.70	290	258	254	55	227	74	77	1.8	3
	62.5	50.59	0.75	0.70	290	255	254	54	226	74	77	1.8	3
	65	52.36	0.76	0.71	290	253	254	54	225	75	78	1.8	3
10	67.5	54.13	0.75	0.70	289	254	254	53	225	75	78	1.8	3
	70	55.98	0.80	~~0.80~~ 0.72	289	257	254	53	224	75	78	1.8	3
	72.5	57.76	0.80	0.72	289	254	254	53	224	75	78	1.9	3
11	75	59.52	0.80	0.73	289	258	254	53	224	75	78	1.9	3
	77.5	61.34	0.84	0.74	289	255	254	53	224	75	78	2.0	3
	80	63.18	0.84	0.74	289	255	254	53	224	75	78	2.0	3
12	82.5	65.06	0.83	0.74	289	260	254	53	225	76	78	2.0	3
	85	66.93	0.84	0.74	288	254	254	53	225	76	78	2.0	3
	87.5	68.82	0.83	0.74	288	260	254	54	225	76	79	2.0	3
	90	70.61											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"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.: 21936

Operator : RV

Field Data Sheet

Date: JUNE 28, 17	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 ft³	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	71.01	0.83	0.74	278	257	253	58	202	76	77	2.0	3
	2.5	73.36	0.81	0.73	288	261	253	54	222	76	77	2.0	3
	5 31	75.21	0.80	0.72	288	261	255	52	228	76	77	2.0	3
2	7.5 33.5	77.05	0.81	0.73	288	261	255	51	227	76	77	2.0	3
	10 36	78.89	0.79	0.72	288	255	255	52	226	76	77	2.0	3
	12.5	80.72	0.79	0.72	288	261	255	52	226	76	78	2.0	3
3	15	82.55	0.78	0.72	288	257	255	52	226	76	78	2.0	3
	17.5	84.39	0.79	0.72	288	259	254	52	224	76	78	2.0	3
	20	86.22	0.78	0.72	288	255	254	51	224	76	78	2.0	3
4	22.5	88.04	0.76	0.71	288	261	254	50	224	76	78	2.0	3
	25	89.87	0.74	0.70	288	255	254	50	224	76	79	~~2.0~~ 1.9	3
	27.5	91.70	0.76	0.71	288	258	254	50	224	76	79	1.9	3
5	30	93.52	0.73	0.69	288	260	254	50	225	76	79	1.8	3
	32.5	95.29	0.73	0.69	288	256	253	50	225	76	79	1.8	3
	35	97.06	0.73	0.69	289	257	254	50	228	76	79	1.8	3
6	37.5	98.84	0.73	0.63	289	257	256	50	228	76	79	1.8	3
	40	100.61	0.70	0.68	289	257	254	50	227	76	79	1.8	3
	42.5	102.40	0.68	0.67	289	255	254	50	228	77	80	1.7	3
7	45	104.14	0.68	0.68	288	254	255	50	228	77	80	1.7	3
	47.5	105.88	0.68	0.67	289	257	254	50	228	77	80	1.7	3
	50	107.63	0.70	0.68	289	258	254	50	228	77	80	1.7	3

Traverse: 1 FW		
Start Time: 12:26	Initial Leak Check: <.002 cfm@ 17 "Hg	
Finish Time: 13:56	Final Leak Check: <.002 cfm@ 15 "Hg	

Traverse:	
Start Time:	Initial Leak Check: cfm@ "Hg
Finish Time:	Final Leak Check: cfm@ "Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: June 25, 19	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 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
*	*	*	*		*			*		*	*	*	*
8	52.5	109.38	0.73	0.69	288	258	253	50	227	76	80	1.7	3
	55	111.18	0.73	0.69	289	260	254	50	228	77	80	1.7	3
	57.5	112.87	0.73	0.70	288	257	254	51	228	77	80	1.7	3
9	60	114.62	0.70	0.68	288	260	254	51	228	77	80	1.7	3
	62.5	116.37	0.71	0.69	288	257	254	51	228	77	80	1.7	3
	65	118.11	0.70	0.68	288	258	254	51	228	77	80	1.7	3
10	67.5	119.86	0.70	0.68	288	258	254	51	228	78	80	1.7	3
	70	121.61	0.69	0.68	287	258	254	51	228	78	80	1.7	3
	72.5	123.36	0.66	0.66	287	261	254	52	228	78	80	1.6	3
11	75	125.04	0.67	0.67	287	261	254	52	228	78	80	1.6	3
	77.5	126.73	0.67	0.67	286	254	254	52	227	78	80	1.6	3
	80	128.42	0.67	0.67	286	256	254	52	227	78	80	1.6	3
12	82.5	130.11	0.66	0.66	285	260	254	52	227	78	80	1.6	3
	85	131.79	0.68	0.67	284	256	254	52	227	78	80	1.6	3
	87.5	133.47	0.67	0.67	284	257	254	53	228	78	80	1.6	3
	90	135.26											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"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.: 21936

Operator : R

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	June 26, 2019
Test Location	APC Outlet No. 2
Operator	DP

Project No.:	21936	
Page	1 of 5	
Probe No.:		
Meter Box No.:	TEAM 3	
Impinger Box No.:	9	

Pitot Factor	0.851	
DGMCF	1.004	
Barometric Pressure	29.45	"Hg
Static Pressure	-7.9	"H2O
Nozzle Size	.2499	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

Particulate Gain

Filter	<0.1	mg
Probe	1.2	mg

Moisture Gain

CWTR	479.1	g
WCBDA	21.1	g

Combustion Gas Concentration

Oxygen	8.19	%
Carbon Dioxide	10.89	%
Carbon Monoxide	12.1	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP2 B09009
Trendicator	COE 20093
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2510
2	.2490
3	.2500
4	.2495
Average:	.2499

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 26/19	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 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	~~35.86~~ 36.24	0.65	0.65	280	251	251	72	73	71	72	1.6	3
	2.5	37.87	0.65	0.65	280	250	250	65	73	73	74	1.6	3
	5	39.50	0.65	0.65	280	250	250	64	73	73	73	1.7	3
2	7.5	41.13	0.65	0.65	280	250	250	63	~~[illegible]~~ 220	73	73	1.7	3
	10	42.79	0.63	0.64	280	250	251	60	226	73	74	1.6	3
	12.5	44.43	0.65	0.65	280	251	250	59	228	74	74	1.6	3
3	15	46.07	0.70	0.68	281	250	250	58	229	74	75	1.75	3
	17.5	47.75	0.67	0.67	281	250	251	58	229	74	75	1.8	3
	20	49.44	0.68	0.67	280	250	250	57	230	74	76	1.75	3
4	22.5	51.14	0.68	0.67	281	251	250	56	231	74	76	1.7	3
	25	52.82	0.67	0.67	280	251	251	56	232	74	77	1.75	3
	27.5	54.49	0.67	0.67	281	250	251	55	231	74	77	1.75	3
5	30	56.17	0.65	0.66	281	251	250	55	232	75	77	1.75	3
	32.5	57.84	0.67	0.67	282	251	251	55	233	75	77	1.7	3
	35	59.50	0.65	0.66	280	250	250	55	235	75	77	1.75	3
6	37.5	61.16	0.61	0.64	284	251	252	55	232	76	78	1.5	3
	40	62.76	0.62	0.64	281	250	250	55	232	76	78	1.6	3
	42.5	64.39	0.62	0.64	283	251	252	55	231	76	79	1.6	3
7	45	66.02	0.58	0.62	285	251	252	55	231	76	79	1.5	3
	47.5	67.59	0.58	0.62	284	250	252	55	231	76	79	1.5	3
	50	69.14	0.57	0.62	284	251	250	55	230	76	80	1.4	3

Traverse: 1				
Start Time: 8:30	Initial Leak Check: 0.01	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.: 21936

Operator : OP

Field Data Sheet

Date: June 26/19	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	
	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
*	*	*	*		*			*		*	*	*	*
8	52.5	70.67	0.65	0.66	286	258	252	55	230	77	80	1.7	3
	55	72.33	0.65	0.66	284	251	252	55	230	77	80	1.7	3
	57.5	73.99	0.67	0.67	283	250	251	55	230	77	80	1.7	3
9	60	75.66	0.73	0.73	285	252	252	55	230	77	80	1.9	3
	62.5	77.45	0.73	0.76	283	252	251	55	231	77	81	1.9	3
	65	79.24	0.73	0.70	284	251	251	55	231	78	81	1.9	3
10	67.5	81.03	0.79	0.73	284	252	250	55	231	78	81	1.95	3.5
	70	82.85	0.79	0.73	284	250	251	56	233	78	81	1.95	3.5
	72.5	84.65	0.78	0.72	285	251	252	56	233	78	81	2.0	4.0
11	75	86.47	0.81	0.74	285	252	250	56	231	79	81	2.1	4.0
	77.5	88.32	0.83	0.75	284	251	250	56	231	78	81	2.1	4.0
	80	90.19	0.84	0.75	285	251	250	56	230	78	81	2.2	4.0
12	82.5	92.08	0.84	0.75	285	256	252	57	231	79	81	2.2	4.0
	85	93.97	0.84	0.75	284	255	253	57	232	79	81	2.2	4.0
	87.5	95.87	0.84	0.75	284	255	252	58	232	79	81	2.2	4.0
	90	97.77											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 10:00	Final Leak Check: 0.008	cfm@ 17	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : DP

Field Data Sheet

Date: June 26/19	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 ft³ *	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	98.43	0.65	0.66	286	256	253	66	159	79	79	1.65	3.0
	2.5	100.1	0.62	0.65	280	251	253	61	97	79	79	1.6	3.0
	5	101.74	0.62	0.64	281	260	255	59	222	79	79	1.6	3
2	7.5	103.37	0.66	0.67	281	255	252	57	223	79	79	1.7	3
	10	105.64	0.65	0.66	281	255	252	57	223	79	79	1.7	3
	12.5	106.71	0.64	0.65	283	254	251	56	224	79	79	1.7	3
3	15	108.36	0.7	0.68	284	252	251	57	228	78	80	1.8	3.5
	17.5	110.07	0.71	0.69	283	254	252	57	229	78	80	1.8	3.5
	20	111.8	0.70	0.68	284	252	251	57	229	78	80	1.8	3.5
4	22.5	113.51	0.71	0.69	285	260	254	57	229	78	80	1.8	3.5
	25	115.23	0.74	0.70	284	255	252	56	229	79	81	1.9	3.5
	27.5	117.01	0.75	0.71	284	254	252	55	225	78	80	1.9	3.5
5	30	118.79	0.73	0.70	285	255	251	55	225	78	80	1.85	3.5
	32.5	120.58	0.71	0.71	284	250	254	55	224	78	81	1.8	3.5
	35	122.33	0.70	0.68	284	250	251	54	225	78	81	1.8	3.5
6	37.5	124.06	0.7	0.68	284	251	252	54	223	78	80	1.8	3.5
	40	125.79	0.66	0.66	285	254	251	54	224	78	80	1.7	3.5
	42.5	127.47	0.66	0.66	284	252	251	54	224	78	80	1.7	3.5
7	45	129.13	0.65	0.66	283	256	254	55	224	78	80	1.7	3.5
	47.5	130.79	0.65	0.66	284	253	253	55	223	78	80	1.7	3.5
	50	132.45	0.64	0.65	283	254	~~25~~ 251	55	222	78	80	1.6	3.5

Traverse: 2			
Start Time: 10:13	Initial Leak Check: 0.007	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.: 21936

Operator : DP

Field Data Sheet

Date: June 26, 2019	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 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
	*	*	*		*			*		*	*	*	*
8	52.5	134.1	0.65	0.66	287	255	253	55	223	78	80	1.6	3.5
	55	135.75	0.67	0.67	287	255	253	56	223	78	80	1.7	3.5
	57.5	137.43	0.67	0.67	285	256	254	57	221	78	80	1.7	3.5
9	60	139.11	0.76	0.71	284	251	253	58	221	79	80	1.85	4.0
	62.5	140.91	0.75	0.71	283	250	252	58	221	79	80	1.9	4.0
	65	142.72	0.74	0.70	286	252	253	59	221	79	80	1.85	4.0
10	67.5	144.5	0.80	0.73	287	255	254	60	222	79	80	2	4
	70	146.33	0.77	0.72	286	253	253	60	222	79	80	2	4
	72.5	148.15	0.77	0.72	284	251	252	59	223	79	80	1.9	4
11	75	149.95	.82	.74	287	254	253	59	222	79	80	2.0	4
	77.5	151.78	.82	.74	287	256	253	59	222	79	80	2.0	4
	80	153.62	0.81	0.74	286	254	252	59	223	79	80	2.1	4
12	82.5	155.46	0.83	0.74	285	253	251	59	223	79	80	2.1	4
	85	157.32	0.82	0.74	284	254	252	59	224	79	80	2.1	4
	87.5	159.17	0.78	0.72	283	255	254	60	223	79	80	2.0	4
	90	161.01											

Traverse: 2				Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg	Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 11:43	Final Leak Check: 0.007	cfm@ 17	"Hg	Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : DP

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date	June 26, 2019
Test Location	APC Outlet No. 2
Operator	DP

Project No.:	21936	
Page	1 of 5	
Probe No.:		
Meter Box No.:	TEAM 3	
Impinger Box No.:	7	

Pitot Factor	0.851	
DGMCF	1.004	
Barometric Pressure	29.46	"Hg
Static Pressure	-7.9	"H2O
Nozzle Size	.2499	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

Particulate Gain

Filter	0.5	mg
Probe	1.2	mg

Moisture Gain

CWTR	517.9	g
WCBDA	21.0	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	11.04	%
Carbon Monoxide	10.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP2 B09009
Trendicator	C06-20093
Control Box	C06 20093
Incline Manometer	C06 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements

1	.2510
2	.2490
3	.2500
4	.2495
Average:	.2499

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: June 26/19	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 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	61.74	0.67	0.67	280	251	248	72	75	75	75	1.7	3.0
	2.5	63.41	0.68	0.67	280	250	250	67	190	75	75	1.7	3.0
	5	65.09	0.67	0.67	280	250	251	67	197	75	75	1.8	3.0
2	7.5	66.79	0.67	0.67	281	252	252	66	210	75	76	1.7	3.0
	10	68.47	0.65	0.66	281	252	256	66	215	76	76	1.6	3.0
	12.5	70.13	0.69	0.68	280	252	250	65	218	76	77	1.7	3.0
3	15	71.81	0.66	0.66	280	253	251	65	221	76	77	1.7	3.0
	17.5	73.48	0.65	0.66	280	251	252	64	221	76	77	1.6	3.0
	20	75.13	0.64	0.65	284	252	251	64	223	77	78	1.6	3.0
4	22.5	76.79	0.67	0.67	283	251	250	63	225	77	79	1.7	3.0
	25	78.45	0.68	0.67	282	254	252	62	224	77	79	1.8	3.0
	27.5	80.13	0.66	0.66	284	251	250	61	229	77	79	1.7	3.0
5	30	81.81	0.67	0.67	285	251	254	60	228	77	79	1.7	3.0
	32.5	83.5	0.68	0.67	284	252	250	59	229	77	79	1.7	3.0
	35	85.18	0.69	0.68	283	251	250	59	230	78	80	1.8	3.0
6	37.5	86.89	0.69	0.68	284	252	251	59	232	78	80	1.8	3.0
	40	88.60	0.71	0.69	284	252	250	59	232	78	80	1.8	3.0
	42.5	90.33	0.69	0.68	283	254	252	58	233	78	81	1.8	3.0
7	45	92.04	0.66	0.66	287	258	254	58	233	78	81	1.7	3.0
	47.5	93.74	0.66	0.66	285	257	255	58	233	78	81	1.7	3.0
	50	95.42	0.69	0.68	284	254	254	59	233	79	81	1.7	3.0

Traverse: 1				
Start Time: 12:59	Initial Leak Check:	0.007 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.: 21936

Operator : DP

Field Data Sheet

Date: June 26/19	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 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
	*	*	*		*			*		*	*	*	*
8	52.5	97.12	0.74	0.76	288	259	254	59	233	79	81	1.9	3.5
	55	98.9	0.75	0.71	289	258	254	59	233	79	81	1.9	3.5
	57.5	100.69	0.75	0.71	288	260	254	59	233	79	81	1.9	3.5
9	60	102.48	0.77	0.72	289	255	254	59	232	79	82	1.95	3.5
	62.5	104.29	0.78	0.72	285	254	251	59	232	79	82	1.95	3.5
	65	106.16	0.75	0.71	284	256	253	60	232	79	82	1.95	3.5
10	67.5	107.88	0.80	0.73	283	255	252	59	233	79	82	2.1	3.5
	70	109.73	0.82	0.74	284	255	255	58	234	79	82	2.1	3.5
	72.5	111.61	0.81	0.74	283	255	256	58	233	79	82	2.1	3.5
11	75	113.44	0.85	0.76	286	255	253	58	232	80	83	2.2	3.5
	77.5	115.34	0.80	0.73	284	253	252	58	231	80	83	2.0	3.5
	80	117.19	0.77	0.72	285	254	254	58	233	80	83	1.95	3.5
12	82.5	119.02	0.76	0.72	284	252	253	58	234	80	83	1.9	3.5
	85	120.83	0.76	0.72	284	250	252	58	235	80	83	1.9	3.5
	87.5	122.62	0.75	0.71	284	251	253	58	234	80	83	1.9	3.5
	90	124.42											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 14:29	Final Leak Check: 0.004	cfm@ 17	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : DP

Field Data Sheet

Date: June 26/19	Plant: Covanta DYEC	Test No.: 3	Particulate/Metals	Page 4 of 5
	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	125.15	0.79	0.73	280	260	254	~~[illegible]~~ 55	144	81	81	2.0	3.5
	2.5	127.01	0.78	0.73	280	259	255	53	229	81	82	2.0	3.5
	5	128.84	0.80	0.74	280	256	254	52	234	81	82	2.1	3.5
2	7.5	130.70	0.78	0.73	281	254	255	51	234	81	82	2.0	3.5
	10	132.54	0.78	0.73	281	253	252	51	236	81	82	2.0	3.5
	12.5	134.37	0.81	0.74	282	255	254	52	236	81	83	2.0	3.5
3	15	136.23	0.79	0.73	281	260	253	52	236	81	83	2.1	3.5
	17.5	138.07	0.79	0.73	280	255	252	52	236	81	83	2.1	3.5
	20	139.92	0.77	0.72	281	254	253	52	237	81	83	2.0	3.5
4	22.5	141.76	0.74	0.71	280	255	253	52	236	81	83	1.9	3.5
	25	143.55	0.74	0.71	280	255	254	52	235	81	83	1.9	3.5
	27.5	145.34	0.75	0.71	282	254	260	52	236	81	83	1.9	3.5
5	30	147.11	0.68	0.68	284	255	254	52	236	81	83	1.8	3.5
	32.5	148.84	0.68	0.68	282	253	256	52	235	81	83	1.8	3.5
	35	150.56	0.68	0.68	281	254	255	52	236	81	83	1.8	3.5
6	37.5	~~152.5~~ 152.27	0.60	0.64	284	259	253	53	236	81	83	1.5	3.5
	40	153.87	0.60	0.64	285	258	253	53	235	81	83	1.5	3.5
	42.5	155.47	0.61	0.64	285	254	254	53	235	81	83	1.6	3.5
7	45	157.07	0.65	0.66	285	258	253	53	235	81	83	1.7	3.5
	47.5	158.72	0.65	0.66	285	254	252	53	235	81	84	1.7	3.5
	50	160.39	0.65	0.66	284	254	253	53	~~235~~ 235	81	84	1.7	3.5

Traverse: 2				
Start Time: 14:38	Initial Leak Check: 0.004	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.: 21936

Operator : DP

Field Data Sheet

Date: June 26/19 | Plant: Covanta DYEC | Plant Location: Courtice, Ontario | Test No.: 3 Particulate/Metals | 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
*	*	*	*		*			*		*	*	*	*
8	52.5	162.05	0.67	0.67	285	259	252	54	235	81	83	1.7	3.5
	55	163.74	0.66	0.67	286	257	252	54	236	81	84	1.7	3.5
	57.5	165.41	0.66	0.67	285	255	254	54	236	81	84	1.7	3.5
9	60	167.10	0.65	0.67	280	258	252	55	235	82	84	1.7	3.5
	62.5	168.78	0.67	0.67	281	256	255	55	235	82	84	1.75	3.5
	65	170.48	0.67	0.67	285	257	252	56	235	82	84	1.75	3.5
10	67.5	172.17	0.65	0.66	284	257	254	56	235	82	84	1.70	3.5
	70	173.85	0.67	0.67	283	255	253	56	235	82	84	1.70	3.5
	72.5	175.55	0.66	0.67	281	250	252	57	235	82	84	1.70	3.5
11	75	177.26	0.55	0.62	282	251	253	57	233	81	84	1.5	3.5
	77.5	178.84	0.55	0.61	281	250	254	57	234	81	84	1.4	3.5
	80	180.39	0.56	0.62	282	251	252	57	235	81	84	1.4	3.5
12	82.5	181.95	0.56	0.62	280	256	252	60	233	82	84	1.4	3.5
	85	183.49	0.58	0.63	279	255	252	58	233	82	84	1.5	3.5
	87.5	185.06	0.58	0.63	281	254	251	57	234	82	84	1.5	3.5
	90	186.64											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 16:08	Final Leak Check: 0.004	cfm@ 17	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21936

Operator : OP

APPENDIX 5

Particle Size Distribution Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: 1	Particle Size	
Test Date	JUNE 26 2019	
Test Location	APC Outlet No. 1	
Operator		

Project No.:	21936	
Page	1 of 2	
Probe No.:	4	
Meter Box No.:	T1	
Impinger Box No.:		

Pitot Factor	0.846	
DGMCF	1.001	
Barometric Pressure	29.45	"Hg
Static Pressure	-8.0	"H2O
Nozzle Size	.176	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	172.7	g
WCBDA	11.7	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	11.04	%
Carbon Monoxide	15.4	ppm

Measuring Device	MII Numbers
Probe / Pitot	A10/25
Trendicator	COE20094
Control Box	COE20094
Incline Manometer	COE20094
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	BO3906

Reading Interval	Dwelll	
Number of Ports	2	
Number of Points/Port	12	

Nozzle Measurements

1 ____________

2 ____________

3 ____________

4 ____________

Average:

Probe Liner Glass / Metal /Teflon / Other AFA

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: Jun 26/19	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 ft³ *	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	19.59	.77	.35	285	258	248	68	~~72~~ 86	75	73	.38	3
2	9.6	22.94	.80	↓	284	258	248	68	70	78	75	.38	3
3	19.6	26.51	.77		284	258	246	68	65	79	74	.38	3
4	29.8	30.06	.68		284	258	246	65	60	82	78	.38	3
5	39.6	33.50	.60		286	256	247	65	62	82	78	.38	3
6	48.8	36.80	.57		284	256	248	64	62	83	79	.38	3
	57.4	39.80											
1	0	39.80	.81		284	258	247	70	63	81	79	.38	3
2	10.5	43.44	.79		285	257	248	65	63	80	79	.38	3
3	21.4	47.30	.68		285	257	248	60	63	80	78	.38	3
4	32.6	51.19	.73		287	258	249	59	63	80	79	.38	3
5	43.2	54.93	.61		290	258	251	60	63	80	79	.38	3
6	~~52.6~~ 53.3	56.60	.61		287	258	249	59	60	80	78	.38	3
	62.6	61.89											

Traverse: 1	
Start Time: 856	Initial Leak Check: c.005 cfm@ 16 "Hg
Finish Time: 953	

Traverse: 2
Start Time: 957
Finish Time: ~~959~~ 1059

1	2
.67	.80
.73	.87
.75	.90
.70	.93
.62	.73
.53	.64

Project No.: 21936
Operator : D-DU

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	2 Particle Size
Test Date	June 26, 2019
Test Location	APC Outlet No. 1
Operator	DL

Project No.:	21936	
Page	1 of 2	
Probe No.:		
Meter Box No.:		
Impinger Box No.:		

Pitot Factor	.848	
DGMCF	1.001	
Barometric Pressure	29.45	"Hg
Static Pressure	-8.0	"H2O
Nozzle Size	0.1776	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	Dwelll
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	173.8	g
WCBDA	11.1	g

Combustion Gas Concentration

Oxygen	8.34	%
Carbon Dioxide	10.86	%
Carbon Monoxide	9.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	366
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	UW171
Barometer	Env. Can
Calipers	

Nozzle Measurements

1 ______
2 ______
3 ______
4 ______
Average:

Probe Liner Glass / Metal /Teflon / Other PPA

Nozzle Glass / Metal / Other

Union None / Metal / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: Jun 26/19	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 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	62.5	.78	.35	288	262	254	64	69	76	76	.38	3
2	10.9	66.25	.74		288	260	246	56	62	76	75	.38	3
3	21.4	69.86	.76		289	259	247	56	61	77	76	.38	3
4	31.3	73.30	.74		289	259	248	56	62	77	76	.38	3
5	41.6	76.89	.67		290	258	249	56	61	79	77	.38	3
6	50.9	80.17	.61		290	259	249	56	60	80	77	.38	3
	60.3	83.0											
1	0	83.0	.82		290	259	249	57	61	80	77	.38	3
2	10.7	86.50	.81		289	259	249	57	60	80	78	.38	3
3	20.9	90.18	.75		289	256	250	64	64	80	79	.38	3
4	31.4	93.83	.64		289	256	249	67	65	80	79	.38	3
5	41.3	97.31	.54		286	256	249	67	65	81	78	.38	3
6	50.6	100.56	.55		285	257	249	67	66	82	79	.38	3
	59.7	103.73											

Traverse:	2
Start Time:	1243
Finish Time:	1343

Initial Leak Check: 0.005 cfm@ 16 "Hg

Traverse:	1
Start Time:	1347
Finish Time:	1447

Project No.: 21936

Operator :

Rev: April 28, 2005

ORTECH Environmental

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	JUNE 26 2019
Test Location	APC Outlet No. 1
Operator	DW

Project No.:	21936	
Page	1 of 2	
Probe No.:	4	
Meter Box No.:	7/1	
Impinger Box No.:	5	

Measuring Device	MII Numbers
Probe / Pitot	386
Trendicator	
Control Box	7837
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	Env. Can
Calipers	

Pitot Factor	0.848	
DGMCF	1.001	
Barometric Pressure	29.48	"Hg
Static Pressure	-8.6	"H2O
Nozzle Size	.1776	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	173.0	g
WCBDA	9.7	g

Combustion Gas Concentration

Oxygen	8.31	%
Carbon Dioxide	10.82	%
Carbon Monoxide	9.6	ppm

Reading Interval	Dwelll
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:

Rev. November 27, 2014

Field Data Sheet

Date: Jun 26/11	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 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	5.20	.77	.35	287	259	250	66	66	79	78	0.38	3.5
2	10.6	9.00	.75		287	257	250	59	76	78	78	0.38	3.5
3	20.9	12.61	.71		288	259	251	57	70	78	78	0.38	3.5
4	31.3	16.26	.64		287	259	251	57	70	81	79	0.38	3.5
5	41.6	19.80	.61		287	259	251	58	67	80	80	0.38	3.5
6	51.4	23.20	.57		286	260	250	58	67	82	81	0.38	3.5
	60.8	26.57									2		
1	0	26.57	.72		286	259	250	61	68	83	81	0.38	3.5
2	10.8	30.38	.71		286	258	251	57	67	84	81	0.38	3.5
3	21.6	34.12	.68		286	259	250	58	66	84	82	0.38	3.5
4	32.0	37.75	.64		285	258	250	57	66	84	82	0.38	3.5
5	41.6	41.10	.54		285	259	251	60	65	86	84	0.38	3.5
6	50.4	44.17	.52		285	259	250	60	61	87	84	0.38	3.5
	57.2	47.21											

Traverse:	2		
Start Time:	1627	Initial Leak Check:	< .006 cfm@ 19 "Hg
Finish Time:	1729		

Traverse:	1
Start Time:	1751
Finish Time:	1930

1615

Project No.: 21936
Operator: [signature]

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particle Size
Test Date	June 25, 2019
Test Location	APC Outlet No. 2
Operator	DL

Project No.:	21936
Page	1 of 2
Probe No.:	4
Meter Box No.:	T2
Impinger Box No.:	13

Pitot Factor	0.848	
DGMCF	0.990	
Barometric Pressure	29.25	"Hg
Static Pressure	-7.8	"H2O
Nozzle Size	0.1776	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Reading Interval	Dwelll
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	142.9	g
WCBDA	15.4	g

Combustion Gas Concentration

Oxygen	8.40	%
Carbon Dioxide	10.60	%
Carbon Monoxide	15.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	PH10/2.5
Trendicator	CDE 20092
Control Box	CDE 20092
Incline Manometer	CDE 20092
Comb.Gas.Analyzer	
Micromanometer	—
Barometer	Env. Can
Calipers	B03306

Nozzle Measurements

1	.1775
2	.1775
3	.1775
4	.1780
Average:	.1776

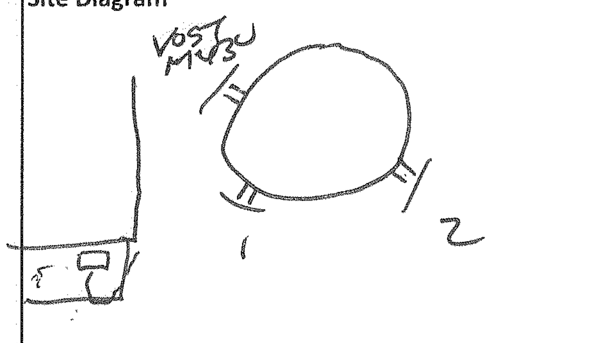
Probe Liner Glass / Metal / Teflon / Other PFA

Nozzle Glass / Metal / Other

Union None / Metal / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram



Notes:

Field Data Sheet

Date: June 25/19	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 ft³ *	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	59.60	.72	.35	280	273	256	71	50	72	73	0.38	3
2	10.6	63.30	.68		281	260	253	61	51	72	71	0.38	3
3	21.3	66.92	.67		281	270	253	60	54	72	72	0.38	3
4	31.8	70.28	.63		282	270	255	62	52	73	74	0.38	3
5	6 41.8	73.42	.58		282	270	267	61	49	72	73	0.38	3
6 6"	~~51.8~~	76.92	.55		283	270	257	61	52	73	74	0.38	3
	60.5	79.97	~~7~~										
1	0	79.97	.75		282	267	254	65	56	73	73	0.38	3
2	10.4	83.64	.74		286	266	256	64	60	73	73	0.38	3
3	20.8	87.32	.72		286	267	257	65	62	73	74	0.38	3
4	31.1	90.93	.67		286	267	257	66	65	73	73	0.38	3
5	41.1	94.50	.62		286	265	257	66	67	73	74	0.38	3
6	50.5	97.82	.57		286	268	257	66	67	73	74	0.38	3
	59.5	100.09											

Traverse:	2
Start Time:	910
Finish Time:	1011

Initial Leak Check: .005 cfm@ 15 "Hg

Traverse:	1
Start Time:	1014
Finish Time:	1114

PRELIM

1	2
.81	.78
.82	.77
.76	.76
.72	.64
.67	.58
.20	

Project No.: 21936

Operator: D. Olls

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.:	2 Particle Size	
Test Date	Jun 25 2019	
Test Location	APC Outlet No. 2	
Operator	RL	

Project No.:	21936	
Page	1 of 2	
Probe No.:		
Meter Box No.:		
Impinger Box No.:		

Pitot Factor	0.8448	
DGMCF	0.990	
Barometric Pressure	29.31	"Hg
Static Pressure	-7.8	"H2O
Nozzle Size	0.1776	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Reading Interval	Dwelll
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	148.7	g
WCBDA	7.5	g

Combustion Gas Concentration

Oxygen	8.22	%
Carbon Dioxide	10.71	%
Carbon Monoxide	19.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	T1
Control Box	U2
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

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:

~~Rev. November 27, 2014~~

Field Data Sheet

Date: Jun 25/18	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 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	1.17	.73	.35	285	266	266	67	67	73	72	.38	3
2	10.5	4.980	.70		285	265	266	61	61	72	73	.38	3
3	20.6	8.35	.67		284	260	261	61	61	72	73	.38	3
4	30.7	12.11	.59		283	268	267	59	61	73	74	.38	3
5	40.5	15.61	.54		283	266	267	56	61	73	74	.38	3
6	49.9	18.98	.53		283	267	267	57	61	73	74	.38	3
	59.1	22.30											
1	0	22.30	.70		282	270	257	62	73	73	74	.38	3
2	10.7	26.37	.70		283	265	267	60	72	73	74	.38	3
3	21.3	30.09	.67		284	266	266	61	59	73	74	.38	3
4	31.8	33.90	.65		284	267	268	59	61	73	74	.38	3
5	41.9	37.33	.63		285	265	265	60	61	74	76	.38	3
6	51.6	40.73	.55		285	268	269	60	61	74	76	.38	3
	60.9												

Traverse:	1
Start Time:	1317
Finish Time:	1416

Initial Leak Check: 0.005 cfm@ 15 "Hg

Traverse:	2
Start Time:	1421
Finish Time:	1522

Project No.: 21936

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	June 25 2019
Test Location	APC Outlet No. 2
Operator	Rw

Project No.:	21936
Page	1 of 2
Probe No.:	4
Meter Box No.:	T2
Impinger Box No.:	13

Measuring Device	MII Numbers
Probe / Pitot	566
Trendicator	
Control Box	T057
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	Env. Can
Calipers	

Pitot Factor	0.8448	
DGMCF	0.990	
Barometric Pressure	29.34	"Hg
Static Pressure	-7.8	"H2O
Nozzle Size	.1776	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	163.6	g
WCBDA	11.5	g

Combustion Gas Concentration

Oxygen	8.31	%
Carbon Dioxide	10.69	%
Carbon Monoxide	12.6	ppm

Reading Interval	Dwelll
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner Glass / Metal /Teflon / Other PFP

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: Jun 25/19	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 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	45.73	.78	.35	286	267	255	73	63	75	75	.38	5
2	10.7	49.55	.74		287	260	260	65	59	75	77	.38	5
3	21.1	53.23	.72		288	269	255	62	56	76	78	.38	5
4	31.4	56.86	.66		288	269	255	62	56	77	79	.38	5
5	41.0	60.24	.57		287	267	255	61	56	77	79	.38	5
6	50.2	63.58	.54		287	267	256	61	57	77	78	.38	5
	59.3	66.84											
1	0	66.84	.72		287	265	257	66	53	78	79	.38	5
2	10.5	70.42	.73		288	268	255	61	55	78	79	.38	5
3	20.9	73.98	.72		287	267	255	60	55	78	79	.38	5
4	31.1	77.50	.67		287	267	255	60	55	78	79	.38	5
5	41.2	81.02	.62		287	269	255	60	56	78	79	.38	5
6	51.1	84.49	.56		286	269	255	60	58	78	79	.38	5
	60.7	87.88											

Traverse: 2		Traverse: 1
Start Time: 1620	Initial Leak Check: <.005 cfm@ 26 "Hg	Start Time: 1723
Finish Time: 1719		Finish Time: 1829

Project No.: 21936
Operator :

Rev: April 28, 2005

ORTECH Environmental

APPENDIX 6

SVOC Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds #1
Test Date	June 27/19
Test Location	APC Outlet No. 1
Operator	RV

Project No.:	21936
Page	1 of 5
Probe No.:	6D
Meter Box No.:	~~Team~~ Team 1
Impinger Box No.:	HH Trap 1

Pitot Factor	0.845	
DGMCF	1.001	
Barometric Pressure	29.67	"Hg
Static Pressure	-8.0	"H2O
Nozzle Size	.2500	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	704.0	g
WCBDA	24.9	g

Combustion Gas Concentration

Oxygen	8.41	%
Carbon Dioxide	10.87	%
Carbon Monoxide	12.1	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	SP5
Trendicator	
Control Box	COG 20094
Incline Manometer	"
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2515
2	.2495
3	.2500
4	.2490
Average:	.2500

Notes:

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: SVOC #1	
	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	47.57	0.86	0.75	284	255	251	76	49	77	76	2	5
	5	51.29	0.90	0.77	286	254	251	64	46	77	77	2	5
2	10	55.07	0.88	0.76	286	253	250	57	46	78	76	2	5
	15	58.86	0.88	0.76	287	254	250	54	48	79	77	2	5
3	20	62.64	0.83	0.74	288	255	250	52	48	81	77	2	5
	25	66.40	0.83	0.74	287	255	250	50	48	83	77	2	5
4	30	70.15	0.75	0.71	287	255	250	50	50	83	77	1.8	5
	35	73.84	0.75	0.71	287	256	250	50	53	85	78	1.8	5
5	40	77.48	0.70	0.68	287	256	250	50	56	85	78	1.7	5
	45	81.03	0.72	0.70	287	256	250	51	56	86	79	1.7	5
6	50	84.57	0.65	0.66	287	255	250	51	47	86	79	1.6	5
	55	87.98	0.66	0.67	287	256	250	51	45	86	80	1.6	5
7	60	91.39	0.70	0.69	287	256	250	52	45	86	79	1.6	5
	65	94.79	0.80	0.69	288	256	250	53	46	87	80	1.6	5
8	70	98.19	0.72	0.70	287	256	250	53	47	87	80	1.6	5
	75	101.66	0.72	0.70	287	256	250	54	48	88	81	1.6	5
9	80	105.16	0.72	0.70	287	256	250	55	49	87	80	1.6	5
	85	108.66	0.72	0.70	287	256	250	56	51	88	81	1.6	5
10	90	112.15	0.75	0.71	287	255	250	55	53	88	81	1.8	5
	95	115.80	0.76	0.72	287	256	250	56	51	88	81	1.8	5
11	100	119.46	0.60	0.64	286	256	250	56	47	88	81	1.5	5

Traverse: #2	FW		
Start Time: 9:53	Initial Leak Check: .005	cfm@ 18	"Hg
Finish Time: 11:53	Final Leak Check: .004	cfm@ 15	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : R

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: SVOC #1	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft³	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	122.89	0.6	0.64	286	255	250	58	45	88	81	1.5	5
12	110	126.25	0.6	0.64	286	255	250	58	42	88	82	1.5	5
	115	129.62	0.6	0.64	286	255	250	59	45	88	82	1.5	5
	120	132.95											

Traverse:		
Start Time:	Initial Leak Check:	cfm@ "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.: 21936

Operator : Rw

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: SVOC #1	Page 4 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	133.30	0.89	0.78	286	251	250	66	45	84	82	2.1	6
	5	137.07	0.90	0.78	287	253	251	66	50	84	82	2.1	6
2	10	140.98	0.88	0.77	287	254	251	63	50	85	82	2.1	6
	15	144.90	0.90	0.78	287	254	250	60	49	86	82	2.1	6
3	20	148.78	0.88	0.77	287	255	251	61	50	87	82	2.1	6
	25	152.68	0.88	0.77	287	254	251	61	49	87	82	2.1	6
4	30	156.57	0.80	0.74	287	255	251	63	48	88	82	2	6
	35	160.42	0.80	0.74	288	255	250	62	47	89	82	2	6
5	40	164.24	0.72	0.70	289	254	250	66	48	88	82	1.7	5.5
	45	167.82	0.70	0.69	289	255	251	65	47	89	82	1.7	5.5
6	50	171.40	0.64	0.66	288	255	250	65	47	89	82	1.5	5
	55	174.75	0.65	0.66	288	255	250	63	47	89	83	1.5	5
7	60	178.07	0.67	0.67	288	254	250	62	47	89	83	1.5	5
	65	181.42	0.70	0.69	288	255	250	61	47	90	83	1.5	5
8	70	184.75	0.70	0.69	287	255	250	61	49	90	83	1.6	5
	75	188.15	0.70	0.69	287	256	251	60	52	90	83	1.6	5
9	80	191.59	0.70	0.69	288	255	250	60	55	91	83	1.6	5
	85	195.06	0.70	0.69	286	255	250	60	47	91	84	1.6	5
10	90	198.56	0.70	0.70	286	255	250	60	47	91	84	1.6	5
	95	201.99	0.71	0.70	287	256	249	56	44	91	84	1.6	5
11	100	205.45	0.68	0.68	287	256	250	55	44	91	84	1.6	5.5

Traverse: #1 FW		Traverse:	
Start Time: 12:02	Initial Leak Check: .004 cfm@ 15 "Hg	Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time: 14:02	Final Leak Check: .004 cfm@ 17 "Hg	Finish Time:	Final Leak Check: cfm @ "Hg

Static — 8.0

Project No.: 21936

Operator : PW

FW

SP2 .2510

-2490
.2500

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: SVOC #1	Page 5 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
	*	*	*		*			*		*	*	*	*
	105	208.93	0.68	0.68	286	255	250	55	44	91	84	~~8~~1.6	5.5
12	110	212.39	0.68	0.68	286	255	250	56	46	91	85	1.6	5.5
	115	215.83	0.66	0.67	286	255	250	55	44	91	85	1.6	5.5
	120	219.24											

Traverse:		
Start Time:	Initial Leak Check: cfm@	"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.: 21936

Operator : N

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds #2
Test Date	June 27/19
Test Location	APC Outlet No. 1
Operator	R

Project No.:	21936
Page	1 of 5
Probe No.:	6B
Meter Box No.:	Team 4
Impinger Box No.:	DD Trap 4

Pitot Factor	0.851	
DGMCF	0.999	
Barometric Pressure	29.64	"Hg
Static Pressure	-8.0	"H2O
Nozzle Size	0.2499	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	~~704.0~~ 735.7	g
WCBDA	~~24.9~~ 15.8	g

Combustion Gas Concentration

Oxygen	8.15	%
Carbon Dioxide	11.01	%
Carbon Monoxide	16.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP2
Trendicator	
Control Box	COE 20090
Incline Manometer	〃
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	0.2510
2	0.2490
3	0.2500
4	0.2495
Average:	0.2499

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

Site Diagram

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: SVOC #2	
	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	969.23	0.87	0.77	287	263	255	68	49	79	79	2.00	9.0
	5	972.99	0.87	0.77	287	262	254	57	50	79	79	2.00	9.0
2	10	976.87	0.89	0.78	288	264	255	53	52	82	79	2.05	9.0
	15	980.82	0.89	0.78	288	260	255	50	55	84	80	2.05	9.0
3	20	984.75	0.86	0.77	289	258	256	48	55	85	80	2.00	9.0
	25	988.65	0.87	0.77	289	256	255	47	55	86	80	2.00	9.0
4	30	992.56	0.86	0.77	290	260	254	47	53	87	81	2.00	9.0
	35	996.49	0.84	0.76	290	261	254	47	46	87	81	1.95	9.0
5	40	1000.35	0.79	0.74	290	260	255	47	45	88	81	1.85	9.0
	45	1004.11	0.80	0.74	290	261	255	48	44	88	82	1.85	9.0
6	50	1007.86	0.74	0.71	290	266	258	48	45	89	82	1.70	9.0
	55	1011.48	0.74	0.71	290	262	256	48	45	88	82	1.70	9.0
7	60	1015.09	0.78	0.73	290	260	255	49	46	88	82	1.80	9.0
	65	1018.80	0.78	0.73	290	261	255	49	46	88	82	1.80	9.0
8	70	1022.52	0.79	0.74	289	260	254	48	44	89	83	1.80	9.0
	75	1026.24	0.78	0.73	289	260	255	48	44	89	83	1.80	9.0
9	80	1029.97	0.77	0.73	289	261	255	49	44	89	83	1.75	9.0
	85	1033.63	0.76	0.73	288	264	254	49	44	89	84	1.75	9.0
10	90	1037.29	0.75	0.72	287	261	256	49	44	89	84	1.75	9.0
	95	1040.93	0.74	0.72	287	263	257	50	44	90	84	1.75	9.0
11	100	1044.60	0.69	0.69	286	264	256	49	42	90	84	1.60	8.5

Traverse: 2 (for wall)				
14:40 Start Time: ~~11:58~~	Initial Leak Check: .001	cfm@ 16	"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.: 21936

Operator : RV / JB

Field Data Sheet

Date: June 22/19	Plant: Covanta DYEC	Test No.: SVOC 2	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

*	*	*	*		*			*		*	*	*	*
Point	Clock Time	Dry Gas Meter ft³	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	1048.10	0.69	0.69	285	263	256	50	42	89	84	1.60	8.5
12	110	1051.57	0.69	0.69	285	263	256	50	42	90	84	1.60	8.5
	115	1055.05	0.68	0.69	285	263	257	50	43	90	86	1.60	8.5
	120	1058.53											

Traverse: 2 (far wall)			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 16:40	Final Leak Check: .002	cfm@ 15	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : SB

Field Data Sheet

Date: June 27/19	Plant:	Covanta DYEC	Test No.:	SVOC 2	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	1058.90	0.84	0.76	285	264	257	54	47	85	84	1.90	8.5
	5	1062.73	0.84	0.76	285	263	256	53	51	86	84	1.90	8.5
2	10	1066.54	0.84	0.76	285	263	257	53	50	87	84	1.90	8.5
	15	1070.36	0.85	0.77	285	264	258	53	50	88	84	1.95	8.5
3	20	1074.22	0.83	0.76	285	264	257	55	51	89	84	1.95	8.5
	25	1078.06	0.83	0.76	286	267	254	57	53	90	84	1.95	8.5
4	30	1081.91	0.79	0.74	286	264	256	55	57	89	84	1.80	8.5
	35	1085.62	0.79	0.74	287	263	254	56	48	90	84	1.80	8.5
5	40	1089.34	0.70	0.70	286	264	258	55	47	90	85	1.60	8.5
	45	1092.90	0.69	0.69	286	264	255	56	47	90	85	1.50	8.5
6	50	1096.36	0.61	0.65	286	265	258	54	48	91	85	1.40	8.3
	55	1099.68	0.62	0.66	286	262	256	54	48	91	85	1.40	8.3
7	60	1102.99	0.67	0.68	287	264	258	52	46	91	85	1.50	8.3
	65	1106.38	0.67	0.68	286	262	256	52	46	91	85	1.50	8.3
8	70	1109.80	0.69	0.70	286	264	254	51	43	91	86	1.60	8.3
	75	1113.28	0.68	0.69	286	266	254	50	44	92	86	1.60	8.3
9	80	1116.75	0.68	0.69	286	260	256	50	44	92	86	1.60	8.3
	85	1120.22	0.70	0.70	287	264	256	51	44	92	86	1.60	8.3
10	90	1123.72	0.69	0.70	287	261	258	51	45	92	86	1.60	8.3
	95	1127.21	0.69	0.70	286	262	265	51	45	94	87	1.60	8.3
11	100	1130.71	0.62	0.66	286	266	255	51	45	95	87	1.40	8.3

Traverse: 1 (far wall)			
Start Time: 16:49	Initial Leak Check: .002	cfm@ 15	"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.: 21936

Operator : JB

Field Data Sheet

Date: June 27/19	Plant:	Covanta DYEC	Test No.:	SVOC 2	Page 5 of 5
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft³ *	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	1134.08	0.63	0.67	285	263	259	51	46	95	87	1.40	8.3
12	110	1137.44	0.63	0.67	285	261	259	51	46	97	87	1.40	8.3
	115	1140.79	0.62	0.67	279	264	257	51	47	97	88	1.40	8.3
	120	1144.12											

Traverse: 1 (far wall)		
Start Time:	Initial Leak Check:	cfm@ ~~17.5~~ "Hg
Finish Time: 18:49	Final Leak Check: .004	cfm@ 17.5 "Hg

Traverse:		
Start Time:	Initial Leak Check:	cfm @ "Hg
Finish Time:	Final Leak Check:	cfm @ "Hg

Project No.: 21936
Operator : JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date June 28/19	
Test Location	APC Outlet No. 1
Operator JB	

Project No.:	21936
Page	1 of 5
Probe No.:	6D
Meter Box No.:	Team 1
Impinger Box No.:	4

Pitot Factor	.845	
DGMCF	1.001	
Barometric Pressure	29.66	"Hg
Static Pressure	-8.3	"H2O
Nozzle Size	0.2500	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	711.8	g
WCBDA	19.2	g

Combustion Gas Concentration

Oxygen	8.18	%
Carbon Dioxide	11.05	%
Carbon Monoxide	11.4 ~~11.5~~	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP5
Trendicator	
Control Box	COE 20894
Incline Manometer	"
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2575
2	.2495
3	.2500
4	.2490
Average:	.2500

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: Jun 29/19	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	20.23	.96	.79	286	253	255	67	68	76	75	2.3	5.5
	5	24.17	.93	.79	289	253	255	66	47	76	75	2.2	5.5
2	10	28.11	.94	.78	289	252	255	58	45	77	75	2.2	5.5
	15	32.06	.91	.77	290	253	255	55	45	78	76	2.2	5.5
3	20	36.00	.84	.74	289	253	255	53	45	81	76	2.0	5.5
	25	39.78	.86	.75	290	254	255	54	46	81	76	2.0	5.5
4	30	43.57	.77	.71	289	254	252	52	46	82	76	1.8	5
	35	47.17	.78	.72	289	254	255	52	46	83	77	1.8	5
5	40	50.76	~~.76~~ .73	.69	290	255	256	53	48	83	78	1.7	5
	45	54.27	.74	.70	288	254	254	53	47	84	78	1.7	5
6	50	57.78	.65	.66	288	254	254	53	50	85	78	1.5	4.5
	55	61.17	.63	.65	287	254	254	52	45	85	78	1.5	4.5
7	60	64.49	.68	.67	289	256	255	53	42	85	78	1.6	4.5
	65	67.91	.68	.67	287	255	255	53	43	86	79	1.6	4.5
8	70	71.31	.70	.68	287	255	255	54	44	86	79	1.7	4.5
	75	74.76	.72	.69	286	255	254	54	45	86	79	1.7	5
9	80	78.23	.71	.69	287	256	255	55	46	86	80	1.7	5
	85	81.73	.71	.69	286	254	254	55	48	87	80	1.7	5
10	90	85.22	.70	.69	286	255	255	55	50	87	81	1.7	5
	95	88.72	.69	.69	285	255	255	56	46	87	81	1.7	5
11	100	92.20	.61	.64	285	255	255	57	45	87	81	1.5	4.5

Traverse: 2			
Start Time: 10:50	Initial Leak Check: .003	cfm@ 15	"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.: 21936

Operator : AS

Field Data Sheet

Date: Jun 28/19	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 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
	*	*	*		*			*		*	*	*	*
	105	95.45	.63	.65	278	254	255	56	44	87	81	1.5	4.5
12	110	98.82	.62	.65	277	255	255	55	44	87	81	1.5	4.5
	115	102.17	.62	.65	277	254	255	55	44	87	81	1.5	4.5
	120	105.39											

Traverse: 2		
Start Time:	Initial Leak Check: cfm@ "Hg	
Finish Time: 1250	Final Leak Check: .005 cfm@ 14 "Hg	

Traverse:		
Start Time:	Initial Leak Check: cfm @ "Hg	
Finish Time:	Final Leak Check: cfm @ "Hg	

Project No.: 21936

Operator : RL

Field Data Sheet

Date: Jun 28/19	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 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	105.84	.81	.74	286	250	256	58	44	85	82	2.0	5.5
	5	109.57	.82	.74	285	253	255	57	46	85	82	2.0	5.5
2	10	113.37	.80	.73	285	254	255	53	42	86	82	2.0	5.5
	15	117.15	.80	.73	285	253	255	58	42	87	82	2.0	5.5
3	20	120.90	.76	.72	285	254	255	52	43	88	82	1.8	5.5
	25	124.56	.76	.72	285	254	255	53	42	85	83	1.8	5.5
4	30	128.20	.67	.67	285	254	253	52	42	89	83	1.6	5
	35	131.66	.70	.69	286	254	255	56	42	89	83	1.7	5
5	40	135.15	.64	.66	286	252	255	55	42	89	83	1.6	5
	45	138.58	.62	.65	286	254	255	54	42	89	84	1.5	5
6	50	141.91	.58	.63	286	254	255	54	42	89	84	1.4	4.5
	55	145.11	.57	.62	286	254	255	52	42	89	84	1.24	4.5
7	60	148.29	.62	.65	285	260	255	52	43	90	84	1.5	4.5
	65	151.54	.63	.65	285	254	255	51	44	90	84	1.5	4.5
8	70	154.81	.66	.67	284	251	254	50	46	90	85	1.6	5.0
	75	158.26	.65	.66	286	254	255	50	45	90	84	1.6	5
9	80	161.50	.68	.68	286	258	256	51	42	90	84	1.6	5
	85	164.94	.67	.67	286	255	255	50	40	90	84	1.6	5
10	90	168.35	.65	.67	286	255	256	51	40	91	85	1.6	5
	95	171.72	.67	.68	286	255	255	51	40	90	85	1.6	5
11	100	175.14	.68	.68	286	256	256	51	41	90	85	1.6	5

Traverse: 1				
Start Time: 1256	Initial Leak Check:	.005	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.: 21936

Operator : AS

Field Data Sheet

Date: Jun 28/19	Plant: Covanta DYEC	Test No.: 3 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	* Clock Time	* Dry Gas Meter ft³	* 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	178.60	.64	.66	286	255	256	51	41	91	85	1.6	5
12	110	181.97	.65	.67	286	255	255	51	40	91	85	1.6	5
	115	185.33	.65	.67	286	255	255	51	40	92	85	1.6	5
	120	188.69											

Traverse: 1		Traverse:	
Start Time:	Initial Leak Check: cfm@ "Hg	Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time: 14:58	Final Leak Check: .003 cfm@ 15 "Hg	Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	June 27 2019
Test Location	APC Outlet No. 2
Operator	AS

Project No.:	21936
Page	1 of 5
Probe No.:	6C
Meter Box No.:	Team 3
Impinger Box No.:	1

Pitot Factor	.851	
DGMCF	1.004	
Barometric Pressure	29.67	"Hg
Static Pressure	-7.6	"H2O
Nozzle Size	.2533	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	715.1	g
WCBDA	17.0	g

Combustion Gas Concentration

Oxygen	8.36	%
Carbon Dioxide	10.78	%
Carbon Monoxide	14.9	ppm

Measuring Device	MII Numbers
Probe / Pitot SP6	COE 20098
Trendicator	COE 20093
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	B03906

Nozzle Measurements	
1	.2545
2	.2520
3	.2535
4	.2530
Average:	.2533

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 27/19	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 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	87.87	.82	.75	283	247	248	68	59	75	73 ~~75~~	2.1	4.5
	5	91.58	.80	.74	286	249	253	64	51	73	74	2.1	4.5
2	10	95.29	.82	.75	286	248	255	60	52	74	75	2.2	5.5
	15	99.14	.81	.75	286	249	255	57	52	76	76	2.2	5.5
3	20	102.98	.79	.74	286	250	255	55	52	75	77	2.1	5.5
	25	106.75	.81	.75	288	251	255	55	55	76	78	2.2	5.5
4	30	110.60	.75	.72	287	252	254	55	54	77	79	2.0	5.5
	35	114.35	.73	.71	287	252	255	~~55~~ 56	54	77	79	2.0	5
5	40	118.05	.69	.69	287	252	254	56	54	78	80	1.8	5
	45	121.56	.71	.70	290	253	255	56	54	78	81	1.8	5
6	50	125.08	.70	.69	288	252	254	56	59	78	81	1.8	5
	55	128.57	.65	.67	288	250	254	54	51	78	82	1.9	5
7	60	131.98	.67	.68	288	251	254	52	50	79	82	1.7	5
	65	135.40	.68	.68	288	251	255	52	49	79	82	1.7	5
8	70	138.84	.69	.69	288	252	254	52	49	80	83	1.7	5
	75	142.29	.67	.68	288	252	254	52	49	80	83	1.7	5
9	80	145.75	.70 ~~.6~~	.69	288	252	255	52	49	80	83	1.8	5
	85	149.20	.71	.69	286	252	255	52	51	80	84	1.8	5
10	90	152.73	.70	.70	286	252	254	52	50	81	84	1.8	5
	95	156.24	.70	.70	287	252	254	52	48	81	84	1.8	5
11	100	159.76	.71	.70	287	251	254	52	47	81	84	1.8	5

Traverse: 1			
Start Time: 8:22	Initial Leak Check: .004	cfm@ 15	"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.: 21936
Operator : AS

Field Data Sheet

Date: Jun 27/19	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 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 *
	105	163.28	.70	.70	286	251	254	51	47	82	84	1.8	5
12	110	166.79	.70	.70	286	251	254	52	49	82	84	1.8	5
	115	170.30	.70	.70	286	251	254	52	48	82	84	1.8	5
	120	173.82											

Traverse: 1		
Start Time:	Initial Leak Check: cfm@ "Hg	
Finish Time: 10:22	Final Leak Check: .002 cfm@ 15 "Hg	

Traverse:	
Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator : AS

Rev: April 28, 2005

ORTECH Environmental

Field Data Sheet

Date: Jun 27/19	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 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	174.27	.84	.77	278	250	255	64	45	82	82	2.2	5.5
	5	178.10	.83	.76	285	251	256	51	48	81	82	2.2	6
2	10	181.94	.84	.76	284	251	254	52	50	81	82	2.2	6
	15	185.82	.83	.76	283	251	254	53	52	81	82	2.2	6
3	20	189.~~8~~78	.79	.74	284	251	254	53	54	81	82	2.1	6
	25	193.47	.80	.74	285	252	254	53	55	81	82	2.1	6
4	30	197.23	.73	.71	286	252	254	53	57	81	82	1.9	6
	35	200.91	.72	.71	287	252	255	53	51	81	82	1.9	6
5	40	204.52	.64	.66	286	252	254	53	47	81	83	1.7	5
	45	207.99	.67	.68	285	252	254	53	45	81	83	1.8	5
6	50	211.45	.60	.64	285	252	254	54	47	81	83	1.6	5
	55	214.75	0.60	0.64	285	252	253	54	45	81	~~88~~83	1.6	5
7	60	218.06	0.62	0.66	285	251	253	54	45	81	84	1.6	5
	65	221.34	0.62	0.66	284	251	252	54	46	81	84	1.6	5
8	70	224.63	0.65	0.67	285	251	254	53	47	81	84	1.7	5
	75	227.98	0.65	0.67	286	251	254	54	50	82	84	1.7	5
9	80	231.37	0.65	0.67	286	252	254	54	52	82	84	1.7	5
	85	234.77	0.68	0.69	286	251	254	54	54	82	84	1.8	5
10	90	238.20	0.65	0.67	285	251	254	54	56	82	85	1.8	5
	95	241.65	0.65	0.67	284	251	254	54	54	82	85	1.7	5
11	100	245.06	0.63	0.66	280	251	254	55	49	82	84	1.7	5

Traverse:		Traverse:	
Start Time: 10:37	Initial Leak Check: .003 cfm@ 15 "Hg	Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: ~~.003 cfm@ 15~~ 2 "Hg	Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator : AS

Field Data Sheet

Date: Jun 27/19 | Plant: Covanta DYEC | Test No.: 1 SVOC |

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
	*	*	*		*			*		*	*	*	*
	105	248.40	0.64	0.68	280	251	254	55	48	82	85	1.8	5
12	110	251.81	.65	.68	280	251	254	55	47	82	85	1.8	5
	115	255.24	.64	.67	280	251	254	55	47	82	85	1.8	5
	120	258.59											

Traverse: 2		
Start Time:	Initial Leak Check: cfm@	"Hg
Finish Time: 12:37	Final Leak Check: .003 cfm@ 15	"Hg

Traverse:		
Start Time:	Initial Leak Check: cfm @	"Hg
Finish Time:	Final Leak Check: cfm @	"Hg

Project No.: 21936

Operator : AS

ORTECH Environmental

Plant		Covanta DYEC
Plant Location		Courtice, Ontario
Test No.:	2	Semi-Volatile Organic Compounds
Test Date	June 27/19	
Test Location		APC Outlet No. 2
Operator		AS

Project No.:	21936
Page	1 of 5
Probe No.:	6A
Meter Box No.:	Team 3
Impinger Box No.:	2

Pitot Factor	.849	
DGMCF	1.004	
Barometric Pressure	29.66	"Hg
Static Pressure	-7.6	"H2O
Nozzle Size	.2518	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	~~715.4~~ 717.7	g
WCBDA	~~17.0~~ 20.1	g

Combustion Gas Concentration

Oxygen	8.42	%
Carbon Dioxide	10.64	%
Carbon Monoxide	10.7	ppm

Measuring Device		MII Numbers
Probe / Pitot	SP4	B04011
Trendicator		COE 20093
Control Box		COE 20093
Incline Manometer		COE 20093
Comb.Gas.Analyzer		
Micromanometer		
Barometer		Env. Can
Calipers		B03906

Nozzle Measurements	
1	.2520
2	.2510
3	.2520
4	.2520
Average:	.2518

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: Jun 27/19	Plant: Covanta DYEC	Test No.: 2 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time *	Dry Gas Meter ft³ *	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	59.27	.89	.77	283	250	268	67	44	82	82	2.2	6
	5	63.10	.89	.77	287	253	268	64	52	82	82	2.2	7
2	10	66.95 ~~69.95~~	.89	.77	288	252	268	64	53	82	82	2.2	7
	15	70.80	.91	.78	288	251	268	56	53	82	83	2.3	7
3	20	74.78	.85	.76	289	251	268	54	52	82	83	2.2	7
	25	78.67	.85	.75	289	251	256	54	51	82	83	2.2	7
4	30	82.58	.80	.73	288	251	239	54	49	82	83	2.0	7
	35	86.33	.82	.74	286	250	235	55	49	82	83	2.1	7
5	40	90.05	.74	.71	285	250	241	55	49	82	84	1.9	6.5
	45	93.73	.70	.69	285	250	248	55	48	82	84	1.8	6
6	50	97.18	0.65	0.66	285	251	250	56	48	82	84	1.7	6
	55	100.6	0.65	0.66	285	250	252	53	47	83	84	1.7	6
7	60	103.93	0.64	0.66	285	250	252	54	46	83	85	1.7	6
	65	107.23	0.64	0.66	283	250	252	54	46	83	85	1.7	6
8	70	110.56	0.67	0.67	283	250	252	53	46	83	85	1.7	6
	75	113.94	0.65	0.66	283	250	252	54	47	83	85	1.7	6
9	80	117.29	0.7	0.69	283	250	252	54	47	83	85	1.8	6
	85	120.76	0.67	0.67	283	250	252	53	48	83	85	1.7	6
10	90	124.18	0.68	0.68	280	250	252	53	49	83	85	1.7	6
	95	127.62	0.68	0.68	280	249	252	53	47	84	85	1.8	6
11	100	131.06	0.64	0.66	280	249	252	53	46	84	84	1.7	6

Traverse: 1		
Start Time: 12:55	Initial Leak Check: .002 cfm@ 15 "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.: 21936

Operator : AS .

Field Data Sheet

Date: June 27/19	Plant: Covanta DYEC	Test No.: 2	SVOC	
	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 *
	105	134.45	0.64	0.66	275	249	251	53	47	83	84	1.6	6.0
12	110	137.78	0.65	0.67	277	249	251	54	47	84	84	1.7	6.0
	115	141.11	0.66	0.67	278	249	251	54	47	83	83	1.7	6.0
	120	144.49											

Traverse:		
Start Time:	Initial Leak Check: cfm@ "Hg	
Finish Time: 14:55	Final Leak Check: 0.005 cfm@ 17 "Hg	

Traverse:	
Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator :

Field Data Sheet

Date: Jun 27/19	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 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
	*	*	*		*			*		*	*	*	*
		144.97											
1	0	~~149.97~~ ~~145.~~	.86	.76	283	248	251	67	42	83	83	2.2	7.5
	5	148.77	.87	.77	284	250	253	53	49	83	82	2.2	8
2	10	152.73	.88	.77	287	251	253	52	50	83	82	2.2	8
	15	156.67	.87	.77	286	250	252	52	50	82	82	2.2	8
3	20	160.63	.84	.75	285	250	252	52	48	82	82	2.1	8
	25	164.53	.83	.75	286	250	252	53	49	82	82	2.1	8
4	30	168.32	.81	.74	287	250	244	53	49	82	82	2 ~~7.5~~	7.5
	35	172.12	.78	.73	287	250	238	53	48	82	82	2.0	7
5	40	175.86	.72	.70	285	250	243	53	48	82	82	1.8	7
	45	179.44	.73	.70	285	250	250	53	47	82	83	1.8	7
6	50	183.02	.66	.67	286	250	252	53	48	82	83	1.7	6.5
	55	186.46	.64	.66	286	250	251	52	45	82	84	1.6	6
7	60	189.78	.65	.66	287	250	251	52	45	82	84	1.6	6
	65	193.12	.67	.67	287	250	251	51	45	82	84	1.7	6.5
8	70	196.49	.70	.69	287	249	250	51	46	82	84	1.8	7
	75	199.96	.70	.69	287	250	251	51	47	83	84	1.8	7
9	80	203.44	.72	.70	287	250	251	51	47	83	84	1.8	7
	85	206.93	0.73	0.70	285	249	251	52	48	83	83	1.9	7
10	90	210.53	0.73	0.70	284	249	251	52	50	83	83	1.9	7
	95	214.09	0.71	0.70	283	249	251	52	49	83	83	1.9	7
11	100	217.61	0.65	0.66	284	249	251	53	51	83	83	1.7	7

Traverse: 2		
Start Time: 15:07	Initial Leak Check: .003 cfm@ 15 "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.: 21936

Operator : AS

Field Data Sheet

Date: Jue 2?/19	Plant: Covanta DYEC	Test No.: 2 SVOC	
	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
	*	*	*		*			*		*	*	*	*
	105	221.04	0.68	0.67	285	249	251	54	53	83	84	1.5	7
12	110	224.35	0.63	0.66	281	249	251	55	46	84	85	1.7	7
	115	227.67	0.62	.65	282	248	250	55	45	83	84	1.6	7
	120	231.02											

Traverse: 2	
Start Time:	Initial Leak Check: cfm@ "Hg
Finish Time: 17:07	Final Leak Check: ~~.004~~ .002 cfm@ 15 "Hg

Traverse:	
Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	Jun 28/19
Test Location	APC Outlet No. 2
Operator	AS

Project No.:	21936
Page	1 of 5
Probe No.:	6A
Meter Box No.:	Team 3
Impinger Box No.:	12

Pitot Factor	.849	
DGMCF	1.004	
Barometric Pressure	29.67	"Hg
Static Pressure	-7.8	"H2O
Nozzle Size	.2518	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	681.4	g
WCBDA	15.0	g

Combustion Gas Concentration

Oxygen	8.37	%
Carbon Dioxide	10.74	%
Carbon Monoxide	14.5	ppm

Measuring Device	MII Numbers
Probe / Pitot SP4	BO4011
Trendicator	
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	BO 3906

Nozzle Measurements	
1	.2520
2	.2510
3	.2520
4	.2520
Average:	.2518

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: Jun 28/19	Plant: Covanta DYEC	Test No.: 3 SVOC	
	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	32.34	.74	.70	283	250	253	68	46	77	77	1.8	3.5
	5	35.86	.72	.69	285	254	256	59	46	77	77	1.8	4
2	10	39.31	.75	.71	284	253	254	54	46	77	77	1.9	4
	15	42.85	.77	.72	285	252	253	52	47	77	77	1.9	4
3	20	46.45	.75	.71	286	252	254	51	47	77	78	1.9	4
	25	50.03	.74	.70	286	252	254	50	47	77	78	1.9	4
4	30	53.60	.71	.69	287	252	253	50	48	77	79	1.8	4
	35	57.15	.70	.68	287	252	253	50	48	77	79	1.8	4
5	40	60.60	.66	.66	287	252	253	50	48	78	80	1.7	4
	45	63.99	.66	.66	287	251	253	50	48	78	80	1.7	4
6	50	67.37	.62	.64	287	251	253	50	49	78	80	1.6	4
	55	70.64	0.61	0.64	285	251	254	50	47	78	81	1.6	4
7	60	73.90	0.66	0.66	288	251	253	50	46	79	81	1.7	4
	65	77.22	0.67	0.67	288	250	253	50	46	79	81	1.7	4
8	70	80.57	0.67	0.67	289	250	252	50	47	79	82	1.7	4
	75	83.94	0.67	0.67	289	250	253	51	47	79	82	1.7	4
9	80	87.30	0.67	0.67	288	250	252	49	47	79	82	1.7	4
	85	90.73	0.67	0.67	288	249	253	51	48	80	82	1.7	4
10	90	94.11	0.68	0.68	283	250	253	52	49	80	83	1.8	4
	95	97.53	0.68	0.68	283	250	253	51	49	81	83	1.8	4
11	100	100.97	0.66	0.66	282	250	253	51	46	81	82	1.7	4

Traverse:				
Start Time: 9:38	Initial Leak Check:	.002 cfm@	16	"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.: 21936

Operator : AS

Field Data Sheet

Date: Jue 28/19	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 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
	*	*	*		*			*		*	*	*	*
	105	104.32	0.64	0.66	280	250	253	51	47	81	83	1.7	4
12	110	107.66	0.59	0.63	281	249	252	51	47	80	82	1.5	4
	115	110.88	0.59	0.63	282	249	252	51	48	81	82	1.5	4
	120	114.65											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 11:38	Final Leak Check: 0.001	cfm@ 15	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : OP

Field Data Sheet

Date: June 28/19	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 ft³	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	114.59	0.8	0.74	280	249	252	68	46	80	80	2.0	4.5
	5	118.25	0.79	0.73	287	251	255	51	48	81	81	2.0	4.5
2	10	121.92	0.80	0.73	288	250	253	51	49	80	81	2.0	4.5
	15	125.60	0.81	0.74	288	250	253	51	50	80	81	2.0	4.5
3	20	129.28	0.76	0.71	289	250	253	51	51	80	81	1.9	4.5
	25	132.87	0.79	0.73	290	252	254	53	54	81	82	2.0	4.5
4	30	136.52	0.75	0.71	289	251	253	52	55	81	82	1.9	4.5
	35	140.15	0.70	0.69	288	250	253	52	50	81	82	1.8	4.5
5	40	143.65	0.70	0.69	288	250	253	51	48	81	82	1.8	4.5
	45	147.15	0.65	0.66	288	250	253	50	47	81	82	1.65	4.0
6	50	150.51	0.59	0.63	286	250	252	50	46	81	82	1.5	4.0
	55	153.76	0.57	0.62	284	250	252	50	46	81	83	1.4	3.5
7	60	156.85	0.62	0.65	286	250	252	51	47	81	83	1.6	4.0
	65	160.06	0.62	0.65	286	251	252	50	47	81	84	1.65	4.0
8	70	163.40	0.64	0.66	286	251	252	50	47	82	83	1.6	4.0
	75	166.70	0.64	0.66	287	251	252	51	48	82	82	1.6	4.0
9	80	169.98	0.65	0.66	286	250	252	51	48	82	83	1.7	4.0
	85	173.35	0.67	0.67	286	250	252	51	50	82	83	1.8	4.0
10	90	176.75	0.61	0.65	279	250	252	51	50	82	83	1.6	4.0
	95	180.23	0.60	0.64	277	250	252	52	51	82	82	1.5	4.0
11	100	183.55	0.57	0.63	267	250	252	52	51	82	83	1.5	4.0

Traverse: 2			
Start Time: 11:56	Initial Leak Check: 0.003	cfm@ 15	"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.: 21936

Operator : DP

Field Data Sheet

Date: June 22, 2019	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 ft³	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	186.73	0.6	0.65	261	250	252	52	51	82	83	1.6	4
12	110	189.97	0.6	0.65	260	250	252	53	52	82	83	1.6	4
	115	193.19	0.6	0.65	260	250	252	53	53	83	85	1.6	4
	120	196.44											

Traverse: 7				
Start Time: —	Initial Leak Check: —	cfm@	—	"Hg
Finish Time: :355	Final Leak Check: .004	cfm@	14	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator :

Rev: April 28, 2005

ORTECH Environmental

APPENDIX 7

Acid Gas Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	M26A
Test Date June 25, 2019	
Test Location	APC Outlet No. 1
Operator SB	

Project No.:	21936
Page	1 of 2
Probe No.: 6D	
Meter Box No.: Team 4	
Impinger Box No.: 14	

Pitot Factor	.845	
DGMCF	.999	
Barometric Pressure	29.23	"Hg
Static Pressure	-7.30	"H2O
Nozzle Size	.2500	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	145.7	g
WCBDA	11.7	g

Combustion Gas Concentration

Oxygen	8.60	%
Carbon Dioxide	10.62	%
Carbon Monoxide	14.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP5
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Reading Interval	5
Number of Ports	~~2~~ 1
Number of Points/Port	12

Nozzle Measurements #4

1 .2515
2 .2495
3 .2500
4 .2490
Average: .2500

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: June 25, 2019	Plant: Covanta DYEC	Test No.: 1	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 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	609.95	.95	.80	288	255	252	58	91	71	71	2.20	6.0
2	5	613.85	.92	.79	288	259	257	59	232	72	72	2.15	6.0
3	10	617.86	.83	.75	288	258	250	60	228	72	72	2.00	6.0
4	15	621.70	.77	.73	287	260	260	62	230	72	72	1.80	6.0
5	20	625.25	.67	.68	287	259	252	64	226	73	73	1.60	5.5
6	25	628.72	.64	.66	287	260	254	62	230	73	73	1.50	5.3
7	30	632.01	.68	.69	287	260	253	59	229	74	74	1.60	5.3
8	35	635.47	.69	.69	288	258	252	55	232	74	74	1.60	5.3
9	40	638.95	.69	.69	287	258	254	52	230	74	74	1.60	5.3
10	45	642.36	.68	.68	287	258	256	52	232	74	74	1.60	5.3
11	50	645.85	.62	.65	286	258	254	52	232	75	75	1.50	5.0
12	55	649.20	.62	.65	286	259	259	52	233	74	74	1.50	5.0
	60	652.50											

Traverse: 1				
Start Time: 8:58	Initial Leak Check: .001	cfm@	19	"Hg
Finish Time: 9:58	Final Leak Check: .001	cfm@	16	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : JB

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: 2	M26A	
Test Date June 25, 2019		
Test Location	APC Outlet No. 1	
Operator JB		

Project No.:	21936	
Page	1 of 2	
Probe No.:	SEE TEST 1	
Meter Box No.:		
Impinger Box No.:	Box 11	

Pitot Factor .845		
DGMCF .999		
Barometric Pressure	29.25	"Hg
Static Pressure	-7.30	"H2O
Nozzle Size	.2500	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	148.9	g
WCBDA	14.8	g

Combustion Gas Concentration

Oxygen	8.38	%
Carbon Dioxide	10.81	%
Carbon Monoxide	20.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	SEE
Control Box	
Incline Manometer	TEST 1
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

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 25, 2019	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 ft³ *	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	652.95	.82	.75	286	259	252	62	222	73	73	2.00	5.5
2	5	656.78	.85	.76	287	259	254	51	209	73	73	2.00	5.5
3	10	660.67	.81	.75	287	259	257	49	221	73	73	1.90	5.3
4	15	664.41	.74	.71	288	260	260	50	232	73	73	1.75	5.3
5	20	668.04	.68	.68	288	259	258	52	232	73	73	1.60	5.0
6	25	671.48	.64	.66	288	260	259	52	230	73	73	1.50	5.0
7	30	674.83	.71	.70	288	261	259	54	227	73	74	1.70	5.3
8	35	678.45	.73	.71	288	260	258	54	230	74	74	1.70	5.3
9	40	682.06	.72	.70	288	260	259	55	232	74	74	1.70	5.3
10	45	685.62	.69	.69	287	262	258	56	230	74	74	1.60	5.3
11	50	689.08	.73	.71	287	260	252	58	230	74	74	1.70	5.3
12	55	692.64	.70	.69	286	259	258	59	230	74	74	1.70	5.3
	60	696.18											

Traverse: 1			
Start Time: 10:49	Initial Leak Check: .001	cfm@ 15	"Hg
Finish Time: 11:49	Final Leak Check: .001	cfm@ 20	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	M26A
Test Date	June 25, 2019
Test Location	APC Outlet No. 1
Operator	JB

Project No.:	21936
Page	1 of 2
Probe No.:	SEE TEST 1
Meter Box No.:	SEE TEST 1
Impinger Box No.:	14

Pitot Factor	.845	
DGMCF	.999	
Barometric Pressure	29.29	"Hg
Static Pressure	-7.30	"H2O
Nozzle Size	0.2500	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	~~2~~ 1
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	3152.7	g
WCBDA	9.2	g

Combustion Gas Concentration

Oxygen	8.34	%
Carbon Dioxide	10.72	%
Carbon Monoxide	17.6	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	SEE TEST 1
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements

1 SEE TEST 1
2 ______
3 ______
4 ______
Average:

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: June 25, 2019	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 ft³ *	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	696.85	.71	.70	287	259	247	58	147	73	74	1.65	5.0
2	5	700.36	.71	.70	287	260	250	47	224	74	74	1.65	5.0
3	10	703.84	.68	.68	287	259	252	44	229	74	74	1.60	5.0
4	15	707.29	.70	.69	288	261	250	45	231	74	74	1.65	5.0
5	20	710.82	.71	.70	289	260	252	46	234	74	74	1.65	5.0
6	25	714.34	.67	.68	289	260	254	46	232	74	74	1.55	5.0
7	30	717.62	.651	.65	289	261	256	46	230	74	74	1.40	5.0
8	35	720.87	.67	.68	289	260	252	47	230	74	74	1.55	5.0
9	40	724.30	.73	.71	290	262	254	48	232	75	75	1.70	5.8
10	45	727.93	.77	.73	290	259	252	49	233	75	75	1.9	6
11	50	731.68	.80	.74	290	260	259	50	239	75	75	1.9	6
12	55	735.43	.80	.74	289	260	251	52	239	75	75	1.8	6
	60	739.17											

Traverse: 1		
Start Time: 12:21	Initial Leak Check: .004 cfm@ 20 "Hg	
Finish Time: 13:21	Final Leak Check: .004 cfm@ 22 "Hg	

Traverse:	
Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21936

Operator : JB / AS.

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: 1	M26A	
Test Date June 26, 2018		
Test Location	APC Outlet No. 2	
Operator JB		

Project No.:	21936	
Page	1 of 2	
Probe No.: 6D		
Meter Box No.: Team 2		
Impinger Box No.: 14		

Pitot Factor	.845	
DGMCF	.990	
Barometric Pressure	29.45	"Hg
Static Pressure	-7.90	"H2O
Nozzle Size	.2500	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	~~2~~ 1
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	163.3	g
WCBDA	14.0	g

Combustion Gas Concentration

Oxygen	8.25	%
Carbon Dioxide	10.70	%
Carbon Monoxide	11.9	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	SP5
Trendicator	COE 20092
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2575
2	.2495
3	.2500
4	.2490
Average:	.2560

Notes:

Field Data Sheet

Date: June 26, 2019	Plant: Covanta DYEC	Test No.: 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 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	288.34	0.90	0.79	283	257	249	67	95	72	73	2.10	4.0
2	5	292.27	0.89	0.79	284	255	252	54	235	72	72	2.10	4.0
3	10	296.24	0.89	0.79	285	254	254	52	239	72	73	2.10	4.0
4	15	299.99	0.84	0.77	285	256	254	53	236	72	73	2.00	4.0
5	20	303.83	0.75	0.73	285	254	255	53	234	73	74	1.75	4.0
6	25	307.47	0.64	0.67	285	258	254	54	236	73	74	1.50	4.0
7	30	310.87	0.66	0.68	285	255	256	55	238	74	76	1.55	4.0
8	35	314.27	0.66	0.68	285	256	258	55	237	73	77	1.55	4.0
9	40	317.69	0.68	0.69	284	255	255	55	237	73	77	1.60	4.0
10	45	321.15	0.67	0.69	284	255	255	55	234	73	78	1.60	4.0
11	50	324.64	0.62	0.66	284	248	254	56	238	73	79	1.45	4.0
12	55	327.98	0.62	0.66	284	255	253	57	238	74	79	1.45	4.0
	60	331.30											

Traverse: 1			
Start Time: 8:29	Initial Leak Check: .004	cfm@ 15	"Hg
Finish Time: 9:29	Final Leak Check: .004	cfm@ 16	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	M26A
Test Date June 26, 2019	
Test Location	APC Outlet No. 2
Operator JB	

Project No.:	21936	
Page	1 of 2	
Probe No.:	6D	
Meter Box No.:	Team 2	
Impinger Box No.:	Box 11	

Pitot Factor	.845	
DGMCF	.990	
Barometric Pressure	29.45	"Hg
Static Pressure	-7.90	"H2O
Nozzle Size	.2500	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	~~2~~ 1
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	163.1	g
WCBDA	14.4	g

Combustion Gas Concentration

Oxygen	8.13	%
Carbon Dioxide	11.00	%
Carbon Monoxide	12.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE TEST 1
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

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 26, 2019	Plant: Covanta DYEC	Test No.: M26A	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A 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	331.86	0.93	0.81	285	255	255	68	98	73	74	2.20	4.0
2	5	335.92	0.92	0.80	286	252	248	67	100	73	73	2.20	4.0
3	10	340.02	0.88	0.79	286	252	250	67	196	73	74	2.10	4.0
4	15	344.01	0.83	0.76	286	253	250	62	208	73	76	2.00	4.0
5	20	347.87	0.76	0.73	287	253	251	59	211	73	77	1.80	4.0
6	25	351.55	0.61	0.66	287	250	250	57	214	74	79	1.45	3.5
7	30	354.89	0.69	0.70	286	250	251	57	213	74	79	1.65	3.5
8	35	358.39	0.72	0.71	286	251	251	59	212	74	79	1.70	3.5
9	40	361.99	0.71	0.71	286	253	251	60	217	75	80	1.70	3.5
10	45	365.56	0.70	0.71	286	250	250	61	214	75	81	1.70	3.5
11	50	369.14	0.56	0.63	285	249	250	63	216	76	81	1.30	3.5
12	55	372.33	0.57	0.64	285	251	252	65	215	76	81	1.35	3.5
	60	375.55											

Traverse: 1			
Start Time: 10:20	Initial Leak Check: .003	cfm@ 14	"Hg
Finish Time: 11:20	Final Leak Check: .002	cfm@ 15	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	M26A
Test Date June 26, 2019	
Test Location	APC Outlet No. 2
Operator JB	

Project No.:	21936
Page	1 of 2
Probe No.:	SEE TEST 1
Meter Box No.:	SEE TEST 1
Impinger Box No.:	Box 14

Pitot Factor	.845	
DGMCF	.990	
Barometric Pressure	29.45	"Hg
Static Pressure	-7.90	"H2O
Nozzle Size	.2500	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	5
Number of Ports	~~2~~ 1
Number of Points/Port	12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	176.4	g
WCBDA	11.0	g

Combustion Gas Concentration

Oxygen	8.09	%
Carbon Dioxide	11.10	%
Carbon Monoxide	10.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE TEST 1
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements

1 SEE TEST 2.
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:

Rev. November 27, 2014

Field Data Sheet

Date: June 26, 2019	Plant: Covanta DYEC	Test No.: M26A	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A 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	376.08	0.90	0.80	285	256	249	67	122	75	75	2.15	4.5
2	5	380.12	0.87	0.78	286	255	252	60	234	75	75	2.05	4.0
3	10	384.03	0.86	0.78	285	253	251	57	237	75	75	2.05	4.0
4	15	387.90	0.81	0.76	283	255	254	57	237	75	77	1.95	4.0
5	20	391.73	0.74	0.73	284	255	255	57	235	76	78	1.80	4.0
6	25	395.38	0.68	0.70	286	254	252	57	231	75	80	1.60	4.0
7	30	398.89	0.68	0.70	285	250	251	58	235	76	81	1.60	4.0
8	35	402.39	0.70	0.71	286	252	250	59	234	76	82	1.70	4.0
9	40	405.98	0.70	0.71	286	255	251	57	234	77	82	1.70	4.0
10	45	409.57	0.71	0.71	285	253	250	54	234	77	82	1.70	4.0
11	50	413.16	0.64	0.68	285	255	255	53	233	77	83	1.55	4.0
12	55	416.62	0.67	0.69	285	255	253	53	234	78	83	1.60	4.0
	60	420.16											

Traverse: 1			
Start Time: 12:39	Initial Leak Check: .002	cfm@ 16	"Hg
Finish Time: 13:39	Final Leak Check: .004	cfm@ 16	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21936

Operator : JB

APPENDIX 8

VOST Field Data Sheets
(8 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organics Sampling Train
Sample Volume Corrections

Test No./ Pair No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm3)*
1-1	0.987	53.50	73.80	20.30	29.67	0.80	30.8	19.53	0.0195
1-2	0.987	74.20	94.50	20.30	29.67	0.80	36.0	19.20	0.0192
1-3	0.987	96.30	117.10	20.80	29.67	0.80	38.4	19.52	0.0195
1-4	0.987	17.80	37.50	19.70	29.67	0.80	41.6	18.30	0.0183
2-1	0.987	72.80	93.80	21.00	29.67	0.80	44.0	19.36	0.0194
2-2	0.987	94.00	114.50	20.50	29.67	0.80	43.2	18.95	0.0189
2-3	0.987	14.90	37.10	22.20	29.67	0.80	45.2	20.39	0.0204
2-4	0.987	37.30	56.00	18.70	29.67	0.80	45.0	17.19	0.0172
3-1	0.987	56.20	78.50	22.30	29.66	0.80	45.8	20.44	0.0204
3-2	0.987	78.80	100.50	21.70	29.66	0.80	45.8	19.89	0.0199
3-3	0.987	0.10	21.50	21.40	29.66	0.80	47.2	19.53	0.0195
3-4	0.987	21.80	44.80	23.00	29.66	0.80	46.6	21.03	0.0210

* Dry at 25°C and 1 atmosphere

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organics Sampling Train
Sample Volume Corrections

Test No./ Pair No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm3)*
1-1	0.993	26.53	47.30	20.77	29.67	2.40	27.8	20.38	0.0204
1-2	0.993	47.70	67.70	20.00	29.67	2.40	27.6	19.64	0.0196
1-3	0.993	70.00	89.30	19.30	29.67	2.40	28.6	18.89	0.0189
1-4	0.993	89.37	110.30	20.93	29.67	2.40	28.8	20.47	0.0205
2-1	0.993	73.20	94.70	21.50	29.66	2.40	27.4	21.12	0.0211
2-2	0.993	95.06	116.40	21.34	29.66	2.40	27.4	20.96	0.0210
2-3	0.993	116.70	138.58	21.88	29.66	2.40	26.8	21.54	0.0215
2-4	0.993	138.80	159.02	20.22	29.66	2.40	27.8	19.84	0.0198
3-1	0.993	59.08	79.45	20.37	29.65	2.40	27.6	19.99	0.0200
3-2	0.993	79.80	101.91	22.11	29.65	2.50	28.8	21.62	0.0216
3-3	0.993	2.15	24.79	22.64	29.65	2.46	28.6	22.15	0.0221
3-4	0.993	25.00	44.72	19.72	29.65	2.34	28.6	19.29	0.0193

* Dry at 25°C and 1 atmosphere

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 1	Control Box ID: Vost #4	
Test location: APC Outlet No. 1	DGMCF: 0.987	Operator: JG	
Date: JUNE 27, 2019	Barometric Pressure: 29.67 "Hg	Project No: 21936	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 29A, 29B	

Tube Pair 1 Start Time: ~~0950~~ 0951		Initial Leak Check NDL @ 15 "Hg				Sample ID: 1A, 1B	
Tube Pair 1 End Time: 1011		Final Leak Check NDL @ 14.5 "Hg				Lab ID: L2279669-46	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3753.5	126	141	19	26	0.8	3.0
5	3758.6	128	142	16	30	0.8	3.0.
10	3763.9	129	143	15	32	0.8	3.0.
15	3769.0	127.	143	14	33	0.8	3.0
20	3773.8	127	143	14	33	0.8	3.0

Tube Pair 2 Start Time: 1016		Initial Leak Check NDL @ 14.5 "Hg				Sample ID: 2A, 2B	
Tube Pair 2 End Time: 1036		Final Leak Check NDL @ 17.5 "Hg				Lab ID: L2279669-47	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3774.2	126	141	15	32	0.8	3.0
5	3779.3	125	141	14	35	0.8	3.0
10	3784.4	124	142	12	37	0.8	3.0.
15	3789.4	126	142	13	37	0.8	3.0
20	3794.5	124	141	13	39	0.8	3.0.

Tube Pair 3 Start Time: 1041		Initial Leak Check NDL @ 17.5 "Hg				Sample ID: 3A 3B	
Tube Pair 3 End Time: 1101		Final Leak Check NDL @ 18.5 "Hg				Lab ID: L2279669-48	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3796.3	126	141	14	35	0.8	3.0
5	3801.8	126	141	15	36	0.8	3.0.
10	3806.9	128	143	15	42	0.8	3.0
15	3812.0	126	142	13	40	0.8	3.0.
20	3817.1	126	141	12	40	0.8	3.0

Tube Pair 4 Start Time: 1106		Initial Leak Check NDL @ 18.5 "Hg				Sample ID: 4A, 4B	
Tube Pair 4 End Time: 1126		Final Leak Check @ "Hg				Lab ID: 2279669-49	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3817.8	125	140	14	39	0.8	3.0
5	3822.9	126	142	12	41	0.8	3.0
10	3827.4	126	141	12	42	0.8	3.0.
15	3832.4	126	141	11	43	0.8	3.0
20	3837.5	126	141	11	43	0.8	3.0

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Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 2	Control Box ID: Vost #4	
Test location: APC Outlet No. 1	DGMCF: 0.987	Operator: JG.	
Date: June 27, 2019	Barometric Pressure: 29.67 "Hg	Project No: 21936	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: L2279669-75	
		TUBE PAIR - 30	

Tube Pair 1 Start Time: 1250		Initial Leak Check NDL @ 14 "Hg				Sample ID: 5A 5B	
Tube Pair 1 End Time: 1310		Final Leak Check NDL @ 15.5 "Hg				Lab ID: L2279669-50	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	3872.8	124	142	16	44.	0.8	3.0.
5	3878.1	127.	143	15	43	0.8	3.0.
10	3883.2	127	143	13	44	0.8	3.0
15	3888.5	127.	142	14	44	0.8	3.0.
20	3893.8	127	143	12	45	0.8	3.0

Tube Pair 2 Start Time: 1315		Initial Leak Check NDL @ 15 "Hg				Sample ID: 6A, 6B	
Tube Pair 2 End Time: 1335		Final Leak Check NDL @ 18.5 "Hg				Lab ID: L2279669-51	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	3894.0	126	142	15	42	0.8	3.0.
5	3899.0	126	142	13	43	0.8	3.0
10	3904.0	126	142	13	43	0.8	3.0
15	3908.5	127	142	13	43	0.8	3.5.
20	3914.5	127	142	12	45	0.8	3.5

Tube Pair 3 Start Time: 1339		Initial Leak Check NDL @ 18.5 "Hg				Sample ID: 7A, 7B	
Tube Pair 3 End Time: 1359		Final Leak Check NDL @ 16.5 "Hg				Lab ID: L2279669-52	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	3914.9	126	142	14	42	0.8	3.0.
5	~~3919.6~~ 3922.9	127	142	13	45	0.8	3.0
10	3927.4	125	142	13	46	0.8	3.0
15	3931.6	125	142	13	47	0.8	~~3.0~~ 4.0
20	3937.1	126	142	13	46	0.8	4.0

Tube Pair 4 Start Time: 1405		Initial Leak Check NDL @ 16.5 "Hg				Sample ID: 8A, 8B	
Tube Pair 4 End Time: 1425		Final Leak Check NDL @ 16 "Hg				Lab ID: L227669-53	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	3937.3	126	141	15	44	0.8	3.5
5	3941.9	126	142	14	44	0.8	5.0
10	3946.9	128	142	14	44	0.8	5.5
15	3950.5	127	141	13	46	0.8	7.0.
20	3956.0	128	141	13	47	0.8	4.0

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Vost Data Sheet

Plant: Covanta DYEC	Test Condition:	
Plant Location Courtice, ON	Test No: 3	Control Box ID: VOST #4
Test location: APC Outlet No. 1	DGMCF: 0.987.	Operator: JG.
Date: JUNE 28, 2019	Barometric Pressure: 29.66 "Hg	Project No: 21936
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 25A, 25B

Tube Pair 1 Start Time: 1431	Initial Leak Check NDL @ 15.5 "Hg	Sample ID: ~~8A, 8B~~ 9A 9B
Tube Pair 1 End Time: 1452	Final Leak Check NDL @ 17 "Hg	Lab ID: L2279669-54

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3956.2	126	140	15	43	0.8	3.0
5	3961.7	126	141	14	45	0.8	3.0
10	3967.3	127	142	14	47	0.8	3.0
15	3972.9	127	141	14	47	0.8	3.0
20	3978.5	126	142	14	47	0.8	3.0

*PAUSE @ 7MIN MARK or 1438 ON @ 1439 Process related.

Tube Pair 2 Start Time: 1457	Initial Leak Check NDL @ 16.5 "Hg	Sample ID: 10A 10B
Tube Pair 2 End Time: 1517	Final Leak Check NDL @ 14.5 "Hg	Lab ID: L2279669-55

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	3978.8	126	141	14	48	0.8	3.0
5	3984.1	126	142	14	46	0.8	3.0
10	3989.7	127	143	15	46	0.8	3.0
15	3995.1	127	143	15	47	0.8	3.0
20	4000.5	128	143	14	47	0.8	3.0

Tube Pair 3 Start Time: 1522	Initial Leak Check NDL @ 14 "Hg	Sample ID: 11A 11B
Tube Pair 3 End Time: 1542.	Final Leak Check NDL @ 17 "Hg	Lab ID: L2279669-56

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	4000.10	126	143	14	47	0.8	3.0
5	4006.0	126	143	13	47	0.8	3.0
10	4011.3	127	143	13	47	0.8	3.0
15	4016.4	127	143	13	47	0.8	3.0
20	4021.6	127	143	14	48	0.8	3.0

Tube Pair 4 Start Time: 1546	Initial Leak Check NDL @ 17 "Hg	Sample ID: 12A, 12B
Tube Pair 4 End Time: 1606	Final Leak Check @ "Hg	Lab ID: L2279669-57

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	4021.8	125	141	15	44	0.8	3.0
5	4027.6	126	141	14	46	0.8	3.0
10	4033.3	127	142	12	47	0.8	3.0
15	4039.1	125	142	12	48	0.8	3.0
20	4044.8	125	142	13	48	0.8	3.0

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Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 1		Control Box ID: 10117
Test location: APC Outlet No. 2	DGMCF: 0.993		Operator: [illegible]
Date: JUNE 27, 2019	Barometric Pressure: 29.67 "Hg		Project No: 21936
~1 LPM for 20 minutes	NDL - No Dectectable Leak		Field Blank Pair ID: 29A, B LZZ79669-74

Tube Pair 1 Start Time: 831		Initial Leak Check NDL @ 15 "Hg			Sample ID: 13A, B	
Tube Pair 1 End Time: 851		Final Leak Check NDL @ 10 "Hg			Lab ID: LZZ79669-58	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	26.53	127	141	23	24	2.4	2
5	31.5	133	143	17	28	2.4	2
10	36.8	131	141	14	29	2.4	2
15	42.3	131	142	14	29	2.4	2
20	47.3	132	142	15	29	2.4	2

Tube Pair 2 Start Time: 857		Initial Leak Check NDL @ 15 "Hg				Sample ID: 14A, B	
Tube Pair 2 End Time: 917		Final Leak Check NDL @ 11 "Hg				Lab ID: LZZ79669-59	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	47.7	132	142	15	28	2.4	2
5	52.7	132	142	14	27	2.4	2
10	57.6	132	142	15	27	2.4	2
15	62.8	132	141	15	28	2.4	2
20	67.7	132	141	13	28	2.4	2

Tube Pair 3 Start Time: 921		Initial Leak Check NDL @ 16 "Hg				Sample ID: 15A, B	
Tube Pair 3 End Time: 941		Final Leak Check NDL @ 12 "Hg				Lab ID: LZZ79669-60	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	70.0	134	141	10	28	2.4	2
5	74.9	134	141	10	28	2.4	2
10	79.9	134	141	10	29	2.4	2
15	83.8	134	141	10	29	2.4	2
20	~~88.0~~ 89.3	134	141	10	29	2.4	2

Tube Pair 4 Start Time: 947		Initial Leak Check NDL @ 16 "Hg				Sample ID: 16A, B	
Tube Pair 4 End Time: 1007		Final Leak Check NDL @ 12 "Hg				Lab ID: LZZ79669-61	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	89.37	133	140	10	28	2.4	2
5	94.8	134	140	11	29	2.4	2
10	99.4	134	140	11	29	2.4	2
15	105.2	134	141	11	29	2.4	2
20	110.3	134	141	11	29	2.4	2

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Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 2	Control Box ID: 1011?	
Test location: APC Outlet No. 2	DGMCF: 0.993	Operator: DW/CB	
Date: June 27, 2019	Barometric Pressure: 29.66 "Hg	Project No: 21936	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 30A + 30B	

Tube Pair 1 Start Time: 1306		Initial Leak Check NDL @ 16 "Hg				Sample ID: 17A,B	
Tube Pair 1 End Time: 1326		Final Leak Check NDL @ 14 "Hg				Lab ID: -62	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	73.2	120	141	22	28	2.4	1
5	78.61	124	141	16	27	2.4	1
10	~~83.~~84.00	125	141	15	27	2.4	1
15	89.34	124	141	16	28	2.4	1
20	94.70	124	141	15	27	2.4	1

Tube Pair 2 Start Time: 13:37		Initial Leak Check NDL @ 14 "Hg				Sample ID: 18A + B	
Tube Pair 2 End Time: 13:57		Final Leak Check NDL @ 14 "Hg				Lab ID: -63	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	95.06	124	139	26	27	2.4	1
5	100.00	125	139	17	27	2.4	1
10	105.50	125	139	17	27	2.4	1
15	110.92	125	139	17	28	2.4	1
20	116.40	125	139	18	28	2.4	1

Tube Pair 3 Start Time: 14:06		Initial Leak Check NDL @ 13 "Hg				Sample ID: 19 A + B	
Tube Pair 3 End Time: 14:26		Final Leak Check NDL @ 13 "Hg				Lab ID: -64	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	116.70	124	138	18	26	2.4	1
5	121.59	124	139	18	26	2.4	1
10	126.18	124	139	18	26	2.4	1
15	132.96	125	139	15	28	2.4	1
20	138.58	125	139	14	28	2.5	1

Tube Pair 4 Start Time: 14:33		Initial Leak Check NDL @ 14 "Hg				Sample ID: 20 A + B	
Tube Pair 4 End Time: 14:53		Final Leak Check NDL @ 16 "Hg				Lab ID: -65	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	138.80	124	139	14	27	2.4	1
5	143.80	125	139	15	28	2.4	1
10	148.83	125	139	15	28	2.4	1
15	153.88	125	139	15	28	2.4	1
20	159.02	125	139	15	28	2.4	1

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Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 3	Control Box ID: 10117	
Test location: APC Outlet No. 2	DGMCF: 0.993	Operator: CB.	
Date: June 27, 2019	Barometric Pressure: 29.65 "Hg	Project No: 21936	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 25 A + B	

Tube Pair 1 Start Time: 15:09	Initial Leak Check NDL @ 14 "Hg	Sample ID: 21A + B
Tube Pair 1 End Time: 15:29	Final Leak Check NDL @ 14 "Hg	Lab ID: -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	59.08	124	138	15	26	2.4	1
5	64.28	125	139	16	28	2.4	1
10	69.40	125	139	17	28	2.4	1
15	74.42	125	140	17	28	2.4	1
20	79.45	125	140	18	28	2.4	1

Tube Pair 2 Start Time: 15:35	Initial Leak Check NDL @ 15 "Hg	Sample ID: 22 A + B
Tube Pair 2 End Time: 15:55	Final Leak Check NDL @ 15 "Hg	Lab ID: -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	79.80	123	140	18	28	2.5	1
5	85.31	125	140	17	29	2.5	1
10	90.88	125	139	16	29	2.5	1
15	96.40	125	139	16	29	2.5	1
20	101.91	125	139	16	29	2.5	1

Tube Pair 3 Start Time: 16:15	Initial Leak Check NDL @ 15 "Hg	Sample ID: 23 A + B
Tube Pair 3 End Time: 16:35	Final Leak Check NDL @ 15 "Hg	Lab ID: -68

Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	2.15	125	140	11	27	2.4	1
5	8.58	125	141	12	28	2.4	1
10	13.91	126	141	13	29	2.5	1
15	19.40	126	141	13	29	2.5	1
20	24.79	125	140	13	30	2.5	1

Tube Pair 4 Start Time: 16:45	Initial Leak Check NDL @ 15 "Hg	Sample ID: 24 A + B
Tube Pair 4 End Time: 17:05	Final Leak Check NDL @ 15 "Hg	Lab ID: -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	25.00	124	140	19	27	2.4	1
5	29.98	125	140	18	29	2.4	1
10	34.93	125	141	17	29	2.3	1
15	39.75	125	141	17	29	2.3	1
20	44.72	125	141	17	29	2.3	1

Rev: May 10, 2016

APPENDIX 9

Aldehydes Field Data Sheets
(8 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Aldehydes
Sample Volume Corrections

Test No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H_2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm^3)*
1	0.990	38.10	71.70	33.60	29.45	0.50	44.2	30.80	0.0308
2	0.990	45.70	79.20	33.50	29.63	0.50	47.1	30.62	0.0306
3	0.990	79.80	112.70	32.90	29.63	0.50	49.8	29.82	0.0298

* Dry at 25°C and 1 atmosphere.

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Aldehydes
Sample Volume Corrections

Test No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H_2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm^3)*
1	0.992	11.45	43.70	32.25	29.68	1.30	27.6	31.56	0.0316
2	0.992	43.80	73.20	29.40	29.68	1.23	28.4	28.69	0.0287
3	0.992	46.00	83.30	37.30	29.63	1.30	31.9	35.93	0.0359

* Dry at 25°C and 1 atmosphere.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 1
Date:	JUNE 26, 2019
Project No.:	21936

Measuring Device	MII Number
Control Module	Vost #4 A11542
Barometer	Environment Canada

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	3838.1	124	140	125	20	40	.5	1.0
5	3841.9	129	141	126	19	42	.5	1.0
10	3844.8	127	142	126	19	43	.5	1.0
15	3847.2	128	141	123	22	42	.5	1.0
20	3850.4	129	141	122	22	45	.5	1.0
25	3853.2	128	142	121	21	44	.5	1.0
30	3855.5	128	142	121	21	44	.5	1.0
35	3858.3	128	142	119	22	46	.5	1.0
40	3860.9	127	142	118	20	46	.5	1.0
45	3863.6	129	142	118	20	46	.5	1.0
50	3866.5	129	142	117	20	46	.5	1.0
55	3869.1	129	142	118	20	46	.5	1.0
60	3871.7	129	142	117	20	46	.5	1.0

Start Time:	1137
Finish Time:	1237
Initial Leak Check:	<.01 Lpm @ 15.5 "Hg

DGMCF:	0.990
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

No Purge, No Final Leak Check

: sample @ ~0.5 lpm for 60 minutes.

Operator: [signature]

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 1
Date:	JUNE 22, 2019
Project No.:	21936

Measuring Device	MII Number
Control Module	Voss #4 A 11542
Barometer	Environment Canada

Barometric Pressure: ~~29.47~~ 29.63 "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 ΔH "H_2O	Pump Vacuum "Hg Gauge
0	4045.7	127	139	130	23	42	0.5	1.0
5	4048.6	129	140	129	24	46	0.5	1.0
10	4052.5	132	140	128	20	46	0.5	1.0
15	4055.4	130	140	127	21	46	0.5	1.0
20	4058.1	129	140	125	24	47	0.5	1.0
25	4060.6	128	140	123	22	47	0.5	1.0
30	4063.4	127	139	121	21	48	0.5	1.0
35	4066.0	129	139	121	21	47	0.5	1.0
40	4068.5	129	140	121	20	48	0.5	1.0
45	4071.3	128	140	120	20	48	0.5	1.0
50	4073.9	128	140	119	20	49	0.5	1.0
55	4076.4	128	140	119	20	49	0.5	1.0
60	4079.2	128	140	118	21	49	0.5	1.0

Start Time:	1622
Finish Time:	1722
Initial Leak Check:	<.01 Lpm @ 15 "Hg

DGMCF:	0.990
Sample Volume:	
Average DGM Temp:	
Average DGM ΔH:	

Comments:

No Purge, No Final Leak Check
: sample @ ~0.5 lpm for 60 minutes.

Operator:

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 1
Date:	June 27, 2019
Project No.:	21936

Measuring Device	MII Number
Control Module	[illegible] A11542
Barometer	Environment Canada

Barometric Pressure: 29.63 "Hg

Clock Time	Dry Gas Meter 4079.8 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	~~408~~	126	140	115	19	46	0.5	1.0
5	4082.5	129	140	117	20	49	0.5	1.0
10	4085.3	128	140	117	23	49	0.5	1.0
15	4087.8	128	140	115	23	50	0.5	1.0
20	4090.6	129	140	116	20	49	0.5	1.0
25	4093.4	128	140	115	20	50	0.5	1.0
30	4096.0	129	140	115	20	51	0.5	1.0
35	4098.7	129	142	117	20	50	0.5	1.0
40	4101.5	128	140	117	20	50	0.5	1.0
45	4104.1	128	141	117	19	50	0.5	1.0
50	4106.8	127	141	115	20	51	0.5	1.0
55	4109.5	128	141	117	20	51	0.5	1.0
60	4112.7	128	141	117	19	51	0.5	1.0

Start Time:	1725
Finish Time:	1825
Initial Leak Check:	<.01 Lpm @ 16 "Hg

DGMCF:	0.990
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

No Purge, No Final Leak Check

: sample @ ~0.5 lpm for 60 minutes.

Operator:

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 2
Date:	June 27, 2018
Project No.:	21936

Measuring Device	MII Number
Control Module	10117
Barometer	Environment Canada

Barometric Pressure: 29.68 "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 ΔH "H_2O	Pump Vacuum "Hg Gauge
0	11.45	134	140	135	25	25	1.3	1
5	14.5	140	141	137	25	27	1.3	1
10	18.5	126	141	135	22	27	1.3	1
15	21.4	127	139	134	22	27	1.3	1
20	23.96	129	140	135	21	28	1.3	1
25	26.4	128	140	135	21	28	1.3	1
30	28.9	126	141	135	21	28	1.3	1
35	31.3	130	140	135	21	28	1.3	1
40	33.96	127	140	135	20	29	1.3	1
45	36.3	128	140	136	21	28	1.3	1
50	38.8	127	140	136	21	28	1.3	1
55	41.2	129	140	136	21	28	1.3	1
60	43.7	126	140	136	21	28	1.3	1

Start Time:	1040	
Finish Time:	1140	
Initial Leak Check:	<.01	Lpm @ 17 "Hg

DGMCF:	0.992
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments: ICED MP WELL (WATER + ICE)

No Purge, No Final Leak Check

: sample @ ~0.5 lpm for 60 minutes.

Operator: [signature]

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 2
Date:	JUNE 27 2019
Project No.:	21936

Measuring Device	MII Number
Control Module	10117
Barometer	Environment Canada

Barometric Pressure: 29.68 "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 ΔH "H_2O	Pump Vacuum "Hg Gauge
0	43.5	125	140	133	26	26	1.3	1
5	46.2	130	140	136	22	27	1.3	1
10	48.6	130	141	136	22	27	1.3	1
15	51.1	125	140	136	21	28	1.3	1
20	53.6	125	140	135	21	29	1.2	1
25	55.9	125	140	136	21	29	1.2	1
30	58.3	129	140	136	21	29	1.2	1
35	60.7	129	141	136	21	29	1.2	1
40	63.2	130	141	136	21	29	1.2	1
45	65.7	130	141	136	21	29	1.2	1
50	68.2	130	140	136	21	29	1.2	1
55	70.5	131	140	135	22	29	1.2	1
60	73.2	130	141	136	22	29	1.2	1

Start Time:	1155
Finish Time:	1255
Initial Leak Check:	0.01 Lpm @ 10 "Hg

DGMCF:	0.992
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

No Purge, No Final Leak Check

: sample @ ~0.5 lpm for 60 minutes.

Operator: D. Ay

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No.
Date:	June 22, 2019
Project No.:	21936

Measuring Device	MII Number
Control Module	10117
Barometer	Environment Canada

Barometric Pressure: 29.63 "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	46.00	130	139	125	25	25	1.3	1
5	49.39	130	140	139	22	30	1.3	1
10	52.41	131	141	143	20	31	1.3	1
15	55.56	132	141	143	20	32	1.3	1
20	58.73	138	144	144	20	33	1.3	1
25	61.90	139	145	144	20	33	1.3	1
30	65.03	136	140	144	19	33	1.3	1
35	67.90	136	141	144	19	33	1.3	1
40	71.00	135	141	144	19	33	1.3	1
45	74.14	135	142	144	19	33	1.3	1
50	77.15	132	141	144	19	33	1.3	1
55	80.17	134	141	145	20	33	1.3	1
60	83.30	134	141	145	20	33	1.3	1

Start Time:	17:30		
Finish Time:	18:30		
Initial Leak Check:	<0.01	Lpm @	17 "Hg

DGMCF:	0.992
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments: – WELL ICED – HIGH AMBIENT TEMP.

No Purge, No Final Leak Check
: sample @ ~0.5 lpm for 60 minutes.

Operator: CHRIS BELORE

APPENDIX 10

ORTECH Sample Log/Chain of Custody Forms
(9 pages)

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21936 - J2615

L2300090

	ORTECH Sample ID 19-21936-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
	1		1	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
	2				PM 2.5 cyclone Rinse	Acetone	Particulate
	3				PM 2.5 exit & connectors	Acetone	Particulate
	4				Back up filter	filter	Particulate
	5				Impinger Soln & rinse	Water	Particulate
5	6				Secondary Filter	Filter	Particulate*
	7				Impinger Rinse	Acetone & Hexane	Particulate
6	8		2	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
7	9				PM 2.5 cyclone Rinse	Acetone	Particulate
8	10				PM 2.5 exit & connectors	Acetone	Particulate
9	11				Back up filter	filter	Particulate
	12				Impinger Soln & rinse	Water	Particulate
10	13				Secondary Filter	Filter	Particulate*
	14				Impinger Rinse	Acetone & Hexane	Particulate
11	15		3	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
12	16				PM 2.5 cyclone Rinse	Acetone	Particulate
13	17				PM 2.5 exit & connectors	Acetone	Particulate
14	18				Back up filter	filter	Particulate
	19				Impinger Soln & rinse	Water	Particulate
15	20				Secondary Filter	Filter	Particulate*
	21				Impinger Rinse	Acetone & Hexane	Particulate
16	22		1	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
17	23				PM 2.5 cyclone Rinse	Acetone	Particulate
18	24				PM 2.5 exit & connectors	Acetone	Particulate
19	25				Back up filter	filter	Particulate
	26				Impinger Soln & rinse	Water	Particulate
20	27				Secondary Filter	Filter	Particulate*
	28				Impinger Rinse	Acetone & Hexane	Particulate
21	29		2	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
22	30				PM 2.5 cyclone Rinse	Acetone	Particulate
23	31				PM 2.5 exit & connectors	Acetone	Particulate
24	32				Back up filter	Filter	Particulate
	33				Impinger Soln & rinse	Water	Particulate
25	34				Secondary Filter	Filter	Particulate*
	35				Impinger Rinse	Acetone & Hexane	Particulate

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21936 - J2615

ORTECH Sample ID 19-21936-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
26 36		3	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
27 37				PM 2.5 cyclone Rinse	Acetone	Particulate
28 38				PM 2.5 exit & connectors	Acetone	Particulate
29 39				Back up filter	Filter	Particulate
30 40				Impinger Soln & rinse	Water	Particulate
41				Secondary Filter	Filter	Particulate*
42				Impinger Rinse	Acetone & Hexane	Particulate
31 43		Blank	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
32 44				PM 2.5 cyclone Rinse	Acetone	Particulate
33 45				PM 2.5 exit & connectors	Acetone	Particulate
34 46				Back up filter	filter	Particulate
35 47				Impinger Soln & rinse	Water	Particulate
48				Secondary Filter	Filter	Particulate*
49				Impinger Rinse	Acetone & Hexane	Particulate
36 50		Blank	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
37 51				PM 2.5 cyclone Rinse	Acetone	Particulate
38 52				PM 2.5 exit & connectors	Acetone	Particulate
39 53				Back up filter	Filter	Particulate
40 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. 15.5 18.8°C

Relinquished To: Aaron Burton Date: 27-June-2019

Relinquished By: [signature] Date: Jun 27/19

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21936 - J2615

L2300111

ORTECH Sample ID 19-21936-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
1		#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 1-4 Solution	Nitric/Peroxide	Metals
5				Impinger 5-6 Solution	Acid. KMnO4	Mercury
6				Impinger 5-6 Rinse	8N HCl	Mercury
7		#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 1-4 Solution	Nitric/Peroxide	Metals
11				Impinger 5-6 Solution	Acid. KMnO4	Mercury
12				Impinger 5-6 Rinse	8N HCl	Mercury
13		#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 1-4 Solution	Nitric/Peroxide	Metals
17				Impinger 5-6 Solution	Acid. KMnO4	Mercury
18				Impinger 5-6 Rinse	8N HCl	Mercury
19		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 1-4 Solution	Nitric/Peroxide	Metals
23				Impinger 5-6 Solution	Acid. KMnO4	Mercury
24				Impinger 5-6 Rinse	8N HCl	Mercury

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21936 - J2615

	ORTECH Sample ID 19-21936-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
5	√ 25		#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 1-4 Solution	Nitric/Peroxide	Metals
	√ 29				Impinger 5-6 Solution	Acid. KMnO4	Mercury
	√ 30				Impinger 5-6 Rinse	8N HCl	Mercury
6	√ 31		#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 1-4 Solution	Nitric/Peroxide	Metals
	√ 35				Impinger 5-6 Solution	Acid. KMnO4	Mercury
	√ 36				Impinger 5-6 Rinse	8N HCl	Mercury
7	√ 37		#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 1-4 Solution	Nitric/Peroxide	Metals
	√ 41				Impinger 5-6 Solution	Acid. KMnO4	Mercury
	√ 42				Impinger 5-6 Rinse	8N HCl	Mercury
8	√ 43		Blank 2	Blank 2	Probe Rinse Acetone	Acetone	Particulate & Metals
	√ 44				Probe Rinse Nitric	0.1N Nitric	Metals
	√ 45				Filter	Particulate	Particulate & Metals
	√ 46				Impinger 1-4 Solution	Nitric/Peroxide	Metals
	√ 47				Impinger 5-6 Solution	Acid. KMnO4	Mercury
	√ 48				Impinger 5-6 Rinse	8N HCl	Mercury

Relinquished By: [signature] Date: JUN 27/19

Relinquished To: AARON BARTON Date: 27-June-2019

16:15

18.6°C

ORTECH Environmental Sample Log

Acid Gases

Covanta

Client: Covanta
Job/Report Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO #: 21936-J2615

L2300144

ORTECH Sample ID 19-21936-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Final Volume(ml)	Sample Analysis
1	June 25, 19	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	470	HCl, HF & Ammonia
2		APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	450	HCl, HF & Ammonia
3		APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	473	HCl, HF & Ammonia
4	June 26, 19	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	488	HCl, HF & Ammonia
5		APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	462.8	HCl, HF & Ammonia
6		APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	487.0	HCl, HF & Ammonia
Blank 1		APC # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	306	HCl, HF & Ammonia
Blank 2		APC # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	300	HCl, HF & Ammonia

Analyze for HCl, HF and Ammonia

Relinquished By: DAN TURTON   Date: JUN 27/19

Relinquished To: AARON BURTON   Date: 27-June-2019

15:15

18.3°C

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21936 - J2615

L2300710

	ORTECH Sample ID 19 - 21936 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1	1	27-Jun-19	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
2	6	27-Jun-19	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
3	11	28-Jun-19	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
4	16	27-Jun-19	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 May 27, 2019 for lists of analytes.

Relinquished To: Aaron Burton   Date: 2-July-2019   11:30   10.6°C

Relinquished By: [signature]   Date: July 2, 19

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21936 - J2615

	ORTECH Sample ID 19 - 21936 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
5	21	27-Jun-19	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
6	26	27-Jun-19	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
7	31	28-Jun-19	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
8	36	27-Jun-19	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 May 27, 2019 for lists of analytes.

11:30
10.6°C

Relinquished To: Aaron Burton Date: 2-July-2019

Relinquished By: [signature] Date: July 2, 19

ORTECH Sample Log
Method 430 Samples
Covanta

Client: Covanta
Project Number: 21936
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/P.O.: Ortech P.O. : 21936 - J2615

L2301524

Test Location	Test Number	ORTECH Sample ID 19-21936-M430-	Sample Date	Sample Media
#1 APC Outlet	1	1	June 26, 2019	DNPH & Toluene
	2	2	June 27, 2019	DNPH & Toluene
	3	3	June 27, 2019	DNPH & Toluene
	Blank 1	Blank 1	June 27, 2019	DNPH & Toluene
#2 APC Outlet	1	4	June 27, 2019	DNPH & Toluene
	2	5	June 27, 2019	DNPH & Toluene
	3	6	June 27, 2019	DNPH & Toluene
	Blank 2	Blank 2	June 27, 2019	DNPH & Toluene
	Trip Spike		June 27, 2019	

Analyse for: Formaldehyde
Acetaldehyde

L2301528

ORTECH Sample Log
VOCs

REVISED

Client: Covanta
Project Number: 21936
Received By:
Job Assigned To: ALS
Quote / PO : ORTECH PO: 21936 - J2615

Test Location	Test Number	Pair Number	ORTECH Sample ID 19-21936-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet			1a,1b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			2a, 2b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			3a,3b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			4a,4b	June 27, 2019	Tenax and Tenax/Charcoal	archive
			5a,5b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			6a,6b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			7a,7b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
			8a,8b	June 27, 2019	Tenax and Tenax/Charcoal	archive
			9a,9b	June 27, 2019	Tenax and Tenax/Charcoal	
			10a,10b	June 27, 2019	Tenax and Tenax/Charcoal	
			11a,11b	June 27, 2019	Tenax and Tenax/Charcoal	
			12a,12b	June 27, 2019	Tenax and Tenax/Charcoal	
				June 27, 2019	Archived	
# 2 APC Outlet	1	1	13a,13b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		2	14a,14b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		3	15a,15b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		4	16a,16b	June 27, 2019	Tenax and Tenax/Charcoal	archive
	2	1	17a,17b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		2	18a,18b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		3	19a,19b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		4	20a,20b	June 27, 2019	Tenax and Tenax/Charcoal	archive
	3	1	21a,21b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		2	22a,22b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		3	23a,23b	June 27, 2019	Tenax and Tenax/Charcoal	archive
		4	24a,24b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		Field Blank 1	29a,29b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		Field Blank 2	30a,30b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		Field Blank 3	25a,25b	June 27, 2019	Tenax and Tenax/Charcoal	VOCs
		Trip Blank	Please used returned unused tube pair			VOCs
	Combined Condesate			June 27, 2019	Archived	

Refer to letter dated May 27, 2019 for lists of analytes.

Received by Aaron Bunton
28-June-2019
11:40
2.2°C

Custody Relinquished by: Date:

APPENDIX 11

Particulate and Metals Train Recovery Data Sheets
(8 pages)

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: June 25, 19
Test No.: 1
Test Location: Unit 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.1
After Act. Rinse:	356.8
Total TS1:	75.7

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.0
After 0.1N HNO_3 Rinse:	402.8
Total TS2:	122.8

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: QZ 6380

CONTAINER TS3

Initial Wt:	.8299
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	666.0
Final Wt:	948.7
1 Gain:	282.7
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	559.4
Initial Wt:	670.5
Final Wt:	780.4
2 Gain:	109.9
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	677.0
Initial Wt:	776.2
Final Wt:	806.0
3 Gain:	29.8
Colour:	clear

Impinger #4 Empty	
Empty Wt:	618.5
Final Wt:	621.7
4 Gain:	3.2
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	428.4
w/ Imp. 1-4 Soln:	1061.9
Imp. 1 to 4 Volume:	633.5
After HNO_3 Rinse:	1168.9
Total TS4:	740.5

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	508.5
Initial Wt:	623.5
Final Wt:	631.3
5 Gain:	8.0
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	677.7
Initial Wt:	789.4
Final Wt:	796.3
6 Gain:	6.9
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	428.0
With Imp. 5&6 Soln:	657.6
Imp. 5&6 Volume:	229.6
After $KMnO_4$ Rinse:	766.0
After100g H_2O Rinse:	872.1
Total TS5-A:	444.1

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	278.0
With 150 mL DI H_2O:	427.0
After HCl Rinse:	482.7
After DI H_2O Rinse:	585.5
Total TS5-B:	307.5

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	900.2
Final Wt:	927.4
7 Gain:	27.2

Impinger Box ID: 7

SAMPLE IDENTIFICATION	19-21936-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

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

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date:

CWTR = 1 to 6: 439.5 ✓

WCBDA= 7: 27.2

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 24, 19
Test No.: 2
Test Location: UNIT

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.0
After Act. Rinse:	335.7
Total TS1:	54.7

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.5
After 0.1N HNO_3 Rinse:	413.5
Total TS2:	133.0

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 0267368

CONTAINER TS3

Initial Wt:	.3125 ~~[illegible]~~
Final Wt:	
Gain:	
Colour:	

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	653.7
Final Wt:	955.0
1 Gain:	301.3
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	674.1
Initial Wt:	788.8
Final Wt:	934.1 ~~676.3~~
2 Gain:	145.3
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	541.9
Initial Wt:	648.5
Final Wt:	~~434.1~~ 676.3
3 Gain:	27.8
Colour:	clear

Impinger #4 Empty	
Empty Wt:	629.0
Final Wt:	630.4
4 Gain:	1.4
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	428.5
w/ Imp. 1-4 Soln:	1120.3
Imp. 1 to 4 Volume:	691.8
After HNO_3 Rinse:	~~1223.1~~ 1240.0
Total TS4:	811.5

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	649.3
Initial Wt:	759.4
Final Wt:	761.1
5 Gain:	1.7
Colour:	purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	654.7
Initial Wt:	770.6
Final Wt:	776.8
6 Gain:	6.2
Colour:	purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	425.8
With Imp. 5&6 Soln:	654.8
Imp. 5&6 Volume:	229.0
After $KMnO_4$ Rinse:	766.8
After100g H_2O Rinse:	868.9
Total TS5-A:	443.1

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	280.5
With 150 mL DI H_2O:	425.7
After HCl Rinse:	478.9
After DI H_2O Rinse:	619.0
Total TS5-B:	338.5

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	945.6
Final Wt:	971.1
7 Gain:	25.5

Impinger Box ID: 9

SAMPLE IDENTIFICATION	19-21936-PM-
TS1 (Probe Rinse-Acetone)	~~[illegible]~~ 7
TS2 (Probe Rinse-0.1N HNO_3)	~~[illegible]~~ 8
TS3 (Filter)	~~[illegible]~~ 9
TS4 (Impinger 1-4 Sol'n-HNO_3)	~~[illegible]~~ 10
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	~~[illegible]~~ 11
TS5-B (Impinger 5,6 Rinse-HCl)	~~[illegible]~~ 12

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

Train Loaded By: DT
Train Recovered By: DT/AS
Recovery Witnessed By:
Date:

CWTR = 1 to 6: 483.7 ✓

WCBDA= 7: 25.5

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 26, 2019
Test No.: 3
Test Location: UNIT #1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	284.7
After Act. Rinse:	399.5
Total TS1:	114.8

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	283.7
After 0.1N HNO_3 Rinse:	430.9
Total TS2:	147.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 18-QF-140

CONTAINER TS3

Initial Wt:	0.7954
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	575.9
Final Wt:	~~925.3~~ 931.3
1 Gain:	355.4
Colour:	WHITE

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	631.4
Initial Wt:	742.8
Final Wt:	932.0
2 Gain:	189.2
Colour:	CLEAR

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	659.5
Initial Wt:	760.0
Final Wt:	777.0
3 Gain:	17.0
Colour:	CLEAR

Impinger #4 Empty	
Empty Wt:	614.8
Final Wt:	617.2
4 Gain:	2.4
Colour:	CLEAR

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.5
w/ Imp. 1-4 Soln:	1199.4
Imp. 1 to 4 Volume:	771.9
After HNO_3 Rinse:	1370.7
Total TS4:	943.2

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	669.1
Initial Wt:	782.3
Final Wt:	782.2
5 Gain:	-0.1
Colour:	PURPLE

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	664.3
Initial Wt:	778.9
Final Wt:	781.2
6 Gain:	2.3
Colour:	PURPLE

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	427.5
With Imp. 5&6 Soln:	653.8
Imp. 5&6 Volume:	226.3
After $KMnO_4$ Rinse:	769.9
After100g H_2O Rinse:	877.0
Total TS5-A:	449.5

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.1
With 150 mL DI H_2O:	445.1
After HCl Rinse:	482.7
After DI H_2O Rinse:	557.5
Total TS5-B:	274.4

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	943.2
Final Wt:	965.9
7 Gain:	22.7

Impinger Box ID: 16

SAMPLE IDENTIFICATION	19-21936-PM-
TS1 (Probe Rinse-Acetone)	~~15~~ 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

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

CWTR = 1 to 6: 566.2 ✓

WCBDA= 7: 22.7

Train Loaded By: DS
Train Recovered By: SG / AS
Recovery Witnessed By:
Date: JUNE 26, 2019

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 26, 19
Test No.: BLANK 1
Test Location:

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	280.8
After Act. Rinse:	571.4
Total TS1:	290.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.2
After 0.1N HNO_3 Rinse:	623.4
Total TS2:	343.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 19 QF119

CONTAINER TS3

Initial Wt:	.7886
Final Wt:	
Gain:	
Colour:	

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:	428.6
w/ Imp. 1-4 Soln:	641.3
Imp. 1 to 4 Volume:	212.7
After HNO_3 Rinse:	741.9
Total TS4:	313.3

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:	428.2
With Imp. 5&6 Soln:	648.3
Imp. 5&6 Volume:	220.1
After $KMnO_4$ Rinse:	762.6
After100g H_2O Rinse:	862.2
Total TS5-A:	434.0

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.3
With 150 mL DI H_2O:	431.9
After HCl Rinse:	481.9
After DI H_2O Rinse:	581.9
Total TS5-B:	300.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
7 Gain:	

Impinger Box ID:

SAMPLE IDENTIFICATION	19-21936-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

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

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date:

CWTR = 1 to 6:

WCBDA= 7:

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Date:	June 25/19
Test No.:	1
Test Location:	unit 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.0
After Act. Rinse:	400.8
Total TS1:	119.8

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.0
After 0.1N HNO_3 Rinse:	423.8
Total TS2:	143.8

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: Q2 6383

CONTAINER TS3

Initial Wt:	.8228
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	575.8
Final Wt:	918.9
1 Gain:	343.1 ~~342.9~~
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	630.6
Initial Wt:	732.4
Final Wt:	826.5
2 Gain:	94.1
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	657.5
Initial Wt:	765.8
Final Wt:	791.0
3 Gain:	25.2
Colour:	clear

Impinger #4 Empty	
Empty Wt:	614.1
Final Wt:	616.4
4 Gain:	2.3
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.6
w/ Imp. 1-4 Soln:	1095.3
Imp. 1 to 4 Volume:	667.7
After HNO_3 Rinse:	1232.4
Total TS4:	804.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	668.6
Initial Wt:	789.2
Final Wt:	792.8
5 Gain:	~~46~~ 3.6
Colour:	purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	667.0
Initial Wt:	764.9
Final Wt:	771.0
6 Gain:	6.1
Colour:	purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	427.5
With Imp. 5&6 Soln:	653.1
Imp. 5&6 Volume:	225.6
After $KMnO_4$ Rinse:	757.2
After100g H_2O Rinse:	865.7
Total TS5-A:	438.2

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	280.4
With 150 mL DI H_2O:	433.5
After HCl Rinse:	487.7
After DI H_2O Rinse:	591.3
Total TS5-B:	310.9

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	918.1
Final Wt:	944.2
7 Gain:	26.1

Impinger Box ID: 16

SAMPLE IDENTIFICATION	19-21936-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

Train Loaded By: DT
Train Recovered By: AS/DT
Recovery Witnessed By:
Date:

474.4
CWTR = 1 to 6: 473.2

WCBDA= 7: 26.1

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Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Date:	JUNE 26, 19
Test No.:	2
Test Location:	UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	279.0
After Act. Rinse:	399.6
Total TS1:	120.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.0
After 0.1N HNO_3 Rinse:	427.2
Total TS2:	147.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 18-OF-118

CONTAINER TS3

Initial Wt:	.7891
Final Wt:	
Gain:	
Colour:	

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	654.1
	Final Wt:	925.1
1	Gain:	271.0
	Colour:	clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	674.4
	Initial Wt:	763.0
	Final Wt:	947.7
2	Gain:	184.7
	Colour:	clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	543.5
	Initial Wt:	660.3
	Final Wt:	681.3
3	Gain:	21.0
	Colour:	clear

	Impinger #4 Empty	
	Empty Wt:	629.3
	Final Wt:	632.0
4	Gain:	2.7
	Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.0
w/ Imp. 1-4 Soln:	1110.4
Imp. 1 to 4 Volume:	684.4
After HNO_3 Rinse:	1283.1
Total TS4:	857.1

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	649.3
	Initial Wt:	752.6
	Final Wt:	753.6
5	Gain:	1.0
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	654.7
	Initial Wt:	779.0
	Final Wt:	777.7
6	Gain:	-1.3
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.6
With Imp. 5&6 Soln:	647.0
Imp. 5&6 Volume:	220.4
After $KMnO_4$ Rinse:	762.7
After100g H_2O Rinse:	865.1
Total TS5-A:	438.5

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	284.5
With 150 mL DI H_2O:	434.5
After HCl Rinse:	499.8
After DI H_2O Rinse:	618.7
Total TS5-B:	334.2

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	971.1
	Final Wt:	992.2
7	Gain:	21.1

Impinger Box ID: 9

SAMPLE IDENTIFICATION	19-21936-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

CWTR = 1 to 6:	479.1 ✓
WCBDA= 7:	21.1

Train Loaded By: BT
Train Recovered By: BT
Recovery Witnessed By:
Date:

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: Jun 26/19
Test No.: 3
Test Location: Unit 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	280.2
After Act. Rinse:	346.6
Total TS1:	66.4

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.0
After 0.1N HNO_3 Rinse:	406.7
Total TS2:	125.7

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 18-QF116

CONTAINER TS3

Initial Wt:	.7655
Final Wt:	
Gain:	
Colour:	

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	656.0
Final Wt:	940.6
1 Gain:	284.6
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	559.7
Initial Wt:	666.0
Final Wt:	867.3
2 Gain:	201.3
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	676.7
Initial Wt:	778.7
Final Wt:	801.8
3 Gain:	23.1
Colour:	clear

Impinger #4 Empty	
Empty Wt:	617.4
Final Wt:	619.2
4 Gain:	1.8
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	425.7
w/ Imp. 1-4 Soln:	1131.3
Imp. 1 to 4 Volume:	705.6
After HNO_3 Rinse:	1249.5
Total TS4:	823.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	508.4
Initial Wt:	622.1
Final Wt:	626.1
5 Gain:	4.0
Colour:	purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	680.0
Initial Wt:	792.5
Final Wt:	795.6
6 Gain:	3.1
Colour:	purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.8
With Imp. 5&6 Soln:	656.5
Imp. 5&6 Volume:	229.7
After $KMnO_4$ Rinse:	771.3
After100g H_2O Rinse:	927.3
Total TS5-A:	500.5

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	284.9
With 150 mL DI H_2O:	~~428.0~~ 434.1
After HCl Rinse:	500.0
After DI H_2O Rinse:	578.5
Total TS5-B:	293.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	927.4
Final Wt:	948.4
7 Gain:	21.0

Impinger Box ID: 7

SAMPLE IDENTIFICATION	19-21936-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

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

Train Loaded By: DT
Train Recovered By: AS
Recovery Witnessed By:
Date:

CWTR = 1 to 6: 517.9 ✓

WCBDA= 7: 21.0

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Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 26, 19
Test No.: BLANK 2
Test Location:

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	280.6
After Act. Rinse:	561.6
Total TS1:	281.0

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	279.8
After 0.1N HNO_3 Rinse:	676.8
Total TS2:	397.0

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 19-QF 124

CONTAINER TS3

Initial Wt:	.8014
Final Wt:	
Gain:	
Colour:	

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:	639.9
Imp. 1 to 4 Volume:	212.0
After HNO_3 Rinse:	737.7
Total TS4:	309.8

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:	428.2
With Imp. 5&6 Soln:	652.8
Imp. 5&6 Volume:	224.6
After $KMnO_4$ Rinse:	765.8
After100g H_2O Rinse:	865.4
Total TS5-A:	437.2

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.3
With 150 mL DI H_2O:	433.8
After HCl Rinse:	483.7
After DI H_2O Rinse:	584.3
Total TS5-B:	303.0

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
7 Gain:	

Impinger Box ID:

SAMPLE IDENTIFICATION	19-21936-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

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

Train Loaded By:
Train Recovered By: BT
Recovery Witnessed By:
Date:

CWTR = 1 to 6:

WCBDA= 7:

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#:	L2300111		Mississauga, ON L5J 2Y4
Date of Report	9-Jul-19		Canada
Date of Sample Receipt	27-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 04-Jul-2019)

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

ALS Environmental

Sample Analysis Summary Report

Sample Name		**19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET**	**19-21936-PM-(7 THRU 12) TEST2 #1 APC OUTLET**	**19-21936-PM-(13 THRU 18) TEST3 #1 APC OUTLET**	**19-21936-PM-(19 THRU 24) BLANK 1**	**19-21936-PM-(25 THRU 30) TEST1 #2 APC OUTLET**
ALS Sample ID		L2300111-1	L2300111-2	L2300111-3	L2300111-4	L2300111-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		25-Jun-19	25-Jun-19	26-Jun-19	26-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
PM via Gravimetric Analysis	**LOR**					
Method 5	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	<0.1	<0.1	0.6 J	1.3	<0.1
Acetone Particulate Matter	0.4	2.1	3.5	2.0	0.3 J	2.0
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	74.7	51.9	114	290	118

ALS Environmental

Sample Analysis Summary Report

Sample Name	LOR	19-21936-PM-(31 THRU 36) TEST2 #2 APC OUTLET		19-21936-PM-(37 THRU 42) TEST3 #2 APC OUTLET		19-21936-PM-(43 THRU 48) BLANK 2		MB	
ALS Sample ID		L2300111-6		L2300111-7		L2300111-8		L2300111-MB	
Matrix		Stack		Stack		Stack		n/a	
Analysis type		Sample		Sample		Sample		Sample	
Sampling Date/Time		25-Jun-19		26-Jun-19		26-Jun-19		n/a	
Date of Receipt		27-Jun-19		27-Jun-19		27-Jun-19		n/a	
PM via Gravimetric Analysis Method 5	**mg**	**mg**		**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	<0.1		0.5	J	2.4		0.1	J
Acetone Particulate Matter	0.4	1.2		1.2		0.3	J	0.3	J
	g	**g**		**g**		**g**		**g**	
Acetone Mass	0.02	117		64.3		280		31.6	

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#:	L2300090		Mississauga, ON L5J 2Y4
Date of Report	16-Jul-19		Canada
Date of Sample Receipt	27-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 201A (SR 02-Jul-2019)
Sample Particulate Analysis via Gravimetric USEPA Method 202 (SR 15-Jul-2019)

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: lwrek

Claire Kocharakkal
Project Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-1 TEST1 #1 APC OUTLET	19-21936-M201A-2 TEST1 #1 APC OUTLET	19-21936-M201A-3 TEST1 #1 APC OUTLET	19-21936-M201A-4 TEST1 #1 APC OUTLET	19-21936-M201A-(5-7) TEST1 #1 APC OUTLET
ALS Sample ID		L2300090-1	L2300090-2	L2300090-3	L2300090-4	L2300090-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
PM via Gravimetric Analysis	**LOR**					
Method 201A	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	2.4	-
Acetone Particulate Matter	0.4	0.6	0.4 J	0.2 J	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	31.7	25.6	9.2	-	-
PM via Gravimetric Analysis	**LOR**					
Method 202	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensible Particulates	0.4	-	-	-	-	1.9
Non-Extractale Condensible Particulates	0.4	-	-	-	-	3.5
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	262

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-8 TEST2 #1 APC OUTLET		19-21936-M201A-9 TEST2 #1 APC OUTLET		19-21936-M201A-10 TEST2 #1 APC OUTLET		19-21936-M201A-11 TEST2 #1 APC OUTLET		19-21936-M201A-(12-14) TEST2 #1 APC OUTLET	
ALS Sample ID		L2300090-6		L2300090-7		L2300090-8		L2300090-9		L2300090-10	
Matrix		Stack		Stack		Stack		Stack		Stack	
Analysis type		Sample		Sample		Sample		Sample		Sample	
Sampling Date/Time		26-Jun-19		26-Jun-19		26-Jun-19		26-Jun-19		26-Jun-19	
Date of Receipt		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
PM via Gravimetric Analysis	**LOR**										
Method 201A	**mg**	**mg**		**mg**		**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	-		-		-		<0.1		-	
Acetone Particulate Matter	0.4	0.5		0.3	J	0.4	J	-		-	
	g	**g**		**g**		**g**		**g**		**g**	
Acetone Mass	0.02	36.5		23.1		8.8		-		-	
PM via Gravimetric Analysis	**LOR**										
Method 202	**mg**	**mg**		**mg**		**mg**		**mg**		**mg**	
Extractable Condensible Particulates	0.4	-		-		-		-		2.2	
Non-Extractale Condensible Particulates	0.4	-		-		-		-		2.9	
	g	**g**		**g**		**g**		**g**		**g**	
Water Mass	0.02	-		-		-		-		275	

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-15 TEST3 #1 APC OUTLET	19-21936-M201A-16 TEST3 #1 APC OUTLET	19-21936-M201A-17 TEST3 #1 APC OUTLET	19-21936-M201A-18 TEST3 #1 APC OUTLET	19-21936-M201A-(19-21) TEST3 #1 APC OUTLET
ALS Sample ID		L2300090-11	L2300090-12	L2300090-13	L2300090-14	L2300090-15
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
PM via Gravimetric Analysis	**LOR**					
Method 201A	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	0.3 J	0.2 J	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	33.8	27.3	11.6	-	-
PM via Gravimetric Analysis	**LOR**					
Method 202	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensible Particulates	0.4	-	-	-	-	1.7
Non-Extractale Condensible Particulates	0.4	-	-	-	-	3.2
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	327

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-22 TEST1 #2 APC OUTLET		19-21936-M201A-23 TEST1 #2 APC OUTLET		19-21936-M201A-24 TEST1 #2 APC OUTLET		19-21936-M201A-25 TEST1 #2 APC OUTLET	19-21936-M201A-(26-28) TEST1 #2 APC OUTLET
ALS Sample ID		L2300090-16		L2300090-17		L2300090-18		L2300090-19	L2300090-20
Matrix		Stack		Stack		Stack		Stack	Stack
Analysis type		Sample		Sample		Sample		Sample	Sample
Sampling Date/Time		24-Jun-19		24-Jun-19		24-Jun-19		24-Jun-19	24-Jun-19
Date of Receipt		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	27-Jun-19
PM via Gravimetric Analysis Method 201A	**LOR mg**	**mg**		**mg**		**mg**		**mg**	**mg**
Filter Particulate Matter	0.8	-		-		-		2.5	-
Acetone Particulate Matter	0.4	0.5		0.4	J	0.3	J	-	-
	g	**g**		**g**		**g**		**g**	**g**
Acetone Mass	0.02	29.1		27.3		9.7		-	-
PM via Gravimetric Analysis Method 202	**LOR mg**	**mg**		**mg**		**mg**		**mg**	**mg**
Extractable Condensible Particulates	0.4	-		-		-		-	2.2
Non-Extractale Condensible Particulates	0.4	-		-		-		-	9.5
	g	**g**		**g**		**g**		**g**	**g**
Water Mass	0.02	-		-		-		-	227

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-29 TEST2 #2 APC OUTLET	19-21936-M201A-30 TEST2 #2 APC OUTLET	19-21936-M201A-31 TEST2 #2 APC OUTLET	19-21936-M201A-32 TEST2 #2 APC OUTLET	19-21936-M201A-(33-35) TEST2 #2 APC OUTLET
ALS Sample ID		L2300090-21	L2300090-22	L2300090-23	L2300090-24	L2300090-25
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
PM via Gravimetric Analysis Method 201A	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	2.7	-
Acetone Particulate Matter	0.4	0.5	0.4 J	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	19.2	23.1	7.3	-	-
PM via Gravimetric Analysis Method 202	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensible Particulates	0.4	-	-	-	-	3.5
Non-Extractale Condensible Particulates	0.4	-	-	-	-	3.0
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	108

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-M201A-36 TEST3 #2 APC OUTLET		19-21936-M201A-37 TEST3 #2 APC OUTLET		19-21936-M201A-38 TEST3 #2 APC OUTLET		19-21936-M201A-39 TEST3 #2 APC OUTLET	19-21936-M201A-(40-42) TEST3 #2 APC OUTLET
ALS Sample ID		L2300090-26		L2300090-27		L2300090-28		L2300090-29	L2300090-30
Matrix		Stack		Stack		Stack		Stack	Stack
Analysis type		Sample		Sample		Sample		Sample	Sample
Sampling Date/Time		25-Jun-19		25-Jun-19		25-Jun-19		25-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	27-Jun-19
PM via Gravimetric Analysis	**LOR**								
Method 201A	**mg**	**mg**		**mg**		**mg**		**mg**	**mg**
Filter Particulate Matter	0.8	-		-		-		2.9	-
Acetone Particulate Matter	0.4	0.3	J	0.2	J	0.4	J	-	-
	g	**g**		**g**		**g**		**g**	**g**
Acetone Mass	0.02	17.4		14.1		6.8		-	-
PM via Gravimetric Analysis	**LOR**								
Method 202	**mg**	**mg**		**mg**		**mg**		**mg**	**mg**
Extractable Condensible Particulates	0.4	-		-		-		-	2.0
Non-Extractale Condensible Particulates	0.4	-		-		-		-	3.3
	g	**g**		**g**		**g**		**g**	**g**
Water Mass	0.02	-		-		-		-	225

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Sample Analysis Summary Report

Sample Name		19-21936-M201A-43 BLANK #1 APC OUTLET		19-21936-M201A-44 BLANK #1 APC OUTLET	19-21936-M201A-45 BLANK #1 APC OUTLET	19-21936-M201A-46 BLANK #1 APC OUTLET	19-21936-M201A-(47-49) BLANK #1 APC OUTLET
ALS Sample ID		L2300090-31		L2300090-32	L2300090-33	L2300090-34	L2300090-35
Matrix		Stack		Stack	Stack	Stack	Stack
Analysis type		Sample		Sample	Sample	Sample	Sample
Sampling Date/Time		26-Jun-19		26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19
Date of Receipt		27-Jun-19		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
PM via Gravimetric Analysis	**LOR**						
Method 201A	**mg**	**mg**		**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-		-	-	2.5	-
Acetone Particulate Matter	0.4	0.3	J	0.5	<0.1	-	-
	g	**g**		**g**	**g**	**g**	**g**
Acetone Mass	0.02	36.8		42.2	52.8	-	-
PM via Gravimetric Analysis	**LOR**						
Method 202	**mg**	**mg**		**mg**	**mg**	**mg**	**mg**
Extractable Condensible Particulates	0.4	-		-	-	-	1.1
Non-Extractale Condensible Particulates	0.4	-		-	-	-	0.7
	g	**g**		**g**	**g**	**g**	**g**
Water Mass	0.02	-		-	-	-	89.0

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Sample Analysis Summary Report

Sample Name		19-21936-M201A-50 BLANK #2 APC OUTLET		19-21936-M201A-51 BLANK #2 APC OUTLET		19-21936-M201A-52 BLANK #2 APC OUTLET		19-21936-M201A-53 BLANK #2 APC OUTLET		19-21936-M201A-(54-56) BLANK #2 APC OUTLET	
ALS Sample ID		L2300090-36		L2300090-37		L2300090-38		L2300090-39		L2300090-40	
Matrix		Stack		Stack		Stack		Stack		Stack	
Analysis type		Sample		Sample		Sample		Sample		Sample	
Sampling Date/Time		26-Jun-19		26-Jun-19		26-Jun-19		26-Jun-19		26-Jun-19	
Date of Receipt		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
PM via Gravimetric Analysis Method 201A	**LOR mg**	**mg**		**mg**		**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	-		-		-		2.0		-	
Acetone Particulate Matter	0.4	0.4	J	0.2	J	0.1	J	-		-	
	g	**g**		**g**		**g**		**g**		**g**	
Acetone Mass	0.02	65.7		64.9		67.4		-		-	
PM via Gravimetric Analysis Method 202	**LOR mg**	**mg**		**mg**		**mg**		**mg**		**mg**	
Extractable Condensible Particulates	0.4	-		-		-		-		1.1	
Non-Extractale Condensible Particulates	0.4	-		-		-		-		0.4	J
	g	**g**		**g**		**g**		**g**		**g**	
Water Mass	0.02	-		-		-		-		101	

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Sample Analysis Summary Report

Sample Name	**MB**
ALS Sample ID	L2300090-MB
Matrix	n/a
Analysis type	Sample
Sampling Date/Time	n/a
Date of Receipt	n/a

PM via Gravimetric Analysis	**LOR**		
Method 201A	**mg**	**mg**	
Filter Particulate Matter	0.8	0.2	J
Acetone Particulate Matter	0.4	<0.1	
	g	**g**	
Acetone Mass	0.02	31.5	
PM via Gravimetric Analysis	**LOR**		
Method 202	**mg**	**mg**	
Extractable Condensible Particulates	0.4	0.5	
Non-Extractale Condensible Particulates	0.4	0.8	
	g	**g**	
Water Mass	0.02	193	

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#:	L2300144		Mississauga, ON L5J 2Y4
Date of Report	10-Jul-19		(905)822-4120
Date of Sample Receipt	27-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS:

Cl as HCl Anion Analysed via Ion Chromatography USEPA Method 26A (GN 4-Jul-19)
F as HF Anion Analysed via Ion Chromatography USEPA Method 26A (GN 4-Jul-19)
Ammonia, Total (as NH_3) via Ion Chromatography USEPA Method CTM-027 (GN 5-Jul-19)

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

ALS Environmental

Sample Analysis Summary Report

Sample Name	**19-21936-M26A-1 APC OUTLET #1**	**19-21936-M26A-2 APC OUTLET #1**	**19-21936-M26A-3 APC OUTLET #1**	**19-21936-M26A-4 APC OUTLET #2**	**19-21936-M26A-5 APC OUTLET #2**
ALS Sample ID	L2300144-1	L2300144-2	L2300144-3	L2300144-4	L2300144-5
Matrix	Stack	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample	Sample
Sampling Date/Time	25-Jun-19	25-Jun-19	25-Jun-19	26-Jun-19	26-Jun-19
Date of Receipt	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Ion Chromatography Analysis					
USEPA Method 26A	**mg**	**mg**	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.695	<0.667	<0.695	<0.716	<0.681
Analysis 1	<0.695	<0.667	<0.695	<0.716	<0.681
Analysis 2	<0.695	<0.667	<0.695	<0.716	<0.681
Total Cl^- as HCl (ave)	6.49	7.85	7.20	5.76	6.44
Analysis 1	6.67	7.87	7.13	5.76	6.55
Analysis 2	6.30	7.82	7.28	5.75	6.33
Ion Chromatography Analysis					
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.705	0.610	0.626	1.22	0.852

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Sample Analysis Summary Report

Sample Name	19-21936-M26A-6 APC OUTLET #2	19-21936-M26A-BLANK1 APC OUTLET #1	19-21936-M26A-BLANK2 APC OUTLET #2
ALS Sample ID	L2300144-6	L2300144-7	L2300144-8
Matrix	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample
Sampling Date/Time	26-Jun-19	25-Jun-19	26-Jun-19
Date of Receipt	27-Jun-19	27-Jun-19	27-Jun-19
Ion Chromatography Analysis			
USEPA Method 26A	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.702	<0.463	<0.456
Analysis 1	<0.702	<0.463	<0.456
Analysis 2	<0.702	<0.463	<0.456
Total Cl^- as HCl (ave)	6.54	<0.679	<0.669
Analysis 1	6.55	<0.679	<0.669
Analysis 2	6.54	<0.679	<0.669
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.875	<0.293	<0.288

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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)	<0.00702	0.0544	99%
Analysis 1	<0.00702	0.0544	
Analysis 2	<0.00702	0.0545	
Total Cl^- as HCl (ave)	<0.0103	0.0762	96%
Analysis 1	<0.0103	0.0762	
Analysis 2	<0.0103	0.0762	
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.00472	0.0513	108%

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Sample QC Summary Report

Sample Name	19-21936-M26A-1 APC OUTLET #1	19-21936-M26A-1 APC OUTLET #1	19-21936-M26A-1 APC OUTLET #1	19-21936-M26A-1 APC OUTLET #1
ALS Sample ID	L2300144-1	L2300144-1DUP	L2300144-1MS	L2300144-1MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Spike	Matrix Spike
Sampling Date/Time	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19
Date of Receipt	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Ion Chromatography Analysis				
USEPA Method 26A	**mg**	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.695	<0.695	4.95	93%
Analysis 1	<0.695	<0.695	4.96	
Analysis 2	<0.695	<0.695	4.93	
Total Cl^- as HCl (ave)	6.49	6.61	14.0	99%
Analysis 1	6.67	6.64	14.0	
Analysis 2	6.30	6.57	14.0	
Ion Chromatography Analysis				
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	0.705	0.691	5.16	99%

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 Mississauga, ON L5J 2Y4 Canada
ALS WO#:	L2300111		
Date of Report	17-Jul-19		
Date of Sample Receipt	27-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 12-Jul-19)
Sample Preparation via USEPA Method 29 (SR 12-Jul-19)

Ag detected in RB. The level is within 5x the detection limit. No impact to data. **RH 16-Jul-19**

LCB = Laboratory Control Blank
LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
LOR = Limit of Reporting

Certified by: laurek

Claire Kocharakkal
Project Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-PM (1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM (7 THRU 12) TEST2 #1 APC OUTLET	19-21936-PM (13 THRU 18) TEST3 #1 APC OUTLET	19-21936-PM (19 THRU 24) BLANK 1	19-21936-PM (25 THRU 30) TEST1 #2 APC OUTLET	19-21936-PM (31 THRU 36) TEST2 #2 APC OUTLET
ALS Sample ID		L2300111-1	L2300111-2	L2300111-3	L2300111-4	L2300111-5	L2300111-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		25-Jun-19	25-Jun-19	26-Jun-19	26-Jun-19	25-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Multi-Metals via ICP-MS	**LOR**						
	ug	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A							
Antimony	0.2	0.344	0.334	0.538	<	0.278	0.300
Arsenic	1	<	<	<	<	<	<
Barium	5	9.80	8.30	10.4	9.95	8.19	10.3
Beryllium	0.2	<	<	<	<	<	<
Cadmium	0.1	0.278	0.318	0.547	<	0.262	0.396
Chromium	1	5.14	5.23	3.19	2.58	4.89	3.02
Cobalt	0.2	<	<	<	<	<	<
Copper	1	1.50	2.94	1.65	1.46	1.45	2.20
Lead	0.5	1.92	2.11	1.80	0.600	1.83	1.51
Molybdenum	0.2	36.8	35.6	23.1	22.2	30.6	22.4
Nickel	0.2	5.64	6.28	4.93	3.51	6.11	5.31
Selenium	2	<	<	<	<	<	<
Silver	0.2	<	<	<	<	<	<
Thallium	0.2	<	<	<	<	<	<
Vanadium	1	<	<	<	<	<	<
Zinc	6	28.2	17.1	35.4	<	29.9	20.5
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	0.104	<	<	0.288	<	<
Arsenic	0.2	<	<	<	<	<	<
Barium	0.5	1.86	1.54	1.56	1.01	1.36	1.57
Beryllium	0.1	<	<	<	<	<	<
Cadmium	0.05	0.103	0.0705	0.110	<	0.164	0.0716
Chromium	0.15	0.816	1.25	0.634	0.354	0.719	1.29
Cobalt	0.1	<	<	<	<	<	<
Copper	0.3	3.39	2.26	1.25	0.719	1.96	2.01
Lead	0.05	0.652	0.661	0.815	1.09	0.870	0.508
Molybdenum	0.1	0.163	0.192	<	<	0.120	0.224
Nickel	0.1	1.59	1.05	0.756	0.251	1.09	1.33
Selenium	1	<	<	<	<	4.82	<
Silver	0.1	<	<	<	<	<	<
Thallium	0.05	0.0720	<	<	<	0.0557	<
Vanadium	0.1	<	<	<	<	<	<
Zinc	3	10.1	9.37	8.64	<	5.46	7.74

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Sample Analysis Summary Report

Sample Name		**19-21936-PM (37 THRU 42) TEST3 #2 APC OUTLET**	**19-21936-PM (43 THRU 48) BLANK 2**	**MB**
ALS Sample ID		L2300111-7	L2300111-8	L2300111-MB
Matrix		Stack	Stack	n/a
Analysis Type		Sample	Sample	Sample
Sampling Date		26-Jun-19	26-Jun-19	n/a
Date of Receipt		27-Jun-19	27-Jun-19	n/a
Multi-Metals via ICP-MS	**LOR**			
	ug	**ug**	**ug**	**ug**
Front Half HF Fraction 1A				
Antimony	0.2	0.232	<	<
Arsenic	1	<	<	<
Barium	5	9.26	10.1	<
Beryllium	0.2	<	<	<
Cadmium	0.1	0.163	<	<
Chromium	1	2.47	2.45	<
Cobalt	0.2	<	<	<
Copper	1	2.25	1.58	<
Lead	0.5	1.10	0.578	<
Molybdenum	0.2	21.9	22.3	10.3
Nickel	0.2	3.75	3.45	1.11
Selenium	2	<	<	<
Silver	0.2	<	<	<
Thallium	0.2	<	<	<
Vanadium	1	<	<	<
Zinc	6	19.9	<	<
Back Half (HNO3 / H2O2) Fraction 2A				
Antimony	0.1	<	<	
Arsenic	0.2	<	<	
Barium	0.5	1.48	1.01	
Beryllium	0.1	<	<	
Cadmium	0.05	0.0606	<	
Chromium	0.15	0.582	0.408	
Cobalt	0.1	<	<	
Copper	0.3	3.61	0.814	
Lead	0.05	0.458	0.980	
Molybdenum	0.1	0.128	<	
Nickel	0.1	0.722	0.341	
Selenium	1	<	<	
Silver	0.1	<	<	
Thallium	0.05	<	<	
Vanadium	0.1	<	<	
Zinc	3	11.3	<	

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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	<	11.4	95	11.5	96
Arsenic	1	<	55.3	92	55.7	93
Barium	5	<	56.0	93	59.3	99
Beryllium	0.2	<	54.0	90	55.2	92
Cadmium	0.1	<	26.8	89	27.0	90
Chromium	1	<	56.4	94	56.5	94
Cobalt	0.2	<	56.8	95	56.7	94
Copper	1	<	56.8	95	56.9	95
Lead	0.5	<	58.8	98	58.0	97
Molybdenum	0.2	<	28.4	94	28.6	95
Nickel	0.2	<	56.7	94	56.1	94
Selenium	2	<	54.7	91	55.2	92
Silver	0.2	1.35	22.0	69	27.9	88
Thallium	0.2	<	57.0	95	56.0	93
Vanadium	1	<	56.6	94	56.3	94
Zinc	6	<	113	94	113	95
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	<	6.11	102	5.78	96
Arsenic	0.2	<	29.1	97	28.5	95
Barium	0.5	<	31.0	103	29.7	99
Beryllium	0.1	<	29.2	97	28.0	93
Cadmium (111)	0.05	<	14.2	94	14.0	93
Chromium (52)	0.15	<	29.5	98	28.5	95
Cobalt	0.1	<	29.3	98	28.8	96
Copper (63)	0.3	<	29.0	97	28.6	95
Lead	0.05	0.0796	30.2	101	29.4	98
Molybdenum	0.1	<	15.6	104	15.0	100
Nickel	0.1	<	29.2	97	28.4	94
Selenium (77)	1	<	28.8	96	27.8	93
Silver	0.1	<	15.5	103	14.5	97
Thallium	0.05	<	30.4	101	29.3	98
Vanadium	0.1	<	29.7	99	29.1	97
Zinc (66)	3	<	57.8	96	57.0	95

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Sample QC Summary Report

Sample Name		19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET
ALS Sample ID		L2300111-1	L2300111-1	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		25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	0.344	0.379	24.5	101	24.7	101
Arsenic	1	<	<	116	96	114	94
Barium	5	9.80	9.71	129	99	126	97
Beryllium	0.2	<	<	109	91	108	90
Cadmium	0.1	0.278	0.272	58.7	97	58.0	96
Chromium	1	5.14	5.35	121	97	119	95
Cobalt	0.2	<	<	117	97	115	95
Copper	1	1.50	1.62	118	97	116	96
Lead	0.5	1.92	1.97	125	102	124	102
Molybdenum	0.2	36.8	36.9	95.8	98	99.0	104
Nickel	0.2	5.64	5.73	123	97	119	95
Selenium	2	<	<	114	95	111	93
Silver	0.2	<	<	59.4	99	59.9	100
Thallium	0.2	<	<	118	99	117	98
Vanadium	1	<	<	116	97	115	95
Zinc	6	28.2	28.9	265	99	262	98
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	0.104	<	11.7	96	11.9	98
Arsenic	0.2	<	<	56.3	94	57.2	95
Barium	0.5	1.86	1.79	61.8	100	61.0	99
Beryllium	0.1	<	<	57.4	96	57.4	96
Cadmium	0.05	0.103	0.0862	27.6	92	28.4	94
Chromium	0.15	0.816	0.809	59.2	97	59.7	98
Cobalt	0.1	<	<	58.6	98	59.4	99
Copper	0.3	3.39	3.25	60.6	95	61.8	97
Lead	0.05	0.652	0.650	59.4	98	59.7	98
Molybdenum	0.1	0.163	0.141	29.6	98	30.2	100
Nickel	0.1	1.59	1.47	60.0	97	60.4	98
Selenium	1	<	<	57.0	94	57.2	94
Silver	0.1	<	<	29.2	97	29.7	99
Thallium	0.05	0.0720	0.0665	59.3	99	56.8	95
Vanadium	0.1	<	<	59.3	99	59.8	100
Zinc	3	10.1	9.58	124	95	126	97

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#:	L2300111		MIssissauga, ON L5J 2Y4
Date of Report	16-Jul-19		Canada
Date of Sample Receipt	27-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS:

Sample Preparation via USEPA Method 29 (AB 12-JULY-2019)
Mercury Analysis via CVAA using Method USEPA 7470A (AB 15-JULY-2019)

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: lovvek

Claire Kocharakkal
Project Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(7 THRU 12) TEST2 #1 APC OUTLET	19-21936-PM-(13 THRU 18) TEST3 #1 APC OUTLET	19-21936-PM-(19 THRU 24) BLANK 1	19-21936-PM-(25 THRU 30) TEST1 #2 APC OUTLET
ALS Sample ID		L2300111-1	L2300111-2	L2300111-3	L2300111-4	L2300111-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		25-Jun-19	25-Jun-19	26-Jun-19	26-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Mercury via CVAA	**LOR**					
Method 29	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Analytical Fraction 2B	0.050	2.86	0.982	0.800	0.174	0.482
Analytical Fraction 3A	0.005	-	-	-	-	-
Analytical Fraction 3B	0.025	<0.025	<0.0225	<0.0225	<0.0225	<0.025
Analytical Fraction 3C	0.25	<0.15	<0.2	<0.15	<0.15	<0.15

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21936-PM-(31 THRU 36) TEST2 #2 APC OUTLET	19-21936-PM-(37 THRU 42) TEST3 #2 APC OUTLET	19-21936-PM-(43 THRU 48) BLANK 2
ALS Sample ID		L2300111-6	L2300111-7	L2300111-8
Matrix		Stack	Stack	Stack
Analysis type		Sample	Sample	Sample
Sampling Date/Time		25-Jun-19	26-Jun-19	26-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19
Mercury via CVAA	**LOR**			
Method 29	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<0.015	<0.015	<0.015
Analytical Fraction 2B	0.050	<0.422	0.413	0.155
Analytical Fraction 3A	0.005	-	-	-
Analytical Fraction 3B	0.025	<0.0225	<0.0275	<0.0225
Analytical Fraction 3C	0.25	<0.2	<0.2	<0.15

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	<0.015	0.289	96%	0.284	95%
Analytical Fraction 2B	0.050	<0.35	6.48	93%	6.43	92%
Analytical Fraction 3A	0.005	-	-	-	-	-
Analytical Fraction 3B	0.025	<0.025	0.481	96%	0.486	97%
Analytical Fraction 3C	0.25	<0.15	2.88	96%	2.89	96%

ALS Environmental

Sample QC Summary Report

Sample Name		19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET	19-21936-PM-(1 THRU 6) TEST1 #1 APC OUTLET
ALS Sample ID		L2300111-1	L2300111-1DUP	L2300111-1MS	L2300111-1MS	L2300111-1MSD	L2300111-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19
Date of Receipt		27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Mercury via CVAA	**LOR**						
Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<0.015	<0.015	0.297	98%	0.295	98%
Analytical Fraction 2B	0.050	2.86	2.90	9.61	93%	9.54	92%
Analytical Fraction 3A	0.005	-	-	-	-	-	-
Analytical Fraction 3B	0.025	<0.025	<0.025	0.487	97%	0.486	96%
Analytical Fraction 3C	0.250	<0.15	<0.15	2.92	94%	2.96	95%

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.: 21936
Date: JUNE 26, 19

Test No.: 1
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

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

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ 6085

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	831.1
Final Wt:	705.0
1 Gain:	173.9
Colour:	~~CLEAR~~

Impinger #2 Empty	
Empty Wt:	653.7
Final Wt:	654.4
2 Gain:	0.7
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	653.8
Initial Wt:	763.4
Final Wt:	761.5
3 Gain:	-1.9
Colour:	—

Impinger #4 Silica Gel	
Initial Wt:	900.5
Final Wt:	912.2
4 Gain:	11.7
% Spent:	10

CWTR=1+2+3:	172.7
WCBDA=4:	11.7

✓

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:	11:17
Purge Off:	12:17

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Mark Fluid Level and Seal and Label Container

CONTAINER TS6

Secondary Filter

Seal and label container TS6

5

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-M201A-
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

Train Loaded By: DT
Train Recovered By: DU / DT
Recovery Witnessed By:
Date:

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 26, 2019

Test No.: 2
Test Location: UNIT #1 APC OUTLET

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem
CONTAINER TS1
Container TS1 Weights
Mark Fluid Level and
Seal and label container TS1

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
CONTAINER TS2
Container TS2 Weights
Mark Fluid Level and
Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top
CONTAINER TS3
Container TS3 Weights
Mark Fluid Level and
Seal and label container TS3

Back-Up Filter

Filter ID: Q7 608

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

	Impinger #1 Knock Out	
	Empty Wt:	490.8
	Final Wt:	667.4
1	Gain:	176.6 ~~177.0~~
	Colour:	CLEAR

	Impinger #2 Empty	
	Empty Wt:	580.5
	Final Wt:	580.7
2	Gain:	0.2
	Colour:	CLEAR

Secondary Filter

	Impinger #3 H_2O	
	Empty Wt:	—
	Initial Wt:	773.2
	Final Wt:	770.2
3	Gain:	-3.0
	Colour:	CLEAR

	Impinger #4 Silica Gel	
	Initial Wt:	948.5
	Final Wt:	959.6
4	Gain:	11.1
	% Spent:	10

CWTR=1+2+3:	173.8 ~~174.2~~
WCBDA=4:	11.1

✓

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:	1513
Purge Off:	1613

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

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

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-M201A-
TS1 (Part. > 10)	
TS2 (Part. > 2.5)	
TS3 (Part. < 2.5)	
TS4 (Back Up Filter, <2.5)	
TS5 (Imp 2 $H_2$0 and rinse)	
TS6 (Secondary Filter)	
TS7 (Acetone / Hexane rinse)	

Train Loaded By: DT
Train Recovered By: JG/DU
Recovery Witnessed By:
Date: JUNE 26, 2019

13

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: June 26, 2019

Test No.: 3
Test Location: UNIT #1 APC OUTLET

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

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

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID:

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1	Knock Out
Empty Wt:	531.1
Final Wt:	706.7
1 Gain:	175.6
Colour:	CLEAR

Impinger #2	Empty
Empty Wt:	654.4
Final Wt:	654.0
2 Gain:	-0.4
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	—
Initial Wt:	761.5
Final Wt:	~~765~~ 759.3
3 Gain:	-2.2
Colour:	CLEAR

Impinger #4	Silica Gel
Initial Wt:	912.2
Final Wt:	921.9
4 Gain:	9.7
% Spent:	10

CWTR=1+2+3:	173
WCBDA=4:	9.7

✓

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:	1840
Purge Off:	1940

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and
Seal and Label Container

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

Mark Fluid Level and
Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-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_2$0 and rinse)	19
TS6 (Secondary Filter)	20
TS7 (Acetone / Hexane rinse)	21

Train Loaded By: DT
Train Recovered By: JG / DU
Recovery Witnessed By:
Date: June 26, 2019

5

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: June 5, 19

Test No.: 1
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

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

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ 6092

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	490.8
Final Wt:	638.1
1 Gain:	147.3
Colour:	CLEAR

Impinger #2 Empty	
Empty Wt:	580.5
Final Wt:	580.5
2 Gain:	0.0
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	673.1
Initial Wt:	780.6
Final Wt:	776.2
3 Gain:	-4.4
Colour:	CLEAR

Impinger #4 Silica Gel	
Initial Wt:	921.6
Final Wt:	937.0
4 Gain:	15.4
% Spent:	—

CWTR=1+2+3:	142.9
WCBDA=4:	~~13.4~~ 15.4

✓

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:	1150
Purge Off:	1250

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and
Seal and Label Container

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

Mark Fluid Level and
Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-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_2O and rinse)	26
TS6 (Secondary Filter)	27
TS7 (Acetone / Hexane rinse)	28

Train Loaded By: DT/DM
Train Recovered By: DT/DM
Recovery Witnessed By:
Date:

13

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 25,19

Test No.: 2
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem
- CONTAINER TS1
- Container TS1 Weights
- Mark Fluid Level and
- Seal and label container TS1

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
- CONTAINER TS2
- Container TS2 Weights
- Mark Fluid Level and
- Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top
- CONTAINER TS3
- Container TS3 Weights
- Mark Fluid Level and
- Seal and label container TS3

Back-Up Filter

Filter ID: QZ 6083

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	531.1
Final Wt:	680.9
1 Gain:	149.8
Colour:	clear

Impinger #2 Empty	
Empty Wt:	653.7
Final Wt:	653.7
2 Gain:	0.0
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	653.9
Initial Wt:	764.5
Final Wt:	763.4
3 Gain:	-1.1
Colour:	clear

Impinger #4 Silica Gel	
Initial Wt:	893.0
Final Wt:	900.5
4 Gain:	7.5
% Spent:	—

CWTR=1+2+3:	148.7
WCBDA=4:	7.5

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
Mark Fluid Level and Seal and Label Container

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

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-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_2O and rinse)	33
TS6 (Secondary Filter)	34
TS7 (Acetone / Hexane rinse)	35

Train Loaded By: DU
Train Recovered By: DB/DU
Recovery Witnessed By:
Date:

5

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 25, 19

Test No.: 3
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem
- CONTAINER TS1
- Container TS1 Weights
- Mark Fluid Level and
- Seal and label container TS1

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
- CONTAINER TS2
- Container TS2 Weights
- Mark Fluid Level and
- Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top
- CONTAINER TS3
- Container TS3 Weights
- Mark Fluid Level and
- Seal and label container TS3

Back-Up Filter

Filter ID: QZ 6084

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1	Knock Out
Empty Wt:	490.8
Final Wt:	656.3
1 Gain:	165.5
Colour:	clear

Impinger #2	Empty
Empty Wt:	580.5
Final Wt:	581.6
2 Gain:	1.1
Colour:	clear

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	—
Initial Wt:	776.2
Final Wt:	773.2
3 Gain:	-3.0
Colour:	

Impinger #4 Silica Gel	
Initial Wt:	937.0
Final Wt:	948.5
4 Gain:	11.5
% Spent:	

CWTR=1+2+3:	163.6
WCBDA=4:	11.5

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:	7:30
Purge Off:	8:30

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

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

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-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: DU
Train Recovered By: DU/BT
Recovery Witnessed By:
Date:

13

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: June 6, 19

Test No.: BLANK 1
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

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

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ6086

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 Empty	
Empty Wt:	
Final Wt:	
2 Gain:	
Colour:	

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	
% Spent:	

CWTR=1+2+3:	
WCBDA=4:	

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:	
Purge Off:	

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Mark Fluid Level and Seal and Label Container

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

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-M201A-
TS1 (Part. > 10)	X3
TS2 (Part. > 2.5)	X4
TS3 (Part. < 2.5)	45
TS4 (Back Up Filter, <2.5)	46
TS5 (Imp 2 H_2O and rinse)	47
TS6 (Secondary Filter)	X8
TS7 (Acetone / Hexane rinse)	X9

Train Loaded By: JT
Train Recovered By: BT
Recovery Witnessed By:
Date:

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PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21936
Date: JUNE 26, 19

Test No.: BLANK 2
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

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

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ6087

CONTAINER TS4

Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 Empty	
Empty Wt:	
Final Wt:	
2 Gain:	
Colour:	

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	
% Spent:	

CWTR=1+2+3:	
WCBDA=4:	

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:	
Purge Off:	

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

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

Mark Fluid Level and Seal and Label Container

SAMPLE IDENTIFICATION	19-21936-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_2O and rinse)	54
TS6 (Secondary Filter)	55
TS7 (Acetone / Hexane rinse)	56

Train Loaded By: BT
Train Recovered By: BT
Recovery Witnessed By:
Date:

APPENDIX 14

SVOC Train Recovery Data Sheets
(8 pages)

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: 1
Test Date: JUN 27/19
Test Location: UNIT 1 APC OUTLET

Sample ID 1
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	281.4
After Acetone/ Hexane Rinse:	432.0
Total TS1:	150.6

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 2
Filter

CONTAINER TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 3
XAD-II Trap

CONTAINER TS3

Initial Wt:	375.5
Final Wt:	382.6
1 Gain:	7.1
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 4
Impingers 1, 2 & 3

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	610.3
Final Wt:	1118.7
2 Gain:	508.4
Colour:	

Impinger #2 Ethylene Glycol	
Empty Wt:	658.0
Initial Wt:	754.7
Final Wt:	941.7
3 Gain:	187.0
Colour:	–

Impinger #3 Empty	
Empty Wt:	531.0
Final Wt:	532.5
4 Gain:	1.5
Colour:	–

Container TS4 Weights	
Empty Wt:	426.1
With Imp Soln:	1209.1
Imp Volume:	1783.0
After ~100g H_2O Rinse:	1351.0
Total TS4:	924.9

CWTR = 1 + 2 + 3 + 4: 704.0

WCBDA=5: 24.9

Sample ID 5
Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	284.5
After Acetone Rinse:	–
After Hexane Rinse:	410.0
Total TS5:	125.5

Impinger Box ID: 15

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

Initial Wt:	981.0
Final Wt:	1005.9
5 Gain:	24.9
% Spent:	–

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
✓ TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	HH
Trap ID:	1
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	181632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: AS
Train Recovered By: QU
Recovery Witnessed By: —
Date: JUN 27/19

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: 2
Test Date: June 27 2019
Test Location: UNIT 1 'APC OUTLET'

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)

Container TS1

Empty Wt:	425.3
After Acetone/ Hexane Rinse:	674.7
Total TS1:	249.4

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Container TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Container TS3

	Initial Wt:	396.3
	Final Wt:	401.7
1	Gain:	5.4
	Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Container TS4

	Impinger #1 Empty	
	Empty Wt:	617.2
	Final Wt:	1156.1
2	Gain:	538.9
	Colour:	–

	Impinger #2 Ethylene Glycol	
	Empty Wt:	582.4
	Initial Wt:	686.1
	Final Wt:	876.2
3	Gain:	190.1
	Colour:	–

	Impinger #3 Empty	
	Empty Wt:	610.9
	Final Wt:	612.2
4	Gain:	1.3
	Colour:	–

Container TS4 Weights	
Empty Wt:	425.4
With Imp Soln:	1665.5
Imp Volume:	1240.1
After ~100g H_2O Rinse:	1367.6
Total TS4:	942.2

CWTR = 1 + 2 + 3 + 4: ~~730.3~~ 735.7

WCBDA=5: 15.8

Container TS5

Empty Wt:	285.9
After Acetone Rinse:	
After Hexane Rinse:	420.8
Total TS5:	136.9

Container TS6 (Impinger)

	Initial Wt:	790.2
	Final Wt:	806.0
5	Gain:	15.8
	% Spent:	–

Impinger Box ID: 10

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	DD
Trap ID:	4
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	181632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: DT
Train Recovered By: Ben
Recovery Witnessed By:
Date: June 27, 2019

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Revision: June 19, 2014

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Semi-Volatile Organics Train Recovery Data Sheet

Client :	Covanta DYEC
Project No.:	21936
Sample Batch No.:	19-21936-SVOC-

Test No.:	3
Test Date:	JUN 29 2019
Test Location:	UNIT 1 APC OUTLET

Sample ID — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	425.5
After Acetone/ Hexane Rinse:	604.7
Total TS1:	179.2

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID — Filter

CONTAINER TS2

Colour:	WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID — XAD-II Trap

CONTAINER TS3

Initial Wt:	387.2
Final Wt:	394.8
1 Gain:	7.6
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID — Impingers 1, 2 & 3

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	496.0
Final Wt:	1081.6
2 Gain:	585.6
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	667.8
Initial Wt:	759.0
Final Wt:	876.7
3 Gain:	117.7
Colour:	—

Impinger #3 Empty	
Empty Wt:	526.7
Final Wt:	527.6
4 Gain:	0.9
Colour:	—

Container TS4 Weights	
Empty Wt:	425.3
With Imp Soln:	-
Imp Volume:	-
After ~100g H_2O Rinse:	1304.5
Total TS4:	879.2

CWTR = 1 + 2 + 3 + 4:	711.8 719.4

WCBDA=5:	19.2

Sample ID — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	~~425.~~ 294.6
After Acetone Rinse:	—
After Hexane Rinse:	444.9
Total TS5:	150.3

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

Initial Wt:	975.7
Final Wt:	994.9
5 Gain:	19.2
% Spent:	0

Impinger Box ID: 4

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	BB
Trap ID:	2
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	1916324
Hexane Batch No.:	100830
Acetone Batch No.:	104791

Train Loaded By: AS

Train Recovered By: DA

Recovery Witnessed By: NICK LAWLEY/LEON

Date: JUN 29 2019

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Revision: June 19, 2014

ORTECH Environmental

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: BLANK 1
Test Date: JUN 27/19
Test Location: —

Sample ID 16 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser — CONTAINER TS1

Empty Wt:	284.5
After Acetone/ Hexane Rinse:	467.8
Total TS1:	183.3

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 17 — Filter — CONTAINER TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 18 — XAD-II Trap — CONTAINER TS3

Initial Wt:	413.6
Final Wt:	—
1 Gain:	—
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 19 — Impingers 1, 2 & 3 — CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	505.7
Final Wt:	—
2 Gain:	—
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	670.0
Initial Wt:	801.0
Final Wt:	—
3 Gain:	—
Colour:	—

Impinger #3 Empty	
Empty Wt:	536.2
Final Wt:	—
4 Gain:	—
Colour:	—

Container TS4 Weights	
Empty Wt:	428.7
With Imp Soln:	559.0
Imp Volume:	—
After ~100g H_2O Rinse:	768.1
Total TS4:	255.4

CWTR = 1 + 2 + 3 + 4: —

WCBDA=5: —

Sample ID 20 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers — CONTAINER TS5

Empty Wt:	427.8
After Acetone Rinse:	—
After Hexane Rinse:	666.7
Total TS5:	238.9

Impinger Box ID: 15

Impinger 4 Silica Gel — CONTAINER TS6 (Impinger)

Initial Wt:	736.2
Final Wt:	736.2
5 Gain:	—
% Spent:	—

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	5
Trap ID:	10
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	1811632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: [signature]
Train Recovered By: [signature]
Recovery Witnessed By: NICK L.
Date: JUNE 27 2019

Revision: June 19, 2014

ORTECH Environmental

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: 1
Test Date: JUNE 27, 2019
Test Location: UNIT 2 APC OUTLET

Sample ID 21
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser
CONTAINER TS1

Empty Wt:	502.1
After Acetone/ Hexane Rinse:	599.0
Total TS1:	96.9

MARK FLUID LEVEL
SEAL AND LABEL CONTAINER TS1

Sample ID 22
Filter
CONTAINER TS2
Colour: WHITE
FOLD IN FOIL
SEAL AND LABEL CONTAINER TS2

Sample ID 23
XAD-II Trap
CONTAINER TS3

Initial Wt:	408.8
Final Wt:	415.2
1 Gain:	~~6.8~~ 6.4
Colour:	WHITE

SEAL TRAP
WRAP IN FOIL
LABEL AS CONTAINER TS3

Sample ID 24
Impingers 1, 2 & 3
CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	605.1
Final Wt:	1130.0
2 Gain:	524.9
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	535.4
Initial Wt:	629.9
Final Wt:	912.6
3 Gain:	182.7
Colour:	—

Impinger #3 Empty	
Empty Wt:	541.1
Final Wt:	542.2
4 Gain:	1.1
Colour:	—

Container TS4 Weights	
Empty Wt:	426.6
With Imp Soln:	~~946.6~~ 1228.0
Imp Volume:	801.4
After ~100g H_2O Rinse:	1284.7
Total TS4:	858.1

CWTR = 1 + 2 + 3 + 4: ~~715.5~~ 715.1

WCBDA=5: 17.0

Sample ID 25
Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers
CONTAINER TS5

Empty Wt:	284.2
After Acetone Rinse:	—
After Hexane Rinse:	424.9
Total TS5:	140.7

Impinger Box ID: 1

Impinger 4 Silica Gel
CONTAINER TS6 (Impinger)

Initial Wt:	906.5
Final Wt:	923.5
5 Gain:	17.0
% Spent:	—

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	GG
Trap ID:	8
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	181632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: AS
Train Recovered By: DL
Recovery Witnessed By: NICK CAVILLE
Date: JUN 27 2019

Revision: June 19, 2014

ORTECH Environmental

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: 2
Test Date: JUNE 27, 2019
Test Location: UNIT 2 APC OUTLET

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)

TS1

Empty Wt:	426.0
After Acetone/ Hexane Rinse:	634.0
Total TS1:	208.0

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

TS3

Initial Wt:	356.1
Final Wt:	362.7
1 Gain:	6.6
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

TS4

Impinger #1 Empty	
Empty Wt:	619.5
Final Wt:	1154.6
2 Gain:	535.1
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	563.2
Initial Wt:	667.1
Final Wt:	842.4
3 Gain:	175.3
Colour:	

Impinger #3 Empty	
Empty Wt:	654.8
Final Wt:	655.5
4 Gain:	0.7
Colour:	—

Container TS4 Weights	
Empty Wt:	425.9
With Imp Soln:	1228.2
Imp Volume:	802.3
After ~100g H_2O Rinse:	1337.1
Total TS4:	911.2

CWTR = 1 + 2 + 3 + 4: 717.7

WCBDA=5: 20.1

TS5

Empty Wt:	426.0
After Acetone Rinse:	—
After Hexane Rinse:	595.9
Total TS5:	169.6

Impinger Box ID: 2

TS6

Initial Wt:	905.3
Final Wt:	925.4
5 Gain:	20.1
% Spent:	—

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	CC
Trap ID:	3
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	126632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: DT
Train Recovered By: RL
Recovery Witnessed By: —
Date: JUNE 27, 2019

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: 3
Test Date: JUNE 25, 2014
Test Location: UNIT 2 AR OUTLET

Sample ID 31
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser
CONTAINER TS1
Empty Wt: 426.8
After Acetone/ Hexane Rinse: 655.3
Total TS1: 228.5
MARK FLUID LEVEL
SEAL AND LABEL CONTAINER TS1

Sample ID 32
Filter
CONTAINER TS2
Colour: WHITE
FOLD IN FOIL
SEAL AND LABEL CONTAINER TS2

Sample ID 33
XAD-II Trap
CONTAINER TS3
Initial Wt: 378.4
Final Wt: 385.1
1 Gain: 6.7
Colour: WHITE
SEAL TRAP
WRAP IN FOIL
LABEL AS CONTAINER TS3

Sample ID 34
Impingers 1, 2 & 3
CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	480.7
Final Wt:	1112.1
2 Gain:	631.4
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	659.5
Initial Wt:	764.2
Final Wt:	806.5
3 Gain:	42.3
Colour:	—

Impinger #3 Empty	
Empty Wt:	677.3
Final Wt:	678.3
4 Gain:	1.0
Colour:	—

Container TS4 Weights	
Empty Wt:	426.8
With Imp Soln:	1189.7
Imp Volume:	762.9
After ~100g H_2O Rinse:	1374.0
Total TS4:	947.2

CWTR = 1 + 2 + 3 + 4: 681.4

WCBDA=5: 150

Sample ID 35
Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers
CONTAINER TS5
Empty Wt: 426.0
After Acetone Rinse: —
After Hexane Rinse: 575.7
Total TS5: 149.7

Impinger Box ID: 12

Impinger 4 Silica Gel
CONTAINER TS6 (Impinger)
Initial Wt: 892.4
Final Wt: 907.4
5 Gain: 15.0
% Spent: 15

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	AA
Trap ID:	7
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	181632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: AS
Train Recovered By: DW
Recovery Witnessed By: NICK L
Date: JUN 25 2014

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21936
Sample Batch No.: 19-21936-SVOC-

Test No.: BLANK 2
Test Date: JUN 27/19
Test Location: —

Sample ID 36

Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	284.4
After Acetone/ Hexane Rinse:	443.7
Total TS1:	159.3

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 37

Filter

CONTAINER TS2

Colour:

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 38

XAD-II Trap

CONTAINER TS3

Initial Wt:	415.6
Final Wt:	—
1 Gain:	—
Colour:	—

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 39

Impingers 1, 2 & 3

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	523.2
Final Wt:	—
2 Gain:	—
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	655.1
Initial Wt:	737.6
Final Wt:	—
3 Gain:	—
Colour:	—

Impinger #3 Empty	
Empty Wt:	569.2
Final Wt:	—
4 Gain:	—
Colour:	—

Container TS4 Weights	
Empty Wt:	423.8
With Imp Soln:	559.6
Imp Volume:	—
After ~100g H_2O Rinse:	660.2
Total TS4:	236.4

CWTR = 1 + 2 + 3 + 4: —

WCBDA=5: —

Sample ID 40

Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	284.5
After Acetone Rinse:	—
After Hexane Rinse:	469.3
Total TS5:	184.8

Impinger Box ID: 14

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

Initial Wt:	742.1
Final Wt:	742.1
5 Gain:	—
% Spent:	—

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	7
Trap ID:	11
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	181632
Hexane Batch No.:	104307
Acetone Batch No.:	104291

Train Loaded By: RM
Train Recovered By: RM
Recovery Witnessed By: RM
Date: JUN 27/19

APPENDIX 15

SVOC Analytical Report
(70 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 Mississauga, ON L5J 2Y4 Canada
ALS WO#:	L2300710		
Date of Report	23-Jul-19		
Date of Sample Receipt	28-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS: **PCDD/F by EPA M23**

The recovery of 1,2,3,7,8,9-HxCDF was above the method control limit for the laboratoey control sample (LCS). As a result, the reported sample values may be elevated for this target.

The chromatographic peak separation for 2,3,7,8-TCDD was marginally outside the method control limit. However, 2,3,7,8-TCDD has not been detected in the samples.

The chromatographic peak separation for 2,3,7,8-TCDF was outside the method control limits. Low level 2,3,7,8-TCDF peaks were observed in two of the samples. No significant impact to the TEQ values is expected.

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET	19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET	19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET	19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET	19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET	19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET
ALS Sample ID	L2300710-1	L2300710-2	L2300710-3	L2300710-4	L2300710-5	L2300710-6
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	27-Jun-19	27-Jun-19	28-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Extraction Date	11-Jun-19	11-Jun-19	11-Jun-19	11-Jun-19	11-Jun-19	11-Jun-19
Target Analytes	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	<7.4	<11	<7.0	<8.5	<7.2	<6.9
1,2,3,7,8-PeCDD	<5.5	<5.9	<4.6	<5.0	<4.5	<3.8
1,2,3,4,7,8-HxCDD	<6.8	<7.3	<4.9	<4.2	<5.6	<4.9
1,2,3,6,7,8-HxCDD	<5.3	7.03	<3.8	<3.3	<4.4	<5.5
1,2,3,7,8,9-HxCDD	<6.5	<7.1	<4.7	<4.0	<5.4	<5.2
1,2,3,4,6,7,8-HpCDD	73.9	<44	32.5	5.21	<24	36.4
OCDD	164	<59	55.0	<24	57.9	58.6
2,3,7,8-TCDF	<5.2	18.7	<6.1	<6.7	<5.3	<4.6
1,2,3,7,8-PeCDF	<5.1	10.5	<5.1	<4.2	<4.7	6.56
2,3,4,7,8-PeCDF	<5.8	40.6	<6.2	<3.8	<3.5	5.54
1,2,3,4,7,8-HxCDF	<7.0	18.3	<6.3	<4.3	<8.3	7.64
1,2,3,6,7,8-HxCDF	<5.8	<14	<5.6	<3.6	<5.6	9.53
2,3,4,6,7,8-HxCDF	<6.8	<18	<4.8	<4.2	<6.5	<5.3
1,2,3,7,8,9-HxCDF	<9.9	<15	<6.9	<6.0	<9.5	<7.2
1,2,3,4,6,7,8-HpCDF	<31	31.6	25.5	<4.8	19.6	21.6
1,2,3,4,7,8,9-HpCDF	10.3	<5.2	<5.3	<3.4	<6.4	5.43
OCDF	38.0	11.8	13.2	13.0	9.89	9.18
Field Spike Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	103	107	108	85	101	104
13C12-1,2,3,4,7,8-HxCDD	110	105	116	100	119	122
13C12-2,3,4,7,8-PeCDF	96	101	99	103	96	96
13C12-1,2,3,4,7,8-HxCDF	97	94	98	92	102	106
13C12-1,2,3,4,7,8,9-HpCDF	111	122	118	110	118	119
Extraction Standards						
13C12-2,3,7,8-TCDD	80	79	71	72	71	97
13C12-1,2,3,7,8-PeCDD	91	95	81	86	76	109
13C12-1,2,3,6,7,8-HxCDD	69	78	64	69	62	78
13C12-1,2,3,4,6,7,8-HpCDD	82	99	78	83	78	105
13C12-OCDD	84	114	85	88	84	120
13C12-2,3,7,8-TCDF	82	81	75	73	73	98
13C12-1,2,3,7,8-PeCDF	90	93	79	82	77	106
13C12-1,2,3,6,7,8-HxCDF	68	79	65	66	62	77
13C12-1,2,3,4,6,7,8-HpCDF	72	86	68	71	67	82
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	87	105	87	80	80	98
Homologue Group Totals	pg	pg	pg	pg	pg	pg
Total-TCDD	<7.4	28.0	<7.0	<8.5	14.3	30.9
Total-PeCDD	15.3	22.4	4.67	<5.0	5.35	37.7
Total-HxCDD	68.6	<7.3	54.5	<4.2	57.9	82.1
Total-HpCDD	138	37.4	32.5	5.21	<3.4	71.3
Total-TCDF	12.8	114	<6.1	<6.7	<5.3	18.9
Total-PeCDF	<5.1	85.0	6.22	<4.2	23.7	42.4
Total-HxCDF	12.7	18.3	12.2	<6.0	9.53	34.9
Total-HpCDF	10.3	43.1	32.8	<3.4	23.5	27.1
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	0.903	17.2	0.600	0.0560	0.216	4.23
Mid Point PCDD/F TEQ (WHO 2005)	12.1	30.8	11.2	9.33	9.98	12.3
Upper Bound PCDD/F TEQ (WHO 2005)	21.3	40.8	18.6	18.5	18.5	18.2

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Sample Analysis summary Report

Sample Name	19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET	19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET
ALS Sample ID	L2300710-7	L2300710-8
Sample Size	1	1
Sample size units	Train	Train
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	28-Jun-19	27-Jun-19
Extraction Date	11-Jun-19	11-Jun-19
Target Analytes	pg	pg
2,3,7,8-TCDD	<8.6	<6.2
1,2,3,7,8-PeCDD	<5.9	<3.7
1,2,3,4,7,8-HxCDD	<8.4	<3.2
1,2,3,6,7,8-HxCDD	14.0	<2.5
1,2,3,7,8,9-HxCDD	12.8	<3.1
1,2,3,4,6,7,8-HpCDD	66.8	2.09
OCDD	119	<2.0
2,3,7,8-TCDF	24.8	<3.6
1,2,3,7,8-PeCDF	30.4	<3.9
2,3,4,7,8-PeCDF	31.0	<3.5
1,2,3,4,7,8-HxCDF	35.0	<2.3
1,2,3,6,7,8-HxCDF	<25	<1.9
2,3,4,6,7,8-HxCDF	26.8	<2.3
1,2,3,7,8,9-HxCDF	<15	5.07
1,2,3,4,6,7,8-HpCDF	87.7	<1.4
1,2,3,4,7,8,9-HpCDF	14.0	<2.1
OCDF	36.9	<1.4
Field Spike Standards	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	110	90
13C12-1,2,3,4,7,8-HxCDD	105	109
13C12-2,3,4,7,8-PeCDF	104	103
13C12-1,2,3,4,7,8-HxCDF	100	103
13C12-1,2,3,4,7,8,9-HpCDF	120	116
Extraction Standards		
13C12-2,3,7,8-TCDD	71	73
13C12-1,2,3,7,8-PeCDD	82	84
13C12-1,2,3,6,7,8-HxCDD	64	63
13C12-1,2,3,4,6,7,8-HpCDD	80	83
13C12-OCDD	91	89
13C12-2,3,7,8-TCDF	73	75
13C12-1,2,3,7,8-PeCDF	79	82
13C12-1,2,3,6,7,8-HxCDF	62	62
13C12-1,2,3,4,6,7,8-HpCDF	69	69
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	89	93
Homologue Group Totals	pg	pg
Total-TCDD	15.1	<6.2
Total-PeCDD	38.7	<3.7
Total-HxCDD	105	<3.2
Total-HpCDD	119	2.09
Total-TCDF	140	<3.6
Total-PeCDF	221	<3.9
Total-HxCDF	137	5.07
Total-HpCDF	114	<2.1
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	23.3	0.528
Mid Point PCDD/F TEQ (WHO 2005)	34.2	7.02
Upper Bound PCDD/F TEQ (WHO 2005)	42.6	13.5

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Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG3094556-1	WG3094556-2
Sample Size	1	1
Sample size units	Train	n/a
Percent Moisture	n/a	n/a
Sample Matrix	Media	Media
Sampling Date	n/a	n/a
Extraction Date	11-Jun-19	11-Jun-19
Target Analytes	**pg**	**% Rec**
2,3,7,8-TCDD	<7.6	98
1,2,3,7,8-PeCDD	<3.8	103
1,2,3,4,7,8-HxCDD	<4.8	124
1,2,3,6,7,8-HxCDD	<3.8	106
1,2,3,7,8,9-HxCDD	<4.6	130
1,2,3,4,6,7,8-HpCDD	<2.4	97
OCDD	<2.8	100
2,3,7,8-TCDF	<5.0	89
1,2,3,7,8-PeCDF	<3.6	102
2,3,4,7,8-PeCDF	<3.2	90
1,2,3,4,7,8-HxCDF	<2.7	111
1,2,3,6,7,8-HxCDF	<2.2	110
2,3,4,6,7,8-HxCDF	<2.6	119
1,2,3,7,8,9-HxCDF	<3.8	157
1,2,3,4,6,7,8-HpCDF	<2.6	99
1,2,3,4,7,8,9-HpCDF	<3.8	118
OCDF	<3.1	96
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	77	70
13C12-1,2,3,7,8-PeCDD	88	82
13C12-1,2,3,6,7,8-HxCDD	65	60
13C12-1,2,3,4,6,7,8-HpCDD	89	81
13C12-OCDD	92	87
13C12-2,3,7,8-TCDF	79	70
13C12-1,2,3,7,8-PeCDF	84	79
13C12-1,2,3,6,7,8-HxCDF	68	57
13C12-1,2,3,4,6,7,8-HpCDF	78	71
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	89	82
Homologue Group Totals	**pg**	
Total-TCDD	<7.6	
Total-PeCDD	<3.8	
Total-HxCDD	<4.8	
Total-HpCDD	<2.4	
Total-TCDF	<5.0	
Total-PeCDF	<3.6	
Total-HxCDF	<3.8	
Total-HpCDF	<3.8	
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.00	
Mid Point PCDD/F TEQ (WHO 2005)	7.75	
Upper Bound PCDD/F TEQ (WHO 2005)	15.5	

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-1	Extraction Date	11-Jun-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A09
Run Date	22-Jul-19 21:45
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<7.4	7.4	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<5.5	5.5	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<6.8	6.8	U		130
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<5.3	5.3	U		130
1,2,3,7,8,9-HxCDD	0.1	34.26	<6.5	6.5	M,U	4.7	130
1,2,3,4,6,7,8-HpCDD	0.01	35.76	73.9	3.6	J		130
OCDD	0.0003	37.24	164	3.0	J		250
2,3,7,8-TCDF	0.1	NotFnd	<5.2	5.2	U		25
1,2,3,7,8-PeCDF	0.03	NotFnd	<5.1	5.1	U		130
2,3,4,7,8-PeCDF	0.3	31.80	<5.8	4.6	M,J,R	5.8	130
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<7.0	7.0	U		130
1,2,3,6,7,8-HxCDF	0.1	33.66	<5.8	5.8	M,U		130
2,3,4,6,7,8-HxCDF	0.1	33.99	<6.8	6.8	M,U	6.6	130
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<9.9	9.9	U		130
1,2,3,4,6,7,8-HpCDF	0.01	35.19	<31	2.2	J,R	31	130
1,2,3,4,7,8,9-HpCDF	0.01	36.00	10.3	3.2	M,J		130
OCDF	0.0003	37.33	38.0	3.2	J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.87	103	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	110	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.79	96	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.59	97	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.99	111	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.86	80	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.02	91	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	69	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	82	25-130
13C12-OCDD	20000	37.23	84	25-130
13C12-2,3,7,8-TCDF	10000	26.93	82	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.07	90	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	68	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	72	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.40	87	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	0	<7.4	7.4	U	25
Total-PeCDD	1	15.3	5.5		130
Total-HxCDD	2	68.6	6.8		130
Total-HpCDD	2	138	3.6		130
Total-TCDF	1	12.8	5.2		25
Total-PeCDF	0	<5.1	5.1	U	130
Total-HxCDF	2	12.7	9.9		130
Total-HpCDF	1	10.3	3.2		130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.903
Mid Point PCDD/F TEQ (WHO 2005)	12.1
Upper Bound PCDD/F TEQ (WHO 2005)	21.3

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

Sample Analysis Report

Sample Name	**19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET**	Sampling Date	27-Jun-19	
ALS Sample ID	L2300710-2	Extraction Date	11-Jun-19	
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A10
Run Date	22-Jul-19 22:27
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<11	11	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<5.9	5.9	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<7.3	7.3	U		130
1,2,3,6,7,8-HxCDD	0.1	34.13	7.03	5.8	M,J		130
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<7.1	7.1	U		130
1,2,3,4,6,7,8-HpCDD	0.01	35.76	<44	3.6	M,J,R	44	130
OCDD	0.0003	37.25	<59	2.6	M,J,R	59	250
2,3,7,8-TCDF	0.1	26.95	18.7	8.5	M,J		25
1,2,3,7,8-PeCDF	0.03	31.09	10.5	7.8	M,J		130
2,3,4,7,8-PeCDF	0.3	31.80	40.6	7.0	M,J		130
1,2,3,4,7,8-HxCDF	0.1	33.59	18.3	11	M,J		130
1,2,3,6,7,8-HxCDF	0.1	33.66	<14	8.8	M,J,R	14	130
2,3,4,6,7,8-HxCDF	0.1	34.01	<18	10	M,J,R	18	130
1,2,3,7,8,9-HxCDF	0.1	34.43	<15	15	M,U	12	130
1,2,3,4,6,7,8-HpCDF	0.01	35.20	31.6	3.5	M,J		130
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<5.2	5.2	U		130
OCDF	0.0003	37.34	11.8	3.1	M,J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.89	107	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	105	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.80	101	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.59	94	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	36.00	122	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.86	79	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.02	95	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	78	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.76	99	25-130
13C12-OCDD	20000	37.24	114	25-130
13C12-2,3,7,8-TCDF	10000	26.95	81	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.07	93	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.66	79	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	86	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.41	105	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	1	28.0	11		25
Total-PeCDD	2	22.4	5.9		130
Total-HxCDD	0	<7.3	7.3	U	130
Total-HpCDD	1	37.4	3.6		130
Total-TCDF	5	114	8.5		25
Total-PeCDF	3	85.0	7.8		130
Total-HxCDF	1	18.3	15		130
Total-HpCDF	2	43.1	5.2		130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	17.2
Mid Point PCDD/F TEQ (WHO 2005)	30.8
Upper Bound PCDD/F TEQ (WHO 2005)	40.8

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

Sample Analysis Report

Sample Name	**19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET**	Sampling Date	28-Jun-19	
ALS Sample ID	L2300710-3	Extraction Date	11-Jun-19	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	23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A11
Run Date	22-Jul-19 23:09
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<7.0	7.0	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<4.6	4.6	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<4.9	4.9	U		130
1,2,3,6,7,8-HxCDD	0.1	34.14	<3.8	3.8	M,U	2.9	130
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<4.7	4.7	U		130
1,2,3,4,6,7,8-HpCDD	0.01	35.75	32.5	3.4	J		130
OCDD	0.0003	37.25	55.0	2.2	J		250
2,3,7,8-TCDF	0.1	NotFnd	<6.1	6.1	U		25
1,2,3,7,8-PeCDF	0.03	31.08	<5.1	4.6	M,J,R	5.1	130
2,3,4,7,8-PeCDF	0.3	31.78	<6.2	4.1	M,J,R	6.2	130
1,2,3,4,7,8-HxCDF	0.1	33.57	<6.3	4.9	M,J,R	6.3	130
1,2,3,6,7,8-HxCDF	0.1	33.66	<5.6	4.1	M,J,R	5.6	130
2,3,4,6,7,8-HxCDF	0.1	33.99	<4.8	4.8	M,U	4.0	130
1,2,3,7,8,9-HxCDF	0.1	34.43	<6.9	6.9	M,U	3.9	130
1,2,3,4,6,7,8-HpCDF	0.01	35.19	25.5	2.4	J		130
1,2,3,4,7,8,9-HpCDF	0.01	36.00	<5.3	3.5	M,J,R	5.3	130
OCDF	0.0003	37.32	13.2	2.6	J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.84	108	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	116	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.78	99	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.58	98	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.99	118	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.83	71	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.00	81	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	64	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	78	25-130
13C12-OCDD	20000	37.24	85	25-130
13C12-2,3,7,8-TCDF	10000	26.90	75	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.06	79	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	65	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	68	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.40	87	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	0	<7.0	7.0	U	25
Total-PeCDD	1	4.67	4.6		130
Total-HxCDD	1	54.5	4.9		130
Total-HpCDD	1	32.5	3.4		130
Total-TCDF	0	<6.1	6.1	U	25
Total-PeCDF	1	6.22	4.6		130
Total-HxCDF	1	12.2	6.9		130
Total-HpCDF	2	32.8	3.5		130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.600
Mid Point PCDD/F TEQ (WHO 2005)	11.2
Upper Bound PCDD/F TEQ (WHO 2005)	18.6

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.
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	**19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET**	Sampling Date	27-Jun-19	
ALS Sample ID	L2300710-4	Extraction Date	11-Jun-19	
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A07
Run Date	22-Jul-19 20:20
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<8.5	8.5	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<5.0	5.0	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<4.2	4.2	U		130
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<3.3	3.3	U		130
1,2,3,7,8,9-HxCDD	0.1	34.26	<4.0	4.0	M,U		130
1,2,3,4,6,7,8-HpCDD	0.01	35.76	5.21	4.3	M,J		130
OCDD	0.0003	37.24	<24	2.6	M,J,R	24	250
2,3,7,8-TCDF	0.1	NotFnd	<6.7	6.7	U		25
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.2	4.2	U		130
2,3,4,7,8-PeCDF	0.3	NotFnd	<3.8	3.8	U		130
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<4.3	4.3	U		130
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<3.6	3.6	U		130
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<4.2	4.2	U		130
1,2,3,7,8,9-HxCDF	0.1	34.40	<6.0	6.0	M,U	4.0	130
1,2,3,4,6,7,8-HpCDF	0.01	35.21	<4.8	2.3	M,J,R	4.8	130
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<3.4	3.4	U		130
OCDF	0.0003	37.34	13.0	3.7	M,J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.89	85	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	100	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.79	103	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.59	92	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	36.00	110	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.86	72	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.02	86	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	69	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	83	25-130
13C12-OCDD	20000	37.24	88	25-130
13C12-2,3,7,8-TCDF	10000	26.95	73	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.07	82	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.66	66	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	71	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.41	80	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<8.5	8.5	U	25
Total-PeCDD	0	<5.0	5.0	U	130
Total-HxCDD	0	<4.2	4.2	U	130
Total-HpCDD	1	5.21	4.3		130
Total-TCDF	0	<6.7	6.7	U	25
Total-PeCDF	0	<4.2	4.2	U	130
Total-HxCDF	0	<6.0	6.0	U	130
Total-HpCDF	0	<3.4	3.4	U	130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.0560
Mid Point PCDD/F TEQ (WHO 2005)	9.33
Upper Bound PCDD/F TEQ (WHO 2005)	18.5

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.
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	**19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET**	Sampling Date	27-Jun-19	
ALS Sample ID	L2300710-5	Extraction Date	11-Jun-19	
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A12
Run Date	22-Jul-19 23:51
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<7.2	7.2	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<4.5	4.5	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<5.6	5.6	U		130
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<4.4	4.4	U		130
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<5.4	5.4	U		130
1,2,3,4,6,7,8-HpCDD	0.01	35.75	<24	3.4	M,J,R	24	130
OCDD	0.0003	37.24	57.9	2.5	J		250
2,3,7,8-TCDF	0.1	NotFnd	<5.3	5.3	U		25
1,2,3,7,8-PeCDF	0.03	31.06	<4.7	3.8	M,J,R	4.7	130
2,3,4,7,8-PeCDF	0.3	NotFnd	<3.5	3.5	U		130
1,2,3,4,7,8-HxCDF	0.1	33.58	<8.3	6.7	M,J,R	8.3	130
1,2,3,6,7,8-HxCDF	0.1	33.66	<5.6	5.6	M,U		130
2,3,4,6,7,8-HxCDF	0.1	33.99	<6.5	6.5	M,U	4.7	130
1,2,3,7,8,9-HxCDF	0.1	34.42	<9.5	9.5	M,U	4.7	130
1,2,3,4,6,7,8-HpCDF	0.01	35.19	19.6	1.9	J		130
1,2,3,4,7,8,9-HpCDF	0.01	35.99	<6.4	2.8	M,J,R	6.4	130
OCDF	0.0003	37.33	9.89	2.6	M,J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.84	101	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	119	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.78	96	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.58	102	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.99	118	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.83	71	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.00	76	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	62	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	78	25-130
13C12-OCDD	20000	37.23	84	25-130
13C12-2,3,7,8-TCDF	10000	26.90	73	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.06	77	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	62	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	67	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.39	80	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	1	14.3	7.2		25
Total-PeCDD	1	5.35	4.5		130
Total-HxCDD	1	57.9	5.6		130
Total-HpCDD	0	<3.4	3.4	U	130
Total-TCDF	0	<5.3	5.3	U	25
Total-PeCDF	2	23.7	3.8		130
Total-HxCDF	2	9.53	9.5		130
Total-HpCDF	2	23.5	2.8		130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.216
Mid Point PCDD/F TEQ (WHO 2005)	9.98
Upper Bound PCDD/F TEQ (WHO 2005)	18.5

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.

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	**19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-6	Extraction Date	11-Jun-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A13
Run Date	23-Jul-19 00:33
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<6.9	6.9	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<3.8	3.8	U		130
1,2,3,4,7,8-HxCDD	0.1	34.09	<4.9	4.5	M,J,R	4.9	130
1,2,3,6,7,8-HxCDD	0.1	34.13	<5.5	3.6	M,J,R	5.5	130
1,2,3,7,8,9-HxCDD	0.1	34.25	<5.2	4.4	M,J,R	5.2	130
1,2,3,4,6,7,8-HpCDD	0.01	35.76	36.4	2.5	J		130
OCDD	0.0003	37.24	58.6	1.7	J		250
2,3,7,8-TCDF	0.1	NotFnd	<4.6	4.6	U		25
1,2,3,7,8-PeCDF	0.03	31.07	6.56	4.0	M,J		130
2,3,4,7,8-PeCDF	0.3	31.73	5.54	3.7	M,J		130
1,2,3,4,7,8-HxCDF	0.1	33.59	7.64	5.1	M,J		130
1,2,3,6,7,8-HxCDF	0.1	33.66	9.53	4.3	M,J		130
2,3,4,6,7,8-HxCDF	0.1	33.98	<5.3	5.0	M,J,R	5.3	130
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<7.2	7.2	U		130
1,2,3,4,6,7,8-HpCDF	0.01	35.20	21.6	2.4	J		130
1,2,3,4,7,8,9-HpCDF	0.01	36.00	5.43	3.5	M,J		130
OCDF	0.0003	37.34	9.18	1.9	M,J		250

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.84	104	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	122	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.78	96	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.58	106	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	36.00	119	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.83	97	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.00	109	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	78	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	105	25-130
13C12-OCDD	20000	37.24	120	25-130
13C12-2,3,7,8-TCDF	10000	26.90	98	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.06	106	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	77	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	82	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.40	98	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	1	30.9	6.9	25
Total-PeCDD	2	37.7	3.8	130
Total-HxCDD	2	82.1	4.5	130
Total-HpCDD	2	71.3	2.5	130
Total-TCDF	1	18.9	4.6	25
Total-PeCDF	3	42.4	4.0	130
Total-HxCDF	3	34.9	7.2	130
Total-HpCDF	2	27.1	3.5	130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4.23
Mid Point PCDD/F TEQ (WHO 2005)	12.3
Upper Bound PCDD/F TEQ (WHO 2005)	18.2

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.
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	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	Sampling Date	28-Jun-19	
ALS Sample ID	L2300710-7	Extraction Date	11-Jun-19	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	23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A14
Run Date	23-Jul-19 01:16
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<8.6	8.6	U		25
1,2,3,7,8-PeCDD	1	32.04	<5.9	5.9	M,U	4.6	130
1,2,3,4,7,8-HxCDD	0.1	34.10	<8.4	8.4	M,U	6.5	130
1,2,3,6,7,8-HxCDD	0.1	34.15	14.0	6.6	M,J		130
1,2,3,7,8,9-HxCDD	0.1	34.28	12.8	8.1	M,J		130
1,2,3,4,6,7,8-HpCDD	0.01	35.77	66.8	3.8	J		130
OCDD	0.0003	37.26	119	2.5	J		250
2,3,7,8-TCDF	0.1	26.98	24.8	8.1	M,J		25
1,2,3,7,8-PeCDF	0.03	31.09	30.4	6.3	M,J		130
2,3,4,7,8-PeCDF	0.3	31.82	31.0	5.8	M,J		130
1,2,3,4,7,8-HxCDF	0.1	33.60	35.0	11	M,J		130
1,2,3,6,7,8-HxCDF	0.1	33.67	<25	9.2	M,J,R	25	130
2,3,4,6,7,8-HxCDF	0.1	34.01	26.8	11	M,J		130
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<15	15	U		130
1,2,3,4,6,7,8-HpCDF	0.01	35.21	87.7	3.2	J		130
1,2,3,4,7,8,9-HpCDF	0.01	36.02	14.0	4.7	M,J		130
OCDF	0.0003	37.34	36.9	2.6	J		250
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	1000	27.89	110	70-130			
13C12-1,2,3,4,7,8-HxCDD	10000	34.10	105	70-130			
13C12-2,3,4,7,8-PeCDF	10000	31.80	104	70-130			
13C12-1,2,3,4,7,8-HxCDF	10000	33.60	100	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	10000	36.01	120	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	10000	27.87	71	40-130			
13C12-1,2,3,7,8-PeCDD	10000	32.03	82	40-130			
13C12-1,2,3,6,7,8-HxCDD	10000	34.14	64	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.76	80	25-130			
13C12-OCDD	20000	37.25	91	25-130			
13C12-2,3,7,8-TCDF	10000	26.95	73	40-130			
13C12-1,2,3,7,8-PeCDF	10000	31.08	79	40-130			
13C12-1,2,3,6,7,8-HxCDF	10000	33.66	62	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.20	69	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.41	89	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	1	15.1	8.6	25
Total-PeCDD	2	38.7	5.9	130
Total-HxCDD	3	105	8.4	130
Total-HpCDD	2	119	3.8	130
Total-TCDF	6	140	8.1	25
Total-PeCDF	6	221	6.3	130
Total-HxCDF	4	137	15	130
Total-HpCDF	3	114	4.7	130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	23.3
Mid Point PCDD/F TEQ (WHO 2005)	34.2
Upper Bound PCDD/F TEQ (WHO 2005)	42.6

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.
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	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-8	Extraction Date	11-Jun-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A08
Run Date	22-Jul-19 21:03
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<6.2	6.2	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<3.7	3.7	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<3.2	3.2	U		130
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<2.5	2.5	U		130
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<3.1	3.1	U		130
1,2,3,4,6,7,8-HpCDD	0.01	35.77	2.09	1.6	M,J		130
OCDD	0.0003	37.24	<2.0	2.0	M,U	1.7	250
2,3,7,8-TCDF	0.1	NotFnd	<3.6	3.6	U		25
1,2,3,7,8-PeCDF	0.03	NotFnd	<3.9	3.9	U		130
2,3,4,7,8-PeCDF	0.3	NotFnd	<3.5	3.5	U		130
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.3	2.3	U		130
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.9	1.9	U		130
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.3	2.3	U		130
1,2,3,7,8,9-HxCDF	0.1	34.42	5.07	3.3	M,J		130
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<1.4	1.4	U		130
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.1	2.1	U		130
OCDF	0.0003	NotFnd	<1.4	1.4	U		250

Field Spike Standards	**pg**	**Ret. Time**	**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.86	90	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.08	109	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.79	103	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.59	103	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	36.00	116	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.83	73	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.02	84	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	63	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.76	83	25-130
13C12-OCDD	20000	37.24	89	25-130
13C12-2,3,7,8-TCDF	10000	26.90	75	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.06	82	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.66	62	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	69	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.41	93	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**Flags**	**LQL**
Total-TCDD	0	<6.2	6.2	U	25
Total-PeCDD	0	<3.7	3.7	U	130
Total-HxCDD	0	<3.2	3.2	U	130
Total-HpCDD	1	2.09	1.6		130
Total-TCDF	0	<3.6	3.6	U	25
Total-PeCDF	0	<3.9	3.9	U	130
Total-HxCDF	1	5.07	3.3		130
Total-HpCDF	0	<2.1	2.1	U	130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.528
Mid Point PCDD/F TEQ (WHO 2005)	7.02
Upper Bound PCDD/F TEQ (WHO 2005)	13.5

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.
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	WG3094556-1	Extraction Date	11-Jun-19		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Blank	Percent Moisture	n/a		23-Jul-2019
Sample Matrix	Media	Split Ratio	5		

Run Information	**Run 1**
Filename	7-190722A05
Run Date	22-Jul-19 18:56
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<7.6	7.6	U		25
1,2,3,7,8-PeCDD	1	NotFnd	<3.8	3.8	U		130
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<4.8	4.8	U		130
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<3.8	3.8	U		130
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<4.6	4.6	U		130
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<2.4	2.4	U		130
OCDD	0.0003	37.25	<2.8	2.8	M,U	2.1	250
2,3,7,8-TCDF	0.1	NotFnd	<5.0	5.0	U		25
1,2,3,7,8-PeCDF	0.03	NotFnd	<3.6	3.6	U		130
2,3,4,7,8-PeCDF	0.3	NotFnd	<3.2	3.2	U		130
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.7	2.7	U		130
1,2,3,6,7,8-HxCDF	0.1	33.67	<2.2	2.2	M,U		130
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.6	2.6	U		130
1,2,3,7,8,9-HxCDF	0.1	34.39	<3.8	3.8	M,U	1.9	130
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<2.6	2.6	U		130
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<3.8	3.8	U		130
OCDF	0.0003	NotFnd	<3.1	3.1	U		250

Field Spike Standards	**% Rec**
37Cl4-2,3,7,8-TCDD	NS
13C12-1,2,3,4,7,8-HxCDD	NS
13C12-2,3,4,7,8-PeCDF	NS
13C12-1,2,3,4,7,8-HxCDF	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS

Extraction Standards				
13C12-2,3,7,8-TCDD	10000	27.83	77	40-130
13C12-1,2,3,7,8-PeCDD	10000	32.00	88	40-130
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	65	40-130
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	89	25-130
13C12-OCDD	20000	37.24	92	25-130
13C12-2,3,7,8-TCDF	10000	26.90	79	40-130
13C12-1,2,3,7,8-PeCDF	10000	31.06	84	40-130
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	68	40-130
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	78	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.40	89	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<7.6	7.6	U	25
Total-PeCDD	0	<3.8	3.8	U	130
Total-HxCDD	0	<4.8	4.8	U	130
Total-HpCDD	0	<2.4	2.4	U	130
Total-TCDF	0	<5.0	5.0	U	25
Total-PeCDF	0	<3.6	3.6	U	130
Total-HxCDF	0	<3.8	3.8	U	130
Total-HpCDF	0	<3.8	3.8	U	130

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00
Mid Point PCDD/F TEQ (WHO 2005)	7.75
Upper Bound PCDD/F TEQ (WHO 2005)	15.5

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.
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
NS	Indicates that this standard was not spiked to sample

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a	
ALS Sample ID	WG3094556-2	Extraction Date	11-Jun-19	
Analysis Method	EPA M23	Sample Size	1	n/a
Analysis Type	LCS	Percent Moisture	n/a	
Sample Matrix	Media	Split Ratio	5	

Approved:
T.Patterson
--e-signature--
23-Jul-2019

Run Information	**Run 1**
Filename	7-190722A02
Run Date	22-Jul-19 16:50
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUST170923H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	1000	27.84	98	70-130	
1,2,3,7,8-PeCDD	5000	32.02	103	70-130	
1,2,3,4,7,8-HxCDD	5000	34.08	124	70-130	
1,2,3,6,7,8-HxCDD	5000	34.13	106	70-130	
1,2,3,7,8,9-HxCDD	5000	34.26	130	70-130	
1,2,3,4,6,7,8-HpCDD	5000	35.76	97	70-130	
OCDD	10000	37.24	100	70-130	
2,3,7,8-TCDF	1000	26.92	89	70-130	
1,2,3,7,8-PeCDF	5000	31.07	102	70-130	
2,3,4,7,8-PeCDF	5000	31.79	90	70-130	
1,2,3,4,7,8-HxCDF	5000	33.59	111	70-130	
1,2,3,6,7,8-HxCDF	5000	33.66	110	70-130	
2,3,4,6,7,8-HxCDF	5000	33.99	119	70-130	
1,2,3,7,8,9-HxCDF	5000	34.41	157	70-130	
1,2,3,4,6,7,8-HpCDF	5000	35.19	99	70-130	
1,2,3,4,7,8,9-HpCDF	5000	36.00	118	70-130	
OCDF	10000	37.33	96	70-130	
Field Spike Standards			**% Rec**		
37Cl4-2,3,7,8-TCDD			NS		
13C12-1,2,3,4,7,8-HxCDD			NS		
13C12-2,3,4,7,8-PeCDF			NS		
13C12-1,2,3,4,7,8-HxCDF			NS		
13C12-1,2,3,4,7,8,9-HpCDF			NS		
Extraction Standards					
13C12-2,3,7,8-TCDD	10000	27.81	70	40-130	
13C12-1,2,3,7,8-PeCDD	10000	32.00	82	40-130	
13C12-1,2,3,6,7,8-HxCDD	10000	34.13	60	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	10000	35.75	81	25-130	
13C12-OCDD	20000	37.24	87	25-130	
13C12-2,3,7,8-TCDF	10000	26.90	70	40-130	
13C12-1,2,3,7,8-PeCDF	10000	31.06	79	40-130	
13C12-1,2,3,6,7,8-HxCDF	10000	33.65	57	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	10000	35.19	71	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	10000	34.40	82	40-130	

NS Indicates that this standard was not spiked to sample

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 Road
ALS WO#:	L2300710		Mississauga, ON
Date of Report	23-Jul-19		L5J 2Y4
Date of Sample Receipt	2-Jul-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS: **Toxic PCB Congeners by EPA 1668C**

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET	19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET	19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET	19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET	19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET	19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET
ALS Sample ID	L2300710-1	L2300710-2	L2300710-3	L2300710-4	L2300710-5	L2300710-6
Sample Size	1	1	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	27-Jun-19	27-Jun-19	28-Jun-19	27-Jun-19	27-Jun-19	27-Jun-19
Extraction Date	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19
Target Analytes	pg	pg	pg	pg	pg	pg
PCB-081	<17	<11	<17	<5.6	<15	<24
PCB-077	278	127	402	<6.1	177	<47
PCB-123	<110	<51	128	<6.0	70.4	<16
PCB-118	8030	3940	8660	13.0	4550	965
PCB-114	206	100	224	<6.0	98.7	23.8
PCB-105	2490	1050	2600	<5.9	1450	310
PCB-126	<10	<11	<18	<6.5	<19	<9.1
PCB-167	73.8	<23	67.8	<2.9	53.4	10.8
PCB-156/157	209	87.0	190	<4.3	145	37.7
PCB-169	<4.8	6.20	<5.8	<3.4	<17	<3.9
PCB-189	<4.3	<3.8	<2.7	<2.9	<2.2	<2.5
Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB-081	63	55	59	54	57	63
13C12-PCB-077	64	56	60	56	58	65
13C12-PCB-123	66	58	64	59	61	67
13C12-PCB-118	65	58	64	61	60	66
13C12-PCB-114	66	58	65	60	62	67
13C12-PCB-105	67	57	62	60	62	68
13C12-PCB-126	67	58	63	60	62	68
13C12-PCB-167	79	69	77	72	76	80
13C12-PCB-156/157	76	68	75	69	72	77
13C12-PCB-169	86	76	83	76	81	89
13C12-PCB-189	73	67	70	65	71	75
Field Spike Standards						
13C12-PCB-031	82	92	83	84	90	86
13C12-PCB-095	77	81	79	80	75	75
13C12-PCB-153	79	82	83	84	82	81
Cleanup Standards						
13C12-PCB-028	49	47	48	40	42	46
13C12-PCB-111	63	61	64	55	58	57
13C12-PCB-178	76	74	79	66	74	70
Toxic Equivalency - (WHO 2005)						
Lower Bound PCB TEQ	0.358	0.354	0.396	0.000390	0.209	0.0404
Mid Point PCB TEQ	0.939	1.46	2.29	0.378	2.37	1.02
Upper Bound PCB TEQ	1.51	1.46	2.38	0.756	2.62	1.08

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Sample Analysis summary Report

Sample Name	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**
ALS Sample ID	L2300710-7	L2300710-8
Sample Size	1	1
Sample size units	Sample	Sample
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	28-Jun-19	27-Jun-19
Extraction Date	11-Jul-19	11-Jul-19
Target Analytes	**pg**	**pg**
PCB-081	<25	<10
PCB-077	479	<11
PCB-123	311	<9.6
PCB-118	15900	<9.0
PCB-114	<370	<9.3
PCB-105	4550	<8.9
PCB-126	<22	<13
PCB-167	121	<3.7
PCB-156/157	<300	<5.8
PCB-169	<12	<4.3
PCB-189	<5.0	<4.5
Extraction Standards	**% Rec**	**% Rec**
13C12-PCB-081	35	46
13C12-PCB-077	36	49
13C12-PCB-123	37	49
13C12-PCB-118	37	50
13C12-PCB-114	37	50
13C12-PCB-105	37	52
13C12-PCB-126	37	50
13C12-PCB-167	45	61
13C12-PCB-156/157	42	59
13C12-PCB-169	48	66
13C12-PCB-189	40	55
Field Spike Standards		
13C12-PCB-031	84	87
13C12-PCB-095	79	76
13C12-PCB-153	82	84
Cleanup Standards		
13C12-PCB-028	33	39
13C12-PCB-111	40	54
13C12-PCB-178	48	66
Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ	0.674	0.00
Mid Point PCB TEQ	3.08	1.37
Upper Bound PCB TEQ	3.26	1.43

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Quality Control Summary Report

Sample Name	**Method Blank**
ALS Sample ID	WG3094556-1
Sample Size	1
Sample size units	Method Blank
Percent Moisture	n/a
Sample Matrix	Media
Sampling Date	n/a
Extraction Date	11-Jul-19

Target Analytes	**pg**
PCB-081	<6.4
PCB-077	<6.6
PCB-123	<6.2
PCB-118	<12
PCB-114	<6.1
PCB-105	<5.7
PCB-126	<6.4
PCB-167	<2.5
PCB-156/157	6.62
PCB-169	<2.9
PCB-189	<3.4
Extraction Standards	**% Rec**
13C12-PCB-081	52
13C12-PCB-077	56
13C12-PCB-123	58
13C12-PCB-118	59
13C12-PCB-114	58
13C12-PCB-105	61
13C12-PCB-126	60
13C12-PCB-167	72
13C12-PCB-156/157	71
13C12-PCB-169	80
13C12-PCB-189	69
Field Spike Standards	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS
Cleanup Standards	
13C12-PCB-028	35
13C12-PCB-111	50
13C12-PCB-178	62
Toxic Equivalency - (WHO 2005)	
Lower Bound PCB TEQ	0.000199
Mid Point PCB TEQ	0.366
Upper Bound PCB TEQ	0.731

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Sample Analysis summary Report

Sample Name	**Laboratory Control Sample**
ALS Sample ID	WG3094556-2
Sample Size	1
Sample size units	n/a
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	11-Jul-19

Target Analytes	**% Rec**
PCB-081	92
PCB-077	94
PCB-123	90
PCB-118	93
PCB-114	90
PCB-105	89
PCB-126	89
PCB-167	90
PCB-156/157	91
PCB-169	92
PCB-189	103
Extraction Standards	**% Rec**
13C12-PCB-081	54
13C12-PCB-077	57
13C12-PCB-123	60
13C12-PCB-118	59
13C12-PCB-114	59
13C12-PCB-105	60
13C12-PCB-126	61
13C12-PCB-167	73
13C12-PCB-156/157	71
13C12-PCB-169	81
13C12-PCB-189	68
Field Spike Standards	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS
Cleanup Standards	
13C12-PCB-028	37
13C12-PCB-111	54
13C12-PCB-178	67

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Sample Analysis Report

Sample Name	**19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET**	Sampling Date	27-Jun-19		Approved:
ALS Sample ID	L2300710-1	Extraction Date	11-Jul-19		*E. Sabljic*
Analysis Method	EPA 1668C	Sample Size	1	Sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		19-Jul-2019
Sample Matrix	Stack	Split Ratio	10		

Run Information	**Run 1**
Filename	5-190718A19
Run Date	19-Jul-19 00:51
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.81	<17	11	M,J,R	17	250
PCB-077	0.0001	22.12	278	11	M		250
PCB-123	0.00003	23.10	<110	9.2	M,J,R	110	250
PCB-118	0.00003	23.27	8030	9.0	M		250
PCB-114	0.00003	23.57	206	9.2	J		250
PCB-105	0.00003	23.92	2490	9.4			250
PCB-126	0.1	25.51	<10	10	M,U	8.9	250
PCB-167	0.00003	26.41	73.8	4.1	J		250
PCB-156/157	0.00003	27.03	209	6.3	J		500
PCB-169	0.03	28.67	<4.8	4.8	M,U	3.7	250
PCB-189	0.00003	29.97	<4.3	2.1	J,R	4.3	250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	63	10-145
13C12-PCB-077	10000	22.11	64	10-145
13C12-PCB-123	10000	23.09	66	10-145
13C12-PCB-118	10000	23.26	65	10-145
13C12-PCB-114	10000	23.56	66	10-145
13C12-PCB-105	10000	23.91	67	10-145
13C12-PCB-126	10000	25.51	67	10-145
13C12-PCB-167	10000	26.40	79	10-145
13C12-PCB-156/157	20000	27.04	76	10-145
13C12-PCB-169	10000	28.70	86	10-145
13C12-PCB-189	10000	29.96	73	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.82	82	70-130
13C12-PCB-095	10000	19.12	77	70-130
13C12-PCB-153	10000	24.19	79	70-130
Cleanup Standards				
13C12-PCB-028	10000	15.99	49	5-145
13C12-PCB-111	10000	22.03	63	10-145
13C12-PCB-178	10000	25.07	76	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.358
Mid Point PCB TEQ	0.939
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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
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	**19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET**	Sampling Date	27-Jun-19	
ALS Sample ID	L2300710-2	Extraction Date	11-Jul-19	
Analysis Method	EPA 1668C	Sample Size	1	Sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	10	

Approved:
E. Sabljic
--e-signature--
19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A20
Run Date	19-Jul-19 01:33
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.81	<11	11	M,U	3.5	250
PCB-077	0.0001	22.13	127	12	J		250
PCB-123	0.00003	23.09	<51	6.8	M,J,R	51	250
PCB-118	0.00003	23.28	3940	6.6	M		250
PCB-114	0.00003	23.59	100	6.7	M,J		250
PCB-105	0.00003	23.94	1050	6.7			250
PCB-126	0.1	25.52	<11	7.5	M,J,R	11	250
PCB-167	0.00003	26.41	<23	3.6	J,R	23	250
PCB-156/157	0.00003	27.03	87.0	5.4	J		500
PCB-169	0.03	28.71	6.20	4.1	J		250
PCB-189	0.00003	NotFnd	<3.8	3.8	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	55	10-145
13C12-PCB-077	10000	22.11	56	10-145
13C12-PCB-123	10000	23.09	58	10-145
13C12-PCB-118	10000	23.27	58	10-145
13C12-PCB-114	10000	23.57	58	10-145
13C12-PCB-105	10000	23.92	57	10-145
13C12-PCB-126	10000	25.51	58	10-145
13C12-PCB-167	10000	26.40	69	10-145
13C12-PCB-156/157	20000	27.04	68	10-145
13C12-PCB-169	10000	28.70	76	10-145
13C12-PCB-189	10000	29.96	67	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.82	92	70-130
13C12-PCB-095	10000	19.13	81	70-130
13C12-PCB-153	10000	24.19	82	70-130
Cleanup Standards				
13C12-PCB-028	10000	16.00	47	5-145
13C12-PCB-111	10000	22.03	61	10-145
13C12-PCB-178	10000	25.08	74	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.354
Mid Point PCB TEQ	1.46
Upper Bound PCB TEQ	1.46

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
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	**19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET**	Sampling Date	28-Jun-19	
ALS Sample ID	L2300710-3	Extraction Date	11-Jul-19	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	10	19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A21
Run Date	19-Jul-19 02:15
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.81	<17	10	M,J,R	17	250
PCB-077	0.0001	22.12	402	11			250
PCB-123	0.00003	23.09	128	9.2	M,J		250
PCB-118	0.00003	23.27	8660	8.6	M		250
PCB-114	0.00003	23.57	224	9.1	J		250
PCB-105	0.00003	23.92	2600	9.6			250
PCB-126	0.1	25.52	<18	10	M,J,R	18	250
PCB-167	0.00003	26.41	67.8	4.9	J		250
PCB-156/157	0.00003	27.03	190	7.3	J		500
PCB-169	0.03	28.71	<5.8	5.8	M,U	2.0	250
PCB-189	0.00003	NotFnd	<2.7	2.7	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	59	10-145
13C12-PCB-077	10000	22.11	60	10-145
13C12-PCB-123	10000	23.09	64	10-145
13C12-PCB-118	10000	23.26	64	10-145
13C12-PCB-114	10000	23.56	65	10-145
13C12-PCB-105	10000	23.91	62	10-145
13C12-PCB-126	10000	25.51	63	10-145
13C12-PCB-167	10000	26.40	77	10-145
13C12-PCB-156/157	20000	27.03	75	10-145
13C12-PCB-169	10000	28.68	83	10-145
13C12-PCB-189	10000	29.96	70	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.82	83	70-130
13C12-PCB-095	10000	19.12	79	70-130
13C12-PCB-153	10000	24.19	83	70-130
Cleanup Standards				
13C12-PCB-028	10000	15.99	48	5-145
13C12-PCB-111	10000	22.02	64	10-145
13C12-PCB-178	10000	25.07	79	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.396
Mid Point PCB TEQ	2.29
Upper Bound PCB TEQ	2.38

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
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	**19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET**	Sampling Date	27-Jun-19		Approved:
ALS Sample ID	L2300710-4	Extraction Date	11-Jul-19		*E. Sabljic*
Analysis Method	EPA 1668C	Sample Size	1	Sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		19-Jul-2019
Sample Matrix	Stack	Split Ratio	10		

Run Information	**Run 1**
Filename	5-190718A22
Run Date	19-Jul-19 02:57
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<5.6	5.6	U		250
PCB-077	0.0001	NotFnd	<6.1	6.1	U		250
PCB-123	0.00003	NotFnd	<6.0	6.0	U		250
PCB-118	0.00003	23.27	13.0	5.7	J		250
PCB-114	0.00003	NotFnd	<6.0	6.0	U		250
PCB-105	0.00003	NotFnd	<5.9	5.9	U		250
PCB-126	0.1	25.51	<6.5	6.5	M,U	2.5	250
PCB-167	0.00003	NotFnd	<2.9	2.9	U		250
PCB-156/157	0.00003	NotFnd	<4.3	4.3	U		500
PCB-169	0.03	NotFnd	<3.4	3.4	U		250
PCB-189	0.00003	NotFnd	<2.9	2.9	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	54	10-145
13C12-PCB-077	10000	22.12	56	10-145
13C12-PCB-123	10000	23.09	59	10-145
13C12-PCB-118	10000	23.26	61	10-145
13C12-PCB-114	10000	23.56	60	10-145
13C12-PCB-105	10000	23.92	60	10-145
13C12-PCB-126	10000	25.51	60	10-145
13C12-PCB-167	10000	26.40	72	10-145
13C12-PCB-156/157	20000	27.03	69	10-145
13C12-PCB-169	10000	28.70	76	10-145
13C12-PCB-189	10000	29.96	65	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.82	84	70-130
13C12-PCB-095	10000	19.12	80	70-130
13C12-PCB-153	10000	24.19	84	70-130
Cleanup Standards				
13C12-PCB-028	10000	15.99	40	5-145
13C12-PCB-111	10000	22.03	55	10-145
13C12-PCB-178	10000	25.07	66	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.000390
Mid Point PCB TEQ	0.378
Upper Bound PCB TEQ	0.756

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
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	**19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET**	Sampling Date	27-Jun-19	
ALS Sample ID	L2300710-5	Extraction Date	11-Jul-19	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	10	19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A23
Run Date	19-Jul-19 03:40
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.82	<15	15	M,U	8.3	250
PCB-077	0.0001	22.12	177	16	M,J		250
PCB-123	0.00003	23.10	70.4	9.0	M,J		250
PCB-118	0.00003	23.28	4550	8.6	M		250
PCB-114	0.00003	23.57	98.7	8.7	M,J		250
PCB-105	0.00003	23.94	1450	8.4	M		250
PCB-126	0.1	25.52	<19	9.8	M,J,R	19	250
PCB-167	0.00003	26.41	53.4	15	J		250
PCB-156/157	0.00003	27.03	145	23	J		500
PCB-169	0.03	28.71	<17	17	M,U	3.1	250
PCB-189	0.00003	NotFnd	<2.2	2.2	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	57	10-145
13C12-PCB-077	10000	22.11	58	10-145
13C12-PCB-123	10000	23.09	61	10-145
13C12-PCB-118	10000	23.26	60	10-145
13C12-PCB-114	10000	23.57	62	10-145
13C12-PCB-105	10000	23.92	62	10-145
13C12-PCB-126	10000	25.51	62	10-145
13C12-PCB-167	10000	26.40	76	10-145
13C12-PCB-156/157	20000	27.04	72	10-145
13C12-PCB-169	10000	28.70	81	10-145
13C12-PCB-189	10000	29.96	71	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.82	90	70-130
13C12-PCB-095	10000	19.13	75	70-130
13C12-PCB-153	10000	24.19	82	70-130
Cleanup Standards				
13C12-PCB-028	10000	16.00	42	5-145
13C12-PCB-111	10000	22.03	58	10-145
13C12-PCB-178	10000	25.07	74	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.209
Mid Point PCB TEQ	2.37
Upper Bound PCB TEQ	2.62

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
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	**19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-6	Extraction Date	11-Jul-19
Analysis Method	EPA 1668C	Sample Size	1 Sample
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	10

Approved:
E. Sabljic
--e-signature--
19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A24
Run Date	19-Jul-19 04:22
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.79	<24	10	M,J,R	24	250
PCB-077	0.0001	22.12	<47	11	J,R	47	250
PCB-123	0.00003	23.08	<16	6.7	M,J,R	16	250
PCB-118	0.00003	23.27	965	6.6			250
PCB-114	0.00003	23.57	23.8	6.5	M,J		250
PCB-105	0.00003	23.92	310	6.4			250
PCB-126	0.1	25.52	<9.1	7.2	M,J,R	9.1	250
PCB-167	0.00003	26.41	10.8	3.5	J		250
PCB-156/157	0.00003	27.03	37.7	5.2	M,J,B		500
PCB-169	0.03	28.68	<3.9	3.9	M,U	3.2	250
PCB-189	0.00003	NotFnd	<2.5	2.5	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	63	10-145
13C12-PCB-077	10000	22.11	65	10-145
13C12-PCB-123	10000	23.09	67	10-145
13C12-PCB-118	10000	23.26	66	10-145
13C12-PCB-114	10000	23.56	67	10-145
13C12-PCB-105	10000	23.91	68	10-145
13C12-PCB-126	10000	25.51	68	10-145
13C12-PCB-167	10000	26.39	80	10-145
13C12-PCB-156/157	20000	27.03	77	10-145
13C12-PCB-169	10000	28.68	89	10-145
13C12-PCB-189	10000	29.96	75	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.81	86	70-130
13C12-PCB-095	10000	19.12	75	70-130
13C12-PCB-153	10000	24.18	81	70-130
Cleanup Standards				
13C12-PCB-028	10000	15.99	46	5-145
13C12-PCB-111	10000	22.02	57	10-145
13C12-PCB-178	10000	25.07	70	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.0404
Mid Point PCB TEQ	1.02
Upper Bound PCB TEQ	1.08

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-7	Extraction Date	11-Jul-19
Analysis Method	EPA 1668C	Sample Size	1 Sample
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	10

Approved:
E. Sabljic
--e-signature--
19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A25
Run Date	19-Jul-19 05:04
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.80	<25	25	M,U		250
PCB-077	0.0001	22.14	479	26			250
PCB-123	0.00003	23.09	311	16	M		250
PCB-118	0.00003	23.28	15900	14	M		250
PCB-114	0.00003	23.59	<370	16	M,R	370	250
PCB-105	0.00003	23.94	4550	16	M		250
PCB-126	0.1	25.57	<22	17	M,J,R	22	250
PCB-167	0.00003	26.41	121	9.4	J		250
PCB-156/157	0.00003	27.04	<300	15	J,R	300	500
PCB-169	0.03	28.72	<12	12	M,U		250
PCB-189	0.00003	NotFnd	<5.0	5.0	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	35	10-145
13C12-PCB-077	10000	22.12	36	10-145
13C12-PCB-123	10000	23.10	37	10-145
13C12-PCB-118	10000	23.27	37	10-145
13C12-PCB-114	10000	23.57	37	10-145
13C12-PCB-105	10000	23.92	37	10-145
13C12-PCB-126	10000	25.52	37	10-145
13C12-PCB-167	10000	26.40	45	10-145
13C12-PCB-156/157	20000	27.04	42	10-145
13C12-PCB-169	10000	28.70	48	10-145
13C12-PCB-189	10000	29.97	40	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.83	84	70-130
13C12-PCB-095	10000	19.13	79	70-130
13C12-PCB-153	10000	24.20	82	70-130
Cleanup Standards				
13C12-PCB-028	10000	16.00	33	5-145
13C12-PCB-111	10000	22.04	40	10-145
13C12-PCB-178	10000	25.08	48	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.674
Mid Point PCB TEQ	3.08
Upper Bound PCB TEQ	3.26

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**	Sampling Date	27-Jun-19		Approved:
ALS Sample ID	L2300710-8	Extraction Date	11-Jul-19		*E. Sabljic*
Analysis Method	EPA 1668C	Sample Size	1	Sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		19-Jul-2019
Sample Matrix	Stack	Split Ratio	10		

Run Information	**Run 1**
Filename	5-190718A18
Run Date	19-Jul-19 00:09
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<10	10	U		250
PCB-077	0.0001	NotFnd	<11	11	U		250
PCB-123	0.00003	NotFnd	<9.6	9.6	U		250
PCB-118	0.00003	NotFnd	<9.0	9.0	U		250
PCB-114	0.00003	NotFnd	<9.3	9.3	U		250
PCB-105	0.00003	23.95	<8.9	8.9	U	7.0	250
PCB-126	0.1	25.51	<13	11	M,J,R	13	250
PCB-167	0.00003	NotFnd	<3.7	3.7	U		250
PCB-156/157	0.00003	NotFnd	<5.8	5.8	U		500
PCB-169	0.03	NotFnd	<4.3	4.3	U		250
PCB-189	0.00003	NotFnd	<4.5	4.5	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.83	46	10-145
13C12-PCB-077	10000	22.13	49	10-145
13C12-PCB-123	10000	23.11	49	10-145
13C12-PCB-118	10000	23.28	50	10-145
13C12-PCB-114	10000	23.59	50	10-145
13C12-PCB-105	10000	23.94	52	10-145
13C12-PCB-126	10000	25.53	50	10-145
13C12-PCB-167	10000	26.41	61	10-145
13C12-PCB-156/157	20000	27.05	59	10-145
13C12-PCB-169	10000	28.71	66	10-145
13C12-PCB-189	10000	29.97	55	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.84	87	70-130
13C12-PCB-095	10000	19.14	76	70-130
13C12-PCB-153	10000	24.20	84	70-130
Cleanup Standards				
13C12-PCB-028	10000	16.01	39	5-145
13C12-PCB-111	10000	22.04	54	10-145
13C12-PCB-178	10000	25.08	66	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	1.37
Upper Bound PCB TEQ	1.43

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
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
ALS Sample ID	WG3094556-1	Extraction Date	11-Jul-19
Analysis Method	EPA 1668C	Sample Size	1 Method Blank
Analysis Type	Blank	Percent Moisture	n/a
Sample Matrix	Media	Split Ratio	10

Approved:
E. Sabljic
--e-signature--
19-Jul-2019

Run Information	**Run 1**
Filename	5-190718A16
Run Date	18-Jul-19 22:45
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<6.4	6.4	U		250
PCB-077	0.0001	22.14	<6.6	6.6	M,U	1.9	250
PCB-123	0.00003	NotFnd	<6.2	6.2	U		250
PCB-118	0.00003	23.28	<12	5.8	J,R	12	250
PCB-114	0.00003	NotFnd	<6.1	6.1	U		250
PCB-105	0.00003	NotFnd	<5.7	5.7	U		250
PCB-126	0.1	NotFnd	<6.4	6.4	U		250
PCB-167	0.00003	26.42	<2.5	2.5	M,U	1.4	250
PCB-156/157	0.00003	27.04	6.62	3.9	M,J		500
PCB-169	0.03	28.70	<2.9	2.9	M,U	2.8	250
PCB-189	0.00003	NotFnd	<3.4	3.4	U		250

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	10000	21.81	52	10-145
13C12-PCB-077	10000	22.12	56	10-145
13C12-PCB-123	10000	23.10	58	10-145
13C12-PCB-118	10000	23.27	59	10-145
13C12-PCB-114	10000	23.57	58	10-145
13C12-PCB-105	10000	23.92	61	10-145
13C12-PCB-126	10000	25.52	60	10-145
13C12-PCB-167	10000	26.40	72	10-145
13C12-PCB-156/157	20000	27.04	71	10-145
13C12-PCB-169	10000	28.70	80	10-145
13C12-PCB-189	10000	29.96	69	10-145
Field Spike Standards				
13C12-PCB-031	0		NS	
13C12-PCB-095	0		NS	
13C12-PCB-153	0		NS	
Cleanup Standards				
13C12-PCB-028	10000	16.00	35	5-145
13C12-PCB-111	10000	22.03	50	10-145
13C12-PCB-178	10000	25.08	62	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.000199
Mid Point PCB TEQ	0.366
Upper Bound PCB TEQ	0.731

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
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
NS	Indicates that this standard has not been added.
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	WG3094556-2	Extraction Date	11-Jul-19		*E. Sabljic*
Analysis Method	EPA 1668C	Sample Size	1	n/a	--e-signature--
Analysis Type	LCS	Percent Moisture	n/a		19-Jul-2019
Sample Matrix	QC	Split Ratio	1		

Run Information	**Run 1**
Filename	5-190718A14
Run Date	18-Jul-19 21:20
Final Volume	25 ul
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS5 SPBOCTYL64948-04A

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-001	5000	8.97	99	60-135	
PCB-003	5000	10.48	97	60-135	
PCB-004	5000	10.65	99	60-135	
PCB-015	5000	14.31	97	60-135	
PCB-019	5000	12.64	100	60-135	
PCB-037	5000	18.25	96	60-135	
PCB-054	5000	14.49	97	60-135	
PCB-081	5000	21.82	92	60-135	
PCB-077	5000	22.13	94	60-135	
PCB-104	5000	17.53	90	60-135	
PCB-123	5000	23.10	90	60-135	
PCB-118	5000	23.28	93	60-135	
PCB-114	5000	23.59	90	60-135	
PCB-105	5000	23.94	89	60-135	
PCB-126	5000	25.52	89	60-135	
PCB-155	5000	20.52	93	60-135	
PCB-167	5000	26.41	90	60-135	
PCB-156/157	10000	27.05	91	60-135	
PCB-169	5000	28.71	92	60-135	
PCB-188	5000	23.51	94	60-135	
PCB-189	5000	29.97	103	60-135	
PCB-202	5000	26.29	99	60-135	
PCB-205	5000	31.37	86	60-135	
PCB-208	5000	29.71	102	60-135	
PCB-206	5000	32.45	100	60-135	
PCB-209	5000	33.58	112	60-135	
Extraction Standards		**Time**	**% Rec**	**Limits**	
13C12-PCB-001	10000	8.95	30	15-145	
13C12-PCB-003	10000	10.48	32	15-145	
13C12-PCB-004	10000	10.63	38	15-145	
13C12-PCB-015	10000	14.30	36	15-145	
13C12-PCB-019	10000	12.62	43	15-145	
13C12-PCB-037	10000	18.24	48	15-145	
13C12-PCB-054	10000	14.48	44	15-145	
13C12-PCB-081	10000	21.81	54	40-145	
13C12-PCB-077	10000	22.12	57	40-145	
13C12-PCB-104	10000	17.52	64	40-145	
13C12-PCB-123	10000	23.09	60	40-145	
13C12-PCB-118	10000	23.27	59	40-145	
13C12-PCB-114	10000	23.57	59	40-145	
13C12-PCB-105	10000	23.92	60	40-145	
13C12-PCB-126	10000	25.52	61	40-145	
13C12-PCB-155	10000	20.50	75	40-145	
13C12-PCB-167	10000	26.40	73	40-145	
13C12-PCB-156/157	20000	27.04	71	40-145	
13C12-PCB-169	10000	28.70	81	40-145	
13C12-PCB-188	10000	23.50	78	40-145	
13C12-PCB-189	10000	29.96	68	40-145	
13C12-PCB-202	10000	26.28	93	40-145	
13C12-PCB-205	10000	31.35	83	40-145	
13C12-PCB-208	10000	29.70	80	40-145	
13C12-PCB-206	10000	32.43	90	40-145	
13C12-PCB-209	10000	33.55	88	40-145	
Field Spike Standards					
13C12-PCB-031	0		NS		
13C12-PCB-095	0		NS		
13C12-PCB-153	0		NS		
Cleanup Standards					
13C12-PCB-028	10000	16.00	37	15-145	
13C12-PCB-111	10000	22.03	54	40-145	
13C12-PCB-178	10000	25.08	67	40-145	

NS Indicates that this standard has not been added.

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 MIssissauga, ON L5J 2Y4 Canada
ALS WO#:	L2300710	**Client Contact:**	Chris Belore
Date of Report	23-Jul-19	**Client Project ID:**	21936 Covanta
Date of Sample Receipt	28-Jun-19		

COMMENTS: **CB by LRGC/MS - Isotope dilution**

Certified by: [signature]

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank (Media)		19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET		19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET		19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET		19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET	
ALS Sample ID	WG3094556-1		L2300710-1		L2300710-2		L2300710-3		L2300710-4	
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		27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	<10	U	2400		2020	M	2570		<10	U
1,3-Dichlorobenzene	<10	U	418		407		435		<10	U
1,4-Dichlorobenzene	<10	U	250		225		248		11.3	
1,2-Dichlorobenzene	<10	U	263		248		303		<10	U
1,3,5-Trichlorobenzene	<10	U	27.3		28.1	M	28	R	<10	U
1,2,4-Trichlorobenzene	<10	U	109		102		107		<10	U
1,2,3-Trichlorobenzene	<10	U	30.9		26.3		27.2		<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<10	U	16.6		17.6		19.2		<10	U
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U
Pentachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	NS		90		92		89		94	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	45		16	M	21		27	M	24	
13C6-1,4-Dichlorobenzene	65		68		68		55		73	
13C6-1,2,3-Trichlorobenzene	70		76		80		110		80	
13C6-1,2,3,4-Tetrachlorobenzene	81		83		86		92		86	
13C6-Pentachlorobenzene	78		79		83		88		85	
13C6-Hexachlorobenzene	82		82		88		92		89	

U	Indicates that this compound was not detected above the LOD.
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 Life Sciences

Sample Analysis Summary Report

Sample Name	19-21936-SVOC- (21 THRU 25) TEST1 #2 APC OUTLET		19-21936-SVOC- (26 THRU 30) TEST2 #2 APC OUTLET		19-21936-SVOC- (31 THRU 35) TEST3 #2 APC OUTLET		19-21936-SVOC- (36 THRU 40) BLANK2 #2 APC OUTLET		Laboratory Control Sample	Laboratory Control Sample (Low Level)	
ALS Sample ID	L2300710-5		L2300710-6		L2300710-7		L2300710-8		WG3094556-2	WG3094556-5	
Sample Size	1		1		1		1		1	1	
Sample units	sample		sample		sample		sample		n/a	n/a	
Moisture Content	n/a		n/a		n/a		n/a		n/a	n/a	
Matrix	Stack		Stack		Stack		Stack		QC	QC	
Sampling Date	27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19		n/a	n/a	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	**% Recovery**	
Chlorobenzene	3090		2200	R	1700		<10	U	NS	NS	
1,3-Dichlorobenzene	397		492		351		<10	U	115	121	
1,4-Dichlorobenzene	259		207	M	238		10.8		106	119	M
1,2-Dichlorobenzene	285		208		208		<10	U	106	76	
1,3,5-Trichlorobenzene	27.9	M	30.5	M	23.4	M	<10	U	96	92	M
1,2,4-Trichlorobenzene	111	M	194	M	73.4		<10	U	96	130	
1,2,3-Trichlorobenzene	24.9		55	M	23.7		<10	U	93	132	
1,2,3,5/1,2,4,5-Tetrachlorobenzene	16.3		22.5		11.9	M	<10	U	68	116	
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	108	116	
Pentachlorobenzene	<10	U	<10	U	<10	U	<10	U	106	92	
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	101	98	
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	**%Rec**	
1-Bromo-2,3-Dichlorobenzene	90		98		93		91		NS	NS	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	**%Rec**	
13C6-Chlorobenzene	15		36		23		28		26	28	
13C6-1,4-Dichlorobenzene	64		60		70		74		73	82	
13C6-1,2,3-Trichlorobenzene	76		113		82		82		97	89	
13C6-1,2,3,4-Tetrachlorobenzene	77		78		84		86		133	97	
13C6-Pentachlorobenzene	74		76		81		83		78	96	
13C6-Hexachlorobenzene	78		81		85		90		85	132	

U	Indicates that this compound was not detected above the LOD.
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 Life Sciences

Sample Analysis Report

Sample Name	**Method Blank (Media)**	Sampling Date	n/a
ALS Sample ID	WG3094556-1	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071912.D
Run Date	7/19/2019 14:53
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<10	U
1,3-Dichlorobenzene		NotFnd	<10	U
1,4-Dichlorobenzene		6.85	<10	U
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
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.52	45	
13C6-1,4-Dichlorobenzene	250	6.85	65	
13C6-1,2,3-Trichlorobenzene	250	9.23	70	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	81	
13C6-Pentachlorobenzene	250	12.28	78	
13C6-Hexachlorobenzene	250	13.91	82	

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-1	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071916.D
Run Date	7/19/2019 16:16
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.52	2400	
1,3-Dichlorobenzene		6.78	418	
1,4-Dichlorobenzene		6.86	250	
1,2-Dichlorobenzene		7.14	263	
1,3,5-Trichlorobenzene		8.30	27.3	
1,2,4-Trichlorobenzene		8.82	109	
1,2,3-Trichlorobenzene		9.23	30.9	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.44	16.6	
1,2,3,4-Tetrachlorobenzene		10.94	<10	U
Pentachlorobenzene		12.28	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	90	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.52	16	M
13C6-1,4-Dichlorobenzene	250	6.86	68	
13C6-1,2,3-Trichlorobenzene	250	9.23	76	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	83	
13C6-Pentachlorobenzene	250	12.27	79	
13C6-Hexachlorobenzene	250	13.91	82	

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	**19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-2	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071917.D
Run Date	7/19/2019 16:37
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.50	2020 M	
1,3-Dichlorobenzene		6.77	407	
1,4-Dichlorobenzene		6.85	225	
1,2-Dichlorobenzene		7.14	248	
1,3,5-Trichlorobenzene		8.31	28.1 M	
1,2,4-Trichlorobenzene		8.82	102	
1,2,3-Trichlorobenzene		9.23	26.3	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.44	17.6	
1,2,3,4-Tetrachlorobenzene		NotFnd	<10	U
Pentachlorobenzene		12.27	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	92	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.49	21	
13C6-1,4-Dichlorobenzene	250	6.85	68	
13C6-1,2,3-Trichlorobenzene	250	9.23	80	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	86	
13C6-Pentachlorobenzene	250	12.27	83	
13C6-Hexachlorobenzene	250	13.91	88	

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	**19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-3	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071918.D
Run Date	7/19/2019 16:58
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.53	2570	
1,3-Dichlorobenzene		6.77	435	
1,4-Dichlorobenzene		6.85	248	
1,2-Dichlorobenzene		7.13	303	
1,3,5-Trichlorobenzene		8.30	28	R
1,2,4-Trichlorobenzene		8.82	107	
1,2,3-Trichlorobenzene		9.23	27.2	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.44	19.2	
1,2,3,4-Tetrachlorobenzene		10.94	<10	U
Pentachlorobenzene		NotFnd	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	89	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.53	27	M
13C6-1,4-Dichlorobenzene	250	6.84	55	
13C6-1,2,3-Trichlorobenzene	250	9.23	110	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	92	
13C6-Pentachlorobenzene	250	12.27	88	
13C6-Hexachlorobenzene	250	13.91	92	

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	**19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-4	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071914.D
Run Date	7/19/2019 15:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<10	U
1,3-Dichlorobenzene		6.81	<10	U
1,4-Dichlorobenzene		6.89	11.3	
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	600	10.24	94	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.56	24	
13C6-1,4-Dichlorobenzene	250	6.89	73	
13C6-1,2,3-Trichlorobenzene	250	9.23	80	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	86	
13C6-Pentachlorobenzene	250	12.27	85	
13C6-Hexachlorobenzene	250	13.91	89	

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-5	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071919.D
Run Date	7/19/2019 17:19
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.52	3090	
1,3-Dichlorobenzene		6.76	397	
1,4-Dichlorobenzene		6.84	259	
1,2-Dichlorobenzene		7.13	285	
1,3,5-Trichlorobenzene		8.30	27.9 M	
1,2,4-Trichlorobenzene		8.82	111 M	
1,2,3-Trichlorobenzene		9.23	24.9	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.44	16.3	
1,2,3,4-Tetrachlorobenzene		10.94	<10	U
Pentachlorobenzene		NotFnd	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	90	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.52	15	R
13C6-1,4-Dichlorobenzene	250	6.84	64	
13C6-1,2,3-Trichlorobenzene	250	9.23	76	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	77	
13C6-Pentachlorobenzene	250	12.27	74	
13C6-Hexachlorobenzene	250	13.91	78	

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	**19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-6	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071920.D
Run Date	7/19/2019 17:40
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.55	2200	R
1,3-Dichlorobenzene		6.74	492	
1,4-Dichlorobenzene		6.83	207 M	
1,2-Dichlorobenzene		7.11	208	
1,3,5-Trichlorobenzene		8.29	30.5 M	
1,2,4-Trichlorobenzene		8.82	194 M	
1,2,3-Trichlorobenzene		9.22	55 M	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.44	22.5	
1,2,3,4-Tetrachlorobenzene		10.90	<10	U
Pentachlorobenzene		NotFnd	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	98	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.55	36	
13C6-1,4-Dichlorobenzene	250	6.82	60	
13C6-1,2,3-Trichlorobenzene	250	9.22	113	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.93	78	
13C6-Pentachlorobenzene	250	12.27	76	
13C6-Hexachlorobenzene	250	13.91	81	

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	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-7	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071921.D
Run Date	7/19/2019 18:01
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.51	1700	
1,3-Dichlorobenzene		6.78	351	
1,4-Dichlorobenzene		6.86	238	
1,2-Dichlorobenzene		7.14	208	
1,3,5-Trichlorobenzene		8.31	23.4	M
1,2,4-Trichlorobenzene		8.82	73.4	
1,2,3-Trichlorobenzene		9.23	23.7	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.43	11.9	M
1,2,3,4-Tetrachlorobenzene		NotFnd	<10	U
Pentachlorobenzene		12.28	<10	U
Hexachlorobenzene		NotFnd	<10	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.24	93	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.50	23	M
13C6-1,4-Dichlorobenzene	250	6.85	70	
13C6-1,2,3-Trichlorobenzene	250	9.23	82	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	84	
13C6-Pentachlorobenzene	250	12.27	81	
13C6-Hexachlorobenzene	250	13.91	85	

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	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-8	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071915.D
Run Date	7/19/2019 15:56
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<10	U
1,3-Dichlorobenzene		NotFnd	<10	U
1,4-Dichlorobenzene		6.89	10.8	
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	600	10.24	91	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.53	28	
13C6-1,4-Dichlorobenzene	250	6.88	74	
13C6-1,2,3-Trichlorobenzene	250	9.23	82	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	86	
13C6-Pentachlorobenzene	250	12.27	83	
13C6-Hexachlorobenzene	250	13.91	90	

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG3094556-2	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071910.D
Run Date	7/19/2019 14:11
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	250	6.82	115	
1,4-Dichlorobenzene	250	6.90	106	
1,2-Dichlorobenzene	250	7.17	106	
1,3,5-Trichlorobenzene	250	8.32	96	
1,2,4-Trichlorobenzene	250	8.83	96	
1,2,3-Trichlorobenzene	250	9.23	93	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	500	10.45	68	
1,2,3,4-Tetrachlorobenzene	250	10.94	108	
Pentachlorobenzene	250	12.28	106	
Hexachlorobenzene	250	13.91	101	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.53	26	
13C6-1,4-Dichlorobenzene	250	6.90	73	
13C6-1,2,3-Trichlorobenzene	250	9.23	97	R
13C6-1,2,3,4-Tetrachlorobenzene	250	10.94	133	
13C6-Pentachlorobenzene	250	12.27	78	
13C6-Hexachlorobenzene	250	13.91	85	

NS Indicates that this compound was not sspiked in.

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 (Low Level)**	Sampling Date	n/a
ALS Sample ID	WG3094556-5	Extraction Date	11-Jul-19
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--
22-Jul-2019

Run Information	**Run 1**
Filename	19071909.D
Run Date	7/19/2019 13:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP-5MS USR433752H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	12.5	6.78	121	
1,4-Dichlorobenzene	12.5	6.86	119	M
1,2-Dichlorobenzene	12.5	7.16	76	
1,3,5-Trichlorobenzene	12.5	8.31	92	M
1,2,4-Trichlorobenzene	12.5	8.84	130	
1,2,3-Trichlorobenzene	12.5	9.24	132	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	25	10.46	116	
1,2,3,4-Tetrachlorobenzene	12.5	10.95	116	
Pentachlorobenzene	12.5	12.28	92	
Hexachlorobenzene	12.5	13.91	98	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	250	4.55	28	
13C6-1,4-Dichlorobenzene	250	6.86	82	
13C6-1,2,3-Trichlorobenzene	250	9.24	89	
13C6-1,2,3,4-Tetrachlorobenzene	250	10.95	97	
13C6-Pentachlorobenzene	250	12.28	96	
13C6-Hexachlorobenzene	250	13.91	132	

M Indicates that a peak has been manually integrated.
NS Indicates that this compound was not sspiked in.

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#:	L2300710		Mississauga, ON L5J 2Y4
Date of Report Revision	26-Jul-19		Canada
Date of Sample Receipt	28-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

*** **REVISED REPORT** ***

This report supersedes all prior reports for the above-noted workorder and test. The report has been revised as follows:
Additional descriptive comments have been added regarding data quality issues.

Overall suppression was observed as low peak areas for the train samples. The laboratory QC samples, spiked with the same standards and processed in the same manner, do not show the same reduction in peak area. The suppression is even observed for 5a-androstane, used as an internal standard, but chemically unrelated to the chlorophenols. As a result, the detection limits have been elevated by a factor of five.

For the sample 19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET, It appeared that we had selective losses for some of the labelled extraction standards added, in particular the d4-2-Chlorophenol and the 2,4,6-tribromophenol. In addition, the d5-phenol, which does not apply to this test, was not recovered at all. Only the 13C6-pentachlorophenol was adequately recovered, and the result for pentachlorophenol has been reported. The losses may be related to volatility or extraction efficiency.

*** **ORIGINAL COMMENTS** ***

Instrument suppression was observed affecting the target regions for the samples. As a result, the detection limits have been elevated.

For the sample 19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET, the recovery of the 2,4,6-tribromophenol was above the method control limit. However, no targets were observed. No impact to overall data quality is expected.

For the sample 19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET, The 2,6-Dichloro-4-Fluorophenol field standard was not recovered, and there was poor recovery of the 2,4,6-tribromophenol. As a result, only pentachlorophenol can be reliably quantified.

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET		19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET		19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET		19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET	
ALS Sample ID	WG3094556-1		L2300710-1		L2300710-2		L2300710-3		L2300710-4	
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		27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
2-Chlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
3-Chlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
4-Chlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,6-Dichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,4/2,5-Dichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
3,5-Dichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3-Dichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
3,4-Dichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,4,6-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3,6-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3,5-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,4,5-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3,4-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
3,4,5-Trichlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
2,3,4,5-Tetrachlorophenol	<250	U	<250	U	<250	U	NQ		<250	U
Pentachlorophenol	<250	U	<250	U	<250	U	<250	U	<250	U
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-2-Chlorophenol	83		78	M	76		22	R	61	
2,4,6-Tribromophenol	158		108		136		8		115	
13C-Pentachlorophenol	57		121		84		55		60	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	NS		52		66		NR		45	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
NR	Indicates that this surrogate or field standard has not been recovered.
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.
NQ	Indicates that this value could not be quantified.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21936-SVOC- (21 THRU 25) TEST1 #2 APC OUTLET		19-21936-SVOC- (26 THRU 30) TEST2 #2 APC OUTLET		19-21936-SVOC- (31 THRU 35) TEST3 #2 APC OUTLET		19-21936-SVOC- (36 THRU 40) BLANK2 #2 APC OUTLET		Laboratory Control Sample	
ALS Sample ID	L2300710-5		L2300710-6		L2300710-7		L2300710-8		WG3094556-2	
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	27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19		n/a	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
2-Chlorophenol	<250	U	<250	U	<250	U	<250	U	74	R
3-Chlorophenol	<250	U	<250	U	<250	U	<250	U	66	
4-Chlorophenol	<250	U	<250	U	<250	U	<250	U	70	
2,6-Dichlorophenol	<250	U	<250	U	<250	U	<250	U	70	
2,4/2,5-Dichlorophenol	<250	U	<250	U	<250	U	<250	U	71	
3,5-Dichlorophenol	<250	U	<250	U	<250	U	<250	U	93	
2,3-Dichlorophenol	<250	U	<250	U	<250	U	<250	U	126	
3,4-Dichlorophenol	<250	U	<250	U	<250	U	<250	U	81	
2,4,6-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	72	
2,3,6-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	61	
2,3,5-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	98	M,R
2,4,5-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	75	
2,3,4-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	77	
3,4,5-Trichlorophenol	<250	U	<250	U	<250	U	<250	U	88	
2,3,5,6/2,3,4,6-Tetrachlorophenol	<250	U	<250	U	<250	U	<250	U	76	M
2,3,4,5-Tetrachlorophenol	<250	U	<250	U	<250	U	<250	U	100	
Pentachlorophenol	<250	U	<250	U	<250	U	<250	U	50	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-2-Chlorophenol	40	R	66	M	71	M	76		133	
2,4,6-Tribromophenol	148		103		74		167		132	M
13C-Pentachlorophenol	43		121		120		81		130	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	105		121		13		135		NS	

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.
NS	Indicates that this compound was not spiked in.
NQ	Indicates that this value could not be quantified.

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG3094556-1	Extraction Date	11-Jul-19
Analysis Method	SIM GC/MS		
Analysis Type	Blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
23-Jul-2019

Run Information	**Run 1**
Filename	19072206.D
Run Date	7/22/2019 13:09
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		NotFnd	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		NotFnd	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.23	83		20-150
2,4,6-Tribromophenol	1000	13.15	158		20-150
13C-Pentachlorophenol	1000	13.81	57		20-150

U — Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-1	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072210.D
Run Date	7/22/2019 14:41
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		9.80	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		10.70	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.31	78	M	20-150
2,4,6-Tribromophenol	1000	13.17	108		20-150
13C-Pentachlorophenol	1000	13.81	121		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.91	52		20-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-2	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072211.D
Run Date	7/22/2019 15:04
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		9.78	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		10.69	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.27	76		20-150
2,4,6-Tribromophenol	1000	13.16	136		20-150
13C-Pentachlorophenol	1000	13.81	84		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.88	66		20-150

U Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-3	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072212.D
Run Date	7/22/2019 15:27
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol			NQ		
3-Chlorophenol			NQ		
4-Chlorophenol			NQ		
2,6-Dichlorophenol			NQ		
2,4/2,5-Dichlorophenol			NQ		
3,5-Dichlorophenol			NQ		
2,3-Dichlorophenol			NQ		
3,4-Dichlorophenol			NQ		
2,4,6-Trichlorophenol			NQ		
2,3,6-Trichlorophenol			NQ		
2,3,5-Trichlorophenol			NQ		
2,4,5-Trichlorophenol			NQ		
2,3,4-Trichlorophenol			NQ		
3,4,5-Trichlorophenol			NQ		
2,3,5,6/2,3,4,6-Tetrachlorophenol			NQ		
2,3,4,5-Tetrachlorophenol			NQ		
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.19	22	R	20-150
2,4,6-Tribromophenol	1000	13.17	8		20-150
13C-Pentachlorophenol	1000	13.81	55		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	NotFnd	0		20-150

U	Indicates that this compound was not detected above the LOR.
NQ	Indicates that this value could not be quantified.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-4	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072208.D
Run Date	7/22/2019 13:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		NotFnd	<250	U	
3,5-Dichlorophenol		9.90	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		NotFnd	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.24	61		20-150
2,4,6-Tribromophenol	1000	13.16	115		20-150
13C-Pentachlorophenol	1000	13.81	60		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.87	45		20-150

U Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-5	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072213.D
Run Date	7/22/2019 15:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		9.81	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		10.71	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.23	40	R	20-150
2,4,6-Tribromophenol	1000	13.17	148		20-150
13C-Pentachlorophenol	1000	13.81	43		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.94	105		20-150

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	**19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-6	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072214.D
Run Date	7/22/2019 16:13
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		9.82	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		10.08	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		10.71	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.38	66	M	20-150
2,4,6-Tribromophenol	1000	13.16	103		20-150
13C-Pentachlorophenol	1000	13.81	121		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.95	121		20-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-7	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072215.D
Run Date	7/22/2019 16:36
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		9.79	<250	U	
3,5-Dichlorophenol		NotFnd	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		NotFnd	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.29	71	M	20-150
2,4,6-Tribromophenol	1000	13.17	74		20-150
13C-Pentachlorophenol	1000	13.81	120		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.90	13		20-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-8	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072209.D
Run Date	7/22/2019 14:18
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol		NotFnd	<250	U	
3-Chlorophenol		NotFnd	<250	U	
4-Chlorophenol		NotFnd	<250	U	
2,6-Dichlorophenol		NotFnd	<250	U	
2,4/2,5-Dichlorophenol		NotFnd	<250	U	
3,5-Dichlorophenol		9.90	<250	U	
2,3-Dichlorophenol		NotFnd	<250	U	
3,4-Dichlorophenol		NotFnd	<250	U	
2,4,6-Trichlorophenol		10.69	<250	U	
2,3,6-Trichlorophenol		NotFnd	<250	U	
2,3,5-Trichlorophenol		NotFnd	<250	U	
2,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,4-Trichlorophenol		NotFnd	<250	U	
3,4,5-Trichlorophenol		NotFnd	<250	U	
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<250	U	
2,3,4,5-Tetrachlorophenol		NotFnd	<250	U	
Pentachlorophenol		NotFnd	<250	U	
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.24	76		20-150
2,4,6-Tribromophenol	1000	13.17	167		20-150
13C-Pentachlorophenol	1000	13.81	81		20-150
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	600	8.87	135		20-150

U Indicates that this compound was not detected above the LOR.

ALS Environmental

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG3094556-2	Extraction Date	11-Jul-19
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--
23-Jul-2019

Run Information	**Run 1**
Filename	19072204.D
Run Date	7/22/2019 12:23
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**	
2-Chlorophenol	1000	8.25	74	R	21-124
3-Chlorophenol	1000	8.53	66		41-123
4-Chlorophenol	1000	8.60	70		41-118
2,6-Dichlorophenol	1000	9.56	70		10-110
2,4/2,5-Dichlorophenol	2000	9.76	71		35-98
3,5-Dichlorophenol	1000	9.89	93		49-118
2,3-Dichlorophenol	1000	10.08	126		63-141
3,4-Dichlorophenol	1000	10.32	81		43-121
2,4,6-Trichlorophenol	1000	10.68	72		10-102
2,3,6-Trichlorophenol	1000	11.10	61		27-98
2,3,5-Trichlorophenol	1000	11.17	98 M	R	31-109
2,4,5-Trichlorophenol	1000	11.23	75		45-95
2,3,4-Trichlorophenol	1000	11.63	77		45-99
3,4,5-Trichlorophenol	1000	11.75	88		45-110
2,3,5,6/2,3,4,6-Tetrachlorophenol	2000	12.34	76 M		30-109
2,3,4,5-Tetrachlorophenol	1000	12.83	100		44-103
Pentachlorophenol	1000	13.81	50		32-121
Extraction Standards			**% Rec**		
d4-2-Chlorophenol	1000	8.23	133		50-150
2,4,6-Tribromophenol	1000	13.15	132 M		50-150
13C-Pentachlorophenol	1000	13.81	130		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.

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#:	L2300710		Mississauga, ON L5J 2Y4
Date of Report	23-Jul-19		Canada
Date of Sample Receipt	28-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 Covanta

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

For the sample 19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET, there was a coeluting interference affecting fluorene-d10. As a result, the reported recovery of this field standard is elevated.

For the sample 19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET, the recoveries of select labelled extraction standards are below the method control limit. Reported native target data are not expected to be biased as a result.

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank (Media)		19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET		19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET		19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET		19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET	
ALS Sample ID	WG3094556-1		L2300710-1		L2300710-2		L2300710-3		L2300710-4	
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		27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Naphthalene	152		1050	B	543	B	306	RB	156	B
2-Methylnaphthalene	<10	U	259		85.8		48.1		13.9	R
1-Methylnaphthalene	<10	U	142		49.0		31.6		13.0	R
Acenaphthylene	<10	U	204	R	306	R	344	R	12.4	R
Acenaphthene	<10	U	156	R	105		56.0		10.0	R
Fluorene	<10	U	160	R	163	R	87.1	R	53.5	R
Phenanthrene	<10	U	925		979		650		12.7	
Anthracene	<10	U	54.4	M	24.8	M,R	15.0	M,R	10.0	
Fluoranthene	<10	U	125	R	103	R	117	M	<10	U
Pyrene	<10	U	94.5	R	76.2	R	71.8	R	<10	U
Benzo(a)Anthracene	<10	U	<10	U	37.3		<10	U	<10	U
Chrysene/Triphenylene	<10	U	10.5	R	27.7	R	16.1	R	<10	U
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(k)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(e)Pyrene	<10	U	<10	U	<10	U	<10	U	<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	<10	U	<10	U	<10	U	<10	U	<10	U
Dibenzo(a,c/a,h)Anthracene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(g,h,i)Perylene	<10	U	17.5	M	<10	U	<10	U	<10	U
Additional Analytes										
Tetralin	194		252	B	364	B	319	B	150	M,B
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U	<10	U
Biphenyl	<10	U	103	M	69.7	M	52.8	M	43.8	R
o-Terphenyl	<10	U	10.7	R	11.1	R	15.5	R	<10	U
1-Methylphenanthrene	<10	U	115	R	106	R	125	R	<10	U
9-Methylphenanthrene	<10	U	68.6		66.3		58.5		<10	U
2-methylanthracene	<10	U	159		298	R	198	R	<10	U
9,10-dimethylanthracene	<10	U	15.7	R	<10	U	<10	U	<10	U
m-terphenyl	<10	U	14.8	R	11.6	R	10.1	R	<10	U
p-terphenyl	<10	U	<10	U	<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	<50	U	<50	U	<50	U
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	NS		85.3		87.4		86.8		87.5	
Fluorene D10	NS		139.3		106.4		118.7		94.8	
Terphenyl D14(Surr.)	NS		107.2		106.6		113		114.9	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	66.2		38.7		32.1		61.6		68.9	
2-Methylnaphthalene-D10	71.1		67.3		71.2		70.6		74.1	
Acenaphthylene D8	73.5		71.5		66.5		67.9		79.3	
Phenanthrene D10	89.1		70.6		72.3		67.4		89.2	
Anthracene-D10	82.4		59.8		67.9		64.2		85.3	
Fluoranthene D10	96.1		81.5		86.8		77.3		97.7	
Benz(a)Anthracene-D12	92.0		120.8		125.7		121.1		129.2	
Chrysene D12	77.2	M	76.8		79.7		74.6		88.5	
Benzo(b)Fluoranthene-D12	98.8		102.3		110.2		113.7		95.2	
Benzo(k)Fluoranthene-D12	76.7		82.2		81.9		79.3		81.2	
Benzo(a)Pyrene D12	91.8		87.9		88.1		96.3		99.4	
Perylene D12	108.6		84.1		85.7		94.2		87.9	
Indeno(1,2,3,cd)Pyrene-D12	104.4		121.3		124.8		128.2		122.2	
Dibenz(a,h)Anthracene-D14	75.8		107.1		108.5		106.5		94.6	
Benzo(g,h,i)Perylene D12	75.8		91.2		91.4		91.6		93.3	

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	19-21936-SVOC- (21 THRU 25) TEST1 #2 APC OUTLET		19-21936-SVOC- (26 THRU 30) TEST2 #2 APC OUTLET		19-21936-SVOC- (31 THRU 35) TEST3 #2 APC OUTLET		19-21936-SVOC- (36 THRU 40) BLANK2 #2 APC OUTLET		Laboratory Control Sample		Laboratory Control Sample (Low Level)	
ALS Sample ID	L2300710-5		L2300710-6		L2300710-7		L2300710-8		WG3094556-2		WG3094556-5	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		n/a		n/a	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC		QC	
Sampling Date	27-Jun-19		27-Jun-19		28-Jun-19		27-Jun-19		n/a		n/a	
Extraction Date	11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**%**		**%**	
Naphthalene	439	B	422	B	470	RB	169	B	140.4		142.5	M
2-Methylnaphthalene	83.1		66.7		92.6		14.9	R	97.9		103.0	
1-Methylnaphthalene	48.9		39.0		55.6		14.1	R	102.5		103.8	
Acenaphthylene	20.5	R	15.6	R	237	R	12.6	R	106.2		111.5	
Acenaphthene	28.3	R	26.9	R	141	R	18.4	R	94.0		103.3	
Fluorene	105	R	76.9	R	106	R	45.8	R	95.2		99.6	
Phenanthrene	164		83.0		1650		17.5	R	99.0		108.9	
Anthracene	20.8	R	46.7	R	49.2	M,R	<10	U	100.2		108.7	
Fluoranthene	32.7		23.8		217		<10	U	92.6		97.2	
Pyrene	27.6	R	33.0	R	173		<10	U	92.4		101.2	
Benzo(a)Anthracene	<10	U	<10	U	<10	U	<10	U	92.8		116.0	
Chrysene/Triphenylene	<10	U	<10	U	11.4	R	<10	U	92.7		96.3	M
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	77.9	M	86.3	R
Benzo(k)Fluoranthene	<10	U	<10	U	<10	U	<10	U	77.0		99.8	M,R
Benzo(e)Pyrene	<10	U	<10	U	<10	U	<10	U	85.2		102.1	M
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	89.7		105.6	M
Perylene	<10	U	<10	U	<10	U	<10	U	91.8		119.0	M
Indeno(1,2,3-cd)Pyrene	<10	U	<10	U	<10	U	<10	U	74.6		92.0	M
Dibenzo(a,c/a,h)Anthracene	<10	U	<10	U	<10	U	<10	U	76.9		75.4	
Benzo(g,h,i)Perylene	<10	U	51.0	M	<10	U	<10	U	72.8		75.8	R
Additional Analytes												
Tetralin	305	M,B	282	B	299	B	210	B				
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U				
Biphenyl	50.5	M	42.0	M	73.1	M	<10	U				
o-Terphenyl	<10	U	<10	U	23.6	M,R	<10	U				
1-Methylphenanthrene	103	R	99.5	R	126	M,R	<10	U				
9-Methylphenanthrene	13.3		<10	U	139	M	<10	U				
2-methylanthracene	51.4		119	M,R	283	M	<10	U				
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U				
m-terphenyl	<10	U	<10	U	26.7	M,R	<10	U				
p-terphenyl	<10	U	<10	U	10.3	M,R	<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	<50	U	<50	U	<50	U	<50	U				
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	82.7		87.3		87.9		87.3		NS		NS	
Fluorene D10	186.7		89.8		115.5		100.5		NS		NS	
Terphenyl D14(Surr.)	109.1		131.4		115.3		114.8		NS		NS	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	73.1		67.5		71.9		59.2		70.8		80.2	
2-Methylnaphthalene-D10	81.8		75.3		81.8		78.4		84.0		85.3	
Acenaphthylene D8	88.4		25.7		77.3		84.3		85.6		79.2	
Phenanthrene D10	82.9		103.0		71.1		105.4		86.9		90.9	
Anthracene-D10	84.4		25.5		61.6		125.7		84.1		70.7	
Fluoranthene D10	92.6		97.9		82.8		78.3		96.8		98.4	
Benz(a)Anthracene-D12	123.1	M	83.0		121.8		111.3		86.3		70.2	
Chrysene D12	91.3		103.5		78.4		74.3		66.9	M	70.4	M
Benzo(b)Fluoranthene-D12	125.7		89.7		122.9		102.7		108.0		79.5	
Benzo(k)Fluoranthene-D12	95.0		64.0		88.8		89.0		85.2		86.7	M
Benzo(a)Pyrene D12	106.5		16.8		89.4		103.6		109.9		83.7	
Perylene D12	105.4		15.6		90.9		92.2		103.9		85.1	M
Indeno(1,2,3,cd)Pyrene-D12	130.8	M	57.9		139.0		103.0		134.1	M	59.5	
Dibenz(a,h)Anthracene-D14	128.1		94.8		124.0		79.6		139.6	M	70.7	M
Benzo(g,h,i)Perylene D12	107.1		85.7		103.1		77.8		138.2		61.2	M

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

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank (Media)**	Sampling Date	n/a
ALS Sample ID	WG3094556-1	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071820.D
Run Date	7/18/2019 22:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.33	152	
2-Methylnaphthalene	3.90	<10	U
1-Methylnaphthalene	4.01	<10	U
Acenaphthylene	NotFnd	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	6.20	<10	U
Phenanthrene	8.41	<10	U
Anthracene	8.53	<10	U
Fluoranthene	11.79	<10	U
Pyrene	12.43	<10	U
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	NotFnd	<10	U
Additional Analytes			
Tetralin	3.19	194	
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.42	<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	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.32	66.2	50-150
2-Methylnaphthalene-D10	500	3.86	71.1	50-150
Acenaphthylene D8	500	4.99	73.5	50-150
Phenanthrene D10	500	8.34	89.1	50-150
Anthracene-D10	500	8.48	82.4	50-150
Fluoranthene D10	500	11.73	96.1	50-150
Benz(a)Anthracene-D12	500	16.29	92.0	50-150
Chrysene D12	500	16.39	77.2 M	50-150
Benzo(b)Fluoranthene-D12	500	19.62	98.8	50-150
Benzo(k)Fluoranthene-D12	500	19.71	76.7	50-150
Benzo(a)Pyrene D12	500	20.51	91.8	50-150
Perylene D12	500	20.73	108.6	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.09	104.4	50-150
Dibenz(a,h)Anthracene-D14	500	24.24	75.8	50-150
Benzo(g,h,i)Perylene D12	500	24.98	75.8	50-150

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	**19-21936-SVOC-(1 THRU 5) TEST1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-1	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071824.D
Run Date	7/19/2019 0:48
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.33	1050	B
2-Methylnaphthalene	3.89	259	
1-Methylnaphthalene	4.00	142	
Acenaphthylene	4.97	204	R
Acenaphthene	5.29	156	R
Fluorene	6.20	160	R
Phenanthrene	8.39	925	
Anthracene	8.51	54.4 M	
Fluoranthene	11.78	125	R
Pyrene	12.42	94.5	R
Benzo(a)Anthracene	16.38	<10	U
Chrysene/Triphenylene	16.45	10.5	R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	25.10	17.5 M	
Additional Analytes			
Tetralin	3.19	252	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.41	103 M	
o-Terphenyl	9.64	10.7	R
1-Methylphenanthrene	9.95	115	R
9-Methylphenanthrene	10.06	68.6	
2-methylanthracene	10.12	159	
9,10-dimethylanthracene	12.54	15.7	R
m-terphenyl	12.81	14.8	R
p-terphenyl	13.30	<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	24.34	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.97	85.3	
Fluorene D10	600	6.16	139.3	
Terphenyl D14(Surr.)	600	13.22	107.2	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	38.7	50-150
2-Methylnaphthalene-D10	500	3.86	67.3	50-150
Acenaphthylene D8	500	4.98	71.5	50-150
Phenanthrene D10	500	8.33	70.6	50-150
Anthracene-D10	500	8.47	59.8	50-150
Fluoranthene D10	500	11.73	81.5	50-150
Benz(a)Anthracene-D12	500	16.28	120.8	50-150
Chrysene D12	500	16.39	76.8	50-150
Benzo(b)Fluoranthene-D12	500	19.62	102.3	50-150
Benzo(k)Fluoranthene-D12	500	19.70	82.2	50-150
Benzo(a)Pyrene D12	500	20.51	87.9	50-150
Perylene D12	500	20.73	84.1	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	121.3	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	107.1	50-150
Benzo(g,h,i)Perylene D12	500	24.98	91.2	50-150

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	**19-21936-SVOC-(6 THRU 10) TEST2 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-2	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071825.D
Run Date	7/19/2019 1:22
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.34	543	B
2-Methylnaphthalene	3.89	85.8	
1-Methylnaphthalene	4.00	49.0	
Acenaphthylene	4.97	306	R
Acenaphthene	5.29	105	
Fluorene	6.20	163	R
Phenanthrene	8.39	979	
Anthracene	8.50	24.8 M	R
Fluoranthene	11.78	103	R
Pyrene	12.42	76.2	R
Benzo(a)Anthracene	16.38	37.3	
Chrysene/Triphenylene	16.46	27.7	R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	24.34	<10	U
Benzo(g,h,i)Perylene	25.10	<10	U
Additional Analytes			
Tetralin	3.20	364	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.42	69.7 M	
o-Terphenyl	9.65	11.1	R
1-Methylphenanthrene	9.95	106	R
9-Methylphenanthrene	10.06	66.3	
2-methylanthracene	10.13	298	R
9,10-dimethylanthracene	12.59	<10	U
m-terphenyl	12.81	11.6	R
p-terphenyl	13.30	<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	24.34	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.97	87.4	
Fluorene D10	600	6.15	106.4	
Terphenyl D14(Surr.)	600	13.22	106.6	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	32.1	50-150
2-Methylnaphthalene-D10	500	3.86	71.2	50-150
Acenaphthylene D8	500	4.99	66.5	50-150
Phenanthrene D10	500	8.34	72.3	50-150
Anthracene-D10	500	8.47	67.9	50-150
Fluoranthene D10	500	11.73	86.8	50-150
Benz(a)Anthracene-D12	500	16.28	125.7	50-150
Chrysene D12	500	16.38	79.7	50-150
Benzo(b)Fluoranthene-D12	500	19.62	110.2	50-150
Benzo(k)Fluoranthene-D12	500	19.70	81.9	50-150
Benzo(a)Pyrene D12	500	20.51	88.1	50-150
Perylene D12	500	20.73	85.7	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	124.8	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	108.5	50-150
Benzo(g,h,i)Perylene D12	500	24.98	91.4	50-150

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	**19-21936-SVOC-(11 THRU 15) TEST3 #1 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-3	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071826.D
Run Date	7/19/2019 1:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.33	306	R B
2-Methylnaphthalene	3.90	48.1	
1-Methylnaphthalene	4.01	31.6	
Acenaphthylene	4.98	344	R
Acenaphthene	5.29	56.0	
Fluorene	6.20	87.1	R
Phenanthrene	8.39	650	
Anthracene	8.51	15.0 M	R
Fluoranthene	11.78	117 M	
Pyrene	12.42	71.8	R
Benzo(a)Anthracene	16.37	<10	U
Chrysene/Triphenylene	16.46	16.1	R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	24.33	<10	U
Benzo(g,h,i)Perylene	25.09	<10	U
Additional Analytes			
Tetralin	3.19	319	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.42	52.8 M	
o-Terphenyl	9.65	15.5	R
1-Methylphenanthrene	9.95	125	R
9-Methylphenanthrene	10.06	58.5	
2-methylanthracene	10.13	198	R
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	12.81	10.1	R
p-terphenyl	13.30	<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	24.33	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.98	86.8	
Fluorene D10	600	6.15	118.7	
Terphenyl D14(Surr.)	600	13.22	113	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	61.6	50-150
2-Methylnaphthalene-D10	500	3.86	70.6	50-150
Acenaphthylene D8	500	4.99	67.9	50-150
Phenanthrene D10	500	8.34	67.4	50-150
Anthracene-D10	500	8.47	64.2	50-150
Fluoranthene D10	500	11.73	77.3	50-150
Benz(a)Anthracene-D12	500	16.27	121.1	50-150
Chrysene D12	500	16.38	74.6	50-150
Benzo(b)Fluoranthene-D12	500	19.61	113.7	50-150
Benzo(k)Fluoranthene-D12	500	19.70	79.3	50-150
Benzo(a)Pyrene D12	500	20.50	96.3	50-150
Perylene D12	500	20.73	94.2	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.06	128.2	50-150
Dibenz(a,h)Anthracene-D14	500	24.21	106.5	50-150
Benzo(g,h,i)Perylene D12	500	24.97	91.6	50-150

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	**19-21936-SVOC-(16 THRU 20) BLANK1 #1 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-4	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071822.D
Run Date	7/18/2019 23:41
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.34	156	B
2-Methylnaphthalene	3.90	13.9	R
1-Methylnaphthalene	4.00	13.0	R
Acenaphthylene	5.03	12.4	R
Acenaphthene	5.28	10.0	R
Fluorene	6.19	53.5	R
Phenanthrene	8.41	12.7	
Anthracene	8.51	10.0	
Fluoranthene	11.79	<10	U
Pyrene	12.41	<10	U
Benzo(a)Anthracene	16.38	<10	U
Chrysene/Triphenylene	16.49	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	NotFnd	<10	U
Additional Analytes			
Tetralin	3.20	150 M	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.37	43.8	R
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	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.97	87.5	
Fluorene D10	600	6.15	94.8	
Terphenyl D14(Surr.)	600	13.22	114.9	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	68.9	50-150
2-Methylnaphthalene-D10	500	3.86	74.1	50-150
Acenaphthylene D8	500	4.98	79.3	50-150
Phenanthrene D10	500	8.34	89.2	50-150
Anthracene-D10	500	8.47	85.3	50-150
Fluoranthene D10	500	11.73	97.7	50-150
Benz(a)Anthracene-D12	500	16.28	129.2	50-150
Chrysene D12	500	16.39	88.5	50-150
Benzo(b)Fluoranthene-D12	500	19.62	95.2	50-150
Benzo(k)Fluoranthene-D12	500	19.70	81.2	50-150
Benzo(a)Pyrene D12	500	20.51	99.4	50-150
Perylene D12	500	20.73	87.9	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	122.2	50-150
Dibenz(a,h)Anthracene-D14	500	24.24	94.6	50-150
Benzo(g,h,i)Perylene D12	500	24.98	93.3	50-150

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	**19-21936-SVOC-(21 THRU 25) TEST1 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-5	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071827.D
Run Date	7/19/2019 2:29
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.34	439	B
2-Methylnaphthalene	3.89	83.1	
1-Methylnaphthalene	4.01	48.9	
Acenaphthylene	5.03	20.5	R
Acenaphthene	5.29	28.3	R
Fluorene	6.19	105	R
Phenanthrene	8.39	164	
Anthracene	8.51	20.8	R
Fluoranthene	11.78	32.7	
Pyrene	12.42	27.6	R
Benzo(a)Anthracene	16.35	<10	U
Chrysene/Triphenylene	16.47	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	24.33	<10	U
Benzo(g,h,i)Perylene	25.10	<10	U
Additional Analytes			
Tetralin	3.20	305 M	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.41	50.5 M	
o-Terphenyl	9.64	<10	U
1-Methylphenanthrene	9.95	103	R
9-Methylphenanthrene	10.06	13.3	
2-methylanthracene	10.13	51.4	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	12.81	<10	U
p-terphenyl	13.30	<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	24.33	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	**Limits**
1-Methylnaphthalene-D10	600	3.97	82.7	
Fluorene D10	600	6.16	186.7	
Terphenyl D14(Surr.)	600	13.22	109.1	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	73.1	50-150
2-Methylnaphthalene-D10	500	3.86	81.8	50-150
Acenaphthylene D8	500	4.98	88.4	50-150
Phenanthrene D10	500	8.33	82.9	50-150
Anthracene-D10	500	8.47	84.4	50-150
Fluoranthene D10	500	11.73	92.6	50-150
Benz(a)Anthracene-D12	500	16.27	123.1 M	50-150
Chrysene D12	500	16.38	91.3	50-150
Benzo(b)Fluoranthene-D12	500	19.62	125.7	50-150
Benzo(k)Fluoranthene-D12	500	19.70	95.0	50-150
Benzo(a)Pyrene D12	500	20.50	106.5	50-150
Perylene D12	500	20.73	105.4	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	130.8 M	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	128.1	50-150
Benzo(g,h,i)Perylene D12	500	24.98	107.1	50-150

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	**19-21936-SVOC-(26 THRU 30) TEST2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-6	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071828.D
Run Date	7/19/2019 3:03
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.34	422	B
2-Methylnaphthalene	3.90	66.7	
1-Methylnaphthalene	4.00	39.0	
Acenaphthylene	5.01	15.6	R
Acenaphthene	5.29	26.9	R
Fluorene	6.20	76.9	R
Phenanthrene	8.39	83.0	
Anthracene	8.51	46.7	R
Fluoranthene	11.79	23.8	
Pyrene	12.42	33.0	R
Benzo(a)Anthracene	16.36	<10	U
Chrysene/Triphenylene	16.46	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	25.10	51.0 M	
Additional Analytes			
Tetralin	3.20	282	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.42	42.0 M	
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	9.94	99.5	R
9-Methylphenanthrene	10.06	<10	U
2-methylanthracene	10.15	119 M	R
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	12.82	<10	U
p-terphenyl	13.29	<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	600	3.98	87.3	
Fluorene D10	600	6.15	89.8	
Terphenyl D14(Surr.)	600	13.22	131.4	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	67.5	50-150
2-Methylnaphthalene-D10	500	3.86	75.3	50-150
Acenaphthylene D8	500	4.98	25.7	50-150
Phenanthrene D10	500	8.34	103.0	50-150
Anthracene-D10	500	8.47	25.5	50-150
Fluoranthene D10	500	11.73	97.9	50-150
Benz(a)Anthracene-D12	500	16.28	83.0	50-150
Chrysene D12	500	16.38	103.5	50-150
Benzo(b)Fluoranthene-D12	500	19.62	89.7	50-150
Benzo(k)Fluoranthene-D12	500	19.70	64.0	50-150
Benzo(a)Pyrene D12	500	20.52	16.8	50-150
Perylene D12	500	20.74	15.6	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.09	57.9	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	94.8	50-150
Benzo(g,h,i)Perylene D12	500	24.98	85.7	50-150

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	**19-21936-SVOC-(31 THRU 35) TEST3 #2 APC OUTLET**	Sampling Date	28-Jun-19
ALS Sample ID	L2300710-7	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071829.D
Run Date	7/19/2019 3:36
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**		**Flags**
Naphthalene	3.34	470		R B
2-Methylnaphthalene	3.90	92.6		
1-Methylnaphthalene	4.00	55.6		
Acenaphthylene	4.97	237		R
Acenaphthene	5.29	141		R
Fluorene	6.20	106		R
Phenanthrene	8.39	1650		
Anthracene	8.51	49.2	M	R
Fluoranthene	11.78	217		
Pyrene	12.42	173		
Benzo(a)Anthracene	16.37	<10	U	
Chrysene/Triphenylene	16.45	11.4		R
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	NotFnd	<10	U	
Benzo(a)Pyrene	NotFnd	<10	U	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	NotFnd	<10	U	
Additional Analytes				
Tetralin	3.20	299		B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	4.42	73.1	M	
o-Terphenyl	9.65	23.6	M	R
1-Methylphenanthrene	9.95	126	M	R
9-Methylphenanthrene	10.06	139	M	
2-methylanthracene	10.12	283	M	
9,10-dimethylanthracene	NotFnd	<10	U	
m-terphenyl	12.81	26.7	M	R
p-terphenyl	13.30	10.3	M	R
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	24.33	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.97	87.9	
Fluorene D10	600	6.15	115.5	
Terphenyl D14(Surr.)	600	13.22	115.3	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	71.9	50-150
2-Methylnaphthalene-D10	500	3.86	81.8	50-150
Acenaphthylene D8	500	4.99	77.3	50-150
Phenanthrene D10	500	8.33	71.1	50-150
Anthracene-D10	500	8.47	61.6	50-150
Fluoranthene D10	500	11.73	82.8	50-150
Benz(a)Anthracene-D12	500	16.27	121.8	50-150
Chrysene D12	500	16.38	78.4	50-150
Benzo(b)Fluoranthene-D12	500	19.62	122.9	50-150
Benzo(k)Fluoranthene-D12	500	19.70	88.8	50-150
Benzo(a)Pyrene D12	500	20.50	89.4	50-150
Perylene D12	500	20.73	90.9	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	139.0	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	124.0	50-150
Benzo(g,h,i)Perylene D12	500	24.98	103.1	50-150

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	**19-21936-SVOC-(36 THRU 40) BLANK2 #2 APC OUTLET**	Sampling Date	27-Jun-19
ALS Sample ID	L2300710-8	Extraction Date	11-Jul-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071823.D
Run Date	7/19/2019 0:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	3.33	169	B
2-Methylnaphthalene	3.89	14.9	R
1-Methylnaphthalene	4.00	14.1	R
Acenaphthylene	5.01	12.6	R
Acenaphthene	5.28	18.4	R
Fluorene	6.19	45.8	R
Phenanthrene	8.41	17.5	R
Anthracene	8.51	<10	U
Fluoranthene	11.79	<10	U
Pyrene	12.42	<10	U
Benzo(a)Anthracene	16.38	<10	U
Chrysene/Triphenylene	16.47	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	NotFnd	<10	U
Additional Analytes			
Tetralin	3.20	210	B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	4.42	<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	24.34	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	600	3.97	87.3	
Fluorene D10	600	6.15	100.5	
Terphenyl D14(Surr.)	600	13.22	114.8	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	500	3.33	59.2	50-150
2-Methylnaphthalene-D10	500	3.86	78.4	50-150
Acenaphthylene D8	500	4.98	84.3	50-150
Phenanthrene D10	500	8.34	105.4	50-150
Anthracene-D10	500	8.47	125.7	50-150
Fluoranthene D10	500	11.73	78.3	50-150
Benz(a)Anthracene-D12	500	16.28	111.3	50-150
Chrysene D12	500	16.39	74.3	50-150
Benzo(b)Fluoranthene-D12	500	19.62	102.7	50-150
Benzo(k)Fluoranthene-D12	500	19.70	89.0	50-150
Benzo(a)Pyrene D12	500	20.51	103.6	50-150
Perylene D12	500	20.73	92.2	50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.07	103.0	50-150
Dibenz(a,h)Anthracene-D14	500	24.24	79.6	50-150
Benzo(g,h,i)Perylene D12	500	24.98	77.8	50-150

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

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**		Sampling Date	n/a
ALS Sample ID	WG3094556-2		Extraction Date	11-Jul-19
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	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071818.D
Run Date	7/18/2019 21:28
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	500	3.35	140.4		50-150
2-Methylnaphthalene	500	3.90	97.9		50-150
1-Methylnaphthalene	500	4.01	102.5		50-150
Acenaphthylene	500	5.01	106.2		50-150
Acenaphthene	500	5.29	94.0		50-150
Fluorene	500	6.21	95.2		50-150
Phenanthrene	500	8.40	99.0		50-150
Anthracene	500	8.52	100.2		50-150
Fluoranthene	500	11.77	92.6		50-150
Pyrene	500	12.42	92.4		50-150
Benzo(a)Anthracene	500	16.34	92.8		50-150
Chrysene/Triphenylene	500	16.47	92.7		50-150
Benzo(b)Fluoranthene	500	19.68	77.9	M	50-150
Benzo(k)Fluoranthene	500	19.76	77.0		50-150
Benzo(e)Pyrene	500	20.42	85.2		50-150
Benzo(a)Pyrene	500	20.56	89.7		50-150
Perylene	500	20.79	91.8		50-150
Indeno(1,2,3-cd)Pyrene	500	24.14	74.6		50-150
Dibenzo(a,c/a,h)Anthracene	500	24.34	76.9		50-150
Benzo(g,h,i)Perylene	500	25.07	72.8		50-150

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	3.33	70.8		30-150
2-Methylnaphthalene-D10	500	3.87	84.0		30-150
Acenaphthylene D8	500	4.98	85.6		30-150
Phenanthrene D10	500	8.34	86.9		50-150
Anthracene-D10	500	8.47	84.1		50-150
Fluoranthene D10	500	11.73	96.8		50-150
Benz(a)Anthracene-D12	500	16.28	86.3		50-150
Chrysene D12	500	16.38	66.9	M	50-150
Benzo(b)Fluoranthene-D12	500	19.62	108.0		50-150
Benzo(k)Fluoranthene-D12	500	19.70	85.2		50-150
Benzo(a)Pyrene D12	500	20.50	109.9		30-150
Perylene D12	500	20.73	103.9		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.05	134.1	M	50-150
Dibenz(a,h)Anthracene-D14	500	24.22	139.6	M	50-150
Benzo(g,h,i)Perylene D12	500	24.96	138.2		50-150

M Indicates that a peak has been manually integrated.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample (Low Level)**	Sampling Date	n/a
ALS Sample ID	WG3094556-5	Extraction Date	11-Jul-19
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	WG3094556

Approved:
Andrew Reid
--e-signature--
22-Jul-2019

Run Information	**Run 1**
Filename	19071817.D
Run Date	7/18/2019 20:54
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP5MS USR433752H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	50	3.33	142.5 M		50-150
2-Methylnaphthalene	50	3.89	103.0		50-150
1-Methylnaphthalene	50	3.99	103.8		50-150
Acenaphthylene	50	4.99	111.5		50-150
Acenaphthene	50	5.28	103.3		50-150
Fluorene	50	6.23	99.6		50-150
Phenanthrene	50	8.42	108.9		50-150
Anthracene	50	8.54	108.7		50-150
Fluoranthene	50	11.80	97.2		50-150
Pyrene	50	12.43	101.2		50-150
Benzo(a)Anthracene	50	16.37	116.0		50-150
Chrysene/Triphenylene	50	16.50	96.3 M		50-150
Benzo(b)Fluoranthene	50	19.70	86.3	R	50-150
Benzo(k)Fluoranthene	50	19.77	99.8 M	R	50-150
Benzo(e)Pyrene	50	20.44	102.1 M		50-150
Benzo(a)Pyrene	50	20.59	105.6 M		50-150
Perylene	50	20.83	119.0 M		50-150
Indeno(1,2,3-cd)Pyrene	50	24.19	92.0 M		50-150
Dibenzo(a,c/a,h)Anthracene	50	24.43	75.4		50-150
Benzo(g,h,i)Perylene	50	25.12	75.8	R	50-150
Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	500	3.32	80.2		30-150
2-Methylnaphthalene-D10	500	3.86	85.3		30-150
Acenaphthylene D8	500	4.98	79.2		30-150
Phenanthrene D10	500	8.36	90.9		50-150
Anthracene-D10	500	8.49	70.7		50-150
Fluoranthene D10	500	11.74	98.4		50-150
Benz(a)Anthracene-D12	500	16.30	70.2		50-150
Chrysene D12	500	16.41	70.4 M		50-150
Benzo(b)Fluoranthene-D12	500	19.63	79.5		50-150
Benzo(k)Fluoranthene-D12	500	19.71	86.7 M		50-150
Benzo(a)Pyrene D12	500	20.53	83.7		30-150
Perylene D12	500	20.75	85.1 M		50-150
Indeno(1,2,3,cd)Pyrene-D12	500	24.09	59.5		50-150
Dibenz(a,h)Anthracene-D14	500	24.26	70.7 M		50-150
Benzo(g,h,i)Perylene D12	500	24.98	61.2 M		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.:	21936
Date:	June 25, 2019
Test No.:	1
Test Location:	UNIT 1

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	673.1
Initial Wt:	782.3
Final Wt:	887.9
Gain:	105.6
Colour:	clear

1

Impinger #2 0.1 N H_2SO4	
Empty Wt:	672.6
Initial Wt:	777.3
Final Wt:	813.2
Gain:	35.9
Colour:	clear

2

Impinger #3 EMPTY	
Empty Wt:	482.1
Final Wt:	486.3
Gain:	4.2
Colour:	clear

3

CONTAINER TS3 WEIGHTS	
Empty Wt:	279.3
With Imp. 1,2,3 Soln:	638.9
Imp. 1,2,3 Volume:	359.6
After Rinse:	749.5
Total TS3:	470.2

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	884.8
Final Wt:	896.5
Gain:	11.7

4

CWTR = 1+2+3:	145.7 ✓
WCBDA= 4:	11.7

SAMPLE ID: 19-21936-M26A-1

Box 14

Train Loaded By:	ST
Train Recovered By:	ST
Recovery Witnessed By:	—

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 25, 19
Test No.:	2
Test Location:	UNIT 1

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	657.3
	Initial Wt:	748.4
	Final Wt:	852.4
1	Gain:	104.0
	Colour:	CLEAR

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	671.9
	Initial Wt:	778.8
	Final Wt:	820.6
2	Gain:	41.8
	Colour:	CLEAR

	Impinger #3 EMPTY	
	Empty Wt:	598.7
	Final Wt:	601.8
3	Gain:	3.1
	Colour:	CLEAR

CONTAINER TS3 WEIGHTS	
Empty Wt:	281.[illegible]
With Imp. 1,2,3 Soln:	625.7
Imp. 1,2,3 Volume:	344.6
After Rinse:	731.5
Total TS3:	450.4

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	913.6
	Final Wt:	928.4
4	Gain:	14.8

CWTR = 1+2+3:	148.9 ✓

WCBDA= 4:	14.8

SAMPLE ID: 19-21936-M26A- 2

Box 11

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Revision: Jan 16, 2006

ORTECH Environmental

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 25, 19
Test No.:	3
Test Location:	UNIT 1

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	673.1
	Initial Wt:	774.5
	Final Wt:	902.1
1	Gain:	127.6
	Colour:	Clear

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	672.6
	Initial Wt:	778.1
	Final Wt:	798.4
2	Gain:	20.3
	Colour:	Clear

	Impinger #3 EMPTY	
	Empty Wt:	482.1
	Final Wt:	486.9
3	Gain:	4.8
	Colour:	Clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	428.0
With Imp. 1,2,3 Soln:	798.3
Imp. 1,2,3 Volume:	370.3
After Rinse:	901.1
Total TS3:	473.1

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	896.5
	Final Wt:	905.7
4	Gain:	9.2

CWTR = 1+2+3:	152.7 ✓
WCBDA= 4:	9.2

SAMPLE ID: 19-21936-M26A- 3

Box 14

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	—

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 25, 19
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:	284.3
With Imp. 1,2,3 Soln:	488.3
Imp. 1,2,3 Volume:	204.0
After Rinse:	590.3
Total TS3:	306.0

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	
	Final Wt:	
4	Gain:	

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 19-21936-M26A- BLANK 1

Train Loaded By:	KT
Train Recovered By:	KT
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 26, 19
Test No.:	1
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3		Impinger 4	

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	673.1
	Initial Wt:	780.9
	Final Wt:	901.4
1	Gain:	120.5
	Colour:	Clear

	Impinger #4 Silica Gel	
	Initial Wt:	783.7
	Final Wt:	797.7
4	Gain:	14.0

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	672.6
	Initial Wt:	785.2
	Final Wt:	819.6
2	Gain:	34.4
	Colour:	clear

	Impinger #3 EMPTY	
	Empty Wt:	482.1
	Final Wt:	490.5
3	Gain:	8.4
	Colour:	clear

CWTR = 1+2+3:	163.3 ✓
WCBDA= 4:	14.0

CONTAINER TS3 WEIGHTS	
Empty Wt:	281.1
With Imp. 1,2,3 Soln:	665.1
Imp. 1,2,3 Volume:	384.0
After Rinse:	769.7
Total TS3:	488.6

SAMPLE ID: 19-21936-M26A- 4

14

Train Loaded By: DT

Train Recovered By: DT

Recovery Witnessed By:

Revision: Jan 16, 2006

ORTECH Environmental

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	June 26, 19
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:	658.2
	Initial Wt:	761.7
	Final Wt:	888.4
1	Gain:	126.7
	Colour:	Clear

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	671.9
	Initial Wt:	776.5
	Final Wt:	806.8
2	Gain:	30.3
	Colour:	clear

	Impinger #3 EMPTY	
	Empty Wt:	598.7
	Final Wt:	604.8
3	Gain:	6.1
	Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	279.3
With Imp. 1,2,3 Soln:	649.3
Imp. 1,2,3 Volume:	370.0
After Rinse:	742.1
Total TS3:	462.8

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	928.4
	Final Wt:	942.8
4	Gain:	14.4

CWTR = 1+2+3:	163.1 ✓
WCBDA= 4:	14.4

SAMPLE ID: 19-21936-M26A- 5

(1)

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Revision: Jan 16, 2006

ORTECH Environmental

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 26, 19
Test No.:	3
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger 4

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	673.1
	Initial Wt:	776.1
	Final Wt:	914.6
1	Gain:	138.5
	Colour:	Clear

	Impinger #4 Silica Gel	
	Initial Wt:	797.7
	Final Wt:	808.7
4	Gain:	11.0

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	672.6
	Initial Wt:	775.5
	Final Wt:	808.9
2	Gain:	33.4
	Colour:	Clear

	Impinger #3 EMPTY	
	Empty Wt:	482.1
	Final Wt:	486.6
3	Gain:	4.5
	Colour:	—

CWTR = 1+2+3:	176.4

WCBDA= 4:	11.0

CONTAINER TS3 WEIGHTS	
Empty Wt:	281.9
With Imp. 1,2,3 Soln:	660.4
Imp. 1,2,3 Volume:	378.5
After Rinse:	768.9
Total TS3:	487.0

SAMPLE ID: 19-21936-M26A-6

14

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	—

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21936
Date:	JUNE 26, 19
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:	284.8
With Imp. 1,2,3 Soln:	485.3
Imp. 1,2,3 Volume:	200.5
After Rinse:	585.4
Total TS3:	300.6

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	
	Final Wt:	
4	Gain:	

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 19-21936-M26A- BLANK 2

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	

Revision: Jan 16, 2006

ORTECH Environmental

APPENDIX 17

VOST Analytical Reports
(6 pages)

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	ORT100	**Client Name:**	ORTECH Environmental
ALS Project ID:	Lynne Wrona	**Client Address:**	804 Southdown Road
ALS WO#:	L2301528		Mississauga, ON L5J 2Y4
Date of Report	15-Jul-19		Canada
Date of Sample Receipt	28-Jun-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Some samples contained high moisture content and as a result showed reduced Internal Standard recovery. The surrogate recoveries were acceptable however and lend confidence that the native results are not biased.

The samples were analyzed in two separate work groups and hence there are two sets of QC samples in this report.

Ketone data by VOST analyses are estimated values only

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21936-VOST-1A,1B TEST1 PAIR1 #1 APC OUTLET		19-21936-VOST-2A,2B TEST1 PAIR2 #1 APC OUTLET		19-21936-VOST-3A,3B TEST1 PAIR3 #1 APC OUTLET		19-21936-VOST-5A,5B TEST2 PAIR1 #1 APC OUTLET		19-21936-VOST-6A,6B TEST2 PAIR2 #1 APC OUTLET		19-21936-VOST-7A,7B TEST2 PAIR3 #1 APC OUTLET	
ALS Sample ID	L2301528-1		L2301528-2		L2301528-3		L2301528-5		L2301528-6		L2301528-7	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	Vost		Vost		Vost		Vost		Vost		Vost	
Sampling Date	27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
Extraction Date	6-Jul-19		11-Jul-19		11-Jul-19		6-Jul-19		11-Jul-19		11-Jul-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	0.026		<0.02	U	0.054		0.042	
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	0.025		0.021	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.12		0.336		0.83		0.335		1.271		1.095	
Methylene Chloride	1.292		1.97		1.186		1.874		1.496		1.797	
trans,1,2-Dichloroethene	0.017		0.014		<0.01	U	0.015		0.035		0.027	
2-Butanone	0.024		0.062		0.066	M	0.041		0.539		0.392	
Chloroform	0.017		0.033		<0.01	U	0.024		0.052		0.037	
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	0.03		0.02	
Benzene	0.053		0.074		0.06		0.096		0.181		0.114	
1,2-Dichloroethane	<0.01	U	0.014		<0.01	U	0.015		0.022		0.015	
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	U	<0.01	U	<0.01	U	<0.01	U	0.038		0.027	
Toluene	0.694		0.758		0.056		0.658		1.386		1.057	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.011		0.015		<0.01	U	0.019		0.032		0.031	
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	0.122		0.224		<0.01	U	0.196		0.378		0.279	
M&P-Xylene	1.045		1.377		0.073		2.169		1.755		1.353	
O-Xylene	0.325		0.429		0.019		0.689		0.556		0.425	
Styrene	0.054	R	0.064	R	<0.02	U	0.1	R	0.088	R	0.07	R
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	0.023	R	<0.02	U	0.034	R	0.051	R	0.036	R
1,3,5-Trimethylbenzene	0.081		0.092		<0.02	U	0.184		0.114		0.089	
1,3-Butadiene	<0.02	U	<0.02	U	<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	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	50.6		78.7		94.9		65.3		122.3		97.7	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	138.1		117.5		106.6		101.2	M	89.3		91.9	
d8-Toluene(SURR)	81.8		76.3		76.3		90.9		71.7		74.6	
4-Bromofluorobenzene(SURR)	105.5		101.4		58.6		137.6		87		84.2	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	107.2		63.4		47	L	97.1		47.7	L,R	75.2	
1,4-Difluorobenzene	66.4		51.2		39.4	L	51.5		44.1	L	68.2	
d5-Chlorobenzene	82.2		69.5		28.9	L	45.1	L	77.8		89.3	

U Indicates that this compound was not detected above the RL.
M Indicates that a peak has been manually integrated.
R Indicates that the Ion abundance ratio does not meet criterea.

L Indicates this value is below the control limit.

ALS Environmental

Sample Analysis Summary Report

Sample Name	**19-21936-VOST-30A,30B TEST2 FIELD BLANK #1 APC OUTLET**		**19-21936-VOST-9A,9B TEST3 PAIR1 #1 APC OUTLET**		**19-21936-VOST-10A,10B TEST3 PAIR2 #1 APC OUTLET**		**19-21936-VOST-11A,11B TEST3 PAIR3 #1 APC OUTLET**		**19-21936-VOST-TRIP BLANK**		**19-21936-VOST-13A,13B TEST1 PAIR1 #2 APC OUTLET**	
ALS Sample ID	L2301528-9		L2301528-10		L2301528-11		L2301528-12		L2301528-14		L2301528-15	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	Vost		Vost		Vost		Vost		Vost		Vost	
Sampling Date	27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
Extraction Date	6-Jul-19		6-Jul-19		11-Jul-19		11-Jul-19		6-Jul-19		6-Jul-19	
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	
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	0.261	
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	<0.1	U	0.186		0.75		0.121		<0.1	U	0.146	
Methylene Chloride	<0.1	U	1.749		1.307		<0.1	U	<0.1	U	0.152	
trans,1,2-Dichloroethene	<0.01	U	0.013		0.016		0.018		<0.01	U	0.013	
2-Butanone	<0.01	U	0.055		0.254		0.031		<0.01	U	0.071	
Chloroform	<0.01	U	0.021		0.028		0.025		<0.01	U	0.015	
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	<0.05	U	0.067		0.088		<0.05	U	<0.05	U	<0.05	U
1,2-Dichloroethane	<0.01	U	0.01		0.01		<0.01	U	<0.01	U	0.01	
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	U	<0.01	U	0.019		0.011		<0.01	U	<0.01	U
Toluene	<0.05	U	0.493		0.867		<0.05	U	<0.05	U	2.023	M
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	0.015		0.018		0.013		<0.01	U	<0.01	U
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	0.171		0.201		<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	1.436		1.015		<0.03		<0.03	U	<0.03	U
O-Xylene	<0.01	U	0.449		0.321		<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	0.068	R	0.052	R	<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	0.028	R	0.031	R	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	0.109		0.07		<0.02	U	<0.02	U	<0.02	U
1,3-Butadiene	<0.02	U	<0.02	U	<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	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	80.8		58.5		75.4		82.9		75		51.3	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	91.1		117.9	M	91.3		90.9		90.2		110	M
d8-Toluene(SURR)	84.7		85.7		78.8		78.2		80.8		77	
4-Bromofluorobenzene(SURR)	83		119.1		76.7		81.8		86.8		75.6	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	85.3		123		115.8		84.1		83.3		124.2	
1,4-Difluorobenzene	83.5		77.4		108		75.4		85.6		72.4	
d5-Chlorobenzene	75.8		76.2		121.5		71.8		82.8		121.6	

U Indicates that this compound was not detected above the RL.
M Indicates that a peak has been manually integrated.
R Indicates that the Ion abundance ratio does not meet criterea.

ALS Environmental

Sample Analysis Summary Report

Sample Name	**19-21936-VOST-14A,14B TEST1 PAIR2 #2 APC OUTLET**		**19-21936-VOST-15A,15B TEST1 PAIR3 #2 APC OUTLET**		**19-21936-VOST-29A,29B FIELD BLANK #2 APC OUTLET**		**19-21936-VOST-17A,17B TEST2 PAIR1 #2 APC OUTLET**		**19-21936-VOST-18A,18B TEST2 PAIR2 #2 APC OUTLET**		**19-21936-VOST-19A,19B TEST2 PAIR3 #2 APC OUTLET**	
ALS Sample ID	L2301528-16		L2301528-17		L2301528-19		L2301528-20		L2301528-21		L2301528-22	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	Vost		Vost		Vost		Vost		Vost		Vost	
Sampling Date	27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
Extraction Date	11-Jul-19		11-Jul-19		6-Jul-19		6-Jul-19		11-Jul-19		11-Jul-19	
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	0.10		<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	0.11		<0.1	U	<0.1	U	<0.1	U	<0.1	U	0.16	
Methylene Chloride	0.45		0.45		<0.1	U	0.11		0.11		0.42	
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
2-Butanone	0.06		0.02		<0.01	U	0.01		<0.01	U	0.05	
Chloroform	0.02		0.02		<0.01	U	<0.01	U	0.02		0.03	
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	<0.05	U	<0.05	U	<0.05	U	<0.05	U	<0.05	U	0.05	
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	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.01	
Toluene	2.15		1.92		<0.05	U	1.02		1.16		1.87	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.02		0.02		<0.01	U	0.02		0.03		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		<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
1,3-Butadiene	<0.02	U	<0.02	U	<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	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	60.2		72.7		81.1		57.5		87.2		104.8	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	100.9		88.3		94.1		99.6		112.3		73.8	
d8-Toluene(SURR)	79.3		74.9		84		66.3		80.1		83.8	
4-Bromofluorobenzene(SURR)	76.2		88.8		85.5		105.1		118.5		89.3	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	100.4		97.7		97.7		99.6		93.6		62.7	
1,4-Difluorobenzene	68.6		73.4		93.2		80.1		59.4		52.5	
d5-Chlorobenzene	97.3	M	79.7	M	86		87.9		54		63.8	

U Indicates that this compound was not detected above the RL.
M Indicates that a peak has been manually integrated.
R Indicates that the Ion abundance ratio does not meet criterea.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21936-VOST-21A,21B TEST3 PAIR1 #2 APC OUTLET		19-21936-VOST-22A,22B TEST3 PAIR2 #2 APC OUTLET		19-21936-VOST-24A,24B TEST3 PAIR4 #2 APC OUTLET		19-21936-VOST-25A,25B FIELD BLANK #2 APC OUTLET	
ALS Sample ID	L2301528-24		L2301528-25		L2301528-27		L2301528-28	
Sample units	sample		sample		sample		sample	
Matrix	Vost		Vost		Vost		Vost	
Sampling Date	27-Jun-19		27-Jun-19		27-Jun-19		27-Jun-19	
Extraction Date	6-Jul-19		11-Jul-19		11-Jul-19		6-Jul-19	
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	0.02		0.02		0.02		<0.01	U
Chloroform	0.02		0.02		0.01		<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
Bromodichloromethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	0.80		0.94		0.73		<0.05	U
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.01		0.02		0.01		<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	
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
1,3-Butadiene	<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)	55.6		65		50.5		65.8	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	116.7		130.2		101.9		89.1	
d8-Toluene(SURR)	76.7		89.6		69.6		72.8	
4-Bromofluorobenzene(SURR)	97.6		114.1		88.6		95	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	107.5		96.9		128		109.3	
1,4-Difluorobenzene	82.3		73.8		94.3		94.3	
d5-Chlorobenzene	119.9		102.6		132.1		104.3	

U Indicates that this compound was not detected above the RL.

R Indicates that the Ion abundance ratio does not meet criterea.

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank		Laboratory Control Sample		Laboratory Control Sample	
ALS Sample ID	WG3097624-1		WG3101737-1		WG3097624-2		WG3101737-2	
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	6-Jul-19		11-Jul-19		6-Jul-19		11-Jul-19	
Target Analytes	**ug/sample**		**ug/sample**		**% Rec**		**% Rec**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	98.2	M	101.4	
Vinyl Chloride	<0.02	U	<0.02	U	108.7		88.2	M
Bromomethane	<0.09	U	<0.09	U	100.2	M	82.7	
Trichlorofluoromethane	<0.02	U	<0.02	U	111.6		88.5	
1,1-Dichloroethene	<0.01	U	<0.01	U	95.4		96.4	
Acetone	<0.1	U	<0.1	U	72.5		113.2	
Methylene Chloride	<0.1	U	<0.1	U	88.4		104	
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	88.2		104.9	M
2-Butanone	<0.01	U	<0.01	U	73.3	M	117.7	
Chloroform	<0.01	U	<0.01	U	89.8		88.8	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	87.9		108.7	
Carbon Tetrachloride	<0.01	U	<0.01	U	117.1		108	
Benzene	<0.05	U	<0.05	U	96.6		98.6	
1,2-Dichloroethane	<0.01	U	<0.01	U	98.2		94	
Trichloroethene	<0.01	U	<0.01	U	108.8		117	
1,2-Dichloropropane	<0.01	U	<0.01	U	96.7		115.8	
Bromodichloromethane	<0.01	U	<0.01	U	111.4		118.9	
Toluene	<0.05	U	<0.05	U	85.1		85.6	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	84.3		118.1	
Tetrachloroethene	<0.01	U	<0.01	U	86.6		97.7	
Chlorodibromomethane	<0.01	U	<0.01	U	87.1		107.4	
Ethylene Dibromide	<0.02	U	<0.02	U	82.8		121.9	
Ethylbenzene	<0.01	U	<0.01	U	90.6		91.4	
M&P-Xylene	<0.03	U	<0.03	U	87.2		83	
O-Xylene	<0.01	U	<0.01	U	87.9		81.3	
Styrene	<0.02	U	<0.02	U	78.7		84.6	
Bromoform	<0.01	U	<0.01	U	92.5		117.7	
Isopropylbenzene	<0.02	U	<0.02	U	88.5		84.6	
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	85.2		104.5	
1,3-Butadiene	<0.02	U	<0.02	U				
Trichlorotrifluoroethane	<0.02	U	<0.02	U				
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	71.7		73.1		96.2		118.6	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	88.2		93.3		96.6		100.4	
d8-Toluene(SURR)	80.4		80.7		93.4		109	
4-Bromofluorobenzene(SURR)	86.2		79.9		104.2		100.6	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	102.9		107		98.5		79.1	
1,4-Difluorobenzene	100.3		92.9		95.4		83.9	
d5-Chlorobenzene	98.9		88.6		129.5		85.9	

U Indicates that this compound was not detected above the RL.
M Indicates that a peak has been manually integrated.

APPENDIX 18

Aldehydes Recovery Data Sheets
(8 pages)

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	1
Test Location:	UNIT 1 APC OUTLET
Test Date:	JUNE 27, 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430- 1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	101.8
Initial Mass:	119.6
Final Mass:	122.4
Gain:	2.8

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	109.6
Mass with impingers:	168.1
With Toluene rinse:	176.0
Total sample:	66.4

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.6
Initial Mass:	119.4
Final Mass:	120.0
Gain:	0.6

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	92.7
Initial Mass:	113.4
Final Mass:	113.4
Gain:	0.0

Impinger 4 (Silica Gel)	
Initial Mass:	122.1
Final Mass:	123.7
Gain:	1.6

Note: Load and recover train away from acetone

Train Loaded By:	JG
Train Recovered By:	DM
Recovery Witnessed By:	
Date:	JUNE 27, 2019

Box 2.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	2
Test Location:	UNIT # 1 APC OUTLET.
Test Date:	JUNE 27, 2019

Impingers 1, 2, 3 & 4	

Sample ID: 19-21936-M430-	~~B~~ 2

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	102.8
Initial Mass:	118.5
Final Mass:	121.6
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	~~109.8~~ 108.4
Mass with impingers:	168.1
With Toluene rinse:	175.9
Total sample:	67.5

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.6
Initial Mass:	118.0
Final Mass:	118.5
Gain:	0.5

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	94.0
Initial Mass:	114.1
Final Mass:	114.1
Gain:	0.0

Impinger 4 (Silica Gel)	
Initial Mass:	123.7
Final Mass:	125.2
Gain:	1.5

Box 2

Note: Load and recover train away from acetone

Train Loaded By: RW

Train Recovered By: RW

Recovery Witnessed By: –

Date: JUNE 27/19

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	3
Test Location:	UNIT #1 APC OUTLET
Test Date:	JUNE 27, 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430- 3

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	104.7
Initial Mass:	123.0
Final Mass:	125.6
Gain:	2.6

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	108.5
Mass with impingers:	169.0
With Toluene rinse:	176.7
Total sample:	68.5

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.6
Initial Mass:	116.8
Final Mass:	117.0
Gain:	0.2

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	101.5
Initial Mass:	124.0
Final Mass:	124.0
Gain:	0.0

Impinger 4 (Silica Gel)	
Initial Mass:	125.4
Final Mass:	127.2
Gain:	1.8

4

Note: Load and recover train away from acetone

Train Loaded By:	DW
Train Recovered By:	JG
Recovery Witnessed By:	JG
Date:	JUNE 27, 2019

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	1
Test Location:	UNIT 2 APC OUTLET
Test Date:	JUNE 27, 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430- 4

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.4
Initial Mass:	118.3
Final Mass:	119.7
Gain:	1.4

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	73.4
Mass with impingers:	—
With Toluene rinse:	132.6
Total sample:	59.2

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.9
Initial Mass:	118.0
Final Mass:	118.6
Gain:	0.6

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.0
Initial Mass:	105.6
Final Mass:	105.5
Gain:	-0.1

Impinger 4 (Silica Gel)	
Initial Mass:	122.1
Final Mass:	124.8
Gain:	2.7

Note: Load and recover train away from acetone

Train Loaded By:	JG
Train Recovered By:	DM
Recovery Witnessed By:	—
Date:	JUN 27/19

Box 3.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	2
Test Location:	UNIT 2 APC OUTLET
Test Date:	JUNE 27 2019

Impingers 1, 2, 3 & 4	

Sample ID: 19-21936-M430-	5

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	103.5
Initial Mass:	123.1
Final Mass:	126.0
Gain:	2.9

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	109.8
Mass with impingers:	~~165~~ 175.3
With Toluene rinse:	178.3
Total sample:	68.5

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.7
Initial Mass:	119.6
Final Mass:	119.6
Gain:	0.0

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.6
Initial Mass:	117.3
Final Mass:	117.6
Gain:	0.3

Impinger 4 (Silica Gel)	
Initial Mass:	124.0
Final Mass:	125.6
Gain:	1.6

Note: Load and recover train away from acetone

Train Loaded By:	JG
Train Recovered By:	QL
Recovery Witnessed By:	—
Date:	JUN27/19

Box 4.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	3
Test Location:	UNIT #2 APC OUTLET
Test Date:	JUNE 27th 2019.

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430- 6

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.7
Initial Mass:	117.7
Final Mass:	120.2
Gain:	3.0

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	108.6
Mass with impingers:	126.8
With Toluene rinse:	172.7
Total sample:	64.1

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.9
Initial Mass:	117.7
Final Mass:	~~117.9~~ 118.0
Gain:	0.3

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.9
Initial Mass:	~~107.5~~
Final Mass:	107.5
Gain:	0.0

Impinger 4 (Silica Gel)	
Initial Mass:	124.8
Final Mass:	126.7
Gain:	1.9

Box 3

Note: Load and recover train away from acetone

Train Loaded By:	DV
Train Recovered By:	JG
Recovery Witnessed By:	
Date:	JUNE 27, 2019.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	BLANK 1
Test Location:	–
Test Date:	JUNE 27 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	108.5
Mass with impingers:	156.0
With Toluene rinse:	168.5
Total sample:	60.0

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	
Final Mass:	
Gain:	

Note: Load and recover train away from acetone

Train Loaded By: RW

Train Recovered By: RW

Recovery Witnessed By: –

Date: JUNE 27 2019

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21936
Test No.:	BLANK 2
Test Location:	—
Test Date:	JUNE 27, 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21936-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	109.0
Mass with impingers:	154.1
With Toluene rinse:	169.3
Total sample:	60.3

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	
Final Mass:	
Gain:	

Note: Load and recover train away from acetone

Train Loaded By:	DW
Train Recovered By:	DW
Recovery Witnessed By:	—
Date:	JUNE 27 2019

APPENDIX 19

Aldehydes Analytical Reports
(15 pages)

ALS Environmental

30-Jul-2019

Lynne Wrona
ALS
1435 Norjohn Court
Unit 1
Burlington, Ontario L7L0E6

Tel: (905) 331-3111
Fax:

Re: L2301524

Work Order: **1907153**

Dear Lynne,

ALS Environmental received 8 samples on 03-Jul-2019 09:50 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: 30-Jul-19

Client: ALS
Project: L2301524
Work Order: 1907153

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1907153-01	19-21936-M430-1 TEST1 #1 APC OUTLET	Liquid		6/26/2019	7/3/2019 09:50	☐
1907153-02	19-21936-M430-2 TEST2 #1 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-03	19-21936-M430-3 TEST3 #1 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-04	19-21936-M430-BLANK1 #1 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-05	19-21936-M430-4 TEST1 #2 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-06	19-21936-M430-5 TEST2 #2 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-07	19-21936-M430-6 TEST3 #2 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐
1907153-08	19-21936-M430-BLANK2 #2 APC OUTLET	Liquid		6/27/2019	7/3/2019 09:50	☐

Client:	ALS
Project:	L2301524
Work Order:	1907153

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.

Final sample volume:
19-21936-M430-1 TEST1 #1 APC OUTLET: 18 mL
19-21936-M430-2 TEST2 #1 APC OUTLET: 25 mL
19-21936-M430-3 TEST3 #1 APC OUTLET: 20 mL
19-21936-M430-BLANK1 #1 APC OUTLET: 15 mL
19-21936-M430-4 TEST1 #2 APC OUTLET: 11 mL
19-21936-M430-5 TEST2 #2 APC OUTLET: 23 mL
19-21936-M430-6 TEST3 #2 APC OUTLET: 17 mL
19-21936-M430-BLANK2 #2 APC OUTLET: 18 mL

ALS Environmental

Date: *30-Jul-19*

Client: ALS
Project: L2301524 **Work Order:** 1907153
Sample ID: 19-21936-M430-1 TEST1 #1 APC OUTLET **Lab ID:** 1907153-01
Collection Date: 6/26/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		3.6	µg/sample	1	7/29/2019 04:34 PM
Acrolein	ND		3.6	µg/sample	1	7/29/2019 04:34 PM
formaldehyde	ND		3.6	µg/sample	1	7/29/2019 04:34 PM

Note:

ALS Environmental

Date: *30-Jul-19*

Client: ALS
Project: L2301524
Sample ID: 19-21936-M430-2 TEST2 #1 APC OUTLET
Collection Date: 6/27/2019
Work Order: 1907153
Lab ID: 1907153-02
Matrix: LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		5.0	µg/sample	1	7/29/2019 04:45 PM
Acrolein	ND		5.0	µg/sample	1	7/29/2019 04:45 PM
formaldehyde	ND		5.0	µg/sample	1	7/29/2019 04:45 PM

Note:

ALS Environmental

Date: *30-Jul-19*

Client: ALS
Project: L2301524
Sample ID: 19-21936-M430-3 TEST3 #1 APC OUTLET
Collection Date: 6/27/2019

Work Order: 1907153
Lab ID: 1907153-03
Matrix: LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		4.0	µg/sample	1	7/29/2019 04:55 PM
Acrolein	ND		4.0	µg/sample	1	7/29/2019 04:55 PM
formaldehyde	ND		4.0	µg/sample	1	7/29/2019 04:55 PM

Note:

ALS Environmental

Date: *30-Jul-19*

Client:	ALS		
Project:	L2301524	**Work Order:**	1907153
Sample ID:	19-21936-M430-BLANK1 #1 APC OUTLET	**Lab ID:**	1907153-04
Collection Date:	6/27/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		3.0	µg/sample	1	7/29/2019 05:06 PM
Acrolein	ND		3.0	µg/sample	1	7/29/2019 05:06 PM
formaldehyde	ND		3.0	µg/sample	1	7/29/2019 05:06 PM

Note:

Client:	ALS		
Project:	L2301524	**Work Order:**	1907153
Sample ID:	19-21936-M430-4 TEST1 #2 APC OUTLET	**Lab ID:**	1907153-05
Collection Date:	6/27/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		2.2	µg/sample	1	7/29/2019 05:17 PM
Acrolein	ND		2.2	µg/sample	1	7/29/2019 05:17 PM
formaldehyde	**7.3**		**2.2**	**µg/sample**	1	7/29/2019 05:17 PM

Note:

ALS Environmental

Date: *30-Jul-19*

Client: ALS
Project: L2301524
Sample ID: 19-21936-M430-5 TEST2 #2 APC OUTLET
Collection Date: 6/27/2019

Work Order: 1907153
Lab ID: 1907153-06
Matrix: LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		4.6	µg/sample	1	7/29/2019 05:28 PM
Acrolein	ND		4.6	µg/sample	1	7/29/2019 05:28 PM
formaldehyde	ND		4.6	µg/sample	1	7/29/2019 05:28 PM

Note:

ALS Environmental

Date: *30-Jul-19*

Client: ALS
Project: L2301524 **Work Order:** 1907153
Sample ID: 19-21936-M430-6 TEST3 #2 APC OUTLET **Lab ID:** 1907153-07
Collection Date: 6/27/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		3.4	µg/sample	1	7/29/2019 05:50 PM
Acrolein	ND		3.4	µg/sample	1	7/29/2019 05:50 PM
formaldehyde	ND		3.4	µg/sample	1	7/29/2019 05:50 PM

Note:

ALS Environmental Date: *30-Jul-19*

Client:	ALS		
Project:	L2301524	**Work Order:**	1907153
Sample ID:	19-21936-M430-BLANK2 #2 APC OUTLET	**Lab ID:**	1907153-08
Collection Date:	6/27/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **7/26/2019**	Analyst: **AT**
Acetaldehyde	ND		3.6	µg/sample	1	7/29/2019 06:00 PM
Acrolein	ND		3.6	µg/sample	1	7/29/2019 06:00 PM
formaldehyde	ND		3.6	µg/sample	1	7/29/2019 06:00 PM

Note:

ALS Environmental

Client: ALS
Work Order: 1907153
Project: L2301524

Date: 30-Jul-19

QC BATCH REPORT

Batch ID: **60482** Instrument ID **HPLC2** Method: **CARB430**

MBLK Sample ID **MBLK-60482-60482** Units: **µg/sample** Analysis Date: **7/29/2019 03:50 PM**
Client ID: Run ID: **HPLC2_190729A** SeqNo: **2056156** Prep Date: **7/26/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	ND	0.40								
Acrolein	ND	0.40								
formaldehyde	ND	0.40								

The following samples were analyzed in this batch:

1907153-01A	1907153-02A	1907153-03A
1907153-04A	1907153-05A	1907153-06A
1907153-07A	1907153-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: *30-Jul-19*

Analytical Comments

Client: ALS
Project: L2301524
Work Order: 1907153

Batch 60482

Method	Type:	SampID	SeqNo	Analysis	Comments
	Prep	1907153-01A	0	Prep analyte(s) Liquid Chromatography	50 ml aqueous
	Prep	1907153-02A	0	Prep analyte(s) Liquid Chromatography	45 ml aqueous
	Prep	1907153-03A	0	Prep analyte(s) Liquid Chromatography	50 ml aqueous
	Prep	1907153-04A	0	Prep analyte(s) Liquid Chromatography	45 ml aqueous
	Prep	1907153-05A	0	Prep analyte(s) Liquid Chromatography	48 ml aqueous
	Prep	1907153-06A	0	Prep analyte(s) Liquid Chromatography	47 ml aqueous
	Prep	1907153-07A	0	Prep analyte(s) Liquid Chromatography	48 ml aqueous
	Prep	1907153-08A	0	Prep analyte(s) Liquid Chromatography	44 ml aqueous
	Prep	LCS-60482	0	Prep analyte(s) Liquid Chromatography	10 ml DI with 2 ml DNPH sol
	Prep	LCSD-60482	0	Prep analyte(s) Liquid Chromatography	10 ml DI with 2 ml DNPH sol
	Prep	MBLK-60482	0	Prep analyte(s) Liquid Chromatography	10 ml DI with 2 ml DNPH sol

Client: ALS
Project: L2301524
WorkOrder: 1907153

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: 03-Jul-19 09:50

Work Order: 1907153

Received by: SNH

Checklist completed by Stephanie Harrington (eSignature) 03-Jul-19 (Date)

Reviewed by: Shawn Smythe (eSignature) 15-Jul-19 (Date)

Matrices:

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):	2.1		
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:

ORTECH
a Kontrol Energy Company

APPENDIX 20

SVOC and VOST Proof Data
(12 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 Road
ALS WO#:	L2279669		Mississauga, ON L5J 2Y4
Date of Report	19-Jun-19		CANADA
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **CB by LRGC/MS - Isotope dilution**

Certified by: ____________________
Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	**Method Blank**		**GLASSWARE PROOF**	
ALS Sample ID	WG3061466-1		L2279669-41	
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	12-Jun-19		12-Jun-19	
Target Analytes	**ng/sample**		**ng/sample**	
Chlorobenzene	<8	U	<8	U
1,3-Dichlorobenzene	<8	U	<8	U
1,4-Dichlorobenzene	<8	U	8.96	
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	22		20	
13C6-1,4-Dichlorobenzene	57		58	
13C6-1,2,3-Trichlorobenzene	64		68	
13C6-1,2,3,4-Tetrachlorobenzene	74		73	
13C6-Pentachlorobenzene	67		73	
13C6-Hexachlorobenzene	67		78	

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 Road
ALS WO#:	L2279669		Mississauga, ON L5J 2Y4
Date of Report	19-Jun-19		CANADA
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Certified by

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG3061466-1		L2279669-41	
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	12-Jun-19		12-Jun-19	
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
Hexachlorophene	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**	
2-Fluorophenol	50		46	
d5-Phenol	71	M	58	M
d4-2-Chlorophenol	57		48	
2,4,6-Tribromophenol	57		69	
13C-Pentachlorophenol	28		101	

U Indicates that this compound was not detected above the LOR.
M Indicates that a peak has been manually integrated.

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 Road
ALS WO#:	L2279669		Mississauga, ON L5J 2Y4
Date of Report	14-Jun-19		CANADA
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **PCDD/F by EPA M23**

Low levels of select targets detected in the proof and blank
Glassware is approved for the collection of samples for PCDD/F analysis

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	Method Blank	GLASSWARE PROOF
ALS Sample ID	WG3061466-1	L2279669-41
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	12-Jun-19	12-Jun-19
Target Analytes	pg	pg
2,3,7,8-TCDD	<2.2	<2.2
1,2,3,7,8-PeCDD	<1.1	<1.7
1,2,3,4,7,8-HxCDD	<0.99	<1.0
1,2,3,6,7,8-HxCDD	<0.81	<0.83
1,2,3,7,8,9-HxCDD	<1.1	<0.88
1,2,3,4,6,7,8-HpCDD	3.00	3.59
OCDD	8.57	13.8
2,3,7,8-TCDF	<1.0	<1.4
1,2,3,7,8-PeCDF	<1.3	<1.6
2,3,4,7,8-PeCDF	<1.0	<1.5
1,2,3,4,7,8-HxCDF	<0.83	<0.96
1,2,3,6,7,8-HxCDF	<0.88	1.00
2,3,4,6,7,8-HxCDF	<3.7	<4.0
1,2,3,7,8,9-HxCDF	<1.1	<1.0
1,2,3,4,6,7,8-HpCDF	1.88	<1.2
1,2,3,4,7,8,9-HpCDF	<0.89	<0.99
OCDF	<3.1	<3.4
Extraction Standards		
13C12-2,3,7,8-TCDD	78	89
13C12-1,2,3,7,8-PeCDD	79	99
13C12-1,2,3,6,7,8-HxCDD	73	83
13C12-1,2,3,4,6,7,8-HpCDD	78	96
13C12-OCDD	63	81
13C12-2,3,7,8-TCDF	81	96
13C12-1,2,3,7,8-PeCDF	79	93
13C12-1,2,3,6,7,8-HxCDF	77	89
13C12-1,2,3,4,6,7,8-HpCDF	84	93
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	NS	NS
Homologue Group Totals	pg	pg
Total-TCDD	<2.2	<2.2
Total-PeCDD	<1.1	<1.7
Total-HxCDD	<0.99	<1.0
Total-HpCDD	3.00	3.59
Total-TCDF	<1.0	<1.4
Total-PeCDF	<1.1	6.98
Total-HxCDF	<0.92	<1.0
Total-HpCDF	1.88	<0.99
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.0514	0.140
Mid Point PCDD/F TEQ (WHO 2005)	2.76	3.11
Upper Bound PCDD/F TEQ (WHO 2005)	4.74	5.57

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#:	L2279669		Mississauga, ON L5J 2Y4
Date of Report	19-Jun-19		CANADA
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG3061466-1		L2279669-41	
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	12-Jun-19		12-Jun-19	
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	19.9	R	21.7	RB
Phenanthrene	<8.0	U	21.1	
Anthracene	14.1		14.8	B
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/j)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,c/a,h)Anthracene	<8.0	U	<8.0	U
Benzo(g,h,i)Perylene	<8.0	U	<8.0	U
Additional Analytes				
Tetralin	<8.0	U	<8.0	U
Quinoline	<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
Benzo(b)anthracene	<8.0	U	<8.0	U
7,12-Dimethylbenzo(a)anthracene	<8.0	U	<8.0	U
3-Methylcholanthrene	<40	U	<40	U
Dibenz(a,j)acridine	<40	U	<40	U
7H-Dibenzo(c,g)carbazole	<40	U	<40	U
Picene	<40	U	<40	U
Dibenzo(a,e)pyrene	<40	U	<40	U
dibenzo(a,i)pyrene	<40	U	<40	U
Coronene	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**	
Naphthalene D8	69.6	M	55.6	M
2-Methylnaphthalene-D10	85.5		72.5	
Acenaphthylene D8	75.4		64.6	
Phenanthrene D10	82.6		73.3	
Anthracene-D10	81.5		73.3	
Fluoranthene D10	82.0		74.6	
Benz(a)Anthracene-D12	69.8		66.7	
Chrysene D12	78.6		72.8	
Benzo(b)Fluoranthene-D12	74.6		69.2	
Benzo(k)Fluoranthene-D12	76.9		74.9	
Benzo(a)Pyrene D12	76.1		75.0	
Perylene D12	73.5		73.1	
Indeno(1,2,3,cd)Pyrene-D12	72.9		73.4	
Dibenz(a,h)Anthracene-D14	73.8		75.2	
Benzo(g,h,i)Perylene D12	76.8		77.0	

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
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#:	L2279669		Mississauga, ON
Date of Report	17-Jun-19		L5J 2Y4
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 COVANTA

COMMENTS: **Toxic PCB Congeners by EPA 1668C**

Low levels of selected targets detected in the proof.
Glassware is approved for the collection of samples for toxic PCB congener analysis.

Certified by: Kennedy

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	**Method Blank**	**GLASSWARE PROOF**
ALS Sample ID	WG3061466-1	L2279669-41
Sample Size	1	1
Sample size units	Blank	Proof
Percent Moisture	n/a	n/a
Sample Matrix	QC	Media Prep
Sampling Date	n/a	n/a
Extraction Date	12-Jun-19	12-Jun-19
Target Analytes	**pg**	**pg**
PCB-081	<1.9	<1.7
PCB-077	<2.0	8.23
PCB-123	<0.99	3.48
PCB-118	<0.92	156
PCB-114	<0.98	5.40
PCB-105	<0.97	46.7
PCB-126	<1.0	<1.6
PCB-167	<0.55	1.34
PCB-156/157	<0.82	<4.0
PCB-169	<0.62	<0.68
PCB-189	<0.81	<0.90
Extraction Standards	**% Rec**	**% Rec**
13C12-PCB-081	68	86
13C12-PCB-077	68	85
13C12-PCB-123	71	88
13C12-PCB-118	72	87
13C12-PCB-114	71	88
13C12-PCB-105	72	87
13C12-PCB-126	76	91
13C12-PCB-167	78	91
13C12-PCB-156/157	77	89
13C12-PCB-169	88	102
13C12-PCB-189	75	75

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00	0.00721
Mid Point PCB TEQ	0.0598	0.0978
Upper Bound PCB TEQ	0.120	0.188

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:	ORT100	**Client Name:**	ORTECH Environmental
ALS Project ID:	Lynne Wrona	**Client Address:**	804 Southdown Road
ALS WO#:	L2279669		Mississauga, ON L5J 2Y4
Date of Report	17-Jun-19		CANADA
Date of Sample Receipt	27-May-19	**Client Contact:**	Chris Belore
		Client Project ID:	21936 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 the collection of VOCs via SW846 Method 5041A/8260C.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		VOST PROOF 1/3		VOST PROOF 2/3		VOST PROOF 3/3	
ALS Sample ID	WG3078923-1		L2279669-76		L2279669-77		L2279669-78	
Sample units	sample		sample		sample		sample	
Matrix	QC		Media Prep		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a		n/a	
Extraction Date	17-Jun-19		17-Jun-19		17-Jun-19		17-Jun-19	
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
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
1,3-Butadiene	<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)	62.3		63.9		73.4		70.4	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	96.6		96.3		97.6		99.7	
d8-Toluene(SURR)	76.5		76.4		78.9		78.2	
4-Bromofluorobenzene(SURR)	88.5		84.9		84.0		83.9	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	105.4		98.9		88.7		98.7	
1,4-Difluorobenzene	114.5		108.0		98.6		107.7	
d5-Chlorobenzene	93.8		88.7		79.1		87.0	

U Indicates that this compound was not detected above the RL.

APPENDIX 21

ORTECH Equipment Calibration Data
(33 pages)

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2019
Probe/Pitot ID	SP2
MII Number	B04009
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	7.04	0.120	0.170	0.840	0.0110
(0.25")	9.21	0.205	0.280	0.855	0.0045
	11.14	0.300	0.410	0.855	0.0043
	13.18	0.420	0.580	0.851	0.0002
	15.62	0.590	0.810	0.853	0.0023
			Mean	0.851	0.0044
Without Nozzle	6.90	0.115	0.160	0.847	0.0043
	9.09	0.200	0.275	0.852	0.0007
	11.32	0.310	0.420	0.859	0.0070
	13.10	0.415	0.580	0.845	0.0062
	15.35	0.570	0.780	0.854	0.0028
			Mean	0.852	0.0042

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 MOE 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, 2019
Probe/Pitot ID	SP4
MII Number	B04011
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	0.0008
(0.25")	9.09	0.200	0.280	0.845	0.0039
	11.32	0.310	0.430	0.849	0.0000
	13.79	0.460	0.640	0.847	0.0013
	15.62	0.590	0.810	0.853	0.0044
			Mean	0.849	0.0021
Without Nozzle	7.33	0.130	0.180	0.849	0.0009
	9.43	0.215	0.300	0.846	0.0023
	11.68	0.330	0.455	0.851	0.0027
	13.94	0.470	0.650	0.850	0.0014
	16.14	0.630	0.880	0.846	0.0028
			Mean	0.848	0.0020

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, 2019
Probe/Pitot ID	SP5
MII Number	COE20109
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	0.0045
(0.25")	9.09	0.200	0.280	0.845	0.0002
	11.50	0.320	0.445	0.848	0.0027
	13.64	0.450	0.640	0.838	0.0068
	15.75	0.600	0.840	0.845	0.0002
			Mean	0.845	0.0029

Without Nozzle	7.04	0.120	0.170	0.840	0.0088
	9.09	0.200	0.275	0.852	0.0038
	11.32	0.310	0.430	0.849	0.0001
	13.41	0.435	0.600	0.851	0.0025
	15.49	0.580	0.800	0.851	0.0025
			Mean	0.849	0.0035

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, 2019
Probe/Pitot ID	SP6
MII Number	COE20098
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	7.19	0.125	0.175	0.845	0.0061
(0.25")	8.86	0.190	0.260	0.854	0.0036
	11.14	0.300	0.415	0.850	0.0010
	13.49	0.440	0.610	0.849	0.0020
	15.49	0.580	0.790	0.856	0.0056
			Mean	0.851	0.0037

Without Nozzle	7.04	0.120	0.170	0.840	0.0052
	9.09	0.200	0.280	0.845	0.0002
	11.14	0.300	0.420	0.845	0.0002
	13.49	0.440	0.620	0.842	0.0029
	15.82	0.605	0.830	0.853	0.0084
			Mean	0.845	0.0034

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, 2019
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	7.04	0.120	0.170	0.840	0.0083
	9.09	0.200	0.275	0.852	0.0043
	10.95	0.290	0.400	0.851	0.0030
	13.49	0.440	0.620	0.842	0.0060
	15.75	0.600	0.820	0.855	0.0069
			Mean	0.848	0.0057

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	April 24, 2019
Barometric Pressure	29.74
System Leak Check	< .001 cfm @ 26 "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.
74.00	10.00	64.00	3.011	19.5	212.648	215.656	3.008	67	0.8	66	0.999	6
74.80	11.00	63.80	3.001	19.5	215.656	218.646	2.990	67	0.8	66	1.002	6
73.80	10.60	63.20	2.973	19.5	218.646	221.606	2.960	67	0.8	66	1.002	6
74.30	9.30	65.00	3.058	19.5	221.771	224.812	3.041	68	1.95	66	1.002	4
73.10	8.40	64.70	3.043	19.5	224.815	227.847	3.032	69	1.95	67	1.003	4
74.10	9.60	64.50	3.034	19.5	227.847	230.884	3.037	69.5	1.95	67	0.999	4
74.20	9.10	65.10	3.062	19.5	231.032	234.073	3.041	70.5	3.45	68	1.005	3
73.50	8.70	64.80	3.048	19.5	234.073	237.126	3.053	71	3.45	68	0.997	3
74.30	9.40	64.90	3.053	19.5	237.126	240.176	3.050	71.5	3.45	68	1.001	3

DGMCF AVERAGE 1.001

BEFORE 0.992

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	Team 1
MII	COE 20094
Date	April 24 2019
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		0.0
70	69		1.4
100	100		0.0
200	201		-0.5
250	251		-0.4
300	301		-0.3
400	400		0.0
500	500		0.0
600	601		-0.2
700	701		-0.1
800	800		0.0
900	900		0.0
1000	1000		0.0
1100	1101		-0.1
1200	1201		-0.1
1250	1251		-0.1

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. 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	April 24, 2019	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		

<u>Back Leg</u>

Manometer Scale "H_20	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.792		0.794	0.3
0-1.0	0.529		0.539	1.9
	0.316		0.317	0.3
	8.80		8.77	-0.3
1.0-10.0	3.95		3.97	0.5
	2.02		2.03	0.5

$$\text{Percent Difference} = \frac{\text{(Ref. Manometer - Instrument Reading)}}{\text{Ref. Manometer}} \times 100$$

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	Team 2
Date	March 25, 2019
Barometric Pressure	29.77
System Leak Check	< 0.001 cfm @ 22 "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

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ {}^oF+460}{Tstd\ {}^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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	^oC	Initial	Final	ft^3	^oF	in. H_2O	^oF	Factor	min.
72.00	9.20	62.80	2.954	19.5	411.145	414.110	2.965	68.5	0.75	71	0.997	6
71.60	10.10	61.50	2.893	19.5	414.110	417.048	2.938	68.5	0.75	70	0.985	6
72.20	9.50	62.70	2.949	19.5	417.048	420.035	2.987	68.5	0.75	70	0.988	6
71.60	9.60	62.00	2.916	19.5	420.195	423.148	2.953	69.5	1.8	71	0.988	4
72.00	10.00	62.00	2.916	19.5	423.148	426.113	2.965	70	1.8	72	0.985	4
72.40	9.50	62.90	2.959	19.5	426.113	429.098	2.985	70.5	1.8	72	0.993	4
72.30	10.10	62.20	2.926	19.5	429.156	432.125	2.969	71	3.2	73	0.985	3
72.10	9.90	62.20	2.926	19.5	432.125	435.065	2.940	71.5	3.2	74	0.996	3
72.60	10.30	62.30	2.931	19.5	435.065	438.025	2.960	72	3.2	74	0.991	3

DGMCF AVERAGE: 0.990

BEFORE: 0.984

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	Team 2
MII	COE 20092
Date	March 25, 2019
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		0.0
70	70		0.0
100	100		0.0
200	200		0.0
250	250		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0
700	700		0.0
800	800		0.0
900	900		0.0
1000	1000		0.0
1100	1100		0.0
1200	1200		0.0
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

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 25, 2019	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 Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.911		0.910	-0.1
0-1.0	0.553		0.562	1.6
	0.319		0.324	1.5
	8.10		8.14	0.5
1.0-10.0	5.09		5.18	1.7
	2.98		3.06	2.6

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer - Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

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	Team 3
Date	April 30, 2019
Barometric Pressure	29.41
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

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^oF+460}{Tstd\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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 Factor	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F		min.
74.10	11.40	62.70	2.949	19.5	309.338	312.280	2.942	65	0.85	64	0.996	6
74.00	11.60	62.40	2.935	19.5	312.280	315.210	2.930	67	0.85	65	0.999	6
74.20	11.60	62.60	2.945	19.5	315.210	318.146	2.936	69	0.85	66	1.004	6
74.40	11.40	63.00	2.963	19.5	318.334	321.284	2.950	71	2	67	1.007	4
74.10	11.10	63.00	2.963	19.5	321.284	324.239	2.955	72	2	68	1.007	4
74.30	11.60	62.70	2.949	19.5	324.239	327.190	2.951	72.5	2	69	1.005	4
74.20	10.70	63.50	2.987	19.5	327.283	330.265	2.982	73	3.5	69	1.004	3
74.00	9.50	64.50	3.034	19.5	330.265	333.286	3.021	74	3.5	70	1.009	3
73.90	10.20	63.70	2.996	19.5	333.286	336.280	2.994	74	3.5	70	1.005	3

DGMCF AVERAGE: 1.004

BEFORE: 0.993

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	Team 3
MII	COE 20093
Date	April 30, 2019
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		0.0
70	69		1.4
100	99		1.0
200	200		0.0
250	251		-0.4
300	301		-0.3
400	399		0.3
500	499		0.2
600	600		0.0
700	701		-0.1
800	800		0.0
900	900		0.0
1000	1001		-0.1
1100	1101		-0.1
1200	1201		-0.1
1250	1251		-0.1

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

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	April 30, 2019	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_20	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.870		0.856	-1.6
0-1.0	0.595		0.584	-1.9
	0.342		0.332	-3.0
	7.19		7.17	-0.3
1.0-10.0	5.22		5.21	-0.2
	3.09		3.07	-0.7

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer - Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

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	Team 4
Date	April 24, 2019
Barometric Pressure	29.47
System Leak Check	< 0.001 cfm @ 26 "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

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^oF+460}{Tstd\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg + DGMPressure/13.6)}$$

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	^oC	Initial	Final	ft^3	^oF	in. H_2O	^oF	Factor	min.
72.10	10.50	61.60	2.898	19.5	972.624	975.553	2.929	68	0.76	68	0.989	6
71.80	9.90	61.90	2.912	20.0	975.553	978.481	2.928	67	0.76	67	0.991	6
71.90	9.90	62.00	2.916	20.0	999.816	1002.747	2.931	71	0.76	70	0.999	6
73.30	10.60	62.70	2.949	20.5	981.547	984.475	2.928	69.5	1.8	69	1.004	4
73.90	11.80	62.10	2.921	20.5	984.475	987.381	2.906	69.5	1.8	69	1.002	4
72.00	9.30	62.70	2.949	20.5	987.381	990.334	2.953	70	1.8	70	0.996	4
73.00	7.60	65.40	3.076	20.0	990.526	993.572	3.046	70.5	3.4	70	1.006	3
72.00	7.40	64.60	3.039	20.0	993.572	996.597	3.025	71	3.4	70	1.002	3
73.00	7.50	65.50	3.081	20.0	996.597	999.654	3.057	71.5	3.4	71	1.006	3

DGMCF AVERAGE 0.999

BEFORE 1.004

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	April 24, 2019
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	34	32	0.0
70		70	0.0
100		100	0.0
200		201	-0.5
250		251	-0.4
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		1101	-0.1
1200		1201	-0.1
1250		1251	-0.1

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

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	April 24, 2019	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_20	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.839		0.830	-1.1
0-1.0	0.535		0.531	-0.8
	0.290		0.287	-1.0
	8.50		8.530	0.4
1.0-10.0	5.48		5.400	-1.5
	2.75		2.790	1.4

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer - Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

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 4
Date	June 14, 2019
Barometric Pressure	29.38
System Leak Check	< 0.005 Lpm @ 18 "Hg

MII NUMBERS	
DGM	A11542
Gasometer	A01463
Barometer	COE 20028

Calibrated By	JB
Signature	
Reviewed and Accepted By	

$ft^3 =$ cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^oF+460}{Tstd\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration Factor	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C		min.	lpm
40.50	33.90	6.60	0.310	21.5	44.67	53.84	0.324	31.0	0.5	31.0	0.988	20	0.5
33.90	27.50	6.40	0.301	21.5	53.84	62.76	0.315	31.0	0.5	31.0	0.985	20	0.4
27.50	20.00	7.50	0.353	22.5	62.76	73.10	0.365	32.0	0.5	32.0	0.996	20	0.5
53.30	38.10	15.20	0.715	22.5	90.37	111.74	0.755	32.0	0.9	32.0	0.976	20	1.1
38.10	23.40	14.70	0.691	22.5	111.74	132.14	0.720	32.0	0.8	32.0	0.989	20	1.0
23.40	9.40	14.00	0.659	23.0	132.14	151.38	0.679	32.0	0.8	32.0	0.997	20	1.0

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

0.5Lpm	0.990
1Lpm	0.987

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
MII	A11542
Date	June 14, 2019
Calibrated By	JB
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	Tredicator Display Value		Percent Difference
	Before Adjustment (°C)	After Adjustment (°C)	(%)
0	0		0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	126		-0.8
150	151		-0.7
200	200		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

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 2
Date	June 13, 2019
Barometric Pressure	29.23
System Leak Check	< 0.005 lpm @ 21 "Hg

MII NUMBERS	
DGM	A10117
Gasometer	A01463
Barometer	COE20028

Calibrated By	Jamie Batten
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^oF+460}{Tstd\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration Factor	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
65.20	55.00	10.20	0.480	21.0	68.010	81.760	0.486	25.0	1.3	25.0	0.998	25	0.6
55.00	45.10	9.90	0.466	21.0	81.760	95.260	0.477	26.0	1.3	26.0	0.990	25	0.5
45.10	35.20	9.90	0.466	21.0	95.260	108.830	0.479	27.0	1.3	27.0	0.988	25	0.5
38.30	22.00	16.30	0.767	21.0	59.360	81.590	0.785	27.0	2.6	27.0	0.990	20	1.1
22.00	6.90	15.10	0.710	21.0	81.590	102.060	0.723	27.0	2.4	27.0	0.997	20	1.0
28.50	13.50	15.00	0.706	21.0	102.060	122.510	0.722	27.0	2.4	27.0	0.991	20	1.0

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	
0.5 Lpm	0.992
1Lpm	0.993

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
MII	A10117
Date	June 13, 2019
Calibrated By	Jamie Batten
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	Tredicator Display Value		Percent Difference
	Before Adjustment (°C)	After Adjustment (°C)	(%)
0	0		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
			0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

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:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	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	0.2 B1	0.995 C		
High	93.3 A2	93.05 B2			
Mid	46.65 A4	45.8 B4		46.4 D4	-1.3 E4
Low	23.3 A3	23.33 B3		23.2 D3	0.6 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	0.5	-0.5
Mid	23.33	23.1	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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	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	0.2 B1	0.995 C		
High	93.3 A2	93.05 B2			
Mid	46.65 A4	45.8 B4		46.4 D4	-1.3 E4
Low	23.3 A3	23.33 B3		23.2 D3	0.6 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	0.5	0.65	-0.15
Mid	23.1	23.2	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	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	0.2 B1	0.995 C		
High	93.3 A2	93.05 B2			
Mid	46.65 A4	45.8 B4		46.4 D4	-1.3 E4
Low	23.3 A3	23.33 B3		23.2 D3	0.6 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	0.65	0.6	0.05
Mid	23.2	23.9	-0.7

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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	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	0.2 B1	0.998 C		
High	93.3 A2	93.34 B2			
Mid	46.65 A4	46.56 B4		46.6 D4	0.0 E4
Low	23.3 A3	23.3 B3		23.3 D3	0.2 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	0.2	0.1	0.1
Mid	23.3	23.5	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	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	0.2 B1	0.998 C		
High	93.3 A2	93.34 B2			
Mid	46.65 A4	46.56 B4		46.6 D4	0.0 E4
Low	23.3 A3	23.3 B3		23.3 D3	0.2 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	0.5	-0.4
Mid	23.5	23.8	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	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	0.2 B1	0.998 C		
High	93.3 A2	93.34 B2			
Mid	46.65 A4	46.56 B4		46.6 D4	0.0 E4
Low	23.3 A3	23.3 B3		23.3 D3	0.2 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	0.5	0.5	0
Mid	23.8	23.9	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC Outlet	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	0.2 B1	0.991 C		
High	93.3 A2	92.7 B2			
Mid	46.65 A4	46.9 B4		46.3 D4	1.4 E4
Low	23.3 A3	23.6 B3		23.1 D3	2.1 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	0.2	0.2	0
Mid	23.6	23.8	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC Outlet	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	0.2 B1	0.995 C		
High	93.3 A2	93.05 B2			
Mid	46.65 A4	45.8 B4		46.4 D4	-1.3 E4
Low	23.3 A3	23.33 B3		23.2 D3	0.6 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	0.2	0.5	-0.3
Mid	23.8	22.9	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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC Outlet	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	0.2 B1	0.995 C		
High	93.3 A2	93.05 B2			
Mid	46.65 A4	45.8 B4		46.4 D4	-1.3 E4
Low	23.3 A3	23.33 B3		23.2 D3	0.6 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	0.5	0.2	0.3
Mid	22.9	22.8	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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC Outlet	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	0.3 B1	1.000 C		
High	93.3 A2	93.6 B2			
Mid	46.65 A4	46.8 B4		46.7 D4	0.3 E4
Low	23.3 A3	23.6 B3		23.3 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	0.3	0.5	-0.2
Mid	23.6	23.4	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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number: 21936		Date: June 25, 2019	
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC Outlet	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	0.2 B1	0.998 C		
High	93.3 A2	93.34 B2			
Mid	46.65 A4	46.56 B4		46.6 D4	0.0 E4
Low	23.3 A3	23.3 B3		23.3 D3	0.2 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	0.5	0.31	0.19
Mid	23.4	23.3	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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21936	Date:	June 25, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC Outlet	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	0.2 B1	0.998		
High	93.3 A2	93.34 B2	C		
Mid	46.65 A4	46.56 B4		46.6 D4	0.0 E4
Low	23.3 A3	23.3 B3		23.3 D3	0.2 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	0.31	0.2	0.11
Mid	23.26	23.9	-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	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

APPENDIX 22

Particulate and Metals Test Emission Calculations
(26 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	1 Particulate & Metals
Date:	June 25, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.001
NOZZLE DIAMETER	6.39 mm
DRY REF GAS VOLUME SAMPLED	3.401 m^3
AVGERGE ISOKINETICITY	97.7 %
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	140.9 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	17.24 m/s
BAROMETRIC PRESSURE (Station)	99.052 Kpa
STATIC PRESSURE	-1.818 Kpa
ABSOLUTE GAS PRESSURE	97.234 Kpa
OXYGEN CONCENTRATION	8.32 %
CARBON DIOXIDE CONCENTRATION	10.83 %
CARBON MONOXIDE CONCENTRATION	17.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.47 m^3/s
DRY REF GAS FLOWRATE	14.83 Rm^3/s
DRY ADJ GAS FLOWRATE	18.85 Rm^3/s
WET REF GAS FLOWRATE	17.61 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.1 mg
	-FILTER	0.1 mg
	-TOTAL	2.2 mg
DRY REF GAS VOLUME SAMPLED		3.401 m^3
PARTICULATE CONC. - ACTUAL		0.377 mg/m^3
PARTICULATE CONC. - DRY REF		0.647 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.509 mg/m^3
PARTICULATE CONC. - WET REF		0.545 mg/m^3
PARTICULATE EMISSION RATE		0.009594 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 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	2.1
Barometric Pressure	29.25 "Hg	**CWTR (g)**	439.5
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	27.2
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.32
CO2%	10.83
COppm	17.3

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	68.58	0.7	289	50	72	71	1.6	3.0		17.75	
	2.5	70.28	0.74	290	65	71	70	1.7	3.0		18.26	96.5
	5	72.02	0.7	290	64	72	70	1.7	3.0		17.76	96.3
2	7.5	73.76	0.7	290	62	72	70	1.6	3.0		17.76	98.9
	10	75.45	0.7	290	61	73	70	1.6	3.0		17.76	96.0
	12.5	77.15	0.7	291	60	73	70	1.6	3.0		17.77	96.5
3	15	78.85	0.7	290	60	74	70	1.7	3.0		17.76	96.6
	17.5	80.57	0.7	290	61	75	70	1.7	3.0		17.76	97.6
	20	82.28	0.7	290	61	76	70	1.7	3.0		17.76	96.9
4	22.5	84.01	0.7	285	60	77	70	1.7	3.0		17.70	98.0
	25	85.74	0.68	287	60	79	71	1.7	3.0		17.47	97.6
	27.5	87.45	0.68	289	60	79	71	1.6	3.0		17.49	97.7
5	30	89.18	0.65	285	60	79	71	1.55	3.0		17.06	98.9
	32.5	90.84	0.65	286	60	79	72	1.6	3.0		17.07	96.8
	35	92.50	0.65	289	59	81	72	1.6	3.0		17.10	96.8
6	37.5	94.19	0.65	285	59	81	72	1.6	3.0		17.06	98.6
	40	95.88	0.65	285	59	81	72	1.6	3.0		17.06	98.3
	42.5	97.56	0.65	286	59	81	72	1.6	3.0		17.07	97.7
7	45	99.24	0.58	285	59	83	73	1.4	3.0		16.11	97.8
	47.5	100.84	0.58	285	59	82	73	1.4	3.0		16.11	98.2
	50	102.44	0.58	285	59	82	73	1.4	3.0		16.11	98.3
8	52.5	104.02	0.63	283	59	83	74	1.6	3.0		16.77	97.1
	55	105.70	0.63	283	58	83	74	1.5	3.0		16.77	98.8
	57.5	107.37	0.64	283	58	84	74	1.5	3.0		16.90	98.2
9	60	109.03	0.65	285	59	84	75	1.6	3.0		17.06	96.7
	62.5	110.70	0.65	285	58	84	75	1.6	3.0		17.06	96.6
	65	112.40	0.66	284	58	84	75	1.6	3.0		17.18	98.4
10	67.5	114.10	0.74	285	58	85	75	1.8	3.0		18.20	97.5
	70	115.90	0.72	285	58	85	75	1.8	3.0		17.95	97.6
	72.5	117.68	0.7	284	57	85	75	1.7	3.0		17.69	97.8
11	75	119.45	0.75	284	57	85	75	1.8	3.0		18.31	98.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	2.1
Barometric Pressure	29.25 "Hg	**CWTR (g)**	439.5
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	27.2
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.32
CO2%	10.83
COppm	17.3

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 %
	77.5	121.28	0.75	284	58	86	76	1.8	3.0		18.31	98.5
	80	123.10	0.75	284	57	86	76	1.8	3.0		18.31	97.7
12	82.5	124.93	0.77	283	57	85	76	1.9	3.0		18.54	98.3
	85	126.75	0.75	284	57	85	76	1.9	3.0		18.31	96.5
	87.5	128.57	0.75	284	58	85	76	1.9	3.0		18.31	97.9
	90	130.39								0.66		97.9
1	0	131.05	0.6	285	62	79	77	1.5	3.0		16.39	
	2.5	132.70	0.6	285	55	80	77	1.5	3.0		16.39	99.6
	5	134.32	0.62	285	51	80	77	1.5	3.0		16.66	97.7
2	7.5	135.98	0.65	285	50	80	77	1.5	3.0		17.06	98.5
	10	137.63	0.64	285	49	80	77	1.5	3.0		16.93	95.6
	12.5	139.31	0.65	285	48	80	77	1.6	3.0		17.06	98.1
3	15	140.99	0.65	284	48	81	77	1.6	3.0		17.05	97.4
	17.5	142.69	0.64	284	48	82	77	1.6	3.0		16.91	98.4
	20	144.38	0.64	285	48	82	77	1.6	3.0		16.93	98.5
4	22.5	146.00	0.63	285	48	83	77	1.6	3.0		16.79	94.5
	25	147.66	0.6	284	50	80	77	1.5	3.0		16.38	97.5
	27.5	149.29	0.6	285	48	80	77	1.45	3.0		16.39	98.2
5	30	150.92	0.6	285	47	80	77	1.45	3.0		16.39	98.3
	32.5	152.53	0.61	285	47	80	77	1.5	3.0		16.52	97.1
	35	154.16	0.61	285	48	80	77	1.5	3.0		16.52	97.5
6	37.5	155.81	0.6	285	48	80	77	1.5	3.0		16.39	98.7
	40	157.43	0.6	285	48	80	77	1.5	3.0		16.39	97.7
	42.5	159.05	0.6	286	48	80	77	1.5	3.0		16.40	97.7
7	45	160.68	0.55	286	49	80	77	1.3	3.0		15.70	98.4
	47.5	162.23	0.55	285	49	80	77	1.3	3.0		15.69	97.7
	50	163.76	0.55	285	49	80	77	1.4	3.0		15.69	96.3
8	52.5	165.34	0.6	285	49	80	75	1.5	3.0		16.39	99.5
	55	166.95	0.62	285	50	80	76	1.5	3.0		16.66	97.3
	57.5	168.57	0.6	288	52	79	75	1.5	3.0		16.42	96.2
9	60	170.19	0.68	285	51	80	75	1.7	3.0		17.45	98.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	2.1
Barometric Pressure	29.25 "Hg	**CWTR (g)**	439.5
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	27.2
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.32
CO2%	10.83
COppm	17.3

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 %
	62.5	171.92	0.68	285	52	80	75	1.6	3.0		17.45	98.2
	65	173.63	0.68	285	53	80	75	1.6	3.0		17.45	97.1
10	67.5	175.34	0.71	285	54	80	75	1.7	3.5		17.83	97.1
	70	177.10	0.71	287	55	80	74	1.7	3.5		17.85	97.8
	72.5	178.86	0.72	286	56	80	74	1.7	3.5		17.96	98.0
11	75	180.63	0.75	285	55	80	74	1.8	3.5		18.32	97.8
	77.5	182.43	0.75	285	55	80	75	1.8	3.5		18.32	97.4
	80	184.22	0.75	285	55	80	75	1.85	3.5		18.32	96.8
12	82.5	186.05	0.74	285	54	80	75	1.8	3.5		18.20	99.0
	85	187.85	0.75	285	55	79	74	1.8	3.5		18.32	98.0
	87.5	189.66	0.75	285	55	78	74	1.8	3.5		18.32	98.1
	90	191.46										97.6

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	2 Particulate & Metals
Date:	June 25, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.001
NOZZLE DIAMETER	6.39 mm
DRY REF GAS VOLUME SAMPLED	3.495 m^3
AVGERGE ISOKINETICITY	99.0 %
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	141.4 °C
AVERAGE GAS MOISTURE BY VOLUME	16.5 %
AVERAGE GAS VELOCITY	17.62 m/s
BAROMETRIC PRESSURE (Station)	99.323 Kpa
STATIC PRESSURE	-1.818 Kpa
ABSOLUTE GAS PRESSURE	97.505 Kpa
OXYGEN CONCENTRATION	8.36 %
CARBON DIOXIDE CONCENTRATION	10.68 %
CARBON MONOXIDE CONCENTRATION	14.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.03 m^3/s
DRY REF GAS FLOWRATE	15.03 Rm^3/s
DRY ADJ GAS FLOWRATE	19.04 Rm^3/s
WET REF GAS FLOWRATE	18.02 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	3.5 mg
	-FILTER	0.1 mg
	-TOTAL	3.6 mg
DRY REF GAS VOLUME SAMPLED		3.495 m^3
PARTICULATE CONC. - ACTUAL		0.595 mg/m^3
PARTICULATE CONC. - DRY REF		1.030 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.813 mg/m^3
PARTICULATE CONC. - WET REF		0.860 mg/m^3
PARTICULATE EMISSION RATE		0.015484 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 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	3.5
Barometric Pressure	29.33 "Hg	**CWTR (g)**	483.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	25.5
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.64 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%	8.36
CO2%	10.68
COppm	14.3

Measured H2O
16.5 %

				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	92.64	0.75	280	70	74	73	1.8	3.5		18.27	
	2.5	94.41	0.75	285	70	74	73	1.8	3.5		18.34	97.0
	5	96.20	0.75	285	69	74	73	1.8	3.5		18.34	98.4
2	7.5	98.02	0.75	285	69	74	73	1.8	3.5		18.34	100.1
	10	99.82	0.75	285	69	75	73	1.8	3.5		18.34	99.0
	12.5	101.63	0.75	285	69	76	73	1.8	3.5		18.34	99.4
3	15	103.43	0.7	286	67	76	73	1.7	3.3		17.73	98.8
	17.5	105.19	0.69	286	65	77	73	1.7	3.3		17.60	100.0
	20	106.94	0.7	286	63	77	73	1.7	3.3		17.73	100.1
4	22.5	108.69	0.69	286	62	77	73	1.7	3.3		17.60	99.4
	25	110.43	0.69	286	59	78	73	1.7	3.3		17.60	99.5
	27.5	112.18	0.69	286	58	79	73	1.7	3.3		17.60	100.0
5	30	113.93	0.6	286	57	79	74	1.45	3.3		16.41	99.9
	32.5	115.58	0.61	286	56	80	74	1.45	3.3		16.55	100.8
	35	117.21	0.62	285	56	80	74	1.45	3.3		16.67	98.7
6	37.5	118.83	0.53	285	56	80	74	1.3	3.3		15.41	97.2
	40	120.37	0.53	285	54	81	74	1.3	3.3		15.41	99.9
	42.5	121.92	0.54	285	54	81	74	1.3	3.3		15.56	100.5
7	45	123.45	0.58	285	53	81	74	1.4	3.3		16.12	98.3
	47.5	125.04	0.59	285	53	81	74	1.4	3.3		16.26	98.6
	50	126.63	0.59	285	52	82	74	1.4	3.3		16.26	97.7
8	52.5	128.21	0.6	286	51	83	75	1.5	3.3		16.41	97.0
	55	129.83	0.6	286	51	82	75	1.5	3.3		16.41	98.6
	57.5	131.46	0.6	286	51	83	75	1.5	3.3		16.41	99.3
9	60	133.09	0.61	285	51	83	75	1.5	3.3		16.54	99.2
	62.5	134.72	0.63	285	51	83	75	1.55	3.3		16.80	98.3
	65	136.40	0.62	286	50	83	75	1.5	3.3		16.68	99.7
10	67.5	138.05	0.63	286	50	83	75	1.55	3.3		16.82	98.8
	70	139.70	0.63	286	50	83	75	1.55	3.3		16.82	98.0
	72.5	141.37	0.63	286	50	84	76	1.55	3.3		16.82	99.2
11	75	143.04	0.59	286	50	84	76	1.45	3.3		16.27	99.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	3.5
Barometric Pressure	29.33 "Hg	**CWTR (g)**	483.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	25.5
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.64 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%	8.36
CO2%	10.68
COppm	14.3

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	92.64	0.75	280	70	74	73	1.8	3.5		18.27	
	2.5	94.41	0.75	285	70	74	73	1.8	3.5		18.34	**97.0**
	5	96.20	0.75	285	69	74	73	1.8	3.5		18.34	**98.4**
2	7.5	98.02	0.75	285	69	74	73	1.8	3.5		18.34	**100.1**
	10	99.82	0.75	285	69	75	73	1.8	3.5		18.34	**99.0**
	12.5	101.63	0.75	285	69	76	73	1.8	3.5		18.34	**99.4**
3	15	103.43	0.7	286	67	76	73	1.7	3.3		17.73	**98.8**
	17.5	105.19	0.69	286	65	77	73	1.7	3.3		17.60	**100.0**
	20	106.94	0.7	286	63	77	73	1.7	3.3		17.73	**100.1**
4	22.5	108.69	0.69	286	62	77	73	1.7	3.3		17.60	**99.4**
	25	110.43	0.69	286	59	78	73	1.7	3.3		17.60	**99.5**
	27.5	112.18	0.69	286	58	79	73	1.7	3.3		17.60	**100.0**
5	30	113.93	0.6	286	57	79	74	1.45	3.3		16.41	**99.9**
	32.5	115.58	0.61	286	56	80	74	1.45	3.3		16.55	**100.8**
	35	117.21	0.62	285	56	80	74	1.45	3.3		16.67	**98.7**
6	37.5	118.83	0.53	285	56	80	74	1.3	3.3		15.41	**97.2**
	40	120.37	0.53	285	54	81	74	1.3	3.3		15.41	**99.9**
	42.5	121.92	0.54	285	54	81	74	1.3	3.3		15.56	**100.5**
7	45	123.45	0.58	285	53	81	74	1.4	3.3		16.12	**98.3**
	47.5	125.04	0.59	285	53	81	74	1.4	3.3		16.26	**98.6**
	50	126.63	0.59	285	52	82	74	1.4	3.3		16.26	**97.7**
8	52.5	128.21	0.6	286	51	83	75	1.5	3.3		16.41	**97.0**
	55	129.83	0.6	286	51	82	75	1.5	3.3		16.41	**98.6**
	57.5	131.46	0.6	286	51	83	75	1.5	3.3		16.41	**99.3**
9	60	133.09	0.61	285	51	83	75	1.5	3.3		16.54	**99.2**
	62.5	134.72	0.63	285	51	83	75	1.55	3.3		16.80	**98.3**
	65	136.40	0.62	286	50	83	75	1.5	3.3		16.68	**99.7**
10	67.5	138.05	0.63	286	50	83	75	1.55	3.3		16.82	**98.8**
	70	139.70	0.63	286	50	83	75	1.55	3.3		16.82	**98.0**
	72.5	141.37	0.63	286	50	84	76	1.55	3.3		16.82	**99.2**
11	75	143.04	0.59	286	50	84	76	1.45	3.3		16.27	**99.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	3.5
Barometric Pressure	29.33 "Hg	**CWTR (g)**	483.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	25.5
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.64 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%	8.36
CO2%	10.68
COppm	14.3

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 %
	77.5	144.65	0.59	286	50	84	76	1.45	3.3		16.27	98.6
	80	146.28	0.6	286	50	84	76	1.45	3.3		16.41	99.8
12	82.5	147.91	0.6	285	50	84	77	1.45	3.3		16.40	99.0
	85	149.53	0.61	285	50	84	77	1.5	3.3		16.54	98.2
	87.5	151.17	0.61	286	50	84	77	1.5	3.3		16.55	98.6
	90	152.80								0.64		98.1
1	0	153.44	0.75	286	50	80	77	1.85	4.0		18.35	
	2.5	155.21	0.74	285	52	81	77	1.85	4.0		18.21	96.5
	5	157.05	0.74	285	51	81	78	1.85	4.0		18.21	100.8
2	7.5	158.88	0.75	286	49	81	78	1.85	4.0		18.35	100.2
	10	160.71	0.74	286	49	81	78	1.85	4.0		18.22	99.6
	12.5	162.56	0.75	286	49	81	78	1.85	4.0		18.35	101.3
3	15	164.38	0.75	285	49	81	78	1.8	4.0		18.34	99.0
	17.5	166.20	0.75	285	49	81	78	1.8	4.0		18.34	99.0
	20	168.03	0.75	286	49	82	78	1.8	4.0		18.35	99.5
4	22.5	169.85	0.75	285	49	82	78	1.8	4.0		18.34	98.9
	25	171.68	0.75	287	49	82	78	1.8	4.0		18.36	99.4
	27.5	173.49	0.75	285	49	82	78	1.8	4.0		18.34	98.4
5	30	175.31	0.75	285	49	82	78	1.8	4.0		18.34	98.9
	32.5	177.12	0.76	287	50	82	78	1.8	4.0		18.48	98.3
	35	178.94	0.76	287	50	82	78	1.8	4.0		18.48	98.3
6	37.5	180.76	0.73	285	50	82	78	1.8	4.0		18.09	98.3
	40	182.57	0.74	288	50	83	78	1.8	4.0		18.25	99.7
	42.5	184.37	0.76	289	50	83	78	1.8	4.0		18.51	98.5
7	45	186.18	0.65	289	50	83	78	1.6	4.0		17.12	97.8
	47.5	187.89	0.66	289	50	83	78	1.6	4.0		17.25	99.9
	50	189.60	0.69	288	50	83	78	1.6	4.0		17.62	99.1
8	52.5	191.32	0.73	290	51	83	78	1.8	4.0		18.15	97.5
	55	193.12	0.72	290	51	83	78	1.8	4.0		18.03	99.3
	57.5	194.92	0.7	291	50	83	78	1.7	4.0		17.78	100.0
9	60	196.69	0.72	290	52	83	79	1.7	4.0		18.03	99.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	DP

Pitot Factor	0.849	**Filter (mg)**	0.1
DGMCF	1.001	**Probe (mg)**	3.5
Barometric Pressure	29.33 "Hg	**CWTR (g)**	483.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	25.5
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.64 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%	8.36
CO2%	10.68
COppm	14.3

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 %
	62.5	198.46	0.72	290	52	83	79	1.7	4.0		18.03	**98.2**
	65	200.25	0.7	290	52	84	79	1.7	4.0		17.77	**99.4**
10	67.5	202.03	0.79	290	53	85	79	1.9	4.5		18.88	**100.1**
	70	203.90	0.78	289	53	85	79	1.9	4.5		18.75	**99.0**
	72.5	205.79	0.77	289	54	86	79	1.9	4.5		18.63	**100.6**
11	75	207.64	0.8	289	54	85	79	1.95	4.5		18.99	**99.0**
	77.5	209.54	0.79	288	53	85	79	1.9	4.5		18.86	**99.9**
	80	211.41	0.8	288	53	85	79	1.95	4.5		18.97	**98.8**
12	82.5	213.29	0.8	289	53	85	79	1.95	4.5		18.99	**98.7**
	85	215.17	0.8	289	52	85	79	1.95	4.5		18.99	**98.8**
	87.5	217.04	0.81	289	52	85	79	1.95	4.5		19.11	**98.3**
	90	218.91										**97.7**

ORTECH Environmental

Plant:	Covamta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 Particulate & Metals
Date:	June 26 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	0.999
NOZZLE DIAMETER	6.39 mm
DRY REF GAS VOLUME SAMPLED	3.797 m^3
AVGERGE ISOKINETICITY	99.3 %
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	141.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.4 %
AVERAGE GAS VELOCITY	19.26 m/s
BAROMETRIC PRESSURE (Station)	99.763 Kpa
STATIC PRESSURE	-2.141 Kpa
ABSOLUTE GAS PRESSURE	97.622 Kpa
OXYGEN CONCENTRATION	8.23 %
CARBON DIOXIDE CONCENTRATION	10.94 %
CARBON MONOXIDE CONCENTRATION	9.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	28.45 m^3/s
DRY REF GAS FLOWRATE	16.28 Rm^3/s
DRY ADJ GAS FLOWRATE	20.84 Rm^3/s
WET REF GAS FLOWRATE	19.72 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2 mg
	-FILTER	0.6 mg
	-TOTAL	2.6 mg
DRY REF GAS VOLUME SAMPLED		3.797 m^3
PARTICULATE CONC. - ACTUAL		0.392 mg/m^3
PARTICULATE CONC. - DRY REF		0.685 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.535 mg/m^3
PARTICULATE CONC. - WET REF		0.565 mg/m^3
PARTICULATE EMISSION RATE		0.011147 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:	Covamta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 26 2019	**Operator:**	RW

Pitot Factor	0.849	**Filter (mg)**	0.6
DGMCF	0.999	**Probe (mg)**	2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	566.2
Static Pressure	-8.600 "H_2O	**WCBDA (g)**	22.7
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.61 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%	8.23
CO2%	10.94
COppm	9.5

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	85.61	0.7	280	77	77	77	1.6	5.0		17.67	
	2.5	87.40	0.9	284	73	78	77	2.1	5.0		20.09	**101.9**
	5	89.48	0.86	285	70	79	77	1.9	5.0		19.65	**104.8**
2	7.5	91.36	0.87	284	68	81	78	1.9	5.0		19.75	**96.8**
	10	93.25	0.87	284	67	82	78	1.9	5.0		19.75	**96.4**
	12.5	95.17	0.87	284	66	83	76	1.9	5.0		19.75	**97.9**
3	15	97.08	0.85	284	64	84	78	1.9	5.0		19.52	**97.4**
	17.5	99.00	0.81	287	62	85	79	1.8	5.0		19.09	**98.8**
	20	100.98	0.8	286	61	85	79	1.7	5.0		18.96	**104.4**
4	22.5	102.72	0.8	286	60	86	79	1.7	5.0		18.96	**92.2**
	25	104.58	0.8	286	59	86	79	1.7	5.0		18.96	**98.5**
	27.5	106.43	0.8	285	59	85	79	1.7	5.0		18.95	**98.0**
5	30	108.30	0.8	285	58	87	79	1.7	5.0		18.95	**99.1**
	32.5	110.15	0.8	288	58	88	80	1.7	5.0		18.99	**97.8**
	35	112.00	0.8	288	57	88	86	1.7	5.0		18.99	**97.8**
6	37.5	113.85	0.78	287	57	88	81	1.7	5.0		18.74	**97.3**
	40	115.70	0.78	287	57	88	80	1.7	5.0		18.74	**98.9**
	42.5	117.55	0.76	287	57	88	81	1.7	5.0		18.50	**99.0**
7	45	119.40	0.78	286	57	89	81	1.7	5.0		18.73	**100.2**
	47.5	121.25	0.7	286	57	89	81	1.6	5.0		17.74	**98.8**
	50	123.05	0.7	286	57	89	81	1.6	5.0		17.74	**101.4**
8	52.5	124.83	0.7	286	57	89	82	1.6	5.0		17.74	**100.3**
	55	126.58	0.75	286	57	88	82	1.6	5.0		18.36	**98.5**
	57.5	128.36	0.76	286	57	88	82	1.6	5.0		18.48	**96.9**
9	60	130.13	0.76	286	57	88	82	1.6	5.0		18.48	**95.7**
	62.5	131.89	0.82	286	57	89	82	1.7	5.0		19.20	**95.2**
	65	133.74	0.83	287	57	89	82	1.8	5.0		19.33	**96.2**
10	67.5	135.63	0.81	286	56	89	82	1.8	5.0		19.08	**97.8**
	70	137.52	0.9	286	56	89	83	2.1	5.5		20.11	**98.9**
	72.5	139.53	0.88	287	56	89	83	2.1	5.5		19.90	**99.8**
11	75	141.54	0.88	287	57	89	83	2.1	5.5		19.90	**101.0**

ORTECH Environmental

Plant:	Covamta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 26 2019	**Operator:**	RW

Pitot Factor	0.849	**Filter (mg)**	0.6
DGMCF	0.999	**Probe (mg)**	2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	566.2
Static Pressure	-8.600 "H_2O	**WCBDA (g)**	22.7
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.61 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%	8.23
CO2%	10.94
COppm	9.5

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 %
	77.5	143.57	0.9	287	57	89	82	2.1	5.5		20.13	**102.0**
	80	145.58	0.88	286	57	89	83	2.1	5.5		19.89	**100.0**
12	82.5	147.61	0.87	286	57	89	83	2	5.0		19.78	**101.9**
	85	149.57	0.9	285	57	88	83	2	5.0		20.10	**99.0**
	87.5	151.54	0.9	286	57	88	83	2	5.0		20.11	**97.8**
	90	153.63								0.61		**103.8**
1	0	154.24	0.95	283	64	83	83	2.2	5.5		20.62	
	2.5	156.23	0.95	286	56	84	82	2.2	5.5		20.67	**96.5**
	5	158.30	0.96	286	53	84	83	2.2	5.5		20.77	**100.6**
2	7.5	160.36	0.93	286	52	85	82	2.2	5.5		20.45	**99.5**
	10	162.42	0.93	286	52	86	83	2.2	5.5		20.45	**101.1**
	12.5	164.50	0.91	286	85	87	83	2.2	5.5		20.23	**101.9**
3	15	166.53	0.92	286	52	87	83	2.1	5.5		20.34	**100.5**
	17.5	168.55	0.91	287	54	88	83	2.1	5.5		20.24	**99.4**
	20	170.56	0.93	287	53	88	83	2.1	5.5		20.46	**99.4**
4	22.5	172.56	0.93	287	53	89	83	2.1	5.5		20.46	**97.9**
	25	174.58	0.85	287	53	89	83	2	5.5		19.56	**98.7**
	27.5	176.54	0.86	287	54	89	83	2	5.5		19.68	**100.2**
5	30	178.49	0.86	287	53	89	83	2	5.5		19.68	**99.1**
	32.5	180.44	0.87	288	54	89	83	2	5.5		19.80	**99.1**
	35	182.49	0.89	288	55	90	83	2	5.5		20.03	**103.6**
6	37.5	184.33	0.8	288	55	90	83	1.8	5.5		18.99	**91.9**
	40	186.23	0.79	288	55	90	83	1.8	5.5		18.87	**100.0**
	42.5	188.11	0.7	288	56	90	83	1.7	5.0		17.76	**99.6**
7	45	189.93	0.7	288	56	90	83	1.7	5.0		17.76	**102.4**
	47.5	191.73	0.82	288	55	90	84	1.9	5.5		19.23	**101.3**
	50	193.63	0.8	288	55	90	84	1.9	5.5		18.99	**98.7**
8	52.5	195.54	0.8	289	55	91	84	1.9	5.5		19.00	**100.5**
	55	197.45	0.8	289	55	91	84	1.9	5.5		19.00	**100.5**
	57.5	199.37	0.8	289	55	91	84	1.9	5.5		19.00	**101.0**
9	60	201.27	0.8	289	55	91	84	1.9	5.5		19.00	**99.9**

ORTECH Environmental

Plant:	Covamta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	June 26 2019	**Operator:**	RW

Pitot Factor	0.849	**Filter (mg)**	0.6
DGMCF	0.999	**Probe (mg)**	2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	566.2
Static Pressure	-8.600 "H_2O	**WCBDA (g)**	22.7
Nozzle	0.2517 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.61 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%	8.23
CO2%	10.94
COppm	9.5

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 %
	62.5	203.18	0.82	288	56	91	85	1.9	5.5		19.23	**100.5**
	65	205.09	0.8	288	56	91	85	1.9	5.5		18.99	**99.1**
10	67.5	206.99	0.8	289	55	91	85	1.9	5.5		19.00	**99.8**
	70	208.89	0.8	286	56	91	85	1.9	5.5		18.96	**99.9**
	72.5	210.79	0.8	286	56	90	85	1.9	5.5		18.96	**99.7**
11	75	212.68	0.8	286	57	90	85	1.9	5.5		18.96	**99.2**
	77.5	214.57	0.8	286	58	91	85	1.9	5.5		18.96	**99.2**
	80	216.47	0.75	286	59	91	85	1.8	5.5		18.36	**99.7**
12	82.5	218.31	0.75	286	60	91	85	1.8	5.5		18.36	**99.6**
	85	220.16	0.75	286	61	91	85	1.8	5.5		18.36	**100.2**
	87.5	222.01	0.75	286	62	91	85	1.8	5.5		18.36	**100.2**
	90	223.85										**99.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 Particulate & Metals
Date:	June 25 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	3.557 m^3
AVGERGE ISOKINETICITY	99.3 %
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	141.5 °C
AVERAGE GAS MOISTURE BY VOLUME	16.1 %
AVERAGE GAS VELOCITY	18.08 m/s
BAROMETRIC PRESSURE (Station)	99.187 Kpa
STATIC PRESSURE	-1.942 Kpa
ABSOLUTE GAS PRESSURE	97.245 Kpa
OXYGEN CONCENTRATION	8.26 %
CARBON DIOXIDE CONCENTRATION	10.68 %
CARBON MONOXIDE CONCENTRATION	20.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.72 m^3/s
DRY REF GAS FLOWRATE	15.48 Rm^3/s
DRY ADJ GAS FLOWRATE	19.76 Rm^3/s
WET REF GAS FLOWRATE	18.44 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2 mg
	-FILTER	0.1 mg
	-TOTAL	2.1 mg
DRY REF GAS VOLUME SAMPLED		3.557 m^3
PARTICULATE CONC. - ACTUAL		0.342 mg/m^3
PARTICULATE CONC. - DRY REF		0.590 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.462 mg/m^3
PARTICULATE CONC. - WET REF		0.496 mg/m^3
PARTICULATE EMISSION RATE		0.009138 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 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 25 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	2
Barometric Pressure	29.29 "Hg	**CWTR (g)**	474.4
Static Pressure	-7.800 "H_2O	**WCBDA (g)**	26.1
Nozzle	0.2499 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%	8.26
CO2%	10.68
COppm	20.9

Measured H2O
16.1 %

				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	7.93	0.66	268	65	71	70	1.6	3.0		17.05	
	2.5	9.60	0.66	275	61	70	71	1.6	3.0		17.13	**98.3**
	5	11.26	0.66	276	59	71	71	1.6	3.0		17.14	**98.1**
2	7.5	12.95	0.65	276	58	71	71	1.6	3.0		17.01	**99.9**
	10	14.60	0.65	276	59	71	71	1.6	3.0		17.01	**98.3**
	12.5	16.31	0.65	276	59	71	71	1.6	3.0		17.01	**101.8**
3	15	18.00	0.7	276	61	71	72	1.7	3.0		17.65	**100.7**
	17.5	19.66	0.72	284	62	71	72	1.8	3.0		18.00	**95.2**
	20	21.54	0.69	284	62	71	72	1.6	3.0		17.62	**106.9**
4	22.5	23.23	0.69	284	62	72	72	1.6	3.0		17.62	**98.1**
	25	24.93	0.72	287	62	72	73	1.6	3.0		18.04	**98.6**
	27.5	26.68	0.7	288	62	72	74	1.6	3.0		17.80	**99.5**
5	30	28.43	0.7	288	61	72	74	1.6	3.0		17.80	**100.9**
	32.5	30.21	0.7	288	61	73	75	1.6	3.0		17.80	**102.6**
	35	31.91	0.69	288	60	73	76	1.6	3.0		17.67	**97.8**
6	37.5	33.64	0.68	288	59	73	75	1.6	3.0		17.54	**100.2**
	40	35.33	0.68	289	58	73	77	1.6	3.0		17.55	**98.6**
	42.5	37.03	0.68	290	57	73	76	1.6	3.0		17.57	**99.1**
7	45	38.72	0.68	290	57	74	76	1.6	3.0		17.57	**98.7**
	47.5	40.42	0.69	290	57	74	76	1.6	3.0		17.69	**99.2**
	50	42.09	0.69	290	57	74	77	1.6	3.0		17.69	**96.7**
8	52.5	43.77	0.7	291	56	74	77	1.6	3.0		17.83	**97.2**
	55	45.46	0.69	291	56	74	77	1.6	3.0		17.71	**97.2**
	57.5	47.15	0.7	291	55	74	77	1.6	3.0		17.83	**97.9**
9	60	48.84	0.75	290	55	74	77	1.8	3.0		18.45	**97.2**
	62.5	50.59	0.75	290	54	74	77	1.8	3.0		18.45	**97.2**
	65	52.36	0.76	290	54	75	78	1.8	3.0		18.57	**98.3**
10	67.5	54.13	0.75	289	53	75	78	1.8	3.0		18.43	**97.5**
	70	55.90	0.8	289	53	75	78	1.9	3.0		19.04	**98.0**
	72.5	57.76	0.8	289	53	75	78	1.9	3.0		19.04	**99.8**
11	75	59.52	0.8	289	53	75	79	1.9	3.0		19.04	**94.4**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 25 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	2
Barometric Pressure	29.29 "Hg	**CWTR (g)**	474.4
Static Pressure	-7.800 "H_2O	**WCBDA (g)**	26.1
Nozzle	0.2499 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%	8.26
CO2%	10.68
COppm	20.9

Measured H2O
16.1 %

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	61.34	0.84	289	53	75	78	2	3.0		19.51	97.5
	80	63.18	0.84	289	53	75	78	2	3.0		19.51	96.3
12	82.5	65.06	0.83	289	53	76	78	2	3.0		19.39	98.4
	85	66.93	0.84	288	53	76	78	2	3.0		19.50	98.4
	87.5	68.82	0.83	288	54	76	79	2	3.0		19.38	98.8
	90	70.61								0.4		94.1
1	0	71.01	0.83	278	58	76	77	2	3.0		19.25	
	2.5	73.36	0.81	288	54	76	77	2	3.0		19.15	122.9
	5	75.21	0.8	288	52	76	77	2	3.0		19.03	98.6
2	7.5	77.05	0.81	288	51	76	77	2	3.0		19.15	98.7
	10	78.89	0.79	288	52	76	77	2	3.0		18.91	98.0
	12.5	80.72	0.79	288	52	76	78	2	3.0		18.91	98.7
3	15	82.55	0.78	288	52	76	78	2	3.0		18.79	98.7
	17.5	84.39	0.79	288	52	76	78	2	3.0		18.91	99.8
	20	86.22	0.78	288	51	76	78	2	3.0		18.79	98.7
4	22.5	88.04	0.76	288	50	76	78	2	3.0		18.54	98.7
	25	89.87	0.74	288	50	76	79	1.9	3.0		18.30	100.6
	27.5	91.70	0.76	288	50	76	79	1.9	3.0		18.54	101.8
5	30	93.52	0.73	288	50	76	79	1.8	3.0		18.18	99.9
	32.5	95.29	0.73	288	50	76	79	1.8	3.0		18.18	99.1
	35	97.06	0.73	289	50	76	79	1.8	3.0		18.19	99.1
6	37.5	98.84	0.73	289	50	76	79	1.8	3.0		18.19	99.7
	40	100.61	0.7	289	50	76	79	1.8	3.0		17.81	99.2
	42.5	102.40	0.68	289	50	77	80	1.7	3.0		17.55	102.4
7	45	104.14	0.69	288	50	77	80	1.7	3.0		17.67	100.8
	47.5	105.88	0.68	289	50	77	80	1.7	3.0		17.55	100.0
	50	107.63	0.7	289	80	77	80	1.7	3.0		17.81	101.4
8	52.5	109.38	0.73	288	50	76	80	1.7	3.0		18.18	99.9
	55	111.18	0.73	289	50	77	80	1.7	3.0		18.19	100.7
	57.5	112.87	0.73	288	51	77	80	1.7	3.0		18.18	94.5
9	60	114.62	0.7	288	51	77	80	1.7	3.0		17.80	97.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 25 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	2
Barometric Pressure	29.29 "Hg	**CWTR (g)**	474.4
Static Pressure	-7.800 "H_2O	**WCBDA (g)**	26.1
Nozzle	0.2499 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%	8.26
CO2%	10.68
COppm	20.9

Measured H2O
16.1 %

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	116.37	0.71	288	51	77	80	1.7	3.0		17.92	99.9
	65	118.11	0.7	288	51	77	80	1.7	3.0		17.80	98.6
10	67.5	119.86	0.7	288	51	78	80	1.7	3.0		17.80	99.9
	70	121.61	0.69	287	51	78	80	1.7	3.0		17.66	99.8
	72.5	123.36	0.66	287	52	78	80	1.6	3.0		17.27	100.4
11	75	125.04	0.67	287	52	78	80	1.6	3.0		17.40	98.6
	77.5	126.73	0.67	286	52	78	80	1.6	3.0		17.39	98.4
	80	128.42	0.67	286	52	78	80	1.6	3.0		17.39	98.3
12	82.5	130.11	0.66	285	52	78	80	1.6	3.0		17.25	98.3
	85	131.79	0.68	284	52	78	80	1.6	3.0		17.49	98.4
	87.5	133.47	0.67	284	53	78	80	1.6	3.0		17.37	96.9
	90	135.26										104.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 25 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	2
Barometric Pressure	29.29 "Hg	**CWTR (g)**	474.4
Static Pressure	-7.800 "H_2O	**WCBDA (g)**	26.1
Nozzle	0.2499 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%	8.26
CO2%	10.68
COppm	20.9

Measured H2O
16.1 %

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	116.37	0.71	288	51	77	80	1.7	3.0		17.92	99.9
	65	118.11	0.7	288	51	77	80	1.7	3.0		17.80	98.6
10	67.5	119.86	0.7	288	51	78	80	1.7	3.0		17.80	99.9
	70	121.61	0.69	287	51	78	80	1.7	3.0		17.66	99.8
	72.5	123.36	0.66	287	52	78	80	1.6	3.0		17.27	100.4
11	75	125.04	0.67	287	52	78	80	1.6	3.0		17.40	98.6
	77.5	126.73	0.67	286	52	78	80	1.6	3.0		17.39	98.4
	80	128.42	0.67	286	52	78	80	1.6	3.0		17.39	98.3
12	82.5	130.11	0.66	285	52	78	80	1.6	3.0		17.25	98.3
	85	131.79	0.68	284	52	78	80	1.6	3.0		17.49	98.4
	87.5	133.47	0.67	284	53	78	80	1.6	3.0		17.37	96.9
	90	135.26										104.0

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 Particulate & Metals
Date:	June 26, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	3.484 m^3
AVGERGE ISOKINETICITY	98.5 %
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	139.6 °C
AVERAGE GAS MOISTURE BY VOLUME	16.3 %
AVERAGE GAS VELOCITY	17.73 m/s
BAROMETRIC PRESSURE (Station)	99.729 Kpa
STATIC PRESSURE	-1.967 Kpa
ABSOLUTE GAS PRESSURE	97.762 Kpa
OXYGEN CONCENTRATION	8.19 %
CARBON DIOXIDE CONCENTRATION	10.89 %
CARBON MONOXIDE CONCENTRATION	12.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.20 m^3/s
DRY REF GAS FLOWRATE	15.27 Rm^3/s
DRY ADJ GAS FLOWRATE	19.61 Rm^3/s
WET REF GAS FLOWRATE	18.26 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.2 mg
	-FILTER	0.1 mg
	-TOTAL	1.3 mg
DRY REF GAS VOLUME SAMPLED		3.484 m^3
PARTICULATE CONC. - ACTUAL		0.218 mg/m^3
PARTICULATE CONC. - DRY REF		0.373 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.291 mg/m^3
PARTICULATE CONC. - WET REF		0.312 mg/m^3
PARTICULATE EMISSION RATE		0.005700 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 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.45 "Hg	**CWTR (g)**	479.1
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21.1
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.19
CO2%	10.89
COppm	12.1

Measured H2O
16.3 %

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	36.24	0.65	280	72	71	72	1.6	3.0		17.02	
	2.5	37.87	0.65	280	65	73	74	1.6	3.0		17.02	97.8
	5	39.50	0.65	280	64	73	73	1.7	3.0		17.02	97.5
2	7.5	41.13	0.65	280	63	73	73	1.7	3.0		17.02	97.6
	10	42.79	0.63	280	60	73	74	1.6	3.0		16.75	99.4
	12.5	44.43	0.65	280	59	74	74	1.6	3.0		17.02	99.6
3	15	46.07	0.7	281	58	74	75	1.75	3.0		17.67	98.0
	17.5	47.75	0.67	280	58	74	75	1.8	3.0		17.28	96.7
	20	49.44	0.68	280	57	74	76	1.75	3.0		17.40	99.4
4	22.5	51.14	0.68	281	56	74	76	1.7	3.0		17.42	99.1
	25	52.82	0.67	280	56	74	77	1.75	3.0		17.28	98.0
	27.5	54.49	0.67	281	55	74	77	1.75	3.0		17.29	98.0
5	30	56.17	0.65	281	55	75	77	1.75	3.0		17.03	98.7
	32.5	57.84	0.67	282	55	75	77	1.7	3.0		17.30	99.5
	35	59.50	0.65	280	55	75	77	1.75	3.0		17.02	97.5
6	37.5	61.16	0.61	284	55	76	78	1.5	3.0		16.53	98.8
	40	62.76	0.62	281	55	76	78	1.6	3.0		16.63	98.3
	42.5	64.39	0.62	283	55	76	79	1.6	3.0		16.65	99.2
7	45	66.02	0.58	285	55	76	79	1.5	3.0		16.13	99.2
	47.5	67.59	0.58	284	55	76	79	1.5	3.0		16.12	98.9
	50	69.14	0.57	284	55	76	80	1.4	3.0		15.98	97.6
8	52.5	70.67	0.65	286	55	77	80	1.7	3.0		17.08	97.1
	55	72.33	0.65	284	55	77	80	1.7	3.0		17.06	98.8
	57.5	73.99	0.67	283	55	77	80	1.7	3.0		17.31	98.6
9	60	75.66	0.73	285	55	77	80	1.9	3.0		18.09	97.7
	62.5	77.45	0.73	283	55	77	81	1.9	3.0		18.07	100.5
	65	79.24	0.73	284	55	78	81	1.9	3.0		18.08	100.2
10	67.5	81.03	0.79	284	55	78	81	1.95	3.5		18.81	100.2
	70	82.85	0.79	284	56	78	81	1.95	3.5		18.81	98.0
	72.5	84.65	0.78	285	56	78	81	2	4.0		18.70	96.9
11	75	86.47	0.81	285	56	79	81	2.1	4.0		19.06	98.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.45 "Hg	**CWTR (g)**	479.1
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21.1
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.19
CO2%	10.89
COppm	12.1

Measured H2O
16.3 %

				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 %
	77.5	88.32	0.83	284	56	78	81	2.1	4.0		19.28	98.3
	80	90.19	0.84	285	56	78	81	2.2	4.0		19.41	98.2
12	82.5	92.08	0.84	285	57	79	81	2.2	4.0		19.41	98.8
	85	93.97	0.84	284	57	79	81	2.2	4.0		19.40	98.7
	87.5	95.87	0.84	284	58	79	81	2.2	4.0		19.40	99.1
	90	97.77								0.66		99.1
1	0	98.43	0.65	280	66	79	79	1.65	3.0		17.02	
	2.5	100.10	0.62	280	61	79	79	1.6	3.0		16.62	98.8
	5	101.74	0.62	281	59	79	79	1.6	3.0		16.63	99.4
2	7.5	103.37	0.66	281	57	79	79	1.7	3.0		17.16	98.8
	10	105.04	0.65	281	57	79	79	1.7	3.0		17.03	98.2
	12.5	106.71	0.64	283	56	79	79	1.7	3.0		16.92	98.9
3	15	108.36	0.7	284	57	78	80	1.8	3.5		17.71	98.6
	17.5	110.07	0.71	283	57	78	80	1.8	3.5		17.82	97.8
	20	111.80	0.7	284	57	78	80	1.8	3.5		17.71	98.2
4	22.5	113.51	0.71	285	57	78	80	1.8	3.5		17.84	97.8
	25	115.23	0.74	284	56	79	81	1.9	3.5		18.20	97.8
	27.5	117.01	0.75	284	55	78	80	1.9	3.5		18.33	98.9
5	30	118.79	0.73	285	55	78	80	1.85	3.5		18.09	98.4
	32.5	120.58	0.71	284	55	78	81	1.8	3.5		17.83	100.4
	35	122.33	0.7	284	54	78	81	1.8	3.5		17.71	99.3
6	37.5	124.06	0.7	284	54	78	80	1.8	3.5		17.71	98.9
	40	125.79	0.66	285	54	78	80	1.7	3.5		17.20	99.0
	42.5	127.47	0.66	284	54	78	80	1.7	3.5		17.19	99.0
7	45	129.13	0.65	283	55	78	80	1.7	3.5		17.05	97.8
	47.5	130.79	0.65	284	55	78	80	1.7	3.5		17.06	98.5
	50	132.45	0.64	283	55	78	80	1.6	3.5		16.92	98.5
8	52.5	134.10	0.65	287	55	78	80	1.6	3.5		17.10	98.6
	55	135.75	0.67	287	56	78	80	1.7	3.5		17.36	98.1
	57.5	137.43	0.67	285	57	78	80	1.7	3.5		17.33	98.4
9	60	139.11	0.76	284	58	79	80	1.95	4.0		18.45	98.3

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.45 "Hg	**CWTR (g)**	479.1
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21.1
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.66 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%	8.19
CO2%	10.89
COppm	12.1

Measured H2O
16.3 %

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	140.91	0.75	283	58	79	80	1.9	4.0		18.31	**98.8**
	65	142.72	0.74	286	59	79	80	1.85	4.0		18.23	**99.9**
10	67.5	144.50	0.8	287	60	79	80	2	4.0		18.97	**99.1**
	70	146.33	0.77	286	60	79	80	2	4.0		18.59	**98.1**
	72.5	148.15	0.77	284	59	79	80	1.9	4.0		18.57	**99.4**
11	75	149.95	0.82	287	59	79	80	2	4.0		19.20	**98.1**
	77.5	151.78	0.82	287	59	79	80	2	4.0		19.20	**96.9**
	80	153.62	0.81	286	59	79	80	2.1	4.0		19.07	**97.4**
12	82.5	155.46	0.83	285	59	79	80	2.1	4.0		19.29	**98.0**
	85	157.32	0.82	284	59	79	80	2.1	4.0		19.16	**97.8**
	87.5	159.17	0.78	283	60	79	80	2	4.0		18.68	**97.8**
	90	161.01										**99.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 Particulate & Metals
Date:	June 26, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	3.471 m^3
AVGERGE ISOKINETICITY	99.7 %
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	139.4 °C
AVERAGE GAS MOISTURE BY VOLUME	17.4 %
AVERAGE GAS VELOCITY	17.68 m/s
BAROMETRIC PRESSURE (Station)	99.763 Kpa
STATIC PRESSURE	-1.967 Kpa
ABSOLUTE GAS PRESSURE	97.796 Kpa
OXYGEN CONCENTRATION	8.07 %
CARBON DIOXIDE CONCENTRATION	11.04 %
CARBON MONOXIDE CONCENTRATION	10.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.12 m^3/s
DRY REF GAS FLOWRATE	15.04 Rm^3/s
DRY ADJ GAS FLOWRATE	19.49 Rm^3/s
WET REF GAS FLOWRATE	18.22 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.2 mg
	-FILTER	0.5 mg
	-TOTAL	1.7 mg
DRY REF GAS VOLUME SAMPLED		3.471 m^3
PARTICULATE CONC. - ACTUAL		0.282 mg/m^3
PARTICULATE CONC. - DRY REF		0.490 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.378 mg/m^3
PARTICULATE CONC. - WET REF		0.404 mg/m^3
PARTICULATE EMISSION RATE		0.007367 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 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.5
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	517.9
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.73 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%	8.07
CO2%	11.04
COppm	10.6

Measured H2O
17.4 %

				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	61.74	0.67	280	72	75	75	1.7	3.0		17.31	
	2.5	63.41	0.68	280	67	75	75	1.7	3.0		17.44	**99.2**
	5	65.09	0.67	280	67	75	75	1.8	3.0		17.31	**99.1**
2	7.5	66.79	0.67	281	66	75	76	1.7	3.0		17.32	**101.0**
	10	68.47	0.65	281	66	76	76	1.6	3.0		17.06	**99.8**
	12.5	70.13	0.69	280	65	76	77	1.7	3.0		17.56	**100.0**
3	15	71.81	0.66	280	65	76	77	1.7	3.0		17.18	**98.1**
	17.5	73.48	0.65	280	64	76	77	1.6	3.0		17.05	**99.7**
	20	75.13	0.64	284	64	77	78	1.6	3.0		16.96	**99.2**
4	22.5	76.79	0.67	283	63	77	79	1.7	3.0		17.34	**100.7**
	25	78.45	0.68	282	62	77	79	1.8	3.0		17.46	**98.3**
	27.5	80.13	0.66	284	61	77	79	1.7	3.0		17.23	**98.7**
5	30	81.81	0.67	285	60	77	79	1.7	3.0		17.37	**100.3**
	32.5	83.50	0.68	284	59	77	79	1.7	3.0		17.48	**100.2**
	35	85.18	0.69	283	59	78	80	1.8	3.0		17.60	**98.8**
6	37.5	86.89	0.69	284	59	78	80	1.8	3.0		17.61	**99.6**
	40	88.60	0.71	284	59	78	80	1.8	3.0		17.87	**99.7**
	42.5	90.33	0.69	283	58	78	81	1.8	3.0		17.60	**99.4**
7	45	92.04	0.66	287	58	78	81	1.7	3.0		17.26	**99.5**
	47.5	93.74	0.66	285	58	78	81	1.7	3.0		17.24	**101.4**
	50	95.42	0.69	284	59	79	81	1.7	3.0		17.61	**100.1**
8	52.5	97.12	0.74	288	59	79	81	1.9	3.5		18.29	**98.9**
	55	98.90	0.75	289	59	79	81	1.9	3.5		18.42	**100.3**
	57.5	100.69	0.75	288	59	79	81	1.9	3.5		18.41	**100.2**
9	60	102.48	0.77	289	59	79	82	1.95	3.5		18.67	**100.2**
	62.5	104.29	0.78	285	59	79	82	1.95	3.5		18.74	**99.9**
	65	106.10	0.75	284	60	79	82	1.95	3.5		18.36	**99.0**
10	67.5	107.88	0.8	283	59	79	82	2.1	3.5		18.95	**99.3**
	70	109.73	0.82	284	58	79	82	2.1	3.5		19.20	**99.9**
	72.5	111.61	0.81	283	58	79	83	2.1	3.5		19.07	**100.3**
11	75	113.44	0.85	286	58	80	83	2.2	3.5		19.57	**98.1**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.5
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	517.9
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.73 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%	8.07
CO2%	11.04
COppm	10.6

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 %
	77.5	115.34	0.8	284	58	80	83	2	3.5		18.96	99.5
	80	117.19	0.77	285	58	80	83	1.95	3.5		18.62	99.7
12	82.5	119.02	0.76	284	58	80	83	1.9	3.5		18.48	100.6
	85	120.83	0.76	284	58	80	83	1.9	3.5		18.48	100.1
	87.5	122.62	0.75	284	58	80	83	1.9	3.5		18.36	99.0
	90	124.42								0.73		100.2
1	0	125.15	0.79	280	55	81	81	2	3.5		18.79	
	2.5	127.01	0.78	280	53	81	82	2	3.5		18.68	100.7
	5	128.84	0.8	280	52	81	82	2.1	3.5		18.91	99.6
2	7.5	130.70	0.78	281	51	81	82	2	3.5		18.69	100.0
	10	132.54	0.78	281	51	81	82	2	3.5		18.69	100.2
	12.5	134.39	0.81	282	52	81	83	2	3.5		19.06	100.8
3	15	136.23	0.79	281	52	81	83	2.1	3.5		18.81	98.3
	17.5	138.07	0.79	280	52	81	83	2.1	3.5		18.79	99.5
	20	139.92	0.77	281	52	81	83	2	3.5		18.57	100.0
4	22.5	141.76	0.74	280	52	81	83	1.9	3.5		18.19	100.8
	25	143.55	0.74	280	52	81	83	1.9	3.5		18.19	99.9
	27.5	145.34	0.75	282	52	81	83	1.9	3.5		18.34	99.9
5	30	147.11	0.68	284	52	81	83	1.8	3.5		17.48	98.3
	32.5	148.84	0.68	282	52	81	83	1.8	3.5		17.46	101.0
	35	150.56	0.68	281	52	81	83	1.8	3.5		17.45	100.3
6	37.5	152.27	0.6	284	53	81	83	1.5	3.5		16.42	99.6
	40	153.87	0.6	285	53	81	83	1.5	3.5		16.43	99.4
	42.5	155.47	0.61	285	53	81	83	1.6	3.5		16.57	99.4
7	45	157.07	0.65	285	53	81	83	1.7	3.5		17.11	98.6
	47.5	158.72	0.65	285	53	81	84	1.7	3.5		17.11	98.6
	50	160.39	0.65	284	53	81	84	1.7	3.5		17.09	99.7
8	52.5	162.05	0.67	285	54	81	83	1.7	3.5		17.37	99.0
	55	163.74	0.66	286	54	81	84	1.7	3.5		17.25	99.4
	57.5	165.41	0.66	285	54	81	84	1.7	3.5		17.24	99.0
9	60	167.10	0.65	280	55	82	84	1.7	3.5		17.05	100.1

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	DP

Pitot Factor	0.851	**Filter (mg)**	0.5
DGMCF	1.004	**Probe (mg)**	1.2
Barometric Pressure	29.46 "Hg	**CWTR (g)**	517.9
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	21
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.73 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%	8.07
CO2%	11.04
COppm	10.6

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 %
	62.5	168.78	0.67	281	55	82	84	1.75	3.5		17.32	**99.8**
	65	170.48	0.67	285	56	82	84	1.75	3.5		17.37	**99.6**
10	67.5	172.17	0.65	284	56	82	84	1.7	3.5		17.09	**99.3**
	70	173.85	0.67	283	56	82	84	1.7	3.5		17.34	**100.1**
	72.5	175.55	0.66	281	57	82	84	1.7	3.5		17.19	**99.7**
11	75	177.26	0.55	282	57	81	84	1.5	3.5		15.70	**100.9**
	77.5	178.84	0.55	281	57	81	84	1.4	3.5		15.69	**102.3**
	80	180.39	0.56	282	57	81	84	1.4	3.5		15.85	**100.2**
12	82.5	181.95	0.56	280	60	82	84	1.4	3.5		15.82	**100.0**
	85	183.49	0.58	279	58	82	84	1.5	3.5		16.09	**98.5**
	87.5	185.06	0.58	281	57	82	84	1.5	3.5		16.11	**98.7**
	90	186.64										99.4

APPENDIX 23

Particle Size Distribution Test Emission Calculations
(12 pages)

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 1

Project No.: 21936
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	1.001
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.45
Static Pressure ("H_2O)	-8.00
Oxygen Content (%)	8.07
Carbon Dioxide Content (%)	11.04
Carbon Monoxide Content (PPM)	15.4
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.8 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	17.1 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.6 Rft^3*	1.178 Rm^3*
Average Cyclone I Cut Diameter		10.03 µm
Average Cyclone IV Cut Diameter		2.29 µm
Average Isokineticity		101.0 %
Stack Gas Physical Parameters		
B_{ws}	17.5 % v/v	
Average m	219.1 (dimensionless)	
M_d	30.09 lbs/lbs mole	
M_w	27.97 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	58.0 ft/s	17.7 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	55394 ACFM	26.1 m^3/s
Wet Reference Q_s	38495 SCFM*	18.2 Rm^3/s*
Dry Reference Q_s	31740 SCFM*	15.0 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	**Emission Rate**
Total Part. (a)	3.06 mg/Rm^3*	0.0458 g/s
Total Part. (b)	7.64 mg/Rm^3*	0.114 g/s
PM_{10} Part. (b)	7.13 mg/Rm^3*	0.107 g/s
$PM_{2.5}$ Part. (b)	6.79 mg/Rm^3*	0.102 g/s
Cond. Part.	4.58 mg/Rm^3*	0.069 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)	531.1	653.7	763.4		900.5
final volume or weight (ml or mg)	705.0	654.4	761.5		912.2
gain in volume or weight (ml or mg)	173.9	0.7	-1.9	0.0	11.7
				TOTAL	**184.4**

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.6	0.4	0.2	2.4	5.4

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21936
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 (%)
1	1	0.00	9.60	19.59	0.72	0.35	285	75	73	0.38	3.0	59.0	10.04	2.29	99.1
	2	9.6	10.02	22.94	0.80	0.35	284	78	75	0.38	3.0	62.1	9.92	2.24	95.5
	3	19.6	10.16	26.51	0.77	0.35	284	78	74	0.38	3.0	61.0	10.05	2.29	95.6
	4	29.8	9.81	30.06	0.68	0.35	284	82	78	0.38	3.0	57.3	10.08	2.31	101.3
	5	39.6	9.23	33.50	0.60	0.35	286	82	78	0.38	3.0	53.9	9.95	2.26	110.0
	6	48.8	8.54	36.80	0.57	0.35	284	83	79	0.38	3.0	52.5	10.08	2.31	110.7
		57.4		39.80											
2	1	0.00	10.49	39.80	0.81	0.35	284	81	79	0.38	3.0	62.5	10.16	2.34	91.8
	2	10.5	10.94	43.44	0.78	0.35	285	80	79	0.38	3.0	61.4	10.03	2.29	95.3
	3	21.4	11.13	47.30	0.68	0.35	285	80	78	0.38	3.0	57.3	10.09	2.31	101.2
	4	32.6	10.68	51.19	0.73	0.35	287	80	79	0.38	3.0	59.5	10.09	2.31	97.9
	5	43.2	10.02	54.93	0.61	0.35	290	80	79	0.38	3.0	54.5	9.78	2.19	112.3
	6	53.3	9.38	58.60	0.61	0.35	287	80	78	0.38	3.0	54.4	10.07	2.31	107.4
		62.6		61.89											
Averages					**0.70**		**285**	**79**		**0.38**		**58.0**	**10.03**	**2.29**	**101.0**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 1

Project No.: 21936
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	1.001
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.45
Static Pressure ("H_2O)	-8.00
Oxygen Content (%)	8.34
Carbon Dioxide Content (%)	10.86
Carbon Monoxide Content (PPM)	9.9
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.6 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	16.9 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.6 Rft^3*	1.150 Rm^3*
Average Cyclone I Cut Diameter		10.19 µm
Average Cyclone IV Cut Diameter		2.36 µm
Average Isokineticity		98.2 %
Stack Gas Physical Parameters		
B_{ws}	17.9 % v/v	
Average m	220.0 (dimensionless)	
M_d	30.07 lbs/lbs mole	
M_w	27.91 lbs/lbs mole	
Average T_s	289 °F	143 °C
Average U_s	58.3 ft/s	17.8 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	55708 ACFM	26.3 m^3/s
Wet Reference Q_s	38554 SCFM*	18.2 Rm^3/s*
Dry Reference Q_s	31637 SCFM*	14.9 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	1.13 mg/Rm^3*	0.0169 g/s
Total Part. (b)	5.57 mg/Rm^3*	0.083 g/s
PM_{10} Part. (b)	5.13 mg/Rm^3*	0.077 g/s
$PM_{2.5}$ Part. (b)	4.87 mg/Rm^3*	0.073 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)	490.8	580.5	773.2		948.5
final volume or weight (ml or mg)	667.4	580.7	770.2		959.6
gain in volume or weight (ml or mg)	176.6	0.2	-3.0	0.0	11.1
				TOTAL	184.9

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.5	0.3	0.4	<0.1	5.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	Plant: DYEC	Test No.: 2	Project No.: 21936
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	10.80	62.50	0.78	0.35	288	76	76	0.38	3.0	61.6	10.07	2.31	94.9
	2	10.8	10.60	66.25	0.74	0.35	288	76	75	0.38	3.0	60.0	10.20	2.36	95.7
	3	21.4	9.90	69.86	0.76	0.35	289	77	76	0.38	3.0	60.8	10.07	2.31	96.3
	4	31.3	10.25	73.30	0.74	0.35	289	77	76	0.38	3.0	60.0	10.02	2.29	98.3
	5	41.6	9.37	76.89	0.67	0.35	290	79	77	0.38	3.0	57.2	10.05	2.30	103.0
	6	50.9	9.37	80.17	0.61	0.35	290	80	77	0.38	3.0	54.5	11.16	2.76	93.0
		60.3		83.00											
1	1	0.00	10.18	83.00	0.82	0.35	290	80	77	0.38	3.0	63.2	10.18	2.35	91.4
	2	10.2	10.73	86.50	0.81	0.35	289	80	78	0.38	3.0	62.8	10.21	2.36	91.5
	3	20.9	10.53	90.18	0.75	0.35	289	80	79	0.38	3.0	60.4	10.13	2.33	96.1
	4	31.4	9.90	93.83	0.64	0.35	289	80	79	0.38	3.0	55.8	10.03	2.29	105.5
	5	41.3	9.30	97.31	0.54	0.35	286	81	78	0.38	3.0	51.2	10.07	2.30	114.0
	6	50.6	9.06	100.56	0.55	0.35	285	82	79	0.38	3.0	51.6	10.07	2.31	112.8
		59.7		103.73											
Averages					**0.70**		**289**	**78**		**0.38**		**58.3**	**10.19**	**2.36**	**98.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 1

Project No.: 21936
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	1.001
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.48
Static Pressure ("H_2O)	-8.60
Oxygen Content (%)	8.31
Carbon Dioxide Content (%)	10.82
Carbon Monoxide Content (PPM)	9.6
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.7 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	17.0 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.2 Rft^3*	1.166 Rm^3*
Average Cyclone I Cut Diameter		10.11 µm
Average Cyclone IV Cut Diameter		2.31 µm
Average Isokineticity		103.1 %
Stack Gas Physical Parameters		
B_{ws}	17.6 % v/v	
Average m	219.5 (dimensionless)	
M_d	30.06 lbs/lbs mole	
M_w	27.95 lbs/lbs mole	
Average T_s	286 °F	141 °C
Average U_s	56.1 ft/s	17.1 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53618 ACFM	25.3 m^3/s
Wet Reference Q_s	37201 SCFM*	17.6 Rm^3/s*
Dry Reference Q_s	30668 SCFM*	14.5 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.60 mg/Rm^3*	0.0087 g/s
Total Part. (b)	4.80 mg/Rm^3*	0.070 g/s
PM_{10} Part. (b)	4.72 mg/Rm^3*	0.068 g/s
$PM_{2.5}$ Part. (b)	4.46 mg/Rm^3*	0.065 g/s
Cond. Part.	4.20 mg/Rm^3*	0.061 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)	531.1	654.4	761.5		912.2
final volume or weight (ml or mg)	706.7	654.0	759.3		921.9
gain in volume or weight (ml or mg)	175.6	-0.4	-2.2	0.0	9.7
				TOTAL	182.7

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	0.3	0.2	<0.1	4.9

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	Plant: DYEC	Test No.: 3	Project No.: 21936
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	10.57	5.20	0.77	0.35	287	79	78	0.38	3.5	61.1	9.89	2.23	98.1
	2	10.6	10.30	9.00	0.75	0.35	287	78	78	0.38	3.5	60.3	10.06	2.30	97.1
	3	20.9	10.44	12.61	0.71	0.35	288	78	78	0.38	3.5	58.7	10.08	2.31	99.6
	4	31.3	10.30	16.26	0.64	0.35	287	81	79	0.38	3.5	55.7	10.11	2.32	104.4
	5	41.6	9.80	19.86	0.61	0.35	287	80	80	0.38	3.5	54.4	10.08	2.31	107.4
	6	51.4	9.35	23.30	0.57	0.35	286	82	81	0.38	3.5	52.6	10.12	2.32	110.3
		60.8		26.57											
1	1	0.00	10.84	26.57	0.72	0.35	286	83	81	0.38	3.5	59.1	10.09	2.31	98.5
	2	10.8	10.78	30.38	0.71	0.35	286	84	81	0.38	3.5	58.7	10.19	2.35	97.9
	3	21.6	10.37	34.12	0.68	0.35	286	84	82	0.38	3.5	57.4	10.13	2.33	100.8
	4	32.0	9.58	37.75	0.64	0.35	285	84	80	0.38	3.5	55.7	10.12	2.33	103.9
	5	41.6	8.80	41.10	0.50	0.35	285	86	84	0.38	3.5	49.2	10.18	2.35	116.7
	6	50.4	8.88	44.17	0.52	0.35	285	87	84	0.38	3.5	50.2	10.32	2.41	112.1
		59.2		47.21											
Averages					**0.65**		**286**	**81**		**0.38**		**56.1**	**10.11**	**2.31**	**103.1**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 2

Project No.: 21936
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	0.99
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.25
Static Pressure ("H_2O)	-7.80
Oxygen Content (%)	8.40
Carbon Dioxide Content (%)	10.60
Carbon Monoxide Content (PPM)	15
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.5 l/min*
Cyclone Qs_{actual}	0.58 ft^3/min	16.3 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.3 Rft^3*	1.141 Rm^3*
Average Cyclone I Cut Diameter		10.41 µm
Average Cyclone IV Cut Diameter		2.44 µm
Average Isokineticity		98.8 %
Stack Gas Physical Parameters		
B_{ws}	15.9 % v/v	
Average m	220.0 (dimensionless)	
M_d	30.03 lbs/lbs mole	
M_w	28.12 lbs/lbs mole	
Average T_s	283 °F	140 °C
Average U_s	56.3 ft/s	17.2 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53826 ACFM	25.4 m^3/s
Wet Reference Q_s	37265 SCFM*	17.6 Rm^3/s*
Dry Reference Q_s	31353 SCFM*	14.8 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	3.24 mg/Rm^3*	0.0480 g/s
Total Part. (b)	13.49 mg/Rm^3*	0.200 g/s
PM_{10} Part. (b)	13.06 mg/Rm^3*	0.193 g/s
$PM_{2.5}$ Part. (b)	12.70 mg/Rm^3*	0.188 g/s
Cond. Part.	10.25 mg/Rm^3*	0.152 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)	490.8	580.5	780.6		921.6
final volume or weight (ml or mg)	638.1	580.5	776.2		937.0
gain in volume or weight (ml or mg)	147.3	0.0	-4.4	0.0	15.4
				TOTAL	158.3

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.5	0.4	0.3	2.5	11.7

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21936
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	10.62	59.60	0.72	0.35	280	72	73	0.38	3.0	58.8	10.30	2.39	95.7
	2	10.6	10.69	63.30	0.68	0.35	281	72	71	0.38	3.0	57.2	10.49	2.47	96.1
	3	21.3	10.49	66.92	0.67	0.35	281	73	74	0.38	3.0	56.8	10.95	2.66	91.2
	4	31.8	10.02	70.28	0.63	0.35	282	73	74	0.38	3.0	55.1	11.12	2.73	92.1
	5	41.8	9.66	73.42	0.58	0.35	282	72	73	0.38	3.0	52.9	10.02	2.28	111.1
	6	51.5	8.99	76.92	0.55	0.35	283	73	74	0.38	3.0	51.5	10.51	2.48	106.7
		60.5		79.97											
2	1	0.00	10.43	79.97	0.75	0.35	282	73	73	0.38	3.0	60.1	10.23	2.36	94.9
	2	10.4	10.36	83.64	0.74	0.35	286	73	73	0.38	3.0	59.9	10.17	2.35	96.6
	3	20.8	10.29	87.32	0.72	0.35	286	73	74	0.38	3.0	59.1	10.27	2.38	96.7
	4	31.1	10.02	90.93	0.67	0.35	286	73	73	0.38	3.0	57.0	10.15	2.34	101.9
	5	41.1	9.44	94.50	0.62	0.35	286	73	74	0.38	3.0	54.8	10.26	2.38	104.4
	6	50.5	8.99	97.82	0.57	0.35	286	73	74	0.38	3.0	52.6	10.47	2.47	105.7
		59.5		100.89											
Averages					**0.66**		**283**	**73**		**0.38**		**56.3**	**10.41**	**2.44**	**98.8**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 2

Project No.: 21936
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	0.99
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.31
Static Pressure ("H_2O)	-7.80
Oxygen Content (%)	8.22
Carbon Dioxide Content (%)	10.71
Carbon Monoxide Content (PPM)	19
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.9 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.8 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.0 Rft^3*	1.188 Rm^3*
Average Cyclone I Cut Diameter		10.19 µm
Average Cyclone IV Cut Diameter		2.35 µm
Average Isokineticity		103.6 %
Stack Gas Physical Parameters		
B_{ws}	15.2 % v/v	
Average m	220.6 (dimensionless)	
M_d	30.04 lbs/lbs mole	
M_w	28.22 lbs/lbs mole	
Average T_s	284 °F	140 °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	53013 ACFM	25.0 m^3/s
Wet Reference Q_s	36758 SCFM*	17.3 Rm^3/s*
Dry Reference Q_s	31185 SCFM*	14.7 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	3.11 mg/Rm^3*	0.0458 g/s
Total Part. (b)	8.58 mg/Rm^3*	0.126 g/s
PM_{10} Part. (b)	8.16 mg/Rm^3*	0.120 g/s
$PM_{2.5}$ Part. (b)	7.83 mg/Rm^3*	0.115 g/s
Cond. Part.	5.47 mg/Rm^3*	0.081 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)	531.1	653.7	764.5		893.0
final volume or weight (ml or mg)	680.9	653.7	763.4		900.5
gain in volume or weight (ml or mg)	149.8	0.0	-1.1	0.0	7.5
				TOTAL	156.2

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.5	0.4	<0.1	2.7	6.5

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21936
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	10.47	1.17	0.73	0.35	285	73	72	0.38	3.0	59.3	10.25	2.37	96.5
	2	10.5	10.18	4.88	0.70	0.35	285	72	73	0.38	3.0	58.0	10.53	2.48	94.9
	3	20.6	10.10	8.35	0.67	0.35	284	72	73	0.38	3.0	56.7	9.89	2.23	105.8
	4	30.7	9.79	12.11	0.59	0.35	283	73	74	0.38	3.0	53.2	10.20	2.35	107.9
	5	40.5	9.40	15.61	0.54	0.35	283	73	74	0.38	3.0	50.9	10.17	2.34	113.2
	6	49.9	9.15	18.98	0.53	0.35	283	73	74	0.38	3.0	50.4	10.09	2.30	115.6
		59.1		22.30											
2	1	0.00	10.69	22.30	0.70	0.35	282	73	74	0.38	3.0	57.9	9.74	2.17	105.5
	2	10.7	10.62	26.37	0.70	0.35	283	73	74	0.38	3.0	58.0	10.34	2.40	97.2
	3	21.3	10.47	30.09	0.67	0.35	284	73	74	0.38	3.0	56.7	10.26	2.37	100.5
	4	31.8	10.10	33.80	0.65	0.35	284	73	74	0.38	3.0	55.9	10.36	2.41	100.6
	5	41.9	9.72	37.33	0.63	0.35	285	74	76	0.38	3.0	55.1	10.37	2.42	102.1
	6	51.6	9.32	40.73	0.59	0.35	285	74	76	0.38	3.0	53.3	10.13	2.32	109.1
		60.9		44.10											
Averages					**0.64**		**284**	**73**		**0.38**		**55.5**	**10.19**	**2.35**	**103.6**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	June 25, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 2

Project No.: 21936
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	0.99
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.34
Static Pressure ("H_2O)	-7.80
Oxygen Content (%)	8.31
Carbon Dioxide Content (%)	10.69
Carbon Monoxide Content (PPM)	12.6
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1776

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.7 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.8 l/min
Stack Gas Sampling Parameters		
V_{ms}	40.9 Rft^3*	1.159 Rm^3*
Average Cyclone I Cut Diameter		10.19 µm
Average Cyclone IV Cut Diameter		2.36 µm
Average Isokineticity		100.8 %
Stack Gas Physical Parameters		
B_{ws}	17.0 % v/v	
Average m	220.2 (dimensionless)	
M_d	30.04 lbs/lbs mole	
M_w	27.99 lbs/lbs mole	
Average T_s	287 °F	142 °C
Average U_s	56.9 ft/s	17.4 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	54422 ACFM	25.7 m^3/s
Wet Reference Q_s	37610 SCFM*	17.8 Rm^3/s*
Dry Reference Q_s	31200 SCFM*	14.7 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	3.28 mg/Rm^3*	0.0483 g/s
Total Part. (b)	7.85 mg/Rm^3*	0.116 g/s
PM_{10} Part. (b)	7.60 mg/Rm^3*	0.112 g/s
$PM_{2.5}$ Part. (b)	7.42 mg/Rm^3*	0.109 g/s
Cond. Part.	4.57 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)	490.8	580.5	776.2		937.0
final volume or weight (ml or mg)	656.3	581.6	773.2		948.5
gain in volume or weight (ml or mg)	165.5	1.1	-3.0	0.0	11.5
				TOTAL	175.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.3	0.2	0.4	2.9	5.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: June 25, 2019	Plant: DYEC	Test No.: 3	Project No.: 21936
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	10.68	45.73	0.78	0.35	286	75	75	0.38	5.0	61.5	10.02	2.29	95.7
	2	10.7	10.46	49.55	0.74	0.35	287	75	77	0.38	5.0	60.0	10.16	2.34	96.5
	3	21.1	10.23	53.23	0.72	0.35	288	76	78	0.38	5.0	59.2	10.07	2.31	99.1
	4	31.4	9.60	56.88	0.66	0.35	288	77	79	0.38	5.0	56.7	10.23	2.37	101.3
	5	41.0	9.19	60.24	0.57	0.35	287	77	79	0.38	5.0	52.6	9.95	2.26	113.2
	6	50.2	9.10	63.58	0.54	0.35	287	77	79	0.38	5.0	51.2	10.06	2.30	114.6
		59.3		66.84											
2	1	0.00	10.46	66.84	0.72	0.35	287	78	78	0.38	5.0	59.2	10.38	2.43	94.8
	2	10.5	10.46	70.42	0.73	0.35	288	78	79	0.38	5.0	59.6	10.44	2.45	93.6
	3	20.9	10.23	73.98	0.72	0.35	287	78	79	0.38	5.0	59.2	10.35	2.42	95.2
	4	31.1	10.08	77.50	0.67	0.35	287	78	79	0.38	5.0	57.1	10.29	2.39	99.7
	5	41.2	9.92	81.00	0.62	0.35	287	78	79	0.38	5.0	54.9	10.19	2.36	104.9
	6	51.1	9.60	84.49	0.56	0.35	286	78	79	0.38	5.0	52.1	10.16	2.34	110.7
		60.7		87.88											
Averages					**0.67**		**287**	**78**		**0.38**		**56.9**	**10.19**	**2.36**	**100.8**

APPENDIX 24

Acid Gases Test Emission Calculations
(12 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	1 - M26A
Date:	June 25, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.999
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.190 m^3
AVGERGE ISOKINETICITY	99.5 %
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	141.8 °C
AVERAGE GAS MOISTURE BY VOLUME	15.2 %
AVERAGE GAS VELOCITY	17.97 m/s
BAROMETRIC PRESSURE (Station)	98.984 Kpa
STATIC PRESSURE	-1.818 Kpa
ABSOLUTE GAS PRESSURE	97.166 Kpa
OXYGEN CONCENTRATION	8.6 %
CARBON DIOXIDE CONCENTRATION	10.62 %
CARBON MONOXIDE CONCENTRATION	14.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.54 m^3/s
DRY REF GAS FLOWRATE	15.50 Rm^3/s
DRY ADJ GAS FLOWRATE	19.26 Rm^3/s
WET REF GAS FLOWRATE	18.30 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.190 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

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	JB

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	0.999	**Probe (mg)**	0
Barometric Pressure	29.23 "Hg	**CWTR (g)**	145.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	11.7
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	1
		Number of points / Port	12

Combustion Gases	
O2%	8.6
CO2%	10.62
COppm	14.0

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	609.95	0.95	288	58	71	71	2.2	6.0		20.56	
2	5	613.85	0.92	288	59	72	72	2.15	6.0		20.23	96.2
3	10	617.86	0.83	288	60	72	72	2	6.0		19.22	100.3
4	15	621.70	0.77	287	62	72	72	1.8	6.0		18.50	101.1
5	20	625.25	0.67	287	64	73	73	1.6	5.5		17.25	96.9
6	25	628.72	0.64	287	62	73	73	1.5	5.3		16.86	101.3
7	30	632.01	0.68	287	59	74	74	1.6	5.3		17.38	98.3
8	35	635.47	0.69	288	55	74	74	1.6	5.3		17.52	100.1
9	40	638.95	0.69	287	52	74	74	1.6	5.3		17.51	100.0
10	45	642.36	0.68	287	52	74	74	1.6	5.3		17.38	97.9
11	50	645.85	0.62	286	52	75	75	1.5	5.0		16.59	101.0
12	55	649.20	0.62	286	52	74	74	1.5	5.0		16.59	101.2
	60	652.50										99.9

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	2 - M26A
Date:	June 25, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.999
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.210 m^3
AVGERGE ISOKINETICITY	100.8 %
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	141.9 °C
AVERAGE GAS MOISTURE BY VOLUME	15.5 %
AVERAGE GAS VELOCITY	18.06 m/s
BAROMETRIC PRESSURE (Station)	99.052 Kpa
STATIC PRESSURE	-1.818 Kpa
ABSOLUTE GAS PRESSURE	97.234 Kpa
OXYGEN CONCENTRATION	8.38 %
CARBON DIOXIDE CONCENTRATION	10.81 %
CARBON MONOXIDE CONCENTRATION	20.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.68 m^3/s
DRY REF GAS FLOWRATE	15.54 Rm^3/s
DRY ADJ GAS FLOWRATE	19.65 Rm^3/s
WET REF GAS FLOWRATE	18.40 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, Ontario
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	JB

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	0.999	**Probe (mg)**	0
Barometric Pressure	29.25 "Hg	**CWTR (g)**	148.9
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	14.8
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	1
		Number of points / Port	12

Combustion Gases	
O2%	8.38
CO2%	10.81
COppm	20.6

Measured H2O
15.5 %

				Temperatures						Leak		
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Check Volume	Velocity m/s	Isokinetic %
1	0	652.95	0.82	286	62	73	73	2	5.5		19.07	
2	5	656.78	0.85	287	51	73	73	2	5.5		19.43	**101.5**
3	10	660.67	0.81	287	49	73	73	1.9	5.3		18.97	**101.3**
4	15	664.41	0.74	288	50	73	73	1.75	5.3		18.14	**99.7**
5	20	668.04	0.68	288	52	73	73	1.6	5.0		17.39	**101.3**
6	25	671.48	0.64	288	52	73	73	1.5	5.0		16.87	**100.1**
7	30	674.83	0.71	288	54	73	74	1.7	5.3		17.77	**100.5**
8	35	678.45	0.73	288	54	74	74	1.7	5.3		18.02	**103.0**
9	40	682.06	0.72	288	55	74	74	1.7	5.3		17.90	**101.2**
10	45	685.62	0.69	287	56	74	74	1.6	5.3		17.51	**100.5**
11	50	689.08	0.73	287	58	74	74	1.7	5.3		18.01	**99.7**
12	55	692.64	0.7	286	59	74	74	1.7	5.3		17.62	**99.8**
	60	696.18										**101.2**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	3 - M26A
Date:	June 25, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.999
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.184 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	142.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	17.81 m/s
BAROMETRIC PRESSURE (Station)	99.187 Kpa
STATIC PRESSURE	-1.818 Kpa
ABSOLUTE GAS PRESSURE	97.370 Kpa
OXYGEN CONCENTRATION	8.34 %
CARBON DIOXIDE CONCENTRATION	10.72 %
CARBON MONOXIDE CONCENTRATION	17.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.31 m^3/s
DRY REF GAS FLOWRATE	15.29 Rm^3/s
DRY ADJ GAS FLOWRATE	19.39 Rm^3/s
WET REF GAS FLOWRATE	18.14 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.184 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 - M26A	**Test Location:**	APC Outlet No. 1
Date:	June 25, 2019	**Operator:**	JB

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	0.999	**Probe (mg)**	0
Barometric Pressure	29.29 "Hg	**CWTR (g)**	152.7
Static Pressure	-7.300 "H_2O	**WCBDA (g)**	9.2
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	1
		Number of points / Port	12

Combustion Gases	
O2%	8.34
CO2%	10.72
COppm	17.6

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	696.85	0.71	287	58	73	74	1.65	5.0		17.76	
2	5	700.36	0.71	287	47	74	74	1.65	5.0		17.76	100.0
3	10	703.84	0.68	287	44	74	74	1.6	5.0		17.38	99.1
4	15	707.29	0.7	288	45	74	74	1.65	5.0		17.64	100.3
5	20	710.82	0.71	289	46	74	74	1.65	5.0		17.78	101.3
6	25	714.34	0.67	289	46	74	74	1.55	5.0		17.27	100.3
7	30	717.62	0.61	289	46	74	74	1.4	5.0		16.48	96.2
8	35	720.87	0.67	289	47	74	74	1.55	5.0		17.27	99.9
9	40	724.30	0.73	290	48	75	75	1.7	5.8		18.04	100.6
10	45	727.93	0.77	290	49	75	75	1.9	6.0		18.53	101.9
11	50	731.68	0.8	290	50	75	75	1.9	6.0		18.89	102.6
12	55	735.43	0.8	289	52	75	75	1.8	6.0		18.87	100.6
	60	739.17										100.3

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 - M26A
Date:	June 26, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.99
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.198 m^3
AVGERGE ISOKINETICITY	100.8 %
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	140.2 $^{\circ}C$
AVERAGE GAS MOISTURE BY VOLUME	16.8 %
AVERAGE GAS VELOCITY	18.00 m/s
BAROMETRIC PRESSURE (Station)	99.729 Kpa
STATIC PRESSURE	-1.967 Kpa
ABSOLUTE GAS PRESSURE	97.762 Kpa
OXYGEN CONCENTRATION	8.25 %
CARBON DIOXIDE CONCENTRATION	10.70 %
CARBON MONOXIDE CONCENTRATION	11.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.59 m^3/s
DRY REF GAS FLOWRATE	15.40 Rm^3/s
DRY ADJ GAS FLOWRATE	19.68 Rm^3/s
WET REF GAS FLOWRATE	18.51 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.198 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 - M26A	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	JB

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	0.99	**Probe (mg)**	0
Barometric Pressure	29.45 "Hg	**CWTR (g)**	163.3
Static Pressure	-7.900 "H_2O	**WCBDA (g)**	14
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	1
		Number of points / Port	12

Combustion Gases	
O2%	8.25
CO2%	10.70
COppm	11.9

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	288.34	0.9	283	67	72	73	2.1	4.0		19.95	
2	5	292.27	0.89	284	54	72	72	2.1	4.0		19.85	**100.0**
3	10	296.24	0.89	285	52	72	73	2.1	4.0		19.86	**101.7**
4	15	299.99	0.84	285	53	72	73	2	4.0		19.30	**96.0**
5	20	303.83	0.75	285	53	73	74	1.75	4.0		18.23	**101.2**
6	25	307.47	0.64	285	54	73	74	1.5	4.0		16.84	**101.3**
7	30	310.87	0.66	285	55	74	76	1.55	4.0		17.10	**102.3**
8	35	314.27	0.66	285	55	73	77	1.55	4.0		17.10	**100.5**
9	40	317.69	0.68	284	55	73	77	1.6	4.0		17.35	**101.1**
10	45	321.15	0.67	284	55	73	78	1.6	4.0		17.22	**100.7**
11	50	324.64	0.62	284	56	73	79	1.45	4.0		16.57	**102.2**
12	55	327.98	0.62	284	57	74	79	1.45	4.0		16.57	**101.6**
	60	331.30										**100.9**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 - M26A
Date:	June 26, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.99
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.214 m^3
AVGERGE ISOKINETICITY	101.8 %
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	141.1 °C
AVERAGE GAS MOISTURE BY VOLUME	16.6 %
AVERAGE GAS VELOCITY	18.04 m/s
BAROMETRIC PRESSURE (Station)	99.729 Kpa
STATIC PRESSURE	-1.967 Kpa
ABSOLUTE GAS PRESSURE	97.762 Kpa
OXYGEN CONCENTRATION	8.13 %
CARBON DIOXIDE CONCENTRATION	11.00 %
CARBON MONOXIDE CONCENTRATION	12.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.66 m^3/s
DRY REF GAS FLOWRATE	15.44 Rm^3/s
DRY ADJ GAS FLOWRATE	19.92 Rm^3/s
WET REF GAS FLOWRATE	18.52 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.214 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 - M26A	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	JB

Pitot Factor	0.845	Filter (mg)	0
DGMCF	0.99	Probe (mg)	0
Barometric Pressure	29.45 "Hg	CWTR (g)	163.1
Static Pressure	-7.900 "H_2O	WCBDA (g)	14.4
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	Leak Check Volume	0 ft^3
Length	0.000 ft	Reading Interval	5 minutes
Width	0.000 ft	Number of Ports	1
		Number of points / Port	12

Combustion Gases	
O2%	8.13
CO2%	11.00
COppm	12.2

Measured H2O
16.6 %

				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	331.86	0.93	285	68	73	74	2.2	4.0		20.28	
2	5	335.92	0.92	286	67	73	73	2.2	4.0		20.19	101.4
3	10	340.02	0.88	286	67	73	74	2.1	4.0		19.74	103.2
4	15	344.01	0.83	286	62	73	76	2	4.0		19.18	102.5
5	20	347.87	0.76	287	59	73	77	1.8	4.0		18.36	101.9
6	25	351.55	0.61	287	57	74	79	1.45	3.5		16.45	101.5
7	30	354.89	0.69	286	57	74	79	1.65	3.5		17.48	102.4
8	35	358.39	0.72	286	59	74	79	1.7	3.5		17.86	100.9
9	40	361.99	0.71	286	60	75	80	1.7	3.5		17.74	101.6
10	45	365.56	0.7	286	61	75	81	1.7	3.5		17.61	101.3
11	50	369.14	0.56	285	63	76	81	1.3	3.5		15.74	102.2
12	55	372.33	0.57	285	65	76	81	1.35	3.5		15.88	101.5
	60	375.55										101.6

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 - M26A
Date:	June 26, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	0.99
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	1.221 m^3
AVGERGE ISOKINETICITY	102.4 %
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	140.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	18.17 m/s
BAROMETRIC PRESSURE (Station)	99.729 Kpa
STATIC PRESSURE	-1.967 Kpa
ABSOLUTE GAS PRESSURE	97.762 Kpa
OXYGEN CONCENTRATION	8.09 %
CARBON DIOXIDE CONCENTRATION	11.10 %
CARBON MONOXIDE CONCENTRATION	10.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.85 m^3/s
DRY REF GAS FLOWRATE	15.44 Rm^3/s
DRY ADJ GAS FLOWRATE	19.98 Rm^3/s
WET REF GAS FLOWRATE	18.67 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.221 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 - M26A	**Test Location:**	APC Outlet No. 2
Date:	June 26, 2019	**Operator:**	JB

Pitot Factor	0.845	Filter (mg)	0
DGMCF	0.99	Probe (mg)	0
Barometric Pressure	29.45 "Hg	CWTR (g)	176.4
Static Pressure	-7.900 "H_2O	WCBDA (g)	11
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	Leak Check Volume	0 ft^3
Length	0.000 ft	Reading Interval	5 minutes
Width	0.000 ft	Number of Ports	1
		Number of points / Port	12

Combustion Gases	
O2%	8.09
CO2%	11.10
COppm	10.2

Measured H2O
17.3 %

				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	376.08	0.9	285	67	75	75	2.15	4.5		19.98	
2	5	380.12	0.87	286	60	75	75	2.05	4.0		19.66	103.0
3	10	384.03	0.86	285	57	75	75	2.05	4.0		19.53	101.5
4	15	387.90	0.81	283	57	75	77	1.95	4.0		18.93	100.9
5	20	391.73	0.74	284	57	76	78	1.8	4.0		18.10	102.6
6	25	395.38	0.68	286	57	75	80	1.6	4.0		17.38	102.1
7	30	398.89	0.68	285	58	76	81	1.6	4.0		17.37	102.4
8	35	402.39	0.7	286	59	76	82	1.7	4.0		17.63	101.9
9	40	405.98	0.7	286	57	77	82	1.7	4.0		17.63	103.0
10	45	409.57	0.71	285	54	77	82	1.7	4.0		17.75	102.9
11	50	413.16	0.64	285	53	77	83	1.55	4.0		16.85	102.1
12	55	416.62	0.67	285	53	78	83	1.6	4.0		17.24	103.5
	60	420.16										103.4

APPENDIX 25

SVOC Test Emission Calculations
(18 pages)

ORTECH Environmental

Plant: Covanta DYEC
Plant Location: Courtice, ON
Test Location: APC Outlet No. 1
Test No.: 1 SVOC
Date: June 27, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	1.001
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	4.778 m^3
AVGERGE ISOKINETICITY	100.4 %
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	141.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	18.04 m/s
BAROMETRIC PRESSURE (Station)	100.474 Kpa
STATIC PRESSURE	-1.992 Kpa
ABSOLUTE GAS PRESSURE	98.482 Kpa
OXYGEN CONCENTRATION	8.41 %
CARBON DIOXIDE CONCENTRATION	10.87 %
CARBON MONOXIDE CONCENTRATION	12.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.66 m^3/s
DRY REF GAS FLOWRATE	15.42 Rm^3/s
DRY ADJ GAS FLOWRATE	19.46 Rm^3/s
WET REF GAS FLOWRATE	18.63 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.778 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 SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 27, 2019	**Operator:**	RW

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	1.001	**Probe (mg)**	0
Barometric Pressure	29.67 "Hg	**CWTR (g)**	704
Static Pressure	-8.000 "H_2O	**WCBDA (g)**	24.9
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.35 ft^3
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%	10.87
COppm	12.1

Measured H2O
17.2 %

				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	47.57	0.86	284	76	77	76	2	5.0		19.45	
	5	51.29	0.9	286	64	77	77	2	5.0		19.92	98.0
2	10	55.07	0.88	286	57	78	76	2	5.0		19.70	97.4
	15	58.86	0.88	287	54	79	77	2	5.0		19.71	98.7
3	20	62.64	0.83	288	52	81	77	2	5.0		19.16	98.4
	25	66.40	0.83	287	50	83	77	2	5.0		19.15	100.6
4	30	70.15	0.75	287	50	83	77	1.8	5.0		18.20	100.1
	35	73.84	0.75	287	50	85	78	1.8	5.0		18.20	103.6
5	40	77.48	0.7	287	50	85	78	1.7	5.0		17.58	101.9
	45	81.03	0.72	287	51	86	79	1.7	5.0		17.83	102.8
6	50	84.57	0.65	287	51	86	79	1.6	5.0		16.94	100.9
	55	87.98	0.66	287	51	86	80	1.6	5.0		17.07	102.3
7	60	91.39	0.7	287	52	86	79	1.6	5.0		17.58	101.4
	65	94.79	0.7	288	53	87	80	1.6	5.0		17.59	98.3
8	70	98.19	0.72	287	53	87	80	1.6	5.0		17.83	98.2
	75	101.66	0.72	287	54	88	81	1.6	5.0		17.83	98.7
9	80	105.16	0.72	287	55	87	80	1.6	5.0		17.83	99.4
	85	108.66	0.72	287	56	88	81	1.6	5.0		17.83	99.6
10	90	112.15	0.75	287	55	88	81	1.8	5.0		18.20	99.1
	95	115.80	0.76	287	56	88	81	1.8	5.0		18.32	101.6
11	100	119.46	0.6	286	56	88	81	1.5	5.0		16.27	101.2
	105	122.89	0.6	286	58	88	81	1.5	5.0		16.27	106.6
12	110	126.25	0.6	286	58	88	82	1.5	5.0		16.27	104.4
	115	129.62	0.6	286	59	88	82	1.5	5.0		16.27	104.6
	120	132.95								0.35		103.4
1	0	133.30	0.89	286	66	84	82	2.1	6.0		19.81	
	5	137.07	0.9	287	66	84	82	2.1	6.0		19.94	96.6
2	10	140.98	0.88	287	63	85	82	2.1	6.0		19.71	99.7
	15	144.90	0.9	287	60	86	82	2.1	6.0		19.94	101.0
3	20	148.78	0.88	287	61	87	82	2.1	6.0		19.71	98.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 27, 2019	**Operator:**	RW

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	1.001	**Probe (mg)**	0
Barometric Pressure	29.67 "Hg	**CWTR (g)**	704
Static Pressure	-8.000 "H_2O	**WCBDA (g)**	24.9
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.35 ft^3
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%	10.87
COppm	12.1

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 %
	25	152.68	0.88	287	61	87	82	2.1	6.0		19.71	100.3
4	30	156.57	0.8	287	63	88	82	2	6.0		18.80	100.0
	35	160.42	0.8	288	62	89	82	2	6.0		18.81	103.7
5	40	164.24	0.72	289	66	88	82	1.7	5.5		17.86	102.9
	45	167.82	0.7	289	65	89	82	1.7	5.5		17.61	101.7
6	50	171.40	0.64	288	65	89	82	1.5	5.0		16.82	103.1
	55	174.75	0.65	288	63	89	83	1.5	5.0		16.95	100.8
7	60	178.07	0.67	288	62	89	83	1.5	5.0		17.21	99.0
	65	181.42	0.7	288	61	90	83	1.5	5.0		17.59	98.4
8	70	184.75	0.7	287	61	90	83	1.6	5.0		17.58	95.6
	75	188.15	0.7	287	60	90	83	1.6	5.0		17.58	97.6
9	80	191.59	0.7	288	60	91	83	1.6	5.0		17.59	98.7
	85	195.06	0.7	286	60	91	84	1.6	5.0		17.57	99.5
10	90	198.56	0.7	286	60	91	84	1.6	5.0		17.57	100.2
	95	201.99	0.71	287	56	91	84	1.6	5.0		17.71	98.2
11	100	205.45	0.68	287	55	91	84	1.6	5.5		17.33	98.4
	105	208.93	0.68	286	55	91	84	1.6	5.5		17.32	101.1
12	110	212.39	0.68	286	56	91	85	1.6	5.5		17.32	100.5
	115	215.83	0.66	286	55	91	85	1.6	5.5		17.06	99.8
	120	219.24										100.4

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 SVOC
Date:	June 27, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.999
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	4.830 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	141.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.5 %
AVERAGE GAS VELOCITY	18.35 m/s
BAROMETRIC PRESSURE (Station)	100.373 Kpa
STATIC PRESSURE	-1.992 Kpa
ABSOLUTE GAS PRESSURE	98.381 Kpa
OXYGEN CONCENTRATION	8.15 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	16.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.11 m^3/s
DRY REF GAS FLOWRATE	15.62 Rm^3/s
DRY ADJ GAS FLOWRATE	20.11 Rm^3/s
WET REF GAS FLOWRATE	18.93 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.830 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. 1
Date:	June 27, 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	0.999	**Probe (mg)**	0
Barometric Pressure	29.64 "Hg	**CWTR (g)**	735.7
Static Pressure	-8.000 "H_2O	**WCBDA (g)**	15.8
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.37 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.15
CO2%	11.01
COppm	16.9

Measured H2O
17.5 %

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	969.23	0.87	287	68	79	79	2	9.0		19.76	
	5	972.99	0.87	287	57	79	79	2	9.0		19.76	97.7
2	10	976.87	0.89	288	52	82	79	2.05	9.0		20.00	100.8
	15	980.82	0.89	288	50	84	80	2.05	9.0		20.00	101.2
3	20	984.75	0.86	289	48	85	80	2	9.0		19.67	100.4
	25	988.65	0.87	289	47	86	80	2	9.0		19.79	101.4
4	30	992.56	0.86	290	47	87	81	2	9.0		19.68	100.9
	35	996.49	0.84	290	47	87	81	1.95	9.0		19.45	101.9
5	40	1000.35	0.79	290	47	88	81	1.85	9.0		18.87	101.3
	45	1004.11	0.8	290	48	88	82	1.85	9.0		18.99	101.6
6	50	1007.86	0.74	290	48	89	82	1.7	9.0		18.26	100.6
	55	1011.48	0.74	290	48	88	82	1.7	9.0		18.26	100.9
7	60	1015.09	0.78	290	49	88	82	1.8	9.0		18.75	100.7
	65	1018.80	0.78	290	49	88	82	1.8	9.0		18.75	100.8
8	70	1022.52	0.79	289	48	89	83	1.8	9.0		18.85	101.1
	75	1026.24	0.78	289	48	89	83	1.8	9.0		18.73	100.2
9	80	1029.97	0.77	289	49	89	83	1.75	9.0		18.61	101.1
	85	1033.63	0.76	288	49	89	84	1.75	9.0		18.48	99.8
10	90	1037.29	0.75	287	49	89	84	1.75	9.0		18.35	100.3
	95	1040.93	0.74	287	50	90	84	1.75	9.0		18.22	100.4
11	100	1044.60	0.69	286	49	90	84	1.6	8.5		17.59	101.8
	105	1048.10	0.69	285	50	89	84	1.6	8.5		17.57	100.4
12	110	1051.57	0.69	285	50	90	84	1.6	8.5		17.57	99.6
	115	1055.05	0.68	285	50	90	86	1.6	8.5		17.45	99.8
	120	1058.53								0.37		100.3
1	0	1058.90	0.84	285	54	85	84	1.9	8.5		19.39	
	5	1062.73	0.84	285	53	86	84	1.9	8.5		19.39	100.1
2	10	1066.54	0.84	285	53	87	84	1.9	8.5		19.39	99.4
	15	1070.36	0.85	285	53	88	84	1.95	8.5		19.50	99.6
3	20	1074.22	0.83	285	55	89	84	1.95	8.5		19.27	100.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 27, 2019	**Operator:**	RW

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	0.999	**Probe (mg)**	0
Barometric Pressure	29.64 "Hg	**CWTR (g)**	735.7
Static Pressure	-8.000 "H_2O	**WCBDA (g)**	15.8
Nozzle	0.2499 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.37 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.15
CO2%	11.01
COppm	16.9

Measured H2O
17.5 %

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	1078.06	0.83	285	57	90	84	1.95	8.5		19.27	100.6
4	30	1081.91	0.79	286	55	89	84	1.8	8.5		18.82	100.7
	35	1085.62	0.79	287	56	90	84	1.8	8.5		18.83	99.6
5	40	1089.34	0.7	286	55	90	85	1.6	8.5		17.71	99.9
	45	1092.90	0.69	286	56	90	85	1.5	8.5		17.59	101.3
6	50	1096.36	0.61	286	54	91	85	1.4	8.3		16.53	99.1
	55	1099.68	0.62	286	54	91	85	1.4	8.3		16.67	101.1
7	60	1102.99	0.67	287	52	91	85	1.5	8.3		17.34	99.9
	65	1106.38	0.67	286	52	91	85	1.5	8.3		17.33	98.6
8	70	1109.80	0.69	286	51	91	86	1.6	8.3		17.59	99.4
	75	1113.28	0.68	286	50	92	86	1.6	8.3		17.46	99.6
9	80	1116.75	0.68	286	50	92	86	1.6	8.3		17.46	99.9
	85	1120.22	0.7	287	51	92	86	1.6	8.3		17.72	99.9
10	90	1123.72	0.69	287	51	92	86	1.6	8.3		17.60	99.4
	95	1127.21	0.69	286	51	94	87	1.6	8.3		17.59	99.8
11	100	1130.71	0.62	286	51	95	87	1.4	8.3		16.67	99.8
	105	1134.08	0.63	285	51	95	87	1.4	8.3		16.79	101.2
12	110	1137.44	0.63	285	51	97	87	1.4	8.3		16.79	100.0
	115	1140.79	0.62	279	51	97	88	1.4	8.3		16.59	99.6
	120	1144.12										99.3

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 SVOC
Date:	June 28, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.845
DGM CORRECTION FACTOR	1.001
NOZZLE DIAMETER	6.35 mm
DRY REF GAS VOLUME SAMPLED	4.686 m^3
AVGERGE ISOKINETICITY	100.7 %
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	141.1 °C
AVERAGE GAS MOISTURE BY VOLUME	17.5 %
AVERAGE GAS VELOCITY	17.70 m/s
BAROMETRIC PRESSURE (Station)	100.440 Kpa
STATIC PRESSURE	-2.067 Kpa
ABSOLUTE GAS PRESSURE	98.374 Kpa
OXYGEN CONCENTRATION	8.18 %
CARBON DIOXIDE CONCENTRATION	11.05 %
CARBON MONOXIDE CONCENTRATION	11.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.16 m^3/s
DRY REF GAS FLOWRATE	15.08 Rm^3/s
DRY ADJ GAS FLOWRATE	19.37 Rm^3/s
WET REF GAS FLOWRATE	18.28 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.686 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. 1
Date:	June 28, 2019	**Operator:**	AS

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	1.001	**Probe (mg)**	0
Barometric Pressure	29.66 "Hg	**CWTR (g)**	711.8
Static Pressure	-8.300 "H_2O	**WCBDA (g)**	19.2
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.45 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.18
CO2%	11.05
COppm	11.4

Measured H2O
17.5 %

				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	20.23	0.96	286	67	76	75	2.3	5.5		20.60	
	5	24.17	0.93	289	66	76	75	2.2	5.5		20.31	**99.0**
2	10	28.11	0.94	289	58	77	75	2.2	5.5		20.42	**100.8**
	15	32.06	0.91	290	55	78	76	2.2	5.5		20.11	**100.4**
3	20	36.00	0.84	289	53	81	76	2	5.5		19.30	**101.6**
	25	39.78	0.86	290	54	81	76	2	5.5		19.55	**101.1**
4	30	43.57	0.77	289	52	82	76	1.8	5.0		18.48	**100.2**
	35	47.17	0.78	289	52	83	77	1.8	5.0		18.60	**100.4**
5	40	50.76	0.73	290	53	83	78	1.7	5.0		18.01	**99.3**
	45	54.27	0.74	288	53	84	78	1.7	5.0		18.11	**100.3**
6	50	57.78	0.65	288	53	85	78	1.5	4.5		16.97	**99.4**
	55	61.17	0.63	287	52	85	78	1.5	4.5		16.70	**102.3**
7	60	64.49	0.68	289	53	85	78	1.6	4.5		17.37	**101.7**
	65	67.91	0.68	287	53	86	79	1.6	4.5		17.35	**101.0**
8	70	71.31	0.7	287	54	86	79	1.7	4.5		17.60	**100.1**
	75	74.76	0.72	286	54	86	79	1.7	5.0		17.84	**100.1**
9	80	78.23	0.71	287	55	86	80	1.7	5.0		17.72	**99.2**
	85	81.73	0.71	286	55	87	80	1.7	5.0		17.71	**100.8**
10	90	85.22	0.7	286	55	87	81	1.7	5.0		17.59	**100.3**
	95	88.72	0.69	285	56	87	81	1.7	5.0		17.45	**101.2**
11	100	92.20	0.61	285	57	87	81	1.5	4.5		16.41	**101.3**
	105	95.45	0.63	278	56	87	81	1.5	4.5		16.60	**100.6**
12	110	98.82	0.62	277	55	87	81	1.5	4.5		16.45	**102.1**
	115	102.17	0.62	277	55	87	81	1.5	4.5		16.45	**102.3**
	120	105.39								0.45		**98.3**
1	0	105.84	0.81	281	58	85	82	2	5.5		18.86	
	5	109.57	0.82	285	57	85	82	2	5.5		19.02	**100.1**
2	10	113.37	0.8	285	53	86	82	2	5.5		18.79	**101.6**
	15	117.15	0.8	285	58	87	82	2	5.5		18.79	**102.3**
3	20	120.90	0.76	285	52	88	82	1.8	5.5		18.31	**101.4**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 SVOC	**Test Location:**	APC Outlet No. 1
Date:	June 28, 2019	**Operator:**	AS

Pitot Factor	0.845	**Filter (mg)**	0
DGMCF	1.001	**Probe (mg)**	0
Barometric Pressure	29.66 "Hg	**CWTR (g)**	711.8
Static Pressure	-8.300 "H_2O	**WCBDA (g)**	19.2
Nozzle	0.25 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.45 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.18
CO2%	11.05
COppm	11.4

Measured H2O
17.5 %

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	124.56	0.76	285	53	85	83	1.8	5.5		18.31	**101.4**
4	30	128.20	0.67	285	52	89	83	1.6	5.0		17.19	**101.0**
	35	131.66	0.7	286	56	89	83	1.7	5.0		17.59	**101.8**
5	40	135.15	0.64	286	55	89	83	1.6	5.0		16.82	**100.6**
	45	138.58	0.62	286	54	89	84	1.5	5.0		16.55	**103.3**
6	50	141.91	0.58	286	54	89	84	1.4	4.5		16.01	**101.8**
	55	145.11	0.57	286	52	89	84	1.4	4.5		15.87	**101.1**
7	60	148.29	0.62	285	52	90	84	1.5	4.5		16.54	**101.4**
	65	151.54	0.63	285	51	90	84	1.5	4.5		16.67	**99.2**
8	70	154.81	0.66	284	50	90	85	1.6	5.0		17.05	**99.0**
	75	158.26	0.65	286	50	90	84	1.6	5.0		16.95	**101.9**
9	80	161.50	0.68	286	51	90	84	1.6	5.0		17.33	**96.7**
	85	164.94	0.67	286	50	90	84	1.6	5.0		17.21	**100.4**
10	90	168.35	0.65	286	51	91	85	1.6	5.0		16.95	**100.2**
	95	171.72	0.67	286	51	90	85	1.6	5.0		17.21	**100.4**
11	100	175.14	0.68	286	51	90	85	1.6	5.0		17.33	**100.4**
	105	178.60	0.64	286	51	91	85	1.6	5.0		16.82	**100.9**
12	110	181.97	0.65	286	51	91	85	1.6	5.0		16.95	**101.2**
	115	185.33	0.65	286	51	92	85	1.6	5.0		16.95	**100.1**
	120	188.69										**100.0**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 SVOC
Date:	June 27, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	4.791 m^3
AVGERGE ISOKINETICITY	99.2 %
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	140.8 ^{o}C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	17.78 m/s
BAROMETRIC PRESSURE (Station)	100.474 Kpa
STATIC PRESSURE	-1.892 Kpa
ABSOLUTE GAS PRESSURE	98.582 Kpa
OXYGEN CONCENTRATION	8.36 %
CARBON DIOXIDE CONCENTRATION	10.78 %
CARBON MONOXIDE CONCENTRATION	14.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.26 m^3/s
DRY REF GAS FLOWRATE	15.24 Rm^3/s
DRY ADJ GAS FLOWRATE	19.30 Rm^3/s
WET REF GAS FLOWRATE	18.41 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.791 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:	June 27, 2019	**Operator:**	AS

Pitot Factor	0.851	Filter (mg)	0
DGMCF	1.004	Probe (mg)	0
Barometric Pressure	29.67 "Hg	CWTR (g)	715.1
Static Pressure	-7.600 "H_2O	WCBDA (g)	17
Nozzle	0.2533 inches		
Stack Diameter	4.500 ft	Leak Check Volume	0.45 ft^3
Length	0.000 ft	Reading Interval	5 minutes
Width	0.000 ft	Number of Ports	2
		Number of points / Port	12

Combustion Gases	
O2%	8.36
CO2%	10.78
COppm	14.9

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	87.87	0.82	283	68	75	73	2.1	4.5		19.11	
	5	91.58	0.8	286	64	73	74	2.1	5.0		18.91	97.5
2	10	95.29	0.82	286	60	74	75	2.2	5.5		19.15	99.0
	15	99.14	0.81	286	57	76	76	2.2	5.5		19.03	101.3
3	20	102.98	0.79	286	55	75	77	2.1	5.5		18.79	101.4
	25	106.75	0.81	288	55	76	78	2.2	5.5		19.06	100.7
4	30	110.60	0.75	287	55	77	79	2	5.5		18.32	101.6
	35	114.35	0.73	287	56	77	79	2	5.0		18.08	102.5
5	40	118.05	0.69	287	56	78	80	1.8	5.0		17.58	102.5
	45	121.56	0.71	290	56	78	81	1.8	5.0		17.87	99.8
6	50	125.08	0.7	288	56	78	81	1.8	5.0		17.72	98.8
	55	128.57	0.65	288	54	78	82	1.7	5.0		17.07	98.5
7	60	131.98	0.67	288	52	79	82	1.7	5.0		17.33	99.7
	65	135.40	0.68	288	52	79	82	1.7	5.0		17.46	98.4
8	70	138.84	0.69	288	52	80	83	1.7	5.0		17.59	98.3
	75	142.29	0.67	288	52	80	83	1.7	5.0		17.33	97.7
9	80	145.75	0.7	288	52	80	83	1.8	5.0		17.72	99.4
	85	149.20	0.71	286	52	70	84	1.8	5.0		17.82	97.0
10	90	152.73	0.7	286	52	81	84	1.8	5.0		17.69	99.2
	95	156.24	0.7	286	52	81	84	1.8	5.0		17.69	98.4
11	100	159.76	0.71	287	52	81	84	1.8	5.0		17.83	98.6
	105	163.28	0.7	286	51	82	84	1.8	5.0		17.69	98.0
12	110	166.79	0.7	286	52	82	84	1.8	5.0		17.69	98.3
	115	170.30	0.7	286	52	82	84	1.8	5.0		17.69	98.3
	120	173.82								0.45		98.6
1	0	174.27	0.84	278	64	82	82	2.2	5.5		19.28	
	5	178.10	0.83	285	51	81	82	2.2	6.0		19.25	97.6
2	10	181.94	0.84	284	52	81	82	2.2	6.0		19.35	99.0
	15	185.82	0.83	283	53	81	82	2.2	6.0		19.23	99.4
3	20	189.78	0.79	284	53	81	82	2.1	6.0		18.77	102.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 SVOC	**Test Location:**	APC Outlet No. 2
Date:	June 27, 2019	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.004	**Probe (mg)**	0
Barometric Pressure	29.67 "Hg	**CWTR (g)**	715.1
Static Pressure	-7.600 "H_2O	**WCBDA (g)**	17
Nozzle	0.2533 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.45 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.36
CO2%	10.78
COppm	14.9

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 %
	25	193.47	0.8	285	53	81	82	2.1	6.0		18.90	97.5
4	30	197.23	0.73	286	53	81	82	1.9	6.0		18.07	98.8
	35	200.91	0.72	287	53	81	82	1.9	6.0		17.95	101.2
5	40	204.52	0.64	286	53	81	83	1.7	5.0		16.92	100.0
	45	207.99	0.67	285	53	81	83	1.8	5.0		17.30	101.8
6	50	211.45	0.6	285	54	81	83	1.6	5.0		16.37	99.1
	55	214.75	0.6	285	54	81	83	1.6	5.0		16.37	99.9
7	60	218.06	0.62	285	54	81	84	1.6	5.0		16.64	100.2
	65	221.34	0.62	284	54	81	84	1.6	5.0		16.63	97.6
8	70	224.63	0.65	285	53	81	84	1.7	5.0		17.04	97.8
	75	227.98	0.65	286	54	82	84	1.7	5.0		17.05	97.3
9	80	231.37	0.65	286	54	82	84	1.7	5.0		17.05	98.5
	85	234.77	0.68	286	54	82	84	1.8	5.0		17.44	98.8
10	90	238.20	0.65	285	54	82	85	1.8	5.0		17.04	97.4
	95	241.65	0.65	284	54	82	85	1.7	5.0		17.02	100.1
11	100	245.06	0.63	280	55	82	84	1.7	5.0		16.72	98.8
	105	248.40	0.64	280	55	82	85	1.8	5.0		16.85	98.1
12	110	251.81	0.65	280	55	82	85	1.8	5.0		16.98	99.4
	115	255.24	0.64	280	55	82	85	1.8	5.0		16.85	99.2
	120	258.59										97.6

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 SVOC
Date:	June 27, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.40 mm
DRY REF GAS VOLUME SAMPLED	4.799 m^3
AVGERGE ISOKINETICITY	99.1 %
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	140.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	18.03 m/s
BAROMETRIC PRESSURE (Station)	100.440 Kpa
STATIC PRESSURE	-1.892 Kpa
ABSOLUTE GAS PRESSURE	98.548 Kpa
OXYGEN CONCENTRATION	8.42 %
CARBON DIOXIDE CONCENTRATION	10.64 %
CARBON MONOXIDE CONCENTRATION	10.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.64 m^3/s
DRY REF GAS FLOWRATE	15.45 Rm^3/s
DRY ADJ GAS FLOWRATE	19.48 Rm^3/s
WET REF GAS FLOWRATE	18.69 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.799 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. 2
Date:	June 27, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.004	**Probe (mg)**	0
Barometric Pressure	29.66 "Hg	**CWTR (g)**	717.7
Static Pressure	-7.600 "H_2O	**WCBDA (g)**	20.1
Nozzle	0.2518 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.48 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.42
CO2%	10.64
COppm	10.7

Measured H2O
17.3 %

				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	59.27	0.89	283	67	82	82	2.2	6.0		19.87	
	5	63.10	0.89	287	64	82	82	2.2	7.0		19.93	**96.6**
2	10	66.95	0.89	288	64	82	82	2.2	7.0		19.94	**97.3**
	15	70.80	0.91	288	56	82	83	2.2	7.0		20.16	**97.4**
3	20	74.78	0.85	289	54	82	83	2.2	7.0		19.50	**99.5**
	25	78.67	0.85	289	54	82	83	2.2	7.0		19.50	**100.7**
4	30	82.58	0.8	288	54	82	83	2	7.0		18.91	**101.2**
	35	86.33	0.82	286	55	82	83	2.1	7.0		19.12	**99.9**
5	40	90.05	0.74	285	55	82	84	1.9	6.5		18.15	**97.8**
	45	93.73	0.7	285	55	82	84	1.8	6.0		17.65	**101.6**
6	50	97.18	0.65	285	56	82	84	1.7	6.0		17.01	**98.0**
	55	100.60	0.65	285	55	83	84	1.7	6.0		17.01	**100.7**
7	60	103.93	0.64	285	54	83	85	1.7	6.0		16.88	**98.0**
	65	107.23	0.64	283	54	83	85	1.7	6.0		16.85	**97.8**
8	70	110.56	0.67	283	53	83	85	1.7	6.0		17.24	**98.5**
	75	113.94	0.65	283	54	83	85	1.7	6.0		16.98	**97.8**
9	80	117.29	0.7	283	54	83	85	1.8	6.0		17.63	**98.4**
	85	120.76	0.67	283	53	83	85	1.7	6.0		17.24	**98.2**
10	90	124.18	0.68	280	53	83	85	1.7	6.0		17.34	**98.9**
	95	127.62	0.68	280	53	84	85	1.8	6.0		17.34	**98.6**
11	100	131.06	0.64	280	53	84	84	1.7	6.0		16.82	**98.5**
	105	134.45	0.64	275	53	83	84	1.6	6.0		16.76	**100.1**
12	110	137.78	0.65	277	54	84	84	1.7	6.0		16.92	**98.1**
	115	141.11	0.66	278	54	83	83	1.7	6.0		17.06	**97.4**
	120	144.49								0.48		**98.3**
1	0	144.97	0.86	283	67	83	83	2.2	7.5		19.54	
	5	148.77	0.87	284	53	83	82	2.2	8.0		19.66	**97.3**
2	10	152.73	0.88	287	52	83	82	2.2	8.0		19.82	**101.0**
	15	156.67	0.87	286	52	82	82	2.2	8.0		19.69	**100.1**
3	20	160.63	0.84	285	52	82	82	2.1	8.0		19.33	**101.2**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 SVOC	**Test Location:**	APC Outlet No. 2
Date:	June 27, 2019	**Operator:**	AS

Pitot Factor	0.849	Filter (mg)	0
DGMCF	1.004	Probe (mg)	0
Barometric Pressure	29.66 "Hg	CWTR (g)	717.7
Static Pressure	-7.600 "H_2O	WCBDA (g)	20.1
Nozzle	0.2518 inches		
Stack Diameter	4.500 ft	Leak Check Volume	0.48 ft^3
Length	0.000 ft	Reading Interval	5 minutes
Width	0.000 ft	Number of Ports	2
		Number of points / Port	12

Combustion Gases	
O2%	8.42
CO2%	10.64
COppm	10.7

Measured H2O
17.3 %

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	164.53	0.83	286	53	82	82	2.1	8.0		19.23	101.3
4	30	168.32	0.81	287	53	82	82	2	7.5		19.01	99.1
	35	172.12	0.78	287	53	82	82	2	7.0		18.66	100.7
5	40	175.86	0.72	285	53	82	82	1.8	7.0		17.90	101.0
	45	179.44	0.73	285	53	82	83	1.8	7.0		18.02	100.4
6	50	183.02	0.66	286	53	82	83	1.7	6.5		17.15	99.6
	55	186.46	0.64	286	52	82	84	1.6	6.0		16.89	100.7
7	60	189.78	0.65	287	52	82	84	1.6	6.0		17.03	98.6
	65	193.12	0.67	287	51	82	84	1.7	6.5		17.29	98.5
8	70	196.49	0.7	287	51	82	84	1.8	7.0		17.67	97.9
	75	199.96	0.7	287	51	83	84	1.8	7.0		17.67	98.7
9	80	203.44	0.72	287	51	83	84	1.8	7.0		17.92	98.8
	85	206.93	0.73	285	52	83	83	1.9	7.0		18.02	97.7
10	90	210.53	0.73	284	52	83	83	1.9	7.0		18.01	100.1
	95	214.09	0.71	283	52	83	83	1.9	7.0		17.75	98.9
11	100	217.61	0.65	284	53	83	83	1.7	7.0		17.00	99.1
	105	221.04	0.65	285	54	83	84	1.5	7.0		17.01	101.0
12	110	224.35	0.63	281	55	84	86	1.7	7.0		16.70	97.4
	115	227.67	0.62	282	55	83	84	1.6	7.0		16.58	98.7
	120	231.02										100.7

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 SVOC
Date:	June 28, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.40 mm
DRY REF GAS VOLUME SAMPLED	4.603 m^3
AVGERGE ISOKINETICITY	98.8 %
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	139.7 ^{o}C
AVERAGE GAS MOISTURE BY VOLUME	17.1 %
AVERAGE GAS VELOCITY	17.29 m/s
BAROMETRIC PRESSURE (Station)	100.474 Kpa
STATIC PRESSURE	-1.942 Kpa
ABSOLUTE GAS PRESSURE	98.532 Kpa
OXYGEN CONCENTRATION	8.37 %
CARBON DIOXIDE CONCENTRATION	10.74 %
CARBON MONOXIDE CONCENTRATION	14.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.54 m^3/s
DRY REF GAS FLOWRATE	14.87 Rm^3/s
DRY ADJ GAS FLOWRATE	18.83 Rm^3/s
WET REF GAS FLOWRATE	17.94 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.603 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. 2
Date:	June 28, 2019	**Operator:**	AS

Pitot Factor	0.849	Filter (mg)	0
DGMCF	1.004	Probe (mg)	0
Barometric Pressure	29.67 "Hg	CWTR (g)	681.4
Static Pressure	-7.800 "H_2O	WCBDA (g)	15
Nozzle	0.2518 inches		
Stack Diameter	4.500 ft	Leak Check Volume	0.54 ft^3
Length	0.000 ft	Reading Interval	5 minutes
Width	0.000 ft	Number of Ports	2
		Number of points / Port	12

Combustion Gases	
O2%	8.37
CO2%	10.74
COppm	14.5

Measured H2O
17.1 %

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	32.34	0.74	283	68	77	77	1.8	3.5		18.11	
	5	35.86	0.72	285	59	77	77	1.8	4.0		17.89	98.0
2	10	39.31	0.75	284	54	77	77	1.9	4.0		18.25	97.5
	15	42.85	0.77	285	52	77	77	1.9	4.0		18.50	98.0
3	20	46.45	0.75	286	51	77	78	1.9	4.0		18.27	98.4
	25	50.03	0.74	286	50	77	78	1.9	4.0		18.15	99.1
4	30	53.60	0.71	287	50	77	79	1.8	4.0		17.79	99.5
	35	57.15	0.7	287	50	77	79	1.8	4.0		17.66	101.0
5	40	60.60	0.66	287	50	78	80	1.7	4.0		17.15	98.8
	45	63.99	0.66	287	50	78	80	1.7	4.0		17.15	99.8
6	50	67.37	0.62	287	50	78	80	1.6	4.0		16.62	99.5
	55	70.64	0.61	285	50	78	81	1.6	4.0		16.47	99.3
7	60	73.90	0.66	288	50	79	81	1.7	4.0		17.16	99.6
	65	77.22	0.67	288	50	79	81	1.7	4.0		17.29	97.6
8	70	80.57	0.67	289	50	79	82	1.7	4.0		17.30	97.8
	75	83.94	0.67	289	51	79	82	1.7	4.0		17.30	98.3
9	80	87.30	0.67	288	49	79	82	1.7	4.0		17.29	98.0
	85	90.73	0.67	288	50	80	82	1.7	4.0		17.29	100.0
10	90	94.11	0.68	283	52	80	83	1.8	4.0		17.36	98.5
	95	97.53	0.68	283	51	81	83	1.8	4.0		17.36	98.5
11	100	100.97	0.65	282	51	81	82	1.7	4.0		16.96	99.0
	105	104.32	0.64	280	51	81	83	1.7	4.0		16.81	98.6
12	110	107.66	0.59	281	51	80	82	1.5	4.0		16.15	98.8
	115	110.88	0.59	282	51	81	82	1.5	4.0		16.16	99.4
	120	114.05								0.54		97.9
1	0	114.59	0.8	280	68	80	80	2	4.5		18.79	
	5	118.24	0.79	287	51	81	81	2	4.5		18.76	97.0
2	10	121.92	0.8	288	51	80	81	2	4.5		18.89	98.7
	15	125.60	0.81	288	51	80	81	2	4.5		19.01	98.3
3	20	129.28	0.76	289	51	80	81	1.9	4.5		18.43	97.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 SVOC	**Test Location:**	APC Outlet No. 2
Date:	June 28, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.004	**Probe (mg)**	0
Barometric Pressure	29.67 "Hg	**CWTR (g)**	681.4
Static Pressure	-7.800 "H_2O	**WCBDA (g)**	15
Nozzle	0.2518 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.54 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.37
CO2%	10.74
COppm	14.5

Measured H2O
17.1 %

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	132.87	0.79	290	53	81	82	2	4.5		18.80	98.4
4	30	136.52	0.75	289	52	81	82	1.9	4.5		18.31	98.0
	35	140.15	0.7	288	52	81	82	1.8	4.5		17.67	100.0
5	40	143.65	0.7	288	51	81	82	1.8	4.5		17.67	99.7
	45	147.15	0.65	288	50	81	82	1.65	4.0		17.03	99.7
6	50	150.51	0.59	288	50	81	82	1.5	4.0		16.23	99.3
	55	153.76	0.57	284	50	81	83	1.4	3.5		15.91	100.8
7	60	156.85	0.62	286	51	81	83	1.6	4.0		16.61	97.1
	65	160.06	0.62	286	50	81	84	1.65	4.0		16.61	96.9
8	70	163.40	0.64	286	50	82	83	1.6	4.0		16.88	100.7
	75	166.70	0.64	287	51	82	83	1.6	4.0		16.89	97.9
9	80	169.98	0.65	286	51	82	83	1.7	4.0		17.01	97.4
	85	173.35	0.67	286	51	82	83	1.8	4.0		17.27	99.3
10	90	176.75	0.61	279	51	82	83	1.6	4.0		16.40	98.7
	95	180.23	0.6	277	52	82	82	1.5	4.0		16.24	105.3
11	100	183.55	0.58	257	52	82	83	1.5	4.0		15.75	101.2
	105	186.73	0.6	261	52	82	83	1.6	4.0		16.06	97.2
12	110	189.97	0.6	260	53	82	83	1.6	4.0		16.05	97.6
	115	193.19	0.6	260	53	83	85	1.6	4.0		16.05	97.0
	120	196.44										97.6

APPENDIX 26

ORTECH Total Hydrocarbon CEM Data
(4 pages)

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 Quench Inlet

Test No. 1
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
10:32	4.6	
10:33	4.4	
10:34	5.1	
10:35	4.8	
10:36	5.1	
10:37	3.8	
10:38	3.6	
10:39	3.4	
10:40	3.4	
10:41	3.4	4.2
10:42	3.2	4.0
10:43	3.6	3.9
10:44	3.7	3.8
10:45	3.8	3.7
10:46	3.7	3.5
10:47	3.5	3.5
10:48	4.3	3.6
10:49	3.4	3.6
10:50	3.2	3.6
10:51	3.1	3.5
10:52	3.1	3.5
10:53	3.4	3.5
10:54	3.0	3.5
10:55	3.1	3.4
10:56	3.0	3.3
10:57	2.6	3.2
10:58	2.4	3.0
10:59	2.5	2.9
11:00	2.7	2.9
11:01	2.8	2.9
11:02	2.3	2.8
11:03	2.2	2.6
11:04	2.1	2.5
11:05	2.1	2.5
11:06	2.3	2.4
11:07	2.7	2.4
11:08	2.7	2.4
11:09	2.4	2.4
11:10	2.9	2.4
11:11	2.3	2.4
11:12	3.2	2.5
11:13	3.8	2.7
11:14	2.4	2.7
11:15	2.2	2.7
11:16	2.4	2.7
11:17	2.6	2.7
11:18	3.6	2.8
11:19	2.4	2.8
11:20	2.4	2.7
11:21	2.2	2.7
11:22	2.2	2.6
11:23	2.1	2.4
11:24	2.5	2.5
11:25	2.4	2.5
11:26	3.3	2.6
11:27	2.4	2.6
11:28	3.5	2.5
11:29	2.6	2.6
11:30	2.4	2.6
11:31	2.5	2.6
11:32	4.2	2.8
Min	2.1	2.4
Max	5.1	4.2
Avg	3.1	2.9

Test No. 2
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
11:40	1.0	
11:41	1.1	
11:42	1.1	
11:43	1.2	
11:44	1.6	
11:45	1.7	
11:46	1.4	
11:47	2.3	
11:48	1.4	
11:49	1.3	1.4
11:50	1.2	1.4
11:51	1.3	1.4
11:52	1.3	1.5
11:53	1.3	1.5
11:54	1.7	1.5
11:55	1.4	1.4
11:56	1.0	1.4
11:57	0.9	1.3
11:58	0.8	1.2
11:59	0.8	1.2
12:00	0.9	1.1
12:01	1.5	1.2
12:02	1.4	1.2
12:03	2.2	1.3
12:04	2.1	1.3
12:05	1.3	1.3
12:06	1.7	1.4
12:07	2.2	1.5
12:08	1.3	1.6
12:09	1.3	1.6
12:10	1.4	1.6
12:11	2.1	1.7
12:12	1.4	1.7
12:13	1.5	1.6
12:14	1.5	1.6
12:15	1.5	1.6
12:16	1.1	1.5
12:17	1.0	1.4
12:18	1.8	1.5
12:19	0.9	1.4
12:20	0.8	1.4
12:21	1.0	1.3
12:22	1.2	1.2
12:23	1.1	1.2
12:24	2.1	1.3
12:25	1.2	1.2
12:26	2.0	1.3
12:27	1.2	1.3
12:28	1.1	1.3
12:29	1.4	1.3
12:30	1.5	1.4
12:31	1.5	1.4
12:32	1.4	1.4
12:33	1.4	1.5
12:34	1.2	1.4
12:35	1.3	1.4
12:36	1.5	1.4
12:37	1.3	1.4
12:38	1.0	1.3
12:39	1.3	1.3
12:40	1.4	1.3
Min	0.8	1.1
Max	2.3	1.7
Avg	1.4	1.4

Test No. 3
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
12:52	0.5	
12:53	0.5	
12:54	0.6	
12:55	0.6	
12:56	0.6	
12:57	0.5	
12:58	0.5	
12:59	0.5	
13:00	0.5	
13:01	0.6	0.5
13:02	0.8	0.6
13:03	0.7	0.6
13:04	0.6	0.6
13:05	0.8	0.6
13:06	1.1	0.7
13:07	0.9	0.7
13:08	1.0	0.8
13:09	0.9	0.8
13:10	1.0	0.8
13:11	1.1	0.9
13:12	1.2	0.9
13:13	1.2	1.0
13:14	1.0	1.0
13:15	1.0	1.0
13:16	1.1	1.0
13:17	1.1	1.1
13:18	1.1	1.1
13:19	1.2	1.1
13:20	1.0	1.1
13:21	1.1	1.1
13:22	1.1	1.1
13:23	1.2	1.1
13:24	0.9	1.1
13:25	0.9	1.1
13:26	0.9	1.1
13:27	0.9	1.0
13:28	0.9	1.0
13:29	0.7	1.0
13:30	0.7	0.9
13:31	0.7	0.9
13:32	0.7	0.9
13:33	0.8	0.8
13:34	1.0	0.8
13:35	0.9	0.8
13:36	0.8	0.8
13:37	0.9	0.8
13:38	0.9	0.8
13:39	0.9	0.8
13:40	1.0	0.9
13:41	0.9	0.9
13:42	1.7	1.0
13:43	0.9	1.0
13:44	0.9	1.0
13:45	0.9	1.0
13:46	1.0	1.0
13:47	0.9	1.0
13:48	0.9	1.0
13:49	0.9	1.0
13:50	0.9	1.0
13:51	1.0	1.0
13:52	0.9	0.9
Min	0.5	0.5
Max	1.7	1.1
Avg	0.9	0.9

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 Quench Inlet

Test No. 1
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
10:32	1.0	
10:33	1.2	
10:34	1.4	
10:35	1.2	
10:36	0.9	
10:37	0.7	
10:38	0.8	
10:39	1.0	
10:40	0.7	
10:41	0.6	0.9
10:42	0.7	0.9
10:43	0.7	0.9
10:44	0.5	0.8
10:45	0.6	0.7
10:46	0.6	0.7
10:47	0.6	0.7
10:48	0.5	0.6
10:49	0.6	0.6
10:50	0.5	0.6
10:51	0.6	0.6
10:52	0.4	0.6
10:53	0.4	0.5
10:54	0.6	0.5
10:55	0.6	0.5
10:56	0.5	0.5
10:57	0.6	0.5
10:58	1.3	0.6
10:59	1.2	0.7
11:00	0.5	0.7
11:01	0.5	0.7
11:02	0.6	0.7
11:03	0.6	0.7
11:04	0.6	0.7
11:05	0.6	0.7
11:06	0.4	0.7
11:07	0.4	0.7
11:08	0.5	0.6
11:09	0.6	0.5
11:10	0.5	0.5
11:11	0.4	0.5
11:12	0.6	0.5
11:13	0.5	0.5
11:14	0.4	0.5
11:15	0.4	0.5
11:16	0.5	0.5
11:17	0.3	0.5
11:18	0.2	0.4
11:19	0.4	0.4
11:20	0.4	0.4
11:21	0.4	0.4
11:22	0.3	0.4
11:23	0.4	0.4
11:24	0.6	0.4
11:25	0.5	0.4
11:26	0.5	0.4
11:27	0.4	0.4
11:28	0.4	0.4
11:29	0.3	0.4
11:30	0.4	0.4
11:31	0.6	0.4
11:32	0.4	0.5

Min	0.2	0.4
Max	1.4	0.9
Avg	0.6	0.6

Test No. 2
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
11:40	0.5	
11:41	0.5	
11:42	0.7	
11:43	0.2	
11:44	0.5	
11:45	0.6	
11:46	0.4	
11:47	0.4	
11:48	0.6	
11:49	0.7	0.5
11:50	0.5	0.5
11:51	0.4	0.5
11:52	0.5	0.5
11:53	0.8	0.5
11:54	0.9	0.6
11:55	0.8	0.6
11:56	0.9	0.6
11:57	1.1	0.7
11:58	1.1	0.8
11:59	1.2	0.8
12:00	0.6	0.8
12:01	0.6	0.8
12:02	0.7	0.9
12:03	0.5	0.8
12:04	0.6	0.8
12:05	0.7	0.8
12:06	0.5	0.8
12:07	0.7	0.7
12:08	0.5	0.7
12:09	0.7	0.6
12:10	0.6	0.6
12:11	0.5	0.6
12:12	0.4	0.6
12:13	0.4	0.6
12:14	0.5	0.6
12:15	0.4	0.5
12:16	0.4	0.5
12:17	0.6	0.5
12:18	0.4	0.5
12:19	0.6	0.5
12:20	0.4	0.5
12:21	0.3	0.4
12:22	0.3	0.4
12:23	0.2	0.4
12:24	0.3	0.4
12:25	0.2	0.4
12:26	0.3	0.4
12:27	0.3	0.3
12:28	0.1	0.3
12:29	0.1	0.3
12:30	0.1	0.2
12:31	0.2	0.2
12:32	0.2	0.2
12:33	0.2	0.2
12:34	0.4	0.2
12:35	0.3	0.2
12:36	0.1	0.2
12:37	0.3	0.2
12:38	0.3	0.2
12:39	0.3	0.3
12:40	1.3	0.4

Min	0.1	0.2
Max	1.3	0.9
Avg	0.5	0.5

Test No. 3
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
12:52	1.0	
12:53	0.7	
12:54	0.8	
12:55	0.8	
12:56	0.7	
12:57	0.7	
12:58	0.9	
12:59	0.6	
13:00	0.5	
13:01	0.6	0.7
13:02	0.6	0.7
13:03	0.9	0.7
13:04	0.8	0.7
13:05	0.6	0.7
13:06	0.5	0.7
13:07	0.5	0.7
13:08	0.5	0.6
13:09	0.5	0.6
13:10	0.7	0.6
13:11	0.7	0.6
13:12	0.8	0.7
13:13	0.7	0.6
13:14	0.8	0.6
13:15	0.8	0.7
13:16	0.5	0.7
13:17	0.8	0.7
13:18	0.6	0.7
13:19	0.7	0.7
13:20	0.7	0.7
13:21	0.8	0.7
13:22	0.7	0.7
13:23	0.6	0.7
13:24	0.5	0.7
13:25	0.4	0.6
13:26	0.6	0.6
13:27	0.7	0.6
13:28	0.5	0.6
13:29	0.7	0.6
13:30	0.5	0.6
13:31	0.4	0.6
13:32	0.4	0.5
13:33	0.4	0.5
13:34	0.5	0.5
13:35	0.5	0.5
13:36	0.3	0.5
13:37	0.4	0.5
13:38	0.4	0.5
13:39	0.4	0.4
13:40	0.3	0.4
13:41	0.0	0.4
13:42	0.4	0.4
13:43	0.1	0.3
13:44	0.3	0.3
13:45	0.1	0.3
13:46	0.4	0.3
13:47	0.2	0.3
13:48	0.3	0.3
13:49	0.4	0.3
13:50	0.4	0.3
13:51	0.0	0.3
13:52	0.3	0.2

Min	0.0	0.2
Max	1.0	0.7
Avg	0.5	0.5

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 APC Outlet

Test No. 1
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:32	0.8	
16:33	0.4	
16:34	0.3	
16:35	0.4	
16:36	0.4	
16:37	0.4	
16:38	0.5	
16:39	0.5	
16:40	0.5	
16:41	0.5	0.5
16:42	0.5	0.4
16:43	0.4	0.4
16:44	0.4	0.5
16:45	0.4	0.5
16:46	0.4	0.5
16:47	0.4	0.5
16:48	0.4	0.4
16:49	0.4	0.4
16:50	0.4	0.4
16:51	0.3	0.4
16:52	0.5	0.4
16:53	0.5	0.4
16:54	0.4	0.4
16:55	0.5	0.4
16:56	0.5	0.4
16:57	0.4	0.4
16:58	0.4	0.4
16:59	0.4	0.4
17:00	0.4	0.4
17:01	0.4	0.4
17:02	0.4	0.4
17:03	0.5	0.4
17:04	0.5	0.4
17:05	0.5	0.4
17:06	0.5	0.4
17:07	0.5	0.4
17:08	0.5	0.4
17:09	0.5	0.4
17:10	5.1	0.9
17:11	2.6	1.1
17:12	1.8	1.3
17:13	1.4	1.4
17:14	1.3	1.5
17:15	1.1	1.5
17:16	1.0	1.6
17:17	0.8	1.6
17:18	0.8	1.6
17:19	0.7	1.7
17:20	0.6	1.2
17:21	0.6	1.0
17:22	0.6	0.9
17:23	0.6	0.8
17:24	0.6	0.7
17:25	0.6	0.7
17:26	0.6	0.7
17:27	0.6	0.6
17:28	0.6	0.6
17:29	0.6	0.6
17:30	0.6	0.6
17:31	0.6	0.6
17:32	0.5	0.6
Min	0.3	0.4
Max	5.1	1.7
Avg	0.7	0.7

Test No. 2
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
17:43	0.9	
17:44	0.7	
17:45	0.6	
17:46	0.6	
17:47	0.5	
17:48	0.5	
17:49	0.5	
17:50	0.5	
17:51	0.5	
17:52	0.6	0.6
17:53	0.6	0.6
17:54	0.8	0.6
17:55	0.8	0.6
17:56	0.7	0.6
17:57	0.7	0.6
17:58	0.7	0.6
17:59	0.8	0.7
18:00	0.7	0.7
18:01	0.8	0.7
18:02	0.8	0.7
18:03	0.8	0.8
18:04	0.8	0.7
18:05	0.8	0.7
18:06	0.8	0.8
18:07	0.8	0.8
18:08	0.8	0.8
18:09	0.8	0.8
18:10	0.8	0.8
18:11	0.8	0.8
18:12	1.0	0.8
18:13	0.9	0.8
18:14	0.9	0.8
18:15	0.9	0.8
18:16	0.8	0.8
18:17	0.8	0.8
18:18	0.7	0.8
18:19	0.8	0.8
18:20	0.7	0.8
18:21	0.7	0.8
18:22	0.7	0.8
18:23	0.6	0.8
18:24	0.7	0.7
18:25	0.8	0.7
18:26	0.7	0.7
18:27	0.9	0.7
18:28	0.7	0.7
18:29	0.7	0.7
18:30	0.8	0.7
18:31	0.7	0.7
18:32	0.7	0.7
18:33	0.7	0.7
18:34	0.6	0.7
18:35	0.6	0.7
18:36	0.7	0.7
18:37	0.7	0.7
18:38	0.7	0.7
18:39	0.6	0.7
18:40	0.7	0.7
18:41	0.7	0.7
18:42	0.7	0.7
18:43	0.6	0.7
Min	0.5	0.6
Max	1.0	0.8
Avg	0.7	0.7

Test No. 3
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
18:53	0.6	
18:54	0.6	
18:55	0.6	
18:56	0.6	
18:57	0.6	
18:58	0.6	
18:59	0.6	
19:00	0.7	
19:01	0.8	
19:02	0.8	0.7
19:03	0.7	0.7
19:04	0.8	0.7
19:05	0.7	0.7
19:06	0.7	0.7
19:07	0.6	0.7
19:08	0.6	0.7
19:09	0.6	0.7
19:10	0.6	0.7
19:11	0.6	0.7
19:12	0.6	0.7
19:13	0.7	0.7
19:14	0.6	0.6
19:15	0.6	0.6
19:16	0.7	0.6
19:17	0.6	0.6
19:18	0.7	0.6
19:19	0.6	0.6
19:20	0.6	0.6
19:21	0.6	0.6
19:22	0.6	0.6
19:23	0.6	0.6
19:24	0.6	0.6
19:25	0.6	0.6
19:26	0.6	0.6
19:27	0.6	0.6
19:28	0.6	0.6
19:29	0.6	0.6
19:30	0.6	0.6
19:31	0.6	0.6
19:32	0.5	0.6
19:33	0.5	0.6
19:34	0.5	0.6
19:35	0.5	0.6
19:36	0.5	0.6
19:37	0.5	0.5
19:38	0.5	0.5
19:39	0.5	0.5
19:40	0.5	0.5
19:41	0.5	0.5
19:42	0.5	0.5
19:43	0.5	0.5
19:44	0.6	0.5
19:45	0.6	0.5
19:46	0.5	0.5
19:47	0.5	0.5
19:48	0.5	0.5
19:49	0.5	0.5
19:50	0.6	0.5
19:51	0.6	0.5
19:52	0.6	0.5
19:53	0.5	0.5
Min	0.5	0.5
Max	0.8	0.7
Avg	0.6	0.6

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 APC Outlet

Test No. 1
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:32	1.8	
16:33	1.7	
16:34	1.7	
16:35	1.7	
16:36	1.5	
16:37	1.5	
16:38	1.1	
16:39	1.0	
16:40	0.9	
16:41	0.9	1.4
16:42	1.0	1.3
16:43	0.9	1.2
16:44	0.9	1.2
16:45	0.9	1.1
16:46	0.9	1.0
16:47	0.9	1.0
16:48	0.9	0.9
16:49	0.8	0.9
16:50	0.9	0.9
16:51	0.9	0.9
16:52	0.9	0.9
16:53	0.9	0.9
16:54	1.0	0.9
16:55	0.8	0.9
16:56	0.9	0.9
16:57	0.8	0.9
16:58	0.9	0.9
16:59	0.9	0.9
17:00	0.9	0.9
17:01	0.8	0.9
17:02	0.8	0.9
17:03	0.9	0.9
17:04	0.9	0.9
17:05	0.9	0.9
17:06	0.8	0.9
17:07	0.9	0.9
17:08	1.0	0.9
17:09	0.9	0.9
17:10	1.2	0.9
17:11	1.5	1.0
17:12	1.1	1.0
17:13	1.0	1.0
17:14	1.0	1.0
17:15	1.0	1.0
17:16	1.0	1.1
17:17	1.0	1.1
17:18	1.0	1.1
17:19	1.0	1.1
17:20	1.1	1.1
17:21	1.0	1.0
17:22	1.1	1.0
17:23	1.0	1.0
17:24	1.0	1.0
17:25	1.0	1.0
17:26	1.1	1.0
17:27	1.0	1.0
17:28	1.1	1.0
17:29	1.0	1.0
17:30	1.0	1.0
17:31	1.0	1.0
17:32	0.9	1.0
Min	0.8	0.9
Max	1.8	1.4
Avg	1.0	1.0

Test No. 2
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
17:43	1.3	
17:44	1.2	
17:45	1.1	
17:46	1.0	
17:47	1.1	
17:48	1.0	
17:49	0.9	
17:50	1.0	
17:51	1.0	
17:52	1.0	1.1
17:53	1.0	1.0
17:54	1.0	1.0
17:55	1.0	1.0
17:56	1.0	1.0
17:57	1.1	1.0
17:58	1.0	1.0
17:59	1.1	1.0
18:00	0.9	1.0
18:01	0.9	1.0
18:02	1.0	1.0
18:03	0.9	1.0
18:04	1.0	1.0
18:05	1.0	1.0
18:06	1.0	1.0
18:07	0.9	1.0
18:08	1.0	1.0
18:09	1.0	1.0
18:10	1.0	1.0
18:11	0.9	1.0
18:12	0.9	0.9
18:13	0.8	0.9
18:14	0.8	0.9
18:15	0.8	0.9
18:16	0.9	0.9
18:17	0.9	0.9
18:18	0.9	0.9
18:19	0.9	0.9
18:20	0.8	0.9
18:21	0.8	0.9
18:22	1.0	0.9
18:23	1.0	0.9
18:24	1.0	0.9
18:25	0.9	0.9
18:26	0.9	0.9
18:27	0.9	0.9
18:28	1.0	0.9
18:29	0.9	0.9
18:30	0.9	0.9
18:31	0.9	0.9
18:32	0.9	0.9
18:33	0.9	0.9
18:34	0.9	0.9
18:35	0.8	0.9
18:36	0.9	0.9
18:37	0.9	0.9
18:38	0.9	0.9
18:39	0.9	0.9
18:40	1.0	0.9
18:41	1.0	0.9
18:42	0.9	0.9
18:43	0.9	0.9
Min	0.8	0.9
Max	1.3	1.1
Avg	0.9	0.9

Test No. 3
June 25, 2019

Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
18:53	1.3	
18:54	1.1	
18:55	1.1	
18:56	1.1	
18:57	1.1	
18:58	1.1	
18:59	1.1	
19:00	1.1	
19:01	1.1	
19:02	1.1	1.1
19:03	1.1	1.1
19:04	1.1	1.1
19:05	1.1	1.1
19:06	1.1	1.1
19:07	1.1	1.1
19:08	1.1	1.1
19:09	1.1	1.1
19:10	1.0	1.1
19:11	1.0	1.1
19:12	1.1	1.1
19:13	1.0	1.1
19:14	1.0	1.1
19:15	1.1	1.1
19:16	1.0	1.1
19:17	1.0	1.0
19:18	1.0	1.0
19:19	1.0	1.0
19:20	1.0	1.0
19:21	1.0	1.0
19:22	1.0	1.0
19:23	1.0	1.0
19:24	1.1	1.0
19:25	1.1	1.0
19:26	1.0	1.0
19:27	1.1	1.0
19:28	0.9	1.0
19:29	0.9	1.0
19:30	1.0	1.0
19:31	0.9	1.0
19:32	0.9	1.0
19:33	1.0	1.0
19:34	1.0	1.0
19:35	1.0	1.0
19:36	0.9	1.0
19:37	0.9	0.9
19:38	0.9	0.9
19:39	0.9	0.9
19:40	0.9	0.9
19:41	0.8	0.9
19:42	0.8	0.9
19:43	0.9	0.9
19:44	0.9	0.9
19:45	0.9	0.9
19:46	0.9	0.9
19:47	0.9	0.9
19:48	0.8	0.9
19:49	0.9	0.9
19:50	0.9	0.9
19:51	0.9	0.9
19:52	0.9	0.9
19:53	0.8	0.9
Min	0.8	0.9
Max	1.3	1.1
Avg	1.0	1.0

APPENDIX 27

Dispersion Modelling Results for the June 2019 Testing Program (17 pages)

TECHNICAL MEMORANDUM

DATE September 23, 2019 **Project No.** 19123663

TO Amanda Huxter
Covanta Durham York Renewable Energy LP

CC Anthony Ciccone

FROM Katherine Armstrong **EMAIL ksarmstrong@golder.com**

CALPUFF MODELLING FOR JUNE 2019 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 (MECP) 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 June 2019 source testing program using the same CALPUFF model and other input data sets used in the ESDM Report and Environmental Assessment, however, the results are compared to O.Reg. 419/05 Schedule 3 limits last updated April 2018.

2.0 EMISSION RATES

Voluntary source testing was completed by Ortech Environmental in June 2019 (Sampling dates were June 25-28) 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 MECP 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 MECP 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 the 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 annual average Point of Impingement (POI) limits. 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[(1)]

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

1 – Ozone levels from Courtice Road Station (2007-2008)

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 Table 2. 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]	Flow Rate [m^3/s]	Exit Velocity [m/s]	Exhaust Temperature [K]
STCK1	87.6 (No Change)	1.7 (No Change)	52.39 (UPDATED)	23.08 (UPDATED)	414.3 (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. In Ontario, MECP guidance allows for the removal of meteorological anomalies to account for extreme, rare and transient conditions that may be present in the datasets and considered outliers. As such, for air quality assessments that require 24-hour average concentrations, the highest predicted 24-hr concentration in each year of meteorological data may be removed. Similarly, for assessments that use shorter 1-hour average concentrations, the eight highest predicted concentrations in each year may be removed, as per the MECP guidance listed in ADMGO. No predicted results are removed for assessment against annual averaging periods. Elimination of these anomalies is optional but both methodologies are considered acceptable for the demonstration of compliance with Ontario Regulation 419/05 standards. Previously, maximums with anomalies were presented.

The resulting dispersion factors are presented in Table 4, below for both the with and without meteorological anomaly removal:

Table 4: Modelling Dispersion Factors

Averaging Period	10-min	½- hr	1-hr	24-hr	30-day	Annual
Dispersion Factor without meteorological anomaly removal [µg/m³ per g/s]	31.69	23.05	19.21	1.018	0.11	0.03
Dispersion Factor with meteorological anomaly removal [µg/m³ per g/s]	9.59	6.98	5.81	0.95	0.11	0.034

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 current Schedule 3 standards listed in O.Reg. 419/05 and in the case of $PM_{2.5}$ and PM_{10}, the MECP AAQC.

The MECP 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 MECP POI Limits'. Where applicable, predicted POI concentrations of Contaminants with No MECP 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 MECP 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 MECP guidance document "Procedure for preparing an Emission Summary and Dispersion Modelling Report" (PIBs 3614e04.1, March 2018). Results are presented both with and without meteorological anomaly removal but only the results with meteorological anomaly removal are presented as a percentage of the relevant limit.

The contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 6% of the relevant limit.

5.0 SUMMARY OF MODELLING UPDATES

The dispersion modelling for the DYEC was updated to reflect data obtained from Voluntary June 2019 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 June 2019 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 consistent with the EA.

Modelling Inputs	Changes from ESDM Report
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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Principal

KSA/ADC/ng

https://golderassociates.sharepoint.com/sites/109752/project files/6 deliverables/spring st/final/rev1/19123663-tm-rev1 23sep2019 covanta updated modelling memo.docx

APPENDIX A

Site-Wide Emission Inventory

Appendix A
Site-Wide Emission Inventory

Source Identifier	Source Description	Source Parameters: Stack Volumetric Flow Rate [Am^3/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Emission Data: Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - Spring 2019 Source Testing Conditions	52.39	141	1.7	87.6	(680538, 4860346)	1 – methylnaphthalene	90-12-0	3.93E-07	1,24, annual	ST	Above-Average	100%
							1,1,2-Trichloroethane	79-00-5	1.54E-05	1,24, annual	ST	Above-Average	100%
							1,2,3,4-tetrachlorobenzene	634-66-2	6.44E-08	1,24, annual	ST	Above-Average	100%
							1,2,3-trichlorobenzene	87-61-6	2.02E-07	1,24, annual	ST	Above-Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	7.47E-07	1,24, annual	ST	Above-Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.12E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichlorobenzene	95-50-1	1.62E-06	1,24, annual	ST	Above-Average	100%
							1,2-Dichloroethane	107-06-2	1.77E-05	1,24, annual	ST	Above-Average	100%
							1,2-Dichloropropane	78-87-5	1.54E-05	1,24, annual	ST	Above-Average	100%
							1,3,5-trichlorobenzene	108-70-3	1.77E-07	1,24, annual	ST	Above-Average	100%
							1,3-Butadiene	106-99-0	3.09E-05	1,24, annual	ST	Above-Average	100%
							1,3-Dichlorobenzene	541-73-1	2.68E-06	1,24, annual	ST	Above-Average	100%
							1,4-Dichlorobenzene	106-46-7	1.53E-06	1,24, annual	ST	Above-Average	100%
							1-Methylphenanthrene	832-69-9	7.24E-07	1,24, annual	ST	Above-Average	100%
							2 – methylnaphthalene	91-57-6	6.82E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,5-tetrachlorophenol	4901-51-3	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3,4-trichlorophenol	15950-66-0	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3,5,6-tetrachlorophenol	935-95-5	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3,5-trichlorophenol	933-78-8	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3,6-trichlorophenol	933-75-5	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,3-dichlorophenol	576-24-9	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,4,5-trichlorophenol	95-95-4	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,4,6-Trichlorophenol	88-06-2	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,4-Dichlorophenol	120-83-2	1.61E-06	1,24, annual	ST	Above-Average	100%
							2,6-dichlorophenol	87-65-0	1.61E-06	1,24, annual	ST	Above-Average	100%
							2-Butanone	78-93-3	1.51E-04	1,24, annual	ST	Above-Average	100%
							2-Chloronaphthalene	91-58-7	6.44E-08	1,24, annual	ST	Above-Average	100%
							2-Methylanthracene	613-12-7	1.19E-06	1,24, annual	ST	Above-Average	100%
							2-monochlorophenol	95-57-8	1.61E-06	1,24, annual	ST	Above-Average	100%
							3,4,5-trichlorophenol	609-19-8	1.61E-06	1,24, annual	ST	Above-Average	100%
							3,4-dichlorophenol	95-77-2	1.61E-06	1,24, annual	ST	Above-Average	100%
							3,5-dichlorophenol	591-35-5	1.61E-06	1,24, annual	ST	Above-Average	100%
							3-Methylcholanthrene	56-49-5	3.22E-07	1,24, annual	ST	Above-Average	100%
							3-monochlorophenol	108-43-0	1.61E-06	1,24, annual	ST	Above-Average	100%
							4-monochlorophenol	106-48-9	1.61E-06	1,24, annual	ST	Above-Average	100%
							7,12-Dimethylbenzo(a)anthracene	57-97-6	6.44E-08	1,24, annual	ST	Above-Average	100%
							9,10-Dimethylanthracene	781-43-1	7.05E-08	1,24, annual	ST	Above-Average	100%
							9-Methylphenanthrene	883-20-5	3.83E-07	1,24, annual	ST	Above-Average	100%
							Acenaphthene	83-32-9	5.52E-07	1,24, annual	ST	Above-Average	26%
							Acenaphthylene	208-96-8	1.21E-06	1,24, annual	ST	Above-Average	29%
							Acetaldehyde	75-07-0	3.83E-03	1,24, annual	ST	Above-Average	100%
							Acetone	67-64-1	5.26E-04	1,24, annual	ST	Above-Average	100%
							Acrolein	107-02-8	3.83E-03	1,24, annual	ST	Above-Average	100%
							Ammonia	7664-41-7	2.03E-02	1,24, annual	ST	Above-Average	100%
							Anthracene	120-12-7	2.27E-07	1,24, annual	ST	Above-Average	36%
							Antimony	7440-36-0	3.07E-06	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 [%]
							Arsenic	7440-38-2	1.73E-06	1,24, annual	ST	Above-Average	100%
							Barium	7440-39-3	9.48E-05	1,24, annual	ST	Above-Average	100%
							Benzene	71-43-2	1.06E-04	1,24, annual	ST	Above-Average	30%
							Benzo(a)anthracene	56-55-3	9.38E-08	1,24, annual	ST	Above-Average	32%
							Benzo(a)fluorene	238-84-6	6.44E-08	1,24, annual	ST	Above-Average	100%
							Benzo(a)pyrene	50-32-8	6.44E-08	1,24, annual	ST	Above-Average	43%
							Benzo(b)fluoranthene	205-99-2	6.44E-08	1,24, annual	ST	Above-Average	15%
							Benzo(b)fluorene	243-17-4	6.44E-08	1,24, annual	ST	Above-Average	100%
							Benzo(e)pyrene	192-97-2	6.44E-08	1,24, annual	ST	Above-Average	100%
							Benzo(g,h,i)perylene	191-24-2	1.17E-07	1,24, annual	ST	Above-Average	100%
							Benzo(k)fluoranthene	207-08-9	6.44E-08	1,24, annual	ST	Above-Average	47%
							Beryllium	7440-41-7	1.73E-06	1,24, annual	ST	Above-Average	100%
							Biphenyl	92-51-3	4.20E-07	1,24, annual	ST	Above-Average	100%
							Bromodichloromethane	75-27-4	2.03E-05	1,24, annual	ST	Above-Average	100%
							Bromoform	75-25-2	1.54E-05	1,24, annual	ST	Above-Average	100%
							Bromomethane	74-83-9	1.54E-04	1,24, annual	ST	Above-Average	100%
							Cadmium	7440-43-9	3.67E-06	1,24, annual	ST	Above-Average	100%
							Carbon Monoxide	630-08-0	4.82E-01	1,24, annual	ST	Above-Average	65%
							Carbon tetrachloride	56-23-5	1.81E-05	1,24, annual	ST	Above-Average	100%
							Chlorobenzene	108-90-7	1.50E-05	1,24, annual	ST	Above-Average	100%
							Chloroform	67-66-3	3.45E-05	1,24, annual	ST	Above-Average	100%
							Chromium (hexavalent)	18540-29-9	4.22E-05	1,24, annual	ST	Above-Average	100%
							Chrysene	218-01-9	9.20E-08	1,24, annual	ST	Above-Average	16%
							Cobalt	7440-48-4	1.73E-06	1,24, annual	ST	Above-Average	100%
							Copper	7440-50-8	3.82E-05	1,24, annual	ST	Above-Average	100%
							Coronene	191-07-1	3.22E-07	1,24, annual	ST	Above-Average	100%
							Cumene (Isopropylbenzene)	98-82-8	3.81E-05	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,c)anthracene	215-58-7	6.44E-08	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,e)pyrene	192-65-4	3.22E-07	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,h)anthracene	53-70-3	6.44E-08	1,24, annual	ST	Above-Average	36%
							Dibromochloromethane	124-48-1	1.54E-05	1,24, annual	ST	Above-Average	100%
							Dichlorodifluoromethane	75-71-8	3.63E-05	1,24, annual	ST	Above-Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.54E-05	1,24, annual	ST	Above-Average	100%
							Dichloromethane	75-09-2	1.29E-03	1,24, annual	ST	Above-Average	100%
							Dioxins, Furans and Dioxin- like PCBs	N/A	1.86E-04	1,24, annual	ST	Above-Average	100%
							Ethylbenzene	100-41-4	1.47E-04	1,24, annual	ST	Above-Average	100%
							Ethylene Dibromide	106-93-4	3.09E-05	1,24, annual	ST	Above-Average	100%
							Fluoranthene	206-44-0	6.65E-07	1,24, annual	ST	Above-Average	34%
							Fluorides	7664-39-3	1.73E-02	1,24, annual	ST	Above-Average	100%
							Fluorine	86-73-7	7.49E-07	1,24, annual	ST	Above-Average	100%
							Formaldehyde	50-00-0	4.65E-03	1,24, annual	ST	Above-Average	99%
							Hexachlorobenzene	118-74-1	6.44E-08	1,24, annual	ST	Above-Average	100%
							Hydrogen Chloride	7647-01-0	1.67E-01	1,24, annual	ST	Above-Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	6.44E-08	1,24, annual	ST	Above-Average	32%
							Lead	7439-92-1	2.06E-05	1,24, annual	ST	Above-Average	100%
							M&P-Xylene	179601-23-1	9.20E-04	1,24, annual	ST	Above-Average	100%
							Mercury	7439-97-6	8.61E-06	1,24, annual	ST	Above-Average	100%
							Mesitylene (1,3,5-Trimethylbenzene)	108-67-8	8.33E-05	1,24, annual	ST	Above-Average	100%
							Molybdenum	7439-98-7	2.47E-04	1,24, annual	ST	Above-Average	100%
							m-Terphenyl	92-06-8	8.94E-08	1,24, annual	ST	Above-Average	100%

		Source Parameters					Emission Data						
Source Identifier	Source Description	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 [%]
							Naphthalene	91-20-3	3.47E-06	1,24, annual	ST	Above-Average	8%
							Nickel	7440-02-0	5.57E-05	1,24, annual	ST	Above-Average	100%
							Nitrogen Oxides	10102-44-0	4.24E+00	1,24, annual	ST	Above-Average	44%
							Nitrogen Oxides	10102-44-0	4.24E+00	1,24, annual	ST	Above-Average	44%
							O-terphenyl	84-15-1	8.69E-08	1,24, annual	ST	Above-Average	100%
							O-Xylene	95-47-6	2.90E-04	1,24, annual	ST	Above-Average	100%
							Pentachlorobenzene	608-93-5	6.44E-08	1,24, annual	ST	Above-Average	100%
							Pentachlorophenol	87-86-5	1.61E-06	1,24, annual	ST	Above-Average	100%
							Perylene	198-55-0	6.44E-08	1,24, annual	ST	Above-Average	100%
							Phenanthrene	85-01-8	4.79E-06	1,24, annual	ST	Above-Average	26%
							Picene	213-46-7	3.22E-07	1,24, annual	ST	Above-Average	100%
							PM10 (Condensable and Filterable)	N/A	2.26E-01	1,24, annual	ST	Above-Average	100%
							PM10 (Filterable Only)	N/A	6.05E-02	1,24, annual	ST	Above-Average	100%
							PM2.5 (Condensable and Filterable)	N/A	2.17E-01	1,24, annual	ST	Above-Average	100%
							PM2.5 (Filterable Only)	N/A	5.20E-02	1,24, annual	ST	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	1.86E-04	1,24, annual	ST	Above-Average	100%
							p-Terphenyl	92-94-4	6.47E-08	1,24, annual	ST	Above-Average	100%
							Pyrene	129-00-0	5.12E-07	1,24, annual	ST	Above-Average	30%
							Selenium	7782-49-2	1.42E-05	1,24, annual	ST	Above-Average	100%
							Silver	7440-22-4	1.73E-06	1,24, annual	ST	Above-Average	100%
							Styrene	100-42-5	6.20E-05	1,24, annual	ST	Above-Average	100%
							Sulphur Dioxide	7446-09-5	3.27E-03	1,24, annual	ST	Above-Average	15%
							Tetrachloroethene	127-18-4	2.78E-05	1,24, annual	ST	Above-Average	100%
							Tetralin	119-64-2	1.95E-06	1,24, annual	ST	Above-Average	100%
							Thallium	7440-28-0	1.34E-06	1,24, annual	ST	Above-Average	100%
							Toluene	108-88-3	1.59E-03	1,24, annual	ST	Above-Average	95%
							Total Chromium (and compounds)	7440-47-3	4.22E-05	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Condensable and Filterable)	N/A	1.85E-01	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Filterable Only)	N/A	1.95E-02	1,24, annual	ST	Above-Average	100%
							trans,1,2-Dichloroethene	156-60-5	2.23E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	1.54E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethene	86-42-0	1.54E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	2.78E-05	1,24, annual	ST	Above-Average	100%
							Trichlorofluoromethane	75-69-4	3.09E-05	1,24, annual	ST	Above-Average	100%
							Trichlorotrifluoroethane	76-13-1	3.14E-05	1,24, annual	ST	Above-Average	100%
							Triphenylene	217-59-4	9.20E-08	1,24, annual	ST	Above-Average	100%
							Vanadium	7440-62-2	8.67E-07	1,24, annual	ST	Above-Average	100%
							Vinyl chloride	75-01-4	2.91E-05	1,24, annual	ST	Above-Average	100%
							Xylenes, m-, p- and o-	1330-20-7	1.21E-03	1,24, annual	ST	Above-Average	95%
							Zinc	7440-66-6	2.94E-04	1,24, annual	ST	Above-Average	100%
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%

		Source Parameters					Emission Data						
Source Identifier	**Source Description**	**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 [%]**
							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	35%
							Nitrogen Oxides	10102-44-0	1.12E+00	½	EF	Marginal	12%
							Sulphur Dioxide	7446-09-5	1.88E-02	½	EF	Above-Average	85%
							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	70%
							Toluene	108-88-3	9.21E-05	½	EF	Marginal	5%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	½	EF	Marginal	5%
							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	92%
							Acenaphthylene	208-96-8	3.02E-06	½	EF	Marginal	71%
							Acenaphthene	83-32-9	1.53E-06	½	EF	Marginal	74%
							Fluorene	86-73-7	4.19E-06	½	EF	Marginal	100%
							Phenanthrene	85-01-8	1.34E-05	½	EF	Marginal	74%
							Anthracene	120-12-7	4.03E-07	½	EF	Marginal	64%
							Fluoranthene	206-44-0	1.32E-06	½	EF	Marginal	66%
							Pyrene	129-00-0	1.22E-06	½	EF	Marginal	70%
							Benzo(a)anthracene	56-55-3	2.04E-07	½	EF	Marginal	68%
							Chrysene	218-01-9	5.01E-07	½	EF	Marginal	84%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	½	EF	Marginal	85%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	½	EF	Marginal	53%
							Benzo(a)pyrene	50-32-8	8.42E-08	½	EF	Marginal	57%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	½	EF	Marginal	68%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	½	EF	Marginal	64%
							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 Before Meteorological Anomaly Removal [µg/m³]	Maximum POI Concentration After Meeorological Anomaly Removal [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MECP Limit [%]	Notes	Version of Date of ACB List
1 – methylnaphthalene	90-12-0	3.93E-07	Calpuff	4.00E-07	3.74E-07	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2,4 – Trichlorobenzene	120-82-1	7.47E-07	Calpuff	7.61E-07	7.12E-07	24-hour	400	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
1,2,4,5-Tetrachlorobenzene	95-94-3	1.12E-07	Calpuff	1.14E-07	1.06E-07	24-hour	1	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2-Dichlorobenzene	95-50-1	1.62E-06	Calpuff	3.12E-05	9.44E-06	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
2 – methylnaphthalene	91-57-6	6.82E-07	Calpuff	6.94E-07	6.49E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
2,3,4,6-Tetrachlorophenol	58-90-2	1.61E-06	Calpuff	1.64E-06	1.53E-06	24-hour	0.75	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4,6-Trichlorophenol	88-06-2	1.61E-06	Calpuff	1.64E-06	1.53E-06	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4-Dichlorophenol	120-83-2	1.61E-06	Calpuff	1.64E-06	1.53E-06	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
3-Methylcholanthrene	56-49-5	3.22E-07	Calpuff	3.28E-07	3.07E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
7,12-Dimethylbenzo(a)anthracene	57-97-6	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
Acenaphthene	83-32-9	5.52E-07	Calpuff	5.62E-07	5.26E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acenaphthylene	208-96-8	1.21E-06	Calpuff	1.23E-06	1.15E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acetaldehyde	75-07-0	3.83E-03	Calpuff	3.90E-03	3.65E-03	24-hour	500	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Acetaldehyde	75-07-0	3.83E-03	Calpuff	3.90E-03	3.65E-03	24-hour	5000	—	Sch. 6	URT	—	<1%	—	
Acrolein	107-02-8	3.83E-03	Calpuff	3.90E-03	3.65E-03	24-hour	0.4	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	3.83E-03	Calpuff	7.36E-02	2.23E-02	1-hour	4.5	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	3.83E-03	Calpuff	3.90E-03	3.65E-03	24-hour	4	Health	Sch. 6	URT	—	<1%	—	Apr-18
Ammonia	7664-41-7	2.03E-02	Calpuff	2.07E-02	1.94E-02	24-hour	100	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Ammonia	7664-41-7	2.03E-02	Calpuff	2.07E-02	1.94E-02	24-hour	1000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Anthracene	120-12-7	2.27E-07	Calpuff	2.31E-07	2.16E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Antimony	7440-36-0	3.07E-06	Calpuff	3.13E-06	2.93E-06	24-hour	25	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Arsenic	7440-38-2	1.73E-06	Calpuff	1.76E-06	1.65E-06	24-hour	0.3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Barium	7440-39-3	9.48E-05	Calpuff	9.65E-05	9.03E-05	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Benzene	71-43-2	1.06E-04	Calpuff	3.36E-06	3.36E-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	1.06E-04	Calpuff	1.08E-04	1.01E-04	24-hour	100	Health	Sch. 6	URT/DAV	B1	<1%	—	
Benzene	71-43-2	1.06E-04	Calpuff	3.36E-06	3.36E-06	Annual	4.5	Health	—	AAV	—	<1%	—	Apr-18
Benzo(a)anthracene	56-55-3	9.38E-08	Calpuff	9.55E-08	8.93E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)fluorene	238-84-6	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)pyrene	50-32-8	6.44E-08	Calpuff	2.03E-09	2.03E-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	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.005	Health	Sch. 6	URT	—	<1%	—	Apr-18
Benzo(a)pyrene	50-32-8	6.44E-08	Calpuff	2.03E-09	2.03E-09	Annual	0.0001	Health	—	AAV	—	<1%	—	Apr-18
Benzo(b)fluoranthene	205-99-2	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(b)fluorene	243-17-4	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(e)pyrene	192-97-2	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(g,h,i)perylene	191-24-2	1.17E-07	Calpuff	1.19E-07	1.11E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(k)fluoranthene	207-08-9	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Beryllium	7440-41-7	1.73E-06	Calpuff	1.76E-06	1.65E-06	24-hour	0.01	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Biphenyl	92-51-3	4.20E-07	Calpuff	4.27E-07	4.00E-07	24-hour	175	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromodichloromethane	75-27-4	2.03E-05	Calpuff	2.07E-05	1.94E-05	24-hour	350	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromoform	75-25-2	1.54E-05	Calpuff	1.57E-05	1.47E-05	24-hour	55	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Bromomethane	74-83-9	1.54E-04	Calpuff	1.57E-04	1.47E-04	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Cadmium	7440-43-9	3.67E-06	Calpuff	3.74E-06	3.50E-06	24-hour	0.025	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Cadmium	7440-43-9	3.67E-06	Calpuff	3.74E-06	3.50E-06	24-hour	0.25	Health	Sch. 6	URT	—	<1%	—	Apr-18
Carbon Monoxide	630-08-0	4.82E-01	Calpuff	1.11E+01	3.36E+00	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	Note 9	Apr-18
Carbon tetrachloride	56-23-5	1.81E-05	Calpuff	1.84E-05	1.72E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Carbon tetrachloride	56-23-5	1.81E-05	Calpuff	1.84E-05	1.72E-05	24-hour	24	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chlorobenzene	108-90-7	1.50E-05	Calpuff	2.88E-04	8.71E-05	1-hour	3500	Health	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chlorobenzene	108-90-7	1.50E-05	Calpuff	4.75E-04	1.44E-04	10-minute	4500	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chloroform	67-66-3	3.45E-05	Calpuff	3.51E-05	3.29E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Chloroform	67-66-3	3.45E-05	Calpuff	3.51E-05	3.29E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chromium (hexavalent)	18540-29-9	4.22E-05	Calpuff	1.33E-06	1.33E-06	Annual	0.00014	Health	Sch. 3	Standard	B1	<1%	Notes 11, 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Chromium (hexavalent)	18540-29-9	4.22E-05	Calpuff	4.30E-05	4.02E-05	24-hour	0.07	Health	Sch. 6	URT	—	<1%	—	
Chrysene	218-01-9	9.20E-08	Calpuff	9.37E-08	8.77E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Cobalt	7440-48-4	1.73E-06	Calpuff	1.76E-06	1.65E-06	24-hour	0.1	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Copper	7440-50-8	3.82E-05	Calpuff	3.89E-05	3.64E-05	24-hour	50	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Dibenzo(a,c)anthracene	215-58-7	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dibenzo(a,h)anthracene	53-70-3	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dichlorodifluoromethane	75-71-8	3.63E-05	Calpuff	3.69E-05	3.46E-05	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.54E-05	Calpuff	1.57E-05	1.47E-05	24-hour	165	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.54E-05	Calpuff	1.57E-05	1.47E-05	24-hour	1650	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dichloromethane	75-09-2	1.29E-03	Calpuff	1.31E-03	1.23E-03	24-hour	220	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloromethane	75-09-2	1.29E-03	Calpuff	1.31E-03	1.23E-03	24-hour	22000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dioxins, Furans and Dioxin- like PCBs	N/A	0.00019 µg TEQ/m³	Calpuff	0.00019 pg TEQ/m³	0.00018 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	1.47E-04	Calpuff	1.49E-04	1.40E-04	24-hour	1000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.47E-04	Calpuff	4.65E-03	1.41E-03	10-minute	1900	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.47E-04	Calpuff	1.49E-04	1.40E-04	24-hour	14000	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Ethylene Dibromide	106-93-4	3.09E-05	Calpuff	3.14E-05	2.94E-05	24-hour	3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Fluoranthene	206-44-0	6.65E-07	Calpuff	6.77E-07	6.34E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.76E-02	1.65E-02	24-hour	0.86	Vegetation	Sch. 3	Standard	B1	2%	Note 2, 20	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.97E-03	1.97E-03	30-day	0.34	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.76E-02	1.65E-02	24-hour	1.74	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.97E-03	1.97E-03	30-day	0.69	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.76E-02	1.65E-02	24-hour	3.44	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	1.73E-02	Calpuff	1.97E-03	1.97E-03	30-day	1.38	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration Before Meteorological Anomaly Removal [µg/m³]	Maximum POI Concentration After Meeorological Anomaly Removal [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MECP Limit [%]	Notes	Version of Date of ACB List
Fluorine	86-73-7	7.49E-07	Calpuff	7.63E-07	7.14E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Formaldehyde	50-00-0	4.65E-03	Calpuff	4.73E-03	4.43E-03	24-hour	65	Odour & Irritation	Sch. 3	Standard	B1	<1%	—	Apr-18
Hexachlorobenzene	118-74-1	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Hydrogen Chloride	7647-01-0	1.67E-01	Calpuff	1.70E-01	1.59E-01	24-hour	20	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Hydrogen Chloride	7647-01-0	1.67E-01	Calpuff	1.70E-01	1.59E-01	24-hour	200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Indeno(1,2,3 – cd)pyrene	193-39-5	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Lead	7439-92-1	2.06E-05	Calpuff	2.09E-05	1.96E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	2.06E-05	Calpuff	2.35E-06	2.35E-06	30-day	0.2	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	2.06E-05	Calpuff	2.09E-05	1.96E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	Note 2URT - Note 4, Table 4	Apr-18
Mercury	7439-97-6	8.61E-06	Calpuff	8.76E-06	8.20E-06	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Molybdenum	7439-98-7	2.47E-04	Calpuff	2.52E-04	2.36E-04	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Naphthalene	91-20-3	3.47E-06	Calpuff	3.53E-06	3.30E-06	24-hour	22.5	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Naphthalene	91-20-3	3.47E-06	Calpuff	1.10E-04	3.32E-05	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Nickel	7440-02-0	5.57E-05	Calpuff	1.76E-06	1.76E-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	5.57E-05	Calpuff	5.67E-05	5.31E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	—	Apr-18
Nickel	7440-02-0	5.57E-05	Calpuff	1.76E-06	1.76E-06	Annual	0.4	Health	—	AAV	—	<1%	—	Apr-18
Nitrogen Oxides	10102-44-0	4.24E+00	Calpuff	4.32E+00	4.04E+00	24-hour	200	Health	Sch. 3	Standard	B1	2%	Notes 2, 17	Apr-18
Nitrogen Oxides	10102-44-0	4.24E+00	Calpuff	8.15E+01	2.47E+01	1-hour	400	Health	Sch. 3	Standard	B1	6%	Notes 2, 17	Apr-18
O-terphenyl	84-15-1	8.69E-08	Calpuff	8.85E-08	8.28E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	
PM_{10} (Condensable and Filterable)	N/A	2.26E-01	Calpuff	4.76E-01	4.61E-01	24-hour	50	—	—	AAQC	—	<1%	—	
PM_{10} (Filterable Only)	N/A	6.05E-02	Calpuff	6.16E-02	3.04E-01	24-hour	50	—	—	AAQC	—	<1%	—	
$PM_{2.5}$ (Condensable and Filterable)	N/A	2.17E-01	Calpuff	2.21E-01	4.53E-01	24-hour	30	—	—	AAQC	—	2%	—	
$PM_{2.5}$ (Filterable Only)	N/A	5.20E-02	Calpuff	5.29E-02	2.96E-01	24-hour	30	—	—	AAQC	—	<1%	—	
Pentachlorobenzene	608-93-5	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	80	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Pentachlorophenol	87-86-5	1.61E-06	Calpuff	1.64E-06	1.53E-06	24-hour	20	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Perylene	198-55-0	6.44E-08	Calpuff	6.55E-08	6.13E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Phenanthrene	85-01-8	4.79E-06	Calpuff	4.87E-06	4.56E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Pyrene	129-00-0	5.12E-07	Calpuff	5.21E-07	4.88E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Selenium	7782-49-2	1.42E-05	Calpuff	1.45E-05	1.35E-05	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Silver	7440-22-4	1.73E-06	Calpuff	1.76E-06	1.65E-06	24-hour	1	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Sulphur Dioxide	7446-09-5	3.27E-03	Calpuff	3.32E-03	3.11E-03	24-hour	275	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Sulphur Dioxide	7446-09-5	3.27E-03	Calpuff	6.27E-02	1.90E-02	1-hour	690	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	2.78E-05	Calpuff	2.83E-05	2.65E-05	24-hour	360	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	2.78E-05	Calpuff	2.83E-05	2.65E-05	24-hour	3600	Health	Sch. 6	URT	—	<1%	—	
Tetralin	119-64-2	1.95E-06	Calpuff	1.99E-06	1.86E-06	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Thallium	7440-28-0	1.34E-06	Calpuff	1.36E-06	1.27E-06	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Toluene	108-88-3	1.59E-03	Calpuff	1.62E-03	1.51E-03	24-hour	2000	Not Applicable	Sch. 3	Guideline	B1	<1%	To be updated - Note 5	Apr-18
Total Chromium (and compounds)	7440-47-3	4.22E-05	Calpuff	4.30E-05	4.02E-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	4.22E-05	Calpuff	4.30E-05	4.02E-05	24-hour	5	Health	Sch. 6	URT	—	<1%	—	Apr-18
Total Particulate Matter (Condensable and Filterable)	N/A	1.85E-01	Calpuff	1.88E-01	4.22E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Total Particulate Matter (Filterable only)	N/A	1.85E-01	Calpuff	1.88E-01	4.22E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Trichloroethane, 1,1,1 -	71-55-6	1.54E-05	Calpuff	1.57E-05	1.47E-05	24-hour	115000	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Trichloroethene	86-42-0	1.54E-05	Calpuff	1.57E-05	1.47E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	2.78E-05	Calpuff	2.83E-05	2.65E-05	24-hour	12	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	2.78E-05	Calpuff	2.83E-05	2.65E-05	24-hour	1200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Trichlorofluoromethane	75-69-4	3.09E-05	Calpuff	3.14E-05	2.94E-05	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Vanadium	7440-62-2	8.67E-07	Calpuff	8.82E-07	8.26E-07	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Vinyl chloride	75-01-4	2.91E-05	Calpuff	2.96E-05	2.77E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Vinyl chloride	75-01-4	2.91E-05	Calpuff	2.96E-05	2.77E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Xylenes, m-, p- and o-	1330-20-7	1.21E-03	Calpuff	1.23E-03	1.15E-03	24-hour	730	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	1.21E-03	Calpuff	3.83E-02	1.16E-02	10-minute	3000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	1.21E-03	Calpuff	1.23E-03	1.15E-03	24-hour	7300	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Zinc	7440-66-6	2.94E-04	Calpuff	2.99E-04	2.80E-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		SO_2		NOx		HCl		THC	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		mg/m^3 @ 11% O_2	%
Date	Time	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
25-Jun-19	0:00	8.15	10		0		117		2		0	8
25-Jun-19	1:00	8.39	12		0		103		2		0	8
25-Jun-19	2:00	8.48	11		0		113		3		0	8
25-Jun-19	3:00	8.68	14	11.8	0		105		2		0	8
25-Jun-19	4:00	8.61	11	12.0	0		120		2		0	9
25-Jun-19	5:00	8.78	15	12.8	0		104		2		0	9
25-Jun-19	6:00	8.36	13	13.3	0		119		2		0	8
25-Jun-19	7:00	8.63	15	13.5	0		108		2		0	8
25-Jun-19	8:00	8.61	13	14.0	0		111		2		0	8
25-Jun-19	9:00	8.23	12	13.3	0		111		2		0	8
25-Jun-19	10:00	8.27	18	14.5	0		109		2		0	8
25-Jun-19	11:00	8.18	18	15.3	0		109		2		0	8
25-Jun-19	12:00	8.51	15	15.8	0		110		2		0	9
25-Jun-19	13:00	8.18	18	17.3	0		109		1		0	8
25-Jun-19	14:00	8.26	10	15.3	0		110		2		0	8
25-Jun-19	15:00	8.53	10	13.3	0		111		2		0	8
25-Jun-19	16:00	8.44	14	13.0	0		113		1		0	8
25-Jun-19	17:00	8.16	12	11.5	0		105		1		0	8
25-Jun-19	18:00	8.38	12	12.0	0		109		2		0	8
25-Jun-19	19:00	8.25	10	12.0	0		113		2		0	8
25-Jun-19	20:00	8.41	11	11.3	0		109		2		0	8
25-Jun-19	21:00	8.24	11	11.0	0		110		2		0	8
25-Jun-19	22:00	8.09	10	10.5	0		113		2		0	8
25-Jun-19	23:00	8.32	11	10.8	0	0.0	106	110	2	1.9	0	8
26-Jun-19	0:00	8.36	10	10.5	0	0.0	109	110	2	1.9	0	8
26-Jun-19	1:00	8.34	11	10.5	0	0.0	114	110	2	1.9	0	8
26-Jun-19	2:00	8.21	12	11.0	0	0.0	109	110	2	1.9	0	8
26-Jun-19	3:00	8.58	13	11.5	0	0.0	108	110	2	1.9	0	8
26-Jun-19	4:00	8.51	14	12.5	0	0.0	117	110	1	1.8	0	8
26-Jun-19	5:00											9
26-Jun-19	6:00	8.33	17		0		114		2		0	8
26-Jun-19	7:00	8.05	19		0		104		1		0	8
26-Jun-19	8:00	8.07	11		0		109		2		0	8
26-Jun-19	9:00	8.06	16	15.8	0		110		1		0	8
26-Jun-19	10:00	8.25	11	14.3	0		115		2		0	8
26-Jun-19	11:00	8.23	9	11.8	0		109		2		0	8
26-Jun-19	12:00	8.37	10	11.5	0		110		1		0	8
26-Jun-19	13:00	8.37	8	9.5	0		110		2		0	8
26-Jun-19	14:00	8.12	9	9.0	0		113		2		0	8
26-Jun-19	15:00	8.14	9	9.0	0		109		1		0	8
26-Jun-19	16:00	8.26	8	8.5	0		108		2		0	8
26-Jun-19	17:00	8.48	10	9.0	0		116		2		0	8
26-Jun-19	18:00	8.32	9	9.0	0		108		1		0	8
26-Jun-19	19:00	8.27	9	9.0	0		113		1		0	8
26-Jun-19	20:00	8.16	10	9.5	0		106		2		0	8
26-Jun-19	21:00	8.17	12	10.0	0		111		2		0	8
26-Jun-19	22:00	8.49	13	11.0	0		114		2		0	8
26-Jun-19	23:00	8.12	16	12.8	0		108		2		0	8
27-Jun-19	0:00	8.11	18	14.8	0		111		2		0	8
27-Jun-19	1:00	8.21	15	15.5	0		112		2		0	8
27-Jun-19	2:00	8.18	14	15.8	0		111		2		0	8
27-Jun-19	3:00	8.65	14	15.3	0		100		2		0	8
27-Jun-19	4:00	8.05	17	15.0	0		116		1		0	8
27-Jun-19	5:00	8.25	23	17.0	0	0.0	97	110	2	1.7	0	8
27-Jun-19	6:00	8.23	14	17.0	0	0.0	109	110	2	1.7	0	8
27-Jun-19	7:00	8.59	11	16.3	0	0.0	111	110	2	1.8	0	8
27-Jun-19	8:00	8.26	9	14.3	0	0.0	109	110	2	1.8	0	8
27-Jun-19	9:00	8.18	11	11.3	0	0.0	112	110	1	1.8	0	8
27-Jun-19	10:00	8.31	12	10.8	0	0.0	111	110	2	1.8	0	8
27-Jun-19	11:00	8.40	11	10.8	0	0.0	112	110	2	1.8	0	8
27-Jun-19	12:00	8.74	10	11.0	0	0.0	110	110	2	1.8	0	9
27-Jun-19	13:00	8.48	13	11.5	0	0.0	112	110	2	1.8	0	8
27-Jun-19	14:00	8.14	17	12.8	0	0.0	107	110	2	1.8	0	8
27-Jun-19	15:00	8.32	17	14.3	0	0.0	112	110	2	1.8	0	8
27-Jun-19	16:00	7.99	13	15.0	0	0.0	108	110	2	1.8	0	8
27-Jun-19	17:00	8.06	11	14.5	0	0.0	110	110	2	1.8	0	8
27-Jun-19	18:00	8.26	10	12.8	0	0.0	112	110	1	1.8	0	8
27-Jun-19	19:00	7.99	26	15.0	0	0.0	109	110	1	1.8	0	8
27-Jun-19	20:00	7.88	11	14.5	0	0.0	110	110	2	1.8	0	8
27-Jun-19	21:00	7.94	17	16.0	0	0.0	111	110	2	1.8	0	8
27-Jun-19	22:00	8.05	11	16.3	0	0.0	108	110	2	1.8	0	8
27-Jun-19	23:00	7.83	21	15.0	0	0.0	107	109	2	1.8	0	8

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet										Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC	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		mg/m^3 @ 11% O_2	%
Date	Time	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
28-Jun-19	0:00	7.99	16	16.3	0	0.0	111	109	2	1.8	0	8
28-Jun-19	1:00	8.19	15	15.8	0	0.0	110	109	2	1.8	0	8
28-Jun-19	2:00	8.29	16	17.0	0	0.0	110	109	2	1.8	0	8
28-Jun-19	3:00	7.99	13	15.0	0	0.0	107	110	2	1.8	0	8
28-Jun-19	4:00	8.31	19	15.8	0	0.0	117	110	1	1.8	0	8
28-Jun-19	5:00	7.95	19	16.8	0	0.0	99	110	2	1.8	0	8
28-Jun-19	6:00	8.25	10	15.3	2	0.1	111	110	2	1.8	0	8
28-Jun-19	7:00	8.04	14	15.5	0	0.1	111	110	2	1.8	0	8
28-Jun-19	8:00	8.53	13	14.0	0	0.1	110	110	4	1.9	0	8
28-Jun-19	9:00	8.29	14	12.8	0	0.1	112	110	2	2.0	0	8
28-Jun-19	10:00	8.33	10	12.8	0	0.1	109	110	2	2.0	0	8
28-Jun-19	11:00	8.29	8	11.3	0	0.1	114	110	2	2.0	0	8
28-Jun-19	12:00	7.99	13	11.3	0	0.1	113	110	2	2.0	0	8
28-Jun-19	13:00	8.09	8	9.8	0	0.1	114	110	2	2.0	0	8
28-Jun-19	14:00	8.64	13	10.5	0	0.1	110	110	2	2.0	0	8
28-Jun-19	15:00	8.87	28	15.5	0	0.1	115	110	2	2.0	0	9
28-Jun-19	16:00	8.04	11	15.0	0	0.1	111	110	2	2.0	0	8
28-Jun-19	17:00	7.76	12	16.0	0	0.1	103	110	1	1.9	0	7
28-Jun-19	18:00	8.29	11	15.5	0	0.1	107	110	2	2.0	0	8
28-Jun-19	19:00	7.99	10	11.0	0	0.1	111	110	2	2.0	0	8
28-Jun-19	20:00	8.11	11	11.0	0	0.1	112	110	3	2.0	0	8
28-Jun-19	21:00	8.17	17	12.3	0	0.1	113	110	2	2.0	0	8
28-Jun-19	22:00	8.40	14	13.0	0	0.1	112	110	2	2.0	0	8
28-Jun-19	23:00	8.73	14	14.0	0	0.1	111	110	3	2.1	0	9
	Min	7.76	8	8.5	0	0.0	97	109	1	1.7	0	7
	Max	8.87	28	17.3	2	0.1	120	110	4	2.1	0	9
	Avg	8.27	13	13.1	0.02	0.03	110	110	2	1.9	0	8
	Std Dev	0.22	3.8	2.4	0.21	0.04	3.82	0.3	0.5	0.1	-	0.3

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet										Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC	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		mg/m^3 @ 11% O_2	%
Date	Time	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
25-Jun-19	0:00	8.08	9		0		113		4		0	8
25-Jun-19	1:00	8.33	11		0		112		5		0	8
25-Jun-19	2:00	8.45	9		0		106		5		0	8
25-Jun-19	3:00	8.60	12	10.3	0		91		3		0	8
25-Jun-19	4:00	8.58	14	11.5	0		119		2		0	8
25-Jun-19	5:00	8.63	15	12.5	0		93		4		1	8
25-Jun-19	6:00	8.21	12	13.3	0		118		3		1	8
25-Jun-19	7:00	8.37	9	12.5	0		113		4		0	8
25-Jun-19	8:00	8.35	11	11.8	0		110		4		0	8
25-Jun-19	9:00	8.43	13	11.3	0		109		4		0	8
25-Jun-19	10:00	8.23	20	13.3	0		106		4		0	8
25-Jun-19	11:00	8.13	21	16.3	0		111		4		0	8
25-Jun-19	12:00	8.38	18	18.0	0		107		4		0	8
25-Jun-19	13:00	8.19	17	19.0	0		112		3		0	8
25-Jun-19	14:00	8.16	13	17.3	0		112		3		0	8
25-Jun-19	15:00	8.23	12	15.0	0		117		4		0	8
25-Jun-19	16:00	8.41	11	13.3	0		105		5		0	8
25-Jun-19	17:00	8.41	11	11.8	0		113		4		0	8
25-Jun-19	18:00	8.35	11	11.3	0		109		2		0	8
25-Jun-19	19:00	8.72	14	11.8	0		111		5		0	8
25-Jun-19	20:00	8.24	12	12.0	0		110		3		0	8
25-Jun-19	21:00	8.04	11	12.0	0		117		3		0	8
25-Jun-19	22:00	8.40	16	13.3	0		108		4		0	8
25-Jun-19	23:00	8.13	9	12.0	0	0.0	112	110	4	3.8	0	8
26-Jun-19	0:00	8.10	9	11.3	0	0.0	112	110	3	3.7	0	8
26-Jun-19	1:00	8.61	12	11.5	0	0.0	109	110	4	3.7	0	8
26-Jun-19	2:00	8.49	12	10.5	0	0.0	112	110	4	3.6	0	8
26-Jun-19	3:00	8.44	10	10.8	0	0.0	105	110	2	3.6	0	8
26-Jun-19	4:00	8.51	11	11.3	0	0.0	119	110	1	3.5	0	8
26-Jun-19	5:00	8.59	14	11.8	0	0.0	100	111	5	3.6	1	8
26-Jun-19	6:00	8.11	12	11.8	0	0.0	115	111	4	3.6	1	8
26-Jun-19	7:00	8.20	9	11.5	0	0.0	112	111	4	3.6	0	8
26-Jun-19	8:00	8.16	11	11.5	0	0.0	108	110	3	3.6	0	8
26-Jun-19	9:00	8.22	10	10.5	0	0.0	111	111	4	3.6	0	8
26-Jun-19	10:00	8.11	11	10.3	0	0.0	109	111	5	3.6	0	8
26-Jun-19	11:00	8.11	10	10.5	0	0.0	114	111	5	3.7	0	8
26-Jun-19	12:00	7.97	9	10.0	0	0.0	109	111	5	3.7	0	8
26-Jun-19	13:00	8.15	9	9.8	0	0.0	112	111	7	3.9	0	8
26-Jun-19	14:00	8.10	11	9.8	0	0.0	112	111	5	4.0	0	8
26-Jun-19	15:00	7.90	9	9.5	0	0.0	109	111	3	3.9	0	7
26-Jun-19	16:00	8.28	15	11.0	0	0.0	110	111	1	3.8	0	8
26-Jun-19	17:00	8.25	13	12.0	0	0.0	113	111	3	3.7	0	8
26-Jun-19	18:00	8.22	12	12.3	0	0.0	117	111	6	3.9	0	8
26-Jun-19	19:00	8.21	9	12.3	0	0.0	107	111	6	3.9	0	8
26-Jun-19	20:00	8.35	10	11.0	0	0.0	104	111	5	4.0	0	8
26-Jun-19	21:00	8.46	9	10.0	0	0.0	115	111	4	4.0	0	8
26-Jun-19	22:00	8.43	9	9.3	0	0.0	109	111	6	4.1	0	8
26-Jun-19	23:00	8.21	12	10.0	0	0.0	107	110	5	4.2	0	8
27-Jun-19	0:00	8.31	11	10.3	0	0.0	112	110	5	4.3	0	8
27-Jun-19	1:00	8.41	14	11.5	0	0.0	109	110	5	4.3	0	8
27-Jun-19	2:00	8.55	19	14.0	0	0.0	114	111	5	4.3	0	8
27-Jun-19	3:00	8.56	19	15.8	0	0.0	98	110	4	4.4	0	8
27-Jun-19	4:00	8.73	17	17.3	0	0.0	123	110	2	4.5	0	8
27-Jun-19	5:00	8.31	13	17.0	0	0.0	89	110	6	4.5	1	8
27-Jun-19	6:00	8.31	12	15.3	0	0.0	117	110	6	4.6	1	8
27-Jun-19	7:00	8.36	13	13.8	0	0.0	114	110	5	4.6	0	8
27-Jun-19	8:00	8.43	11	12.3	0	0.0	107	110	5	4.7	0	8
27-Jun-19	9:00	8.40	14	12.5	0	0.0	113	110	5	4.8	0	8
27-Jun-19	10:00	8.20	15	13.3	0	0.0	107	110	5	4.8	0	8
27-Jun-19	11:00	8.39	16	14.0	0	0.0	110	110	5	4.8	0	8
27-Jun-19	12:00	8.69	10	13.8	0	0.0	109	110	5	4.8	0	8
27-Jun-19	13:00	8.30	9	12.5	0	0.0	112	110	4	4.6	0	8
27-Jun-19	14:00	8.29	10	11.3	0	0.0	110	110	5	4.6	0	8
27-Jun-19	15:00	8.39	9	9.5	0	0.0	113	110	5	4.7	0	8
27-Jun-19	16:00	8.17	9	9.3	0	0.0	114	110	5	4.9	0	8
27-Jun-19	17:00	8.14	9	9.3	0	0.0	110	110	5	5.0	0	8
27-Jun-19	18:00	8.11	11	9.5	0	0.0	109	110	3	4.8	0	8
27-Jun-19	19:00	8.36	13	10.5	2	0.1	113	110	2	4.7	0	8
27-Jun-19	20:00	7.94	12	11.3	0	0.1	106	110	6	4.7	0	8
27-Jun-19	21:00	8.15	9	11.3	0	0.1	114	110	4	4.7	0	8
27-Jun-19	22:00	7.88	16	12.5	0	0.1	112	110	4	4.6	0	7
27-Jun-19	23:00	8.14	10	11.8	0	0.1	112	110	5	4.6	0	8

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet										Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC	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		mg/m^3 @ 11% O_2	%
Date	**Time**	**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**
28-Jun-19	0:00	8.13	17	13.0	0	0.1	108	110	5	4.6	0	8
28-Jun-19	1:00	8.18	21	16.0	0	0.1	108	110	5	4.6	0	8
28-Jun-19	2:00	8.25	18	16.5	0	0.1	112	110	5	4.6	0	8
28-Jun-19	3:00	8.45	10	16.5	1	0.1	108	110	3	4.6	0	8
28-Jun-19	4:00	8.44	13	15.5	2	0.2	122	110	2	4.6	0	8
28-Jun-19	5:00										1	8
28-Jun-19	6:00										1	8
28-Jun-19	7:00	8.96	9		0		119		8		0	8
28-Jun-19	8:00	8.28	9		0		110		6		0	8
28-Jun-19	9:00	8.31	10		0		112		5		0	8
28-Jun-19	10:00	8.50	14	10.5	0		105		6		0	8
28-Jun-19	11:00	8.37	12	11.3	0		112		5		0	8
28-Jun-19	12:00	8.38	17	13.3	0		109		5		0	8
28-Jun-19	13:00	8.38	13	14.0	0		108		4		0	8
28-Jun-19	14:00	8.77	10	13.0	0		107		4		0	8
28-Jun-19	15:00	8.63	12	13.0	0		111		5		0	8
28-Jun-19	16:00	8.16	12	11.8	0		109		4		0	8
28-Jun-19	17:00	8.07	13	11.8	0		116		4		0	8
28-Jun-19	18:00	8.43	9	11.5	0		113		6		0	8
28-Jun-19	19:00	8.29	9	10.8	0		109		6		0	8
28-Jun-19	20:00	8.33	7	9.5	1		106		6		0	8
28-Jun-19	21:00	8.36	7	8.0	4		114		6		0	8
28-Jun-19	22:00	8.44	12	8.8	1		113		5		0	8
28-Jun-19	23:00	8.59	10	9.0	3		106		6		0	8
	Min	7.88	7	8.0	0	0.0	89	110	1	3.5	0	7
	Max	8.96	21	19.0	4	0.2	123	111	8	5.0	1	8
	Avg	8.32	12	12.2	0.15	0.02	110	110	4	4.2	0.08	8
	Std Dev	0.20	3.1	2.3	0.6	0.04	5.44	0.4	1.3	0.5	0.3	0.1

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