Report No. | 21880

ORTECH
a Kontrol Energy Company

Report:

Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre 2018 Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX

Date: October 31, 2018



Report:

Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre 2018 Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX

Submitted to: The Regional Municipality of Durham
Works Department
605 Rossland Road East, Level 4
PO Box 623, Whitby, Ontario L1N 6A3

Mr. Gioseph Anello
Manager, Waste Planning & Technical Services
Tel: (905) 668-4113, Ext. 3445
E-mail: gioseph.anello@durham.ca

Covanta Corporation
445 South Street
Morristown, NJ, USA 07960

Mr. Rick Kohler
Environmental Engineer
Tel: (862) 345-5197
E-mail: rkohler@covanta.com

Site Location: Durham York Energy Centre
1835 Energy Drive
Courtice, Ontario L1E 2R2

Prepared by: ORTECH Consulting Inc.
804 Southdown Rd.
Mississauga, Ontario L5J 2Y4

Tina Sanderson, B.Sc.
Senior Specialist, Emission Testing
Tel: (905) 822-4120, Ext. 522
E-mail: tsanderson@ortech.ca

Reviewed by: ORTECH Consulting Inc.
804 Southdown Rd.
Mississauga, Ontario L5J 2Y4

Hank Van Bakel, P.Eng.
President
Tel: (905) 822-4120, Ext. 628
E-mail: hvanbakel@ortech.ca

Report No.: 21880
56 pages, 28 Appendices

Revision History

Version	Date	Summary Changes/Purpose of Revision
1	October 31, 2018	None

Table of Contents

Table of Contents

List of Appendices

EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between September 11 and September 14, 2018. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter". This program is the seventh 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

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 (September 11 to September 14, 2018) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on September 11, 2018 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

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

The MECP "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provides an updated framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. This document was replaced by "Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", with the most recent version published on April 27, 2018, however the dioxin and furan toxicity equivalent calculation methodology remains the same. The dioxins, furans and dioxin-like PCBs toxicity equivalent emission data was also calculated using half the detection limit for those compounds not detected. The half detection limit data was used to assess against the dispersion modelling Point of Impingement limit. The toxicity equivalent concentrations calculated using the full detection limit, for those compounds less than the reportable detection limit, were used to assess against the in-stack limit detailed in Schedule C of the ECA.

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	361	-
Average Combustion Zone Temp. (°C)*	-	-	-	1226	-
Steam (tonnes/day)*	-	-	-	787	-
MSW Combusted (tonnes/day)*	-	-	-	205	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	606	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4248	-
Filterable Particulate (mg/Rm^3) (1)	<0.23	0.59	0.21	<0.34	9
PM_{10} with Condensable (mg/Rm^3) (1)	<4.67	<6.81	<4.21	<5.23	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.47	<6.61	<3.95	<5.01	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.10	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.57	0.48	0.46	0.50	-
Cadmium (µg/Rm^3) (1)	0.068	0.30	0.050	0.14	7
Lead (µg/Rm^3) (1)	0.19	0.14	0.22	0.18	50
Mercury (µg/Rm^3) (1)	0.31	0.27	0.31	0.30	15
Antimony (µg/Rm^3) (1)	<0.035	0.069	0.038	<0.047	-
Arsenic (µg/Rm^3) (1)	0.085	0.061	<0.035	<0.060	-
Barium (µg/Rm^3) (1)	1.22	1.33	1.40	1.32	-
Beryllium (µg/Rm^3) (1)	0.018	0.028	<0.035	<0.027	-
Chromium (µg/Rm^3) (1)	1.11	1.77	1.24	1.38	-
Cobalt (µg/Rm^3) (1)	0.028	<0.036	<0.035	<0.033	-
Copper (µg/Rm^3) (1)	0.93	1.04	0.44	0.81	-
Molybdenum (µg/Rm^3) (1)	7.38	8.07	7.42	7.62	-
Nickel (µg/Rm^3) (1)	3.29	3.61	3.20	3.37	-
Selenium (µg/Rm^3) (1)	<0.18	<0.18	<0.17	<0.18	-
Silver (µg/Rm^3) (1)	<0.035	0.018	<0.035	<0.029	-
Thallium (µg/Rm^3) (1)	0.11	0.016	0.0088	0.043	-
Vanadium (µg/Rm^3) (1)	<0.018	0.042	0.032	<0.031	-
Zinc (µg/Rm^3) (1)	3.85	5.33	3.06	4.08	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<5.66	<4.74	<4.75	<5.05	60
Total Chlorobenzenes (ng/Rm^3) (1)	<560	<432	<436	<476	-
Total Chlorophenols (ng/Rm^3) (1)	<181	<176	<183	<180	-
Total PAHs (ng/Rm^3) (1)	<288	<316	<226	<277	-
VOCs (µg/Rm^3) (1)	<74.3	<99.8	<123	<98.9	-
Aldehydes (µg/Rm^3) (1)	<325	<307	<303	<312	-
Total VOCs (µg/Rm^3) (1) (4)	<399	<407	<426	<411	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.9	0.5	0.6	0.7	50

* based on process data provided by Covanta

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

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

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

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

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	361	-
Average Combustion Zone Temp. (°C)*	-	-	-	1252	-
Steam (tonnes/day)*	-	-	-	786	-
MSW Combusted (tonnes/day)*	-	-	-	205	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	735	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4447	-
Filterable Particulate (mg/Rm^3) (1)	0.46	<0.27	<0.24	<0.32	9
PM_{10} with Condensable (mg/Rm^3) (1)	4.09	<4.89	<4.13	<4.37	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	3.78	<4.39	<3.63	<3.93	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.10	<0.10	<0.10	-
Ammonia (mg/Rm^3) (1)	1.05	0.91	0.70	0.89	-
Cadmium (µg/Rm^3) (1)	0.013	0.035	0.057	0.035	7
Lead (µg/Rm^3) (1)	0.25	0.099	0.30	0.22	50
Mercury (µg/Rm^3) (1)	0.15	0.12	0.13	0.13	15
Antimony (µg/Rm^3) (1)	<0.036	<0.034	0.038	<0.036	-
Arsenic (µg/Rm^3) (1)	0.037	0.047	<0.037	<0.040	-
Barium (µg/Rm^3) (1)	1.15	1.01	1.80	1.32	-
Beryllium (µg/Rm^3) (1)	0.022	0.032	<0.037	<0.030	-
Chromium (µg/Rm^3) (1)	0.79	0.42	1.13	0.78	-
Cobalt (µg/Rm^3) (1)	0.28	<0.034	<0.037	<0.12	-
Copper (µg/Rm^3) (1)	0.45	0.73	0.65	0.61	-
Molybdenum (µg/Rm^3) (1)	4.03	3.88	7.89	5.27	-
Nickel (µg/Rm^3) (1)	0.91	0.39	3.29	1.53	-
Selenium (µg/Rm^3) (1)	<0.18	<0.17	<0.18	<0.18	-
Silver (µg/Rm^3) (1)	<0.036	<0.034	<0.037	<0.036	-
Thallium (µg/Rm^3) (1)	<0.036	<0.034	<0.037	<0.036	-
Vanadium (µg/Rm^3) (1)	<0.018	<0.017	<0.018	<0.018	-
Zinc (µg/Rm^3) (1)	2.97	1.84	3.13	2.65	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.33	<3.43	<2.89	<3.22	60
Total Chlorobenzenes (ng/Rm^3) (1)	<596	<462	<355	<471	-
Total Chlorophenols (ng/Rm^3) (1)	<168	<163	<162	<165	-
Total PAHs (ng/Rm^3) (1)	<194	<282	<171	<216	-
VOCs (µg/Rm^3) (1)	<70.1	<74.3	<96.8	<80.4	-
Aldehydes (µg/Rm^3) (1)	<489	<377	<346	<404	-
Total VOCs (µg/Rm^3) (1) (4)	<559	<451	<443	<484	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	1.2	0.8	0.9	1.0	50

* based on process data provided by Covanta

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

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

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

(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)	8.0	13.0	20.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.6	2.9	3.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.8	13.4	27.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.6	4.1	5.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	111	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.1	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 September 2018 emission testing program was performed by Golder Associates. A summary of the results are provided in the tables appended to this report (Appendix 27) based on calculated ground level Point of Impingement (POI) concentrations for the average total Main Stack emissions. As shown in the tables, the calculated impingement concentrations for all of the contaminants were well below the relevant MECP standards.

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

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 763 tonnes of steam per day for each Boiler (approximately 94.5% 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 an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between September 11 and September 14, 2018. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter". This program is the seventh 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

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, a Pre-Test Plan letter was submitted to the MECP stating that the 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 acceptance letter received from the MECP, dated July 30, 2018, indicating acceptance of the proposed sampling strategy. 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 September 11 and September 14, 2018.

2. PROCESS DESCRIPTION

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

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

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

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

2.1 Control Equipment

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

2.2 Continuous Emission Monitoring Systems

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

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

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

3. SAMPLING LOCATIONS

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

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

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

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

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

The results for the cyclonic flow checks are summarized below:

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

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

4. SAMPLING PROCEDURES

4.1 General

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

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

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

Since relative accuracy and system bias testing was performed in the 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 (September 11 to September 14, 2018) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH on September 11, 2018 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

4.2 Particulate and Metals

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

- A glass nozzle and probe liner assembly
- A quartz fiber filter with a low metal background
- The first 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 September 11, 2018 at 09:00 to September 14, 2018 at 13:00, 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 September 11, 2018. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA.

5. SAMPLE RECOVERY AND ANALYSIS

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

5.1 Particulate and Metals

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

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

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

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

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

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

The inorganic analytical reports are provided in Appendix 12.

5.2 Particle Size Distribution

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

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

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

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

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

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

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

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

5.3 Semi-Volatile Organic Compounds

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

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

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

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

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

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

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

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

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

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

The SVOC analytical reports are provided in Appendix 15.

5.4 Acid Gases

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

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

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

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

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

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

5.5 Volatile Organics Train Recovery

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

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

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

The VOST analytical report is provided in Appendix 17.

5.6 Aldehydes

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

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

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

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

6. INTERNAL AND EXTERNAL QA/QC PROGRAM

6.1 General

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

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

6.2 Pre-Test Activities

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

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

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

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

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

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

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

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

6.3 Emission Testing QA/QC Results

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

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

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

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

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

The control box used for Particulate and Metals Test No. 1 at BH Outlet No. 2 repeatedly lost power during the first forty-two minutes of the test. The instrument technician decided to change the control box in order to maintain consistent power. As a result the dry gas meter correction factor (DGMCF) changed from 1.003 to 0.996. The readings for the first forty-two minutes of the test were corrected for the difference between the dry gas meter readings and the DGMCF in order to calculate the sample volume for the test. The correction is detailed on the field data sheet.

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 18.6% well within the acceptable limit of less than ±20%, for elements that are greater than 5 times the minimum detection limit.
- A blank spike (performed as a pre-digestion spike) was analyzed with the test samples. All of the recovery results were between 87-114%, except for silver in the front half sample (56%). 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 84-115%. The acceptable limit is 70-130% of the true value.

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

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

Antimony, beryllium, chromium, molybdenum and nickel were observed by the analytical laboratory in the method blank at levels greater than the limit of reporting. Antimony, chromium, lead and nickel 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 5.6% 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 97-105% 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 96-104% 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 4.1%, 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 94% for hydrogen chloride, 92% 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 96% for hydrogen chloride, 94% for hydrogen fluoride and 106% 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. The trip spike sample prepared by the analytical laboratory, and submitted for analysis with the test samples, was prepared incorrectly and as a result recovery data for the sample could not be determined.

The samples, including both blank samples, were concentrated prior to analysis to reduce the reported detection limits (µg/sample). 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 and acrolein was detected in two 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 76-111% 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 analytical report for the dioxin-like PCBs, there appear to have been losses of selected PCBs during laboratory preparation, particularly for the poly-ortho substituted congeners for BH Outlet No. 2 Test No. 3 and the BH Outlet No. 2 blank. Each target has been calculated against an exact 13C-labelled extraction standard, therefore the data is not expected to be biased. However, the reported recoveries of the 13C12-PCB-111 cleanup standard and the 13C12-PCB-153 field standard appear to be biased low.

Per the analytical report for chlorophenols, BH Outlet No. 2 Test No. 1 and Test No. 2 samples showed poor and inconsistent extraction standard recoveries. They also showed an absence of field spike recoveries. Therefore, the overall target chlorophenol values are suspect and maybe compromised. However, the results are consistent with BH Outlet No. 2 Test No. 3 and all three tests at BH Outlet No. 1.

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 61-142%.

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 (September 11 to September 14, 2018) by the DYEC CEMS. Total hydrocarbon concentrations were also measured at the BH Outlet and Quench Inlet by ORTECH on September 11, 2018.

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

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

7.1 Stack Gas Sampling Parameters

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

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

7.2 Stack Gas Physical Parameters

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

Stack Gas Parameter	Boiler No. 1 BH Outlet*	Boiler No. 2 BH Outlet*
Gas Temperature (°C)	140	141
Moisture by Volume (%)	17.0	16.8
Velocity (m/s)	17.9	17.2
Static Pressure (kPa)	-2.42	-2.38
Absolute Pressure (kPa)	98.9	98.9
Carbon Dioxide by Volume (%)**	11.0	11.1
Oxygen by Volume (%)**	8.31	7.98

* 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	26.2
Dry Reference Flowrate (Rm^3/s)**	15.4	15.3
Dry Adjusted Flowrate (Rm^3/s)***	19.6	20.0
Wet Reference Flowrate (Rm^3/s)**	18.6	18.4

* 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)	<0.25	<0.25
Dry Reference Conc. (mg/Rm^3)*	<0.43	<0.42
Dry Adjusted Conc. (mg/Rm^3)**	<0.34	<0.32
Wet Reference Conc. (mg/Rm^3)*	<0.36	<0.35
Emission Rate (mg/s)	<6.78	<6.41

* 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 (<0.34 mg/Rm^3, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (<0.32 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 0.3 mg and 0.8 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 0.3 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)	<0.96	<0.57	<0.79	<0.24
Dry Reference Conc. (mg/Rm^3)*	<1.61	<0.97	<1.33	<0.41
Dry Adjusted Conc. (mg/Rm^3)**	<1.28	<0.75	<1.06	<0.31
Wet Reference Conc. (mg/Rm^3)*	<1.35	<0.81	<1.12	<0.34
Emission Rate (mg/s)	<24.1	<15.0	<19.9	<6.23

* 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)	1.72	1.82	1.26	0.95
Dry Reference Conc. (mg/Rm^3)*	2.88	3.10	2.11	1.62
Dry Adjusted Conc. (mg/Rm^3)**	2.28	2.38	1.67	1.24
Wet Reference Conc. (mg/Rm^3)*	2.43	2.59	1.78	1.35
Emission Rate (mg/s)	43.8	47.8	32.0	24.9

* 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 1.3 mg for the inorganic fraction and 1.3 mg for the organic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was 1.3 mg for the inorganic fraction and 1.6 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)	<3.94	<3.34	<3.77	<3.01
Dry Reference Conc. (mg/Rm^3)*	<6.60	<5.69	<6.32	<5.13
Dry Adjusted Conc. (mg/Rm^3)**	<5.23	<4.37	<5.01	<3.93
Wet Reference Conc. (mg/Rm^3)*	<5.56	<4.75	<5.33	<4.28
Emission Rate (mg/s)	<99.9	<87.7	<95.7	<78.9

* 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)	4.43	1.93	<0.079	<0.080	0.37	0.68
Dry Reference Conc. (mg/Rm^3)*	7.60	3.24	<0.14	<0.13	0.64	1.15
Dry Adjusted Conc. (mg/Rm^3)**	5.94	2.51	<0.11	<0.10	0.50	0.89
Wet Reference Conc. (mg/Rm^3)*	6.26	2.72	<0.11	<0.11	0.53	0.96
Emission Rate (mg/s)	117	48.9	<2.08	<2.02	9.85	17.3
Dry Adjusted Conc. (ppm)**	3.99	1.68	<0.13	<0.13	0.72	1.28

* at 25°C and 1 atmosphere

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

Hydrogen fluoride and ammonia were not detected in the blank samples in quantities greater than the detection limit. Hydrogen chloride was detected in the blank trains but the amounts found were insignificant when compared to the amount of hydrogen chloride collected in the test trains. 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 September 11, 2018 at 09:00 to September 14, 2018 at 13:00 for each Boiler. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

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

Combustion Gases Emission Parameter		In-Stack ECA Limit	Maximum Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Oxygen (%, 1-hr)	-	9.27	9.63
	Carbon Monoxide (mg/Rm^3, 4-hr)*	≤ 40	20.0	27.0
	Sulphur Dioxide (mg/Rm^3, 24-hr)*	≤ 35	0	0.2
	Nitrogen Oxides (mg/Rm^3, 24-hr)*	≤ 121	110	111
	Hydrogen Chloride (mg/Rm^3, 24-hr)*	≤ 9	3.3	5.3
	Total Hydrocarbons (mg/Rm^3, 1-hr)*	-	0	1
Quench Inlet	Oxygen (%, 1-hr)	≥ 6	9	10

* dry at reference conditions, adjusted to 11% oxygen

** dry at reference conditions

Total hydrocarbon concentration data was measured by ORTECH on September 11, 2018 at the Quench Inlet and BH Outlet sampling locations. The results of the total hydrocarbons tests are summarized in Table 10 (Appendix 1 and Appendix 2). The average THC concentration for each location, along with the in-stack limit stated in the ECA, is summarized in the following table.

Combustion Gases Emission Parameter		Limit	Average Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Total Hydrocarbons (1-minute)*	-	0.3	0.3
	Total Hydrocarbons (10-minute)**	-	0.3	0.3
Quench Inlet	Total Hydrocarbons (1-minute)*	-	0.7	1.0
	Total Hydrocarbons (10-minute)**	50	0.7	1.0

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

** ppm dry basis, expressed as equivalent methane (average of each 60 minute test calculated using the 10-minute rolling average)

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

7.7 Metal Emission Data

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

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

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

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

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

The average cadmium emission data is summarized below:

Cadmium Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.10	0.027
Dry Reference Conc. (µg/Rm^3)*	0.18	0.046
Dry Adjusted Conc. (µg/Rm^3)**	0.14	0.035
Wet Reference Conc. (µg/Rm^3)*	0.15	0.038
Emission Rate (mg/s)	0.0028	0.00071

* 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)	0.14	0.16
Dry Reference Conc. (µg/Rm^3)*	0.23	0.28
Dry Adjusted Conc. (µg/Rm^3)**	0.18	0.22
Wet Reference Conc. (µg/Rm^3)*	0.19	0.23
Emission Rate (mg/s)	0.0037	0.0043

* at 25°C and 1 atmosphere

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

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

7.8 Mercury Emission Data

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

The average mercury emission data is summarized below:

Mercury Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.22	0.10
Dry Reference Conc. (µg/Rm^3)*	0.38	0.17
Dry Adjusted Conc. (µg/Rm^3)**	0.30	0.13
Wet Reference Conc. (µg/Rm^3)*	0.31	0.14
Emission Rate (mg/s)	0.0059	0.0026

* 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)	0.25	0.26
Dry Reference Conc. (ng/Rm^3)*	0.43	0.45
Dry Adjusted Conc. (ng/Rm^3)**	0.34	0.34
Wet Reference Conc. (ng/Rm^3)*	0.36	0.37
Emission Rate (ng/s)	6.74	6.83

* 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)	0.049	0.035
Dry Reference Conc. (ng/Rm^3)*	0.085	0.060
Dry Adjusted Conc. (ng/Rm^3)**	0.066	0.046
Wet Reference Conc. (ng/Rm^3)*	0.070	0.050
Emission Rate (ng/s)	1.32	0.93

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

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

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

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

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

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

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

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

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

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

Total Dioxin and Furan Isomer and PBCs Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (pg TEQ/m^3)	3.32	3.16
Dry Reference Conc. (pg TEQ/Rm^3)*	5.74	5.42
Dry Adjusted Conc. (pg TEQ/Rm^3)**	4.49	4.17
Wet Reference Conc. (pg TEQ/Rm^3)*	4.73	4.50
Emission Rate (ng TEQ/s)	0.089	0.083

* 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)*	<5.05	<3.22

* 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)	<351	<358
Dry Reference Conc. (ng/Rm^3)*	<608	<612
Dry Adjusted Conc. (ng/Rm^3)**	<476	<471
Wet Reference Conc. (ng/Rm^3)*	<501	<510
Emission Rate (µg/s)	<9.46	<9.39

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

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

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

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

The average total chlorophenol emission data is presented below:

Chlorophenol Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<133	<125
Dry Reference Conc. (ng/Rm^3)*	<230	<214
Dry Adjusted Conc. (ng/Rm^3)**	<180	<165
Wet Reference Conc. (ng/Rm^3)*	<189	<178
Emission Rate (µg/s)	<3.57	<3.29

* at 25°C and 1 atmosphere

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

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

7.9.3 Polycyclic Aromatic Hydrocarbon Emission Data

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

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

The average total PAH emission data is presented below:

Total PAH Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<204	<164
Dry Reference Conc. (ng/Rm^3)*	<354	<281
Dry Adjusted Conc. (ng/Rm^3)**	<277	<216
Wet Reference Conc. (ng/Rm^3)*	<292	<233
Emission Rate (µg/s)	<5.51	<4.31

* at 25°C and 1 atmosphere

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

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

7.10 Aldehydes

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

The samples, including both blank samples, were concentrated prior to analysis to reduce the reported detection limits (µg/sample). Concentrating the samples reduced the detection limits by at least 50%. 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 and acrolein was detected in two 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)	<17.7	<20.2	<70.8	<83.0	<142	<202
Dry Reference Conc. (µg/Rm^3)*	<30.6	<34.9	<123	<143	<245	<348
Dry Adjusted Conc. (µg/Rm^3)**	<24.0	<26.7	<95.9	<110	<192	<267
Wet Reference Conc. (µg/Rm^3)*	<25.2	<28.8	<101	<118	<202	<287
Emission Rate (mg/s)	<0.48	<0.54	<1.90	<2.19	<3.81	<5.35

* 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)	<73.1	<61.3
Dry Reference Conc. (µg/Rm^3)*	<127	<105
Dry Adjusted Conc. (µg/Rm^3)**	<98.9	<80.4
Wet Reference Conc. (µg/Rm^3)*	<104	<87.4
Emission Rate (mg/s)	<1.96	<1.60

* 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)*	<526	<631
Dry Adjusted Conc. (µg/Rm^3)**	<411	<484
Emission Rate (mg/s)	<8.15	<9.68

* 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 September 2018 emission testing program was well below the applicable standard, guideline or upper risk threshold. The contaminant with the highest predicted concentration relative to the standard was nitrogen oxides (21% of the standard), all other contaminants were less than 5% of the relevant standard.

9. FACILITY PROCESS DATA

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

- Hydrogen Chloride (mg/Rm^3, adjusted to 11% oxygen)
- Nitrogen Oxides (mg/Rm^3, adjusted to 11% oxygen)
- Sulphur Dioxide (mg/Rm^3, adjusted to 11% oxygen)
- Carbon Monoxide (mg/Rm^3, adjusted to 11% oxygen)
- Oxygen (% volume, dry)
- 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 September 11 at 09:00 to September 14, 2018 at 13:00 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
Sep. 11, 2018	373	0	0	1238	1271	795	793	213	206	725	814	125	126	4171	4211
Sep. 12, 2018	366	0	0	1224	1251	790	796	213	204	657	759	125	126	4162	4696
Sep. 13, 2018	366	0	0	1205	1241	794	791	212	211	568	745	125	126	4167	4387
Sep. 14, 2018	337	3842	1090	1235	1244	768	763	183	199	473	623	126	126	4491	4492
Average	361	961	273	1226	1252	787	786	205	205	606	735	125	126	4248	4447

* 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 763 tonnes of steam per day for each Boiler. The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes of steam per hour or 807.4 tonnes per day for each Boiler).

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

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

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

The 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 September 11, 2018 at the Quench Inlet and BH Outlet sampling locations. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was well below the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	361	-
Average Combustion Zone Temp. (°C)*	-	-	-	1226	-
Steam (tonnes/day)*	-	-	-	787	-
MSW Combusted (tonnes/day)*	-	-	-	205	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	606	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4248	-
Filterable Particulate (mg/Rm^3) (1)	<0.23	0.59	0.21	<0.34	9
PM_{10} with Condensable (mg/Rm^3) (1)	<4.67	<6.81	<4.21	<5.23	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.47	<6.61	<3.95	<5.01	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.10	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.57	0.48	0.46	0.50	-
Cadmium (µg/Rm^3) (1)	0.068	0.30	0.050	0.14	7
Lead (µg/Rm^3) (1)	0.19	0.14	0.22	0.18	50
Mercury (µg/Rm^3) (1)	0.31	0.27	0.31	0.30	15
Antimony (µg/Rm^3) (1)	<0.035	0.069	0.038	<0.047	-
Arsenic (µg/Rm^3) (1)	0.085	0.061	<0.035	<0.060	-
Barium (µg/Rm^3) (1)	1.22	1.33	1.40	1.32	-
Beryllium (µg/Rm^3) (1)	0.018	0.028	<0.035	<0.027	-
Chromium (µg/Rm^3) (1)	1.11	1.77	1.24	1.38	-
Cobalt (µg/Rm^3) (1)	0.028	<0.036	<0.035	<0.033	-
Copper (µg/Rm^3) (1)	0.93	1.04	0.44	0.81	-
Molybdenum (µg/Rm^3) (1)	7.38	8.07	7.42	7.62	-
Nickel (µg/Rm^3) (1)	3.29	3.61	3.20	3.37	-
Selenium (µg/Rm^3) (1)	<0.18	<0.18	<0.17	<0.18	-
Silver (µg/Rm^3) (1)	<0.035	0.018	<0.035	<0.029	-
Thallium (µg/Rm^3) (1)	0.11	0.016	0.0088	0.043	-
Vanadium (µg/Rm^3) (1)	<0.018	0.042	0.032	<0.031	-
Zinc (µg/Rm^3) (1)	3.85	5.33	3.06	4.08	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<5.66	<4.74	<4.75	<5.05	60
Total Chlorobenzenes (ng/Rm^3) (1)	<560	<432	<436	<476	-
Total Chlorophenols (ng/Rm^3) (1)	<181	<176	<183	<180	-
Total PAHs (ng/Rm^3) (1)	<288	<316	<226	<277	-
VOCs (µg/Rm^3) (1)	<74.3	<99.8	<123	<98.9	-
Aldehydes (µg/Rm^3) (1)	<325	<307	<303	<312	-
Total VOCs (µg/Rm^3) (1) (4)	<399	<407	<426	<411	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.9	0.5	0.6	0.7	50

* based on process data provided by Covanta

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

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

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

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

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	361	-
Average Combustion Zone Temp. (°C)*	-	-	-	1252	-
Steam (tonnes/day)*	-	-	-	786	-
MSW Combusted (tonnes/day)*	-	-	-	205	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	735	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4447	-
Filterable Particulate (mg/Rm^3) (1)	0.46	<0.27	<0.24	<0.32	9
PM_{10} with Condensable (mg/Rm^3) (1)	4.09	<4.89	<4.13	<4.37	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	3.78	<4.39	<3.63	<3.93	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.10	<0.10	<0.10	-
Ammonia (mg/Rm^3) (1)	1.05	0.91	0.70	0.89	-
Cadmium (µg/Rm^3) (1)	0.013	0.035	0.057	0.035	7
Lead (µg/Rm^3) (1)	0.25	0.099	0.30	0.22	50
Mercury (µg/Rm^3) (1)	0.15	0.12	0.13	0.13	15
Antimony (µg/Rm^3) (1)	<0.036	<0.034	0.038	<0.036	-
Arsenic (µg/Rm^3) (1)	0.037	0.047	<0.037	<0.040	-
Barium (µg/Rm^3) (1)	1.15	1.01	1.80	1.32	-
Beryllium (µg/Rm^3) (1)	0.022	0.032	<0.037	<0.030	-
Chromium (µg/Rm^3) (1)	0.79	0.42	1.13	0.78	-
Cobalt (µg/Rm^3) (1)	0.28	<0.034	<0.037	<0.12	-
Copper (µg/Rm^3) (1)	0.45	0.73	0.65	0.61	-
Molybdenum (µg/Rm^3) (1)	4.03	3.88	7.89	5.27	-
Nickel (µg/Rm^3) (1)	0.91	0.39	3.29	1.53	-
Selenium (µg/Rm^3) (1)	<0.18	<0.17	<0.18	<0.18	-
Silver (µg/Rm^3) (1)	<0.036	<0.034	<0.037	<0.036	-
Thallium (µg/Rm^3) (1)	<0.036	<0.034	<0.037	<0.036	-
Vanadium (µg/Rm^3) (1)	<0.018	<0.017	<0.018	<0.018	-
Zinc (µg/Rm^3) (1)	2.97	1.84	3.13	2.65	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.33	<3.43	<2.89	<3.22	60
Total Chlorobenzenes (ng/Rm^3) (1)	<596	<462	<355	<471	-
Total Chlorophenols (ng/Rm^3) (1)	<168	<163	<162	<165	-
Total PAHs (ng/Rm^3) (1)	<194	<282	<171	<216	-
VOCs (µg/Rm^3) (1)	<70.1	<74.3	<96.8	<80.4	-
Aldehydes (µg/Rm^3) (1)	<489	<377	<346	<404	-
Total VOCs (µg/Rm^3) (1) (4)	<559	<451	<443	<484	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	1.2	0.8	0.9	1.0	50

* based on process data provided by Covanta

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

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

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

(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)	8.0	13.0	20.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.6	2.9	3.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	109	110	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	8.8	13.4	27.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.6	4.1	5.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	111	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.1	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

APPENDIX 1

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

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

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 11, 2018	9:19	12:46	180
2	September 11, 2018	14:00	17:10	180
3	September 13, 2018	10:23	14:37	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 12, 2018	8:35	10:39	120.1
2	September 12, 2018	11:44	13:47	119.9
3	September 12, 2018	15:17	17:22	119.9

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 11, 2018	9:17	10:17	60
2	September 11, 2018	11:12	12:12	60
3	September 11, 2018	12:43	13:43	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 13, 2018	10:24	14:44	240
2	September 13, 2018	17:09	21:18	240
3	September 14, 2018	9:36	13:46	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	September 13, 2018	11:14	12:14	60
2	September 13, 2018	14:37	15:37	60
3	September 14, 2018	11:47	12:47	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	September 13, 2018	12:37	12:57	20
	2	September 13, 2018	13:03	13:23	20
	3	September 13, 2018	13:28	13:48	20
	4	September 13, 2018	13:53	14:13	20
2	1	September 13, 2018	17:09	17:29	20
	2	September 13, 2018	17:34	17:54	20
	3	September 13, 2018	18:00	18:20	20
	4	September 13, 2018	18:24	18:45	21
3	1	September 14, 2018	9:38	9:58	20
	2	September 14, 2018	10:10	10:30	20
	3	September 14, 2018	10:36	10:56	20
	4	September 14, 2018	11:01	11:21	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	September 11, 2019	16:32	17:32	60
BH Outlet	2	September 11, 2019	17:43	18:43	60
BH Outlet	3	September 11, 2019	18:53	19:53	60
Quench Inlet	1	September 11, 2019	10:32	11:32	60
Quench Inlet	2	September 11, 2019	11:40	12:40	60
Quench Inlet	3	September 11, 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	0.851	0.996	7.03	4.419	101.0
2	0.851	0.996	7.03	4.421	100.2
3	0.851	1.020	7.03	4.550	100.8

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.845	0.991	4.51	1.196	98.3
2	0.845	0.991	4.51	1.203	104.4
3	0.845	0.991	4.51	1.206	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	0.846	0.991	6.99	1.393	99.2
2	0.846	0.991	6.99	1.393	97.7
3	0.846	0.991	6.99	1.397	98.2

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.840	0.991	5.57	3.804	101.7
2	0.840	0.991	5.57	3.790	102.2
3	0.840	0.991	5.57	3.707	102.0

* Dry at 25°C and 1 atmosphere

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

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	138	17.3	17.9	-2.44	98.5	11.2	8.23
2	139	17.5	18.1	-2.44	98.6	11.1	8.28
3	141	17.2	18.5	-2.61	98.9	11.0	8.40
Average	139	17.3	18.2	-2.50	98.7	11.1	8.30

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	140	16.0	17.8	-2.12	99.4	11.0	8.49
2	140	16.0	16.8	-2.12	99.4	10.9	8.48
3	141	16.0	17.0	-2.12	99.3	11.1	8.20
Average	140	16.0	17.2	-2.12	99.4	11.0	8.39

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	138	17.4	17.4	-2.44	98.5	11.3	8.20
2	138	17.3	17.7	-2.44	98.6	11.1	8.22
3	139	17.7	17.8	-2.44	98.6	11.2	8.18
Average	138	17.5	17.6	-2.44	98.6	11.2	8.20

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	17.3	18.3	-2.61	98.9	11.0	8.39
2	140	18.1	18.3	-2.61	98.7	11.2	8.08
3	140	17.7	17.9	-2.71	98.5	11.0	8.26
Average	141	17.7	18.2	-2.65	98.7	11.0	8.24

* 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	26.4	15.4	19.7	18.7
2	26.7	15.6	19.8	18.8
3	27.3	15.9	20.1	19.2
Average	26.8	15.6	19.9	18.9

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	26.3	15.7	19.7	18.6
2	24.9	14.8	18.6	17.6
3	25.2	15.0	19.2	17.8
Average	25.5	15.2	19.2	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	25.7	15.0	19.2	18.2
2	26.1	15.2	19.5	18.4
3	26.2	15.2	19.5	18.5
Average	26.0	15.1	19.4	18.4

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	27.1	15.7	19.9	19.0
2	27.1	15.6	20.2	19.0
3	26.5	15.3	19.5	18.6
Average	26.9	15.5	19.9	18.9

* 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			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	1.2	<0.1	<1.3	4.419	<0.17	<0.29	<0.23	<0.24	<4.54
2	2.9	0.4	3.3	4.421	0.43	0.75	0.59	0.62	11.6
3	0.8	0.4	1.2	4.550	0.15	0.26	0.21	0.22	4.19
Average					<0.25	<0.43	<0.34	<0.36	<6.78
Blank	0.3	0.8							

* At 25 °C and 1 atmosphere

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

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

$PM_{2.5}$

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	$PM_{2.5}$ Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.6	1.196	<0.30	<0.50	<0.40	<0.42	<7.88
2	<3.9	1.203	<1.93	<3.24	<2.58	<2.73	<48.0
3	<0.3	1.206	<0.15	<0.25	<0.19	<0.21	<3.73
Average			<0.79	<1.33	<1.06	<1.12	<19.9
Blank	<0.4						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.9	1.196	<0.45	<0.75	<0.60	<0.64	<11.8
2	<4.2	1.203	<2.08	<3.49	<2.78	<2.94	<51.7
3	<0.7	1.206	<0.35	<0.58	<0.45	<0.49	<8.71
Average			<0.96	<1.61	<1.28	<1.35	<24.1
Blank	<0.5						

* At 25 °C and 1 atmosphere

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

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

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

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	3.4	1.196	1.70	2.84	2.27	2.40	44.6
2	3.3	1.203	1.63	2.74	2.18	2.31	40.6
3	3.7	1.206	1.83	3.07	2.40	2.59	46.0
Average			1.72	2.88	2.28	2.43	43.8
Blank	1.3						

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	2.7	1.196	1.35	2.26	1.80	1.91	35.4
2	2.8	1.203	1.38	2.33	1.85	1.96	34.4
3	2.1	1.206	1.04	1.74	1.36	1.47	26.1
Average			1.26	2.11	1.67	1.78	32.0
Blank	1.3						

* At 25 °C and 1 atmosphere

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

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

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled Rm^3*	Actual mg/m^3	Hydrogen Chloride Concentration Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HCl Emission Rate mg/s
1	10.4	1.393	4.36	7.47	5.84	6.15	115
2	10.5	1.393	4.40	7.54	5.89	6.21	116
3	10.9	1.397	4.55	7.80	6.10	6.43	120
Average			4.43	7.60	5.94	6.26	117
Blank	0.453						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm^3*	Actual mg/m^3	Hydrogen Fluoride Concentration Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HF Emission Rate mg/s
1	<0.193	1.393	<0.081	<0.14	<0.11	<0.11	<2.13
2	<0.182	1.393	<0.076	<0.13	<0.10	<0.11	<2.01
3	<0.191	1.397	<0.080	<0.14	<0.11	<0.11	<2.11
Average			<0.079	<0.14	<0.11	<0.11	<2.08
Blank	<0.175						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm^3*	Actual mg/m^3	Ammonia Concentration Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Ammonia Emission Rate mg/s
1	1.01	1.393	0.42	0.73	0.57	0.60	11.2
2	0.851	1.393	0.36	0.61	0.48	0.50	9.41
3	0.815	1.397	0.34	0.58	0.46	0.48	8.98
Average			0.37	0.64	0.50	0.53	9.85
Blank	<0.453						

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 September 11 to September 14, 2018

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.83	8.38	9.27
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	7	13	26
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	8.0	13.0	20.0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0	0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0	0
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	95	109	123
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	109	109	110
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	2	3	6
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	2.6	2.9	3.3
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0	0
Quench Inlet	Oxygen (%, 1 hr Avg)	8	8	9

Data measured by the ORTECH CEMS on September 11, 2018

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.1	1.3
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.3	0.8
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.1	0.5	0.7
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.3	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0.6	0.9	1.2
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.4	0.5	0.6
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.2	0.6	0.8
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.7	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	0.7	0.9	1.1
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	0.5	0.5	0.6
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0.5	0.6	0.7
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		0.7	

* 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	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	0.48	0.48
Barium	5.32	1.55	6.87
Beryllium	<0.2	0.10	0.10
Cadmium	0.27	0.11	0.38
Chromium	5.00	1.29	6.29
Cobalt	<0.2	0.16	0.16
Copper	2.00	3.24	5.24
Lead	0.51	0.58	1.09
Mercury *	<0.015	1.78	1.78
Molybdenum	41.7	<0.1	41.7
Nickel	15.9	2.68	18.6
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	0.38	0.22	0.60
Vanadium	<1	<0.1	<0.10
Zinc	12.1	9.65	21.8
Total			<107

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.39	<0.1	0.39
Arsenic	<1	0.34	0.34
Barium	5.82	1.66	7.48
Beryllium	<0.2	0.16	0.16
Cadmium	1.60	0.080	1.68
Chromium	8.85	1.07	9.92
Cobalt	<0.2	<0.1	<0.20
Copper	1.94	3.92	5.86
Lead	<0.5	0.78	0.78
Mercury *	<0.015	1.52	1.52
Molybdenum	45.3	<0.1	45.3
Nickel	17.8	2.47	20.3
Selenium	<2	<1	<1.00
Silver	<0.2	0.10	0.10
Thallium	<0.2	0.089	0.089
Vanadium	<1	0.24	0.24
Zinc	21.3	8.59	29.9
Total			<125

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.22	<0.1	0.22
Arsenic	<1	<0.2	<0.20
Barium	6.56	1.49	8.05
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.29	<0.05	0.29
Chromium	6.09	1.07	7.16
Cobalt	<0.2	<0.1	<0.20
Copper	1.81	0.75	2.56
Lead	0.81	0.47	1.29
Mercury *	<0.015	1.79	1.79
Molybdenum	42.7	<0.1	42.7
Nickel	17.2	1.21	18.4
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	0.051	0.051
Vanadium	<1	0.18	0.18
Zinc	13.1	4.50	17.6
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 14
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 1

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.026	<0.045	<0.035	<0.037	<0.00070
Arsenic	0.48	0.063	0.11	0.085	0.089	0.0017
Barium	6.87	0.91	1.55	1.22	1.28	0.024
Beryllium	0.10	0.014	0.024	0.018	0.019	0.00036
Cadmium	0.38	0.051	0.087	0.068	0.072	0.0013
Chromium	6.29	0.83	1.42	1.11	1.17	0.022
Cobalt	0.16	0.021	0.036	0.03	0.029	0.00055
Copper	5.24	0.69	1.19	0.93	0.98	0.018
Lead	1.09	0.14	0.25	0.19	0.20	0.0038
Mercury	1.78	0.23	0.40	0.31	0.33	0.0062
Molybdenum	41.7	5.50	9.44	7.38	7.77	0.15
Nickel	18.6	2.45	4.20	3.29	3.46	0.065
Selenium	<1.00	<0.13	<0.23	<0.18	<0.19	<0.0035
Silver	<0.20	<0.026	<0.045	<0.035	<0.037	<0.00070
Thallium	0.60	0.079	0.14	0.11	0.11	0.0021
Vanadium	<0.10	<0.013	<0.023	<0.018	<0.019	<0.00035
Zinc	21.8	2.87	4.92	3.85	4.05	0.076
Total	<107	<14.1	<24.1	<18.8	<19.9	<0.37

Dry Gas Volume Sampled (Rm^3*) :	4.419
Actual Flowrate (m^3/s) :	26.4
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.7
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 15
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 2

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.39	0.051	0.087	0.069	0.072	0.0014
Arsenic	0.34	0.045	0.078	0.061	0.065	0.0012
Barium	7.48	0.99	1.69	1.33	1.40	0.026
Beryllium	0.16	0.021	0.036	0.028	0.029	0.00055
Cadmium	1.68	0.22	0.38	0.30	0.32	0.0059
Chromium	9.92	1.31	2.24	1.77	1.86	0.035
Cobalt	<0.20	<0.026	<0.045	<0.036	<0.038	<0.00071
Copper	5.86	0.77	1.33	1.04	1.10	0.021
Lead	0.78	0.10	0.18	0.14	0.15	0.0027
Mercury	1.52	0.20	0.34	0.27	0.28	0.0054
Molybdenum	45.3	5.99	10.2	8.07	8.50	0.16
Nickel	20.3	2.68	4.58	3.61	3.80	0.072
Selenium	<1.00	<0.13	<0.23	<0.18	<0.19	<0.0035
Silver	0.10	0.013	0.023	0.018	0.019	0.00036
Thallium	0.089	0.012	0.020	0.016	0.017	0.00032
Vanadium	0.24	0.031	0.054	0.042	0.045	0.00084
Zinc	29.9	3.95	6.76	5.33	5.61	0.11
Total	<125	<16.5	<28.3	<22.3	<23.5	<0.44

Dry Gas Volume Sampled (Rm^3*) :	4.421
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	18.8

* At 25°C and 1 atmosphere

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

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

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.22	0.028	0.048	0.038	0.040	0.00077
Arsenic	<0.20	<0.026	<0.044	<0.035	<0.036	<0.00070
Barium	8.05	1.03	1.77	1.40	1.47	0.028
Beryllium	<0.20	<0.026	<0.044	<0.035	<0.036	<0.00070
Cadmium	0.29	0.037	0.064	0.050	0.053	0.0010
Chromium	7.16	0.92	1.57	1.24	1.30	0.025
Cobalt	<0.20	<0.026	<0.044	<0.035	<0.036	<0.00070
Copper	2.56	0.33	0.56	0.44	0.47	0.0089
Lead	1.29	0.16	0.28	0.22	0.23	0.0045
Mercury	1.79	0.23	0.39	0.31	0.32	0.0062
Molybdenum	42.7	5.47	9.38	7.42	7.77	0.15
Nickel	18.4	2.36	4.05	3.20	3.35	0.064
Selenium	<1.00	<0.13	<0.22	<0.17	<0.18	<0.0035
Silver	<0.20	<0.026	<0.044	<0.035	<0.036	<0.00070
Thallium	0.051	0.0065	0.011	0.0088	0.0092	0.00018
Vanadium	0.18	0.023	0.040	0.032	0.033	0.00064
Zinc	17.6	2.25	3.87	3.06	3.20	0.062
Total	<102	<13.1	<22.4	<17.7	<18.6	<0.36

Dry Gas Volume Sampled (Rm^3*) :	4.550
Actual Flowrate (m^3/s) :	27.3
Dry Reference Flowrate (Rm^3/s*) :	15.9
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
Wet Reference Flowrate (Rm^3/s*) :	19.2

* 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. 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	<0.026	0.051	0.028	<0.035	39.0
Arsenic	0.063	0.045	<0.026	<0.045	42.2
Barium	0.91	0.99	1.03	0.98	6.4
Beryllium	0.014	0.021	<0.026	<0.020	29.8
Cadmium	0.051	0.22	0.037	0.10	99.9
Chromium	0.83	1.31	0.92	1.02	25.1
Cobalt	0.021	<0.026	<0.026	<0.024	12.4
Copper	0.69	0.77	0.33	0.60	39.8
Lead	0.14	0.10	0.16	0.14	23.0
Mercury	0.23	0.20	0.23	0.22	8.3
Molybdenum	5.50	5.99	5.47	5.65	5.1
Nickel	2.45	2.68	2.36	2.50	6.6
Selenium	<0.13	<0.13	<0.13	<0.13	1.8
Silver	<0.026	0.013	<0.026	<0.022	33.6
Thallium	0.079	0.012	0.0065	0.032	125
Vanadium	<0.013	0.031	0.023	<0.023	40.4
Zinc	2.87	3.95	2.25	3.02	28.4
Total	<14.1	<16.5	<13.1	<14.6	12.3

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

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.045	0.087	0.048	<0.060	38.9
Arsenic	0.11	0.078	<0.044	<0.077	42.1
Barium	1.55	1.69	1.77	1.67	6.5
Beryllium	0.024	0.036	<0.044	<0.034	29.9
Cadmium	0.087	0.38	0.064	0.18	99.7
Chromium	1.42	2.24	1.57	1.75	25.0
Cobalt	0.036	<0.045	<0.044	<0.042	12.4
Copper	1.19	1.33	0.56	1.02	39.7
Lead	0.25	0.18	0.28	0.23	23.2
Mercury	0.40	0.34	0.39	0.38	8.4
Molybdenum	9.44	10.2	9.38	9.69	5.0
Nickel	4.20	4.58	4.05	4.28	6.5
Selenium	<0.23	<0.23	<0.22	<0.22	1.7
Silver	<0.045	0.023	<0.044	<0.037	33.7
Thallium	0.14	0.020	0.011	0.056	125
Vanadium	<0.023	0.054	0.040	<0.039	40.3
Zinc	4.92	6.76	3.87	5.18	28.2
Total	<24.1	<28.3	<22.4	<25.0	12.2

* 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	<0.035	0.069	0.038	<0.047	39.0
Arsenic	0.085	0.061	<0.035	<0.060	41.6
Barium	1.22	1.33	1.40	1.32	7.1
Beryllium	0.018	0.028	<0.035	<0.027	30.4
Cadmium	0.068	0.30	0.050	0.14	99.9
Chromium	1.11	1.77	1.24	1.38	25.2
Cobalt	0.03	<0.036	<0.035	<0.033	12.8
Copper	0.93	1.04	0.44	0.81	39.5
Lead	0.19	0.14	0.22	0.18	23.3
Mercury	0.31	0.27	0.31	0.30	8.2
Molybdenum	7.38	8.07	7.42	7.62	5.1
Nickel	3.29	3.61	3.20	3.37	6.4
Selenium	<0.18	<0.18	<0.17	<0.18	1.3
Silver	<0.035	0.018	<0.035	<0.029	33.6
Thallium	0.11	0.016	0.0088	0.043	124
Vanadium	<0.018	0.042	0.032	<0.031	40.5
Zinc	3.85	5.33	3.06	4.08	28.2
Total	<18.8	<22.3	<17.7	<19.6	12.1

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

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

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.037	0.072	0.040	<0.050	39.2
Arsenic	0.089	0.065	<0.036	<0.063	41.8
Barium	1.28	1.40	1.47	1.38	6.8
Beryllium	0.019	0.029	<0.036	<0.028	30.1
Cadmium	0.072	0.32	0.053	0.15	100
Chromium	1.17	1.86	1.30	1.45	25.3
Cobalt	0.029	<0.038	<0.036	<0.034	12.7
Copper	0.98	1.10	0.47	0.85	39.7
Lead	0.20	0.15	0.23	0.19	23.0
Mercury	0.33	0.28	0.32	0.31	8.1
Molybdenum	7.77	8.50	7.77	8.02	5.3
Nickel	3.46	3.80	3.35	3.54	6.7
Selenium	<0.19	<0.19	<0.18	<0.19	1.6
Silver	<0.037	0.019	<0.036	<0.031	33.5
Thallium	0.11	0.017	0.0092	0.046	124
Vanadium	<0.019	0.045	0.033	<0.032	40.6
Zinc	4.05	5.61	3.20	4.29	28.5
Total	<19.9	<23.5	<18.6	<20.6	12.4

* 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	<0.00070	0.0014	0.00077	<0.00094	38.7
Arsenic	0.0017	0.0012	<0.00070	<0.0012	40.8
Barium	0.024	0.026	0.028	0.026	8.0
Beryllium	0.00036	0.00055	<0.00070	<0.00054	31.3
Cadmium	0.0013	0.0059	0.0010	0.0028	99.7
Chromium	0.022	0.035	0.025	0.027	25.0
Cobalt	0.00055	<0.00071	<0.00070	<0.00065	13.4
Copper	0.018	0.021	0.0089	0.016	38.9
Lead	0.0038	0.0027	0.0045	0.0037	24.0
Mercury	0.0062	0.0054	0.0062	0.0059	8.4
Molybdenum	0.15	0.16	0.15	0.15	5.0
Nickel	0.065	0.072	0.064	0.067	6.0
Selenium	<0.0035	<0.0035	<0.0035	<0.0035	0.7
Silver	<0.00070	0.00036	<0.00070	<0.00058	33.8
Thallium	0.0021	0.00032	0.00018	0.00086	124
Vanadium	<0.00035	0.00084	0.00064	<0.00061	40.6
Zinc	0.076	0.11	0.062	0.081	27.7
Total	<0.37	<0.44	<0.36	<0.39	11.7

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

Metal	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.035	<0.060	<0.047	<0.050	<0.00094
Arsenic	<0.045	<0.077	<0.060	<0.063	<0.0012
Barium	0.98	1.67	1.32	1.38	0.026
Beryllium	<0.020	<0.034	<0.027	<0.028	<0.00054
Cadmium	0.10	0.18	0.14	0.15	0.0028
Chromium	1.02	1.75	1.38	1.45	0.027
Cobalt	<0.024	<0.042	<0.033	<0.034	<0.00065
Copper	0.60	1.02	0.81	0.85	0.016
Lead	0.14	0.23	0.18	0.19	0.0037
Mercury	0.22	0.38	0.30	0.31	0.0059
Molybdenum	5.65	9.69	7.62	8.02	0.15
Nickel	2.50	4.28	3.37	3.54	0.067
Selenium	<0.13	<0.22	<0.18	<0.19	<0.0035
Silver	<0.022	<0.037	<0.029	<0.031	<0.00058
Thallium	0.032	0.056	0.043	0.046	0.00086
Vanadium	<0.023	<0.039	<0.031	<0.032	<0.00061
Zinc	3.02	5.18	4.08	4.29	0.081
Total	<14.6	<25.0	<19.6	<20.6	<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. 1 BH Outlet
Blank Train Metal Analyses

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	0.35	0.35
Barium	5.98	<0.5	5.98
Beryllium	0.30	0.26	0.55
Cadmium	0.12	<0.05	0.12
Chromium	4.27	0.48	4.75
Cobalt	<0.2	<0.1	<0.20
Copper	1.06	1.60	2.66
Lead	<0.5	0.39	0.39
Mercury *	<0.015	0.24	0.24
Molybdenum	46.0	<0.1	46.0
Nickel	15.9	1.08	17.0
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	<6	<3	<6.00
Total			<85.9

* Includes the permanganate impingers.

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

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

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	152	0.023	0.040	0.032	0.033	0.63
Pentachlorodibenzo-p-dioxins	289	0.044	0.076	0.060	0.063	1.19
Hexachlorodibenzo-p-dioxins	448	0.068	0.12	0.093	0.097	1.85
Heptachlorodibenzo-p-dioxins	465	0.071	0.12	0.096	0.10	1.92
Octachlorodibenzo-p-dioxin	227	0.035	0.060	0.047	0.049	0.94
Total	1581	0.24	0.42	0.33	0.34	6.53

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	30.4	0.0046	0.0080	0.0063	0.0066	0.13
Pentachlorodibenzofurans	84.6	0.013	0.022	0.018	0.018	0.35
Hexachlorodibenzofurans	73.4	0.011	0.019	0.015	0.016	0.30
Heptachlorodibenzofurans	61.3	0.0093	0.016	0.013	0.013	0.25
Octachlorodibenzofuran	26.0	0.0040	0.0068	0.0054	0.0056	0.11
Total	276	0.042	0.072	0.057	0.060	1.14

Dry Gas Volume Sampled (Rm^3*) :	3.804
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	159	0.024	0.042	0.032	0.034	0.65
Pentachlorodibenzo-p-dioxins	321	0.049	0.085	0.065	0.070	1.32
Hexachlorodibenzo-p-dioxins	533	0.081	0.14	0.11	0.12	2.19
Heptachlorodibenzo-p-dioxins	467	0.071	0.12	0.095	0.10	1.92
Octachlorodibenzo-p-dioxin	211	0.032	0.056	0.043	0.046	0.87
Total	1691	0.26	0.45	0.34	0.37	6.96

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	68.8	0.010	0.018	0.014	0.015	0.28
Pentachlorodibenzofurans	137	0.021	0.036	0.028	0.030	0.56
Hexachlorodibenzofurans	66.2	0.010	0.017	0.013	0.014	0.27
Heptachlorodibenzofurans	68.1	0.010	0.018	0.014	0.015	0.28
Octachlorodibenzofuran	20.8	0.0032	0.0055	0.0042	0.0045	0.086
Total	361	0.055	0.095	0.074	0.078	1.49

Dry Gas Volume Sampled (Rm^3*) :	3.790
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	150	0.023	0.040	0.032	0.033	0.62
Pentachlorodibenzo-p-dioxins	286	0.045	0.077	0.061	0.063	1.18
Hexachlorodibenzo-p-dioxins	536	0.083	0.14	0.11	0.12	2.21
Heptachlorodibenzo-p-dioxins	450	0.070	0.12	0.095	0.10	1.86
Octachlorodibenzo-p-dioxin	208	0.032	0.056	0.044	0.046	0.86
Total	1630	0.25	0.44	0.35	0.36	6.73

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	73.1	0.011	0.020	0.015	0.016	0.30
Pentachlorodibenzofurans	98.7	0.015	0.027	0.021	0.022	0.41
Hexachlorodibenzofurans	66.2	0.010	0.018	0.014	0.015	0.27
Heptachlorodibenzofurans	61.9	0.0096	0.017	0.013	0.014	0.26
Octachlorodibenzofuran	22.5	0.0035	0.0061	0.0048	0.0050	0.093
Total	322	0.050	0.087	0.068	0.072	1.33

Dry Gas Volume Sampled (Rm^3*) :	3.707
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.023	0.024	0.023	0.024	2.2
Pentachlorodibenzo-p-dioxins	0.044	0.049	0.045	0.046	5.7
Hexachlorodibenzo-p-dioxins	0.068	0.081	0.083	0.078	10.5
Heptachlorodibenzo-p-dioxins	0.071	0.071	0.070	0.071	0.6
Octachlorodibenzo-p-dioxin	0.035	0.032	0.032	0.033	4.1
Total	0.24	0.26	0.25	0.25	3.4

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.0046	0.010	0.011	0.0088	41.5
Pentachlorodibenzofurans	0.013	0.021	0.015	0.016	24.8
Hexachlorodibenzofurans	0.011	0.010	0.010	0.011	5.6
Heptachlorodibenzofurans	0.0093	0.010	0.0096	0.0098	5.3
Octachlorodibenzofuran	0.0040	0.0032	0.0035	0.0035	11.3
Total	0.042	0.055	0.050	0.049	13.3

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

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.040	0.042	0.040	0.041	2.5
Pentachlorodibenzo-p-dioxins	0.076	0.085	0.077	0.079	6.0
Hexachlorodibenzo-p-dioxins	0.12	0.14	0.14	0.13	10.8
Heptachlorodibenzo-p-dioxins	0.12	0.12	0.12	0.12	0.7
Octachlorodibenzo-p-dioxin	0.060	0.056	0.056	0.057	3.8
Total	0.42	0.45	0.44	0.43	3.7

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.0080	0.018	0.020	0.015	41.6
Pentachlorodibenzofurans	0.022	0.036	0.027	0.028	25.1
Hexachlorodibenzofurans	0.019	0.017	0.018	0.018	5.3
Heptachlorodibenzofurans	0.016	0.018	0.017	0.017	5.6
Octachlorodibenzofuran	0.0068	0.0055	0.0061	0.0061	11.0
Total	0.072	0.095	0.087	0.085	13.6

* 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	0.032	0.032	0.032	0.032	1.4
Pentachlorodibenzo-p-dioxins	0.060	0.065	0.061	0.062	4.8
Hexachlorodibenzo-p-dioxins	0.093	0.11	0.11	0.10	10.2
Heptachlorodibenzo-p-dioxins	0.096	0.095	0.095	0.096	0.7
Octachlorodibenzo-p-dioxin	0.047	0.043	0.044	0.045	4.8
Total	0.33	0.34	0.35	0.34	2.9

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	0.0063	0.014	0.015	0.012	41.3
Pentachlorodibenzofurans	0.018	0.028	0.021	0.022	23.9
Hexachlorodibenzofurans	0.015	0.013	0.014	0.014	6.2
Heptachlorodibenzofurans	0.013	0.014	0.013	0.013	4.5
Octachlorodibenzofuran	0.0054	0.0042	0.0048	0.0048	12.0
Total	0.057	0.074	0.068	0.066	12.6

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

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

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.033	0.034	0.033	0.034	2.3
Pentachlorodibenzo-p-dioxins	0.063	0.070	0.063	0.065	5.7
Hexachlorodibenzo-p-dioxins	0.097	0.12	0.12	0.11	10.5
Heptachlorodibenzo-p-dioxins	0.10	0.10	0.10	0.10	0.7
Octachlorodibenzo-p-dioxin	0.049	0.046	0.046	0.047	4.2
Total	0.34	0.37	0.36	0.36	3.4

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.0066	0.015	0.016	0.013	41.5
Pentachlorodibenzofurans	0.018	0.030	0.022	0.023	24.8
Hexachlorodibenzofurans	0.016	0.014	0.015	0.015	5.6
Heptachlorodibenzofurans	0.013	0.015	0.014	0.014	5.3
Octachlorodibenzofuran	0.0056	0.0045	0.0050	0.0050	11.3
Total	0.060	0.078	0.072	0.070	13.3

* 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	0.63	0.65	0.62	0.63	2.9
Pentachlorodibenzo-p-dioxins	1.19	1.32	1.18	1.23	6.3
Hexachlorodibenzo-p-dioxins	1.85	2.19	2.21	2.09	9.8
Heptachlorodibenzo-p-dioxins	1.92	1.92	1.86	1.90	1.9
Octachlorodibenzo-p-dioxin	0.94	0.87	0.86	0.89	4.8
Total	6.53	6.96	6.73	6.74	3.2

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	0.13	0.28	0.30	0.24	40.9
Pentachlorodibenzofurans	0.35	0.56	0.41	0.44	25.2
Hexachlorodibenzofurans	0.30	0.27	0.27	0.28	6.1
Heptachlorodibenzofurans	0.25	0.28	0.26	0.26	5.7
Octachlorodibenzofuran	0.11	0.086	0.093	0.095	11.6
Total	1.14	1.49	1.33	1.32	13.2

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	0.024	0.041	0.032	0.034	0.63
Pentachlorodibenzo-p-dioxins	0.046	0.079	0.062	0.065	1.23
Hexachlorodibenzo-p-dioxins	0.078	0.13	0.10	0.11	2.09
Heptachlorodibenzo-p-dioxins	0.071	0.12	0.096	0.10	1.90
Octachlorodibenzo-p-dioxin	0.033	0.057	0.045	0.047	0.89
Total	0.25	0.43	0.34	0.36	6.74

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	0.0088	0.015	0.012	0.013	0.24
Pentachlorodibenzofurans	0.016	0.028	0.022	0.023	0.44
Hexachlorodibenzofurans	0.011	0.018	0.014	0.015	0.28
Heptachlorodibenzofurans	0.0098	0.017	0.013	0.014	0.26
Octachlorodibenzofuran	0.0035	0.0061	0.0048	0.0050	0.095
Total	0.049	0.085	0.066	0.070	1.32

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<2.9	148
Pentachlorodibenzo-p-dioxins	<1.8	21.3
Hexachlorodibenzo-p-dioxins	41.8	186
Heptachlorodibenzo-p-dioxins	57.9	76.6
Octachlorodibenzo-p-dioxin	37.6	47.3
Total	<142	479

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<2.2	<7.3
Pentachlorodibenzofurans	<2.5	<5.0
Hexachlorodibenzofurans	<2.7	<9.9
Heptachlorodibenzofurans	<2.5	<5.3
Octachlorodibenzofuran	<5.2	<12
Total	<15.1	<39.5

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<4.2	<0.64	<1.10	<0.87	<0.91	<0.017
12378-pentachlorodibenzo-p-dioxin	<5.0	<0.76	<1.31	<1.04	<1.09	<0.021
123478-hexachlorodibenzo-p-dioxin	<13	<1.98	<3.42	<2.70	<2.82	<0.054
123678-hexachlorodibenzo-p-dioxin	22.5	3.43	5.91	4.67	4.89	0.093
123789-hexachlorodibenzo-p-dioxin	<14	<2.13	<3.68	<2.90	<3.04	<0.058
1234678-heptachlorodibenzo-p-dioxin	219	33.4	57.6	45.4	47.6	0.90
Octachlorodibenzo-p-dioxin	227	34.6	59.7	47.1	49.3	0.94
2378-tetrachlorodibenzofuran	<8.0	<1.22	<2.10	<1.66	<1.74	<0.033
12378-pentachlorodibenzofuran	<4.5	<0.69	<1.18	<0.93	<0.98	<0.019
23478-pentachlorodibenzofuran	14.6	2.22	3.84	3.03	3.17	0.060
123478-hexachlorodibenzofuran	9.60	1.46	2.52	1.99	2.09	0.040
123678-hexachlorodibenzofuran	<8.4	<1.28	<2.21	<1.74	<1.82	<0.035
234678-hexachlorodibenzofuran	20.6	3.14	5.42	4.27	4.47	0.085
123789-hexachlorodibenzofuran	<4.7	<0.72	<1.24	<0.97	<1.02	<0.019
1234678-heptachlorodibenzofuran	44.4	6.76	11.7	9.21	9.64	0.18
1234789-heptachlorodibenzofuran	<9.6	<1.46	<2.52	<1.99	<2.09	<0.040
Octachlorodibenzofuran	26.0	3.96	6.83	5.39	5.65	0.11
PCB 81	<71	<10.8	<18.7	<14.7	<15.4	<0.29
PCB 77	1700	259	447	353	369	7.02
PCB 123	613	93.4	161	127	133	2.53
PCB 118	3160	481	831	655	686	13.0
PCB 114	<83	<12.6	<21.8	<17.2	<18.0	<0.34
PCB 105	1400	213	368	290	304	5.78
PCB 126	<91	<13.9	<23.9	<18.9	<19.8	<0.38
PCB 167	261	39.7	68.6	54.1	56.7	1.08
PCB 156	<130	<19.8	<34.2	<27.0	<28.2	<0.54
PCB 157	<37	<5.63	<9.73	<7.67	<8.04	<0.15
PCB 169	<22	<3.35	<5.78	<4.56	<4.78	<0.091
PCB 189	8.62	1.31	2.27	1.79	1.87	0.036
Total Dioxins & Furans Only	<655	<99.8	<172	<136	<142	<2.70
Total PCBs Only	<7577	<1154	<1992	<1571	<1646	<31.3
Total Dioxins & Furans and PCBs	<8232	<1254	<2164	<1707	<1788	<34.0

Dry Gas Volume Sampled (Rm^3*) :	3.804
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.8	<0.27	<0.47	<0.37	<0.39	<0.0074
12378-pentachlorodibenzo-p-dioxin	<5.5	<0.84	<1.45	<1.12	<1.19	<0.023
123478-hexachlorodibenzo-p-dioxin	12.2	1.85	3.22	2.49	2.64	0.050
123678-hexachlorodibenzo-p-dioxin	24.3	3.69	6.41	4.95	5.26	0.10
123789-hexachlorodibenzo-p-dioxin	17.3	2.63	4.56	3.53	3.75	0.071
1234678-heptachlorodibenzo-p-dioxin	226	34.3	59.6	46.1	49.0	0.93
Octachlorodibenzo-p-dioxin	211	32.0	55.7	43.0	45.7	0.87
2378-tetrachlorodibenzofuran	<8.5	<1.29	<2.24	<1.73	<1.84	<0.035
12378-pentachlorodibenzofuran	7.31	1.11	1.93	1.49	1.58	0.030
23478-pentachlorodibenzofuran	13.3	2.02	3.51	2.71	2.88	0.055
123478-hexachlorodibenzofuran	10.2	1.55	2.69	2.08	2.21	0.042
123678-hexachlorodibenzofuran	<7.5	<1.14	<1.98	<1.53	<1.62	<0.031
234678-hexachlorodibenzofuran	<2.4	<0.36	<0.63	<0.49	<0.52	<0.0099
123789-hexachlorodibenzofuran	<4.5	<0.68	<1.19	<0.92	<0.97	<0.019
1234678-heptachlorodibenzofuran	41.3	6.27	10.9	8.42	8.95	0.17
1234789-heptachlorodibenzofuran	11.5	1.75	3.03	2.34	2.49	0.047
Octachlorodibenzofuran	20.8	3.16	5.49	4.24	4.51	0.086
PCB 81	<20	<3.04	<5.28	<4.08	<4.33	<0.082
PCB 77	<35	<5.32	<9.23	<7.13	<7.58	<0.14
PCB 123	96.0	14.6	25.3	19.6	20.8	0.40
PCB 118	<740	<112	<195	<151	<160	<3.05
PCB 114	<30	<4.56	<7.92	<6.11	<6.50	<0.12
PCB 105	308	46.8	81.3	62.8	66.7	1.27
PCB 126	<34	<5.16	<8.97	<6.93	<7.37	<0.14
PCB 167	<17	<2.58	<4.49	<3.46	<3.68	<0.070
PCB 156	<33	<5.01	<8.71	<6.72	<7.15	<0.14
PCB 157	<13	<1.97	<3.43	<2.65	<2.82	<0.054
PCB 169	<14	<2.13	<3.69	<2.85	<3.03	<0.058
PCB 189	<6.2	<0.94	<1.64	<1.26	<1.34	<0.026
Total Dioxins & Furans Only	<625	<95.0	<165	<127	<135	<2.57
Total PCBs Only	<1346	<204	<355	<274	<292	<5.54
Total Dioxins & Furans and PCBs	<1972	<299	<520	<402	<427	<8.12

Dry Gas Volume Sampled (Rm³*) :	3.790
Actual Flowrate (m³/s) :	27.1
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	20.2
Wet Reference Flowrate (Rm³/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<3.3	<0.51	<0.89	<0.70	<0.73	<0.014
12378-pentachlorodibenzo-p-dioxin	5.37	0.84	1.45	1.14	1.19	0.022
123478-hexachlorodibenzo-p-dioxin	<10	<1.56	<2.70	<2.12	<2.22	<0.041
123678-hexachlorodibenzo-p-dioxin	<18	<2.80	<4.86	<3.81	<3.99	<0.074
123789-hexachlorodibenzo-p-dioxin	14.9	2.32	4.02	3.15	3.31	0.061
1234678-heptachlorodibenzo-p-dioxin	224	34.9	60.4	47.4	49.7	0.92
Octachlorodibenzo-p-dioxin	208	32.4	56.1	44.0	46.2	0.86
2378-tetrachlorodibenzofuran	<3.0	<0.47	<0.81	<0.63	<0.67	<0.012
12378-pentachlorodibenzofuran	<3.6	<0.56	<0.97	<0.76	<0.80	<0.015
23478-pentachlorodibenzofuran	11.0	1.71	2.97	2.33	2.44	0.045
123478-hexachlorodibenzofuran	5.97	0.93	1.61	1.26	1.32	0.025
123678-hexachlorodibenzofuran	6.34	0.99	1.71	1.34	1.41	0.026
234678-hexachlorodibenzofuran	<16	<2.49	<4.32	<3.39	<3.55	<0.066
123789-hexachlorodibenzofuran	<4.3	<0.67	<1.16	<0.91	<0.95	<0.018
1234678-heptachlorodibenzofuran	36.8	5.73	9.93	7.79	8.17	0.15
1234789-heptachlorodibenzofuran	10.2	1.59	2.75	2.16	2.26	0.042
Octachlorodibenzofuran	22.5	3.50	6.07	4.76	4.99	0.093
PCB 81	<23	<3.58	<6.20	<4.87	<5.10	<0.095
PCB 77	<75	<11.7	<20.2	<15.9	<16.6	<0.31
PCB 123	<120	<18.7	<32.4	<25.4	<26.6	<0.50
PCB 118	1290	201	348	273	286	5.32
PCB 114	<50	<7.79	<13.5	<10.6	<11.1	<0.21
PCB 105	463	72.1	125	98.0	103	1.91
PCB 126	<28	<4.36	<7.55	<5.93	<6.21	<0.12
PCB 167	<19	<2.96	<5.13	<4.02	<4.22	<0.078
PCB 156	<30	<4.67	<8.09	<6.35	<6.66	<0.12
PCB 157	24.5	3.82	6.61	5.19	5.44	0.10
PCB 169	<8.1	<1.26	<2.19	<1.71	<1.80	<0.033
PCB 189	<5.2	<0.81	<1.40	<1.10	<1.15	<0.021
Total Dioxins & Furans Only	<603	<94.0	<163	<128	<134	<2.49
Total PCBs Only	<2136	<333	<576	<452	<474	<8.82
Total Dioxins & Furans and PCBs	<2739	<427	<739	<580	<608	<11.3

Dry Gas Volume Sampled (Rm^3*) :	3.707
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 37
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<0.64	<0.27	<0.51	<0.48	39.1
12378-pentachlorodibenzo-p-dioxin	<0.76	<0.84	0.84	<0.81	5.3
123478-hexachlorodibenzo-p-dioxin	<1.98	1.85	<1.56	<1.80	12.1
123678-hexachlorodibenzo-p-dioxin	3.43	3.69	<2.80	<3.31	13.8
123789-hexachlorodibenzo-p-dioxin	<2.13	2.63	2.32	<2.36	10.6
1234678-heptachlorodibenzo-p-dioxin	33.4	34.3	34.9	34.2	2.3
Octachlorodibenzo-p-dioxin	34.6	32.0	32.4	33.0	4.1
2378-tetrachlorodibenzofuran	<1.22	<1.29	<0.47	<0.99	46.0
12378-pentachlorodibenzofuran	<0.69	1.11	<0.56	<0.79	36.7
23478-pentachlorodibenzofuran	2.22	2.02	1.71	1.99	12.9
123478-hexachlorodibenzofuran	1.46	1.55	0.93	1.31	25.5
123678-hexachlorodibenzofuran	<1.28	<1.14	0.99	<1.14	12.9
234678-hexachlorodibenzofuran	3.14	<0.36	<2.49	<2.00	72.6
123789-hexachlorodibenzofuran	<0.72	<0.68	<0.67	<0.69	3.4
1234678-heptachlorodibenzofuran	6.76	6.27	5.73	6.26	8.2
1234789-heptachlorodibenzofuran	<1.46	1.75	1.59	<1.60	8.9
Octachlorodibenzofuran	3.96	3.16	3.50	3.54	11.3
PCB 81	<10.8	<3.04	<3.58	<5.81	74.7
PCB 77	259	<5.32	<11.7	<92.0	157
PCB 123	93.4	14.6	<18.7	<42.2	105
PCB 118	481	<112	201	<265	72.7
PCB 114	<12.6	<4.56	<7.79	<8.33	48.9
PCB 105	213	46.8	72.1	111	81.0
PCB 126	<13.9	<5.16	<4.36	<7.79	67.6
PCB 167	39.7	<2.58	<2.96	<15.1	141
PCB 156	<19.8	<5.01	<4.67	<9.83	87.9
PCB 157	<5.63	<1.97	3.82	<3.81	48.1
PCB 169	<3.35	<2.13	<1.26	<2.25	46.7
PCB 189	1.31	<0.94	<0.81	<1.02	25.5
Total Dioxins & Furans Only	<99.8	<95.0	<94.0	<96.2	3.2
Total PCBs Only	<1154	<204	<333	<564	91.4
Total Dioxins & Furans and PCBs	<1254	<299	<427	<660	78.5

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

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

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.10	<0.47	<0.89	<0.82	38.9
12378-pentachlorodibenzo-p-dioxin	<1.31	<1.45	1.45	<1.40	5.6
123478-hexachlorodibenzo-p-dioxin	<3.42	3.22	<2.70	<3.11	11.9
123678-hexachlorodibenzo-p-dioxin	5.91	6.41	<4.86	<5.73	13.9
123789-hexachlorodibenzo-p-dioxin	<3.68	4.56	4.02	<4.09	10.9
1234678-heptachlorodibenzo-p-dioxin	57.6	59.6	60.4	59.2	2.5
Octachlorodibenzo-p-dioxin	59.7	55.7	56.1	57.2	3.8
2378-tetrachlorodibenzofuran	<2.10	<2.24	<0.81	<1.72	46.0
12378-pentachlorodibenzofuran	<1.18	1.93	<0.97	<1.36	37.0
23478-pentachlorodibenzofuran	3.84	3.51	2.97	3.44	12.8
123478-hexachlorodibenzofuran	2.52	2.69	1.61	2.28	25.6
123678-hexachlorodibenzofuran	<2.21	<1.98	1.71	<1.97	12.7
234678-hexachlorodibenzofuran	5.42	<0.63	<4.32	<3.45	72.5
123789-hexachlorodibenzofuran	<1.24	<1.19	<1.16	<1.19	3.2
1234678-heptachlorodibenzofuran	11.7	10.9	9.93	10.8	8.1
1234789-heptachlorodibenzofuran	<2.52	3.03	2.75	<2.77	9.2
Octachlorodibenzofuran	6.83	5.49	6.07	6.13	11.0
PCB 81	<18.7	<5.28	<6.20	<10.0	74.4
PCB 77	447	<9.23	<20.2	<159	157
PCB 123	161	25.3	<32.4	<72.9	105
PCB 118	831	<195	348	<458	72.4
PCB 114	<21.8	<7.92	<13.5	<14.4	48.6
PCB 105	368	81.3	125	191	80.7
PCB 126	<23.9	<8.97	<7.55	<13.5	67.3
PCB 167	68.6	<4.49	<5.13	<26.1	141
PCB 156	<34.2	<8.71	<8.09	<17.0	87.6
PCB 157	<9.73	<3.43	6.61	<6.59	47.8
PCB 169	<5.78	<3.69	<2.19	<3.89	46.5
PCB 189	2.27	<1.64	<1.40	<1.77	25.3
Total Dioxins & Furans Only	<172	<165	<163	<167	3.0
Total PCBs Only	<1992	<355	<576	<974	91.1
Total Dioxins & Furans and PCBs	<2164	<520	<739	<1141	78.2

* At 25°C and 1 atmosphere

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

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

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.87	<0.37	<0.70	<0.65	39.7
12378-pentachlorodibenzo-p-dioxin	<1.04	<1.12	1.14	<1.10	4.9
123478-hexachlorodibenzo-p-dioxin	<2.70	2.49	<2.12	<2.43	12.1
123678-hexachlorodibenzo-p-dioxin	4.67	4.95	<3.81	<4.48	13.3
123789-hexachlorodibenzo-p-dioxin	<2.90	3.53	3.15	<3.19	9.8
1234678-heptachlorodibenzo-p-dioxin	45.4	46.1	47.4	46.3	2.2
Octachlorodibenzo-p-dioxin	47.1	43.0	44.0	44.7	4.8
2378-tetrachlorodibenzofuran	<1.66	<1.73	<0.63	<1.34	45.7
12378-pentachlorodibenzofuran	<0.93	1.49	<0.76	<1.06	35.8
23478-pentachlorodibenzofuran	3.03	2.71	2.33	2.69	13.0
123478-hexachlorodibenzofuran	1.99	2.08	1.26	1.78	25.2
123678-hexachlorodibenzofuran	<1.74	<1.53	1.34	<1.54	13.0
234678-hexachlorodibenzofuran	4.27	<0.49	<3.39	<2.72	72.9
123789-hexachlorodibenzofuran	<0.97	<0.92	<0.91	<0.93	3.8
1234678-heptachlorodibenzofuran	9.21	8.42	7.79	8.47	8.4
1234789-heptachlorodibenzofuran	<1.99	2.34	2.16	<2.16	8.1
Octachlorodibenzofuran	5.39	4.24	4.76	4.80	12.0
PCB 81	<14.7	<4.08	<4.87	<7.89	75.2
PCB 77	353	<7.13	<15.9	<125	157
PCB 123	127	19.6	<25.4	<57.4	105
PCB 118	655	<151	273	<360	73.2
PCB 114	<17.2	<6.11	<10.6	<11.3	49.4
PCB 105	290	62.8	98.0	150	81.5
PCB 126	<18.9	<6.93	<5.93	<10.6	68.1
PCB 167	54.1	<3.46	<4.02	<20.5	142
PCB 156	<27.0	<6.72	<6.35	<13.3	88.4
PCB 157	<7.67	<2.65	5.19	<5.17	48.6
PCB 169	<4.56	<2.85	<1.71	<3.04	47.1
PCB 189	1.79	<1.26	<1.10	<1.38	25.9
Total Dioxins & Furans Only	<136	<127	<128	<130	3.7
Total PCBs Only	<1571	<274	<452	<766	91.8
Total Dioxins & Furans and PCBs	<1707	<402	<580	<896	79.0

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

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

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

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.91	<0.39	<0.73	<0.68	39.1
12378-pentachlorodibenzo-p-dioxin	<1.09	<1.19	1.19	<1.16	5.3
123478-hexachlorodibenzo-p-dioxin	<2.82	2.64	<2.22	<2.56	12.1
123678-hexachlorodibenzo-p-dioxin	4.89	5.26	<3.99	<4.72	13.8
123789-hexachlorodibenzo-p-dioxin	<3.04	3.75	3.31	<3.37	10.6
1234678-heptachlorodibenzo-p-dioxin	47.6	49.0	49.7	48.7	2.2
Octachlorodibenzo-p-dioxin	49.3	45.7	46.2	47.1	4.2
2378-tetrachlorodibenzofuran	<1.74	<1.84	<0.67	<1.41	46.0
12378-pentachlorodibenzofuran	<0.98	1.58	<0.80	<1.12	36.7
23478-pentachlorodibenzofuran	3.17	2.88	2.44	2.83	13.0
123478-hexachlorodibenzofuran	2.09	2.21	1.32	1.87	25.6
123678-hexachlorodibenzofuran	<1.82	<1.62	1.41	<1.62	12.9
234678-hexachlorodibenzofuran	4.47	<0.52	<3.55	<2.85	72.6
123789-hexachlorodibenzofuran	<1.02	<0.97	<0.95	<0.98	3.5
1234678-heptachlorodibenzofuran	9.64	8.95	8.17	8.92	8.3
1234789-heptachlorodibenzofuran	<2.09	2.49	2.26	<2.28	8.9
Octachlorodibenzofuran	5.65	4.51	4.99	5.05	11.3
PCB 81	<15.4	<4.33	<5.10	<8.29	74.7
PCB 77	369	<7.58	<16.6	<131	157
PCB 123	133	20.8	<26.6	<60.2	105
PCB 118	686	<160	286	<378	72.7
PCB 114	<18.0	<6.50	<11.1	<11.9	48.9
PCB 105	304	66.7	103	158	81.0
PCB 126	<19.8	<7.37	<6.21	<11.1	67.6
PCB 167	56.7	<3.68	<4.22	<21.5	141
PCB 156	<28.2	<7.15	<6.66	<14.0	87.9
PCB 157	<8.04	<2.82	5.44	<5.43	48.1
PCB 169	<4.78	<3.03	<1.80	<3.20	46.8
PCB 189	1.87	<1.34	<1.15	<1.46	25.6
Total Dioxins & Furans Only	<142	<135	<134	<137	3.3
Total PCBs Only	<1646	<292	<474	<804	91.4
Total Dioxins & Furans and PCBs	<1788	<427	<608	<941	78.5

* At 25°C and 1 atmosphere

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

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

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.017	<0.0074	<0.014	<0.013	39.2
12378-pentachlorodibenzo-p-dioxin	<0.021	<0.023	0.022	<0.022	4.8
123478-hexachlorodibenzo-p-dioxin	<0.054	0.050	<0.041	<0.048	13.2
123678-hexachlorodibenzo-p-dioxin	0.093	0.10	<0.074	<0.089	14.9
123789-hexachlorodibenzo-p-dioxin	<0.058	0.071	0.061	<0.063	10.9
1234678-heptachlorodibenzo-p-dioxin	0.90	0.93	0.92	0.92	1.5
Octachlorodibenzo-p-dioxin	0.94	0.87	0.86	0.89	4.8
2378-tetrachlorodibenzofuran	<0.033	<0.035	<0.012	<0.027	46.7
12378-pentachlorodibenzofuran	<0.019	0.030	<0.015	<0.021	37.5
23478-pentachlorodibenzofuran	0.060	0.055	0.045	0.053	14.0
123478-hexachlorodibenzofuran	0.040	0.042	0.025	0.035	26.6
123678-hexachlorodibenzofuran	<0.035	<0.031	0.026	<0.031	13.9
234678-hexachlorodibenzofuran	0.085	<0.0099	<0.066	<0.054	72.8
123789-hexachlorodibenzofuran	<0.019	<0.019	<0.018	<0.019	4.5
1234678-heptachlorodibenzofuran	0.18	0.17	0.15	0.17	9.4
1234789-heptachlorodibenzofuran	<0.040	0.047	0.042	<0.043	9.2
Octachlorodibenzofuran	0.11	0.086	0.093	0.095	11.6
PCB 81	<0.29	<0.082	<0.095	<0.16	75.4
PCB 77	7.02	<0.14	<0.31	<2.49	157
PCB 123	2.53	0.40	<0.50	<1.14	106
PCB 118	13.0	<3.05	5.32	<7.14	73.4
PCB 114	<0.34	<0.12	<0.21	<0.22	49.4
PCB 105	5.78	1.27	1.91	2.99	81.7
PCB 126	<0.38	<0.14	<0.12	<0.21	68.3
PCB 167	1.08	<0.070	<0.078	<0.41	142
PCB 156	<0.54	<0.14	<0.12	<0.27	88.5
PCB 157	<0.15	<0.054	0.10	<0.10	48.4
PCB 169	<0.091	<0.058	<0.033	<0.061	47.5
PCB 189	0.036	<0.026	<0.021	<0.028	26.4
Total Dioxins & Furans Only	<2.70	<2.57	<2.49	<2.59	4.2
Total PCBs Only	<31.3	<5.54	<8.82	<15.2	92.1
Total Dioxins & Furans and PCBs	<34.0	<8.12	<11.3	<17.8	79.2

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	<0.48	<0.82	<0.65	<0.68	<0.013
12378-pentachlorodibenzo-p-dioxin	<0.81	<1.40	<1.10	<1.16	<0.022
123478-hexachlorodibenzo-p-dioxin	<1.80	<3.11	<2.43	<2.56	<0.048
123678-hexachlorodibenzo-p-dioxin	<3.31	<5.73	<4.48	<4.72	<0.089
123789-hexachlorodibenzo-p-dioxin	<2.36	<4.09	<3.19	<3.37	<0.063
1234678-heptachlorodibenzo-p-dioxin	34.2	59.2	46.3	48.7	0.92
Octachlorodibenzo-p-dioxin	33.0	57.2	44.7	47.1	0.89
2378-tetrachlorodibenzofuran	<0.99	<1.72	<1.34	<1.41	<0.027
12378-pentachlorodibenzofuran	<0.79	<1.36	<1.06	<1.12	<0.021
23478-pentachlorodibenzofuran	1.99	3.44	2.69	2.83	0.053
123478-hexachlorodibenzofuran	1.31	2.28	1.78	1.87	0.035
123678-hexachlorodibenzofuran	<1.14	<1.97	<1.54	<1.62	<0.031
234678-hexachlorodibenzofuran	<2.00	<3.45	<2.72	<2.85	<0.054
123789-hexachlorodibenzofuran	<0.69	<1.19	<0.93	<0.98	<0.019
1234678-heptachlorodibenzofuran	6.26	10.8	8.47	8.92	0.17
1234789-heptachlorodibenzofuran	<1.60	<2.77	<2.16	<2.28	<0.043
Octachlorodibenzofuran	3.54	6.13	4.80	5.05	0.095
PCB 81	<5.81	<10.0	<7.89	<8.29	<0.16
PCB 77	<92.0	<159	<125	<131	<2.49
PCB 123	<42.2	<72.9	<57.4	<60.2	<1.14
PCB 118	<265	<458	<360	<378	<7.14
PCB 114	<8.33	<14.4	<11.3	<11.9	<0.22
PCB 105	111	191	150	158	2.99
PCB 126	<7.79	<13.5	<10.6	<11.1	<0.21
PCB 167	<15.1	<26.1	<20.5	<21.5	<0.41
PCB 156	<9.83	<17.0	<13.3	<14.0	<0.27
PCB 157	<3.81	<6.59	<5.17	<5.43	<0.10
PCB 169	<2.25	<3.89	<3.04	<3.20	<0.061
PCB 189	<1.02	<1.77	<1.38	<1.46	<0.028
Total Dioxins & Furans Only	<96.2	<167	<130	<137	<2.59
Total PCBs Only	<564	<974	<766	<804	<15.2
Total Dioxins & Furans and PCBs	<660	<1141	<896	<941	<17.8

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<2.9	<29
12378-pentachlorodibenzo-p-dioxin	<1.8	<5.6
123478-hexachlorodibenzo-p-dioxin	<3.3	<13
123678-hexachlorodibenzo-p-dioxin	<2.2	<8.7
123789-hexachlorodibenzo-p-dioxin	<2.4	<9.7
1234678-heptachlorodibenzo-p-dioxin	25.5	34.9
Octachlorodibenzo-p-dioxin	37.6	47.3
2378-tetrachlorodibenzofuran	<2.2	<7.3
12378-pentachlorodibenzofuran	<2.5	<5.0
23478-pentachlorodibenzofuran	<2.2	<4.50
123478-hexachlorodibenzofuran	<2.4	<8.8
123678-hexachlorodibenzofuran	<1.9	<7.00
234678-hexachlorodibenzofuran	<2.2	<8.1
123789-hexachlorodibenzofuran	<2.7	<9.9
1234678-heptachlorodibenzofuran	<6.5	<4.0
1234789-heptachlorodibenzofuran	<2.5	<5.3
Octachlorodibenzofuran	<5.2	<12.0
PCB 81	<30	<81
PCB 77	<35	<100
PCB 123	<17	<52
PCB 118	<20	<41
PCB 114	<14	<46
PCB 105	<36	<48
PCB 126	<17	<49
PCB 167	<16	<42
PCB 156	<17	<44
PCB 157	<17	<47
PCB 169	<18	<52
PCB 189	<9.7	<34
Total Dioxins & Furans Only	<106	<220
Total PCBs Only	<247	<636
Total Dioxins & Furans and PCBs	<353	<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 44
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.64	<0.27	<0.51	<0.48
12378-pentachlorodibenzo-p-dioxin	1.000	<0.76	<0.84	0.84	<0.81
123478-hexachlorodibenzo-p-dioxin	0.100	<0.20	0.19	<0.16	<0.18
123678-hexachlorodibenzo-p-dioxin	0.100	0.34	0.37	<0.28	<0.33
123789-hexachlorodibenzo-p-dioxin	0.100	<0.21	0.26	0.23	<0.24
1234678-heptachlorodibenzo-p-dioxin	0.010	0.33	0.34	0.35	0.34
Octachlorodibenzo-p-dioxin	0.0003	0.010	0.0096	0.0097	0.0099
2378-tetrachlorodibenzofuran	0.100	<0.12	<0.13	<0.047	<0.099
12378-pentachlorodibenzofuran	0.030	<0.021	0.033	<0.017	<0.024
23478-pentachlorodibenzofuran	0.300	0.67	0.61	0.51	0.60
123478-hexachlorodibenzofuran	0.100	0.15	0.15	0.093	0.13
123678-hexachlorodibenzofuran	0.100	<0.13	<0.11	0.099	<0.11
234678-hexachlorodibenzofuran	0.100	0.31	<0.036	<0.25	<0.20
123789-hexachlorodibenzofuran	0.100	<0.072	<0.068	<0.067	<0.069
1234678-heptachlorodibenzofuran	0.010	0.068	0.063	0.057	0.063
1234789-heptachlorodibenzofuran	0.010	<0.015	0.017	0.016	<0.016
Octachlorodibenzofuran	0.0003	0.0012	0.00095	0.0011	0.0011
PCB 81	0.0003	<0.0032	<0.00091	<0.0011	<0.0017
PCB 77	0.0001	0.026	<0.00053	<0.0012	<0.0092
PCB 123	0.00003	0.0028	0.00044	<0.00056	<0.0013
PCB 118	0.00003	0.014	<0.0034	0.0060	<0.0079
PCB 114	0.00003	<0.00038	<0.00014	<0.00023	<0.00025
PCB 105	0.00003	0.0064	0.0014	0.0022	0.0033
PCB 126	0.100	<1.39	<0.52	<0.44	<0.78
PCB 167	0.00003	0.0012	<0.000077	<0.000089	<0.00045
PCB 156	0.00003	<0.00059	<0.00015	<0.00014	<0.00029
PCB 157	0.00003	<0.00017	<0.000059	0.00011	<0.00011
PCB 169	0.030	<0.10	<0.064	<0.038	<0.067
PCB 189	0.00003	0.000039	<0.000028	<0.000024	<0.000031
Total Dioxins & Furans Only		<4.05	<3.50	<3.54	<3.70
Total PCBs Only		<1.54	<0.59	<0.49	<0.87
Total Dioxins & Furans and PCBs		<5.59	<4.09	<4.02	<4.57

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. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.10	<0.47	<0.89	<0.82
12378-pentachlorodibenzo-p-dioxin	1.000	<1.31	<1.45	1.45	<1.40
123478-hexachlorodibenzo-p-dioxin	0.100	<0.34	0.32	<0.27	<0.31
123678-hexachlorodibenzo-p-dioxin	0.100	0.59	0.64	<0.49	<0.57
123789-hexachlorodibenzo-p-dioxin	0.100	<0.37	0.46	0.40	<0.41
1234678-heptachlorodibenzo-p-dioxin	0.010	0.58	0.60	0.60	0.59
Octachlorodibenzo-p-dioxin	0.0003	0.018	0.017	0.017	0.017
2378-tetrachlorodibenzofuran	0.100	<0.21	<0.22	<0.081	<0.17
12378-pentachlorodibenzofuran	0.030	<0.035	0.058	<0.029	<0.041
23478-pentachlorodibenzofuran	0.300	1.15	1.05	0.89	1.03
123478-hexachlorodibenzofuran	0.100	0.25	0.27	0.16	0.23
123678-hexachlorodibenzofuran	0.100	<0.22	<0.20	0.17	<0.20
234678-hexachlorodibenzofuran	0.100	0.54	<0.063	<0.43	<0.35
123789-hexachlorodibenzofuran	0.100	<0.12	<0.12	<0.12	<0.12
1234678-heptachlorodibenzofuran	0.010	0.12	0.11	0.099	0.11
1234789-heptachlorodibenzofuran	0.010	<0.025	0.030	0.028	<0.028
Octachlorodibenzofuran	0.0003	0.0021	0.0016	0.0018	0.0018
PCB 81	0.0003	<0.0056	<0.0016	<0.0019	<0.0030
PCB 77	0.0001	0.045	<0.00092	<0.0020	<0.016
PCB 123	0.00003	0.0048	0.00076	<0.00097	<0.0022
PCB 118	0.00003	0.025	<0.0059	0.010	<0.014
PCB 114	0.00003	<0.00065	<0.00024	<0.00040	<0.00043
PCB 105	0.00003	0.011	0.0024	0.0037	0.0057
PCB 126	0.100	<2.39	<0.90	<0.76	<1.35
PCB 167	0.00003	0.0021	<0.00013	<0.00015	<0.00078
PCB 156	0.00003	<0.0010	<0.00026	<0.00024	<0.00051
PCB 157	0.00003	<0.00029	<0.00010	0.00020	<0.00020
PCB 169	0.030	<0.17	<0.11	<0.066	<0.12
PCB 189	0.00003	0.000068	<0.000049	<0.000042	<0.000053
Total Dioxins & Furans Only		<6.99	<6.08	<6.13	<6.40
Total PCBs Only		<2.66	<1.02	<0.84	<1.51
Total Dioxins & Furans and PCBs		<9.65	<7.10	<6.97	<7.91

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.87	<0.37	<0.70	<0.65
12378-pentachlorodibenzo-p-dioxin	1.000	<1.04	<1.12	1.14	<1.10
123478-hexachlorodibenzo-p-dioxin	0.100	<0.27	0.25	<0.21	<0.24
123678-hexachlorodibenzo-p-dioxin	0.100	0.47	0.50	<0.38	<0.45
123789-hexachlorodibenzo-p-dioxin	0.100	<0.29	0.35	0.32	<0.32
1234678-heptachlorodibenzo-p-dioxin	0.010	0.45	0.46	0.47	0.46
Octachlorodibenzo-p-dioxin	0.0003	0.014	0.013	0.013	0.013
2378-tetrachlorodibenzofuran	0.100	<0.17	<0.17	<0.063	<0.13
12378-pentachlorodibenzofuran	0.030	<0.028	0.045	<0.023	<0.032
23478-pentachlorodibenzofuran	0.300	0.91	0.81	0.70	0.81
123478-hexachlorodibenzofuran	0.100	0.20	0.21	0.13	0.18
123678-hexachlorodibenzofuran	0.100	<0.17	<0.15	0.13	<0.15
234678-hexachlorodibenzofuran	0.100	0.43	<0.049	<0.34	<0.27
123789-hexachlorodibenzofuran	0.100	<0.097	<0.092	<0.091	<0.093
1234678-heptachlorodibenzofuran	0.010	0.092	0.084	0.078	0.085
1234789-heptachlorodibenzofuran	0.010	<0.020	0.023	0.022	<0.022
Octachlorodibenzofuran	0.0003	0.0016	0.0013	0.0014	0.0014
PCB 81	0.0003	<0.0044	<0.0012	<0.0015	<0.0024
PCB 77	0.0001	0.035	<0.00071	<0.0016	<0.013
PCB 123	0.00003	0.0038	0.00059	<0.00076	<0.0017
PCB 118	0.00003	0.020	<0.0045	0.0082	<0.011
PCB 114	0.00003	<0.00052	<0.00018	<0.00032	<0.00034
PCB 105	0.00003	0.0087	0.0019	0.0029	0.0045
PCB 126	0.100	<1.89	<0.69	<0.59	<1.06
PCB 167	0.00003	0.0016	<0.00010	<0.00012	<0.00062
PCB 156	0.00003	<0.00081	<0.00020	<0.00019	<0.00040
PCB 157	0.00003	<0.00023	<0.000079	0.00016	<0.00016
PCB 169	0.030	<0.14	<0.086	<0.051	<0.091
PCB 189	0.00003	0.000054	<0.000038	<0.000033	<0.000042
Total Dioxins & Furans Only		<5.52	<4.70	<4.81	<5.01
Total PCBs Only		<2.10	<0.79	<0.66	<1.18
Total Dioxins & Furans and PCBs		<7.62	<5.49	<5.47	<6.19

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

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.44	0.18	0.35	0.32
12378-pentachlorodibenzo-p-dioxin	1.000	0.52	0.56	1.14	0.74
123478-hexachlorodibenzo-p-dioxin	0.100	0.13	0.25	0.11	0.16
123678-hexachlorodibenzo-p-dioxin	0.100	0.47	0.50	0.19	0.38
123789-hexachlorodibenzo-p-dioxin	0.100	0.15	0.35	0.32	0.27
1234678-heptachlorodibenzo-p-dioxin	0.010	0.45	0.46	0.47	0.46
Octachlorodibenzo-p-dioxin	0.0003	0.014	0.013	0.013	0.013
2378-tetrachlorodibenzofuran	0.100	0.083	0.087	0.032	0.067
12378-pentachlorodibenzofuran	0.030	0.014	0.045	0.011	0.023
23478-pentachlorodibenzofuran	0.300	0.91	0.81	0.70	0.81
123478-hexachlorodibenzofuran	0.100	0.20	0.21	0.13	0.18
123678-hexachlorodibenzofuran	0.100	0.087	0.076	0.13	0.099
234678-hexachlorodibenzofuran	0.100	0.43	0.024	0.17	0.21
123789-hexachlorodibenzofuran	0.100	0.049	0.046	0.046	0.047
1234678-heptachlorodibenzofuran	0.010	0.092	0.084	0.078	0.085
1234789-heptachlorodibenzofuran	0.010	0.010	0.023	0.022	0.018
Octachlorodibenzofuran	0.0003	0.0016	0.0013	0.0014	0.0014
PCB 81	0.0003	0.0022	0.00061	0.00073	0.0012
PCB 77	0.0001	0.035	0.00036	0.00079	0.012
PCB 123	0.00003	0.0038	0.00059	0.00038	0.0016
PCB 118	0.00003	0.020	0.0023	0.0082	0.010
PCB 114	0.00003	0.00026	0.000092	0.00016	0.00017
PCB 105	0.00003	0.0087	0.0019	0.0029	0.0045
PCB 126	0.100	0.94	0.35	0.30	0.53
PCB 167	0.00003	0.0016	0.000052	0.000060	0.00058
PCB 156	0.00003	0.00040	0.00010	0.000095	0.00020
PCB 157	0.00003	0.00012	0.000040	0.00016	0.00010
PCB 169	0.030	0.068	0.043	0.026	0.046
PCB 189	0.00003	0.000054	0.000019	0.000017	0.000030
Total Dioxins & Furans Only		4.04	3.72	3.90	3.89
Total PCBs Only		1.08	0.40	0.34	0.60
Total Dioxins & Furans and PCBs		5.12	4.12	4.24	4.49

* 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	<0.87	<0.37	<0.70	<0.65
12378-pentachlorodibenzo-p-dioxin	0.500	<0.52	<0.56	0.57	<0.55
123478-hexachlorodibenzo-p-dioxin	0.100	<0.27	0.25	<0.21	<0.24
123678-hexachlorodibenzo-p-dioxin	0.100	0.47	0.50	<0.38	<0.45
123789-hexachlorodibenzo-p-dioxin	0.100	<0.29	0.35	0.32	<0.32
1234678-heptachlorodibenzo-p-dioxin	0.010	0.45	0.46	0.47	0.46
Octachlorodibenzo-p-dioxin	0.001	0.047	0.043	0.044	0.045
2378-tetrachlorodibenzofuran	0.100	<0.17	<0.17	<0.063	<0.13
12378-pentachlorodibenzofuran	0.050	<0.047	0.074	<0.038	<0.053
23478-pentachlorodibenzofuran	0.500	1.51	1.36	1.16	1.34
123478-hexachlorodibenzofuran	0.100	0.20	0.21	0.13	0.18
123678-hexachlorodibenzofuran	0.100	<0.17	<0.15	0.13	<0.15
234678-hexachlorodibenzofuran	0.100	0.43	<0.049	<0.34	<0.27
123789-hexachlorodibenzofuran	0.100	<0.097	<0.092	<0.091	<0.093
1234678-heptachlorodibenzofuran	0.010	0.092	0.084	0.078	0.085
1234789-heptachlorodibenzofuran	0.010	<0.020	0.023	0.022	<0.022
Octachlorodibenzofuran	0.001	0.0054	0.0042	0.0048	0.0048
Total Dioxins & Furans		<5.66	<4.74	<4.75	<5.05
In-Stack Emission Limit					60

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

NATO/CCMS (1989) Toxicity Equivalency Factors

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

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

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.91	<0.39	<0.73	<0.68
12378-pentachlorodibenzo-p-dioxin	1.000	<1.09	<1.19	1.19	<1.16
123478-hexachlorodibenzo-p-dioxin	0.100	<0.28	0.26	<0.22	<0.26
123678-hexachlorodibenzo-p-dioxin	0.100	0.49	0.53	<0.40	<0.47
123789-hexachlorodibenzo-p-dioxin	0.100	<0.30	0.37	0.33	<0.34
1234678-heptachlorodibenzo-p-dioxin	0.010	0.48	0.49	0.50	0.49
Octachlorodibenzo-p-dioxin	0.0003	0.015	0.014	0.014	0.014
2378-tetrachlorodibenzofuran	0.100	<0.17	<0.18	<0.067	<0.14
12378-pentachlorodibenzofuran	0.030	<0.029	0.048	<0.024	<0.034
23478-pentachlorodibenzofuran	0.300	0.95	0.86	0.73	0.85
123478-hexachlorodibenzofuran	0.100	0.21	0.22	0.13	0.19
123678-hexachlorodibenzofuran	0.100	<0.18	<0.16	0.14	<0.16
234678-hexachlorodibenzofuran	0.100	0.45	<0.052	<0.36	<0.28
123789-hexachlorodibenzofuran	0.100	<0.10	<0.097	<0.095	<0.098
1234678-heptachlorodibenzofuran	0.010	0.096	0.089	0.082	0.089
1234789-heptachlorodibenzofuran	0.010	<0.021	0.025	0.023	<0.023
Octachlorodibenzofuran	0.0003	0.0017	0.0014	0.0015	0.0015
PCB 81	0.0003	<0.0046	<0.0013	<0.0015	<0.0025
PCB 77	0.0001	0.037	<0.00076	<0.0017	<0.013
PCB 123	0.00003	0.0040	0.00062	<0.00080	<0.0018
PCB 118	0.00003	0.021	<0.0048	0.0086	<0.011
PCB 114	0.00003	<0.00054	<0.00019	<0.00033	<0.00036
PCB 105	0.00003	0.0091	0.0020	0.0031	0.0047
PCB 126	0.100	<1.98	<0.74	<0.62	<1.11
PCB 167	0.00003	0.0017	<0.00011	<0.00013	<0.00065
PCB 156	0.00003	<0.00085	<0.00021	<0.00020	<0.00042
PCB 157	0.00003	<0.00024	<0.000084	0.00016	<0.00016
PCB 169	0.030	<0.14	<0.091	<0.054	<0.096
PCB 189	0.00003	0.000056	<0.000040	<0.000035	<0.000044
Total Dioxins & Furans Only		<5.78	<4.99	<5.04	<5.27
Total PCBs Only		<2.20	<0.84	<0.69	<1.24
Total Dioxins & Furans and PCBs		<7.98	<5.83	<5.73	<6.51

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.017	<0.0074	<0.014	<0.013
12378-pentachlorodibenzo-p-dioxin	1.000	<0.021	<0.023	0.022	<0.022
123478-hexachlorodibenzo-p-dioxin	0.100	<0.0054	0.0050	<0.0041	<0.0048
123678-hexachlorodibenzo-p-dioxin	0.100	0.0093	0.010	<0.0074	<0.0089
123789-hexachlorodibenzo-p-dioxin	0.100	<0.0058	0.0071	0.0061	<0.0063
1234678-heptachlorodibenzo-p-dioxin	0.010	0.0090	0.0093	0.0092	0.0092
Octachlorodibenzo-p-dioxin	0.0003	0.00028	0.00026	0.00026	0.00027
2378-tetrachlorodibenzofuran	0.100	<0.0033	<0.0035	<0.0012	<0.0027
12378-pentachlorodibenzofuran	0.030	<0.00056	0.00090	<0.00045	<0.00064
23478-pentachlorodibenzofuran	0.300	0.018	0.016	0.014	0.016
123478-hexachlorodibenzofuran	0.100	0.0040	0.0042	0.0025	0.0035
123678-hexachlorodibenzofuran	0.100	<0.0035	<0.0031	0.0026	<0.0031
234678-hexachlorodibenzofuran	0.100	0.0085	<0.00099	<0.0066	<0.0054
123789-hexachlorodibenzofuran	0.100	<0.0019	<0.0019	<0.0018	<0.0019
1234678-heptachlorodibenzofuran	0.010	0.0018	0.0017	0.0015	0.0017
1234789-heptachlorodibenzofuran	0.010	<0.00040	0.00047	0.00042	<0.00043
Octachlorodibenzofuran	0.0003	0.000032	0.000026	0.000028	0.000029
PCB 81	0.0003	<0.000088	<0.000025	<0.000028	<0.000047
PCB 77	0.0001	0.00070	<0.000014	<0.000031	<0.00025
PCB 123	0.00003	0.000076	0.000012	<0.000015	<0.000034
PCB 118	0.00003	0.00039	<0.000091	0.00016	<0.00021
PCB 114	0.00003	<0.000010	<0.0000037	<0.0000062	<0.0000067
PCB 105	0.00003	0.00017	0.000038	0.000057	0.000090
PCB 126	0.100	<0.038	<0.014	<0.012	<0.021
PCB 167	0.00003	0.000032	<0.0000021	<0.0000024	<0.000012
PCB 156	0.00003	<0.000016	<0.0000041	<0.0000037	<0.0000080
PCB 157	0.00003	<0.0000046	<0.0000016	0.0000030	<0.0000031
PCB 169	0.030	<0.0027	<0.0017	<0.0010	<0.0018
PCB 189	0.00003	0.0000011	<0.00000077	<0.00000064	<0.00000083
Total Dioxins & Furans Only		<0.11	<0.095	<0.094	<0.099
Total PCBs Only		<0.042	<0.016	<0.013	<0.024
Total Dioxins & Furans and PCBs		<0.15	<0.11	<0.11	<0.12

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/m^3	Dry Reference Concentration pg TEQ/Rm^3*	Dry Adjusted Concentration pg TEQ/Rm^3**	Wet Reference Concentration pg TEQ/Rm^3*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<0.48	<0.82	<0.65	<0.68	<0.013
12378-pentachlorodibenzo-p-dioxin	<0.81	<1.40	<1.10	<1.16	<0.022
123478-hexachlorodibenzo-p-dioxin	<0.18	<0.31	<0.24	<0.26	<0.0048
123678-hexachlorodibenzo-p-dioxin	<0.33	<0.57	<0.45	<0.47	<0.0089
123789-hexachlorodibenzo-p-dioxin	<0.24	<0.41	<0.32	<0.34	<0.0063
1234678-heptachlorodibenzo-p-dioxin	0.34	0.59	0.46	0.49	0.0092
Octachlorodibenzo-p-dioxin	0.0099	0.017	0.013	0.014	0.00027
2378-tetrachlorodibenzofuran	<0.099	<0.17	<0.13	<0.14	<0.0027
12378-pentachlorodibenzofuran	<0.024	<0.041	<0.032	<0.034	<0.00064
23478-pentachlorodibenzofuran	0.60	1.03	0.81	0.85	0.016
123478-hexachlorodibenzofuran	0.13	0.23	0.18	0.19	0.0035
123678-hexachlorodibenzofuran	<0.11	<0.20	<0.15	<0.16	<0.0031
234678-hexachlorodibenzofuran	<0.20	<0.35	<0.27	<0.28	<0.0054
123789-hexachlorodibenzofuran	<0.069	<0.12	<0.093	<0.098	<0.0019
1234678-heptachlorodibenzofuran	0.063	0.11	0.085	0.089	0.0017
1234789-heptachlorodibenzofuran	<0.016	<0.028	<0.022	<0.023	<0.00043
Octachlorodibenzofuran	0.0011	0.0018	0.0014	0.0015	0.000029
PCB 81	<0.0017	<0.0030	<0.0024	<0.0025	<0.000047
PCB 77	<0.0092	<0.016	<0.013	<0.013	<0.00025
PCB 123	<0.0013	<0.0022	<0.0017	<0.0018	<0.000034
PCB 118	<0.0079	<0.014	<0.011	<0.011	<0.00021
PCB 114	<0.00025	<0.00043	<0.00034	<0.00036	<0.0000067
PCB 105	0.0033	0.0057	0.0045	0.0047	0.000090
PCB 126	<0.78	<1.35	<1.06	<1.11	<0.021
PCB 167	<0.00045	<0.00078	<0.00062	<0.00065	<0.000012
PCB 156	<0.00029	<0.00051	<0.00040	<0.00042	<0.0000080
PCB 157	<0.00011	<0.00020	<0.00016	<0.00016	<0.0000031
PCB 169	<0.067	<0.12	<0.091	<0.096	<0.0018
PCB 189	<0.000031	<0.000053	<0.000042	<0.000044	<0.00000083
Total Dioxins & Furans Only	<3.70	<6.40	<5.01	<5.27	<0.099
Total PCBs Only	<0.87	<1.51	<1.18	<1.24	<0.024
Total Dioxins & Furans and PCBs	<4.57	<7.91	<6.19	<6.51	<0.12

* 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	0.24	0.41	0.32	0.34	0.0064
12378-pentachlorodibenzo-p-dioxin	0.54	0.94	0.74	0.78	0.015
123478-hexachlorodibenzo-p-dioxin	0.12	0.21	0.16	0.17	0.0033
123678-hexachlorodibenzo-p-dioxin	0.28	0.49	0.38	0.40	0.0077
123789-hexachlorodibenzo-p-dioxin	0.20	0.35	0.27	0.29	0.0054
1234678-heptachlorodibenzo-p-dioxin	0.34	0.59	0.46	0.49	0.0092
Octachlorodibenzo-p-dioxin	0.0099	0.017	0.013	0.014	0.00027
2378-tetrachlorodibenzofuran	0.050	0.086	0.067	0.071	0.0013
12378-pentachlorodibenzofuran	0.017	0.030	0.023	0.025	0.00047
23478-pentachlorodibenzofuran	0.60	1.03	0.81	0.85	0.016
123478-hexachlorodibenzofuran	0.13	0.23	0.18	0.19	0.0035
123678-hexachlorodibenzofuran	0.073	0.13	0.099	0.10	0.0020
234678-hexachlorodibenzofuran	0.15	0.26	0.21	0.22	0.0041
123789-hexachlorodibenzofuran	0.034	0.060	0.047	0.049	0.00093
1234678-heptachlorodibenzofuran	0.063	0.11	0.085	0.089	0.0017
1234789-heptachlorodibenzofuran	0.014	0.023	0.018	0.019	0.00036
Octachlorodibenzofuran	0.0011	0.0018	0.0014	0.0015	0.000029
PCB 81	0.00087	0.0015	0.0012	0.0012	0.000024
PCB 77	0.0089	0.015	0.012	0.013	0.00024
PCB 123	0.0012	0.0020	0.0016	0.0017	0.000032
PCB 118	0.0074	0.013	0.010	0.011	0.00020
PCB 114	0.00012	0.00022	0.00017	0.00018	0.0000034
PCB 105	0.0033	0.0057	0.0045	0.0047	0.000090
PCB 126	0.39	0.67	0.53	0.56	0.011
PCB 167	0.00043	0.00073	0.000579	0.00061	0.000012
PCB 156	0.00015	0.00025	0.00020	0.00021	0.0000040
PCB 157	0.000076	0.00013	0.00010	0.00011	0.0000020
PCB 169	0.034	0.058	0.046	0.048	0.00091
PCB 189	0.000022	0.000038	0.000030	0.000031	0.00000059
Total Dioxins & Furans Only	2.87	4.97	3.89	4.09	0.077
Total PCBs Only	0.45	0.77	0.60	0.64	0.012
Total Dioxins & Furans and PCBs	3.32	5.74	4.49	4.73	0.089

* At 25°C and 1 atmosphere

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

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1970	300	518	409	428	8.13
1,3-Dichlorobenzene	274	41.7	72.0	56.8	59.5	1.13
1,4-Dichlorobenzene	184	28.0	48.4	38.2	40.0	0.76
1,2-Dichlorobenzene	147	22.4	38.6	30.5	31.9	0.61
Total Dichlorobenzene	605	92.1	159	125	131	2.50
1,3,5-trichlorobenzene	19.7	3.00	5.18	4.09	4.28	0.081
1,2,4-trichlorobenzene	35.7	5.44	9.38	7.40	7.75	0.15
1,2,3-trichlorobenzene	19.1	2.91	5.02	3.96	4.15	0.079
Total Trichlorobenzene	74.5	11.3	19.6	15.5	16.2	0.31
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	17.4	2.65	4.57	3.61	3.78	0.072
1,2,3,4-tetrachlorobenzene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Total Tetrachlorobenzene	<27.4	<4.17	<7.20	<5.68	<5.95	<0.11
Pentachlorobenzene	13.3	2.03	3.50	2.76	2.89	0.055
Hexachlorobenzene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Total Chlorobenzenes	<2700	<411	<710	<560	<587	<11.1

Dry Gas Volume Sampled (Rm^3*) :	3.804
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1430	217	377	291	310	5.89
1,3-Dichlorobenzene	251	38.1	66.2	51.1	54.4	1.03
1,4-Dichlorobenzene	166	25.2	43.8	33.8	36.0	0.68
1,2-Dichlorobenzene	132	20.0	34.8	26.9	28.6	0.54
Total Dichlorobenzene	549	83.4	145	112	119	2.26
1,3,5-trichlorobenzene	18.9	2.87	4.99	3.85	4.09	0.078
1,2,4-trichlorobenzene	38.3	5.82	10.1	7.80	8.30	0.16
1,2,3-trichlorobenzene	26.8	4.07	7.07	5.46	5.81	0.11
Total Trichlorobenzene	84.0	12.8	22.2	17.1	18.2	0.35
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	20.1	3.05	5.30	4.10	4.35	0.083
1,2,3,4-tetrachlorobenzene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Total Tetrachlorobenzene	<30.1	<4.57	<7.94	<6.13	<6.52	<0.12
Pentachlorobenzene	17.5	2.66	4.62	3.57	3.79	0.072
Hexachlorobenzene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Total Chlorobenzenes	<2121	<322	<560	<432	<459	<8.73

Dry Gas Volume Sampled (Rm³*) :	3.790
Actual Flowrate (m³/s) :	27.1
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	20.2
Wet Reference Flowrate (Rm³/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1370	213	370	290	304	5.65
1,3-Dichlorobenzene	276	43.0	74.5	58.4	61.2	1.14
1,4-Dichlorobenzene	160	24.9	43.2	33.9	35.5	0.66
1,2-Dichlorobenzene	116	18.1	31.3	24.6	25.7	0.48
Total Dichlorobenzene	552	86.0	149	117	122	2.28
1,3,5-trichlorobenzene	19.5	3.04	5.26	4.13	4.33	0.080
1,2,4-trichlorobenzene	49.1	7.65	13.2	10.4	10.9	0.20
1,2,3-trichlorobenzene	17.4	2.71	4.69	3.68	3.86	0.072
Total Trichlorobenzene	86.0	13.4	23.2	18.2	19.1	0.35
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	18.5	2.88	4.99	3.92	4.11	0.076
1,2,3,4-tetrachlorobenzene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Total Tetrachlorobenzene	<28.5	<4.44	<7.69	<6.03	<6.32	<0.12
Pentachlorobenzene	14.3	2.23	3.86	3.03	3.17	0.059
Hexachlorobenzene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Total Chlorobenzenes	<2061	<321	<556	<436	<457	<8.51

Dry Gas Volume Sampled (Rm^3*) :	3.707
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 54
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	300	217	213	244	20.1
1,3-Dichlorobenzene	41.7	38.1	43.0	40.9	6.2
1,4-Dichlorobenzene	28.0	25.2	24.9	26.1	6.6
1,2-Dichlorobenzene	22.4	20.0	18.1	20.2	10.7
Total Dichlorobenzene	92.1	83.4	86.0	87.2	5.2
1,3,5-trichlorobenzene	3.00	2.87	3.04	2.97	2.9
1,2,4-trichlorobenzene	5.44	5.82	7.65	6.30	18.8
1,2,3-trichlorobenzene	2.91	4.07	2.71	3.23	22.8
Total Trichlorobenzene	11.3	12.8	13.4	12.5	8.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.65	3.05	2.88	2.86	7.1
1,2,3,4-tetrachlorobenzene	<1.52	<1.52	<1.56	<1.53	1.4
Total Tetrachlorobenzene	<4.17	<4.57	<4.44	<4.39	4.6
Pentachlorobenzene	2.03	2.66	2.23	2.30	14.0
Hexachlorobenzene	<1.52	<1.52	<1.56	<1.53	1.4
Total Chlorobenzenes	<411	<322	<321	<351	14.7

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

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	518	377	370	422	19.8
1,3-Dichlorobenzene	72.0	66.2	74.5	70.9	6.0
1,4-Dichlorobenzene	48.4	43.8	43.2	45.1	6.3
1,2-Dichlorobenzene	38.6	34.8	31.3	34.9	10.5
Total Dichlorobenzene	159	145	149	151	4.8
1,3,5-trichlorobenzene	5.18	4.99	5.26	5.14	2.7
1,2,4-trichlorobenzene	9.38	10.1	13.2	10.9	18.8
1,2,3-trichlorobenzene	5.02	7.07	4.69	5.60	23.0
Total Trichlorobenzene	19.6	22.2	23.2	21.6	8.6
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	4.57	5.30	4.99	4.96	7.4
1,2,3,4-tetrachlorobenzene	<2.63	<2.64	<2.70	<2.65	1.4
Total Tetrachlorobenzene	<7.20	<7.94	<7.69	<7.61	4.9
Pentachlorobenzene	3.50	4.62	3.86	3.99	14.3
Hexachlorobenzene	<2.63	<2.64	<2.70	<2.65	1.4
Total Chlorobenzenes	<710	<560	<556	<608	14.4

* At 25°C and 1 atmosphere

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

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	409	291	290	330	20.6
1,3-Dichlorobenzene	56.8	51.1	58.4	55.5	6.9
1,4-Dichlorobenzene	38.2	33.8	33.9	35.3	7.1
1,2-Dichlorobenzene	30.5	26.9	24.6	27.3	10.9
Total Dichlorobenzene	125	112	117	118	5.8
1,3,5-trichlorobenzene	4.09	3.85	4.13	4.02	3.7
1,2,4-trichlorobenzene	7.40	7.80	10.4	8.53	19.0
1,2,3-trichlorobenzene	3.96	5.46	3.68	4.37	21.9
Total Trichlorobenzene	15.5	17.1	18.2	16.9	8.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.61	4.10	3.92	3.87	6.4
1,2,3,4-tetrachlorobenzene	<2.07	<2.04	<2.12	<2.08	1.9
Total Tetrachlorobenzene	<5.68	<6.13	<6.03	<5.95	4.0
Pentachlorobenzene	2.76	3.57	3.03	3.12	13.2
Hexachlorobenzene	<2.07	<2.04	<2.12	<2.08	1.9
Total Chlorobenzenes	<560	<432	<436	<476	15.3

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

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

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	428	310	304	347	20.1
1,3-Dichlorobenzene	59.5	54.4	61.2	58.4	6.1
1,4-Dichlorobenzene	40.0	36.0	35.5	37.1	6.6
1,2-Dichlorobenzene	31.9	28.6	25.7	28.8	10.8
Total Dichlorobenzene	131	119	122	124	5.2
1,3,5-trichlorobenzene	4.28	4.09	4.33	4.23	2.9
1,2,4-trichlorobenzene	7.75	8.30	10.9	8.98	18.7
1,2,3-trichlorobenzene	4.15	5.81	3.86	4.61	22.8
Total Trichlorobenzene	16.2	18.2	19.1	17.8	8.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.78	4.35	4.11	4.08	7.1
1,2,3,4-tetrachlorobenzene	<2.17	<2.17	<2.22	<2.19	1.3
Total Tetrachlorobenzene	<5.95	<6.52	<6.32	<6.27	4.6
Pentachlorobenzene	2.89	3.79	3.17	3.28	14.0
Hexachlorobenzene	<2.17	<2.17	<2.22	<2.19	1.3
Total Chlorobenzenes	<587	<459	<457	<501	14.8

* At 25°C and 1 atmosphere

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

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Monochlorobenzene	8.13	5.89	5.65	6.56	20.9
1,3-Dichlorobenzene	1.13	1.03	1.14	1.10	5.4
1,4-Dichlorobenzene	0.76	0.68	0.66	0.70	7.4
1,2-Dichlorobenzene	0.61	0.54	0.48	0.54	11.8
Total Dichlorobenzene	2.50	2.26	2.28	2.34	5.6
1,3,5-trichlorobenzene	0.081	0.078	0.080	0.080	2.3
1,2,4-trichlorobenzene	0.15	0.16	0.20	0.17	17.4
1,2,3-trichlorobenzene	0.079	0.11	0.072	0.087	23.6
Total Trichlorobenzene	0.31	0.35	0.35	0.34	7.5
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.072	0.083	0.076	0.077	7.1
1,2,3,4-tetrachlorobenzene	<0.041	<0.041	<0.041	<0.041	0.2
Total Tetrachlorobenzene	<0.11	<0.12	<0.12	<0.12	4.6
Pentachlorobenzene	0.055	0.072	0.059	0.062	14.4
Hexachlorobenzene	<0.041	<0.041	<0.041	<0.041	0.2
Total Chlorobenzenes	<11.1	<8.73	<8.51	<9.46	15.5

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

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	244	422	330	347	6.56
1,3-Dichlorobenzene	40.9	70.9	55.5	58.4	1.10
1,4-Dichlorobenzene	26.1	45.1	35.3	37.1	0.70
1,2-Dichlorobenzene	20.2	34.9	27.3	28.8	0.54
Total Dichlorobenzene	87.2	151	118	124	2.34
1,3,5-trichlorobenzene	2.97	5.14	4.02	4.23	0.080
1,2,4-trichlorobenzene	6.30	10.9	8.53	8.98	0.17
1,2,3-trichlorobenzene	3.23	5.60	4.37	4.61	0.087
Total Trichlorobenzene	12.5	21.6	16.9	17.8	0.34
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.86	4.96	3.87	4.08	0.077
1,2,3,4-tetrachlorobenzene	<1.53	<2.65	<2.08	<2.19	<0.041
Total Tetrachlorobenzene	<4.39	<7.61	<5.95	<6.27	<0.12
Pentachlorobenzene	2.30	3.99	3.12	3.28	0.062
Hexachlorobenzene	<1.53	<2.65	<2.08	<2.19	<0.041
Total Chlorobenzenes	<351	<608	<476	<501	<9.46

* 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	31.7	<10
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<51.7	<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	<132	<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	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
3-monochlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
4-monochlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Total Monochlorophenols	<150	<22.8	<39.4	<31.1	<32.6	<0.62
2,6-dichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,4 & 2,5-dichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
3,5-dichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,3-dichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
3,4-dichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Total Dichlorophenols	<250	<38.1	<65.7	<51.8	<54.3	<1.03
2,4,6-trichlorophenol	71.3	10.9	18.7	14.8	15.5	0.29
2,3,6-trichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,3,5-trichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,4,5-trichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,3,4-trichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
3,4,5-trichlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Total Trichlorophenols	<321	<48.9	<84.5	<66.6	<69.8	<1.33
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
2,3,4,5-tetrachlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Total Tetrachlorophenols	<100	<15.2	<26.3	<20.7	<21.7	<0.41
Pentachlorophenol	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Total Chlorophenols	<871	<133	<229	<181	<189	<3.60

Dry Gas Volume Sampled (Rm^3*) :	3.804
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
3-monochlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
4-monochlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Total Monochlorophenols	<150	<22.8	<39.6	<30.6	<32.5	<0.62
2,6-dichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,4 & 2,5-dichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
3,5-dichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,3-dichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
3,4-dichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Total Dichlorophenols	<250	<38.0	<66.0	<50.9	<54.2	<1.03
2,4,6-trichlorophenol	64.5	9.80	17.0	13.1	14.0	0.27
2,3,6-trichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,3,5-trichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,4,5-trichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,3,4-trichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
3,4,5-trichlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Total Trichlorophenols	<315	<47.8	<83.0	<64.1	<68.1	<1.29
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
2,3,4,5-tetrachlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Total Tetrachlorophenols	<100	<15.2	<26.4	<20.4	<21.7	<0.41
Pentachlorophenol	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Total Chlorophenols	<865	<131	<228	<176	<187	<3.56

Dry Gas Volume Sampled (Rm^3*) :	3.790
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
3-monochlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
4-monochlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Total Monochlorophenols	<150	<23.4	<40.5	<31.7	<33.3	<0.62
2,6-dichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,4 & 2,5-dichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
3,5-dichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,3-dichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
3,4-dichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Total Dichlorophenols	<250	<38.9	<67.4	<52.9	<55.5	<1.03
2,4,6-trichlorophenol	64.6	10.1	17.4	13.7	14.3	0.27
2,3,6-trichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,3,5-trichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,4,5-trichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,3,4-trichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
3,4,5-trichlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Total Trichlorophenols	<315	<49.0	<84.9	<66.6	<69.8	<1.30
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
2,3,4,5-tetrachlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Total Tetrachlorophenols	<100	<15.6	<27.0	<21.2	<22.2	<0.41
Pentachlorophenol	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Total Chlorophenols	<865	<135	<233	<183	<192	<3.57

Dry Gas Volume Sampled (Rm^3*) :	3.707
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 64
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
3-monochlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
4-monochlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
Total Monochlorophenols	<22.8	<22.8	<23.4	<23.0	1.4
2,6-dichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,4 & 2,5-dichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
3,5-dichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,3-dichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
3,4-dichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
Total Dichlorophenols	<38.1	<38.0	<38.9	<38.3	1.4
2,4,6-trichlorophenol	10.9	9.80	10.1	10.2	5.4
2,3,6-trichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,3,5-trichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,4,5-trichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,3,4-trichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
3,4,5-trichlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
Total Trichlorophenols	<48.9	<47.8	<49.0	<48.6	1.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
2,3,4,5-tetrachlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
Total Tetrachlorophenols	<15.2	<15.2	<15.6	<15.3	1.4
Pentachlorophenol	<7.61	<7.59	<7.79	<7.67	1.4
Total Chlorophenols	<133	<131	<135	<133	1.3

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	<13.1	<13.2	<13.5	<13.3	1.4
3-monochlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
4-monochlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
Total Monochlorophenols	<39.4	<39.6	<40.5	<39.8	1.4
2,6-dichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,4 & 2,5-dichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
3,5-dichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,3-dichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
3,4-dichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
Total Dichlorophenols	<65.7	<66.0	<67.4	<66.4	1.4
2,4,6-trichlorophenol	18.7	17.0	17.4	17.7	5.1
2,3,6-trichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,3,5-trichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,4,5-trichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,3,4-trichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
3,4,5-trichlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
Total Trichlorophenols	<84.5	<83.0	<84.9	<84.1	1.2
2,3,5,6/2,3,4,6-tetrachlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
2,3,4,5-tetrachlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
Total Tetrachlorophenols	<26.3	<26.4	<27.0	<26.5	1.4
Pentachlorophenol	<13.1	<13.2	<13.5	<13.3	1.4
Total Chlorophenols	<229	<228	<233	<230	1.2

* At 25°C and 1 atmosphere

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

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
3-monochlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
4-monochlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
Total Monochlorophenols	<31.1	<30.6	<31.7	<31.1	1.9
2,6-dichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,4 & 2,5-dichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
3,5-dichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,3-dichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
3,4-dichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
Total Dichlorophenols	<51.8	<50.9	<52.9	<51.9	1.9
2,4,6-trichlorophenol	14.8	13.1	13.7	13.9	6.1
2,3,6-trichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,3,5-trichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,4,5-trichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,3,4-trichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
3,4,5-trichlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
Total Trichlorophenols	<66.6	<64.1	<66.6	<65.8	2.2
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
2,3,4,5-tetrachlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
Total Tetrachlorophenols	<20.7	<20.4	<21.2	<20.8	1.9
Pentachlorophenol	<10.4	<10.2	<10.6	<10.4	1.9
Total Chlorophenols	<181	<176	<183	<180	1.9

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

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

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
3-monochlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
4-monochlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
Total Monochlorophenols	<32.6	<32.5	<33.3	<32.8	1.3
2,6-dichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,4 & 2,5-dichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
3,5-dichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,3-dichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
3,4-dichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
Total Dichlorophenols	<54.3	<54.2	<55.5	<54.6	1.3
2,4,6-trichlorophenol	15.5	14.0	14.3	14.6	5.4
2,3,6-trichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,3,5-trichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,4,5-trichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,3,4-trichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
3,4,5-trichlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
Total Trichlorophenols	<69.8	<68.1	<69.8	<69.2	1.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
2,3,4,5-tetrachlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
Total Tetrachlorophenols	<21.7	<21.7	<22.2	<21.9	1.3
Pentachlorophenol	<10.9	<10.8	<11.1	<10.9	1.3
Total Chlorophenols	<189	<187	<192	<189	1.2

* 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	<0.21	<0.21	<0.21	<0.21	0.2
3-monochlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
4-monochlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
Total Monochlorophenols	<0.62	<0.62	<0.62	<0.62	0.2
2,6-dichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,4 & 2,5-dichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
3,5-dichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,3-dichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
3,4-dichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
Total Dichlorophenols	<1.03	<1.03	<1.03	<1.03	0.2
2,4,6-trichlorophenol	0.29	0.27	0.27	0.28	5.9
2,3,6-trichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,3,5-trichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,4,5-trichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,3,4-trichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
3,4,5-trichlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
Total Trichlorophenols	<1.33	<1.29	<1.30	<1.31	1.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
2,3,4,5-tetrachlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
Total Tetrachlorophenols	<0.41	<0.41	<0.41	<0.41	0.2
Pentachlorophenol	<0.21	<0.21	<0.21	<0.21	0.2
Total Chlorophenols	<3.60	<3.56	<3.57	<3.57	0.5

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	<7.67	<13.3	<10.4	<10.9	<0.21
3-monochlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
4-monochlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
Total Monochlorophenols	<23.0	<39.8	<31.1	<32.8	<0.62
2,6-dichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,4 & 2,5-dichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
3,5-dichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,3-dichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
3,4-dichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
Total Dichlorophenols	<38.3	<66.4	<51.9	<54.6	<1.03
2,4,6-trichlorophenol	10.2	17.7	13.9	14.6	0.28
2,3,6-trichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,3,5-trichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,4,5-trichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,3,4-trichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
3,4,5-trichlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
Total Trichlorophenols	<48.6	<84.1	<65.8	<69.2	<1.31
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
2,3,4,5-tetrachlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
Total Tetrachlorophenols	<15.3	<26.5	<20.8	<21.9	<0.41
Pentachlorophenol	<7.67	<13.3	<10.4	<10.9	<0.21
Total Chlorophenols	<133	<230	<180	<189	<3.57

* 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	<50	<50
3-monochlorophenol	<50	<50
4-monochlorophenol	<50	<50
Total Monochlorophenols	<150	<150
2,6-dichlorophenol	<50	<50
2,4 & 2,5-dichlorophenol	<50	<50
3,5-dichlorophenol	<50	<50
2,3-dichlorophenol	<50	<50
3,4-dichlorophenol	<50	<50
Total Dichlorophenols	<250	<250
2,4,6-trichlorophenol	<50	<50
2,3,6-trichlorophenol	<50	<50
2,3,5-trichlorophenol	<50	<50
2,4,5-trichlorophenol	<50	<50
2,3,4-trichlorophenol	<50	<50
3,4,5-trichlorophenol	<50	<50
Total Trichlorophenols	<300	<300
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<50
2,3,4,5-tetrachlorophenol	<50	<50
Total Tetrachlorophenols	<100	<100
Pentachlorophenol	<50	<50
Total Chlorophenols	<850	<850

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

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

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	21.4	3.26	5.63	4.44	4.65	0.088
Acenaphthylene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Anthracene	13.2	2.01	3.47	2.74	2.87	0.054
Benzo(a)Anthracene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Benzo(b)Fluoranthene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Benzo(j/k)Fluoranthene	10.7	1.63	2.81	2.22	2.32	0.044
Benzo(a)fluorene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Benzo(b)fluorene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Benzo(g,h,i)Perylene	55.6	8.47	14.6	11.5	12.1	0.23
Benzo(a)Pyrene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Benzo(e)Pyrene	22.3	3.40	5.86	4.62	4.84	0.092
Biphenyl	48.2	7.34	12.7	10.0	10.5	0.20
2-Chloronaphthalene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Chrysene/Triphenylene/Benzo(b)Anthracene	16.9	2.57	4.44	3.51	3.67	0.070
Coronene	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Dibenzo(a,c/a,h)Anthracene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Dibenzo(a,e)pyrene	<50	<7.61	<13.1	<10.4	<10.9	<0.21
9,10-dimethylanthracene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
7,12-Dimethylbenzo(a)anthracene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Fluoranthene	55.0	8.38	14.5	11.4	11.9	0.23
Fluorene	51.7	7.87	13.6	10.7	11.2	0.21
Indeno(1,2,3-cd)Pyrene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
2-methylanthracene	31.2	4.75	8.20	6.47	6.78	0.13
3-Methylcholanthrene	<50	<7.61	<13.1	<10.4	<10.9	<0.21
1-Methylnaphthalene	18.4	2.80	4.84	3.82	4.00	0.076
2-Methylnaphthalene	29.3	4.46	7.70	6.08	6.36	0.12
1-Methylphenanthrene	19.8	3.02	5.21	4.11	4.30	0.082
9-Methylphenanthrene	15.8	2.41	4.15	3.28	3.43	0.065
Naphthalene	111	16.9	29.2	23.0	24.1	0.46
Perylene	<10	<1.52	<2.63	<2.07	<2.17	<0.041
Phenanthrene	219	33.4	57.6	45.4	47.6	0.90
Picene	<50	<7.61	<13.1	<10.4	<10.9	<0.21
Pyrene	43.4	6.61	11.4	9.00	9.43	0.18
Tetralin	210	32.0	55.2	43.6	45.6	0.87
m-terphenyl	55.2	8.41	14.5	11.4	12.0	0.23
o-Terphenyl	<10	<1.52	<2.63	<2.07	<2.17	<0.041
p-terphenyl	11.9	1.81	3.13	2.47	2.58	0.049
Total	<1390	<212	<365	<288	<302	<5.74

Dry Gas Volume Sampled (Rm^3*) :	3.804
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	11.4	1.73	3.01	2.32	2.47	0.047
Acenaphthylene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Anthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(a)Anthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(b)Fluoranthene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(j/k)Fluoranthene	60.5	9.19	16.0	12.3	13.1	0.25
Benzo(a)fluorene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(b)fluorene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(g,h,i)Perylene	39.3	5.97	10.4	8.01	8.51	0.16
Benzo(a)Pyrene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Benzo(e)Pyrene	20.3	3.08	5.36	4.14	4.40	0.084
Biphenyl	149	22.6	39.3	30.4	32.3	0.61
2-Chloronaphthalene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Chrysene/Triphenylene/Benzo(b)Anthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Coronene	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Dibenzo(a,c/a,h)Anthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Dibenzo(a,e)pyrene	<50	<7.59	<13.2	<10.2	<10.8	<0.21
9,10-dimethylanthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
7,12-Dimethylbenzo(a)anthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Fluoranthene	29.0	4.40	7.65	5.91	6.28	0.12
Fluorene	19.4	2.95	5.12	3.95	4.20	0.080
Indeno(1,2,3-cd)Pyrene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
2-methylanthracene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
3-Methylcholanthrene	<50	<7.59	<13.2	<10.2	<10.8	<0.21
1-Methylnaphthalene	26.0	3.95	6.86	5.30	5.63	0.11
2-Methylnaphthalene	41.9	6.36	11.1	8.54	9.08	0.17
1-Methylphenanthrene	35.2	5.35	9.29	7.17	7.63	0.14
9-Methylphenanthrene	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Naphthalene	388	58.9	102	79.1	84.1	1.60
Perylene	62.6	9.51	16.5	12.8	13.6	0.26
Phenanthrene	65.6	9.96	17.3	13.4	14.2	0.27
Picene	<50	<7.59	<13.2	<10.2	<10.8	<0.21
Pyrene	47.1	7.15	12.4	9.60	10.2	0.19
Tetralin	176	26.7	46.4	35.9	38.1	0.72
m-terphenyl	<10	<1.52	<2.64	<2.04	<2.17	<0.041
o-Terphenyl	<10	<1.52	<2.64	<2.04	<2.17	<0.041
p-terphenyl	<10	<1.52	<2.64	<2.04	<2.17	<0.041
Total	<1551	<236	<409	<316	<336	<6.39

Dry Gas Volume Sampled (Rm^3*) :	3.790
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

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

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	10.6	1.65	2.86	2.24	2.35	0.044
Acenaphthylene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Anthracene	11.0	1.71	2.97	2.33	2.44	0.045
Benzo(a)Anthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Benzo(b)Fluoranthene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Benzo(j/k)Fluoranthene	38.5	6.00	10.4	8.15	8.54	0.16
Benzo(a)fluorene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Benzo(b)fluorene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Benzo(g,h,i)Perylene	87.0	13.6	23.5	18.4	19.3	0.36
Benzo(a)Pyrene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Benzo(e)Pyrene	14.2	2.21	3.83	3.01	3.15	0.059
Biphenyl	23.0	3.58	6.20	4.87	5.10	0.095
2-Chloronaphthalene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Chrysene/Triphenylene/Benzo(b)Anthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Coronene	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Dibenzo(a,c/a,h)Anthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Dibenzo(a,e)pyrene	<50	<7.79	<13.5	<10.6	<11.1	<0.21
9,10-dimethylanthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
7,12-Dimethylbenzo(a)anthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
Fluoranthene	21.2	3.30	5.72	4.49	4.70	0.087
Fluorene	27.4	4.27	7.39	5.80	6.08	0.11
Indeno(1,2,3-cd)Pyrene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
2-methylanthracene	<10	<1.56	<2.70	<2.12	<2.22	<0.041
3-Methylcholanthrene	<50	<7.79	<13.5	<10.6	<11.1	<0.21
1-Methylnaphthalene	23.2	3.61	6.26	4.91	5.15	0.096
2-Methylnaphthalene	27.6	4.30	7.45	5.84	6.12	0.11
1-Methylphenanthrene	31.1	4.84	8.39	6.58	6.90	0.13
9-Methylphenanthrene	25.8	4.02	6.96	5.46	5.73	0.11
Naphthalene	116	18.1	31.3	24.6	25.7	0.48
Perylene	34.6	5.39	9.33	7.32	7.68	0.14
Phenanthrene	66.3	10.3	17.9	14.0	14.7	0.27
Picene	<50	<7.79	<13.5	<10.6	<11.1	<0.21
Pyrene	38.5	6.00	10.4	8.15	8.54	0.16
Tetralin	107	16.7	28.9	22.6	23.7	0.44
m-terphenyl	<10	<1.56	<2.70	<2.12	<2.22	<0.041
o-Terphenyl	<10	<1.56	<2.70	<2.12	<2.22	<0.041
p-terphenyl	13.6	2.12	3.67	2.88	3.02	0.056
Total	<1067	<166	<288	<226	<237	<4.40

Dry Gas Volume Sampled (Rm^3*) :	3.707
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 74
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	3.26	1.73	1.65	2.21	40.9
Acenaphthylene	<1.52	<1.52	<1.56	<1.53	1.4
Anthracene	2.01	<1.52	1.71	<1.75	14.2
Benzo(a)Anthracene	<1.52	<1.52	<1.56	<1.53	1.4
Benzo(b)Fluoranthene	<1.52	<1.52	<1.56	<1.53	1.4
Benzo(j/k)Fluoranthene	1.63	9.19	6.00	5.60	67.7
Benzo(a)fluorene	<1.52	<1.52	<1.56	<1.53	1.4
Benzo(b)fluorene	<1.52	<1.52	<1.56	<1.53	1.4
Benzo(g,h,i)Perylene	8.47	5.97	13.6	9.33	41.4
Benzo(a)Pyrene	<1.52	<1.52	<1.56	<1.53	1.4
Benzo(e)Pyrene	3.40	3.08	2.21	2.90	21.2
Biphenyl	7.34	22.6	3.58	11.2	90.2
2-Chloronaphthalene	<1.52	<1.52	<1.56	<1.53	1.4
Chrysene/Triphenylene/Benzo(b)Anthracene	2.57	<1.52	<1.56	<1.88	31.8
Coronene	<7.61	<7.59	<7.79	<7.67	1.4
Dibenzo(a,c/a,h)Anthracene	<1.52	<1.52	<1.56	<1.53	1.4
Dibenzo(a,e)pyrene	<7.61	<7.59	<7.79	<7.67	1.4
9,10-dimethylanthracene	<1.52	<1.52	<1.56	<1.53	1.4
7,12-Dimethylbenzo(a)anthracene	<1.52	<1.52	<1.56	<1.53	1.4
Fluoranthene	8.38	4.40	3.30	5.36	49.8
Fluorene	7.87	2.95	4.27	5.03	50.7
Indeno(1,2,3-cd)Pyrene	<1.52	<1.52	<1.56	<1.53	1.4
2-methylanthracene	4.75	<1.52	<1.56	<2.61	71.1
3-Methylcholanthrene	<7.61	<7.59	<7.79	<7.67	1.4
1-Methylnaphthalene	2.80	3.95	3.61	3.45	17.1
2-Methylnaphthalene	4.46	6.36	4.30	5.04	22.8
1-Methylphenanthrene	3.02	5.35	4.84	4.40	27.9
9-Methylphenanthrene	2.41	<1.52	4.02	<2.65	47.9
Naphthalene	16.9	58.9	18.1	31.3	76.5
Perylene	<1.52	9.51	5.39	<5.47	73.0
Phenanthrene	33.4	9.96	10.3	17.9	74.9
Picene	<7.61	<7.59	<7.79	<7.67	1.4
Pyrene	6.61	7.15	6.00	6.59	8.8
Tetralin	32.0	26.7	16.7	25.1	31.0
m-terphenyl	8.41	<1.52	<1.56	<3.83	104
o-Terphenyl	<1.52	<1.52	<1.56	<1.53	1.4
p-terphenyl	1.81	<1.52	2.12	<1.82	16.5
Total	<212	<236	<166	<204	17.3

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

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	5.63	3.01	2.86	3.83	40.6
Acenaphthylene	<2.63	<2.64	<2.70	<2.65	1.4
Anthracene	3.47	<2.64	2.97	<3.03	13.8
Benzo(a)Anthracene	<2.63	<2.64	<2.70	<2.65	1.4
Benzo(b)Fluoranthene	<2.63	<2.64	<2.70	<2.65	1.4
Benzo(j/k)Fluoranthene	2.81	16.0	10.4	9.72	67.9
Benzo(a)fluorene	<2.63	<2.64	<2.70	<2.65	1.4
Benzo(b)fluorene	<2.63	<2.64	<2.70	<2.65	1.4
Benzo(g,h,i)Perylene	14.6	10.4	23.5	16.2	41.4
Benzo(a)Pyrene	<2.63	<2.64	<2.70	<2.65	1.4
Benzo(e)Pyrene	5.86	5.36	3.83	5.02	21.1
Biphenyl	12.7	39.3	6.20	19.4	90.5
2-Chloronaphthalene	<2.63	<2.64	<2.70	<2.65	1.4
Chrysene/Triphenylene/Benzo(b)Anthracene	4.44	<2.64	<2.70	<3.26	31.4
Coronene	<13.1	<13.2	<13.5	<13.3	1.4
Dibenzo(a,c/a,h)Anthracene	<2.63	<2.64	<2.70	<2.65	1.4
Dibenzo(a,e)pyrene	<13.1	<13.2	<13.5	<13.3	1.4
9,10-dimethylanthracene	<2.63	<2.64	<2.70	<2.65	1.4
7,12-Dimethylbenzo(a)anthracene	<2.63	<2.64	<2.70	<2.65	1.4
Fluoranthene	14.5	7.65	5.72	9.28	49.5
Fluorene	13.6	5.12	7.39	8.70	50.4
Indeno(1,2,3-cd)Pyrene	<2.63	<2.64	<2.70	<2.65	1.4
2-methylanthracene	8.20	<2.64	<2.70	<4.51	70.8
3-Methylcholanthrene	<13.1	<13.2	<13.5	<13.3	1.4
1-Methylnaphthalene	4.84	6.86	6.26	5.99	17.4
2-Methylnaphthalene	7.70	11.1	7.45	8.73	23.1
1-Methylphenanthrene	5.21	9.29	8.39	7.63	28.1
9-Methylphenanthrene	4.15	<2.64	6.96	<4.58	47.8
Naphthalene	29.2	102	31.3	54.3	76.8
Perylene	<2.63	16.5	9.33	<9.49	73.2
Phenanthrene	57.6	17.3	17.9	30.9	74.6
Picene	<13.1	<13.2	<13.5	<13.3	1.4
Pyrene	11.4	12.4	10.4	11.4	8.9
Tetralin	55.2	46.4	28.9	43.5	30.8
m-terphenyl	14.5	<2.64	<2.70	<6.62	103
o-Terphenyl	<2.63	<2.64	<2.70	<2.65	1.4
p-terphenyl	3.13	<2.64	3.67	<3.15	16.4
Total	<365	<409	<288	<354	17.4

* At 25°C and 1 atmosphere

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

Compound	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	4.44	2.32	2.24	3.00	41.5
Acenaphthylene	<2.07	<2.04	<2.12	<2.08	1.9
Anthracene	2.74	<2.04	2.33	<2.37	14.9
Benzo(a)Anthracene	<2.07	<2.04	<2.12	<2.08	1.9
Benzo(b)Fluoranthene	<2.07	<2.04	<2.12	<2.08	1.9
Benzo(j/k)Fluoranthene	2.22	12.3	8.15	7.57	67.1
Benzo(a)fluorene	<2.07	<2.04	<2.12	<2.08	1.9
Benzo(b)fluorene	<2.07	<2.04	<2.12	<2.08	1.9
Benzo(g,h,i)Perylene	11.5	8.01	18.4	12.7	41.8
Benzo(a)Pyrene	<2.07	<2.04	<2.12	<2.08	1.9
Benzo(e)Pyrene	4.62	4.14	3.01	3.92	21.2
Biphenyl	10.0	30.4	4.87	15.1	89.4
2-Chloronaphthalene	<2.07	<2.04	<2.12	<2.08	1.9
Chrysene/Triphenylene/Benzo(b)Anthracene	3.51	<2.04	<2.12	<2.55	32.3
Coronene	<10.4	<10.2	<10.6	<10.4	1.9
Dibenzo(a,c/a,h)Anthracene	<2.07	<2.04	<2.12	<2.08	1.9
Dibenzo(a,e)pyrene	<10.4	<10.2	<10.6	<10.4	1.9
9,10-dimethylanthracene	<2.07	<2.04	<2.12	<2.08	1.9
7,12-Dimethylbenzo(a)anthracene	<2.07	<2.04	<2.12	<2.08	1.9
Fluoranthene	11.4	5.91	4.49	7.27	50.3
Fluorene	10.7	3.95	5.80	6.83	51.3
Indeno(1,2,3-cd)Pyrene	<2.07	<2.04	<2.12	<2.08	1.9
2-methylanthracene	6.47	<2.04	<2.12	<3.54	71.6
3-Methylcholanthrene	<10.4	<10.2	<10.6	<10.4	1.9
1-Methylnaphthalene	3.82	5.30	4.91	4.67	16.4
2-Methylnaphthalene	6.08	8.54	5.84	6.82	21.9
1-Methylphenanthrene	4.11	7.17	6.58	5.95	27.3
9-Methylphenanthrene	3.28	<2.04	5.46	<3.59	48.3
Naphthalene	23.0	79.1	24.6	42.2	75.6
Perylene	<2.07	12.8	7.32	<7.38	72.3
Phenanthrene	45.4	13.4	14.0	24.3	75.5
Picene	<10.4	<10.2	<10.6	<10.4	1.9
Pyrene	9.00	9.60	8.15	8.92	8.2
Tetralin	43.6	35.9	22.6	34.0	31.1
m-terphenyl	11.4	<2.04	<2.12	<5.20	104
o-Terphenyl	<2.07	<2.04	<2.12	<2.08	1.9
p-terphenyl	2.47	<2.04	2.88	<2.46	17.1
Total	<288	<316	<226	<277	16.7

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

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

Compound	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	4.65	2.47	2.35	3.16	41.0
Acenaphthylene	<2.17	<2.17	<2.22	<2.19	1.3
Anthracene	2.87	<2.17	2.44	<2.49	14.2
Benzo(a)Anthracene	<2.17	<2.17	<2.22	<2.19	1.3
Benzo(b)Fluoranthene	<2.17	<2.17	<2.22	<2.19	1.3
Benzo(j/k)Fluoranthene	2.32	13.1	8.54	7.99	67.7
Benzo(a)fluorene	<2.17	<2.17	<2.22	<2.19	1.3
Benzo(b)fluorene	<2.17	<2.17	<2.22	<2.19	1.3
Benzo(g,h,i)Perylene	12.1	8.51	19.3	13.3	41.3
Benzo(a)Pyrene	<2.17	<2.17	<2.22	<2.19	1.3
Benzo(e)Pyrene	4.84	4.40	3.15	4.13	21.2
Biphenyl	10.5	32.3	5.10	16.0	90.2
2-Chloronaphthalene	<2.17	<2.17	<2.22	<2.19	1.3
Chrysene/Triphenylene/Benzo(b)Anthracene	3.67	<2.17	<2.22	<2.69	31.8
Coronene	<10.9	<10.8	<11.1	<10.9	1.3
Dibenzo(a,c/a,h)Anthracene	<2.17	<2.17	<2.22	<2.19	1.3
Dibenzo(a,e)pyrene	<10.9	<10.8	<11.1	<10.9	1.3
9,10-dimethylanthracene	<2.17	<2.17	<2.22	<2.19	1.3
7,12-Dimethylbenzo(a)anthracene	<2.17	<2.17	<2.22	<2.19	1.3
Fluoranthene	11.9	6.28	4.70	7.64	49.8
Fluorene	11.2	4.20	6.08	7.17	50.7
Indeno(1,2,3-cd)Pyrene	<2.17	<2.17	<2.22	<2.19	1.3
2-methylanthracene	6.78	<2.17	<2.22	<3.72	71.1
3-Methylcholanthrene	<10.9	<10.8	<11.1	<10.9	1.3
1-Methylnaphthalene	4.00	5.63	5.15	4.93	17.1
2-Methylnaphthalene	6.36	9.08	6.12	7.19	22.8
1-Methylphenanthrene	4.30	7.63	6.90	6.28	27.9
9-Methylphenanthrene	3.43	<2.17	5.73	<3.77	47.8
Naphthalene	24.1	84.1	25.7	44.6	76.5
Perylene	<2.17	13.6	7.68	<7.80	73.0
Phenanthrene	47.6	14.2	14.7	25.5	75.0
Picene	<10.9	<10.8	<11.1	<10.9	1.3
Pyrene	9.43	10.2	8.54	9.39	8.8
Tetralin	45.6	38.1	23.7	35.8	31.0
m-terphenyl	12.0	<2.17	<2.22	<5.46	104
o-Terphenyl	<2.17	<2.17	<2.22	<2.19	1.3
p-terphenyl	2.58	<2.17	3.02	<2.59	16.4
Total	<302	<336	<237	<292	17.3

* At 25°C and 1 atmosphere

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

Compound	Emission Rate				Coefficient
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	of Variation %
Acenaphthene	0.088	0.047	0.044	0.060	41.7
Acenaphthylene	<0.041	<0.041	<0.041	<0.041	0.2
Anthracene	0.054	<0.041	0.045	<0.047	14.5
Benzo(a)Anthracene	<0.041	<0.041	<0.041	<0.041	0.2
Benzo(b)Fluoranthene	<0.041	<0.041	<0.041	<0.041	0.2
Benzo(j/k)Fluoranthene	0.044	0.25	0.16	0.15	68.1
Benzo(a)fluorene	<0.041	<0.041	<0.041	<0.041	0.2
Benzo(b)fluorene	<0.041	<0.041	<0.041	<0.041	0.2
Benzo(g,h,i)Perylene	0.23	0.16	0.36	0.25	40.1
Benzo(a)Pyrene	<0.041	<0.041	<0.041	<0.041	0.2
Benzo(e)Pyrene	0.092	0.084	0.059	0.078	22.3
Biphenyl	0.20	0.61	0.095	0.30	90.7
2-Chloronaphthalene	<0.041	<0.041	<0.041	<0.041	0.2
Chrysene/Triphenylene/Benzo(b)Anthracene	0.070	<0.041	<0.041	<0.051	32.5
Coronene	<0.21	<0.21	<0.21	<0.21	0.2
Dibenzo(a,c/a,h)Anthracene	<0.041	<0.041	<0.041	<0.041	0.2
Dibenzo(a,e)pyrene	<0.21	<0.21	<0.21	<0.21	0.2
9,10-dimethylanthracene	<0.041	<0.041	<0.041	<0.041	0.2
7,12-Dimethylbenzo(a)anthracene	<0.041	<0.041	<0.041	<0.041	0.2
Fluoranthene	0.23	0.12	0.087	0.14	50.5
Fluorene	0.21	0.080	0.11	0.14	51.3
Indeno(1,2,3-cd)Pyrene	<0.041	<0.041	<0.041	<0.041	0.2
2-methylanthracene	0.13	<0.041	<0.041	<0.070	71.8
3-Methylcholanthrene	<0.21	<0.21	<0.21	<0.21	0.2
1-Methylnaphthalene	0.076	0.11	0.096	0.093	16.9
2-Methylnaphthalene	0.12	0.17	0.11	0.14	23.5
1-Methylphenanthrene	0.082	0.14	0.13	0.12	27.7
9-Methylphenanthrene	0.065	<0.041	0.11	<0.071	46.6
Naphthalene	0.46	1.60	0.48	0.84	77.2
Perylene	<0.041	0.26	0.14	<0.15	73.5
Phenanthrene	0.90	0.27	0.27	0.48	75.6
Picene	<0.21	<0.21	<0.21	<0.21	0.2
Pyrene	0.18	0.19	0.16	0.18	9.9
Tetralin	0.87	0.72	0.44	0.68	31.9
m-terphenyl	0.23	<0.041	<0.041	<0.10	104
o-Terphenyl	<0.041	<0.041	<0.041	<0.041	0.2
p-terphenyl	0.049	<0.041	0.056	<0.049	15.3
Total	<5.74	<6.39	<4.40	<5.51	18.4

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

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	2.21	3.83	3.00	3.16	0.060
Acenaphthylene	<1.53	<2.65	<2.08	<2.19	<0.041
Anthracene	<1.75	<3.03	<2.37	<2.49	<0.047
Benzo(a)Anthracene	<1.53	<2.65	<2.08	<2.19	<0.041
Benzo(b)Fluoranthene	<1.53	<2.65	<2.08	<2.19	<0.041
Benzo(j/k)Fluoranthene	5.60	9.72	7.57	7.99	0.15
Benzo(a)fluorene	<1.53	<2.65	<2.08	<2.19	<0.041
Benzo(b)fluorene	<1.53	<2.65	<2.08	<2.19	<0.041
Benzo(g,h,i)Perylene	9.33	16.2	12.7	13.3	0.25
Benzo(a)Pyrene	<1.53	<2.65	<2.08	<2.19	<0.041
Benzo(e)Pyrene	2.90	5.02	3.92	4.13	0.078
Biphenyl	11.2	19.4	15.1	16.0	0.30
2-Chloronaphthalene	<1.53	<2.65	<2.08	<2.19	<0.041
Chrysene/Triphenylene/Benzo(b)Anthracene	<1.88	<3.26	<2.55	<2.69	<0.051
Coronene	<7.67	<13.3	<10.4	<10.9	<0.21
Dibenzo(a,c/a,h)Anthracene	<1.53	<2.65	<2.08	<2.19	<0.041
Dibenzo(a,e)pyrene	<7.67	<13.3	<10.4	<10.9	<0.21
9,10-dimethylanthracene	<1.53	<2.65	<2.08	<2.19	<0.041
7,12-Dimethylbenzo(a)anthracene	<1.53	<2.65	<2.08	<2.19	<0.041
Fluoranthene	5.36	9.28	7.27	7.64	0.14
Fluorene	5.03	8.70	6.83	7.17	0.14
Indeno(1,2,3-cd)Pyrene	<1.53	<2.65	<2.08	<2.19	<0.041
2-methylanthracene	<2.61	<4.51	<3.54	<3.72	<0.070
3-Methylcholanthrene	<7.67	<13.3	<10.4	<10.9	<0.21
1-Methylnaphthalene	3.45	5.99	4.67	4.93	0.093
2-Methylnaphthalene	5.04	8.73	6.82	7.19	0.14
1-Methylphenanthrene	4.40	7.63	5.95	6.28	0.12
9-Methylphenanthrene	<2.65	<4.58	<3.59	<3.77	<0.071
Naphthalene	31.3	54.3	42.2	44.6	0.84
Perylene	<5.47	<9.49	<7.38	<7.80	<0.15
Phenanthrene	17.9	30.9	24.3	25.5	0.48
Picene	<7.67	<13.3	<10.4	<10.9	<0.21
Pyrene	6.59	11.4	8.92	9.39	0.18
Tetralin	25.1	43.5	34.0	35.8	0.68
m-terphenyl	<3.83	<6.62	<5.20	<5.46	<0.10
o-Terphenyl	<1.53	<2.65	<2.08	<2.19	<0.041
p-terphenyl	<1.82	<3.15	<2.46	<2.59	<0.049
Total	<204	<354	<277	<292	<5.51

* 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	14.8	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	<10	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(j/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	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene/Benzo(b)Anthracene	11.2	<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	30.0	20.4
Fluorene	<10	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	<10	<10
2-Methylnaphthalene	<10	<10
1-Methylphenanthrene	<10	<10
9-Methylphenanthrene	<10	<10
Naphthalene	42.6	<10
Perylene	<10	<10
Phenanthrene	37.2	13.4
Picene	<50	<50
Pyrene	35.2	20.2
Tetralin	73.4	<10
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<704	<554

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

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

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acetaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acetaldehyde Emission Rate mg/s
1	<1.0	0.0317	<18.3	<31.5	<24.9	<26.0	<0.50
2	<1.0	0.0326	<17.6	<30.7	<23.7	<25.1	<0.48
3	<1.0	0.0336	<17.2	<29.8	<23.3	<24.5	<0.45
Average			<17.7	<30.6	<24.0	<25.2	<0.48
Blank	<1.0						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Formaldehyde Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Formaldehyde Emission Rate mg/s
1	<4.0	0.0317	<73.2	<126	<99.8	<104	<1.98
2	<4.0	0.0326	<70.6	<123	<94.7	<100	<1.91
3	<4.0	0.0336	<68.7	<119	<93.2	<97.9	<1.82
Average			<70.8	<123	<95.9	<101	<1.90
Blank	<4.0						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acrolein Concentration Actual $\mu g/m^3$	Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acrolein Emission Rate mg/s
1	<8.0	0.0317	<146	<252	<200	<208	<3.96
2	<8.0	0.0326	<141	<245	<189	<201	<3.82
3	<8.0	0.0336	<137	<238	<186	<196	<3.64
Average			<142	<245	<192	<202	<3.81
Blank	<8.0						

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 the corresponding isokinetic SVOC tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

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

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

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 1A/1B	Run No. 2 Tube 2A/2B	Run No. 3 Tube 3A/3B			
	µg	µg	µg	µg	%	µg
Acetone	0.19	0.16	0.25	0.20	21.5	0.60
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
Bromodichloromethane	0.014	0.015	0.015	0.015	3.9	0.044
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	0.041	0.041	0.076	0.053	38.4	0.16
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.038	0.049	0.038	0.042	15.2	0.13
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	0.029	0.020	<0.023	22.6	<0.069
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.023	0.037	0.041	0.034	28.1	0.10
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.09	0.41	1.29	0.93	49.5	2.79
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.022	0.022	0.014	0.019	23.9	0.058
Toluene	0.26	<0.05	<0.05	<0.12	101	<0.36
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	0.026	<0.02	<0.02	<0.022	15.7	<0.066
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.13	<1.25	<2.22	<1.87	28.9	<5.60

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0203
Run No. 2	0.0199
Run No. 3	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 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	0.32	0.41	0.22	0.32	31.4	0.95
Benzene	0.053	<0.05	<0.05	<0.051	3.4	<0.15
Bromodichloromethane	0.014	0.012	0.012	0.013	9.1	0.038
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	0.092	0.071	0.068	0.077	17.0	0.23
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.037	0.030	0.035	0.034	10.6	0.10
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	0.040	0.030	0.034	0.035	14.5	0.10
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.94	1.76	0.62	1.44	49.8	4.31
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.012	0.010	0.012	0.011	10.2	0.034
Toluene	0.051	0.19	<0.05	<0.096	82.1	<0.29
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	<2.95	<2.96	<1.49	<2.47	34.2	<7.41

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0183
Run No. 2	0.0199
Run No. 3	0.0191

* 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 10A/10B	Run No. 2 Tube 11A/11B	Run No. 3 Tube 12A/12B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.21	0.25	0.42	0.29	38.5	0.87
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
Bromodichloromethane	0.013	0.011	0.022	0.015	38.2	0.046
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	0.14	0.11	0.32	0.19	61.0	0.57
Carbon Tetrachloride	<0.01	<0.01	0.012	<0.011	10.8	<0.032
Chloroform	<0.01	0.034	0.046	<0.030	61.1	<0.090
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	0.051	<0.030	59.0	<0.091
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.026	0.024	0.025	0.025	4.0	0.075
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.88	1.85	1.66	1.80	6.6	5.40
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	0.18	0.30	0.062	0.18	66.1	0.55
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	<2.92	<3.04	<3.05	<3.00	2.3	<9.01

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0193
Run No. 2	0.0192
Run No. 3	0.0191

* At 25°C and 1 atmosphere.

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

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

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	0.60	5.81	10.0	7.91	8.29	0.16
Benzene	<0.15	<1.46	<2.52	<1.99	<2.09	<0.040
Bromodichloromethane	0.044	0.43	0.74	0.58	0.61	0.012
Bromoform	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Bromomethane	<0.27	<2.63	<4.54	<3.58	<3.75	<0.071
1,3-Butadiene	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
2-Butanone	0.16	1.54	2.66	2.10	2.20	0.042
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Chloroform	0.13	1.22	2.10	1.66	1.74	0.033
Cumene (Isopropylbenzene)	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Dibromochloromethane	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Dichlorodifluoromethane	<0.069	<0.67	<1.16	<0.92	<0.96	<0.018
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
trans,1,2-Dichloroethene	0.10	0.98	1.70	1.34	1.40	0.027
1,1-Dichloroethene	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Ethylbenzene	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Ethylene Dibromide	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Methylene Chloride	2.79	27.2	47.0	37.0	38.8	0.74
Styrene	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Tetrachloroethene	0.058	0.57	0.98	0.77	0.81	0.015
Toluene	<0.36	<3.50	<6.04	<4.77	<4.99	<0.095
1,1,1-Trichloroethane	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Trichlorotrifluoroethane	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Trichlorofluoromethane	<0.066	<0.64	<1.11	<0.88	<0.92	<0.017
M&P-Xylene	<0.090	<0.88	<1.51	<1.19	<1.25	<0.024
O-Xylene	<0.030	<0.29	<0.50	<0.40	<0.42	<0.0079
Vinyl Chloride	<0.060	<0.58	<1.01	<0.80	<0.83	<0.016
Total	<5.60	<54.6	<94.2	<74.3	<77.8	<1.48

Dry Gas Volume Sampled (Rm^3*) :	0.0594
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.7
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	0.95	9.50	16.5	12.7	13.5	0.26
Benzene	<0.15	<1.54	<2.67	<2.06	<2.19	<0.042
Bromodichloromethane	0.038	0.38	0.66	0.51	0.54	0.010
Bromoform	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Bromomethane	<0.27	<2.71	<4.71	<3.64	<3.87	<0.074
1,3-Butadiene	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
2-Butanone	0.23	2.32	4.03	3.11	3.31	0.063
Carbon Tetrachloride	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Chloroform	0.10	1.02	1.78	1.37	1.46	0.028
Cumene (Isopropylbenzene)	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Dibromochloromethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Dichlorodifluoromethane	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
1,2-Dichloroethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
trans,1,2-Dichloroethene	0.10	1.04	1.82	1.40	1.49	0.028
1,1-Dichloroethene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
1,2-Dichloropropane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Ethylbenzene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Ethylene Dibromide	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Methylene Chloride	4.31	43.3	75.3	58.1	61.8	1.17
Styrene	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Tetrachloroethene	0.034	0.34	0.59	0.46	0.49	0.0093
Toluene	<0.29	<2.89	<5.03	<3.88	<4.13	<0.078
1,1,1-Trichloroethane	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Trichlorotrifluoroethane	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Trichlorofluoromethane	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
M&P-Xylene	<0.090	<0.90	<1.57	<1.21	<1.29	<0.025
O-Xylene	<0.030	<0.30	<0.52	<0.40	<0.43	<0.0082
Vinyl Chloride	<0.060	<0.60	<1.05	<0.81	<0.86	<0.016
Total	<7.41	<74.4	<129	<99.8	<106	<2.02

Dry Gas Volume Sampled (Rm^3*) :	0.0573
Actual Flowrate (m^3/s) :	27.1
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/s*) :	19.0

* At 25°C and 1 atmosphere

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

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

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	0.87	8.70	15.1	11.8	12.4	0.23
Benzene	<0.15	<1.50	<2.60	<2.04	<2.14	<0.040
Bromodichloromethane	0.046	0.46	0.80	0.63	0.66	0.012
Bromoform	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Bromomethane	<0.27	<2.71	<4.69	<3.68	<3.85	<0.072
1,3-Butadiene	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
2-Butanone	0.57	5.70	9.88	7.75	8.12	0.15
Carbon Tetrachloride	<0.032	<0.32	<0.56	<0.44	<0.46	<0.0085
Chloroform	<0.090	<0.90	<1.56	<1.23	<1.28	<0.024
Cumene (Isopropylbenzene)	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Dibromochloromethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Dichlorodifluoromethane	<0.091	<0.91	<1.58	<1.24	<1.30	<0.024
1,2-Dichloroethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
trans,1,2-Dichloroethene	0.075	0.75	1.30	1.02	1.07	0.020
1,1-Dichloroethene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
1,2-Dichloropropane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Ethylbenzene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Ethylene Dibromide	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Methylene Chloride	5.40	54.1	93.7	73.5	77.0	1.43
Styrene	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Tetrachloroethene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Toluene	0.55	5.50	9.53	7.48	7.84	0.15
1,1,1-Trichloroethane	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Trichlorotrifluoroethane	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Trichlorofluoromethane	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
M&P-Xylene	<0.090	<0.90	<1.56	<1.23	<1.28	<0.024
O-Xylene	<0.030	<0.30	<0.52	<0.41	<0.43	<0.0080
Vinyl Chloride	<0.060	<0.60	<1.04	<0.82	<0.86	<0.016
Total	<9.01	<90.3	<156	<123	<129	<2.39

Dry Gas Volume Sampled (Rm^3*) :	0.0576
Actual Flowrate (m^3/s) :	26.5
Dry Reference Flowrate (Rm^3/s*) :	15.3
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 88
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Acetone	5.81	9.50	8.70	8.00
Benzene	<1.46	<1.54	<1.50	<1.50
Bromodichloromethane	0.43	0.38	0.46	0.42
Bromoform	<0.29	<0.30	<0.30	<0.30
Bromomethane	<2.63	<2.71	<2.71	<2.68
1,3-Butadiene	<0.58	<0.60	<0.60	<0.60
2-Butanone	1.54	2.32	5.70	3.19
Carbon Tetrachloride	<0.29	<0.30	<0.32	<0.30
Chloroform	1.22	1.02	<0.90	<1.05
Cumene (Isopropylbenzene)	<0.58	<0.60	<0.60	<0.60
Dibromochloromethane	<0.29	<0.30	<0.30	<0.30
Dichlorodifluoromethane	<0.67	<0.60	<0.91	<0.73
1,2-Dichloroethane	<0.29	<0.30	<0.30	<0.30
trans,1,2-Dichloroethene	0.98	1.04	0.75	0.93
1,1-Dichloroethene	<0.29	<0.30	<0.30	<0.30
1,2-Dichloropropane	<0.29	<0.30	<0.30	<0.30
Ethylbenzene	<0.29	<0.30	<0.30	<0.30
Ethylene Dibromide	<0.58	<0.60	<0.60	<0.60
Mesitylene (1,3,5-Trimethylbenzene)	<0.58	<0.60	<0.60	<0.60
Methylene Chloride	27.2	43.3	54.1	41.5
Styrene	<0.58	<0.60	<0.60	<0.60
Tetrachloroethene	0.57	0.34	<0.30	<0.40
Toluene	<3.50	<2.89	5.50	<3.96
1,1,1-Trichloroethane	<0.29	<0.30	<0.30	<0.30
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.30	<0.30	<0.30
Trichlorotrifluoroethane	<0.58	<0.60	<0.60	<0.60
Trichlorofluoromethane	<0.64	<0.60	<0.60	<0.62
M&P-Xylene	<0.88	<0.90	<0.90	<0.89
O-Xylene	<0.29	<0.30	<0.30	<0.30
Vinyl Chloride	<0.58	<0.60	<0.60	<0.60
Total	<54.6	<74.4	<90.3	<73.1

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

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	10.0	16.5	15.1	13.9
Benzene	<2.52	<2.67	<2.60	<2.60
Bromodichloromethane	0.74	0.66	0.80	0.73
Bromoform	<0.50	<0.52	<0.52	<0.52
Bromomethane	<4.54	<4.71	<4.69	<4.65
1,3-Butadiene	<1.01	<1.05	<1.04	<1.03
2-Butanone	2.66	4.03	9.88	5.52
Carbon Tetrachloride	<0.50	<0.52	<0.56	<0.53
Chloroform	2.10	1.78	<1.56	<1.82
Cumene (Isopropylbenzene)	<1.01	<1.05	<1.04	<1.03
Dibromochloromethane	<0.50	<0.52	<0.52	<0.52
Dichlorodifluoromethane	<1.16	<1.05	<1.58	<1.26
1,2-Dichloroethane	<0.50	<0.52	<0.52	<0.52
trans,1,2-Dichloroethene	1.70	1.82	1.30	1.61
1,1-Dichloroethene	<0.50	<0.52	<0.52	<0.52
1,2-Dichloropropane	<0.50	<0.52	<0.52	<0.52
Ethylbenzene	<0.50	<0.52	<0.52	<0.52
Ethylene Dibromide	<1.01	<1.05	<1.04	<1.03
Mesitylene (1,3,5-Trimethylbenzene)	<1.01	<1.05	<1.04	<1.03
Methylene Chloride	47.0	75.3	93.7	72.0
Styrene	<1.01	<1.05	<1.04	<1.03
Tetrachloroethene	0.98	0.59	<0.52	<0.70
Toluene	<6.04	<5.03	9.53	<6.87
1,1,1-Trichloroethane	<0.50	<0.52	<0.52	<0.52
Trichloroethene/1,1,2-Trichloroethene	<0.50	<0.52	<0.52	<0.52
Trichlorotrifluoroethane	<1.01	<1.05	<1.04	<1.03
Trichlorofluoromethane	<1.11	<1.05	<1.04	<1.07
M&P-Xylene	<1.51	<1.57	<1.56	<1.55
O-Xylene	<0.50	<0.52	<0.52	<0.52
Vinyl Chloride	<1.01	<1.05	<1.04	<1.03
Total	<94.2	<129	<156	<127

* At 25°C and 1 atmosphere

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

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	7.91	12.7	11.8	10.8
Benzene	<1.99	<2.06	<2.04	<2.03
Bromodichloromethane	0.58	0.51	0.63	0.57
Bromoform	<0.40	<0.40	<0.41	<0.40
Bromomethane	<3.58	<3.64	<3.68	<3.63
1,3-Butadiene	<0.80	<0.81	<0.82	<0.81
2-Butanone	2.10	3.11	7.75	4.32
Carbon Tetrachloride	<0.40	<0.40	<0.44	<0.41
Chloroform	1.66	1.37	<1.23	<1.42
Cumene (Isopropylbenzene)	<0.80	<0.81	<0.82	<0.81
Dibromochloromethane	<0.40	<0.40	<0.41	<0.40
Dichlorodifluoromethane	<0.92	<0.81	<1.24	<0.99
1,2-Dichloroethane	<0.40	<0.40	<0.41	<0.40
trans,1,2-Dichloroethene	1.34	1.40	1.02	1.25
1,1-Dichloroethene	<0.40	<0.40	<0.41	<0.40
1,2-Dichloropropane	<0.40	<0.40	<0.41	<0.40
Ethylbenzene	<0.40	<0.40	<0.41	<0.40
Ethylene Dibromide	<0.80	<0.81	<0.82	<0.81
Mesitylene (1,3,5-Trimethylbenzene)	<0.80	<0.81	<0.82	<0.81
Methylene Chloride	37.0	58.1	73.5	56.2
Styrene	<0.80	<0.81	<0.82	<0.81
Tetrachloroethene	0.77	0.46	<0.41	<0.55
Toluene	<4.77	<3.88	7.48	<5.37
1,1,1-Trichloroethane	<0.40	<0.40	<0.41	<0.40
Trichloroethene/1,1,2-Trichloroethene	<0.40	<0.40	<0.41	<0.40
Trichlorotrifluoroethane	<0.80	<0.81	<0.82	<0.81
Trichlorofluoromethane	<0.88	<0.81	<0.82	<0.83
M&P-Xylene	<1.19	<1.21	<1.23	<1.21
O-Xylene	<0.40	<0.40	<0.41	<0.40
Vinyl Chloride	<0.80	<0.81	<0.82	<0.81
Total	<74.3	<99.8	<123	<98.9

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

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

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	8.29	13.5	12.4	11.4
Benzene	<2.09	<2.19	<2.14	<2.14
Bromodichloromethane	0.61	0.54	0.66	0.60
Bromoform	<0.42	<0.43	<0.43	<0.43
Bromomethane	<3.75	<3.87	<3.85	<3.83
1,3-Butadiene	<0.83	<0.86	<0.86	<0.85
2-Butanone	2.20	3.31	8.12	4.54
Carbon Tetrachloride	<0.42	<0.43	<0.46	<0.43
Chloroform	1.74	1.46	<1.28	<1.49
Cumene (Isopropylbenzene)	<0.83	<0.86	<0.86	<0.85
Dibromochloromethane	<0.42	<0.43	<0.43	<0.43
Dichlorodifluoromethane	<0.96	<0.86	<1.30	<1.04
1,2-Dichloroethane	<0.42	<0.43	<0.43	<0.43
trans,1,2-Dichloroethene	1.40	1.49	1.07	1.32
1,1-Dichloroethene	<0.42	<0.43	<0.43	<0.43
1,2-Dichloropropane	<0.42	<0.43	<0.43	<0.43
Ethylbenzene	<0.42	<0.43	<0.43	<0.43
Ethylene Dibromide	<0.83	<0.86	<0.86	<0.85
Mesitylene (1,3,5-Trimethylbenzene)	<0.83	<0.86	<0.86	<0.85
Methylene Chloride	38.8	61.8	77.0	59.2
Styrene	<0.83	<0.86	<0.86	<0.85
Tetrachloroethene	0.81	0.49	<0.43	<0.57
Toluene	<4.99	<4.13	7.84	<5.65
1,1,1-Trichloroethane	<0.42	<0.43	<0.43	<0.43
Trichloroethene/1,1,2-Trichloroethene	<0.42	<0.43	<0.43	<0.43
Trichlorotrifluoroethane	<0.83	<0.86	<0.86	<0.85
Trichlorofluoromethane	<0.92	<0.86	<0.86	<0.88
M&P-Xylene	<1.25	<1.29	<1.28	<1.28
O-Xylene	<0.42	<0.43	<0.43	<0.43
Vinyl Chloride	<0.83	<0.86	<0.86	<0.85
Total	<77.8	<106	<129	<104

* 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	0.16	0.26	0.23	0.22
Benzene	<0.040	<0.042	<0.040	<0.040
Bromodichloromethane	0.012	0.010	0.012	0.011
Bromoform	<0.0079	<0.0082	<0.0080	<0.0080
Bromomethane	<0.071	<0.074	<0.072	<0.072
1,3-Butadiene	<0.016	<0.016	<0.016	<0.016
2-Butanone	0.042	0.063	0.15	0.085
Carbon Tetrachloride	<0.0079	<0.0082	<0.0085	<0.0082
Chloroform	0.033	0.028	<0.024	<0.028
Cumene (Isopropylbenzene)	<0.016	<0.016	<0.016	<0.016
Dibromochloromethane	<0.0079	<0.0082	<0.0080	<0.0080
Dichlorodifluoromethane	<0.018	<0.016	<0.024	<0.020
1,2-Dichloroethane	<0.0079	<0.0082	<0.0080	<0.0080
trans,1,2-Dichloroethene	0.027	0.028	0.020	0.025
1,1-Dichloroethene	<0.0079	<0.0082	<0.0080	<0.0080
1,2-Dichloropropane	<0.0079	<0.0082	<0.0080	<0.0080
Ethylbenzene	<0.0079	<0.0082	<0.0080	<0.0080
Ethylene Dibromide	<0.016	<0.016	<0.016	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.016	<0.016	<0.016	<0.016
Methylene Chloride	0.74	1.17	1.43	1.11
Styrene	<0.016	<0.016	<0.016	<0.016
Tetrachloroethene	0.015	0.0093	<0.0080	<0.011
Toluene	<0.095	<0.078	0.15	<0.11
1,1,1-Trichloroethane	<0.0079	<0.0082	<0.0080	<0.0080
Trichloroethene/1,1,2-Trichloroethene	<0.0079	<0.0082	<0.0080	<0.0080
Trichlorotrifluoroethane	<0.016	<0.016	<0.016	<0.016
Trichlorofluoromethane	<0.017	<0.016	<0.016	<0.017
M&P-Xylene	<0.024	<0.025	<0.024	<0.024
O-Xylene	<0.0079	<0.0082	<0.0080	<0.0080
Vinyl Chloride	<0.016	<0.016	<0.016	<0.016
Total	<1.48	<2.02	<2.39	<1.96

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

Compound	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	8.00	13.9	10.8	11.4	0.22
Benzene	<1.50	<2.60	<2.03	<2.14	<0.040
Bromodichloromethane	0.42	0.73	0.57	0.60	0.011
Bromoform	<0.30	<0.52	<0.40	<0.43	<0.0080
Bromomethane	<2.68	<4.65	<3.63	<3.83	<0.072
1,3-Butadiene	<0.60	<1.03	<0.81	<0.85	<0.016
2-Butanone	3.19	5.52	4.32	4.54	0.085
Carbon Tetrachloride	<0.30	<0.53	<0.41	<0.43	<0.0082
Chloroform	<1.05	<1.82	<1.42	<1.49	<0.028
Cumene (Isopropylbenzene)	<0.60	<1.03	<0.81	<0.85	<0.016
Dibromochloromethane	<0.30	<0.52	<0.40	<0.43	<0.0080
Dichlorodifluoromethane	<0.73	<1.26	<0.99	<1.04	<0.020
1,2-Dichloroethane	<0.30	<0.52	<0.40	<0.43	<0.0080
trans,1,2-Dichloroethene	0.93	1.61	1.25	1.32	0.025
1,1-Dichloroethene	<0.30	<0.52	<0.40	<0.43	<0.0080
1,2-Dichloropropane	<0.30	<0.52	<0.40	<0.43	<0.0080
Ethylbenzene	<0.30	<0.52	<0.40	<0.43	<0.0080
Ethylene Dibromide	<0.60	<1.03	<0.81	<0.85	<0.016
Mesitylene (1,3,5-Trimethylbenzene)	<0.60	<1.03	<0.81	<0.85	<0.016
Methylene Chloride	41.5	72.0	56.2	59.2	1.11
Styrene	<0.60	<1.03	<0.81	<0.85	<0.016
Tetrachloroethene	<0.40	<0.70	<0.55	<0.57	<0.011
Toluene	<3.96	<6.87	<5.37	<5.65	<0.11
1,1,1-Trichloroethane	<0.30	<0.52	<0.40	<0.43	<0.0080
Trichloroethene/1,1,2-Trichloroethene	<0.30	<0.52	<0.40	<0.43	<0.0080
Trichlorotrifluoroethane	<0.60	<1.03	<0.81	<0.85	<0.016
Trichlorofluoromethane	<0.62	<1.07	<0.83	<0.88	<0.017
M&P-Xylene	<0.89	<1.55	<1.21	<1.28	<0.024
O-Xylene	<0.30	<0.52	<0.40	<0.43	<0.0080
Vinyl Chloride	<0.60	<1.03	<0.81	<0.85	<0.016
Total	<73.1	<127	<98.9	<104	<1.96

* 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 19A/19B	Field Blank 2 Tube 9A/9B	Field Blank 3 Tube 30A/30B	Trip Blank Tube 14A/14B	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 2

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

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

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 12, 2018	9:26	13:22	180
2	September 12, 2018	14:49	18:02	180
3	September 13, 2018	15:16	19:05	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 11, 2018	9:20	11:24	120
2	September 11, 2018	13:10	15:15	120
3	September 11, 2018	16:40	18:44	120

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 12, 2018	9:24	10:24	60
2	September 12, 2018	11:49	12:49	60
3	September 12, 2018	13:38	14:38	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	September 13, 2018	8:53	13:09	240
2	September 13, 2018	15:17	19:33	240
3	September 14, 2018	8:29	12:41	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		Sampling Time
		Start	Finish	min
1	September 13, 2018	15:31	16:31	60
2	September 13, 2018	17:11	18:11	60
3	September 14, 2018	8:32	9:32	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period		Sampling Time
			Start	Finish	min
1	1	September 13, 2018	10:23	10:43	20
	2	September 13, 2018	10:52	11:12	20
	3	September 13, 2018	11:22	11:42	20
	4	September 13, 2018	11:55	12:15	20
2	1	September 13, 2018	12:28	12:48	20
	2	September 13, 2018	12:53	13:13	20
	3	September 13, 2018	14:10	14:30	21
	4	September 13, 2018	14:51	15:11	20
3	1	September 14, 2018	9:52	10:12	20
	2	September 14, 2018	10:19	10:39	20
	3	September 14, 2018	10:46	11:06	20
	4	September 14, 2018	11:12	11:32	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period		Sampling Time
			Start	Finish	min
BH Outlet	1	September 11, 2018	16:32	17:32	60
BH Outlet	2	September 11, 2018	17:43	18:43	60
BH Outlet	3	September 11, 2018	18:53	19:53	60
Quench Inlet	1	September 11, 2018	10:32	11:32	60
Quench Inlet	2	September 11, 2018	11:40	12:40	60
Quench Inlet	3	September 11, 2018	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	1.003/0.996	7.03	4.245	98.9
2	0.851	0.996	7.03	4.400	102.1
3	0.840	1.006	6.92	4.220	98.5

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.845	1.006	4.51	1.249	102.2
2	0.845	1.006	4.51	1.224	103.7
3	0.845	1.006	4.51	1.231	101.6

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.846	1.006	6.99	1.358	98.0
2	0.846	1.006	6.99	1.356	99.7
3	0.846	1.006	6.99	1.314	99.2

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	0.846	0.996	5.90	4.041	98.9
2	0.846	0.996	5.90	4.109	99.9
3	0.846	0.996	5.90	4.010	99.9

* Dry at 25°C and 1 atmosphere

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

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	138	15.8	17.2	-2.64	98.9	10.9	8.11
2	141	17.2	17.7	-2.64	98.8	11.0	7.74
3	141	17.2	18.1	-2.48	98.8	11.0	8.07
Average	140	16.7	17.7	-2.59	98.9	10.9	7.97

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	15.1	17.7	-2.14	98.8	11.2	7.88
2	141	17.1	17.5	-2.14	98.9	11.4	7.96
3	141	17.2	18.0	-2.14	99.0	11.2	8.06
Average	141	16.5	17.7	-2.14	98.9	11.3	7.97

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	140	14.9	16.7	-2.61	98.9	10.8	8.39
2	141	15.5	16.5	-2.61	98.9	10.7	8.11
3	140	16.3	16.2	-2.61	98.9	11.3	7.40
Average	140	15.6	16.5	-2.61	98.9	10.9	7.97

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	142	16.3	17.7	-2.48	99.1	11.0	8.12
2	141	17.5	18.1	-2.48	98.8	11.0	8.06
3	140	17.6	17.6	-2.29	98.9	11.2	7.79
Average	141	17.1	17.8	-2.42	99.0	11.1	7.99

* 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	25.4	15.1	19.5	18.0
2	26.1	15.2	20.2	18.3
3	26.8	15.6	20.2	18.8
Average	26.1	15.3	20.0	18.4

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	26.2	15.6	20.5	18.4
2	25.9	15.1	19.7	18.2
3	26.6	15.5	20.1	18.7
Average	26.2	15.4	20.1	18.4

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	24.7	14.8	18.7	17.4
2	24.4	14.5	18.8	17.2
3	24.0	14.2	19.3	16.9
Average	24.4	14.5	18.9	17.2

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	26.1	15.4	19.8	18.3
2	26.7	15.5	20.1	18.7
3	26.0	15.1	20.0	18.3
Average	26.3	15.3	20.0	18.5

* 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	Particulate Concentration				Particulate
	Probe Rinse	Main Filter	Total	Volume Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	2.3	0.2	2.5	4.245	0.35	0.59	0.46	0.50	8.90
2	1.5	<0.1	<1.6	4.400	<0.21	<0.36	<0.27	<0.30	<5.52
3	1.2	<0.1	<1.3	4.220	<0.18	<0.31	<0.24	<0.26	<4.80
Average					<0.25	<0.42	<0.32	<0.35	<6.41
Blank	0.3	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	0.4	1.249	0.19	0.32	0.24	0.27	5.00
2	<0.6	1.224	<0.29	<0.49	<0.38	<0.41	<7.40
3	<0.5	1.231	<0.24	<0.41	<0.31	<0.34	<6.30
Average			<0.24	<0.41	<0.31	<0.34	<6.23
Blank	0.4						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	0.9	1.249	0.43	0.72	0.55	0.61	11.2
2	<1.4	1.224	<0.67	<1.14	<0.88	<0.95	<17.3
3	<1.3	1.231	<0.62	<1.06	<0.81	<0.88	<16.4
Average			<0.57	<0.97	<0.75	<0.81	<15.0
Blank	0.8						

* 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	4.1	1.249	1.95	3.28	2.50	2.78	51.2
2	4.1	1.224	1.95	3.35	2.57	2.78	50.6
3	3.3	1.231	1.56	2.68	2.07	2.22	41.6
Average			1.82	3.10	2.38	2.59	47.8
Blank	1.3						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	1.7	1.249	0.81	1.36	1.04	1.15	21.2
2	2.3	1.224	1.10	1.88	1.44	1.56	28.4
3	2.0	1.231	0.95	1.62	1.25	1.35	25.2
Average			0.95	1.62	1.24	1.35	24.9
Blank	1.6						

* 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	4.18	1.358	1.83	3.08	2.38	2.58	46.5
2	4.25	1.356	1.86	3.13	2.43	2.63	47.3
3	4.61	1.314	2.09	3.51	2.72	2.94	53.0
Average			1.93	3.24	2.51	2.72	48.9
Blank	0.444						

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	<0.193	1.358	<0.084	<0.14	<0.11	<0.12	<2.15
2	<0.175	1.356	<0.077	<0.13	<0.10	<0.11	<1.95
3	<0.172	1.314	<0.078	<0.13	<0.10	<0.11	<1.98
Average			<0.080	<0.13	<0.10	<0.11	<2.02
Blank	<0.174						

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	1.84	1.358	0.81	1.35	1.05	1.14	20.5
2	1.60	1.356	0.70	1.18	0.91	0.99	17.8
3	1.19	1.314	0.54	0.91	0.70	0.76	13.7
Average			0.68	1.15	0.89	0.96	17.3
Blank	<0.448						

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 September 11 to September 14, 2018

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.21	8.03	9.63
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	7	13	46
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	8.8	13.4	27.0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0.07	3
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0.1	0.2
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	101	111	125
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	110	111	111
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	1	4	7
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	2.6	4.1	5.3
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0.03	1
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	10

Data measured by the ORTECH CEMS on September 11, 2018

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.2	0.9
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.1	0.3	0.4
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.1	0.4	0.6
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.3	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0.7	1.2	1.8
Quench Inlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0.2	0.8	1.4
Quench Inlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0.5	0.9	1.3
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		1.0	
Quench Inlet	1	Total Hydrocarbons (ppm dry, 10-min Avg)	0.9	1.2	1.5
Quench Inlet	2	Total Hydrocarbons (ppm dry, 10-min Avg)	0.5	0.8	1.1
Quench Inlet	3	Total Hydrocarbons (ppm dry, 10-min Avg)	0.7	0.9	1.1
Average		Total Hydrocarbons (ppm dry, 10-min Avg)		1.0	

* Reference conditions, dry basis adjusted to 11% oxygen

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

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	0.20	0.20
Barium	5.27	1.04	6.31
Beryllium	<0.2	0.12	0.12
Cadmium	<0.1	0.074	0.074
Chromium	1.35	3.00	4.35
Cobalt	0.22	1.30	1.52
Copper	1.12	1.33	2.45
Lead	<0.5	1.36	1.36
Mercury *	<0.015	0.82	0.82
Molybdenum	22.1	<0.1	22.1
Nickel	1.53	3.44	4.97
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	10.2	6.08	16.3
Total			<62.3

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	0.28	0.28
Barium	5.03	0.86	5.89
Beryllium	<0.2	0.19	0.19
Cadmium	0.15	0.054	0.21
Chromium	1.77	0.66	2.43
Cobalt	<0.2	<0.1	<0.20
Copper	1.40	2.87	4.27
Lead	<0.5	0.58	0.58
Mercury *	<0.015	0.67	0.67
Molybdenum	22.7	<0.1	22.7
Nickel	1.53	0.78	2.31
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	6.73	4.02	10.8
Total			<52.2

* 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	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.21	<0.1	0.21
Arsenic	<1	<0.2	<0.20
Barium	8.34	1.47	9.81
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.31	<0.05	0.31
Chromium	5.53	0.63	6.16
Cobalt	<0.2	<0.1	<0.20
Copper	2.02	1.53	3.55
Lead	0.62	1.03	1.65
Mercury *	<0.015	0.72	0.72
Molybdenum	43.1	<0.1	43.1
Nickel	17.2	0.79	18.0
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	11.9	5.20	17.1
Total			<103

* Includes the permanganate impingers

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

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

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.028	<0.047	<0.036	<0.040	<0.00071
Arsenic	0.20	0.028	0.047	0.037	0.040	0.00071
Barium	6.31	0.88	1.49	1.15	1.25	0.022
Beryllium	0.12	0.017	0.029	0.022	0.024	0.00043
Cadmium	0.074	0.010	0.017	0.013	0.015	0.00026
Chromium	4.35	0.61	1.02	0.79	0.86	0.015
Cobalt	1.52	0.21	0.36	0.28	0.30	0.0054
Copper	2.45	0.34	0.58	0.45	0.48	0.0087
Lead	1.36	0.19	0.32	0.25	0.27	0.0048
Mercury	0.82	0.11	0.19	0.15	0.16	0.0029
Molybdenum	22.1	3.09	5.21	4.03	4.37	0.079
Nickel	4.97	0.70	1.17	0.91	0.98	0.018
Selenium	<1.00	<0.14	<0.24	<0.18	<0.20	<0.0036
Silver	<0.20	<0.028	<0.047	<0.036	<0.040	<0.00071
Thallium	<0.20	<0.028	<0.047	<0.036	<0.040	<0.00071
Vanadium	<0.10	<0.014	<0.024	<0.018	<0.020	<0.00036
Zinc	16.3	2.28	3.84	2.97	3.22	0.058
Total	<62.3	<8.72	<14.7	<11.4	<12.3	<0.22

Dry Gas Volume Sampled (Rm^3*) :	4.245
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	19.5
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

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

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

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.026	<0.045	<0.034	<0.038	<0.00069
Arsenic	0.28	0.036	0.063	0.047	0.052	0.00095
Barium	5.89	0.78	1.34	1.01	1.11	0.020
Beryllium	0.19	0.025	0.043	0.032	0.036	0.00065
Cadmium	0.21	0.027	0.047	0.035	0.039	0.00071
Chromium	2.43	0.32	0.55	0.42	0.46	0.0084
Cobalt	<0.20	<0.026	<0.045	<0.034	<0.038	<0.00069
Copper	4.27	0.57	0.97	0.73	0.81	0.015
Lead	0.58	0.077	0.13	0.099	0.11	0.0020
Mercury	0.67	0.089	0.15	0.12	0.13	0.0023
Molybdenum	22.7	3.00	5.16	3.88	4.29	0.078
Nickel	2.31	0.31	0.52	0.39	0.44	0.0080
Selenium	<1.00	<0.13	<0.23	<0.17	<0.19	<0.0035
Silver	<0.20	<0.026	<0.045	<0.034	<0.038	<0.00069
Thallium	<0.20	<0.026	<0.045	<0.034	<0.038	<0.00069
Vanadium	<0.10	<0.013	<0.023	<0.017	<0.019	<0.00035
Zinc	10.8	1.42	2.44	1.84	2.03	0.037
Total	<52.2	<6.91	<11.9	<8.92	<9.85	<0.18

Dry Gas Volume Sampled (Rm^3*) :	4.400
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/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	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.21	0.028	0.049	0.038	0.040	0.00076
Arsenic	<0.20	<0.028	<0.047	<0.037	<0.039	<0.00074
Barium	9.81	1.35	2.32	1.80	1.93	0.036
Beryllium	<0.20	<0.028	<0.047	<0.037	<0.039	<0.00074
Cadmium	0.31	0.043	0.074	0.057	0.061	0.0011
Chromium	6.16	0.85	1.46	1.13	1.21	0.023
Cobalt	<0.20	<0.028	<0.047	<0.037	<0.039	<0.00074
Copper	3.55	0.49	0.84	0.65	0.70	0.013
Lead	1.65	0.23	0.39	0.30	0.32	0.0061
Mercury	0.72	0.099	0.17	0.13	0.14	0.0026
Molybdenum	43.1	5.95	10.2	7.89	8.47	0.16
Nickel	18.0	2.48	4.26	3.29	3.54	0.066
Selenium	<1.00	<0.14	<0.24	<0.18	<0.20	<0.0037
Silver	<0.20	<0.028	<0.047	<0.037	<0.039	<0.00074
Thallium	<0.20	<0.028	<0.047	<0.037	<0.039	<0.00074
Vanadium	<0.10	<0.014	<0.024	<0.018	<0.020	<0.00037
Zinc	17.1	2.36	4.05	3.13	3.36	0.063
Total	<103	<14.2	<24.3	<18.8	<20.2	<0.38

Dry Gas Volume Sampled (Rm^3*) :	4.220
Actual Flowrate (m^3/s) :	26.8
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	20.2
Wet Reference Flowrate (Rm^3/s*) :	18.8

* 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	<0.028	<0.026	0.028	<0.028	3.53
Arsenic	0.028	0.036	<0.028	<0.031	16.1
Barium	0.88	0.78	1.35	1.01	30.4
Beryllium	0.017	0.025	<0.028	<0.023	24.0
Cadmium	0.010	0.027	0.043	0.027	60.9
Chromium	0.61	0.32	0.85	0.59	44.6
Cobalt	0.21	<0.026	<0.028	<0.089	121
Copper	0.34	0.57	0.49	0.47	24.2
Lead	0.19	0.077	0.23	0.16	47.6
Mercury	0.11	0.089	0.099	0.10	12.7
Molybdenum	3.09	3.00	5.95	4.01	41.7
Nickel	0.70	0.31	2.48	1.16	99.9
Selenium	<0.14	<0.13	<0.14	<0.14	2.90
Silver	<0.028	<0.026	<0.028	<0.027	2.90
Thallium	<0.028	<0.026	<0.028	<0.027	2.90
Vanadium	<0.014	<0.013	<0.014	<0.014	2.90
Zinc	2.28	1.42	2.36	2.02	25.7
Total	<8.72	<6.91	<14.2	<9.93	38.1

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

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.047	<0.045	0.049	<0.047	3.32
Arsenic	0.047	0.063	<0.047	<0.052	16.7
Barium	1.49	1.34	2.32	1.72	31.0
Beryllium	0.029	0.043	<0.047	<0.040	24.9
Cadmium	0.017	0.047	0.074	0.046	61.4
Chromium	1.02	0.55	1.46	1.01	44.8
Cobalt	0.36	<0.045	<0.047	<0.15	120
Copper	0.58	0.97	0.84	0.80	25.2
Lead	0.32	0.13	0.39	0.28	47.7
Mercury	0.19	0.15	0.17	0.17	11.5
Molybdenum	5.21	5.16	10.2	6.86	42.3
Nickel	1.17	0.52	4.26	1.99	101
Selenium	<0.24	<0.23	<0.24	<0.23	2.25
Silver	<0.047	<0.045	<0.047	<0.047	2.25
Thallium	<0.047	<0.045	<0.047	<0.047	2.25
Vanadium	<0.024	<0.023	<0.024	<0.023	2.25
Zinc	3.84	2.44	4.05	3.44	25.4
Total	<14.7	<11.9	<24.3	<17.0	38.6

* 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	<0.036	<0.034	0.038	<0.036	4.70
Arsenic	0.037	0.047	<0.037	<0.040	15.0
Barium	1.15	1.01	1.80	1.32	31.8
Beryllium	0.022	0.032	<0.037	<0.030	24.6
Cadmium	0.013	0.035	0.057	0.035	61.9
Chromium	0.79	0.42	1.13	0.78	45.7
Cobalt	0.28	<0.034	<0.037	<0.12	120
Copper	0.45	0.73	0.65	0.61	24.0
Lead	0.25	0.099	0.30	0.22	48.5
Mercury	0.15	0.12	0.13	0.13	12.9
Molybdenum	4.03	3.88	7.89	5.27	43.1
Nickel	0.91	0.39	3.29	1.53	101
Selenium	<0.18	<0.17	<0.18	<0.18	3.78
Silver	<0.036	<0.034	<0.037	<0.036	3.78
Thallium	<0.036	<0.034	<0.037	<0.036	3.78
Vanadium	<0.018	<0.017	<0.018	<0.018	3.78
Zinc	2.97	1.84	3.13	2.65	26.6
Total	<11.4	<8.92	<18.8	<13.0	39.5

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

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

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	<0.040	<0.038	0.040	<0.039	3.34
Arsenic	0.040	0.052	<0.039	<0.044	16.4
Barium	1.25	1.11	1.93	1.43	30.6
Beryllium	0.024	0.036	<0.039	<0.033	24.4
Cadmium	0.015	0.039	0.061	0.038	61.1
Chromium	0.86	0.46	1.21	0.84	44.7
Cobalt	0.30	<0.038	<0.039	<0.13	120
Copper	0.48	0.81	0.70	0.66	24.7
Lead	0.27	0.11	0.32	0.23	47.6
Mercury	0.16	0.13	0.14	0.14	12.1
Molybdenum	4.37	4.29	8.47	5.71	42.0
Nickel	0.98	0.44	3.54	1.65	100
Selenium	<0.20	<0.19	<0.20	<0.19	2.49
Silver	<0.040	<0.038	<0.039	<0.039	2.49
Thallium	<0.040	<0.038	<0.039	<0.039	2.49
Vanadium	<0.020	<0.019	<0.020	<0.019	2.49
Zinc	3.22	2.03	3.36	2.87	25.5
Total	<12.3	<9.85	<20.2	<14.1	38.3

* 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	<0.00071	<0.00069	0.00076	<0.00072	4.76
Arsenic	0.00071	0.00095	<0.00074	<0.00080	16.1
Barium	0.022	0.020	0.036	0.026	32.8
Beryllium	0.00043	0.00065	<0.00074	<0.00061	26.2
Cadmium	0.00026	0.00071	0.0011	0.00071	62.8
Chromium	0.015	0.0084	0.023	0.016	46.3
Cobalt	0.0054	<0.00069	<0.00074	<0.0023	119
Copper	0.0087	0.015	0.013	0.012	25.6
Lead	0.0048	0.0020	0.0061	0.0043	48.6
Mercury	0.0029	0.0023	0.0026	0.0026	11.1
Molybdenum	0.079	0.078	0.16	0.11	44.2
Nickel	0.018	0.0080	0.066	0.031	102
Selenium	<0.0036	<0.0035	<0.0037	<0.0036	3.40
Silver	<0.00071	<0.00069	<0.00074	<0.00071	3.40
Thallium	<0.00071	<0.00069	<0.00074	<0.00071	3.40
Vanadium	<0.00036	<0.00035	<0.00037	<0.00036	3.40
Zinc	0.058	0.037	0.063	0.053	26.1
Total	<0.22	<0.18	<0.38	<0.26	40.4

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

Metal	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.028	<0.047	<0.036	<0.039	<0.00072
Arsenic	<0.031	<0.052	<0.040	<0.044	<0.00080
Barium	1.01	1.72	1.32	1.43	0.026
Beryllium	<0.023	<0.040	<0.030	<0.033	<0.00061
Cadmium	0.027	0.046	0.035	0.038	0.00071
Chromium	0.59	1.01	0.78	0.84	0.016
Cobalt	<0.089	<0.15	<0.12	<0.13	<0.0023
Copper	0.47	0.80	0.61	0.66	0.012
Lead	0.16	0.28	0.22	0.23	0.0043
Mercury	0.10	0.17	0.13	0.14	0.0026
Molybdenum	4.01	6.86	5.27	5.71	0.11
Nickel	1.16	1.99	1.53	1.65	0.031
Selenium	<0.14	<0.23	<0.18	<0.19	<0.0036
Silver	<0.027	<0.047	<0.036	<0.039	<0.00071
Thallium	<0.027	<0.047	<0.036	<0.039	<0.00071
Vanadium	<0.014	<0.023	<0.018	<0.019	<0.00036
Zinc	2.02	3.44	2.65	2.87	0.053
Total	<9.93	<17.0	<13.0	<14.1	<0.26

* 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	<0.20
Arsenic	<1	<0.2	<0.20
Barium	6.3	0.81	7.11
Beryllium	<0.2	0.15	0.15
Cadmium	<0.1	<0.05	<0.10
Chromium	4.56	0.59	5.15
Cobalt	<0.2	<0.1	<0.20
Copper	1.27	0.52	1.79
Lead	<0.5	0.48	0.48
Mercury *	<0.015	0.21	0.21
Molybdenum	44.4	<0.1	44.4
Nickel	15.1	0.25	15.4
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	<6	<3	<6.00
Total			<82.8

* Includes the permanganate impingers.

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

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

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	106	0.015	0.026	0.020	0.022	0.40
Pentachlorodibenzo-p-dioxins	200	0.029	0.049	0.038	0.042	0.76
Hexachlorodibenzo-p-dioxins	559	0.082	0.14	0.11	0.12	2.13
Heptachlorodibenzo-p-dioxins	539	0.079	0.13	0.10	0.11	2.05
Octachlorodibenzo-p-dioxin	510	0.074	0.13	0.098	0.11	1.94
Total	1914	0.28	0.47	0.37	0.40	7.29

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	47.5	0.0069	0.012	0.0091	0.0099	0.18
Pentachlorodibenzofurans	62.7	0.0092	0.016	0.012	0.013	0.24
Hexachlorodibenzofurans	69.1	0.010	0.017	0.013	0.014	0.26
Heptachlorodibenzofurans	74.6	0.011	0.018	0.014	0.016	0.28
Octachlorodibenzofuran	33.6	0.0049	0.0083	0.0065	0.0070	0.13
Total	288	0.042	0.071	0.055	0.060	1.10

Dry Gas Volume Sampled (Rm^3*) :	4.041
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	18.3

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	114	0.016	0.028	0.021	0.023	0.43
Pentachlorodibenzo-p-dioxins	101	0.014	0.025	0.019	0.020	0.38
Hexachlorodibenzo-p-dioxins	558	0.079	0.14	0.10	0.11	2.10
Heptachlorodibenzo-p-dioxins	568	0.080	0.14	0.11	0.11	2.14
Octachlorodibenzo-p-dioxin	519	0.073	0.13	0.097	0.10	1.96
Total	1860	0.26	0.45	0.35	0.38	7.02

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	43.1	0.0061	0.010	0.0081	0.0087	0.16
Pentachlorodibenzofurans	47.8	0.0068	0.012	0.0090	0.0096	0.18
Hexachlorodibenzofurans	68.7	0.0097	0.017	0.013	0.014	0.26
Heptachlorodibenzofurans	82.4	0.012	0.020	0.015	0.017	0.31
Octachlorodibenzofuran	29.8	0.0042	0.0073	0.0056	0.0060	0.11
Total	272	0.038	0.066	0.051	0.055	1.03

Dry Gas Volume Sampled (Rm^3*) :	4.109
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
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	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	108	0.016	0.027	0.020	0.022	0.41
Pentachlorodibenzo-p-dioxins	196	0.028	0.049	0.037	0.040	0.74
Hexachlorodibenzo-p-dioxins	501	0.073	0.12	0.094	0.10	1.89
Heptachlorodibenzo-p-dioxins	459	0.066	0.11	0.086	0.094	1.73
Octachlorodibenzo-p-dioxin	378	0.055	0.094	0.071	0.078	1.42
Total	1642	0.24	0.41	0.31	0.34	6.18

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	31.3	0.0045	0.0078	0.0059	0.0064	0.12
Pentachlorodibenzofurans	22.7	0.0033	0.0057	0.0043	0.0047	0.085
Hexachlorodibenzofurans	47.1	0.0068	0.012	0.0089	0.0097	0.18
Heptachlorodibenzofurans	51.5	0.0075	0.013	0.0097	0.011	0.19
Octachlorodibenzofuran	22.7	0.0033	0.0057	0.0043	0.0047	0.085
Total	175	0.025	0.044	0.033	0.036	0.66

Dry Gas Volume Sampled (Rm^3*) :	4.010
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/s*) :	18.3

* 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				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.015	0.016	0.016	0.016	2.1
Pentachlorodibenzo-p-dioxins	0.029	0.014	0.028	0.024	35.1
Hexachlorodibenzo-p-dioxins	0.082	0.079	0.073	0.078	6.0
Heptachlorodibenzo-p-dioxins	0.079	0.080	0.066	0.075	10.0
Octachlorodibenzo-p-dioxin	0.074	0.073	0.055	0.068	16.4
Total	0.28	0.26	0.24	0.26	8.1

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.0069	0.0061	0.0045	0.0059	20.8
Pentachlorodibenzofurans	0.0092	0.0068	0.0033	0.0064	46.1
Hexachlorodibenzofurans	0.010	0.0097	0.0068	0.0089	20.1
Heptachlorodibenzofurans	0.011	0.012	0.0075	0.010	22.3
Octachlorodibenzofuran	0.0049	0.0042	0.0033	0.0041	19.6
Total	0.042	0.038	0.025	0.035	24.8

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

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.026	0.028	0.027	0.027	2.8
Pentachlorodibenzo-p-dioxins	0.049	0.025	0.049	0.041	34.7
Hexachlorodibenzo-p-dioxins	0.14	0.14	0.12	0.13	5.3
Heptachlorodibenzo-p-dioxins	0.13	0.14	0.11	0.13	9.8
Octachlorodibenzo-p-dioxin	0.13	0.13	0.094	0.12	16.0
Total	0.47	0.45	0.41	0.45	7.3

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.012	0.010	0.0078	0.010	20.1
Pentachlorodibenzofurans	0.016	0.012	0.0057	0.011	45.4
Hexachlorodibenzofurans	0.017	0.017	0.012	0.015	19.7
Heptachlorodibenzofurans	0.018	0.020	0.013	0.017	22.1
Octachlorodibenzofuran	0.0083	0.0073	0.0057	0.0071	18.9
Total	0.071	0.066	0.044	0.060	24.2

* 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	0.020	0.021	0.020	0.021	2.9
Pentachlorodibenzo-p-dioxins	0.038	0.019	0.037	0.031	34.5
Hexachlorodibenzo-p-dioxins	0.11	0.10	0.094	0.10	6.8
Heptachlorodibenzo-p-dioxins	0.10	0.11	0.086	0.099	11.0
Octachlorodibenzo-p-dioxin	0.098	0.097	0.071	0.089	17.3
Total	0.37	0.35	0.31	0.34	8.8

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	0.0091	0.0081	0.0059	0.0077	21.5
Pentachlorodibenzofurans	0.012	0.0090	0.0043	0.0084	46.5
Hexachlorodibenzofurans	0.013	0.013	0.0089	0.012	21.0
Heptachlorodibenzofurans	0.014	0.015	0.0097	0.013	23.2
Octachlorodibenzofuran	0.0065	0.0056	0.0043	0.0054	20.3
Total	0.055	0.051	0.033	0.046	25.5

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

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

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.022	0.023	0.022	0.022	2.2
Pentachlorodibenzo-p-dioxins	0.042	0.020	0.040	0.034	34.9
Hexachlorodibenzo-p-dioxins	0.12	0.11	0.10	0.11	6.2
Heptachlorodibenzo-p-dioxins	0.11	0.11	0.094	0.11	10.3
Octachlorodibenzo-p-dioxin	0.11	0.10	0.078	0.096	16.6
Total	0.40	0.38	0.34	0.37	8.3

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.0099	0.0087	0.0064	0.0083	21.0
Pentachlorodibenzofurans	0.013	0.0096	0.0047	0.0091	46.2
Hexachlorodibenzofurans	0.014	0.014	0.0097	0.013	20.3
Heptachlorodibenzofurans	0.016	0.017	0.011	0.014	22.5
Octachlorodibenzofuran	0.0070	0.0060	0.0047	0.0059	19.8
Total	0.060	0.055	0.036	0.050	25.0

* 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	0.40	0.43	0.41	0.41	3.5
Pentachlorodibenzo-p-dioxins	0.76	0.38	0.74	0.63	34.0
Hexachlorodibenzo-p-dioxins	2.13	2.10	1.89	2.04	6.6
Heptachlorodibenzo-p-dioxins	2.05	2.14	1.73	1.98	11.0
Octachlorodibenzo-p-dioxin	1.94	1.96	1.42	1.77	17.2
Total	7.29	7.02	6.18	6.83	8.5

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	0.18	0.16	0.12	0.15	21.1
Pentachlorodibenzofurans	0.24	0.18	0.085	0.17	46.0
Hexachlorodibenzofurans	0.26	0.26	0.18	0.23	20.8
Heptachlorodibenzofurans	0.28	0.31	0.19	0.26	23.3
Octachlorodibenzofuran	0.13	0.11	0.085	0.11	19.8
Total	1.10	1.03	0.66	0.93	25.2

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

Dioxins

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.016	0.027	0.021	0.022	0.41
Pentachlorodibenzo-p-dioxins	0.024	0.041	0.031	0.034	0.63
Hexachlorodibenzo-p-dioxins	0.078	0.13	0.10	0.11	2.04
Heptachlorodibenzo-p-dioxins	0.075	0.13	0.099	0.11	1.98
Octachlorodibenzo-p-dioxin	0.068	0.12	0.089	0.096	1.77
Total	0.26	0.45	0.34	0.37	6.83

Furans

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.0059	0.010	0.0077	0.0083	0.15
Pentachlorodibenzofurans	0.0064	0.011	0.0084	0.0091	0.17
Hexachlorodibenzofurans	0.0089	0.015	0.012	0.013	0.23
Heptachlorodibenzofurans	0.010	0.017	0.013	0.014	0.26
Octachlorodibenzofuran	0.0041	0.0071	0.0054	0.0059	0.11
Total	0.035	0.060	0.046	0.050	0.93

* 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	Laboratory Blank
	pg	pg
Tetrachlorodibenzo-p-dioxins	<5.7	148
Pentachlorodibenzo-p-dioxins	<4.4	21.3
Hexachlorodibenzo-p-dioxins	<6.0	186
Heptachlorodibenzo-p-dioxins	23.0	76.6
Octachlorodibenzo-p-dioxin	<46	47.3
Total	<85.1	479

Furans

Congener Group	Blank Train	Laboratory Blank
	pg	pg
Tetrachlorodibenzofurans	<4.6	<7.3
Pentachlorodibenzofurans	<3.4	<5.0
Hexachlorodibenzofurans	<4.5	<9.9
Heptachlorodibenzofurans	<3.9	<5.3
Octachlorodibenzofuran	<5.6	<12
Total	<22.0	<39.5

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

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

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.2	<0.18	<0.30	<0.23	<0.25	<0.0046
12378-pentachlorodibenzo-p-dioxin	<3.0	<0.44	<0.74	<0.58	<0.62	<0.011
123478-hexachlorodibenzo-p-dioxin	11.1	1.62	2.75	2.14	2.31	0.042
123678-hexachlorodibenzo-p-dioxin	19.9	2.91	4.92	3.83	4.14	0.076
123789-hexachlorodibenzo-p-dioxin	12.3	1.80	3.04	2.37	2.56	0.047
1234678-heptachlorodibenzo-p-dioxin	254	37.1	62.9	48.9	52.9	0.97
Octachlorodibenzo-p-dioxin	510	74.5	126	98.2	106	1.94
2378-tetrachlorodibenzofuran	2.12	0.31	0.52	0.41	0.44	0.0081
12378-pentachlorodibenzofuran	<3.2	<0.47	<0.79	<0.62	<0.67	<0.012
23478-pentachlorodibenzofuran	6.42	0.94	1.59	1.24	1.34	0.024
123478-hexachlorodibenzofuran	7.83	1.14	1.94	1.51	1.63	0.030
123678-hexachlorodibenzofuran	<6.5	<0.95	<1.61	<1.25	<1.35	<0.025
234678-hexachlorodibenzofuran	13.4	1.96	3.32	2.58	2.79	0.051
123789-hexachlorodibenzofuran	<3.3	<0.48	<0.82	<0.64	<0.69	<0.013
1234678-heptachlorodibenzofuran	40.2	5.87	9.95	7.74	8.37	0.15
1234789-heptachlorodibenzofuran	7.55	1.10	1.87	1.45	1.57	0.029
Octachlorodibenzofuran	33.6	4.91	8.31	6.47	7.00	0.13
PCB 81	<57	<8.32	<14.1	<11.0	<11.9	<0.22
PCB 77	<74	<10.8	<18.3	<14.2	<15.4	<0.28
PCB 123	344	50.2	85.1	66.2	71.6	1.31
PCB 118	2330	340	577	448	485	8.88
PCB 114	71.0	10.4	17.6	13.7	14.8	0.27
PCB 105	615	89.8	152	118	128	2.34
PCB 126	<80	<11.7	<19.8	<15.4	<16.7	<0.30
PCB 167	<19	<2.77	<4.70	<3.66	<3.96	<0.072
PCB 156	<46	<6.72	<11.4	<8.85	<9.58	<0.18
PCB 157	<12	<1.75	<2.97	<2.31	<2.50	<0.046
PCB 169	<12	<1.75	<2.97	<2.31	<2.50	<0.046
PCB 189	<8.3	<1.21	<2.05	<1.60	<1.73	<0.032
Total Dioxins & Furans Only	<936	<137	<232	<180	<195	<3.57
Total PCBs Only	<3668	<536	<908	<706	<764	<14.0
Total Dioxins & Furans and PCBs	<4604	<672	<1139	<886	<959	<17.5

Dry Gas Volume Sampled (Rm^3*) :	4.041
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/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 35
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<2.0	<0.28	<0.49	<0.38	<0.40	<0.0075
12378-pentachlorodibenzo-p-dioxin	3.82	0.54	0.93	0.72	0.77	0.014
123478-hexachlorodibenzo-p-dioxin	9.09	1.28	2.21	1.71	1.83	0.034
123678-hexachlorodibenzo-p-dioxin	21.9	3.09	5.33	4.11	4.42	0.083
123789-hexachlorodibenzo-p-dioxin	<8.4	<1.19	<2.04	<1.58	<1.69	<0.032
1234678-heptachlorodibenzo-p-dioxin	269	38.0	65.5	50.5	54.3	1.01
Octachlorodibenzo-p-dioxin	519	73.3	126	97.4	105	1.96
2378-tetrachlorodibenzofuran	<1.8	<0.25	<0.44	<0.34	<0.36	<0.0068
12378-pentachlorodibenzofuran	<3.6	<0.51	<0.88	<0.68	<0.73	<0.014
23478-pentachlorodibenzofuran	6.53	0.92	1.59	1.23	1.32	0.025
123478-hexachlorodibenzofuran	7.28	1.03	1.77	1.37	1.47	0.027
123678-hexachlorodibenzofuran	<6.4	<0.90	<1.56	<1.20	<1.29	<0.024
234678-hexachlorodibenzofuran	12.7	1.79	3.09	2.38	2.56	0.048
123789-hexachlorodibenzofuran	4.18	0.59	1.02	0.78	0.84	0.016
1234678-heptachlorodibenzofuran	40.2	5.68	9.78	7.54	8.11	0.15
1234789-heptachlorodibenzofuran	9.68	1.37	2.36	1.82	1.95	0.037
Octachlorodibenzofuran	29.8	4.21	7.25	5.59	6.01	0.11
PCB 81	<92	<13.0	<22.4	<17.3	<18.6	<0.35
PCB 77	1200	170	292	225	242	4.53
PCB 123	1410	199	343	265	284	5.32
PCB 118	10400	1469	2531	1952	2098	39.2
PCB 114	<360	<50.9	<87.6	<67.6	<72.6	<1.36
PCB 105	3160	446	769	593	637	11.9
PCB 126	<350	<49.4	<85.2	<65.7	<70.6	<1.32
PCB 167	<21	<2.97	<5.11	<3.94	<4.24	<0.079
PCB 156	<73	<10.3	<17.8	<13.7	<14.7	<0.28
PCB 157	<25	<3.53	<6.08	<4.69	<5.04	<0.094
PCB 169	<24	<3.39	<5.84	<4.50	<4.84	<0.091
PCB 189	<11	<1.55	<2.68	<2.06	<2.22	<0.041
Total Dioxins & Furans Only	<955	<135	<233	<179	<193	<3.60
Total PCBs Only	<17126	<2420	<4168	<3214	<3455	<64.6
Total Dioxins & Furans and PCBs	<18081	<2555	<4400	<3393	<3647	<68.2

Dry Gas Volume Sampled (Rm³*) :	4.109
Actual Flowrate (m³/s) :	26.7
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	20.1
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 36
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.5	<0.22	<0.37	<0.28	<0.31	<0.0056
12378-pentachlorodibenzo-p-dioxin	<3.2	<0.46	<0.80	<0.60	<0.66	<0.012
123478-hexachlorodibenzo-p-dioxin	<5.8	<0.84	<1.45	<1.09	<1.19	<0.022
123678-hexachlorodibenzo-p-dioxin	21.7	3.14	5.41	4.09	4.47	0.082
123789-hexachlorodibenzo-p-dioxin	11.4	1.65	2.84	2.15	2.35	0.043
1234678-heptachlorodibenzo-p-dioxin	213	30.8	53.1	40.1	43.8	0.80
Octachlorodibenzo-p-dioxin	378	54.7	94.3	71.2	77.8	1.42
2378-tetrachlorodibenzofuran	<1.5	<0.22	<0.37	<0.28	<0.31	<0.0056
12378-pentachlorodibenzofuran	2.95	0.43	0.74	0.56	0.61	0.011
23478-pentachlorodibenzofuran	<5.3	<0.77	<1.32	<1.00	<1.09	<0.020
123478-hexachlorodibenzofuran	5.26	0.76	1.31	0.99	1.08	0.020
123678-hexachlorodibenzofuran	5.37	0.78	1.34	1.01	1.10	0.020
234678-hexachlorodibenzofuran	<11	<1.59	<2.74	<2.07	<2.26	<0.041
123789-hexachlorodibenzofuran	<4.0	<0.58	<1.00	<0.75	<0.82	<0.015
1234678-heptachlorodibenzofuran	28.6	4.14	7.13	5.38	5.89	0.11
1234789-heptachlorodibenzofuran	<5.5	<0.80	<1.37	<1.04	<1.13	<0.021
Octachlorodibenzofuran	22.7	3.29	5.66	4.27	4.67	0.085
PCB 81	<19	<2.75	<4.74	<3.58	<3.91	<0.072
PCB 77	367	53.2	91.5	69.1	75.5	1.38
PCB 123	<88	<12.7	<21.9	<16.6	<18.1	<0.33
PCB 118	713	103	178	134	147	2.68
PCB 114	30.4	4.40	7.58	5.72	6.26	0.11
PCB 105	328	47.5	81.8	61.8	67.5	1.24
PCB 126	<16	<2.32	<3.99	<3.01	<3.29	<0.060
PCB 167	<54	<7.82	<13.5	<10.2	<11	<0.20
PCB 156	<36	<5.21	<8.98	<6.78	<7.41	<0.14
PCB 157	<17	<2.46	<4.24	<3.20	<3.50	<0.064
PCB 169	<19	<2.75	<4.74	<3.58	<3.91	<0.072
PCB 189	<15	<2.17	<3.74	<2.82	<3.09	<0.056
Total Dioxins & Furans Only	<727	<105	<181	<137	<150	<2.74
Total PCBs Only	<1702	<247	<425	<321	<350	<6.41
Total Dioxins & Furans and PCBs	<2429	<352	<606	<457	<500	<9.15

Dry Gas Volume Sampled (Rm^3*) :	4.010
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/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. 2 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<0.18	<0.28	<0.22	<0.23	24.0
12378-pentachlorodibenzo-p-dioxin	<0.44	0.54	<0.46	<0.48	11.0
123478-hexachlorodibenzo-p-dioxin	1.62	1.28	<0.84	<1.25	31.4
123678-hexachlorodibenzo-p-dioxin	2.91	3.09	3.14	3.05	4.1
123789-hexachlorodibenzo-p-dioxin	1.80	<1.19	1.65	<1.54	20.6
1234678-heptachlorodibenzo-p-dioxin	37.1	38.0	30.8	35.3	11.0
Octachlorodibenzo-p-dioxin	74.5	73.3	54.7	67.5	16.4
2378-tetrachlorodibenzofuran	0.31	<0.25	<0.22	<0.26	17.8
12378-pentachlorodibenzofuran	<0.47	<0.51	0.43	<0.47	8.7
23478-pentachlorodibenzofuran	0.94	0.92	<0.77	<0.88	10.7
123478-hexachlorodibenzofuran	1.14	1.03	0.76	0.98	20.0
123678-hexachlorodibenzofuran	<0.95	<0.90	0.78	<0.88	10.1
234678-hexachlorodibenzofuran	1.96	1.79	<1.59	<1.78	10.2
123789-hexachlorodibenzofuran	<0.48	0.59	<0.58	<0.55	10.9
1234678-heptachlorodibenzofuran	5.87	5.68	4.14	5.23	18.1
1234789-heptachlorodibenzofuran	1.10	1.37	<0.80	<1.09	26.2
Octachlorodibenzofuran	4.91	4.21	3.29	4.13	19.6
PCB 81	<8.32	<13.0	<2.75	<8.02	63.9
PCB 77	<10.8	170	53.2	<77.8	106
PCB 123	50.2	199	<12.7	<87.4	113
PCB 118	340	1469	103	638	114
PCB 114	10.4	<50.9	4.40	<21.9	116
PCB 105	89.8	446	47.5	195	113
PCB 126	<11.7	<49.4	<2.32	<21.1	118
PCB 167	<2.77	<2.97	<7.82	<4.52	63.3
PCB 156	<6.72	<10.3	<5.21	<7.41	35.3
PCB 157	<1.75	<3.53	<2.46	<2.58	34.7
PCB 169	<1.75	<3.39	<2.75	<2.63	31.4
PCB 189	<1.21	<1.55	<2.17	<1.65	29.6
Total Dioxins & Furans Only	<137	<135	<105	<126	14.0
Total PCBs Only	<536	<2420	<247	<1067	111
Total Dioxins & Furans and PCBs	<672	<2555	<352	<1193	99.8

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

TABLE 38
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.30	<0.49	<0.37	<0.39	24.7
12378-pentachlorodibenzo-p-dioxin	<0.74	0.93	<0.80	<0.82	11.7
123478-hexachlorodibenzo-p-dioxin	2.75	2.21	<1.45	<2.14	30.6
123678-hexachlorodibenzo-p-dioxin	4.92	5.33	5.41	5.22	5.0
123789-hexachlorodibenzo-p-dioxin	3.04	<2.04	2.84	<2.64	20.0
1234678-heptachlorodibenzo-p-dioxin	62.9	65.5	53.1	60.5	10.8
Octachlorodibenzo-p-dioxin	126	126	94.3	116	16.0
2378-tetrachlorodibenzofuran	0.52	<0.44	<0.37	<0.45	17.0
12378-pentachlorodibenzofuran	<0.79	<0.88	0.74	<0.80	8.8
23478-pentachlorodibenzofuran	1.59	1.59	<1.32	<1.50	10.3
123478-hexachlorodibenzofuran	1.94	1.77	1.31	1.67	19.4
123678-hexachlorodibenzofuran	<1.61	<1.56	1.34	<1.50	9.5
234678-hexachlorodibenzofuran	3.32	3.09	<2.74	<3.05	9.5
123789-hexachlorodibenzofuran	<0.82	1.02	<1.00	<0.94	11.7
1234678-heptachlorodibenzofuran	9.95	9.78	7.13	8.95	17.6
1234789-heptachlorodibenzofuran	1.87	2.36	<1.37	<1.87	26.4
Octachlorodibenzofuran	8.31	7.25	5.66	7.08	18.9
PCB 81	<14.1	<22.4	<4.74	<13.7	64.3
PCB 77	<18.3	292	91.5	<134	106
PCB 123	85.1	343	<21.9	<150	113
PCB 118	577	2531	178	1095	115
PCB 114	17.6	<87.6	7.58	<37.6	116
PCB 105	152	769	81.8	334	113
PCB 126	<19.8	<85.2	<3.99	<36.3	119
PCB 167	<4.70	<5.11	<13.5	<7.76	63.7
PCB 156	<11.4	<17.8	<8.98	<12.7	35.7
PCB 157	<2.97	<6.08	<4.24	<4.43	35.3
PCB 169	<2.97	<5.84	<4.74	<4.52	32.1
PCB 189	<2.05	<2.68	<3.74	<2.82	30.2
Total Dioxins & Furans Only	<232	<233	<181	<215	13.6
Total PCBs Only	<908	<4168	<425	<1833	111
Total Dioxins & Furans and PCBs	<1139	<4400	<606	<2049	100

* At 25°C and 1 atmosphere

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

TABLE 39
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.23	<0.38	<0.28	<0.30	24.7
12378-pentachlorodibenzo-p-dioxin	<0.58	0.72	<0.60	<0.63	11.8
123478-hexachlorodibenzo-p-dioxin	2.14	1.71	<1.09	<1.64	31.9
123678-hexachlorodibenzo-p-dioxin	3.83	4.11	4.09	4.01	3.9
123789-hexachlorodibenzo-p-dioxin	2.37	<1.58	2.15	<2.03	20.1
1234678-heptachlorodibenzo-p-dioxin	48.9	50.5	40.1	46.5	12.0
Octachlorodibenzo-p-dioxin	98.2	97.4	71.2	88.9	17.3
2378-tetrachlorodibenzofuran	0.41	<0.34	<0.28	<0.34	18.4
12378-pentachlorodibenzofuran	<0.62	<0.68	0.56	<0.62	9.8
23478-pentachlorodibenzofuran	1.24	1.23	<1.00	<1.15	11.7
123478-hexachlorodibenzofuran	1.51	1.37	0.99	1.29	20.7
123678-hexachlorodibenzofuran	<1.25	<1.20	1.01	<1.15	11.0
234678-hexachlorodibenzofuran	2.58	2.38	<2.07	<2.34	10.9
123789-hexachlorodibenzofuran	<0.64	0.78	<0.75	<0.72	10.9
1234678-heptachlorodibenzofuran	7.74	7.54	5.38	6.89	19.0
1234789-heptachlorodibenzofuran	1.45	1.82	<1.04	<1.44	27.2
Octachlorodibenzofuran	6.47	5.59	4.27	5.44	20.3
PCB 81	<11.0	<17.3	<3.58	<10.6	64.6
PCB 77	<14.2	225	69.1	<103	106
PCB 123	66.2	265	<16.6	<116	113
PCB 118	448	1952	134	845	115
PCB 114	13.7	<67.6	5.72	<29.0	116
PCB 105	118	593	61.8	258	113
PCB 126	<15.4	<65.7	<3.01	<28.0	118
PCB 167	<3.66	<3.94	<10.2	<5.92	62.1
PCB 156	<8.85	<13.7	<6.78	<9.78	36.3
PCB 157	<2.31	<4.69	<3.20	<3.40	35.4
PCB 169	<2.31	<4.50	<3.58	<3.46	31.8
PCB 189	<1.60	<2.06	<2.82	<2.16	28.6
Total Dioxins & Furans Only	<180	<179	<137	<165	15.0
Total PCBs Only	<706	<3214	<321	<1414	111
Total Dioxins & Furans and PCBs	<886	<3393	<457	<1579	100

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

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

TABLE 40
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.25	<0.40	<0.31	<0.32	24.2
12378-pentachlorodibenzo-p-dioxin	<0.62	0.77	<0.66	<0.68	11.2
123478-hexachlorodibenzo-p-dioxin	2.31	1.83	<1.19	<1.78	31.5
123678-hexachlorodibenzo-p-dioxin	4.14	4.42	4.47	4.34	4.0
123789-hexachlorodibenzo-p-dioxin	2.56	<1.69	2.35	<2.20	20.5
1234678-heptachlorodibenzo-p-dioxin	52.9	54.3	43.8	50.3	11.3
Octachlorodibenzo-p-dioxin	106	105	77.8	96.2	16.6
2378-tetrachlorodibenzofuran	0.44	<0.36	<0.31	<0.37	18.0
12378-pentachlorodibenzofuran	<0.67	<0.73	0.61	<0.67	8.9
23478-pentachlorodibenzofuran	1.34	1.32	<1.09	<1.25	11.0
123478-hexachlorodibenzofuran	1.63	1.47	1.08	1.39	20.2
123678-hexachlorodibenzofuran	<1.35	<1.29	1.10	<1.25	10.3
234678-hexachlorodibenzofuran	2.79	2.56	<2.26	<2.54	10.4
123789-hexachlorodibenzofuran	<0.69	0.84	<0.82	<0.78	10.8
1234678-heptachlorodibenzofuran	8.37	8.11	5.89	7.46	18.3
1234789-heptachlorodibenzofuran	1.57	1.95	<1.13	<1.55	26.5
Octachlorodibenzofuran	7.00	6.01	4.67	5.89	19.8
PCB 81	<11.9	<18.6	<3.91	<11.4	64.1
PCB 77	<15.4	242	75.5	<111	106
PCB 123	71.6	284	<18.1	<125	113
PCB 118	485	2098	147	910	115
PCB 114	14.8	<72.6	6.26	<31.2	116
PCB 105	128	637	67.5	278	113
PCB 126	<16.7	<70.6	<3.29	<30.2	118
PCB 167	<3.96	<4.24	<11	<6.43	63.0
PCB 156	<9.58	<14.7	<7.41	<10.6	35.6
PCB 157	<2.50	<5.04	<3.50	<3.68	34.8
PCB 169	<2.50	<4.84	<3.91	<3.75	31.4
PCB 189	<1.73	<2.22	<3.09	<2.34	29.3
Total Dioxins & Furans Only	<195	<193	<150	<179	14.3
Total PCBs Only	<764	<3455	<350	<1523	111
Total Dioxins & Furans and PCBs	<959	<3647	<500	<1702	99.9

* At 25°C and 1 atmosphere

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

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.0046	<0.0075	<0.0056	<0.0059	25.4
12378-pentachlorodibenzo-p-dioxin	<0.011	0.014	<0.012	<0.013	12.4
123478-hexachlorodibenzo-p-dioxin	0.042	0.034	<0.022	<0.033	31.4
123678-hexachlorodibenzo-p-dioxin	0.076	0.083	0.082	0.080	4.6
123789-hexachlorodibenzo-p-dioxin	0.047	<0.032	0.043	<0.040	19.5
1234678-heptachlorodibenzo-p-dioxin	0.97	1.01	0.80	0.93	12.0
Octachlorodibenzo-p-dioxin	1.94	1.96	1.42	1.77	17.2
2378-tetrachlorodibenzofuran	0.0081	<0.0068	<0.0056	<0.0068	17.8
12378-pentachlorodibenzofuran	<0.012	<0.014	0.011	<0.012	10.1
23478-pentachlorodibenzofuran	0.024	0.025	<0.020	<0.023	11.5
123478-hexachlorodibenzofuran	0.030	0.027	0.020	0.026	20.4
123678-hexachlorodibenzofuran	<0.025	<0.024	0.020	<0.023	10.7
234678-hexachlorodibenzofuran	0.051	0.048	<0.041	<0.047	10.5
123789-hexachlorodibenzofuran	<0.013	0.016	<0.015	<0.014	11.6
1234678-heptachlorodibenzofuran	0.15	0.15	0.11	0.14	18.8
1234789-heptachlorodibenzofuran	0.029	0.037	<0.021	<0.029	27.6
Octachlorodibenzofuran	0.13	0.11	0.085	0.11	19.8
PCB 81	<0.22	<0.35	<0.072	<0.21	65.0
PCB 77	<0.28	4.53	1.38	<2.06	107
PCB 123	1.31	5.32	<0.33	<2.32	114
PCB 118	8.88	39.2	2.68	16.9	116
PCB 114	0.27	<1.36	0.11	<0.58	117
PCB 105	2.34	11.9	1.24	5.17	114
PCB 126	<0.30	<1.32	<0.060	<0.56	119
PCB 167	<0.072	<0.079	<0.20	<0.12	62.3
PCB 156	<0.18	<0.28	<0.14	<0.20	36.9
PCB 157	<0.046	<0.094	<0.064	<0.068	36.1
PCB 169	<0.046	<0.091	<0.072	<0.069	32.5
PCB 189	<0.032	<0.041	<0.056	<0.043	29.0
Total Dioxins & Furans Only	<3.57	<3.60	<2.74	<3.30	14.8
Total PCBs Only	<14.0	<64.6	<6.41	<28.3	112
Total Dioxins & Furans and PCBs	<17.5	<68.2	<9.15	<31.6	101

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

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.23	<0.39	<0.30	<0.32	<0.0059
12378-pentachlorodibenzo-p-dioxin	<0.48	<0.82	<0.63	<0.68	<0.013
123478-hexachlorodibenzo-p-dioxin	<1.25	<2.14	<1.64	<1.78	<0.033
123678-hexachlorodibenzo-p-dioxin	3.05	5.22	4.01	4.34	0.080
123789-hexachlorodibenzo-p-dioxin	<1.54	<2.64	<2.03	<2.20	<0.040
1234678-heptachlorodibenzo-p-dioxin	35.3	60.5	46.5	50.3	0.93
Octachlorodibenzo-p-dioxin	67.5	116	88.9	96.2	1.77
2378-tetrachlorodibenzofuran	<0.26	<0.45	<0.34	<0.37	<0.0068
12378-pentachlorodibenzofuran	<0.47	<0.80	<0.62	<0.67	<0.012
23478-pentachlorodibenzofuran	<0.88	<1.50	<1.15	<1.25	<0.023
123478-hexachlorodibenzofuran	0.98	1.67	1.29	1.39	0.026
123678-hexachlorodibenzofuran	<0.88	<1.50	<1.15	<1.25	<0.023
234678-hexachlorodibenzofuran	<1.78	<3.05	<2.34	<2.54	<0.047
123789-hexachlorodibenzofuran	<0.55	<0.94	<0.72	<0.78	<0.014
1234678-heptachlorodibenzofuran	5.23	8.95	6.89	7.46	0.14
1234789-heptachlorodibenzofuran	<1.09	<1.87	<1.44	<1.55	<0.029
Octachlorodibenzofuran	4.13	7.08	5.44	5.89	0.11
PCB 81	<8.02	<13.7	<10.6	<11.4	<0.21
PCB 77	<77.8	<134	<103	<111	<2.06
PCB 123	<87.4	<150	<116	<125	<2.32
PCB 118	638	1095	845	910	16.9
PCB 114	<21.9	<37.6	<29.0	<31.2	<0.58
PCB 105	195	334	258	278	5.17
PCB 126	<21.1	<36.3	<28.0	<30.2	<0.56
PCB 167	<4.52	<7.76	<5.92	<6.43	<0.12
PCB 156	<7.41	<12.7	<9.78	<10.6	<0.20
PCB 157	<2.58	<4.43	<3.40	<3.68	<0.068
PCB 169	<2.63	<4.52	<3.46	<3.75	<0.069
PCB 189	<1.65	<2.82	<2.16	<2.34	<0.043
Total Dioxins & Furans Only	<126	<215	<165	<179	<3.30
Total PCBs Only	<1067	<1833	<1414	<1523	<28.3
Total Dioxins & Furans and PCBs	<1193	<2049	<1579	<1702	<31.6

* 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 43
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<5.7	<29
12378-pentachlorodibenzo-p-dioxin	<4.4	<5.6
123478-hexachlorodibenzo-p-dioxin	<6.0	<13
123678-hexachlorodibenzo-p-dioxin	<3.9	<8.7
123789-hexachlorodibenzo-p-dioxin	<4.3	<9.7
1234678-heptachlorodibenzo-p-dioxin	23.0	34.9
Octachlorodibenzo-p-dioxin	<46	47.3
2378-tetrachlorodibenzofuran	<4.6	<7.3
12378-pentachlorodibenzofuran	<3.4	<5.0
23478-pentachlorodibenzofuran	<3.0	<4.5
123478-hexachlorodibenzofuran	<4.0	<8.8
123678-hexachlorodibenzofuran	<3.2	<7.0
234678-hexachlorodibenzofuran	<3.7	<8.1
123789-hexachlorodibenzofuran	<4.5	<9.9
1234678-heptachlorodibenzofuran	<2.9	<4.0
1234789-heptachlorodibenzofuran	<3.9	<5.3
Octachlorodibenzofuran	<5.6	<12
PCB 81	<20	<81
PCB 77	<25	<100
PCB 123	<8.6	<52
PCB 118	<42	<41
PCB 114	<7.0	<46
PCB 105	26.1	<48
PCB 126	<7.2	<49
PCB 167	<23	<42
PCB 156	<11	<44
PCB 157	<5.1	<47
PCB 169	<5.4	<52
PCB 189	<3.2	<34
Total Dioxins & Furans Only	<132	<220
Total PCBs Only	<184	<636
Total Dioxins & Furans and PCBs	<316	<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 44
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.18	<0.28	<0.22	<0.23
12378-pentachlorodibenzo-p-dioxin	1.000	<0.44	0.54	<0.46	<0.48
123478-hexachlorodibenzo-p-dioxin	0.100	0.16	0.13	<0.084	<0.12
123678-hexachlorodibenzo-p-dioxin	0.100	0.29	0.31	0.31	0.30
123789-hexachlorodibenzo-p-dioxin	0.100	0.18	<0.12	0.17	<0.15
1234678-heptachlorodibenzo-p-dioxin	0.010	0.37	0.38	0.31	0.35
Octachlorodibenzo-p-dioxin	0.0003	0.022	0.022	0.016	0.020
2378-tetrachlorodibenzofuran	0.100	0.031	<0.025	<0.022	<0.026
12378-pentachlorodibenzofuran	0.030	<0.014	<0.015	0.013	<0.014
23478-pentachlorodibenzofuran	0.300	0.28	0.28	<0.23	<0.26
123478-hexachlorodibenzofuran	0.100	0.11	0.10	0.076	0.098
123678-hexachlorodibenzofuran	0.100	<0.095	<0.090	0.078	<0.088
234678-hexachlorodibenzofuran	0.100	0.20	0.18	<0.16	<0.18
123789-hexachlorodibenzofuran	0.100	<0.048	0.059	<0.058	<0.055
1234678-heptachlorodibenzofuran	0.010	0.059	0.057	0.041	0.052
1234789-heptachlorodibenzofuran	0.010	0.011	0.014	<0.0080	<0.011
Octachlorodibenzofuran	0.0003	0.0015	0.0013	0.00099	0.0012
PCB 81	0.0003	<0.0025	<0.0039	<0.00083	<0.0024
PCB 77	0.0001	<0.0011	0.017	0.0053	<0.0078
PCB 123	0.00003	0.0015	0.0060	<0.00038	<0.0026
PCB 118	0.00003	0.010	0.044	0.0031	0.019
PCB 114	0.00003	0.00031	<0.0015	0.00013	<0.00066
PCB 105	0.00003	0.0027	0.013	0.0014	0.0058
PCB 126	0.100	<1.17	<4.94	<0.23	<2.11
PCB 167	0.00003	<0.000083	<0.000089	<0.00023	<0.00014
PCB 156	0.00003	<0.00020	<0.00031	<0.00016	<0.00022
PCB 157	0.00003	<0.000053	<0.00011	<0.000074	<0.000077
PCB 169	0.030	<0.053	<0.10	<0.083	<0.079
PCB 189	0.00003	<0.000036	<0.000047	<0.000065	<0.000049
Total Dioxins & Furans Only		<2.49	<2.60	<2.26	<2.45
Total PCBs Only		<1.24	<5.13	<0.33	<2.23
Total Dioxins & Furans and PCBs		<3.73	<7.73	<2.58	<4.68

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

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

TABLE 45
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.30	<0.49	<0.37	<0.39
12378-pentachlorodibenzo-p-dioxin	1.000	<0.74	0.93	<0.80	<0.82
123478-hexachlorodibenzo-p-dioxin	0.100	0.27	0.22	<0.14	<0.21
123678-hexachlorodibenzo-p-dioxin	0.100	0.49	0.53	0.54	0.52
123789-hexachlorodibenzo-p-dioxin	0.100	0.30	<0.20	0.28	<0.26
1234678-heptachlorodibenzo-p-dioxin	0.010	0.63	0.65	0.53	0.60
Octachlorodibenzo-p-dioxin	0.0003	0.038	0.038	0.028	0.035
2378-tetrachlorodibenzofuran	0.100	0.052	<0.044	<0.037	<0.045
12378-pentachlorodibenzofuran	0.030	<0.024	<0.026	0.022	<0.024
23478-pentachlorodibenzofuran	0.300	0.48	0.48	<0.40	<0.45
123478-hexachlorodibenzofuran	0.100	0.19	0.18	0.13	0.17
123678-hexachlorodibenzofuran	0.100	<0.16	<0.16	0.13	<0.15
234678-hexachlorodibenzofuran	0.100	0.33	0.31	<0.27	<0.30
123789-hexachlorodibenzofuran	0.100	<0.082	0.10	<0.10	<0.094
1234678-heptachlorodibenzofuran	0.010	0.099	0.098	0.071	0.090
1234789-heptachlorodibenzofuran	0.010	0.019	0.024	<0.014	<0.019
Octachlorodibenzofuran	0.0003	0.0025	0.0022	0.0017	0.0021
PCB 81	0.0003	<0.0042	<0.0067	<0.0014	<0.0041
PCB 77	0.0001	<0.0018	0.029	0.0092	<0.013
PCB 123	0.00003	0.0026	0.010	<0.00066	<0.0045
PCB 118	0.00003	0.017	0.076	0.0053	0.033
PCB 114	0.00003	0.00053	<0.0026	0.00023	<0.0011
PCB 105	0.00003	0.0046	0.023	0.0025	0.010
PCB 126	0.100	<1.98	<8.52	<0.40	<3.63
PCB 167	0.00003	<0.00014	<0.00015	<0.00040	<0.00023
PCB 156	0.00003	<0.00034	<0.00053	<0.00027	<0.00038
PCB 157	0.00003	<0.000089	<0.00018	<0.00013	<0.00013
PCB 169	0.030	<0.089	<0.18	<0.14	<0.14
PCB 189	0.00003	<0.000062	<0.000080	<0.00011	<0.000085
Total Dioxins & Furans Only		<4.22	<4.48	<3.88	<4.19
Total PCBs Only		<2.10	<8.84	<0.56	<3.83
Total Dioxins & Furans and PCBs		<6.32	<13.32	<4.44	<8.03

* At 25°C and 1 atmosphere

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

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

TABLE 46
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.23	<0.38	<0.28	<0.30
12378-pentachlorodibenzo-p-dioxin	1.000	<0.58	0.72	<0.60	<0.63
123478-hexachlorodibenzo-p-dioxin	0.100	0.21	0.17	<0.11	<0.16
123678-hexachlorodibenzo-p-dioxin	0.100	0.38	0.41	0.41	0.40
123789-hexachlorodibenzo-p-dioxin	0.100	0.24	<0.16	0.21	<0.20
1234678-heptachlorodibenzo-p-dioxin	0.010	0.49	0.50	0.40	0.46
Octachlorodibenzo-p-dioxin	0.0003	0.029	0.029	0.021	0.027
2378-tetrachlorodibenzofuran	0.100	0.041	<0.034	<0.028	<0.034
12378-pentachlorodibenzofuran	0.030	<0.018	<0.020	0.017	<0.018
23478-pentachlorodibenzofuran	0.300	0.37	0.37	<0.30	<0.35
123478-hexachlorodibenzofuran	0.100	0.15	0.14	0.099	0.13
123678-hexachlorodibenzofuran	0.100	<0.13	<0.12	0.10	<0.12
234678-hexachlorodibenzofuran	0.100	0.26	0.24	<0.21	<0.23
123789-hexachlorodibenzofuran	0.100	<0.064	0.078	<0.075	<0.072
1234678-heptachlorodibenzofuran	0.010	0.077	0.075	0.054	0.069
1234789-heptachlorodibenzofuran	0.010	0.015	0.018	<0.010	<0.014
Octachlorodibenzofuran	0.0003	0.0019	0.0017	0.0013	0.0016
PCB 81	0.0003	<0.0033	<0.0052	<0.0011	<0.0032
PCB 77	0.0001	<0.0014	0.023	0.0069	<0.010
PCB 123	0.00003	0.0020	0.0079	<0.00050	<0.0035
PCB 118	0.00003	0.013	0.059	0.0040	0.025
PCB 114	0.00003	0.00041	<0.0020	0.00017	<0.00087
PCB 105	0.00003	0.0036	0.018	0.0019	0.0077
PCB 126	0.100	<1.54	<6.57	<0.30	<2.80
PCB 167	0.00003	<0.00011	<0.00012	<0.00031	<0.00018
PCB 156	0.00003	<0.00027	<0.00041	<0.00020	<0.00029
PCB 157	0.00003	<0.000069	<0.00014	<0.000096	<0.00010
PCB 169	0.030	<0.069	<0.14	<0.11	<0.10
PCB 189	0.00003	<0.000048	<0.000062	<0.000085	<0.000065
Total Dioxins & Furans Only		<3.28	<3.46	<2.93	<3.22
Total PCBs Only		<1.63	<6.82	<0.42	<2.96
Total Dioxins & Furans and PCBs		<4.91	<10.3	<3.36	<6.18

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

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

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

TABLE 46A
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.12	0.19	0.14	0.15
12378-pentachlorodibenzo-p-dioxin	1.000	0.29	0.72	0.30	0.44
123478-hexachlorodibenzo-p-dioxin	0.100	0.21	0.17	0.055	0.15
123678-hexachlorodibenzo-p-dioxin	0.100	0.38	0.41	0.41	0.40
123789-hexachlorodibenzo-p-dioxin	0.100	0.24	0.079	0.21	0.18
1234678-heptachlorodibenzo-p-dioxin	0.010	0.49	0.50	0.40	0.46
Octachlorodibenzo-p-dioxin	0.0003	0.029	0.029	0.021	0.027
2378-tetrachlorodibenzofuran	0.100	0.041	0.017	0.014	0.024
12378-pentachlorodibenzofuran	0.030	0.0092	0.010	0.017	0.012
23478-pentachlorodibenzofuran	0.300	0.37	0.37	0.15	0.30
123478-hexachlorodibenzofuran	0.100	0.15	0.14	0.099	0.13
123678-hexachlorodibenzofuran	0.100	0.063	0.06	0.10	0.075
234678-hexachlorodibenzofuran	0.100	0.26	0.24	0.10	0.20
123789-hexachlorodibenzofuran	0.100	0.032	0.078	0.038	0.049
1234678-heptachlorodibenzofuran	0.010	0.077	0.075	0.054	0.069
1234789-heptachlorodibenzofuran	0.010	0.015	0.018	0.0052	0.013
Octachlorodibenzofuran	0.0003	0.0019	0.0017	0.0013	0.0016
PCB 81	0.0003	0.0016	0.0026	0.00054	0.0016
PCB 77	0.0001	0.00071	0.023	0.0069	0.010
PCB 123	0.00003	0.0020	0.0079	0.00025	0.0034
PCB 118	0.00003	0.013	0.059	0.0040	0.025
PCB 114	0.00003	0.00041	0.0010	0.00017	0.00053
PCB 105	0.00003	0.0036	0.018	0.0019	0.0077
PCB 126	0.100	0.77	3.28	0.15	1.40
PCB 167	0.00003	0.000055	0.000059	0.00015	0.000089
PCB 156	0.00003	0.00013	0.00021	0.00010	0.00015
PCB 157	0.00003	0.000035	0.000070	0.000048	0.000051
PCB 169	0.030	0.035	0.068	0.054	0.052
PCB 189	0.00003	0.000024	0.000031	0.000042	0.000032
Total Dioxins & Furans Only		2.77	3.10	2.12	2.67
Total PCBs Only		0.83	3.46	0.22	1.50
Total Dioxins & Furans and PCBs		3.60	6.57	2.34	4.17

* 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	<0.23	<0.38	<0.28	<0.30
12378-pentachlorodibenzo-p-dioxin	0.500	<0.29	0.36	<0.30	<0.32
123478-hexachlorodibenzo-p-dioxin	0.100	0.21	0.17	<0.11	<0.16
123678-hexachlorodibenzo-p-dioxin	0.100	0.38	0.41	0.41	0.40
123789-hexachlorodibenzo-p-dioxin	0.100	0.24	<0.16	0.21	<0.20
1234678-heptachlorodibenzo-p-dioxin	0.010	0.49	0.50	0.40	0.46
Octachlorodibenzo-p-dioxin	0.001	0.098	0.097	0.071	0.089
2378-tetrachlorodibenzofuran	0.100	0.041	<0.034	<0.028	<0.034
12378-pentachlorodibenzofuran	0.050	<0.031	<0.034	0.028	<0.031
23478-pentachlorodibenzofuran	0.500	0.62	0.61	<0.50	<0.58
123478-hexachlorodibenzofuran	0.100	0.15	0.14	0.099	0.13
123678-hexachlorodibenzofuran	0.100	<0.13	<0.12	0.10	<0.12
234678-hexachlorodibenzofuran	0.100	0.26	0.24	<0.21	<0.23
123789-hexachlorodibenzofuran	0.100	<0.064	0.078	<0.075	<0.072
1234678-heptachlorodibenzofuran	0.010	0.077	0.075	0.054	0.069
1234789-heptachlorodibenzofuran	0.010	0.015	0.018	<0.010	<0.014
Octachlorodibenzofuran	0.001	0.0065	0.0056	0.0043	0.0054
Total Dioxins & Furans		<3.33	<3.43	<2.89	<3.22
In-Stack Emission Limit					60

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

NATO/CCMS (1989) Toxicity Equivalency Factors

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

TABLE 47
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.25	<0.40	<0.31	<0.32
12378-pentachlorodibenzo-p-dioxin	1.000	<0.62	0.77	<0.66	<0.68
123478-hexachlorodibenzo-p-dioxin	0.100	0.23	0.18	<0.12	<0.18
123678-hexachlorodibenzo-p-dioxin	0.100	0.41	0.44	0.45	0.43
123789-hexachlorodibenzo-p-dioxin	0.100	0.26	<0.17	0.23	<0.22
1234678-heptachlorodibenzo-p-dioxin	0.010	0.53	0.54	0.44	0.50
Octachlorodibenzo-p-dioxin	0.0003	0.032	0.031	0.023	0.029
2378-tetrachlorodibenzofuran	0.100	0.044	<0.036	<0.031	<0.037
12378-pentachlorodibenzofuran	0.030	<0.020	<0.022	0.018	<0.020
23478-pentachlorodibenzofuran	0.300	0.40	0.40	<0.33	<0.37
123478-hexachlorodibenzofuran	0.100	0.16	0.15	0.11	0.14
123678-hexachlorodibenzofuran	0.100	<0.14	<0.13	0.11	<0.12
234678-hexachlorodibenzofuran	0.100	0.28	0.26	<0.23	<0.25
123789-hexachlorodibenzofuran	0.100	<0.069	0.084	<0.082	<0.078
1234678-heptachlorodibenzofuran	0.010	0.084	0.081	0.059	0.075
1234789-heptachlorodibenzofuran	0.010	0.016	0.020	<0.011	<0.016
Octachlorodibenzofuran	0.0003	0.0021	0.0018	0.0014	0.0018
PCB 81	0.0003	<0.0036	<0.0056	<0.0012	<0.0034
PCB 77	0.0001	<0.0015	0.024	0.0076	<0.011
PCB 123	0.00003	0.0021	0.0085	<0.00054	<0.0037
PCB 118	0.00003	0.015	0.063	0.0044	0.027
PCB 114	0.00003	0.00044	<0.0022	0.00019	<0.00094
PCB 105	0.00003	0.0038	0.019	0.0020	0.0083
PCB 126	0.100	<1.67	<7.06	<0.33	<3.02
PCB 167	0.00003	<0.00012	<0.00013	<0.00033	<0.00019
PCB 156	0.00003	<0.00029	<0.00044	<0.00022	<0.00032
PCB 157	0.00003	<0.000075	<0.00015	<0.00010	<0.00011
PCB 169	0.030	<0.075	<0.15	<0.12	<0.11
PCB 189	0.00003	<0.000052	<0.000067	<0.000093	<0.000070
Total Dioxins & Furans Only		<3.55	<3.71	<3.20	<3.49
Total PCBs Only		<1.77	<7.33	<0.46	<3.19
Total Dioxins & Furans and PCBs		<5.32	<11.0	<3.67	<6.68

* At 25°C and 1 atmosphere

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

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

TABLE 48
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.0046	<0.0075	<0.0056	<0.0059
12378-pentachlorodibenzo-p-dioxin	1.000	<0.011	0.014	<0.012	<0.013
123478-hexachlorodibenzo-p-dioxin	0.100	0.0042	0.0034	<0.0022	<0.0033
123678-hexachlorodibenzo-p-dioxin	0.100	0.0076	0.0083	0.0082	0.0080
123789-hexachlorodibenzo-p-dioxin	0.100	0.0047	<0.0032	0.0043	<0.0040
1234678-heptachlorodibenzo-p-dioxin	0.010	0.0097	0.010	0.0080	0.0093
Octachlorodibenzo-p-dioxin	0.0003	0.00058	0.00059	0.00043	0.00053
2378-tetrachlorodibenzofuran	0.100	0.00081	<0.00068	<0.00056	<0.00068
12378-pentachlorodibenzofuran	0.030	<0.00037	<0.00041	0.00033	<0.00037
23478-pentachlorodibenzofuran	0.300	0.0073	0.0074	<0.0060	<0.0069
123478-hexachlorodibenzofuran	0.100	0.0030	0.0027	0.0020	0.0026
123678-hexachlorodibenzofuran	0.100	<0.0025	<0.0024	0.0020	<0.0023
234678-hexachlorodibenzofuran	0.100	0.0051	0.0048	<0.0041	<0.0047
123789-hexachlorodibenzofuran	0.100	<0.0013	0.0016	<0.0015	<0.0014
1234678-heptachlorodibenzofuran	0.010	0.0015	0.0015	0.0011	0.0014
1234789-heptachlorodibenzofuran	0.010	0.00029	0.00037	<0.00021	<0.00029
Octachlorodibenzofuran	0.0003	0.000038	0.000034	0.000026	0.000033
PCB 81	0.0003	<0.000065	<0.00010	<0.000021	<0.000064
PCB 77	0.0001	<0.000028	0.00045	0.00014	<0.00021
PCB 123	0.00003	0.000039	0.00016	<0.0000099	<0.000070
PCB 118	0.00003	0.00027	0.0012	0.000081	0.00051
PCB 114	0.00003	0.0000081	<0.000041	0.0000034	<0.000017
PCB 105	0.00003	0.000070	0.00036	0.000037	0.00015
PCB 126	0.100	<0.030	<0.13	<0.0060	<0.056
PCB 167	0.00003	<0.0000022	<0.0000024	<0.0000061	<0.0000035
PCB 156	0.00003	<0.0000053	<0.0000083	<0.0000041	<0.0000059
PCB 157	0.00003	<0.0000014	<0.0000028	<0.0000019	<0.0000020
PCB 169	0.030	<0.0014	<0.0027	<0.0021	<0.0021
PCB 189	0.00003	<0.00000095	<0.0000012	<0.0000017	<0.0000013
Total Dioxins & Furans Only		<0.065	<0.069	<0.059	<0.064
Total PCBs Only		<0.032	<0.14	<0.0085	<0.059
Total Dioxins & Furans and PCBs		<0.097	<0.21	<0.067	<0.12

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	<0.23	<0.39	<0.30	<0.32	<0.0059
12378-pentachlorodibenzo-p-dioxin	<0.48	<0.82	<0.63	<0.68	<0.013
123478-hexachlorodibenzo-p-dioxin	<0.12	<0.21	<0.16	<0.18	<0.0033
123678-hexachlorodibenzo-p-dioxin	0.30	0.52	0.40	0.43	0.0080
123789-hexachlorodibenzo-p-dioxin	<0.15	<0.26	<0.20	<0.22	<0.0040
1234678-heptachlorodibenzo-p-dioxin	0.35	0.60	0.46	0.50	0.0093
Octachlorodibenzo-p-dioxin	0.020	0.035	0.027	0.029	0.00053
2378-tetrachlorodibenzofuran	<0.026	<0.045	<0.034	<0.037	<0.00068
12378-pentachlorodibenzofuran	<0.014	<0.024	<0.018	<0.020	<0.00037
23478-pentachlorodibenzofuran	<0.26	<0.45	<0.35	<0.37	<0.0069
123478-hexachlorodibenzofuran	0.098	0.17	0.13	0.14	0.0026
123678-hexachlorodibenzofuran	<0.088	<0.15	<0.12	<0.12	<0.0023
234678-hexachlorodibenzofuran	<0.18	<0.30	<0.23	<0.25	<0.0047
123789-hexachlorodibenzofuran	<0.055	<0.094	<0.072	<0.078	<0.0014
1234678-heptachlorodibenzofuran	0.052	0.090	0.069	0.075	0.0014
1234789-heptachlorodibenzofuran	<0.011	<0.019	<0.014	<0.016	<0.00029
Octachlorodibenzofuran	0.0012	0.0021	0.0016	0.0018	0.000033
PCB 81	<0.0024	<0.0041	<0.0032	<0.0034	<0.000064
PCB 77	<0.0078	<0.013	<0.010	<0.011	<0.00021
PCB 123	<0.0026	<0.0045	<0.0035	<0.0037	<0.000070
PCB 118	0.019	0.033	0.025	0.027	0.00051
PCB 114	<0.00066	<0.0011	<0.00087	<0.00094	<0.000017
PCB 105	0.0058	0.010	0.0077	0.0083	0.00015
PCB 126	<2.11	<3.63	<2.80	<3.02	<0.056
PCB 167	<0.00014	<0.00023	<0.00018	<0.00019	<0.0000035
PCB 156	<0.00022	<0.00038	<0.00029	<0.00032	<0.0000059
PCB 157	<0.000077	<0.00013	<0.00010	<0.00011	<0.0000020
PCB 169	<0.079	<0.14	<0.10	<0.11	<0.0021
PCB 189	<0.000049	<0.000085	<0.000065	<0.000070	<0.0000013
Total Dioxins & Furans Only	<2.45	<4.19	<3.22	<3.49	<0.064
Total PCBs Only	<2.23	<3.83	<2.96	<3.19	<0.059
Total Dioxins & Furans and PCBs	<4.68	<8.03	<6.18	<6.68	<0.12

* At 25°C and 1 atmosphere

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

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

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

TABLE 50
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm³**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.11	0.19	0.15	0.16	0.0030
12378-pentachlorodibenzo-p-dioxin	0.33	0.57	0.44	0.47	0.0087
123478-hexachlorodibenzo-p-dioxin	0.11	0.19	0.15	0.16	0.0029
123678-hexachlorodibenzo-p-dioxin	0.30	0.52	0.40	0.43	0.0080
123789-hexachlorodibenzo-p-dioxin	0.13	0.23	0.18	0.19	0.0035
1234678-heptachlorodibenzo-p-dioxin	0.35	0.60	0.46	0.50	0.0093
Octachlorodibenzo-p-dioxin	0.020	0.035	0.027	0.029	0.00053
2378-tetrachlorodibenzofuran	0.018	0.031	0.024	0.026	0.00048
12378-pentachlorodibenzofuran	0.0092	0.016	0.012	0.013	0.00024
23478-pentachlorodibenzofuran	0.22	0.38	0.30	0.32	0.0059
123478-hexachlorodibenzofuran	0.098	0.17	0.13	0.14	0.0026
123678-hexachlorodibenzofuran	0.057	0.097	0.075	0.081	0.0015
234678-hexachlorodibenzofuran	0.15	0.26	0.20	0.22	0.0040
123789-hexachlorodibenzofuran	0.037	0.064	0.049	0.053	0.00099
1234678-heptachlorodibenzofuran	0.052	0.090	0.069	0.075	0.0014
1234789-heptachlorodibenzofuran	0.0096	0.016	0.013	0.014	0.00025
Octachlorodibenzofuran	0.0012	0.0021	0.0016	0.0018	0.000033
PCB 81	0.0012	0.0021	0.0016	0.0017	0.000032
PCB 77	0.0076	0.013	0.010	0.011	0.00020
PCB 123	0.0026	0.0044	0.0034	0.0037	0.000068
PCB 118	0.019	0.033	0.025	0.027	0.00051
PCB 114	0.00040	0.00069	0.00053	0.00057	0.000011
PCB 105	0.0058	0.010	0.0077	0.0083	0.00015
PCB 126	1.06	1.82	1.40	1.51	0.028
PCB 167	0.000068	0.00012	0.000089	0.000097	0.0000018
PCB 156	0.00011	0.00019	0.00015	0.00016	0.0000029
PCB 157	0.000039	0.000066	0.000051	0.000055	0.0000010
PCB 169	0.039	0.068	0.052	0.056	0.0010
PCB 189	0.000025	0.000042	0.000032	0.000035	0.00000065
Total Dioxins & Furans Only	2.02	3.47	2.67	2.89	0.053
Total PCBs Only	1.13	1.95	1.50	1.62	0.030
Total Dioxins & Furans and PCBs	3.16	5.42	4.17	4.50	0.083

* At 25°C and 1 atmosphere

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

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

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

TABLE 51
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2160	315	535	416	450	8.23
1,3-Dichlorobenzene	299	43.7	74.0	57.5	62.3	1.14
1,4-Dichlorobenzene	248	36.2	61.4	47.7	51.6	0.95
1,2-Dichlorobenzene	270	39.4	66.8	52.0	56.2	1.03
Total Dichlorobenzene	817	119	202	157	170	3.11
1,3,5-trichlorobenzene	14.2	2.07	3.51	2.73	2.96	0.054
1,2,4-trichlorobenzene	46.3	6.76	11.5	8.91	9.64	0.18
1,2,3-trichlorobenzene	15.3	2.23	3.79	2.94	3.19	0.058
Total Trichlorobenzene	76	11.1	18.8	14.6	15.8	0.29
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	12.7	1.85	3.14	2.44	2.64	0.048
1,2,3,4-tetrachlorobenzene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Total Tetrachlorobenzene	<22.7	<3.31	<5.62	<4.37	<4.73	<0.087
Pentachlorobenzene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Hexachlorobenzene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Total Chlorobenzenes	<3096	<452	<766	<596	<645	<11.8

Dry Gas Volume Sampled (Rm^3*) :	4.041
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/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 52
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1820	257	443	342	367	6.87
1,3-Dichlorobenzene	230	32.5	56.0	43.2	46.4	0.87
1,4-Dichlorobenzene	173	24.4	42.1	32.5	34.9	0.65
1,2-Dichlorobenzene	120	17.0	29.2	22.5	24.2	0.45
Total Dichlorobenzene	523	73.9	127	98.2	106	1.97
1,3,5-trichlorobenzene	14.1	1.99	3.43	2.65	2.84	0.053
1,2,4-trichlorobenzene	47.2	6.67	11.5	8.86	9.52	0.18
1,2,3-trichlorobenzene	14.3	2.02	3.48	2.68	2.88	0.054
Total Trichlorobenzene	76	10.7	18.4	14.2	15.3	0.29
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	12.7	1.79	3.09	2.38	2.56	0.048
1,2,3,4-tetrachlorobenzene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Total Tetrachlorobenzene	<22.7	<3.21	<5.52	<4.26	<4.58	<0.086
Pentachlorobenzene	10.4	1.47	2.53	1.95	2.10	0.039
Hexachlorobenzene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Total Chlorobenzenes	<2462	<348	<599	<462	<497	<9.29

Dry Gas Volume Sampled (Rm^3*) :	4.109
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
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 53
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1380	200	344	260	284	5.20
1,3-Dichlorobenzene	195	28.2	48.6	36.7	40.1	0.73
1,4-Dichlorobenzene	130	18.8	32.4	24.5	26.8	0.49
1,2-Dichlorobenzene	90.5	13.1	22.6	17.0	18.6	0.34
Total Dichlorobenzene	416	60.2	104	78.2	85.5	1.56
1,3,5-trichlorobenzene	13.2	1.91	3.29	2.49	2.72	0.050
1,2,4-trichlorobenzene	24.0	3.48	5.99	4.52	4.94	0.090
1,2,3-trichlorobenzene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Total Trichlorobenzene	<47	<6.84	<11.8	<8.89	<9.71	<0.18
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	11.1	1.61	2.77	2.09	2.28	0.042
1,2,3,4-tetrachlorobenzene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Total Tetrachlorobenzene	<21.1	<3.06	<5.26	<3.97	<4.34	<0.079
Pentachlorobenzene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Hexachlorobenzene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Total Chlorobenzenes	<1884	<273	<470	<355	<388	<7.09

Dry Gas Volume Sampled (Rm^3*) :	4.010
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/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. 2 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	315	257	200	257	22.4
1,3-Dichlorobenzene	43.7	32.5	28.2	34.8	22.9
1,4-Dichlorobenzene	36.2	24.4	18.8	26.5	33.5
1,2-Dichlorobenzene	39.4	17.0	13.1	23.2	61.4
Total Dichlorobenzene	119	73.9	60.2	84.5	36.6
1,3,5-trichlorobenzene	2.07	1.99	1.91	1.99	4.1
1,2,4-trichlorobenzene	6.76	6.67	3.48	5.63	33.2
1,2,3-trichlorobenzene	2.23	2.02	<1.45	<1.90	21.4
Total Trichlorobenzene	11.1	10.7	<6.84	<9.53	24.6
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	1.85	1.79	1.61	1.75	7.3
1,2,3,4-tetrachlorobenzene	<1.46	<1.41	<1.45	<1.44	1.7
Total Tetrachlorobenzene	<3.31	<3.21	<3.06	<3.19	4.1
Pentachlorobenzene	<1.46	1.47	<1.45	<1.46	0.7
Hexachlorobenzene	<1.46	<1.41	<1.45	<1.44	1.7
Total Chlorobenzenes	<452	<348	<273	<358	25.2

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

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	535	443	344	441	21.6
1,3-Dichlorobenzene	74.0	56.0	48.6	59.5	21.9
1,4-Dichlorobenzene	61.4	42.1	32.4	45.3	32.5
1,2-Dichlorobenzene	66.8	29.2	22.6	39.5	60.4
Total Dichlorobenzene	202	127	104	144	35.6
1,3,5-trichlorobenzene	3.51	3.43	3.29	3.41	3.3
1,2,4-trichlorobenzene	11.5	11.5	5.99	9.64	32.9
1,2,3-trichlorobenzene	3.79	3.48	<2.49	<3.25	20.8
Total Trichlorobenzene	18.8	18.4	<11.8	<16.3	24.1
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.14	3.09	2.77	3.00	6.8
1,2,3,4-tetrachlorobenzene	<2.47	<2.43	<2.49	<2.47	1.2
Total Tetrachlorobenzene	<5.62	<5.52	<5.26	<5.47	3.4
Pentachlorobenzene	<2.47	2.53	<2.49	<2.50	1.1
Hexachlorobenzene	<2.47	<2.43	<2.49	<2.47	1.2
Total Chlorobenzenes	<766	<599	<470	<612	24.3

* At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	416	342	260	339	23.0
1,3-Dichlorobenzene	57.5	43.2	36.7	45.8	23.3
1,4-Dichlorobenzene	47.7	32.5	24.5	34.9	33.9
1,2-Dichlorobenzene	52.0	22.5	17.0	30.5	61.6
Total Dichlorobenzene	157	98.2	78.2	111	37.0
1,3,5-trichlorobenzene	2.73	2.65	2.49	2.62	4.8
1,2,4-trichlorobenzene	8.91	8.86	4.52	7.43	33.9
1,2,3-trichlorobenzene	2.94	2.68	<1.88	<2.50	22.1
Total Trichlorobenzene	14.6	14.2	<8.89	<12.6	25.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.44	2.38	2.09	2.31	8.2
1,2,3,4-tetrachlorobenzene	<1.92	<1.88	<1.88	<1.89	1.4
Total Tetrachlorobenzene	<4.37	<4.26	<3.97	<4.20	4.9
Pentachlorobenzene	<1.92	1.95	<1.88	<1.92	1.8
Hexachlorobenzene	<1.92	<1.88	<1.88	<1.89	1.4
Total Chlorobenzenes	<596	<462	<355	<471	25.7

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

TABLE 57
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Wet Reference Concentrations for Chlorobenzenes

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	450	367	284	367	22.6
1,3-Dichlorobenzene	62.3	46.4	40.1	49.6	23.0
1,4-Dichlorobenzene	51.6	34.9	26.8	37.8	33.6
1,2-Dichlorobenzene	56.2	24.2	18.6	33.0	61.5
Total Dichlorobenzene	170	106	85.5	120	36.7
1,3,5-trichlorobenzene	2.96	2.84	2.72	2.84	4.2
1,2,4-trichlorobenzene	9.64	9.52	4.94	8.03	33.4
1,2,3-trichlorobenzene	3.19	2.88	<2.06	<2.71	21.6
Total Trichlorobenzene	15.8	15.3	<9.71	<13.6	24.8
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.64	2.56	2.28	2.50	7.6
1,2,3,4-tetrachlorobenzene	<2.08	<2.02	<2.06	<2.05	1.6
Total Tetrachlorobenzene	<4.73	<4.58	<4.34	<4.55	4.3
Pentachlorobenzene	<2.08	2.10	<2.06	<2.08	1.0
Hexachlorobenzene	<2.08	<2.02	<2.06	<2.05	1.6
Total Chlorobenzenes	<645	<497	<388	<510	25.3

* 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				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Monochlorobenzene	8.23	6.87	5.20	6.76	22.5
1,3-Dichlorobenzene	1.14	0.87	0.73	0.91	22.6
1,4-Dichlorobenzene	0.95	0.65	0.49	0.70	33.2
1,2-Dichlorobenzene	1.03	0.45	0.34	0.61	60.8
Total Dichlorobenzene	3.11	1.97	1.56	2.22	36.2
1,3,5-trichlorobenzene	0.054	0.053	0.050	0.052	4.4
1,2,4-trichlorobenzene	0.18	0.18	0.090	0.15	33.8
1,2,3-trichlorobenzene	0.058	0.054	<0.038	<0.050	21.8
Total Trichlorobenzene	0.29	0.29	<0.18	<0.25	25.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.048	0.048	0.042	0.046	8.0
1,2,3,4-tetrachlorobenzene	<0.038	<0.038	<0.038	<0.038	0.6
Total Tetrachlorobenzene	<0.087	<0.086	<0.079	<0.084	4.6
Pentachlorobenzene	<0.038	0.039	<0.038	<0.038	2.1
Hexachlorobenzene	<0.038	<0.038	<0.038	<0.038	0.6
Total Chlorobenzenes	<11.8	<9.29	<7.09	<9.39	25.1

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

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	257	441	339	367	6.76
1,3-Dichlorobenzene	34.8	59.5	45.8	49.6	0.91
1,4-Dichlorobenzene	26.5	45.3	34.9	37.8	0.70
1,2-Dichlorobenzene	23.2	39.5	30.5	33.0	0.61
Total Dichlorobenzene	84.5	144	111	120	2.22
1,3,5-trichlorobenzene	1.99	3.41	2.62	2.84	0.052
1,2,4-trichlorobenzene	5.63	9.64	7.43	8.03	0.15
1,2,3-trichlorobenzene	<1.90	<3.25	<2.50	<2.71	<0.050
Total Trichlorobenzene	<9.53	<16.3	<12.6	<13.6	<0.25
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	1.75	3.00	2.31	2.50	0.046
1,2,3,4-tetrachlorobenzene	<1.44	<2.47	<1.89	<2.05	<0.038
Total Tetrachlorobenzene	<3.19	<5.47	<4.20	<4.55	<0.084
Pentachlorobenzene	<1.46	<2.50	<1.92	<2.08	<0.038
Hexachlorobenzene	<1.44	<2.47	<1.89	<2.05	<0.038
Total Chlorobenzenes	<358	<612	<471	<510	<9.39

* 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	42.3	<10
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<62.3	<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	<142	<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	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
3-monochlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
4-monochlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Total Monochlorophenols	<150	<21.9	<37.1	<28.9	<31.2	<0.57
2,6-dichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,4 & 2,5-dichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
3,5-dichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,3-dichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
3,4-dichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Total Dichlorophenols	<250	<36.5	<61.9	<48.1	<52.1	<0.95
2,4,6-trichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,3,6-trichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,3,5-trichlorophenol	75.4	11.0	18.7	14.5	15.7	0.29
2,4,5-trichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,3,4-trichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
3,4,5-trichlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Total Trichlorophenols	<325	<47.5	<80.5	<62.6	<67.8	<1.24
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
2,3,4,5-tetrachlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Total Tetrachlorophenols	<100	<14.6	<24.7	<19.2	<20.8	<0.38
Pentachlorophenol	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Total Chlorophenols	<875	<128	<217	<168	<182	<3.34

Dry Gas Volume Sampled (Rm^3*) :	4.041
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/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 62
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
3-monochlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
4-monochlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Total Monochlorophenols	<150	<21.2	<36.5	<28.2	<30.3	<0.57
2,6-dichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,4 & 2,5-dichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
3,5-dichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,3-dichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
3,4-dichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Total Dichlorophenols	<250	<35.3	<60.8	<46.9	<50.4	<0.94
2,4,6-trichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,3,6-trichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,3,5-trichlorophenol	69.2	9.78	16.8	13.0	14.0	0.26
2,4,5-trichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,3,4-trichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
3,4,5-trichlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Total Trichlorophenols	<319	<45.1	<77.7	<59.9	<64.4	<1.20
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
2,3,4,5-tetrachlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Total Tetrachlorophenols	<100	<14.1	<24.3	<18.8	<20.2	<0.38
Pentachlorophenol	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Total Chlorophenols	<869	<123	<212	<163	<175	<3.28

Dry Gas Volume Sampled (Rm^3*) :	4.109
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
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 63
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
3-monochlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
4-monochlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Total Monochlorophenols	<150	<21.7	<37.4	<28.2	<30.9	<0.56
2,6-dichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,4 & 2,5-dichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
3,5-dichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,3-dichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
3,4-dichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Total Dichlorophenols	<250	<36.2	<62.3	<47.1	<51.4	<0.94
2,4,6-trichlorophenol	61.6	8.92	15.4	11.6	12.7	0.23
2,3,6-trichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,3,5-trichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,4,5-trichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,3,4-trichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
3,4,5-trichlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Total Trichlorophenols	<312	<45.1	<77.7	<58.7	<64.1	<1.17
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
2,3,4,5-tetrachlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Total Tetrachlorophenols	<100	<14.5	<24.9	<18.8	<20.6	<0.38
Pentachlorophenol	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Total Chlorophenols	<862	<125	<215	<162	<177	<3.24

Dry Gas Volume Sampled (Rm^3*) :	4.010
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/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 64
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
3-monochlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
4-monochlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
Total Monochlorophenols	<21.9	<21.2	<21.7	<21.6	1.7
2,6-dichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
2,4 & 2,5-dichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
3,5-dichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
2,3-dichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
3,4-dichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
Total Dichlorophenols	<36.5	<35.3	<36.2	<36.0	1.7
2,4,6-trichlorophenol	<7.30	<7.06	8.92	<7.76	13.0
2,3,6-trichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
2,3,5-trichlorophenol	11.0	9.78	<7.24	<9.34	20.6
2,4,5-trichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
2,3,4-trichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
3,4,5-trichlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
Total Trichlorophenols	<47.5	<45.1	<45.1	<45.9	3.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
2,3,4,5-tetrachlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
Total Tetrachlorophenols	<14.6	<14.1	<14.5	<14.4	1.7
Pentachlorophenol	<7.30	<7.06	<7.24	<7.20	1.7
Total Chlorophenols	<128	<123	<125	<125	2.0

TABLE 65
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
3-monochlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
4-monochlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
Total Monochlorophenols	<37.1	<36.5	<37.4	<37.0	1.2
2,6-dichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
2,4 & 2,5-dichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
3,5-dichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
2,3-dichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
3,4-dichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
Total Dichlorophenols	<61.9	<60.8	<62.3	<61.7	1.2
2,4,6-trichlorophenol	<12.4	<12.2	15.4	<13.3	13.4
2,3,6-trichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
2,3,5-trichlorophenol	18.7	16.8	<12.5	<16.0	19.9
2,4,5-trichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
2,3,4-trichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
3,4,5-trichlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
Total Trichlorophenols	<80.5	<77.7	<77.7	<78.6	2.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
2,3,4,5-tetrachlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
Total Tetrachlorophenols	<24.7	<24.3	<24.9	<24.7	1.2
Pentachlorophenol	<12.4	<12.2	<12.5	<12.3	1.2
Total Chlorophenols	<217	<212	<215	<214	1.2

* At 25°C and 1 atmosphere

TABLE 66
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
3-monochlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
4-monochlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
Total Monochlorophenols	<28.9	<28.2	<28.2	<28.4	1.4
2,6-dichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
2,4 & 2,5-dichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
3,5-dichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
2,3-dichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
3,4-dichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
Total Dichlorophenols	<48.1	<46.9	<47.1	<47.4	1.4
2,4,6-trichlorophenol	<9.62	<9.38	11.6	<10.2	11.9
2,3,6-trichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
2,3,5-trichlorophenol	14.5	13.0	<9.41	<12.3	21.3
2,4,5-trichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
2,3,4-trichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
3,4,5-trichlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
Total Trichlorophenols	<62.6	<59.9	<58.7	<60.4	3.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
2,3,4,5-tetrachlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
Total Tetrachlorophenols	<19.2	<18.8	<18.8	<18.9	1.4
Pentachlorophenol	<9.62	<9.38	<9.41	<9.47	1.4
Total Chlorophenols	<168	<163	<162	<165	2.1

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

TABLE 67
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
3-monochlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
4-monochlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
Total Monochlorophenols	<31.2	<30.3	<30.9	<30.8	1.6
2,6-dichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
2,4 & 2,5-dichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
3,5-dichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
2,3-dichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
3,4-dichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
Total Dichlorophenols	<52.1	<50.4	<51.4	<51.3	1.6
2,4,6-trichlorophenol	<10.4	<10.1	12.7	<11.1	12.8
2,3,6-trichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
2,3,5-trichlorophenol	15.7	14.0	<10.3	<13.3	20.8
2,4,5-trichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
2,3,4-trichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
3,4,5-trichlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
Total Trichlorophenols	<67.8	<64.4	<64.1	<65.4	3.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
2,3,4,5-tetrachlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
Total Tetrachlorophenols	<20.8	<20.2	<20.6	<20.5	1.6
Pentachlorophenol	<10.4	<10.1	<10.3	<10.3	1.6
Total Chlorophenols	<182	<175	<177	<178	2.0

* At 25°C and 1 atmosphere

TABLE 68
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
2-monochlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
3-monochlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
4-monochlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
Total Monochlorophenols	<0.57	<0.57	<0.56	<0.57	0.6
2,6-dichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
2,4 & 2,5-dichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
3,5-dichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
2,3-dichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
3,4-dichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
Total Dichlorophenols	<0.95	<0.94	<0.94	<0.95	0.6
2,4,6-trichlorophenol	<0.19	<0.19	0.23	<0.20	12.0
2,3,6-trichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
2,3,5-trichlorophenol	0.29	0.26	<0.19	<0.25	20.9
2,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
2,3,4-trichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
3,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
Total Trichlorophenols	<1.24	<1.20	<1.17	<1.21	2.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
2,3,4,5-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
Total Tetrachlorophenols	<0.38	<0.38	<0.38	<0.38	0.6
Pentachlorophenol	<0.19	<0.19	<0.19	<0.19	0.6
Total Chlorophenols	<3.34	<3.28	<3.24	<3.29	1.4

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	<7.20	<12.3	<9.47	<10.3	<0.19
3-monochlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
4-monochlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
Total Monochlorophenols	<21.6	<37.0	<28.4	<30.8	<0.57
2,6-dichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
2,4 & 2,5-dichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
3,5-dichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
2,3-dichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
3,4-dichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
Total Dichlorophenols	<36.0	<61.7	<47.4	<51.3	<0.95
2,4,6-trichlorophenol	<7.76	<13.3	<10.2	<11.1	<0.20
2,3,6-trichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
2,3,5-trichlorophenol	<9.34	<16.0	<12.3	<13.3	<0.25
2,4,5-trichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
2,3,4-trichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
3,4,5-trichlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
Total Trichlorophenols	<45.9	<78.6	<60.4	<65.4	<1.21
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
2,3,4,5-tetrachlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
Total Tetrachlorophenols	<14.4	<24.7	<18.9	<20.5	<0.38
Pentachlorophenol	<7.20	<12.3	<9.47	<10.3	<0.19
Total Chlorophenols	<125	<214	<165	<178	<3.29

* At 25°C and 1 atmosphere

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

TABLE 70
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Blank Analyses

Congener Group	Lab Blank Total ng	Blank Train Total ng
2-monochlorophenol	<50	<50
3-monochlorophenol	<50	<50
4-monochlorophenol	<50	<50
Total Monochlorophenols	<150	<150
2,6-dichlorophenol	<50	<50
2,4 & 2,5-dichlorophenol	<50	<50
3,5-dichlorophenol	<50	<50
2,3-dichlorophenol	<50	<50
3,4-dichlorophenol	<50	<50
Total Dichlorophenols	<250	<250
2,4,6-trichlorophenol	<50	<50
2,3,6-trichlorophenol	<50	<50
2,3,5-trichlorophenol	<50	<50
2,4,5-trichlorophenol	<50	<50
2,3,4-trichlorophenol	<50	<50
3,4,5-trichlorophenol	<50	<50
Total Trichlorophenols	<300	<300
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<50
2,3,4,5-tetrachlorophenol	<50	<50
Total Tetrachlorophenols	<100	<100
Pentachlorophenol	<50	<50
Total Chlorophenols	<850	<850

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

TABLE 71
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Acenaphthylene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Anthracene	11.1	1.62	2.75	2.14	2.31	0.042
Benzo(a)Anthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Benzo(b)Fluoranthene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Benzo(j/k)Fluoranthene	22.0	3.21	5.44	4.23	4.58	0.084
Benzo(a)fluorene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Benzo(b)fluorene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Benzo(g,h,i)Perylene	27.9	4.07	6.90	5.37	5.81	0.11
Benzo(a)Pyrene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Benzo(e)Pyrene	14.3	2.09	3.54	2.75	2.98	0.054
Biphenyl	20.8	3.04	5.15	4.00	4.33	0.079
2-Chloronaphthalene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Chrysene/Triphenylene/Benzo(b)Anthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Coronene	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Dibenzo(a,c/a,h)Anthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Dibenzo(a,e)pyrene	<50	<7.30	<12.4	<9.62	<10.4	<0.19
9,10-dimethylanthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
7,12-Dimethylbenzo(a)anthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Fluoranthene	29.8	4.35	7.37	5.74	6.21	0.11
Fluorene	19.7	2.88	4.88	3.79	4.10	0.075
Indeno(1,2,3-cd)Pyrene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
2-methylanthracene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
3-Methylcholanthrene	<50	<7.30	<12.4	<9.62	<10.4	<0.19
1-Methylnaphthalene	14.8	2.16	3.66	2.85	3.08	0.056
2-Methylnaphthalene	17.6	2.57	4.36	3.39	3.67	0.067
1-Methylphenanthrene	24.8	3.62	6.14	4.77	5.16	0.095
9-Methylphenanthrene	25.5	3.72	6.31	4.91	5.31	0.097
Naphthalene	79.8	11.7	19.7	15.4	16.6	0.30
Perylene	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Phenanthrene	86.8	12.7	21.5	16.7	18.1	0.33
Picene	<50	<7.30	<12.4	<9.62	<10.4	<0.19
Pyrene	36.6	5.34	9.06	7.04	7.62	0.14
Tetralin	198	28.9	49.0	38.1	41.2	0.75
m-terphenyl	<10	<1.46	<2.47	<1.92	<2.08	<0.038
o-Terphenyl	<10	<1.46	<2.47	<1.92	<2.08	<0.038
p-terphenyl	<10	<1.46	<2.47	<1.92	<2.08	<0.038
Total	<1010	<147	<250	<194	<210	<3.85

Dry Gas Volume Sampled (Rm^3*) :	4.041
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/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 72
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	17.7	2.50	4.31	3.32	3.57	0.067
Acenaphthylene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Anthracene	23.2	3.28	5.65	4.35	4.68	0.088
Benzo(a)Anthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Benzo(b)Fluoranthene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Benzo(j/k)Fluoranthene	22.5	3.18	5.48	4.22	4.54	0.085
Benzo(a)fluorene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Benzo(b)fluorene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Benzo(g,h,i)Perylene	18.7	2.64	4.55	3.51	3.77	0.071
Benzo(a)Pyrene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Benzo(e)Pyrene	17.7	2.50	4.31	3.32	3.57	0.067
Biphenyl	46.3	6.54	11.3	8.69	9.34	0.17
2-Chloronaphthalene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Chrysene/Triphenylene/Benzo(b)Anthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Coronene	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Dibenzo(a,c/a,h)Anthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Dibenzo(a,e)pyrene	<50	<7.06	<12.2	<9.38	<10.1	<0.19
9,10-dimethylanthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
7,12-Dimethylbenzo(a)anthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Fluoranthene	72.3	10.2	17.6	13.6	14.6	0.27
Fluorene	57.7	8.15	14.0	10.8	11.6	0.22
Indeno(1,2,3-cd)Pyrene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
2-methylanthracene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
3-Methylcholanthrene	<50	<7.06	<12.2	<9.38	<10.1	<0.19
1-Methylnaphthalene	21.8	3.08	5.31	4.09	4.40	0.082
2-Methylnaphthalene	38.5	5.44	9.37	7.23	7.77	0.15
1-Methylphenanthrene	32.4	4.58	7.89	6.08	6.54	0.12
9-Methylphenanthrene	41.8	5.91	10.2	7.84	8.43	0.16
Naphthalene	175	24.7	42.6	32.8	35.3	0.66
Perylene	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Phenanthrene	305	43.1	74.2	57.2	61.5	1.15
Picene	<50	<7.06	<12.2	<9.38	<10.1	<0.19
Pyrene	52.8	7.46	12.8	9.91	10.7	0.20
Tetralin	182	25.7	44.3	34.2	36.7	0.69
m-terphenyl	15.1	2.13	3.67	2.83	3.05	0.057
o-Terphenyl	<10	<1.41	<2.43	<1.88	<2.02	<0.038
p-terphenyl	<10	<1.41	<2.43	<1.88	<2.02	<0.038
Total	<1501	<212	<365	<282	<303	<5.66

Dry Gas Volume Sampled (Rm^3*) :	4.109
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
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 73
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	10.5	1.52	2.62	1.98	2.16	0.040
Acenaphthylene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Anthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(a)Anthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(b)Fluoranthene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(j/k)Fluoranthene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(a)fluorene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(b)fluorene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(g,h,i)Perylene	17.8	2.58	4.44	3.35	3.66	0.067
Benzo(a)Pyrene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Benzo(e)Pyrene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Biphenyl	29.2	4.23	7.28	5.50	6.01	0.11
2-Chloronaphthalene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Chrysene/Triphenylene/Benzo(b)Anthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Coronene	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Dibenzo(a,c/a,h)Anthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Dibenzo(a,e)pyrene	<50	<7.24	<12.5	<9.41	<10.3	<0.19
9,10-dimethylanthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
7,12-Dimethylbenzo(a)anthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Fluoranthene	23.4	3.39	5.84	4.41	4.82	0.088
Fluorene	10.0	1.45	2.49	1.88	2.06	0.038
Indeno(1,2,3-cd)Pyrene	14.0	2.03	3.49	2.64	2.88	0.053
2-methylanthracene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
3-Methylcholanthrene	<50	<7.24	<12.5	<9.41	<10.3	<0.19
1-Methylnaphthalene	17.1	2.48	4.26	3.22	3.52	0.064
2-Methylnaphthalene	20.0	2.90	4.99	3.77	4.12	0.075
1-Methylphenanthrene	26.2	3.79	6.53	4.93	5.39	0.099
9-Methylphenanthrene	34.7	5.03	8.65	6.53	7.14	0.13
Naphthalene	92.5	13.4	23.1	17.4	19.0	0.35
Perylene	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Phenanthrene	54.5	7.89	13.6	10.3	11.2	0.21
Picene	<50	<7.24	<12.5	<9.41	<10.3	<0.19
Pyrene	31.8	4.61	7.93	5.99	6.54	0.12
Tetralin	137	19.8	34.2	25.8	28.2	0.52
m-terphenyl	<10	<1.45	<2.49	<1.88	<2.06	<0.038
o-Terphenyl	<10	<1.45	<2.49	<1.88	<2.06	<0.038
p-terphenyl	<10	<1.45	<2.49	<1.88	<2.06	<0.038
Total	<909	<132	<227	<171	<187	<3.42

Dry Gas Volume Sampled (Rm^3*) :	4.010
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/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. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	<1.46	2.50	1.52	<1.83	32.0
Acenaphthylene	<1.46	<1.41	<1.45	<1.44	1.7
Anthracene	1.62	3.28	<1.45	<2.12	47.7
Benzo(a)Anthracene	<1.46	<1.41	<1.45	<1.44	1.7
Benzo(b)Fluoranthene	<1.46	<1.41	<1.45	<1.44	1.7
Benzo(j/k)Fluoranthene	3.21	3.18	<1.45	<2.61	38.6
Benzo(a)fluorene	<1.46	<1.41	<1.45	<1.44	1.7
Benzo(b)fluorene	<1.46	<1.41	<1.45	<1.44	1.7
Benzo(g,h,i)Perylene	4.07	2.64	2.58	3.10	27.3
Benzo(a)Pyrene	<1.46	<1.41	<1.45	<1.44	1.7
Benzo(e)Pyrene	2.09	2.50	<1.45	<2.01	26.4
Biphenyl	3.04	6.54	4.23	4.60	38.7
2-Chloronaphthalene	<1.46	<1.41	<1.45	<1.44	1.7
Chrysene/Triphenylene/Benzo(b)Anthracene	<1.46	<1.41	<1.45	<1.44	1.7
Coronene	<7.30	<7.06	<7.24	<7.20	1.7
Dibenzo(a,c/a,h)Anthracene	<1.46	<1.41	<1.45	<1.44	1.7
Dibenzo(a,e)pyrene	<7.30	<7.06	<7.24	<7.20	1.7
9,10-dimethylanthracene	<1.46	<1.41	<1.45	<1.44	1.7
7,12-Dimethylbenzo(a)anthracene	<1.46	<1.41	<1.45	<1.44	1.7
Fluoranthene	4.35	10.2	3.39	5.98	61.7
Fluorene	2.88	8.15	1.45	4.16	84.9
Indeno(1,2,3-cd)Pyrene	<1.46	<1.41	2.03	<1.63	20.9
2-methylanthracene	<1.46	<1.41	<1.45	<1.44	1.7
3-Methylcholanthrene	<7.30	<7.06	<7.24	<7.20	1.7
1-Methylnaphthalene	2.16	3.08	2.48	2.57	18.2
2-Methylnaphthalene	2.57	5.44	2.90	3.64	43.2
1-Methylphenanthrene	3.62	4.58	3.79	4.00	12.7
9-Methylphenanthrene	3.72	5.91	5.03	4.88	22.5
Naphthalene	11.7	24.7	13.4	16.6	42.8
Perylene	<1.46	<1.41	<1.45	<1.44	1.7
Phenanthrene	12.7	43.1	7.89	21.2	90.0
Picene	<7.30	<7.06	<7.24	<7.20	1.7
Pyrene	5.34	7.46	4.61	5.80	25.5
Tetralin	28.9	25.7	19.8	24.8	18.5
m-terphenyl	<1.46	2.13	<1.45	<1.68	23.3
o-Terphenyl	<1.46	<1.41	<1.45	<1.44	1.7
p-terphenyl	<1.46	<1.41	<1.45	<1.44	1.7
Total	<147	<212	<132	<164	26.0

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

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<2.47	4.31	2.62	<3.13	32.5
Acenaphthylene	<2.47	<2.43	<2.49	<2.47	1.2
Anthracene	2.75	5.65	<2.49	<3.63	48.3
Benzo(a)Anthracene	<2.47	<2.43	<2.49	<2.47	1.2
Benzo(b)Fluoranthene	<2.47	<2.43	<2.49	<2.47	1.2
Benzo(j/k)Fluoranthene	5.44	5.48	<2.49	<4.47	38.3
Benzo(a)fluorene	<2.47	<2.43	<2.49	<2.47	1.2
Benzo(b)fluorene	<2.47	<2.43	<2.49	<2.47	1.2
Benzo(g,h,i)Perylene	6.90	4.55	4.44	5.30	26.3
Benzo(a)Pyrene	<2.47	<2.43	<2.49	<2.47	1.2
Benzo(e)Pyrene	3.54	4.31	<2.49	<3.45	26.4
Biphenyl	5.15	11.3	7.28	7.90	39.3
2-Chloronaphthalene	<2.47	<2.43	<2.49	<2.47	1.2
Chrysene/Triphenylene/Benzo(b)Anthracene	<2.47	<2.43	<2.49	<2.47	1.2
Coronene	<12.4	<12.2	<12.5	<12.3	1.2
Dibenzo(a,c/a,h)Anthracene	<2.47	<2.43	<2.49	<2.47	1.2
Dibenzo(a,e)pyrene	<12.4	<12.2	<12.5	<12.3	1.2
9,10-dimethylanthracene	<2.47	<2.43	<2.49	<2.47	1.2
7,12-Dimethylbenzo(a)anthracene	<2.47	<2.43	<2.49	<2.47	1.2
Fluoranthene	7.37	17.6	5.84	10.3	62.2
Fluorene	4.88	14.0	2.49	7.14	85.4
Indeno(1,2,3-cd)Pyrene	<2.47	<2.43	3.49	<2.80	21.4
2-methylanthracene	<2.47	<2.43	<2.49	<2.47	1.2
3-Methylcholanthrene	<12.4	<12.2	<12.5	<12.3	1.2
1-Methylnaphthalene	3.66	5.31	4.26	4.41	18.8
2-Methylnaphthalene	4.36	9.37	4.99	6.24	43.8
1-Methylphenanthrene	6.14	7.89	6.53	6.85	13.4
9-Methylphenanthrene	6.31	10.2	8.65	8.38	23.2
Naphthalene	19.7	42.6	23.1	28.5	43.4
Perylene	<2.47	<2.43	<2.49	<2.47	1.2
Phenanthrene	21.5	74.2	13.6	36.4	90.5
Picene	<12.4	<12.2	<12.5	<12.3	1.2
Pyrene	9.06	12.8	7.93	9.95	25.9
Tetralin	49.0	44.3	34.2	42.5	17.8
m-terphenyl	<2.47	3.67	<2.49	<2.88	23.9
o-Terphenyl	<2.47	<2.43	<2.49	<2.47	1.2
p-terphenyl	<2.47	<2.43	<2.49	<2.47	1.2
Total	<250	<365	<227	<281	26.5

* 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	<1.92	3.32	1.98	<2.41	32.9
Acenaphthylene	<1.92	<1.88	<1.88	<1.89	1.4
Anthracene	2.14	4.35	<1.88	<2.79	48.7
Benzo(a)Anthracene	<1.92	<1.88	<1.88	<1.89	1.4
Benzo(b)Fluoranthene	<1.92	<1.88	<1.88	<1.89	1.4
Benzo(j/k)Fluoranthene	4.23	4.22	<1.88	<3.45	39.3
Benzo(a)fluorene	<1.92	<1.88	<1.88	<1.89	1.4
Benzo(b)fluorene	<1.92	<1.88	<1.88	<1.89	1.4
Benzo(g,h,i)Perylene	5.37	3.51	3.35	4.08	27.5
Benzo(a)Pyrene	<1.92	<1.88	<1.88	<1.89	1.4
Benzo(e)Pyrene	2.75	3.32	<1.88	<2.65	27.3
Biphenyl	4.00	8.69	5.50	6.06	39.5
2-Chloronaphthalene	<1.92	<1.88	<1.88	<1.89	1.4
Chrysene/Triphenylene/Benzo(b)Anthracene	<1.92	<1.88	<1.88	<1.89	1.4
Coronene	<9.62	<9.38	<9.41	<9.47	1.4
Dibenzo(a,c/a,h)Anthracene	<1.92	<1.88	<1.88	<1.89	1.4
Dibenzo(a,e)pyrene	<9.62	<9.38	<9.41	<9.47	1.4
9,10-dimethylanthracene	<1.92	<1.88	<1.88	<1.89	1.4
7,12-Dimethylbenzo(a)anthracene	<1.92	<1.88	<1.88	<1.89	1.4
Fluoranthene	5.74	13.6	4.41	7.90	62.6
Fluorene	3.79	10.8	1.88	5.50	85.6
Indeno(1,2,3-cd)Pyrene	<1.92	<1.88	2.64	<2.15	19.8
2-methylanthracene	<1.92	<1.88	<1.88	<1.89	1.4
3-Methylcholanthrene	<9.62	<9.38	<9.41	<9.47	1.4
1-Methylnaphthalene	2.85	4.09	3.22	3.39	18.8
2-Methylnaphthalene	3.39	7.23	3.77	4.79	44.1
1-Methylphenanthrene	4.77	6.08	4.93	5.26	13.6
9-Methylphenanthrene	4.91	7.84	6.53	6.43	22.9
Naphthalene	15.4	32.8	17.4	21.9	43.7
Perylene	<1.92	<1.88	<1.88	<1.89	1.4
Phenanthrene	16.7	57.2	10.3	28.1	90.7
Picene	<9.62	<9.38	<9.41	<9.47	1.4
Pyrene	7.04	9.91	5.99	7.65	26.5
Tetralin	38.1	34.2	25.8	32.7	19.2
m-terphenyl	<1.92	2.83	<1.88	<2.21	24.3
o-Terphenyl	<1.92	<1.88	<1.88	<1.89	1.4
p-terphenyl	<1.92	<1.88	<1.88	<1.89	1.4
Total	<194	<282	<171	<216	27.0

* 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	<2.08	3.57	2.16	<2.60	32.2
Acenaphthylene	<2.08	<2.02	<2.06	<2.05	1.6
Anthracene	2.31	4.68	<2.06	<3.02	47.9
Benzo(a)Anthracene	<2.08	<2.02	<2.06	<2.05	1.6
Benzo(b)Fluoranthene	<2.08	<2.02	<2.06	<2.05	1.6
Benzo(j/k)Fluoranthene	4.58	4.54	<2.06	<3.73	38.8
Benzo(a)fluorene	<2.08	<2.02	<2.06	<2.05	1.6
Benzo(b)fluorene	<2.08	<2.02	<2.06	<2.05	1.6
Benzo(g,h,i)Perylene	5.81	3.77	3.66	4.42	27.4
Benzo(a)Pyrene	<2.08	<2.02	<2.06	<2.05	1.6
Benzo(e)Pyrene	2.98	3.57	<2.06	<2.87	26.6
Biphenyl	4.33	9.34	6.01	6.56	38.9
2-Chloronaphthalene	<2.08	<2.02	<2.06	<2.05	1.6
Chrysene/Triphenylene/Benzo(b)Anthracene	<2.08	<2.02	<2.06	<2.05	1.6
Coronene	<10.4	<10.1	<10.3	<10.3	1.6
Dibenzo(a,c/a,h)Anthracene	<2.08	<2.02	<2.06	<2.05	1.6
Dibenzo(a,e)pyrene	<10.4	<10.1	<10.3	<10.3	1.6
9,10-dimethylanthracene	<2.08	<2.02	<2.06	<2.05	1.6
7,12-Dimethylbenzo(a)anthracene	<2.08	<2.02	<2.06	<2.05	1.6
Fluoranthene	6.21	14.6	4.82	8.54	61.9
Fluorene	4.10	11.6	2.06	5.93	85.1
Indeno(1,2,3-cd)Pyrene	<2.08	<2.02	2.88	<2.33	20.7
2-methylanthracene	<2.08	<2.02	<2.06	<2.05	1.6
3-Methylcholanthrene	<10.4	<10.1	<10.3	<10.3	1.6
1-Methylnaphthalene	3.08	4.40	3.52	3.67	18.3
2-Methylnaphthalene	3.67	7.77	4.12	5.18	43.4
1-Methylphenanthrene	5.16	6.54	5.39	5.70	12.9
9-Methylphenanthrene	5.31	8.43	7.14	6.96	22.5
Naphthalene	16.6	35.3	19.0	23.7	43.0
Perylene	<2.08	<2.02	<2.06	<2.05	1.6
Phenanthrene	18.1	61.5	11.2	30.3	90.1
Picene	<10.4	<10.1	<10.3	<10.3	1.6
Pyrene	7.62	10.7	6.54	8.27	25.7
Tetralin	41.2	36.7	28.2	35.4	18.7
m-terphenyl	<2.08	3.05	<2.06	<2.40	23.5
o-Terphenyl	<2.08	<2.02	<2.06	<2.05	1.6
p-terphenyl	<2.08	<2.02	<2.06	<2.05	1.6
Total	<210	<303	<187	<233	26.2

* At 25°C and 1 atmosphere

TABLE 78
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Rates

Compound	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Acenaphthene	<0.038	0.067	0.040	<0.048	33.5
Acenaphthylene	<0.038	<0.038	<0.038	<0.038	0.6
Anthracene	0.042	0.088	<0.038	<0.056	49.3
Benzo(a)Anthracene	<0.038	<0.038	<0.038	<0.038	0.6
Benzo(b)Fluoranthene	<0.038	<0.038	<0.038	<0.038	0.6
Benzo(j/k)Fluoranthene	0.084	0.085	<0.038	<0.069	39.2
Benzo(a)fluorene	<0.038	<0.038	<0.038	<0.038	0.6
Benzo(b)fluorene	<0.038	<0.038	<0.038	<0.038	0.6
Benzo(g,h,i)Perylene	0.11	0.071	0.067	0.081	26.7
Benzo(a)Pyrene	<0.038	<0.038	<0.038	<0.038	0.6
Benzo(e)Pyrene	0.054	0.067	<0.038	<0.053	27.6
Biphenyl	0.079	0.17	0.11	0.12	40.1
2-Chloronaphthalene	<0.038	<0.038	<0.038	<0.038	0.6
Chrysene/Triphenylene/Benzo(b)Anthracene	<0.038	<0.038	<0.038	<0.038	0.6
Coronene	<0.19	<0.19	<0.19	<0.19	0.6
Dibenzo(a,c/a,h)Anthracene	<0.038	<0.038	<0.038	<0.038	0.6
Dibenzo(a,e)pyrene	<0.19	<0.19	<0.19	<0.19	0.6
9,10-dimethylanthracene	<0.038	<0.038	<0.038	<0.038	0.6
7,12-Dimethylbenzo(a)anthracene	<0.038	<0.038	<0.038	<0.038	0.6
Fluoranthene	0.11	0.27	0.088	0.16	63.3
Fluorene	0.075	0.22	0.038	0.11	86.2
Indeno(1,2,3-cd)Pyrene	<0.038	<0.038	0.053	<0.043	19.9
2-methylanthracene	<0.038	<0.038	<0.038	<0.038	0.6
3-Methylcholanthrene	<0.19	<0.19	<0.19	<0.19	0.6
1-Methylnaphthalene	0.056	0.082	0.064	0.068	19.5
2-Methylnaphthalene	0.067	0.15	0.075	0.096	44.8
1-Methylphenanthrene	0.095	0.12	0.099	0.11	14.2
9-Methylphenanthrene	0.097	0.16	0.13	0.13	23.6
Naphthalene	0.30	0.66	0.35	0.44	44.4
Perylene	<0.038	<0.038	<0.038	<0.038	0.6
Phenanthrene	0.33	1.15	0.21	0.56	91.3
Picene	<0.19	<0.19	<0.19	<0.19	0.6
Pyrene	0.14	0.20	0.12	0.15	27.1
Tetralin	0.75	0.69	0.52	0.65	18.8
m-terphenyl	<0.038	0.057	<0.038	<0.044	24.9
o-Terphenyl	<0.038	<0.038	<0.038	<0.038	0.6
p-terphenyl	<0.038	<0.038	<0.038	<0.038	0.6
Total	<3.85	<5.66	<3.42	<4.31	27.6

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Polycyclic Aromatic Hydrocarbon Emission Data

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<1.83	<3.13	<2.41	<2.60	<0.048
Acenaphthylene	<1.44	<2.47	<1.89	<2.05	<0.038
Anthracene	<2.12	<3.63	<2.79	<3.02	<0.056
Benzo(a)Anthracene	<1.44	<2.47	<1.89	<2.05	<0.038
Benzo(b)Fluoranthene	<1.44	<2.47	<1.89	<2.05	<0.038
Benzo(j/k)Fluoranthene	<2.61	<4.47	<3.45	<3.73	<0.069
Benzo(a)fluorene	<1.44	<2.47	<1.89	<2.05	<0.038
Benzo(b)fluorene	<1.44	<2.47	<1.89	<2.05	<0.038
Benzo(g,h,i)Perylene	3.10	5.30	4.08	4.42	0.081
Benzo(a)Pyrene	<1.44	<2.47	<1.89	<2.05	<0.038
Benzo(e)Pyrene	<2.01	<3.45	<2.65	<2.87	<0.053
Biphenyl	4.60	7.90	6.06	6.56	0.12
2-Chloronaphthalene	<1.44	<2.47	<1.89	<2.05	<0.038
Chrysene/Triphenylene/Benzo(b)Anthracene	<1.44	<2.47	<1.89	<2.05	<0.038
Coronene	<7.20	<12.3	<9.47	<10.3	<0.19
Dibenzo(a,c/a,h)Anthracene	<1.44	<2.47	<1.89	<2.05	<0.038
Dibenzo(a,e)pyrene	<7.20	<12.3	<9.47	<10.3	<0.19
9,10-dimethylanthracene	<1.44	<2.47	<1.89	<2.05	<0.038
7,12-Dimethylbenzo(a)anthracene	<1.44	<2.47	<1.89	<2.05	<0.038
Fluoranthene	5.98	10.3	7.90	8.54	0.16
Fluorene	4.16	7.14	5.50	5.93	0.11
Indeno(1,2,3-cd)Pyrene	<1.63	<2.80	<2.15	<2.33	<0.043
2-methylanthracene	<1.44	<2.47	<1.89	<2.05	<0.038
3-Methylcholanthrene	<7.20	<12.3	<9.47	<10.3	<0.19
1-Methylnaphthalene	2.57	4.41	3.39	3.67	0.068
2-Methylnaphthalene	3.64	6.24	4.79	5.18	0.096
1-Methylphenanthrene	4.00	6.85	5.26	5.70	0.11
9-Methylphenanthrene	4.88	8.38	6.43	6.96	0.13
Naphthalene	16.6	28.5	21.9	23.7	0.44
Perylene	<1.44	<2.47	<1.89	<2.05	<0.038
Phenanthrene	21.2	36.4	28.1	30.3	0.56
Picene	<7.20	<12.3	<9.47	<10.3	<0.19
Pyrene	5.80	9.95	7.65	8.27	0.15
Tetralin	24.8	42.5	32.7	35.4	0.65
m-terphenyl	<1.68	<2.88	<2.21	<2.40	<0.044
o-Terphenyl	<1.44	<2.47	<1.89	<2.05	<0.038
p-terphenyl	<1.44	<2.47	<1.89	<2.05	<0.038
Total	<164	<281	<216	<233	<4.31

* At 25°C and 1 atmosphere

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

TABLE 80
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Polycyclic Aromatic Hydrocarbon Analyses

Compound	Blank Train ng	Laboratory Blank ng
Acenaphthene	10.0	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	13.3	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(j/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	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene/Benzo(b)Anthracene	17.8	<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	53.9	20.4
Fluorene	<10	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	<10	<10
2-Methylnaphthalene	<10	<10
1-Methylphenanthrene	<10	<10
9-Methylphenanthrene	<10	<10
Naphthalene	34.6	<10
Perylene	<10	<10
Phenanthrene	72.1	13.4
Picene	<50	<50
Pyrene	66.9	20.2
Tetralin	69.1	<10
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<788	<554

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

TABLE 81
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Acetaldehyde, Formaldehyde and Acrolein Emission Data

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acetaldehyde Concentration Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acetaldehyde Emission Rate mg/s
1	<1.0	0.0300	<19.3	<33.4	<25.7	<27.5	<0.52
2	<1.0	0.0270	<21.4	<37.0	<28.5	<30.5	<0.57
3	<1.0	0.0291	<19.9	<34.4	<25.9	<28.3	<0.52
Average			<20.2	<34.9	<26.7	<28.8	<0.54
Blank	<1.0						

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	<4.0	0.0300	<77.4	<133	<103	<110	<2.06
2	<4.0	0.0270	<85.8	<148	<114	<122	<2.29
3	4.3	0.0291	85.8	148	112	122	2.23
Average			<83.0	<143	<110	<118	<2.19
Blank	<4.0						

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	14	0.0300	271	467	360	385	7.22
2	8.2	0.0270	176	303	234	250	4.69
3	<8.0	0.0291	<160	<275	<208	<227	<4.15
Average			<202	<348	<267	<287	<5.35
Blank	<8.0						

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 the corresponding isokinetic tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

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

TABLE 82
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected			Average	Coefficient of Variation	Total Collected
	Run No. 1 Tube 16A/16B	Run No. 2 Tube 17A/17B	Run No. 3 Tube 18A/18B			
	µg	µg	µg	µg	%	µg
Acetone	0.42	0.35	0.22	0.33	30.6	1.00
Benzene	<0.05	0.055	0.056	<0.054	6.0	<0.16
Bromodichloromethane	<0.01	<0.01	0.015	<0.012	24.7	<0.035
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	0.11	0.19	<0.13	38.8	<0.39
1,3-Butadiene	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.14	0.14	0.17	0.15	13.5	0.44
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.030	0.030	0.036	0.032	10.8	0.096
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	0.044	<0.028	49.5	<0.084
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.017	<0.01	0.011	<0.013	29.9	<0.038
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.35	0.27	0.40	0.67	87.5	2.02
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.058	0.047	0.047	0.051	12.5	0.15
Toluene	0.24	0.087	0.080	0.14	67.7	0.41
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
Trichlorofluoromethane	<0.02	<0.02	0.025	<0.022	13.3	<0.065
M&P-Xylene	0.037	<0.03	<0.03	<0.032	12.5	<0.097
O-Xylene	0.019	<0.01	<0.01	<0.013	40.0	<0.039
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.74	<1.42	<1.56	<1.91	37.9	<5.72

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0210
Run No. 2	0.0201
Run No. 3	0.0223

* 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 21A/21B	Run No. 2 Tube 22A/22B	Run No. 3 Tube 23A/23B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.33	0.22	0.75	0.43	65.3	1.30
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
Bromodichloromethane	0.011	0.013	<0.01	<0.011	13.5	<0.034
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.02	<0.02	<0.02	<0.020	-	<0.060
2-Butanone	0.20	0.21	0.25	0.22	13.3	0.66
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.028	0.033	0.028	0.030	9.7	0.089
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	0.046	<0.029	52.4	<0.086
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.013	0.013	<0.01	<0.012	14.4	<0.036
1,1-Dichloroethene	0.016	<0.01	<0.01	<0.012	28.9	<0.036
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	0.42	1.05	0.50	0.65	52.2	1.96
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	0.028	0.027	0.032	0.029	9.1	0.087
Toluene	0.071	<0.05	0.070	<0.064	18.6	<0.19
1,1,1-Trichloroethane	0.013	<0.01	<0.01	<0.011	15.7	<0.033
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	0.022	<0.021	5.6	<0.062
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	<1.55	<2.06	<2.13	<1.92	16.5	<5.75

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0192
Run No. 2	0.0203
Run No. 3	0.0206

* 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 25A/25B	Run No. 2 Tube 26A/26B	Run No. 3 Tube 27A/27B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.21	0.30	0.93	0.48	82.3	1.43
Benzene	<0.05	0.083	0.18	<0.10	64.8	<0.31
Bromodichloromethane	0.014	0.015	0.026	0.018	36.3	0.055
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	0.23	0.38	0.99	0.53	75.6	1.60
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	0.035	0.045	0.045	0.042	13.9	0.13
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	0.023	<0.021	8.2	<0.063
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	0.018	0.011	<0.01	<0.013	33.5	<0.039
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.33	1.07	0.39	0.93	52.0	2.78
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	0.11	0.050	<0.05	<0.069	48.3	<0.21
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	<2.40	<2.36	<3.03	<2.60	14.6	<7.79

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0215
Run No. 2	0.0203
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 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	1.00	9.26	15.7	12.2	13.2	0.24
Benzene	<0.16	<1.50	<2.54	<1.97	<2.14	<0.039
Bromodichloromethane	<0.035	<0.33	<0.55	<0.43	<0.46	<0.0085
Bromoform	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Bromomethane	<0.39	<3.64	<6.16	<4.79	<5.19	<0.095
1,3-Butadiene	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
2-Butanone	0.44	4.13	7.00	5.44	5.89	0.11
Carbon Tetrachloride	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Chloroform	0.096	0.89	1.51	1.18	1.27	0.023
Cumene (Isopropylbenzene)	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Dibromochloromethane	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Dichlorodifluoromethane	<0.084	<0.78	<1.32	<1.03	<1.11	<0.020
1,2-Dichloroethane	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
trans,1,2-Dichloroethene	<0.038	<0.35	<0.60	<0.47	<0.50	<0.0092
1,1-Dichloroethene	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
1,2-Dichloropropane	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Ethylbenzene	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Ethylene Dibromide	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Methylene Chloride	2.02	18.8	31.8	24.7	26.8	0.49
Styrene	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Tetrachloroethene	0.15	1.41	2.40	1.86	2.02	0.037
Toluene	0.41	3.82	6.48	5.04	5.45	0.10
1,1,1-Trichloroethane	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.28	<0.47	<0.37	<0.40	<0.0073
Trichlorotrifluoroethane	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Trichlorofluoromethane	<0.065	<0.60	<1.02	<0.80	<0.86	<0.016
M&P-Xylene	<0.097	<0.90	<1.53	<1.19	<1.29	<0.024
O-Xylene	<0.039	<0.36	<0.61	<0.48	<0.52	<0.0095
Vinyl Chloride	<0.060	<0.56	<0.95	<0.74	<0.80	<0.015
Total	<5.72	<53.2	<90.1	<70.1	<75.8	<1.39

Dry Gas Volume Sampled (Rm^3*) :	0.0635
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	18.3

* At 25°C and 1 atmosphere

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

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

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	1.30	12.8	21.6	16.8	18.2	0.33
Benzene	<0.15	<1.47	<2.50	<1.94	<2.10	<0.038
Bromodichloromethane	<0.034	<0.33	<0.57	<0.44	<0.48	<0.0087
Bromoform	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Bromomethane	<0.27	<2.65	<4.49	<3.49	<3.78	<0.069
1,3-Butadiene	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
2-Butanone	0.66	6.47	11.0	8.53	9.23	0.17
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Chloroform	0.089	0.87	1.48	1.15	1.25	0.023
Cumene (Isopropylbenzene)	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Dibromochloromethane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Dichlorodifluoromethane	<0.086	<0.84	<1.43	<1.11	<1.20	<0.022
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
trans,1,2-Dichloroethene	<0.036	<0.35	<0.60	<0.47	<0.50	<0.0092
1,1-Dichloroethene	<0.036	<0.35	<0.60	<0.47	<0.50	<0.0092
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Ethylbenzene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Ethylene Dibromide	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Methylene Chloride	1.96	19.3	32.6	25.4	27.5	0.50
Styrene	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Tetrachloroethene	0.087	0.85	1.45	1.13	1.22	0.022
Toluene	<0.19	<1.87	<3.18	<2.47	<2.67	<0.049
1,1,1-Trichloroethane	<0.033	<0.32	<0.55	<0.43	<0.46	<0.0085
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Trichlorotrifluoroethane	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Trichlorofluoromethane	<0.062	<0.61	<1.03	<0.80	<0.87	<0.016
M&P-Xylene	<0.090	<0.88	<1.50	<1.16	<1.26	<0.023
O-Xylene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0077
Vinyl Chloride	<0.060	<0.59	<1.00	<0.78	<0.84	<0.015
Total	<5.75	<56.4	<95.6	<74.3	<80.4	<1.47

Dry Gas Volume Sampled (Rm^3*) :	0.0601
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	18.3

* At 25°C and 1 atmosphere

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

TABLE 87
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m^3	µg/Rm^3*	µg/Rm^3**	µg/Rm^3*	mg/s
Acetone	1.43	13.7	23.6	17.8	19.4	0.36
Benzene	<0.31	<2.99	<5.15	<3.89	<4.25	<0.078
Bromodichloromethane	0.055	0.53	0.91	0.68	0.75	0.014
Bromoform	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Bromomethane	<0.27	<2.58	<4.45	<3.36	<3.67	<0.067
1,3-Butadiene	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
2-Butanone	1.60	15.3	26.4	19.9	21.8	0.40
Carbon Tetrachloride	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Chloroform	0.13	1.20	2.06	1.55	1.70	0.031
Cumene (Isopropylbenzene)	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Dibromochloromethane	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Dichlorodifluoromethane	<0.063	<0.60	<1.04	<0.78	<0.86	<0.016
1,2-Dichloroethane	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
trans,1,2-Dichloroethene	<0.039	<0.37	<0.64	<0.48	<0.53	<0.0097
1,1-Dichloroethene	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
1,2-Dichloropropane	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Ethylbenzene	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Ethylene Dibromide	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Methylene Chloride	2.78	26.6	45.8	34.6	37.8	0.69
Styrene	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Tetrachloroethene	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Toluene	<0.21	<1.99	<3.43	<2.59	<2.83	<0.052
1,1,1-Trichloroethane	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Trichlorotrifluoroethane	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Trichlorofluoromethane	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
M&P-Xylene	<0.090	<0.86	<1.48	<1.12	<1.22	<0.022
O-Xylene	<0.030	<0.29	<0.49	<0.37	<0.41	<0.0075
Vinyl Chloride	<0.060	<0.57	<0.99	<0.75	<0.82	<0.015
Total	<7.79	<74.5	<128	<96.8	<106	<1.94

Dry Gas Volume Sampled (Rm^3*) :	0.0607
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/s*) :	18.3

* 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	9.26	12.8	13.7	11.9
Benzene	<1.50	<1.47	<2.99	<1.99
Bromodichloromethane	<0.33	<0.33	0.53	<0.40
Bromoform	<0.28	<0.29	<0.29	<0.29
Bromomethane	<3.64	<2.65	<2.58	<2.96
1,3-Butadiene	<0.56	<0.59	<0.57	<0.57
2-Butanone	4.13	6.47	15.3	8.64
Carbon Tetrachloride	<0.28	<0.29	<0.29	<0.29
Chloroform	0.89	0.87	1.20	0.99
Cumene (Isopropylbenzene)	<0.56	<0.59	<0.57	<0.57
Dibromochloromethane	<0.28	<0.29	<0.29	<0.29
Dichlorodifluoromethane	<0.78	<0.84	<0.60	<0.74
1,2-Dichloroethane	<0.28	<0.29	<0.29	<0.29
trans,1,2-Dichloroethene	<0.35	<0.35	<0.37	<0.36
1,1-Dichloroethene	<0.28	<0.35	<0.29	<0.31
1,2-Dichloropropane	<0.28	<0.29	<0.29	<0.29
Ethylbenzene	<0.28	<0.29	<0.29	<0.29
Ethylene Dibromide	<0.56	<0.59	<0.57	<0.57
Mesitylene (1,3,5-Trimethylbenzene)	<0.56	<0.59	<0.57	<0.57
Methylene Chloride	18.8	19.3	26.6	21.5
Styrene	<0.56	<0.59	<0.57	<0.57
Tetrachloroethene	1.41	0.85	<0.29	<0.85
Toluene	3.82	<1.87	<1.99	<2.56
1,1,1-Trichloroethane	<0.28	<0.32	<0.29	<0.30
Trichloroethene/1,1,2-Trichloroethene	<0.28	<0.29	<0.29	<0.29
Trichlorotrifluoroethane	<0.56	<0.59	<0.57	<0.57
Trichlorofluoromethane	<0.60	<0.61	<0.57	<0.60
M&P-Xylene	<0.90	<0.88	<0.86	<0.88
O-Xylene	<0.36	<0.29	<0.29	<0.31
Vinyl Chloride	<0.56	<0.59	<0.57	<0.57
Total	<53.2	<56.4	<74.5	<61.3

TABLE 89
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	15.7	21.6	23.6	20.3
Benzene	<2.54	<2.50	<5.15	<3.40
Bromodichloromethane	<0.55	<0.57	0.91	<0.67
Bromoform	<0.47	<0.50	<0.49	<0.49
Bromomethane	<6.16	<4.49	<4.45	<5.03
1,3-Butadiene	<0.95	<1.00	<0.99	<0.98
2-Butanone	7.00	11.0	26.4	14.8
Carbon Tetrachloride	<0.47	<0.50	<0.49	<0.49
Chloroform	1.51	1.48	2.06	1.68
Cumene (Isopropylbenzene)	<0.95	<1.00	<0.99	<0.98
Dibromochloromethane	<0.47	<0.50	<0.49	<0.49
Dichlorodifluoromethane	<1.32	<1.43	<1.04	<1.26
1,2-Dichloroethane	<0.47	<0.50	<0.49	<0.49
trans,1,2-Dichloroethene	<0.60	<0.60	<0.64	<0.61
1,1-Dichloroethene	<0.47	<0.60	<0.49	<0.52
1,2-Dichloropropane	<0.47	<0.50	<0.49	<0.49
Ethylbenzene	<0.47	<0.50	<0.49	<0.49
Ethylene Dibromide	<0.95	<1.00	<0.99	<0.98
Mesitylene (1,3,5-Trimethylbenzene)	<0.95	<1.00	<0.99	<0.98
Methylene Chloride	31.8	32.6	45.8	36.8
Styrene	<0.95	<1.00	<0.99	<0.98
Tetrachloroethene	2.40	1.45	<0.49	<1.45
Toluene	6.48	<3.18	<3.43	<4.36
1,1,1-Trichloroethane	<0.47	<0.55	<0.49	<0.51
Trichloroethene/1,1,2-Trichloroethene	<0.47	<0.50	<0.49	<0.49
Trichlorotrifluoroethane	<0.95	<1.00	<0.99	<0.98
Trichlorofluoromethane	<1.02	<1.03	<0.99	<1.01
M&P-Xylene	<1.53	<1.50	<1.48	<1.50
O-Xylene	<0.61	<0.50	<0.49	<0.54
Vinyl Chloride	<0.95	<1.00	<0.99	<0.98
Total	<90.1	<95.6	<128	<105

* At 25°C and 1 atmosphere

TABLE 90
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	12.2	16.8	17.8	15.6
Benzene	<1.97	<1.94	<3.89	<2.60
Bromodichloromethane	<0.43	<0.44	0.68	<0.52
Bromoform	<0.37	<0.39	<0.37	<0.38
Bromomethane	<4.79	<3.49	<3.36	<3.88
1,3-Butadiene	<0.74	<0.78	<0.75	<0.75
2-Butanone	5.44	8.53	19.9	11.3
Carbon Tetrachloride	<0.37	<0.39	<0.37	<0.38
Chloroform	1.18	1.15	1.55	1.29
Cumene (Isopropylbenzene)	<0.74	<0.78	<0.75	<0.75
Dibromochloromethane	<0.37	<0.39	<0.37	<0.38
Dichlorodifluoromethane	<1.03	<1.11	<0.78	<0.98
1,2-Dichloroethane	<0.37	<0.39	<0.37	<0.38
trans,1,2-Dichloroethene	<0.47	<0.47	<0.48	<0.47
1,1-Dichloroethene	<0.37	<0.47	<0.37	<0.40
1,2-Dichloropropane	<0.37	<0.39	<0.37	<0.38
Ethylbenzene	<0.37	<0.39	<0.37	<0.38
Ethylene Dibromide	<0.74	<0.78	<0.75	<0.75
Mesitylene (1,3,5-Trimethylbenzene)	<0.74	<0.78	<0.75	<0.75
Methylene Chloride	24.7	25.4	34.6	28.2
Styrene	<0.74	<0.78	<0.75	<0.75
Tetrachloroethene	1.86	1.13	<0.37	<1.12
Toluene	5.04	<2.47	<2.59	<3.37
1,1,1-Trichloroethane	<0.37	<0.43	<0.37	<0.39
Trichloroethene/1,1,2-Trichloroethene	<0.37	<0.39	<0.37	<0.38
Trichlorotrifluoroethane	<0.74	<0.78	<0.75	<0.75
Trichlorofluoromethane	<0.80	<0.80	<0.75	<0.78
M&P-Xylene	<1.19	<1.16	<1.12	<1.16
O-Xylene	<0.48	<0.39	<0.37	<0.41
Vinyl Chloride	<0.74	<0.78	<0.75	<0.75
Total	<70.1	<74.3	<96.8	<80.4

* 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/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	13.2	18.2	19.4	17.0
Benzene	<2.14	<2.10	<4.25	<2.83
Bromodichloromethane	<0.46	<0.48	0.75	<0.56
Bromoform	<0.40	<0.42	<0.41	<0.41
Bromomethane	<5.19	<3.78	<3.67	<4.21
1,3-Butadiene	<0.80	<0.84	<0.82	<0.82
2-Butanone	5.89	9.23	21.8	12.3
Carbon Tetrachloride	<0.40	<0.42	<0.41	<0.41
Chloroform	1.27	1.25	1.70	1.41
Cumene (Isopropylbenzene)	<0.80	<0.84	<0.82	<0.82
Dibromochloromethane	<0.40	<0.42	<0.41	<0.41
Dichlorodifluoromethane	<1.11	<1.20	<0.86	<1.06
1,2-Dichloroethane	<0.40	<0.42	<0.41	<0.41
trans,1,2-Dichloroethene	<0.50	<0.50	<0.53	<0.51
1,1-Dichloroethene	<0.40	<0.50	<0.41	<0.44
1,2-Dichloropropane	<0.40	<0.42	<0.41	<0.41
Ethylbenzene	<0.40	<0.42	<0.41	<0.41
Ethylene Dibromide	<0.80	<0.84	<0.82	<0.82
Mesitylene (1,3,5-Trimethylbenzene)	<0.80	<0.84	<0.82	<0.82
Methylene Chloride	26.8	27.5	37.8	30.7
Styrene	<0.80	<0.84	<0.82	<0.82
Tetrachloroethene	2.02	1.22	<0.41	<1.21
Toluene	5.45	<2.67	<2.83	<3.65
1,1,1-Trichloroethane	<0.40	<0.46	<0.41	<0.42
Trichloroethene/1,1,2-Trichloroethene	<0.40	<0.42	<0.41	<0.41
Trichlorotrifluoroethane	<0.80	<0.84	<0.82	<0.82
Trichlorofluoromethane	<0.86	<0.87	<0.82	<0.85
M&P-Xylene	<1.29	<1.26	<1.22	<1.26
O-Xylene	<0.52	<0.42	<0.41	<0.45
Vinyl Chloride	<0.80	<0.84	<0.82	<0.82
Total	<75.8	<80.4	<106	<87.4

* At 25°C and 1 atmosphere

TABLE 92
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Rates

Compound	Emission Rate			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s
Acetone	0.24	0.33	0.36	0.31
Benzene	<0.039	<0.038	<0.078	<0.052
Bromodichloromethane	<0.0085	<0.0087	0.014	<0.010
Bromoform	<0.0073	<0.0077	<0.0075	<0.0075
Bromomethane	<0.095	<0.069	<0.067	<0.077
1,3-Butadiene	<0.015	<0.015	<0.015	<0.015
2-Butanone	0.11	0.17	0.40	0.22
Carbon Tetrachloride	<0.0073	<0.0077	<0.0075	<0.0075
Chloroform	0.023	0.023	0.031	0.026
Cumene (Isopropylbenzene)	<0.015	<0.015	<0.015	<0.015
Dibromochloromethane	<0.0073	<0.0077	<0.0075	<0.0075
Dichlorodifluoromethane	<0.020	<0.022	<0.016	<0.019
1,2-Dichloroethane	<0.0073	<0.0077	<0.0075	<0.0075
trans,1,2-Dichloroethene	<0.0092	<0.0092	<0.0097	<0.0094
1,1-Dichloroethene	<0.0073	<0.0092	<0.0075	<0.0080
1,2-Dichloropropane	<0.0073	<0.0077	<0.0075	<0.0075
Ethylbenzene	<0.0073	<0.0077	<0.0075	<0.0075
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	0.49	0.50	0.69	0.56
Styrene	<0.015	<0.015	<0.015	<0.015
Tetrachloroethene	0.037	0.022	<0.0075	<0.022
Toluene	0.10	<0.049	<0.052	<0.067
1,1,1-Trichloroethane	<0.0073	<0.0085	<0.0075	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.0073	<0.0077	<0.0075	<0.0075
Trichlorotrifluoroethane	<0.015	<0.015	<0.015	<0.015
Trichlorofluoromethane	<0.016	<0.016	<0.015	<0.016
M&P-Xylene	<0.024	<0.023	<0.022	<0.023
O-Xylene	<0.0095	<0.0077	<0.0075	<0.0082
Vinyl Chloride	<0.015	<0.015	<0.015	<0.015
Total	<1.39	<1.47	<1.94	<1.60

TABLE 93
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Volatile Organic Emission Data

Compound	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	11.9	20.3	15.6	17.0	0.31
Benzene	<1.99	<3.40	<2.60	<2.83	<0.052
Bromodichloromethane	<0.40	<0.67	<0.52	<0.56	<0.010
Bromoform	<0.29	<0.49	<0.38	<0.41	<0.0075
Bromomethane	<2.96	<5.03	<3.88	<4.21	<0.077
1,3-Butadiene	<0.57	<0.98	<0.75	<0.82	<0.015
2-Butanone	8.64	14.8	11.3	12.3	0.22
Carbon Tetrachloride	<0.29	<0.49	<0.38	<0.41	<0.0075
Chloroform	0.99	1.68	1.29	1.41	0.026
Cumene (Isopropylbenzene)	<0.57	<0.98	<0.75	<0.82	<0.015
Dibromochloromethane	<0.29	<0.49	<0.38	<0.41	<0.0075
Dichlorodifluoromethane	<0.74	<1.26	<0.98	<1.06	<0.019
1,2-Dichloroethane	<0.29	<0.49	<0.38	<0.41	<0.0075
trans,1,2-Dichloroethene	<0.36	<0.61	<0.47	<0.51	<0.0094
1,1-Dichloroethene	<0.31	<0.52	<0.40	<0.44	<0.0080
1,2-Dichloropropane	<0.29	<0.49	<0.38	<0.41	<0.0075
Ethylbenzene	<0.29	<0.49	<0.38	<0.41	<0.0075
Ethylene Dibromide	<0.57	<0.98	<0.75	<0.82	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.57	<0.98	<0.75	<0.82	<0.015
Methylene Chloride	21.5	36.8	28.2	30.7	0.56
Styrene	<0.57	<0.98	<0.75	<0.82	<0.015
Tetrachloroethene	<0.85	<1.45	<1.12	<1.21	<0.022
Toluene	<2.56	<4.36	<3.37	<3.65	<0.067
1,1,1-Trichloroethane	<0.30	<0.51	<0.39	<0.42	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.49	<0.38	<0.41	<0.0075
Trichlorotrifluoroethane	<0.57	<0.98	<0.75	<0.82	<0.015
Trichlorofluoromethane	<0.60	<1.01	<0.78	<0.85	<0.016
M&P-Xylene	<0.88	<1.50	<1.16	<1.26	<0.023
O-Xylene	<0.31	<0.54	<0.41	<0.45	<0.0082
Vinyl Chloride	<0.57	<0.98	<0.75	<0.82	<0.015
Total	<61.3	<105	<80.4	<87.4	<1.60

* 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 19A/19B	Field Blank 2 Tube 9A/9B	Field Blank 3 Tube 30A/30B	Trip Blank Tube 14A/14B	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

Pre-Test Plan Acceptance Letter and
ECA No. 7306-8FDKNX
(88 pages)

Ministry of the Environment, Conservation and Parks
Technical Assessment and Standards Development Branch
40 St. Clair Avenue West
7th Floor
Toronto ON M4V 1M2
Phone: 416.327.5519
Fax: 416.327.2936

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Direction des évaluations techniques et de l'élaboration des normes
40, avenue St. Clair Ouest
7e étage
Toronto (Ontario) M4V 1M2
Tél: 416.327.5519
Téléc: 416.327.2936

Ontario

Via email: cbelore@ortech.ca
TSS File No.: CR:SA:109670:18

2018/07/30

Mr. Chris Belore
ORTECH Consulting Inc.
804 Southdown Rd.
Mississauga, Ontario
L5J 2Y4

Re.: Pre-test plan for source testing to be conducted at Durham-York Energy Centre. Environmental Compliance Approval No. 7306-8FDKNX.

Dear Mr. Belore:

We reviewed your letter, dated 2018/07/25, prepared and submitted on behalf of Covanta Durham York Renewable Energy L.P. (DYEC), and referring to source testing (ORTECH Project 21880) to be conducted at DYEC's energy from waste facility.

Your letter indicates ORTECH's intent at using the pre-test plan from ORTECH's Project 21800, approved by this office on 2017/07/31, to conduct the 2018 Compliance Source Testing Program.

The testing is required by Condition 7(1) of the Environmental Compliance Approval No. 7306-8FDKNX, issued on 2011/06/28.

***Target Sources*:**

- Municipal Solid Waste Combustor Unit 1 (Baghouse Outlet Duct)
- Municipal Solid Waste Combustor Unit 2 (Baghouse Outlet Duct)

Note: *During this 2018 compliance source testing program, the voluntary Dioxin and Furan testing will be not be undertaken at the Inlet to the air pollution control (APC) system.*

***Target contaminants*:**

- Total suspended particulate matter (TSP),
- PM_{10},
- $PM_{2.5}$,
- PM condensable,
- Metals (17 selected metals, as listed in the ECA's Schedule "D"),
- Semivolatile Organic Compounds (17 dioxins and furans isomers, 12 dioxin-like PCBs, 39 selected PAHs, 12 chlorobenzenes, and19 chlorophenols) – as listed in ECA's Schedule "D",
- Volatile Organic Compounds (33 selected VOCs, as listed in the ECA's Schedule "D"),
- Aldehydes (acetaldehyde, acrolein and formaldehyde,),
- Halides (hydrogen fluoride and hydrogen chloride),
- Ammonia,
- Nitrogen oxides (NOx),
- Sulphur dioxide (SO_2),
- Combustion gases (oxygen, CO, and CO_2), and
- Total organic matter (THC).

***Reference methodologies*:**

- TSP: OSTC Method ON-5
- $PM_{2.5}/PM_{10}$: US EPA 40CFR60 Method 201A,
- PM condensable: US EPA 40CFR60 Method 202,
- Metals: US EPA 40CFR60 Method 29,
- SVOCs: Environment Canada's Report EPS 1/RM/2,
- VOCs: US EPA SW-846 Method 0030,
- Aldehydes: State of California Method CARB 430 (with Ashland modification),
- Halides & Ammonia: US EPA 40CFR60 Method 26A,
- NOx: DYEC CEM,
- SO_2: DYEC CEM,
- CO_2: DYEC CEM,
- O_2: DYEC CEM,
- CO: DYEC CEM,
- THC: US EPA 40CFR60 Method 25A, and
- Stack Gas Parameters: Ontario Source Testing Code's Method ON-1 to ON-4.

Note: *Due to the high negative static pressure (-9"WC) at the sampling ports, the use of clothing to seal the sampling ports is not considered appropriate during sampling due to its porosity and loose material, potentially generating a infiltration air path that may*

compromise the integrity of the sample being collected. A more appropriate approach to seal the sampling ports is required to be undertaken.

***Brief Process Description*:**

The DYEC is an energy-from-waste facility built with a maximum thermal/combustion processing rate of 140,000 tonnes per year of municipals solid waste (MSW). The facility operates on a continuous basis, hours/day, 7 days/week, 365 days/year, with the waste delivered initially set at 6 days per week between 07:00 and 19:00 hours.

The facility consists of two thermal treatment lines, each equipped and operated independently operated boilers/furnaces and air pollution control equipment. Each thermal treatment line has a maximum continuous rating (MCR) of 218 t/d of MSW, with a heat content of 13 MJ/kg, and a steam MCR of 33.64 tonnes/hour, to generate 20 MW of electricity (nominal capacity).

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.

Each thermal treatment line is equipped with independent air pollution control equipment; consisting of a Selective Non-Catalytic Reduction System with ammonia injection (for NOx control), an activated carbon injection system (to reduce mercury and dioxins in flue gas), a dry recirculation lime injection scrubber (to control acid gases), and a pulse jet type baghouse (to control particulate emissions).

The treated exhaust gases from both lines are vented to the atmosphere via a common exhaust stack, having an exit diameter of 1.71 metres, extending 87.6 metres above grade.

***Target Process Condition during the Source Testing Program*:**

It is stated in the pre-test plan states that during the source testing program, DYEC will target maximum load at each of the two thermal treatment lines.

DYEC's personnel will be responsible for the monitoring, collection, compilation and reporting of pertinent process data during the test program, in order to establish MSW processing levels that can be properly correlated to the magnitude of the emissions of the contaminants of interest being exhausted from the process.

The process parameters to be monitored and recorded include:

- Power output (MWh/d)
- Auxiliary fuel combusted (m^3/d)
- Average combustion zone temperature (^oC)
- Steam generated (t/d)
- MSW combusted (t/d)

- NOx reagent injection rate (L/d)
- Carbon injection rate (kg/d)
- Lime injection rate (kg/d)
- DYEC CEMs (printouts to be appended to the source testing report)
- Baghouses inlet temperature and pressure drop.
- Any upset conditions during the source testing program (including actions taken to correct it, if applicable).

Consistent with our request during the 2017 compliance source testing program, we require digital data (in Excel) of DYEC and ORTECH's CEMS output. In the case of DYEC CEMS output, we require the 1-munute averages for the full days when source testing was conducted, to confirm that the in-stack emissions and process parameters were within the ECA requirements, in order to validate that the thermal treatment units and associated air pollution control equipment were operating as expected by the MECP.

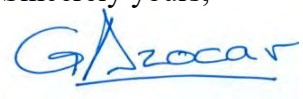
Our review indicated that the 2017 pre-test plan is suitable for conducting the 2018 source testing program, as the proposed reference methodologies, sampling strategies, and process monitoring strategies are still appropriate for this program.

We noted the sampling schedule for the week of September 10, 2018, with testing starting on September 11 and extending for four consecutive days. If changes in the sampling schedule occur, please notify the MECP's York-Durham District Office, and the Technology Standards Section.

Just a reminder that the source testing report is required to be submitted only in electronic format to the Technology Standards Section; and in electronic and hardcopy formats to the MECP's York-Durham District Office.

If you have any questions with regard to this assessment, I can be reached by phone at 416-327-6403, or by email at guillermo.azocar@ontario.ca.

Sincerely yours,



Guillermo Azocar
Source Assessment Specialist
Technology Standards Section

cc: M. Neild – Covanta DYEC L.P. (via email: mneild@covanta.com)
R. Kohler – Covanta DYEC L.P. (via email: rkholer@covant.com)
A. Huxter – Covanta DYEC L.P. (via email: ahuxter@covanta.com)
V. Bowering – MECP York-Durham D.O. (via email: Valerie. bowering@ontario.ca)
P. Dunn – MECP York-Durham D.O. (via email: philip.dunn@ontario.ca)
C. Grant – MECP TASDB TSS (via email: cathy.grant@ontario.ca)
C. Ruddy -MECP TASDB TSS (via email: caitlyn.ruddy@ontario.ca)

File AQ-02 (Durham-York Energy Centre)

Doc.Mgmt.5AB070094)

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 (^{o}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^{o}C (the Target Location) or by correlation of the required temperature of 1000^{o}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^{o}C and a reference pressure of 101.3 kilopascals, as measured and recorded by the CEM System, for the period from and including initial commissioning of the facility to twelve months following the completion of the first Source Testing program.

(ii) The 4-hour average concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, as measured and recorded by the CEM System, shall not be more than 40 milligrams per dry cubic metre, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, after the first twelve months following the completion of the first Source Testing program.

(d) The emissions from the Boilers after those emissions have been controlled by the associated APC Equipment for discharge into the atmosphere via the Stack shall comply with the emission concentration limits listed in the attached Schedule "C", as measured by a CEM System or by Source Testing as applicable.

(e) The Boilers shall include combustion air control systems, which are capable of automatically adjusting the distribution and the quantity of combustion air, in such a manner that changes in the Waste Processing Rate and/or Waste composition or irregularities in the loading and/or combustion shall not adversely affect the performance of the Boilers.

(f) The Boilers shall provide and maintain a high degree of gas turbulence and mixing in the combustion chamber.

(g) The Boilers shall achieve the temperature, oxygen availability and turbulence requirements over the complete range of operating parameters, including feed rate, feed characteristics, combustion air, flue gas flow rate and heat losses.

(h) The inlet temperature into each baghouse of the APC Equipment of the Boilers shall not be less than 120°C and not more than 185°C.

(3) The Owner shall install and maintain visual and audible alarm systems to alert the Facility/Equipment operators of any potential deviation from the above Performance Requirements for parameters that are continuously monitored by applicable CEM Systems and shall forthwith take all reasonable actions to bring the Equipment/Facility into compliance with all Performance Conditions.

(4) In the event that the CEM Systems indicate that emissions from the Boilers and the Stack exceed any Performance Requirements in the attached Schedule "C" for a continuous three (3) hour period, the Owner shall forthwith cut-off all Waste feed into the affected Boiler and initiate an Emergency Shutdown, while maintaining a temperature of 1000°C, as practicable, in the combustion zone of the Boiler.

Residual Waste Compliance Criteria

(5) (a) The Residual Waste generated at the Site and destined for a non-hazardous waste disposal site in Ontario shall not meet any of the criteria from the definition of "hazardous waste" set out in the *O. Reg. 347.*

(b) The Residual Waste that meets any of the criteria from the definition of "hazardous waste" set out in the *O. Reg.* 347 shall be handled and disposed of in accordance with the LDR requirements set out in the *EPA* and the *O. Reg. 347*.

(6) The Residual Waste, limited to the bottom ash, destined for a non-hazardous waste disposal site shall meet the definition of "incinerator ash" set out in the *O. Reg. 347*.

7. **TESTING, MONITORING** and **AUDITING**

Source Testing

(1) The Owner shall perform annual Source Testing in accordance with the procedures and schedule outlined in the attached Schedule "E", to determine the rate of emission of the Test Contaminants from the Stack. The first Source Testing program shall be conducted not later than six (6) months after the Commencement Date of Operation of the Facility/Equipment and subsequent Source Testing program shall be conducted once (1) every calendar year thereafter.

Continuous Monitoring

(2) The Owner shall select, test and install appropriate CEM Systems and continuous recording devices in accordance with the requirements outlined in the attached Schedule "F" to conduct and maintain a program to continuously monitor, as a minimum, the following parameters prior to commencement of operation of the Boilers:

(a) the temperature at one (1) second downstream of the combustion zone of each Boiler where most of the combustion has been completed and the combustion temperature is fully developed;

(b) the inlet temperature of the gases into each baghouse of the APC Equipment of each Boiler;

(c) the concentration of carbon monoxide, oxygen and organic matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler;

(d) the opacity and moisture content of the flue gas and the concentration of oxygen, nitrogen oxides, sulphur dioxide, hydrogen chloride, hydrogen fluoride and ammonia in the Undiluted Gases leaving the baghouse of the APC Equipment of each Boiler.

Long-Term Sampling for Dioxins and Furans

(3) (a) The Owner shall develop, install, maintain and update as necessary a long-term sampling system, with a minimum monthly sampling frequency, to measure the concentration of Dioxins and Furans in the Undiluted Gases leaving the APC Equipment associated with each Boiler. The performance of

this sampling system will be evaluated during the annual Source Testing programs in accordance with the principles outlined by 40 CFR 60, Appendix B, Specification 4.

(b) The Owner shall evaluate the performance of the long-term sampling system in determining Dioxins and Furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers.

Ambient Air Monitoring

(4) (a) The Regions shall develop and implement the Ambient Air Monitoring and Reporting Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable by the Regional Director.

(b) The Regions shall report the results of the Ambient Air Monitoring program to the Regional Director in accordance with the Ambient Air Monitoring and Reporting Plan and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Ambient Air Monitoring and Reporting Plan and the results of the Ambient Air Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233* and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved Noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

Residual Waste Testing

(7) (a) A minimum of six (6) months prior to the Commencement Date of Operation, the Owner shall submit to the Director for approval, a Testing Protocol for testing of the bottom ash for compliance with the criteria set out in the "incinerator ash" definition from the *O. Reg.* 347 and for testing of the Residual Waste for compliance with the criteria set out in this Certificate.

(b) As a minimum, the Testing Protocol shall comply with the Ministry's regulatory requirements for sampling and testing of waste, including the requirements set out in the Ministry's document entitled "Principles of Sampling and Analysis of Waste for TCLP under Ontario Regulation 347", dated February 2002, as amended.

(c) The Testing Protocol shall include the rationale for the proposed methods and the following:

(i) a sampling protocol, including the proposed number of samples to be taken and their locations, to ensure that representative sample(s) are being tested for compliance with this Certificate;

(ii) sample(s) handling and preserving procedures;

(iii) analytical protocol for the applicable contaminants to ensure that appropriate analytical method(s) are being used for compliance testing required by this Certificate; and

(iv) a testing protocol for the bottom ash during the Site commissioning period.

(d) The Owner shall implement the Testing Protocol on the Commencement Date of Operation.

(8) For handling of the bottom ash as a solid non-hazardous waste, the Owner shall follow the following schedule for compliance testing:

(a) for the Site commissioning period, the bottom ash shall be tested in accordance with the Testing Protocol approved by the Director;

(b) for the period following the Site commissioning period, the bottom ash shall be tested for the content of the combustible materials on an annual basis, until the compliance testing results indicate that the bottom ash meets the “incinerator ash” definition from the *O. Reg. 347* for three (3) consecutive years, following which a triennial compliance testing event may be carried out;

(c) should any annual or triennial compliance testing event indicate that the bottom ash does not meet the "incinerator ash" definition, prior to each of the next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re‑establish compliance with the "incinerator ash" definition from the *O. Reg. 347* and that the bottom ash does not exceed the Leachate Toxicity Criteria, the compliance testing schedule set out in Condition 7.(8)(b) may be resumed; and

(d) should the results of any compliance testing of the bottom ash indicate that the concentrations of the leachate toxic contaminants in the bottom ash equal to or exceed the Leachate Toxicity Criteria, the bottom ash shall be handled as a hazardous waste. Once three (3) consecutive tests re‑establish that the bottom ash does not exceed the Leachate Toxicity Criteria, the bottom ash compliance testing schedule set out in Condition 7.(8)(b) may be resumed.

(9) (a) For handling of the bottom ash as a hazardous waste and for handling of the fly ash, prior to final disposal at a hazardous waste landfill site in Ontario, the Owner shall undertake any sampling and testing that would be required to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347*.

(b) The Owner shall follow the following schedule for compliance testing:

(i) prior to each of the first three (3) shipments of the ash from the Site, the ash shall be tested so that for the compliance with the LDR requirements can be demonstrated;

(ii) following the three (3) initial compliance testing events, the ash shall be tested on an annual basis, until the compliance testing results indicate that the ash meets the LDR requirements during the three (3) consecutive years, following which a triennial compliance testing may be carried out; and

(iii) should any annual or triennial compliance testing event indicate that the ash does not meet the LDR requirements, prior to next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re‑establish compliance with the LDR requirements, the compliance testing schedule set out in Condition 7.(9)(b)(ii) may be resumed.

Soil Testing:

(10) (a) Within one hundred and twenty (120) days from the date of this Certificate, the Regions shall undertake the soil testing in accordance with the Soil Testing Plan required by this Certificate.

(b) The soil testing shall be repeated every three (3) years or as agreed upon in writing by the Regional Director.

Disposal of Residual Waste

(11) The Owners shall ensure that no portion of the Residual Waste undergoing compliance testing is transferred from the Site until the results of the compliance testing required by this Certificate demonstrate compliance with the relevant Ministry's requirements.

(12) Bottom ash that is not a hazardous waste, as defined in the *O. Reg. 347,* may be disposed of at an approved non-hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

(13) Residual Waste shall be treated to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347* prior to disposal of at an approved hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

Groundwater and Surface Water Monitoring

(14) (a) The Regions shall develop and implement the Groundwater and Surface Water Monitoring Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(b) The Regions shall report the results of the Groundwater and Surface Water Monitoring program to the Regional Director and to the Director in accordance with the schedule set out in the EA Approval and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Groundwater and Surface Water Monitoring Plan and the results of the Groundwater and Surface Water Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

8. NUISANCE IMPACT CONTROL and HOUSEKEEPING

Odour Management

(1) (a) The Owner shall maintain a negative air pressure atmosphere in the Tipping Building at all times to contain any potential odours within the confines of the Tipping Building.

(b) (i) Once per year, or as required by the District Manager, the Owner shall undertake a test to measure the worse case scenario negative air pressure atmosphere throughout the Tipping Building, while the activities approved in this Certificate are carried out in the Tipping Building.

(ii) Notwithstanding the requirements set out in Condition 8.(1)(b)(i), the Owner shall install sufficient instrumentation to measure the air flow into the Boilers and demonstrate that adequate air flow is maintained

to maintain a negative air pressure atmosphere throughout the Tipping Building.

(c) In the event that adequate negative air pressure cannot be maintained, the Owner shall implement any necessary additional odour containment and control measures, including, but not necessarily limited to, those in the required Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the entrance and exit doors into the Tipping Building, the Residue Building and the Grizzly Building are kept closed at all times except to permit the entry or exit of the respective waste transport vehicles and waste handling equipment into and out of these Buildings.

(3) The Owner shall ensure that, at all times, the air from the Tipping Building, the Residue Building, the Grizzly Building and from the Equipment is exhausted through an appropriate and fully functional APC Equipment approved by this Certificate.

(4) The Owner shall undertake appropriate housekeeping activities, including regular cleaning of the tipping floor to control potential sources of fugitive odour emissions.

(5) The Owner shall ensure that no Waste handling equipment or empty storage containers are stored outside, unless they have been washed to prevent fugitive odour emissions.

(6) The Owner shall regularly clean all equipment and storage areas that are used to handle, process and store waste at the Site, including the surfaces of the outdoor spill containment areas, as required.

(7) (i) Prior to the receipt of Waste at the Site, the Owner shall provide documentation which outlines the testing carried out by a licensed structural engineer to confirm the effectiveness of the containment in the buildings, conveyors and tanks and silos at the Site.

(ii) The testing shall be carried out and repeated as directed by the District Manager in accordance with the test protocol prepared in consultation with and approved by the District Manager.

(iii) These tests shall be repeated as directed or agreed by the District Manager.

(8) The Owner shall prepare and implement an Odour Management and Mitigation Plan in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(9) (a) In addition to the requirements set out in the EA Approval, the Odour Management and Mitigation Plan shall include the following:

(i) identification of all potential sources of odourous emissions;

(ii) description of the preventative and control measures to minimize odourous emissions from the identified sources;
(iii) procedures for the implementation of the Odour Management and Mitigation Plan;
(iv) inspection and maintenance procedures to ensure effective implementation of the Odour Management and Mitigation Plan; and
(v) procedures for verification and recording the progress of the implementation of the Odour Management and Mitigation Plan.

(b) The Owner shall continue to submit an updated Odour Management and Mitigation Plan until such time as the Regional Director notifies the Owner in writing that further submissions are no longer required.

Vehicles and Traffic

(10) (a) The Owner shall ensure that all vehicles transporting waste to and from the Site are not leaking or dripping waste when arriving at or leaving the Site.

(b) Should the Owner become aware that the truck(s) delivering waste to the Site have leaked wastewater on the municipal roadways, the Owner shall immediately report the violation to the owner of the vehicle(s) and to the District Manager.

(c) The Owner shall ensure that the exterior of all vehicles delivering Waste to the Site or hauling waste from the Site is washed prior to the trucks' departure from the Site, if necessary.

(d) Any necessary truck washing shall occur only in the designated wash down area of the Tipping Building or the Residue Building.

(11) The Owner shall ensure that there is no queuing or parking of vehicles that are waiting to enter the Site on any roadway that is not a distinct part of the Site.

Litter

(12) The Owner shall:

(a) take all practical steps to prevent the escape of litter from the Site;
(b) pick up litter around the Site on a daily basis, or more frequently if necessary; and
(c) if necessary, erect litter fences around the areas causing a litter problem.

Dust

(13) The Owner shall ensure that all on-site roads and operations/yard areas are regularly swept/washed to prevent dust impacts off-Site.

Vermin and Vectors

(14) The Owner shall:

(a) implement necessary housekeeping procedures to eliminate sources and potential sources of attraction for vermin and vectors; and

(b) hire a qualified, licensed pest control professional to design and implement a pest control plan for the Site. The pest control plan shall remain in place, and be updated from time to time as necessary, until the Site has been closed and this Certificate has been revoked.

Visual Screening

(15) The Owner shall provide visual screening for the Site in accordance with the documentation included in the attached Schedule "A".

9. STAFF TRAINING

(1) (a) The Owner shall ensure that all operators of the Site are trained with respect to the following, as per the specific job requirements of each individual operator:

(i) terms and conditions of this Certificate and the requirements of the EA Approval;
(ii) operation and management of the Site, or area(s) within the Site, as per the specific job requirements of each individual operator, and which may include procedures for receiving, screening and identifying Waste, refusal, handling, processing and temporarily storing wastes, operation of the Equipment, the APC Equipment, the CEM System and the Works;
(iii) testing, monitoring and operating requirements;
(iv) maintenance and inspection procedures;
(v) recording procedures;
(vi) nuisance impact control and housekeeping procedures;
(vii) procedures for recording and responding to public complaints;
(viii) an outline of the responsibilities of Site personnel including roles and responsibilities during emergency situations;
(ix) the Contingency and Emergency Response Plan including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
(x) environmental, and occupational health and safety concerns pertaining to the wastes to be handled;
(xi) emergency first-aid information; and
(xii) relevant waste management legislation and regulations, including the *EPA,* the *OWRA,* the *O. Reg. 347,* the *O. Reg. 419/05* and the Ministry guidelines affecting thermal treatment facilities.

(2) The Owner shall ensure that all personnel are trained in the requirements of this Certificate relevant to the employee's position:

(a) upon commencing employment at the Site in a particular position;
(b) whenever items listed in Condition 9.(1) are changed or updated; and
(c) during the planned refresher training.

10. **COMPLAINTS / ODOUR-CONTAMINANT EMISSIONS RESPONSE PROCEDURE**

(1) The Owner or a designated representative of the Owner shall be available to receive public complaints caused by the operations at the Site twenty-four (24) hours per day, seven (7) days per week.

(2) If at any time, the Owner or the Ministry receives a complaint or the Owner or the Provincial Officer detects an emission of odour or any contaminant, (Emission Event), from the Site, in addition to the requirements set out in the EA approval, the Owner shall record all relevant information in the computerized tracking system and shall respond to the complaint/Emission Event according to the following procedure:

Step 1: Record of Complaint/Emission Event

(a) (i) The Owner shall record each complaint/Emission Event and each record shall include the following:

(A) name, address and the telephone number of the complainant, if known;
(B) time and date of the complaint/Emission Event;
(C) details of the complaint; and

(ii) After the complaint/Emission Event has been recorded in the tracking system, the Owner shall immediately report to the District Manager by phone or e-mail during office hours and to the Ministry's Spills Actions Centre at 1-800-268-6060 after office hours on the receipt of the complaint or occurrence of the Emission Event.

Step 2: Investigation and Handling of Complaint/Emission Event

(b) The Owner shall immediately initiate investigation of the complaint/Emission Event. As a minimum, the investigation shall include the following:

(i) determination of the activities being undertaken at the Site at the time of the complaint/Emission Event;
(ii) meteorological conditions including, but not limited to the ambient temperature, approximate wind speed and its direction.
(iii) determination if the complaint is attributed to activities being undertaken at the Site and if so, the possible cause(s) of the complaint/Emission Event; and

(iv) determination of the remedial action(s) to address the cause(s) of the Complaint/Emission Event, and the schedule for the implementation of the necessary remedial action(s).

(c) The Owner shall respond to the complainant, if known, and the response shall include the results of the investigation of the Complaint, the action(s) taken or planned to be taken to address the cause(s) of the Complaint, and if any follow-up response(s) will be provided.

(d) Upon completed investigation of the Complaint/Emission event, the Owner shall, within three (3) business days, submit a report to the District Manager on the Complaint, on the action(s) taken or planned to be taken to address the cause(s) of the Complaint and on all proposed action(s) to prevent recurrence of the Complaint/Emission Event in the future.

(3) If, in the opinion of the District Manager, failure of the APC Equipment and/or any other process or equipment upset or malfunction results in off-site Complaint/Emission Event, confirmed by the Owner or a Provincial Officer of the Ministry, the Owner shall, immediately upon notification from the District Manager, implement any necessary additional control measures, including, but not necessarily limited to, those in the Contingency and Emergency Response Plan required by this Certificate.

(4) If the District Manager deems the additional control measures taken as per condition 10.(3) to be unsuitable, insufficient or ineffective, the District Manager may direct the Owner, in writing, to take further measures to address the noted failure, upset or malfunction including pursuant to section 39 of the *EPA* requiring a reduction in the receipt of Waste, cessation of the receipt of Waste, removal and off-site disposal of Waste from the Tipping Building as well as making repairs or modifications to equipment or processes.

11. CONTINGENCY and EMERGENCY RESPONSE PLAN

(1) (a) The Owner shall develop and implement a Contingency and Emergency Response Plan in accordance with the requirements set out in the EA Approval.

(b) Notwithstanding the requirements set out in the EA Approval, the Contingency and Emergency Response Plan shall be prepared in consultation with the District Manager or designate, the local Municipality and the Fire Department.

(2) In addition to the requirements set out in the EA Approval, the Contingency and Emergency Response Plan, as a minimum, shall include the following:

(a) the Site plan clearly showing the equipment layout and all storage areas for wastes and reagents;

(b) a list of Site personnel responsible for the implementation of the contingency measures and various emergency response tasks and their training requirements;
(c) a list of equipment and materials required for the implementation of the contingency measures and the emergency situation response;
(d) maintenance and testing program for equipment required for the implementation of the contingency measures and the emergency situation response;
(e) procedures to be undertaken as part of the implementation of the contingency measures and the emergency situation response;
(f) names and telephone numbers of waste management companies available for emergency response;
(g) notification protocol, with names and telephone numbers of persons to be contacted, including the Owner, the Site personnel, the Ministry of the Environment Spills Action Centre and the York Durham District, the local Fire and Police Departments, the local Municipality, the local Medical Officer of Health, and the Ministry of Labour;
(h) procedures and actions to be taken should the incoming Waste not meet the applicable quality criteria specified in this Certificate;
(i) procedures and actions to be taken should the outgoing Residual Waste fail to meet the criteria specified in this Certificate;
(j) procedures and actions to be taken should the current disposal options for the outgoing Residual Waste become unavailable;
(k) design of the contingency measure, procedures and actions should the emissions from the Site, including the fugitive odour/dust emissions, cause occurrences of public Complaints;
(l) procedures and actions to be taken should the Owner be unable to maintain the negative pressure in the Tipping Building;
(m) procedures and actions to be taken should the occurrence of Complaints require the Owner to suspend the waste processing activities at the Site; and
(n) identification and risk assessment of all reasonably foreseeable incidents that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate, including but not limited to:
    (i) a breakdown of the Facility/Equipment or part of the Facility/Equipment, including the APC Equipment and the CEM Systems associated with the Boilers;
    (ii) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements;
    (iii) any change in process parameters which may result in non compliance with the Performance Requirements;
    (iv) power failure resulting in the use of the Emergency Diesel Generator or Total Power Failure; and
    (v) description of the preventative and control measures to minimize the occurrence or impacts of the above incidents; and
    (vi) procedures for corrective measures and timelines to take to address the above incidents in a timely manner to effectively prevent or minimize the discharge of any contaminant into the natural environment and continue to maintain compliance with the *EPA* , the Regulations and

this Certificate, including procedures for Waste Processing Rate reduction, waste feed cut-off, Controlled Shutdown or Emergency Shutdown of the Boilers as applicable.

(3) The Owner shall submit the finalized Contingency and Emergency Response Plan to the Director a minimum of one hundred and twenty (120) days prior to the Commencement Date of Operation, for approval.

(4) An up-to-date version of the Contingency and Emergency Response Plan shall be kept at the Site at all times, in a central location available to all staff, and it shall be available for inspection by a Provincial Officer upon request.

(5) The Owner shall ensure that the names and telephone numbers of the persons to be contacted in the event of an emergency situation are kept up-to-date, and that these numbers are prominently displayed at the Site and at all times available to all staff and emergency response personnel.

(6) The Contingency and Emergency Response Plan shall be reviewed on a regular basis and updated, as necessary. The revised version of the Contingency and Emergency Response Plan shall be submitted to the local Municipality and the Fire Department for comments and to the District Manager for comments and concurrence.

(7) The Owner shall implement the recommendations of the updated Contingency and Emergency Response Plan, immediately upon receipt of the written concurrence from the District Manager.

12. EMERGENCY SITUATION RESPONSE and REPORTING

(1) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site and manage any emergency situation in accordance with the Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the equipment and materials listed in the Contingency and Emergency Response Plan are immediately available at the Site, are in a good state of repair, and fully operational at all times.

(3) The Owner shall ensure that all Site personnel responsible for the emergency situation response are fully trained in the use of the equipment and related materials, and in the procedures to be employed in the event of an emergency.

(4) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

13. **SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER**

(1) The Owner shall notify the District Manager in writing, at least six (60) days prior to the scheduled date for the first receipt of Waste at the Site, as to whether or not the construction of the Facility has been carried out in accordance with this Certificate to a point of Substantial Completion.

(2) (a) The Owner shall forthwith notify the District Manager and the Spills Action Centre by telephone, when any of the following incidents occur that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate:

(i) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements triggering a Waste Processing Rate Reduction, Waste Feed cut-off, Controlled Shutdown or Emergency Shutdown as specified in the Emergency Response and Contingency Plan;
(ii) failure of the APC Equipment associated with the Boilers; and
(iii) power failure resulting in the use of the emergency diesel generator or Total Power Failure;

(b) In addition to fulfilling the notification requirements from the *EPA,* the Owner shall prepare and submit a written report to the District Manager with respect to any of the above said occurrences, within five (5) calendar days of the occurrence, in the following format:

(i) date of the occurrence;
(ii) general description of the occurrence;
(iii) duration of the occurrence;
(iv) effect of the occurrence on the emissions from the Facility;
(v) measures taken to alleviate the effect of the occurrence on the emissions from the Facility; and
(vi) measures taken to prevent the occurrence of the same or similar occurrence in the future.

(3) Should a Spill, as defined in the *EPA*, occur at the Site, in addition to fulfilling the requirements from the *EPA* and applicable regulations, the Owner shall submit to the District Manager a written report within three (3) calendar days outlining the nature of the Spill, remedial measure taken and the measures taken to prevent future occurrences at the Site.

(4) (a) Within ninety (90) days from the date of this Certificate, the Regions shall prepare and submit to the District Manager for concurrence, a Soil Testing Plan to monitor the impact of the Site operations at the locations where the ambient air monitoring is proposed by the Owner in accordance with the requirements set out in the EA Approval.

(b) (i) This Plan shall ensure that representative samples of the soil to be tested are collected in sufficient numbers and that the samples are properly preserved and tested so that reliable data on the soil characteristics is collected.

(ii) As a minimum, the Plan shall include testing for cadmium, lead, chromium, nickel, cobalt, copper, molybdenum, selenium, zinc and mercury, Dioxins and Furans.

(iii) This Plan shall comply with the Ministry's regulatory requirements for sampling and testing of soil and it shall include the rationale for the proposed methods.

(iv) This Plan be kept at the Site at all times and be available for inspection by a Provincial Officer upon request.

14. RECORDS KEEPING

(1) Any information requested by the Ministry concerning the Facility and its operation under this Certificate, including, but not limited to, any records required to be kept by this Certificate, shall be provided to the Ministry, upon request**,** in a timely manner.

(2) The Owner shall retain, for a minimum of seven (7) years from the date of their creation, except as noted below, all reports, records and information described in this Certificate.

Daily Activities

(3) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) date of record and the name and signature of the person completing the report;
(b) quantity and source of the incoming Waste received at the Site;
(c) records of the estimated quantity of Waste thermally treated in the Boilers;
(d) quantity of the Unacceptable Waste received at the Site by the end of the approved Waste receipt period and the type(s) of the Unacceptable Waste received;
(e) quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;
(f) destination and/or receiving site(s) for the Residual Waste shipped from the Site;
(g) quantity and type of any Rejected Waste accepted at the Site;
(h) destination and/or receiving site(s) for the Rejected Waste shipped from the Site;
(i) housekeeping activities, including litter collection and washing/cleaning activities, etc.
(j) amount of electricity produced;

(k) amount of excess electricity exported to the electrical grid.

Monitoring and Testing Records

(4) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) day and time of the activity;
(b) all original records produced by the recording devices associated with the CEM Systems;
(c) a summary of daily records of readings of the CEM Systems, including:
  (i) the daily minimum and maximum 4-hour average readings for carbon monoxide;
  (ii) the daily minimum and maximum one hour average readings for oxygen;
  (iii) the daily minimum and maximum 10-minute average readings for organic matter;
  (iv) the daily minimum and maximum 24-hour average readings for sulphur dioxide;
  (v) the daily minimum and maximum 24-hour average readings for nitrogen oxides;
  (vi) the daily minimum and maximum 24-hour average readings for hydrogen chloride;
  (vii) the daily minimum and maximum 6-minute average and 2-hour average opacity readings; and
  (viii) the daily minimum and maximum one-hour average readings for temperature measurements.
(d) records of all excursions from the applicable Performance Requirements as measured by the CEM Systems, duration of the excursions, reasons for the excursions and corrective measures taken to eliminate the excursions;
(e) all records produced during any Acoustic Audit;
(f) all records produced during any Source Testing;
(g) all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;
(h) all records produced during the Residual Waste compliance testing;
(i) all records produced during the Soil Testing;
(j) all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;
(k) all records produced during the Ambient Air Monitoring required by this Certificate;
(l) all records associated with radiation monitoring of the incoming Waste, including but not limited to:
  (i) transaction number;
  (ii) hauler;
  (iii) vehicle ID;
  (iv) alarm level;
  (v) maximum CPS;
  (vi) uSv/hr;

(vii) comment;
(viii) background CPS;
(ix) driver time in and out; and
(x) name of the Trainer Personnel that carried out the monitoring.

(m) results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;

(n) results the negative pressure in the Tipping Building carried out, as required.

Inspections/Maintenance/Repairs

(5) The Owner shall maintain an on-Site written or digital record of inspections and maintenance as required by this Certificate. As a minimum, the record shall include the following:

(a) the name and signature of the Trained Personnel that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered, including the need for a maintenance or repair activity;
(d) the recommendations for remedial action;
(e) the date, time and description of actions (repair or maintenance) undertaken;
(f) the name and signature of the Trained Personnel who undertook the remedial action; and
(g) an estimate of the quantity of any materials removed during cleaning of the Works.

Emergency Situations

(6) The Owner shall maintain an on-Site written or digital record of the emergency situations. As a minimum, the record shall include the following:

(a) the type of an emergency situation;
(b) description of how the emergency situation was handled;
(c) the type and amount of material spilled, if applicable;
(d) a description of how the material was cleaned up and stored, if generated; and
(e) the location and time of final disposal, if applicable; and
(f) description of the preventative and control measures undertaken to minimize the potential for re-occurrence of the emergency situation in the future.

Complaints Response Records

(7) The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.

Training

(8) The Owner shall maintain an on-Site written or digital record of training as required by this Certificate. As a minimum, the record shall include the following:

(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

Reports

(9) The Owner shall keep at the Site the following reports required by this Certificate:

(a) the ESDM Report
(b) the Acoustic Assessment Report;
(c) the Annual Report; and
(d) the Third Party Audit.

15. **REPORTING**

Annual Report

(1) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

(a) a summary of the quality and the quantity of the Wastes accepted at the Site, including the maximum amount of the Waste received annually and daily and the sources of the Waste;

(b) a summary of the quality and the quantity of the Residual Waste shipped from the Site, including the analytical data required to characterize the Residual Waste, the off-Site destinations for the Residual Waste and its subsequent use, if known;

(c) estimated material balance for each month documenting the maximum amount of wastes stored at the Site;

(d) annual water usage;

(e) annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;

(f) summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;

(g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;

(h) a summary of dates, duration and reasons for any environmental and operational problems, Boilers downtime, APC Equipment and CEM System malfunctions that may have negatively impacted the quality of the environment or any incidents triggered by the Emergency Response and

Contingency Plan and corrective measures taken to eliminate the environmental impacts of the incidents;

(i) a summary of the dates, duration and reasons for all excursions from the applicable Performance Requirements as measured by the CEM Systems or as reported by the annual Source Testing, reasons for the excursions and corrective measures taken to eliminate the excursions;

(j) results of the evaluation of the performance of the long-term sampling system in determining the Dioxins and Furans emission trends and/or fluctuations for the year reported on as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers;

(k) dates of all environmental complaints relating to the Site together with cause of the Complaints and actions taken to prevent future Complaints and/or events that could lead to future Complaints;

(l) any environmental and operational problems that could have negatively impacted the environment, discovered as a result of daily inspections or otherwise and any mitigative actions taken;

(m) a summary of any emergency situations that have occurred at the Site and how they were handled;

(n) the results and an interpretive analysis of the results of the groundwater and surface water, including an assessment of the need to amend the monitoring programs;

(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;

(p) any recommendations to improve the environmental and process performance of the Site in the future;

(q) statement of compliance with this Certificate, including compliance with the *O. Reg. 419/05* and all air emission limits based on the results of source testing, continuous monitoring and engineering calculations, as may be appropriate; and

(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.

Third Party Audit

(2) (a) The Regions shall ensure that an independent technical review of the operations at the Site is undertaken in accordance with the requirements of the EA Approval.

(b) In addition to the Third Party Audit requirements set out in the EA approval, the Third Party Audit shall include the following:

(i) a review of the data from the monitoring and testing required by this Certificate;
(ii) a review of all complaints received about the operation of the Facility;
(iii) any recommendations for improving the operation of the Facility received from the Advisory Committee; and
(iv) a recommendation of any improvements that could be made to ensure that the operation of the Facility is optimized and is protective of the health and safety of people and the environment.

(3) The Regions shall submit a Written Audit Report on the results of the independent technical review to the Regional Director in accordance with the Audit Plan and retain a copy at the Site.

Soil Testing Report

(4) Within one (1) month of completion of each Soil Testing event, the Regions shall submit to the District Manager a Soil Testing Report, which includes the details on the sampling/testing procedures, the results of the testing and a comparison with the results obtained during the previous Soil Testing.

16. PUBLIC ACCESS TO DOCUMENTATION

(1) The Owner shall, at all times, maintain documentation that describes the current operations of the Facility. The Owner shall post the documentation at the website for the undertaking and during regular business hours, the Owner shall make the following documents available for inspection at the Site by any interested member of the public, upon submission to the Ministry for review:

(a) a current ESDM Report that demonstrates compliance with the Performance Limits for the Facility regarding all Compounds of Concern;

(b) a current Acoustic Assessment Report that demonstrates compliance with the Performance Limits for the Facility regarding noise emissions;

(c) the most recent Annual Report;

(d) the most current Third Party Audit Report;

(e) Odour Management and Mitigation Plan, prepared in accordance with the requirements of the EA Approval;

(f) Noise Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval; and

(g) Groundwater and Surface Water Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval.

(2) The Owner shall ensure that necessary hardware and software are provided at a location available to the public, to provide on-line real-time reporting of the operating parameter data for the Facility, including acceptable operating limits, stack emissions, and all other parameters for which continuous monitoring is required and that continuous records of the same be kept and made available to the public.

17. ADVISORY COMMITTEE

(1) The Regions shall establish an Advisory Committee in accordance with the requirements set out in the EA Approval.

18. CLOSURE of the SITE

(1) A minimum of nine (9) months prior to closure of the Site, the Owner shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Owner shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

SCHEDULE "A"

Supporting Documentation

(1) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Emission Summary and Dispersion Modelling Report, dated March 2011, prepared by Golder Associates;

(b) Acoustic Assessment Report prepared by Golder Associates Ltd., dated March 2011 and signed by Paul Niejadlik.

(2) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Attachment #1 containing the "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.;

(b) Attachment #3 containing the "Public Consultation Report", dated March 2011, prepared by Golder Associates Ltd.;

(c) Attachment #4 containing the Host Community Agreement

(d) Attachment #5 containing the proof of legal name for Covanta Durham York Renewable Energy Limited Partnership; and

(e) A letter May 24, 2011 from Anthony Ciccone, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, providing additional technical information on the proposal and attaching a report entitled "Amendment #1 Durham York Energy Centre Design and Operations Report", dated May 2011;

(3) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of Durham and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) "Surface Water and Groundwater Technical Study Report" dated July 2009, prepared by Jacques Whitford, Markham, Ontario (CD Report).

(b) "Stormwater Design Model Output" prepared by Sigma Energy, dated March 2001 (CD Report).

(c) Clearance letter from Central Lake Ontario Conservation date February 22, 2011.

(d) A letter dated March 23, 2011, from Brian Bahor, Covanta Energy Corporation, to Stefanos Habtom, Ontario Ministry of the Environment, providing additional technical design information on the proposed stormwater management ponds.

SCHEDULE "B"

Procedure to calculate and record the 10-minute average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor

(a) Calculate and record one-hour average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor, employing CALPUFF atmospheric dispersion model or the dispersion model acceptable to the Director that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour average odour concentrations.

(b) Convert and record each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations using the One-hour Average to 10-Minute Average Conversion described below; and

(c) Record and present the 10-Minute Average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the most impacted Sensitive Receptor in a histogram. The histogram shall identify all predicted 10-minute average odour concentration occurrences in terms of frequency, identifying the number of occurrences over the entire range of predicted odour concentration in increments of not more than 1/10 of one odour unit. The maximum 10-minute average concentration of odour at the Sensitive Receptor will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

One-hour Average To 10-minute Average Conversion

1. Use the following formula to convert and record one-hour average concentrations predicted by the CALPUFF atmospheric dispersion model or by the dispersion model acceptable to the Director to 10-minute average concentrations:

X10min = X60min*1.65

where X10min = 10-minute average concentration
X60min = one-hour average concentration

SCHEDULE "C"

PERFORMANCE REQUIREMENTS
In-Stack Emission Limits

Parameter	In-Stack Emission Limit	Verification of Compliance
Total Suspended Particulate Matter (filterable particulate measured in accordance with the Ontario Source Testing Code)	9 mg/Rm3	Results from compliance Source Testing
cadmium	7 µg/Rm3	Results from compliance Source Testing
lead	50 µg/Rm3	Results from compliance Source Testing
mercury	15 µg/Rm3	Results from compliance Source Testing
dioxins and furans	60 pg/Rm3	Results from compliance Source Testing; results expressed as I-TEQ
hydrochloric acid (HCl)	9 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
sulphur dioxide (SO2)	35 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
nitrogen oxides (NOx)	121 mg/ Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
organic matter (undiluted, expressed as equivalent methane)	50 ppmdv (33 mg/ Rm3)	Results from compliance source testing
carbon monoxide	35 ppmdv (40 mg/Rm3)	Calculated as the rolling arithmetic average of four (4) hours of data measured by a CEM System that provides data at least once every fifteen minutes, in accordance with condition 6 (2) (c)
opacity	10 percent	Calculated as the rolling arithmetic average of six (6) minutes of data measured by a CEM System that provides data at least once every minute
	5 percent	Calculated as the rolling arithmetic average of two (2) hours of data measured by a CEM System that provides data at least once every

		fifteen minutes

mg/Rm3- milligrams per reference cubic metre;

pg/Rm3 - picograms per reference cubic metre

ppmdv parts per million by dry volume,

µg/Rm3 - micrograms per reference cubic metre

R- reference conditions - 25 degrees Celsius, 101.3 kilopascals, dry basis, 11% oxygen

SCHEDULE "D"

TEST CONTAMINANTS

Hydrogen Chloride
Hydrogen Fluoride
Oxides of Nitrogen expressed as Nitrogen Dioxide
Sulphur Dioxide
Total Hydrocarbons, expressed as methane on wet basis
Carbon Dioxide
Total Suspended Particulate Matter (< 44 microns)
Total PM-10 including condensables
Total PM-2.5 including condensables

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Schedule "D" - Cont'd

Chlorobenzenes	Chlorophenols
Monochlorobenzene (MCB) 1,2-Dichlorobenzene (1,2-DCB) 1,3-Dichlorobenzene (1,3-DCB) 1,4-Dichlorobenzene (1,4-DCB) 1,2,3-Trichlorobenzene (1,2,3-TCB) 1,2,4-Trichlorobenzene (1,2,4-TCB) 1,3,5-Trichlorobenzene (1,3,5-TCB) 1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB) 1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB) 1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB) Pentachlorobenzene (PeCB) Hexachlorobenzene (HxCB)	2-monochlorophenol (2-MCP) 3-monochlorophenol (3-MCP) 4-monochlorophenol (4-MCP) 2,3-dichlorophenol (2,3-DCP) 2,4-dichlorophenol (2,4-DCP) 2,5-dichlorophenol (2,5-DCP) 2,6-dichlorophenol (2,6-DCP) 3,4-dichlorophenol (3,4-DCP) 3,5-dichlorophenol (3,5-DCP) 2,3,4-trichlorophenol (2,3,4-T3CP) 2,3,5-trichlorophenol (2,3,5-T3CP) 2,3,6-trichlorophenol (2,3,6-T3CP) 2,4,5-trichlorophenol (2,4,5-T3CP) 2,4,6-trichlorophenol (2,4,6-T3CP) 3,4,5-trichlorophenol (3,4,5-T3CP) 2,3,4,5-tetrachlorophenol (2,3,4,5-T4CP) 2,3,4,6-tetrachlorophenol (2,3,4,6-T4CP) 2,3,5,6-tetrachlorophenol (2,3,5,6-T4CP) Pentachlorophenol (PeCP)

Schedule "D" - Cont'd

Co-Planar PCBs (Dioxin-like PCBs)	Volatile Organic Matter
PCB-077 (3,3',4,4'-TCB)	Acetaldehyde
PCB-081 (3,4,4',5-TCB)	Acetone
PCB-105 (2,3,3',4,4'-PeCB)	Acrolein
PCB-114 (2,3,4,4',5-PeCB)	Benzene
PCB-118 (2,3',4,4',5-PeCB)	Bromodichloromethane
PCB-123 (2',3,4,4',5-PeCB)	Bromoform
PCB-126 (3,3',4,4',5-PeCB)	Bromomethane
PCB-156 (2,3,3',4,4',5-HxCB)	Butadiene, 1,3 -
PCB-157 (2,3,3',4,4',5'-HxCB)	Butanone, 2 -
PCB-167 (2,3',4,4',5,5'-HxCB)	Carbon Tetrachloride
PCB-169 (3,3',4,4',5,5'-HxCB)	Chloroform
PCB-189 (2,3,3',4,4',5,5'-HpCB)	Cumene
	Dibromochloromethane
	Dichlorodifluoromethane
	Dichloroethane, 1,2 -
	Dichloroethene, Trans - 1,2
	Dichloroethene, 1,1 -
	Dichloropropane, 1,2 -
	Ethylbenzene
	Ethylene Dibromide
	Formaldehyde
	Mesitylene
	Methylene Chloride
	Styrene
	Tetrachloroethene
	Toluene
	Trichloroethane, 1,1,1 -
	Trichloroethene
	Trichloroethylene, 1,1,2 -
	Trichlorotrifluoroethane
	Trichlorofluoromethane
	Xylenes, M-, P- and O-
	Vinyl Chloride

Schedule "D" - Cont'd

Polycyclic Organic Matter	Dioxin/Furan Isomers
Acenaphthylene	
Acenaphthene	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Anthracene	1,2,3,7,8-Pentachlorodibenzo-p-dioxin
Benzo(a)anthracene	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
Benzo(b)fluoranthene	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
Benzo(k)fluoranthene	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
Benzo(a)fluorene	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
Benzo(b)fluorene	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin
Benzo(ghi)perylene	
Benzo(a)pyrene	2,3,7,8-Tetrachlorodibenzofuran
Benzo(e)pyrene	2,3,4,7,8-Pentachlorodibenzofuran
Biphenyl	1,2,3,7,8-Pentachlorodibenzofuran
2-Chloronaphthalene	1,2,3,4,7,8-Hexachlorodibenzofuran
Chrysene	1,2,3,6,7,8-Hexachlorodibenzofuran
Coronene	1,2,3,7,8,9-Hexachlorodibenzofuran
Dibenzo(a,c)anthracene	2,3,4,6,7,8-Hexachlorodibenzofuran
Dibenzo(a,h)anthracene	1,2,3,4,6,7,8-Heptachlorodibenzofuran
Dibenzo(a,e)pyrene	1,2,3,4,7,8,9-Heptachlorodibenzofuran
9,10-Dimethylanthracene	1,2,3,4,6,7,8,9-Octachlorodibenzofuran
7,12-Dimethylbenzo(a)anthracene	
Fluoranthene	
Fluorene	
Indeno(1,2,3-cd)pyrene	
2-Methylanthracene	
3-Methylcholanthrene	
1-Methylnaphthalene	
2-Methylnaphthalene	
1-Methylphenanthrene	
9-Methylphenanthrene	
Naphthalene	
Perylene	
Phenanthrene	
Picene	
Pyrene	
Tetralin	
M-terphenyl	
O-terphenyl	
P-terphenyl	
Triphenylene	

SCHEDULE "E"

SOURCE TESTING PROCEDURES

1. The Owner shall submit, to the Manager a test protocol including the Pre-Test Information required by the Source Testing Code, at least two (2) months prior to the scheduled Source Testing date.

2. (1) For the purpose of the Source Testing program, the Owner is temporarily permitted to operate the Boilers at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b) during the period of the Source Testing. The Owner shall ensure that the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone of the Boilers, as measured and recorded by the CEM System, shall not be less than 5 percent by volume on a dry basis, during this Source Testing program.

   (2) If the Source Testing results demonstrate that compliance with the Performance Requirements can be maintained at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b), the Owner may apply to the Director for approval to alter the required residual oxygen concentration.

3. The Owner shall finalize the test protocol in consultation with the Manager.

4. The Owner shall not commence the Source Testing until the Manager has accepted the test protocol.

5. The Owner shall complete the first Source Testing not later than six (6) months after Commencement of Operation of the Facility/Equipment.

6. The Owner shall conduct subsequent Source Testing at least once (1) every calendar year thereafter.

7. The Owner shall notify the District Manager and the Manager in writing of the location, date and time of any impending Source Testing required by this Certificate, at least fifteen (15) days prior to the Source Testing.

8. The Owner shall submit a report on the Source Testing programs to the District Manager and the Manager not later than three (3) months after completing each Source Testing program. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

   (1) an executive summary;
   (2) records of operating conditions; including process description, records of waste composition and feed rate during the Source Testing;
   (3) all records produced by the CEM Equipment;
   (4) procedures followed during the Source Testing and any deviation from the proposed test protocol and the reasons therefore;
   (5) the results of the analyses of the stack emissions;

(6) a summary table that compares the Source Testing results, the monitoring data and the records of operating conditions during the Source Testing to the requirements imposed by the *EPA*, the Regulation and/or the Performance Requirements;
(7) the results of dispersion calculations in accordance with the *O. Reg. 419/05*, indicating the maximum concentration of the Test Contaminants, at the Point of Impingement.
(8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the Test Contaminants.

9. The Owner shall ensure that the Source Testing Report is made available and easily accessible for review by the public at the Facility, immediately after the document is submitted to the Ministry.

10. The Director may not accept the results of the Source Testing if:
(1) the Source Testing Code or the requirements of the Manager were not followed; or
(2) the Owner did not notify the District Manager and the Manager of the Source Testing; or
(3) the Owner failed to provide a complete report on the Source Testing.

11. If the Director does not accept the results of the Source Testing, the Director may require re-testing.

SCHEDULE "F"

PARAMETER:
Temperature

LOCATION:
The sample point for the Continuous Temperature Monitor shall be located at a point where the temperature in the combustion zone of the Boilers has reached at least 1000^{o}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^{o}C minimum
3.	Flame Temperature:	1800 ^{o}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 for Waste 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 ofPart II.1 of
the Environmental Protection Act
Ministry ofthe 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

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.

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	September 11, 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 Series
Meter Box No.:	Team 4
Impinger Box No.:	14

Pitot Factor	.851	
DGMCF	.996	
Barometric Pressure	29.82	"Hg
Static Pressure	-9.81 ~~-10.5~~	"H2O
Nozzle Size	.2768	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	<0.1	mg
Probe	1.2	mg

Moisture Gain

CWTR	647.5	g
WCBDA	33.7	g

Combustion Gas Concentration

Oxygen	8.23	%
Carbon Dioxide	11.15	%
Carbon Monoxide	11.4	ppm

Measuring Device	MII Numbers
Probe / Pitot ISO	B03778
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2760
2	.2770
3	.2770
4	.2770
Average:	.2768

Site Diagram

Notes:

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
		47.12											
1	0	~~54.07~~	.65	.84	262	251	248	72	81	72	74	2.4	6
	2.5	49.24	.65	.83	261	254	248	57	234	72	72	2.4	6
	5	51.43	.65	.83	261	253	253	56	239	73	74	2.3	6
2	7.5	53.50	.67	.84	262	252	249	55	238	74	72	2.4	6
	10	55.64	.68	.85	263	251	246	56	235	74	73	2.45	6
	12.5	57.78	.71	.87	263	250	253	58	239	75	72	2.6	6.5
3	15	59.99	.75	.89	263	250	252	59	240	76	73	2.7	6.5
	17.5	62.24	.75	.88	283	250	249	61	239	77	73	2.65	6.5
	20	64.49	.75	.88	283	249	248	61	236	77	73	2.6	6.5
4	22.5	66.71	.81	.91	284	249	252	61	239	77	73	2.75	7
	25	68.99	.76	.88	285	249	251	60	241	77	73	2.6	7
	27.5	71.21	.76	.88	285	248	250	58	237	78	73	2.6	7
5	30	73.46	.73	.87	284	248	252	58	239	78	73	2.5	6.5
	32.5	75.65	.73	.87	286	249	251	56	240	78	73	2.5	6.5
	35	77.82	.71	.85	286	249	249	56	239	78	73	2.45	6.5
6	37.5	79.99	.69	.84	286	249	248	55	237	78	73	2.4	6.5
	40	82.14	.67	.83	286	249	252	54	239	78	74	2.35	6.5
	42.5	84.26	.67	.83	286	249	250	54	239	79	74	2.35	6.5
7	45	86.39	.62	.80	285	249	249	54	237	78	74	2.2	6
	47.5	88.44	.64	.81	285	249	251	53	238	78	74	2.25	6
	50	90.49	.65	.82	283	249	249	53	238	79	74	2.3	6

Traverse: 2				
Start Time: 9:19	Initial Leak Check: .002	cfm@ 21	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

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

PM Metals

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	92.58	.71	.85	290	249	249	53	237	79	74	2.4	6.5
	55	94.73	.73	.87	286	249	250	53	240	79	74	2.5	7
	57.5	96.91	.72	.86	286	249	251	53	241	79	74	2.5	7
9	60	99.08	.72	.86	286	249	248	53	238	79	74	2.5	7
	62.5	101.23	.76	.89	286	249	248	54	236	79	74	2.6	7
	65	103.45	.76	.89	286	250	254	54	240	79	74	2.6	7
10	67.5	105.67	.82	.92	286	250	252	54	241	79	74	2.8	7
	70	107.97	.80	.91	286	250	249	54	240	79	74	2.75	7
	72.5	110.25	.81	.91	286	250	248	55	237	78	74	2.75	7
11	75	112.55	.82	.92	285	250	253	55	240	78	74	2.8	7
	77.5	114.85	.83	.93	285	250	252	55	242	79	74	2.85	7
	80	117.17	.83	.93	285	250	250	55	240	79	74	2.85	7
12	82.5	119.50	.84	.93	285	250	248	55	238	78	74	2.85	7
	85	121.83	.84	.93	285	250	253	56	240	79	74	2.85	7
	87.5	124.17	.82	.92	286	250	253	56	242	78	74	2.8	7
	90	126.54											

Traverse: 2				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 10:49	Final Leak Check: .004	cfm@ 16	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	127.14	.65	.80	285	247	251	66	124	73	74	2.2	6.5
	2.5	129.41	.65	.82	251	251	251	49	222	74	73	2.3	6.5
	5	131.51	.66	.82	255	252	252	46	238	75	73	2.25	6.5
2	7.5	133.60	.66	.82	255	251	250	46	238	76	73	2.25	6.5
	10	135.67	.67	.83	255	250	247	46	235	77	73	2.35	6.5
	12.5	137.77	.67	.83	256	249	253	47	237	77	74	2.35	6.5
3	15	139.86	.71	.84	256	249	253	47	240	78	74	2.4	7
	17.5	141.98	.70	.84	283	249	250	47	239	79	74	2.3	7
	20	144.07	.70	.84	283	248	247	47	235	79	74	2.3	7
4	22.5	146.15	.70	.84	283	248	253	47	237	80	74	2.3	7
	25	148.24	.70	.84	284	249	253	47	240	80	74	2.3	7
	27.5	150.33	.68	.82	284	248	250	47	239	80	75	2.25	7
5	30	152.42	.67	.82	284	248	249	47	236	80	75	2.25	7
	32.5	154.50	.67	.82	285	248	252	48	238	81	75	2.25	7
	35	156.59	.67	.82	285	248	250	48	238	81	75	2.25	7
6	37.5	158.65	.64	.80	285	248	250	48	236	81	75	2.1	6.5
	40	160.64	.65	.81	285	248	252	49	237	81	75	2.15	7
	42.5	162.66	.65	.81	285	248	250	49	237	81	76	2.15	7
7	45	164.67	.61	.78	285	248	250	49	235	82	76	2.0	6.5
	47.5	166.63	.62	.79	285	248	253	49	237	82	76	2.05	6.5
	50	168.59	.60	.78	285	248	250	49	237	82	76	2.0	6.5

Traverse: 1				
Start Time: 11:16	Initial Leak Check: .003	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	170.53	.70	.84	285	248	249	49	235	82	76	2.3	7
	55	172.60	.68	.83	285	248	252	49	235	82	76	2.25	7
	57.5	174.69	.61	.78	285	248	251	50	238	82	76	2.0	6.5
9	60	176.69	.78	.89	285	248	249	50	234	82	76	2.6	7
	62.5	178.85	.78	.89	285	250	252	50	237	82	76	2.6	7
	65	181.07	.77	.88	285	249	252	51	240	82	76	2.55	7
10	67.5	183.28	.82	.91	285	249	250	51	238	82	76	2.75	7.5
	70	185.57	.83	.91	285	249	248	51	237	81	77	2.75	7.5
	72.5	187.87	.80	.90	285	249	254	52	240	81	77	2.6	7
11	75	190.10	.80	.90	284	250	252	52	240	81	77	2.6	7
	77.5	192.35	.83	.91	284	250	250	52	238	81	77	2.7	7
	80	194.65	.82	.91	284	249	248	52	236	81	77	2.7	7
12	82.5	196.87	.82	.91	284	250	254	52	239	81	77	2.75	7
	85	199.16	.84	.92	284	250	253	53	242	82	77	2.75	7
	87.5	201.46	.81	.90	285	250	251	53	240	82	77	2.6	7
	90	203.75											

Traverse: 1			
Start Time: –	Initial Leak Check: –	cfm@ –	"Hg
Finish Time: 12:46	Final Leak Check: .003	cfm@ 15	"Hg

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

Static -10.5

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	September 11 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 Series
Meter Box No.:	Team 4
Impinger Box No.:	

Pitot Factor	.851	
DGMCF	.996	
Barometric Pressure	29.85	"Hg
Static Pressure	-.81	"H2O
Nozzle Size	.2768	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	0.4	mg
Probe	2.9	mg

Moisture Gain

CWTR	656.7	g
WCBDA	31.5	g

Combustion Gas Concentration

Oxygen	8.08	%
Carbon Dioxide	11.09	%
Carbon Monoxide	12.7	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot 150	B03778
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2760
2	.2760
3	.2770
4	.2770
Average:	.2768

Notes:

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot 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	4.33	.64	.81	251	247	230	76	150	75	75	2.25	6
	2.5	6.38	.70	.85	257	251	249	66	86	76	75	2.4	6
	5	8.52	.65	.82	260	250	252	64	89	77	75	2.25	6
2	7.5	10.59	.66	.82	260	250	248	62	221	77	75	2.25	6
	10	12.65	.67	.83	260	249	251	61	238	78	75	2.35	6.5
	12.5	14.75	.67	.83	260	249	248	61	240	79	76	2.35	6.5
3	15	16.87	.66	.83	260	249	250	62	242	80	76	2.3	6.5
	17.5	18.97	.70	.85	260	248	252	63	242	80	76	2.45	6.5
	20	21.13	.68	.83	283	249	248	63	242	81	76	2.35	6.5
4	22.5	23.26	.70	.84	284	248	253	61	242	81	76	2.35	6.5
	25	25.37	.67	.82	285	249	248	60	242	81	76	2.25	6.5
	27.5	27.45	.69	.83	285	248	252	59	242	81	76	2.3	6.5
5	30	29.55	.69	.83	285	248	248	58	241	81	77	2.3	6.5
	32.5	31.66	.69	.83	285	249	251	58	242	82	77	2.3	6.5
	35	33.68	.69	.83	285	248	251	57	241	82	77	2.3	6.5
6	37.5	35.83	.67	.82	286	249	250	57	242	82	77	2.25	6.5
	40	37.94	.67	.82	286	249	250	56	242	82	77	2.25	6.5
	42.5	40.02	.67	.82	286	249	249	55	241	82	77	2.25	6.5
7	45	42.09	.62	.79	286	248	253	55	241	82	77	2.05	6
	47.5	44.08	.65	.81	286	249	248	55	241	82	77	2.2	6.5
	50	46.12	.64	.80	286	248	253	55	241	83	77	2.15	6.5

Traverse: 1					
Start Time: 14:00	Initial Leak Check:	.008	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

PM- Metals

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	48.16	.71	.85	286	249	249	55	241	83	77	2.35	6.5
	55	50.29	.74	.86	286	248	240	54	240	83	77	2.45	7
"	57.5	52.46	.72	.85	287	249	252	54	247	82	77	2.35	6.5
9	60	54.61	.80	.90	286	249	248	54	249	82	77	2.65	7
	62.5	56.86	.78	.89	286	249	249	54	249	82	77	2.6	7
"	65	59.09	.79	.89	286	249	252	54	248	82	77	2.6	7
10	67.5	61.34	.82	.91	285	249	248	54	248	82	77	2.7	7
	70	63.62	.84	.92	285	249	251	55	248	82	78	2.75	7
"	72.5	65.92	.85	.92	285	250	249	55	248	82	77	2.75	7
11	75	68.23	.86	.93	285	249	250	54	249	82	77	2.8	7
	77.5	70.56	.85	.92	285	250	249	55	248	82	77	2.8	7
	80	72.90	.87	.94	285	250	250	55	249	81	78	2.85	7.5
12	82.5	75.25	.87	.93	285	250	248	55	250	81	77	2.85	7.5
	85	77.61	.86	.93	286	250	250	56	249	81	78	2.85	7.5
	87.5	79.95	.88	.94	286	250	251	56	249	81	77	2.9	7.5
	90	82.33											

Traverse: 1				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 15:30	Final Leak Check: .005	cfm@ 21	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	83.06	.91	.97	287	247	248	66	195	77	77	2.9	7.5
	2.5	85.37	.93	.96	287	252	250	57	240	78	77	2.9	7.5
	5	87.70	.93	.96	289	252	250	53	246	78	77	3.0	7.5
2	7.5	90.10	.92	.96	289	252	249	52	248	79	78	3.0	7.5
	10	92.48	.94	.97	289	251	252	52	249	79	77	3.1	7.5
	12.5	94.91	.94	.97	290	251	248	52	248	80	77	3.1	7.5
3	15	97.34	.88	.94	290	251	252	52	249	80	77	2.85	7.5
	17.5	99.69	.89	.94	290	251	249	52	247	80	77	2.85	7.5
	20	102.04	.89	.94	290	251	250	52	247	81	77	2.9	7.5
4	22.5	104.40	.81	.90	290	250	251	52	247	81	77	2.7	7
	25	106.70	.81	.90	289	251	248	52	246	81	77	2.7	7
	27.5	108.98	.79	.89	289	251	251	52	247	81	77	2.65	7
5	30	111.25	.74	.86	289	250	251	52	246	81	77	2.5	7
	32.5	113.47	.74	.86	288	250	249	52	246	81	77	2.45	7
	35	115.67	.74	.86	288	250	252	52	245	82	77	2.45	7
6	37.5	117.86	.67	.82	288	250	249	52	245	82	77	2.25	7
	40	119.97	.67	.82	288	250	252	52	246	82	77	2.2	7
	42.5	122.05	.71	.84	287	250	250	52	244	82	77	2.3	7
7	45	124.17	.69	.83	288	250	250	53	246	82	77	2.25	7
	47.5	126.27	.70	.84	288	250	251	52	244	82	77	2.35	7
	50	128.42	.66	.81	288	250	249	53	245	82	78	2.2	6.5

Traverse: 2					
Start Time: 15:40	Initial Leak Check: .004	cfm@ 21	"Hg	Traverse:	
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg	Start Time: /	Initial Leak Check: / cfm@ / "Hg
				Finish Time: /	Final Leak Check: cfm@ "Hg

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 11 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	130.49	.68	.83	288	250	252	53	245	82	78	2.25	7
	55	132.58	.70	.84	288	250	248	53	244	82	78	2.3	7
	57.5	134.71	.66	.81	287	250	252	53	246	82	78	2.2	7
9	60	136.78	.71	.84	287	250	249	53	244	82	78	2.3	7
	62.5	138.89	.67	.82	286	250	251	53	245	83	78	2.2	7
	65	140.96	.70	.84	286	250	250	53	244	83	78	2.3	7
10	67.5	143.06	.70	.84	286	250	249	53	244	83	78	2.3	7
	70	145.17	.69	.83	285	250	252	54	244	83	78	2.3	7
	72.5	147.24	.67	.77	284	250	249	54	243	83	78	2	6.5
11	75	149.23	.64	.80	284	250	251	54	244	83	78	2.1	6.5
	77.5	151.23	.63	.81	259	249	251	54	242	83	78	2.2	6.5
	80	153.29	.63	.81	258	250	249	54	243	83	78	2.2	6.5
12	82.5	155.35	.63	.81	258	249	252	55	243	82	78	2.2	6.5
	85	157.42	.62	.81	257	249	248	55	243	82	78	2.2	6.5
	87.5	159.50	.64	.82	257	249	252	55	244	82	78	2.25	6.5
	90	161.60											

Traverse: 2				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 17:10	Final Leak Check: .002	cfm@ 15	"Hg

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

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date	Sept 13/18
Test Location	APC Outlet No. 1
Operator Signature	AS

Project No.:	21880
Page	1 of 5
Probe No.:	6A
Meter Box No.:	Box 7
Impinger Box No.:	14

Pitot Factor	.8551	
DGMCF	~~1.00~~ 1.020	
Barometric Pressure	29.98	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2768	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	0.4	mg
Probe	0.8	mg

Moisture Gain

CWTR	464.9	g
WCBDA	28.3	g

Combustion Gas Concentration

Oxygen	8.40	%
Carbon Dioxide	10.99	%
Carbon Monoxide	13.6	ppm

Measuring Device	MII Numbers
Probe / Pitot 15D	B03778
Trendicator	
Control Box	Box 7 AQ907 2
Incline Manometer	FS B00717
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2775
2	.2765
3	.2760
4	.2770
Average:	.2768

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: Sept 13/18	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 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	570.03	.80	.87	281	259	254	65	96	75	75	2.3	4
	2.5	572.75	.85	.90	287	264	265	67	249	77	80	2.2	4
	5	574.8	.85	.90	288	263	265	70	253	77	81	~~2.2~~ 2.4	4
2	7.5	577.01	.84	.90	287	263	265	68	253	77	82	2.4	4
	10	579.20	.85	.90	287	262	264	70	252	78	84	2.5	4
	12.5	581.41	.86	.91	290	262	265	69	253	79	85	2.6	4
3	15	583.68	.86	.91	288	262	264	68	253	79	86	2.6	4
	17.5	585.95	.86	.91	288	262	265	66	254	79	87	2.6	4
	20	588.21	.88	.92	288	257	264	63	254	80	88	2.8	4
4	22.5	590.56	.83	.90	288	236	259	59	251	80	89	2.6	4
	25	592.83	.83	.90	289	251	258	59	249	81	90	2.6	4
	27.5	595.10	.81	.89	289	253	258	57	248	82	90	2.5	4
5	30	597.33	.73	.84	289	254	258	55	248	82	91	2.3	4
	32.5	599.49	.71	.83	289	254	258	55	247	83	92	2.2	4
	35	601.58	.72	.84	289	254	258	54	246	83	92	2.2	4
6	37.5	603.69	.59	.76	289	255	258	54	245	84	93	1.9	3
	40	605.65	.60	.77	289	255	258	53	245	84	93	1.9	3
	42.5	607.62	.59	.76	289	255	258	53	245	85	94	1.9	3
7	45	609.57	.72	.84	289	255	258	52	245	85	94	2.2	3.5
	47.5	611.66	.73	.85	289	255	259	52	246	86	95	2.4	4
	50	613.86	~~.74~~ .73	.86	289	256	258	51	247	86	96	2.4	4

Traverse: 1				
Start Time: 10:23	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.: 21880

Operator : AS

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: Particulate/Metals T3	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	616.06	.74	.86	288	256	258	51	247	87	96	2.4	4
	55	619.27	.74	.86	288	256	258	51	247	87	96	2.4	4
	57.5	620.48	.74	.86	288	256	258	51	246	88	97	2.4	4
9	60	622.68	.75	.87	287	256	258	51	246	88	98	2.4	4
	62.5	624.88	.76	~~25.87~~	287	256	258	51	247	88	98	2.5	4
	65	627.13	.80	.90	287	256	258	51	247	89	99	2.6	4
10	67.5	629.43	.75	.87	287	256	258	51	247	89	99	2.5	4
	70	631.69	.74	.86	287	256	258	51	247	90	99	2.4	4
	72.5	633.88	.74	.86	287	256	258	52	247	90	99	2.4	4
11	75	636.07	.67	.82	287	256	259	52	247	90	100	2.32	4
	77.5	638.18	.68	.83	287	256	258	52	247	91	100	2.2	4
	80	640.27	.68	.83	287	256	259	52	247	91	100	2.2	4
12	82.5	642.36	.70	.84	287	255	258	52	247	91	100	2.3	4
	85	644.52	.70	.84	287	256	259	52	247	91	100	2.3	4
	87.5	646.69	.70	.84	287	255	259	52	248	91	101	2.3	4
	90	648.88											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 11:53	Final Leak Check: .102	cfm@ 15	"Hg

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

Project No.: 21880

Operator : AS

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: Particulate/Metals T3	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	650.49	.70	.83	278	255	260	65	93	86	87	2.4	4
	2.5	652.65	.73	.85	278	259	263	55	239	86	88	2.5	4
	5	654.89	.75	.86	278	260	264	50	251	86	89	2.5	4
2	7.5	657.12	.78	.88	279	258	263	49	251	86	91	2.6	4.5
	10	659.39	.77	.88	279	258	262	50	250	86	92	2.5	4.5
	12.5	661.62	.75	.87	278	257	261	50	249	86	92	2.4	4.5
3	15	663 83	.76	.87	279	257	260	51	249	86	93	2.41	4.5
	17.5	666.02	.80	.89	287	257	257	51	249	86	94	2.6	4.5
	20	668.30	.77	.87	287	257	261	52	249	87	95	2.5	4.5
4	22.5	670.54	.78	.88	288	257	261	51	249	87	96	2.5	4.5
	25	672 76	.79	.89	288	257	261	51	248	88	96	2.5	4.5
	27.5	675.02	.79	.89	287	257	261	52	249	88	97	25	4.5
5	30	677.26	.75	.87	287	257	261	51	250	88	97	2.4	4
	32.5	679.47	.76	.87	287	257	262	52	249	89	98	2.4	4
	35	681.67	.77	.88	287	257	260	52	248	89	98	2.4	4
6	37.5	683.87	.74	.86	287	257	261	53	249	89	99	2.4	4
	40	686.04	.72	.85	286	257	260	53	248	90	99	2.3	4
	42.5	688.17	.69	.83	285	258	260	53	248	90	100	2.2	4
7	45	690.28	.65	.81	285	257	260	53	247	90	100	2.1	4
	47.5	692.34	.67	.82	285	257	260	53	248	91	100	2.2	4
	50	694.57	.68	.83	286	257	261	54	248	91	100	2.2	4

Traverse: 2				
Start Time: 13:07	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.: 21880

Operator : AS

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: T3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	696.62	.74	.87	286	257	261	54	249	91	101	2.4	4
	55	698.86	.76	.88	286	257	261	52	214	92	101	2.4	4
	57.5	701.09	.76	.88	286	257	260	52	239	92	101	2.4	4
9	60	703.35	.82	.91	286	258	261	53	244	92	102	2.7	4.5
	62.5	705.68	.83	.92	287	258	260	52	250	93	103	2.7	4.5
	65	708.01	.81	.91	286	258	260	52	249	93	103	2.6	4.5
10	67.5	710.32	.88	.95	287	258	261	52	249	93	103	2.8	5
	70	712.71	.87	.94	287	259	261	52	250	94	104	2.8	5
	72.5	715.10	.88	.95	286	259	262	53	251	94	104	2.8	5
11	75	717.49	.91	.97	287	259	262	53	251	94	104	2.9	5
	77.5	719.93	.89	.95	286	259	262	52	251	94	104	2.8	5
	80	722.34	.91	.97	287	259	262	53	252	94	104	2.9	5
12	82.5	724.77	.88	.95	287	260	262	53	252	95	104	2.8	5
	85	727.18	.90	.96	286	260	262	53	252	95	105	2.8	5
	87.5	729.58	.90	.96	287	260	263	53	252	95	105	2.9	5
	90	732.02											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 14:37	Final Leak Check: .003	cfm@ 15.5	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particulate/Metals
Test Date	September 12 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 Series
Meter Box No.:	Team 3
Impinger Box No.:	14

Pitot Factor	.851	
DGMCF	~~1.003~~ .996	
Barometric Pressure	29.99	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2768	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	0.2	mg
Probe	2.3	mg

Moisture Gain

CWTR	559.3	g
WCBDA	27.1	g

Combustion Gas Concentration

Oxygen	8.11	%
Carbon Dioxide	10.88	%
Carbon Monoxide	15.7	ppm

Measuring Device	MII Numbers
Probe / Pitot ISO	B03778
Trendicator	COE 2009
Control Box	COE 2009
Incline Manometer	COE 2009
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2760
2	.2770
3	.2770
4	.2770
Average:	.2768

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: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	8.64	.61	.79	261	253	247	71	163	70	70	2.25	4
	2.5	10.56	.59	.77	263	259	250	52	214	73	73	2.2	4
	5	12.51	.59	.77	265	259	251	52	239	73	73	2.2	4
2	7.5	14.44	.57	.75	271	258	250	47	245	72	73	2.1	4
	10	16.35	.57	.76	266	257	250	46	245	72	73	2.15	4
	12.5	18.25	.57	.76	266	256	249	46	247	73	73	2.15	4
3	15	20.15	.63	.80	265	256	249	46	243	75	73	2.35	4.5
	17.5	22.15	.64	.79	285	256	248	46	244	74	74	2.3	4.5
	20	24.14	.64	.79	285	256	249	46	245	73	74	2.3	4.5
4	22.5	26.13	.66	.80	285	257	248	46	244	73	74	2.35	4.5
	25	28.14	.65	.80	286	257	249	48	245	73	74	2.35	4.5
52.5	27.5	30.13	.65	.80	286	257	249	47	245	73	74	2.35	4.5
5	30	31.75	.64	.79	287	257	251	47	242	76	75	2.3	4.5
	32.5	33.74	.64	.79	288	258	251	47	244	74	75	2.3	4.5
	35	35.75	.64	.79	287	258	251	47	245	74	75	2.3	4.5
6	37.5	37.74	.65	.80	288	257	250	46	246	75	76	2.35	4.5
	40	39.74	.6	.77	288	257	249	47	245	75	76	2.2	4.5
61.80	42.5	41.68	.6	.77	286	259	243	49	228	75	76	2.2	4.5
7	45	63.80	.56	.74	285	251	259	49	238	73	71	1.85	4
	47.5	65.67	.56	.74	288	251	257	47	251	74	72	1.85	6
	50	67.52	.56	.74	288	250	252	47	248	75	72	1.85	6

Traverse:						Traverse:					
Start Time:	9:26	Initial Leak Check:	.0002	cfm@	15 "Hg	Start Time:	/	Initial Leak Check:	/	cfm@	"Hg
Finish Time:	—	Final Leak Check:	—	cfm@	— "Hg	Finish Time:	/	Final Leak Check:	/	cfm@	"Hg

PM Metals 9:53 lost Power Pump on at 10:01
Pump off at 10:18 pump on 10:19
lost power again - switched out control boxes
For ISO output readings from 0-40 min * new box DGM reading: 61.80 10:41 on
corrected for change in Box

Project No.: 21880
Operator:

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	69.35	.56	.75	287	249	247	47	243	77	72	1.85	6
	55	71.22	.67	.82	288	249	253	47	244	78	73	2.3	6.5
	57.5	73.28	.67	.82	288	249	251	47	246	80	73	2.3	6.5
9	60	75.36	.76	.87	288	249	249	47	245	81	74	2.55	7
	62.5	77.55	.76	.87	288	250	252	47	247	81	74	2.55	7
	65	79.75	.74	.86	288	250	249	48	246	82	74	2.5	7
10	67.5	81.94	.79	.89	288	250	252	48	247	82	75	2.65	7
	70	84.18	.79	.89	288	250	250	48	247	83	75	2.65	7
	72.5	86.43	.81	.91	288	250	252	48	247	83	76	2.7	7.5
11	75	88.70	.83	.92	288	250	253	49	249	83	76	2.8	7.5
	77.5	90.99	.86	.93	288	250	248	49	248	84	76	2.85	7.5
	80	93.36	.88	.94	289	250	253	49	249	84	76	2.95	7.5
12	82.5	95.73	.88	.94	289	250	251	49	250	84	77	2.95	7.5
	85	98.10	.88	.94	289	250	250	49	248	84	77	2.95	7.5
	87.5	100.46	.88	.94	289	251	253	50	250	84	77	2.95	7.5
	90	102.87											

Traverse: 1			
Start Time: —	Initial Leak Check: —	cfm@	"Hg
Finish Time: 11:28	Final Leak Check: .005	cfm@ 21	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	103,48	.63	.82	239	248	249	63	152	78	77	2.2	6.5
	2.5	105.69	.66	.84	239	253	253	49	240	79	77	2,35	7
	5	107.80	.66	.84	241	253	252	47	246	80	77	2,35	7
2	7.5	109.92	.62	.82	240	252	249	47	246	81	77	2.2	7
	10	111,99	.64	.83	238	251	252	47	245	82	77	2.3	7
	12.5	114.09	.61	.82	237	250	249	48	245	83	78	2.25	7
3	15	116.18	.62	.82	238	250	254	48	246	83	78	2.25	7
	17.5	118.27	.61	.79	284	250	252	48	247	84	78	2.1	6.5
	20	120,28	.62	.80	284	249	249	48	243	84	78	2.15	6.5
4	22.5	122,30	.64	.81	284	249	253	49	245	85	78	2,2	7
	25	124.37	.61	.79	287	250	250	49	245	85	78	2.1	6.5
	27.5	126.38	.59	.78	286	249	251	49	244	86	79	2.05	6.5
5	30	128.36	.63	.80	286	249	252	49	245	86	79	2.15	6.5
	32.5	130,40	.61	.79	287	249	250	49	244	86	79	2.1	6.5
	35	132,39	.64	.81	287	249	253	50	246	86	79	2.2	6.5
6	37.5	134.45	.62	.80	287	249	249	50	245	86	79	2.15	6.5
	40	136.49	.62	.80	287	249	253	50	245	87	79	2.1	6.5
	42.5	138.50	.61	.79	287	249	252	50	246	87	80	2.05	6.5
7	45	140.50	.61	.79	287	249	252	50	244	87	80	2.05	6.5
	47.5	142,44	.59	.78	287	249	254	51	246	87	80	2.05	6.5
	50	144.40	.61	.79	287	249	249	51	245	87	80	2.1	6.5

Traverse: 2				
Start Time: 11:52	Initial Leak Check: .003	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 1 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	146.40	.68	.84	288	249	253	51	245	87	80	2.35	7
	55	148.51	.65	.82	288	249	252	51	247	87	80	2.25	7
	57.5	150.63	.65	.81	288	249	251	51	246	87	80	2.25	7
9	60	152.69	.73	.87	289	250	252	52	248	87	81	2.5	7
	62.5	154.89	.73	.87	288	250	250	52	246	87	81	2.5	7
	65	157.10	.75	.88	288	250	253	52	248	87	81	2.55	7
10	67.5	159.34	.74	.87	288	250	249	52	248	87	81	2.5	7
	70	161.55	.74	.87	288	250	254	52	247	87	81	2.5	7
	72.5	163.74	.75	.88	288	250	254	53	249	87	81	2.55	7
11	75	165.96	.75	.88	288	250	250	53	248	87	81	2.55	7
	77.5	168.18	.75	.88	288	250	255	53	248	87	81	2.55	7
	80	170.43	.75	.88	288	250	251	53	249	87	81	2.55	7
12	82.5	172.63	.71	.86	287	250	252	54	247	87	81	2.4	7
	85	174.81	.74	.87	287	250	254	54	249	87	81	2.5	7
	87.5	177.02	.71	.80	287	250	250	54	248	87	81	2.4	7
	90	179.27											

Traverse: 2				
Start Time: ~	Initial Leak Check: ~	cfm@ ~	"Hg
Finish Time: 13:22	Final Leak Check: .0025	cfm@ 16	"Hg

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

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particulate/Metals
Test Date	September 12 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	
Meter Box No.:	
Impinger Box No.:	

Pitot Factor	.851	
DGMCF	.996	
Barometric Pressure	29.96	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2768	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	1.5	mg

Moisture Gain

CWTR	639.8	g
WCBDA	30.4	g

Combustion Gas Concentration

Oxygen	7.74	%
Carbon Dioxide	10.98	%
Carbon Monoxide	14.8	ppm

Measuring Device	MII Numbers
Probe / Pitot ISD	B03778
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	79.83	.62	.83	255	248	247	80	160	80	80	2.25	6
	2.5	81.92	.61	.82	254	252	250	74	206	81	80	2.2	6
	5	83.99	.59	.80	255	252	254	71	216	82	80	2.15	6
2	7.5	86.04	.65	.84	256	251	250	69	218	83	81	2.4	6
	10	88.17	.64	.84	256	250	255	66	221	84	81	2.4	6
	12.5	90.30	.64	.84	256	250	251	65	222	85	81	2.4	6
3	15	92.43	.64	.84	256	250	250	65	222	86	81	2.4	6
	17.5	94.56	.63	.82	283	249	252	64	222	87	81	2.25	6
	20	96.66	.65	.83	283	250	253	63	221	88	81	2.3	6.5
4	22.5	98.76	.66	.84	284	250	251	63	222	88	82	2.4	6.5
	25	100.92	.66	.84	287	249	253	62	221	89	82	2.4	6.5
	27.5	103.05	.66	.84	288	249	253	62	220	89	82	2.4	6.5
5	30	105.18	.66	.84	288	250	250	62	222	89	82	2.4	6.5
	32.5	107.31	.63	.82	289	249	255	62	222	89	82	2.25	6
	35	109.41	.63	.82	289	250	251	62	220	90	83	2.25	6
6	37.5	111.49	.69	.86	288	249	255	62	220	90	83	2.45	6.5
	40	113.67	.68	.85	289	250	253	60	220	90	83	2.4	6.5
	42.5	115.83	.68	.85	289	249	254	58	221	90	83	2.4	6.5
7	45	117.98	.65	.83	290	250	254	57	232	90	83	2.3	6.3
	47.5	120.09	.67	.85	290	249	254	56	240	90	84	2.3	6.3
	50	122.19	.66	.84	291	249	250	55	240	90	84	2.3	6.3

Traverse: 2				
Start Time: 14:49	Initial Leak Check: .005	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	124.30	.68	.85	291	249	254	55	240	90	84	2.40	6.5
	55	126.47	.69	.86	291	250	254	55	241	91	84	2.40	6.5
	57.5	128.64	.70	.86	290	250	250	54	241	91	84	2.45	6.5
9	60	130.84	.74	.89	290	250	255	54	242	91	84	2.60	6.8
	62.5	133.08	.77	.91	290	250	252	54	241	90	84	2.70	6.8
	65	135.37	.77	.91	290	250	254	54	243	90	84	2.70	6.8
10	67.5	137.65	.80	.92	291	250	253	54	243	90	84	2.80	7.0
	70	139.99	.82	.94	290	250	254	54	244	90	84	2.85	7.0
	72.5	142.35	.81	.93	290	250	252	54	243	90	84	2.80	7.0
11	75	144.69	.84	.95	290	251	253	54	244	90	84	2.90	7.0
	77.5	147.06	.84	.95	291	250	255	54	244	90	84	2.90	7.0
	80	149.44	.83	.94	291	251	254	54	245	90	84	2.90	7.0
12	82.5	151.81	.83	.94	290	251	255	55	244	89	84	2.90	7.0
	85	154.18	.81	.93	290	251	250	55	244	89	84	2.80	7.0
	87.5	156.54	.81	.93	290	251	257	57	244	89	84	2.80	7.0
	90	158.93											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 16:19	Final Leak Check: .002	cfm@ 20	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	159.95	.81	.93	283	249	253	65	169	84	84	2.8	6.5
	2.5	162.08	.84	.87	289	252	253	54	227	85	84	2.5	6.5
	5	164.28	.85	.95	290	253	256	52	240	86	83	2.95	7
2	7.5	166.63	.85	.95	290	252	251	50	242	87	83	3.0	7
	10	169.03	.83	.94	290	252	256	51	244	87	83	2.95	7
	12.5	171.43	.83	.94	290	252	251	51	243	88	83	2.9	7
3	15	173.80	.80	.92	290	251	256	51	243	88	84	2.75	7
	17.5	176.13	.79	.92	290	252	252	53	244	89	84	2.75	7
	20	178.44	.84	.95	290	252	255	53	243	89	84	2.95	7
4	22.5	180.84	.82	.93	291	252	254	53	245	89	84	2.85	7
	25	183.17	.82	.93	292	252	252	54	244	89	84	2.85	7
	27.5	185.52	.83	.94	292	252	254	54	245	90	84	2.9	7
5	30	187.88	.81	.93	292	252	252	54	244	90	84	2.8	7
	32.5	190.24	.78	.86	292	252	254	54	244	90	84	2.45	7
	35	192.44	.71	.87	292	251	252	55	242	90	84	2.5	7
6	37.5	194.65	.59	.79	292	252	254	55	243	90	84	2.1	6.5
	40	196.67	.61	.81	291	251	251	55	240	90	84	2.15	6.5
	42.5	198.71	.57	.78	291	251	254	55	241	91	84	2.05	6
7	45	200.70	.57	.78	291	251	252	55	239	91	84	2.0	6
	47.5	202.66	.57	.78	290	251	253	55	240	91	84	2.0	6
	50	204.65	.65	.83	290	251	252	55	239	91	84	2.3	6

Traverse:						
Start Time:	16:32	Initial Leak Check:	.002	cfm@	20	"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.: 21880

Operator : [illegible]

Field Data Sheet

Date: Sept. 12 2018	Plant: Covanta DYEC	Test No.: 2 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	206.77	.64	.83	290	252	255	55	242	91	84	2.3	6.5
	55	208.92	.65	.83	290	252	250	55	241	91	84	2.3	6.5
	57.5	211.03	.65	.83	289	252	256	56	242	91	84	2.3	6.5
9	60	213.15	.66	.84	289	251	255	56	241	91	85	2.35	6.5
	62.5	215.28	.66	.84	289	251	256	56	242	91	85	2.35	6.5
	65	217.42	.68	.85	289	252	252	56	242	91	85	2.4	7
10	67.5	219.60	.64	.83	289	251	256	57	242	91	85	2.2	7
	70	221.69	.64	.83	286	251	253	57	242	91	85	2.2	7
	72.5	223.78	.67	.85	286	251	253	57	240	91	85	2.4	7
11	75	225.93	.62	.82	286	251	255	58	242	91	85	2.2	6.5
	77.5	228.01	.62	.82	276	251	250	58	240	91	85	2.2	6.5
	80	230.08	.62	.82	276	251	255	58	241	91	85	2.2	6.5
12	82.5	232.15	.6	.81	275	251	250	59	240	91	85	2.15	6.5
	85	234.19	.6	.81	275	251	250	59	240	91	85	2.15	6.5
	87.5	236.24	.6	.81	275	251	251	59	240	91	84	2.15	6.5
	90	238.28											

Traverse: 18:02			
Start Time: —	Initial Leak Check: —	cfm@	"Hg
Finish Time:	Final Leak Check: .003	cfm@ 15	"Hg

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

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date 9/13/18	
Test Location	APC Outlet No. 2
Operator Signature	JB

Project No.:	21880
Page	1 of 5
Probe No.:	
Meter Box No.:	
Impinger Box No.:	

Pitot Factor	0.840	
DGMCF	1.006	
Barometric Pressure	29.92	"Hg
Static Pressure	-9.95	"H2O
Nozzle Size	.2725	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	616.1	g
WCBDA	29.1	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	10.98	%
Carbon Monoxide	10.4	ppm

Measuring Device	MII Numbers
Probe / Pitot S8	~~S8~~ B03769
Trendicator	COE 20094
Control Box	COE 20094
Incline Manometer	COE 20094
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2725
2	.2715
3	.2725
4	.2735
Average:	.2725

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: 9/13/18	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	59.55	.82	.85	286	252	258	83	157	82	81	2.6	3
	2.5	61.66	.83	.85	286	256	258	75	234	82	81	2.6	3
	5	63.86	.81	.84	286	256	259	70	242	82	81	2.55	3
2	7.5	66.05	.81	.84	286	256	258	66	244	82	81	2.50	3
	10	68.25	.84	.86	286	256	258	63	245	83	82	2.50	3
	12.5	70.42	.83	.86	286	256	258	62	245	82	81	2.50	3
3	15	72.60	.81	.84	286	256	258	60	245	83	82	2.40	3
	17.5	74.75	.82	.85	287	256	258	60	246	83	82	2.40	3
	20	76.88	.82	.85	287	257	258	59	245	83	82	2.40	3
4	22.5	79.00	.80	.84	288	257	258	59	246	83	82	2.35	3
	25	81.12	.80	.84	288	257	258	59	245	84	82	2.35	3
	27.5	83.24	.78	.83	288	256	258	57	245	84	82	2.30	3
5	30	85.33	.72	.80	288	257	258	57	245	84	82	2.15	3
	32.5	87.33	.71	.79	289	257	258	57	245	85	82	2.15	3
	35	89.32	.71	.79	288	257	258	57	245	85	83	2.15	3
6	37.5	91.32	.69	.78	288	257	258	57	245	86	83	2.10	3
	40	93.29	.69	.78	288	258	257	57	244	86	83	2.10	3
	42.5	95.28	.68	.78	288	257	258	57	244	86	83	2.05	3
7	45	97.24	.73	.80	288	257	258	56	244	87	83	2.20	3
	47.5	99.28	.72	.80	287	257	258	56	245	87	83	2.15	3
	50	101.31	.74	.81	288	258	258	56	244	88	84	2.20	3

Traverse: 2				
Start Time: 15:10	Initial Leak Check: .005	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.: 21880

Operator: JB

Field Data Sheet

Date: 9/13/18	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	103.36	.76	.82	288	257	259	57	245	88	84	2.30	3
	55	105.43	.76	.82	288	257	259	57	245	88	84	2.30	3
	57.5	107.53	.77	.83	288	257	258	56	245	88	84	2.30	3
9	60	109.62	.80	.84	288	257	258	57	245	88	84	2.35	3
	62.5	111.71	.79	.84	288	257	258	57	245	88	85	2.35	3
	65	113.81	.79	.84	288	257	258	57	245	88	85	2.35	3
10	67.5	115.92	.78	.83	288	256	258	57	245	88	85	2.35	3
	70	118.03	.78	.83	288	257	259	56	245	89	85	2.35	3
	72.5	120.14	.80	.85	288	257	258	56	245	88	85	2.40	3
11	75	122.27	.76	.82	288	257	258	56	245	89	85	2.30	3
	77.5	124.36	.77	.83	284	257	258	56	244	88	85	2.30	3
	80	126.45	.76	.83	284	257	258	56	244	89	85	2.30	3
12	82.5	128.54	.76	.83	284	256	258	57	244	88	85	2.30	3
	85	130.64	.76	.83	284	256	259	57	244	89	86	2.30	3
	87.5	132.74	.76	.83	284	256	258	57	244	89	85	2.30	3
	90	134.82											

Traverse: 2				
Start Time:	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 16:46	Final Leak Check: .003	cfm@ 20	"Hg

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

Project No.: 21880

Operator : JB

Field Data Sheet

Date: 9/13/18	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 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	135.67	.85	.87	284	255	259	75	184	85	85	2.70	3.5
	2.5	137.97	.84	.87	285	256	259	66	238	85	85	2.50	3.0
	5	140.17	.84	.87	285	256	258	64	244	85	85	2.50	3.0
2	7.5	142.38	.82	.86	285	256	259	64	245	85	85	2.45	3.0
	10	144.43	.83	.86	285	256	258	64	246	85	85	2.50	3.0
	12.5	146.60	.80	.85	284	256	258	64	246	85	85	2.40	3.0
3	15	148.76	.75	.82	284	256	258	65	246	85	85	2.25	3.0
	17.5	150.83	.76	.83	285	257	259	65	246	87	85	2.25	3.0
	20	152.90	.75	.82	288	259	261	67	248	88	87	2.25	3.0
4	22.5	154.94	.70	.79	285	257	259	66	247	87	85	2.10	3.0
	25	156.93	.71	.80	285	257	259	65	246	87	85	2.15	3.0
	27.5	158.93	.72	.80	284	257	258	65	246	87	85	2.20	3.0
5	30	160.96	.67	.78	285	257	259	66	246	88	85	2.05	3.0
	32.5	162.94	.67	.78	285	257	259	66	246	88	86	2.05	3.0
	35	164.92	.65	.77	285	257	259	66	246	89	86	2.00	3.0
6	37.5	166.87	.67	.78	284	257	259	66	245	89	86	2.05	3.0
	40	168.81	.70	.79	285	257	259	65	245	89	86	2.10	3.0
	42.5	170.79	.68	.78	285	257	259	65	246	89	86	2.10	3.0
7	45	172.78	.72	.81	285	257	259	64	245	89	86	2.20	3.0
	47.5	174.82	.74	.82	285	257	259	64	246	89	86	2.25	3.0
	50	176.87	.73	.81	286	257	259	64	247	89	86	2.25	3.0

Traverse: 1				
Start Time: 17:35	Initial Leak Check: .002	cfm@ 20	"Hg
Finish Time: ~~17:05~~	Final Leak Check:	cfm@	"Hg

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

Project No.: 21880

Operator : JB

Field Data Sheet

Date: 9/13/18	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	178.92	.76	.83	286	257	259	64	246	89	86	2.3	3.0
	55	181.02	.76	.83	286	257	260	63	246	90	86	2.3	3.0
	57.5	183.12	.76	.83	286	257	259	63	246	90	86	2.3	3.0
9	60	185.21	.76	.83	286	257	260	63	246	90	86	2.3	3.0
	62.5	187.30	.76	.83	286	256	259	63	246	89	86	2.3	3.0
	65	189.40	.76	.83	286	256	259	63	246	89	86	2.3	3.0
10	67.5	191.50	.78	.84	286	256	260	64	246	89	86	2.35	3.0
	70	193.61	.76	.83	283	256	260	64	247	89	86	2.30	3.0
	72.5	195.70	.76	.83	286	256	259	64	246	89	86	2.30	3.0
11	75	197.79	.72	.81	284	255	260	64	246	89	86	2.20	3.0
	77.5	199.87	.72	.81	284	256	259	64	245	89	86	2.15	3.0
	80	201.90	.72	.81	284	256	259	65	246	89	86	2.15	3.0
12	82.5	203.92	.72	.81	284	256	259	65	245	89	86	2.15	3.0
	85	205.95	.72	.81	285	256	259	64	245	89	86	2.15	3.0
	87.5	207.97	.72	.81	284	255	259	65	245	89	86	2.15	3.0
	90	210.01											

Traverse:					
Start Time:	Initial Leak Check:		cfm@		"Hg
Finish Time: 19:05	Final Leak Check:	.002	cfm@	15	"Hg

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

Project No.: 21880

Operator : JB

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	SEPTEMBER 12, 2019
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T2
Impinger Box No.:	7

Pitot Factor	0.845	
DGMCF	0.991	
Barometric Pressure	29.98	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

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

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	87.1	g
WCBDA	14.2	g

Combustion Gas Concentration

Oxygen	8.49	%
Carbon Dioxide	11.01	%
Carbon Monoxide	11.7	ppm

Measuring Device	MII Numbers
Probe / Pitot	SGE
Trendicator	
Control Box	TEST C0152009
Incline Manometer	1
Comb.Gas.Analyzer	UNIT 2
Micromanometer	
Barometer	Env. Can
Calipers	

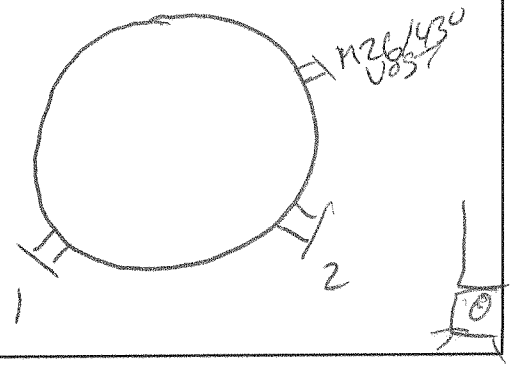
Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram



Nozzle Measurements	
1	SGE
2	TEST 1
3	UNIT 2
4	
Average:	

1 ΔP	2 ΔP
.72	.77
.75	.75
.77	.67
.71	.55
.63	.52
.56	.52

Notes:

Field Data Sheet

Date: SEPT 12/14	Plant: Covanta DYEC	Test No.: 1	Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	99.6	.67	.85	282	266	252	50	65	68	66	.38	4
2	10.4	93.24	.73		282	263	251	52	63	69	66	.38	4
3	21.1	96.91	.75		282	265	250	51	61	70	67	.38	4
4	31.9	100.68	.70		284	264	251	52	62	72	67	.39	4
5	42.3	104.39	.62		284	262	251	53	62	73	68	.38	4
6	52.1	107.81	.53		283	266	251	53	61	74	68	.38	4
	61.3	111.00											
1	0	111.00	.80		281	265	254	57	64	75	70	.38	4
2	10.8	114.78	.87		283	263	254	52	59	75	71	.38	4
3	21.5	118.53	.90		285	268	254	52	59	77	72	.38	4
4	31.6	122.11	.83		285	265	255	53	55	77	72	.38	4
5	41.0	125.42	.73		285	268	255	53	60	78	73	.38	4
6	49.9	128.55	.64		284	268	255	53	61	79	74	.38	4
	58.8	131.65											

Traverse:	1
Start Time:	935
Finish Time:	936

Initial Leak Check: .009 cfm@ 16 "Hg

Traverse:	
Start Time:	940
Finish Time:	1039

ready to start @ 815

Project No.: 21880

Operator : RM

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particle Size
Test Date	SEPT 12/18
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T2
Impinger Box No.:	

Pitot Factor	.845	
DGMCF	0.991	
Barometric Pressure	29.99	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	156.8	g
WCBDA	12.3	g

Combustion Gas Concentration

Oxygen	8.48	%
Carbon Dioxide	10.88	%
Carbon Monoxide	19.5	ppm

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

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

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

Probe Liner Glass / Metal / Teflon / Other N/A

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: Sept 9/16	Plant: Covanta DYEC	Test No.: 2 Particle Size	Page of
	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	31.75	.61	.35	254	267	268	61	81	78	75	.39	5
2	9.60	35.20	.68		257	268	259	60	75	80	76		5
3	19.80 ~~10.00~~	38.70	.68		254	267	256	62	67	81	76		5
4	29.8 10.20	42.49	.68		254	266	257	65	67	82	77		5
5	39.6 9.8	46.00	.58		254	269	257	63	67	82	77		5
6	49.8	49.32	.51		254	267	257	61	66	83	78		5
	57.3	52.43											
1 0	~~10.5~~	52.43	.76		253	270	257	62	66	83	79		5
2	10.5	56.19	.72		255	266	259	59	67	83	79		5
3	21.4	60.05	.71		255	269	258	59	64	84	80		5
4	32.5	64.00	.69		256	268	258	60	67	85	80		5
5	43.2	67.82	.69		255	266	259	60	68	85	80		5
6	53.2	71.30	.56		255	267	258	61	69	85	81		5
	62.6	74.74											

Traverse: 1		Traverse: 2
Start Time: 1144	Initial Leak Check: .006 cfm@ 16 "Hg	Start Time: 1245
Finish Time:		Finish Time: 1348 T

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	SEPT 12 2018
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T2
Impinger Box No.:	

Pitot Factor	0.845	
DGMCF	0.991	
Barometric Pressure	29.96	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	110.2	g
WCBDA	15.7	g

Combustion Gas Concentration

Oxygen	8.20	%
Carbon Dioxide	11.07	%
Carbon Monoxide	10.8	ppm

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

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

Nozzle Measurements

1	SEE
2	TEST
3	
4	1
Average:	

Probe Liner Glass / Metal /Teflon / Other (PFA)

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: SEPT 12/18	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	75.01	.62	.35	282	267	257	60	85	83	81	.35	4
2	9.7	79.40	.71	.35	283	269	255	63	67	84	80	.35	4
3	19.8	82.15	.69	.3	284	269	257	62	73	84	81		4
4	30.0	85.957	.65		285	268	257	62	72	85	81		4
5	40.2	89.52	.50		285	268	256	61	70	85	81		4
6	49.6	92.58	.53		286	270	257	61	69	86	81		4
	58.5	96.02											
1	0	96.02	.72		285	267	256	65	73	86	82		4
2	11.0	100.05	.77		287	267	257	54	64	86	82		4
3	21.5	103.72	.77		287	266	256	53	64	86	82		4
4	31.9	107.64	.74		287	269	257	53	63	87	82		4
5	42.2	111.27	.67		287	271	250	53	63	87	83		4
6	52.1	114.95	.567		285	269	257	53	64	87	83		4
	61.4	118.40											

Traverse: 1		Traverse: 2
Start Time: 1517	Initial Leak Check: cfm@ "Hg	Start Time: 1620
Finish Time: 1616		Finish Time: 1722

Project No.: 21880

Operator:

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particle Size
Test Date	SEPTEMBER 11, 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T1
Impinger Box No.:	

Pitot Factor	0.845	
DGMCF	1.006	
Barometric Pressure	29.82	"Hg
Static Pressure	-56.6	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

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

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	151.7	g
WCBDA	11.4	g

Combustion Gas Concentration

Oxygen	7.88	%
Carbon Dioxide	11.24	%
Carbon Monoxide	12.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	PM10/2.5
Trendicator	20E20034
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	PLANT
Micromanometer	—
Barometer	Env. Can
Calipers	B02103

Nozzle Measurements	
1	0.1770
2	0.1780
3	0.1775
4	0.1775
Average:	

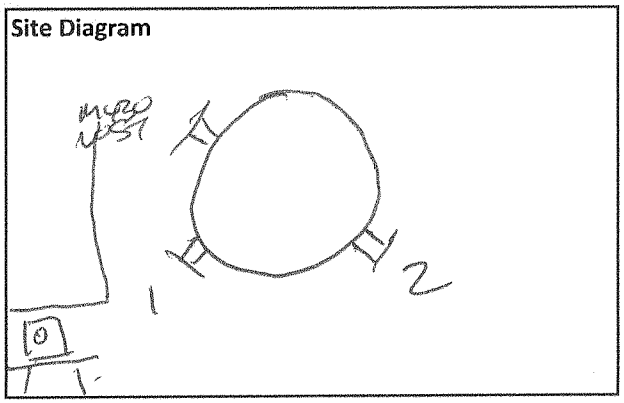
Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram



PREGIN ΔPS

1	2	new
	.60	
	.70	
	.79	
	.83	
	.82	
	.82	

Notes:

Field Data Sheet

Date: SEPT 11/18	Plant: Covanta DYEC	Test No.: 1 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
		86.90											
1	0	~~87.00~~	.91	.35	257	251	244	72	72	72	71	.39	~~25~~ 5
2	10.8	91.56	.82		256	245	244	67	70	71	70	.38	5
3	21.6	95.36	~~1.182~~ 1.18		257	244	244	60	66	72	72	.35	5
4	32.5	99.20	1.72		257	244	244	60	63	73	72	.38	5
5	43.1	103.00	.67		255	245	244	59	62	73	71	.38	5
6	53.1	106.60	.58		255	244	245	59	62	74	72	.36	5
	62.4	110.03											
1	0	110.03	.78		252	243	246	62	66	74	72	.38	5
2	10.3	113.69	.77		255	243	247	58	64	74	72	.38	5
3	20.6	117.32	.76		255	244	246	59	64	74	73	.38	5
4	30.4	120.92	.72		254	245	247	61	65	75	73	.38	5
5	39.8	124.10	.64		254	244	247	62	64	75	73	.39	5
6	48.9	127.40	.56		254	244	247	62	64	75	73	.38	5
	57.6	130.48											

Traverse:	2	Initial Leak Check: .009 cfm@ 16 "Hg	Traverse:	
Start Time:	920		Start Time:	1026
Finish Time:	1022		Finish Time:	1124

Static = -8.6

Project No.: 21880

Operator: TD CG

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particle Size
Test Date	SEPTEMBER 11, 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T1
Impinger Box No.:	7

Pitot Factor	.845	
DGMCF	1.006	
Barometric Pressure	29.85	"Hg
Static Pressure	-0.6	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

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

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	174.5	g
WCBDA	11.2	g

Combustion Gas Concentration

Oxygen	7.96	%
Carbon Dioxide	11.38	%
Carbon Monoxide	14.3	ppm

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

Nozzle Measurements	
1	SEC
2	TEST
3	
4	1
Average:	

Probe Liner Glass / Metal /Teflon / Other PPT

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: SEPT 11/18	Plant: Covanta DYEC	Test No.: 2 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	30.66	.78	.35	296	245	247	60	67	75	75	0.38	5
2	10.6	34.50	.93		297	243	246	56	62	75	75	0.36	5
3	21.3	38.28	.86		295	243	248	55	60	75	75	0.38	5
4	31.8	41.94	.79		288	244	247	55	61	76	74	0.38	5
5	41.8	45.55	.66		286	243	247	55	61	76	75	0.36	5
6	51.5	49.05	.58		287	244	247	56	61	77	75	0.36	5
	60.5	52.17											
1	0	52.17	.67		286	245	247	59	66	77	76	0.38	5
2	10.4	55.97	.67		286	243	247	55	61	79	75	0.38	5
3	20.8	59.46	.71		285	244	247	54	60	77	76	0.38	5
4	31.1	63.26	.65		285	244	249	54	60	78	76	0.38	5
5	41.1	66.93	.63		285	244	249	54	61	78	76	0.38	5
6	50.5	70.30	.59		285	284	243	55	61	78	76	0.38	5
	59.5												

Traverse:			
Start Time:	1310	Initial Leak Check:	.004 cfm@ 15 "Hg
Finish Time:	1511		

Traverse:	
Start Time:	1415
Finish Time:	1513

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	SEPT 11/18
Test Location	APC Outlet No. 2
Operator Signature	RM

Project No.:	21880
Page	1 of
Probe No.:	4
Meter Box No.:	T1
Impinger Box No.:	5

Pitot Factor	0.845	
DGMCF	1.006	
Barometric Pressure	29.86	"Hg
Static Pressure	-0.6	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	11	inches

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

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	175.3	g
WCBDA	13.0	g

Combustion Gas Concentration

Oxygen	8.06	%
Carbon Dioxide	11.17	%
Carbon Monoxide	11.7	ppm

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

Nozzle Measurements	
1	SEE
2	TEST
3	
4	1
Average:	

Probe Liner Glass / Metal /Teflon / Other TFE

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: SEPT 11/18	Plant: Covanta DYEC	Test No.: 3	Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter 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	73.69	.77	.35	286	243	273	74	77	76	76	.38	5
2	10.6	77.46	.87		280	244	240	57	67	77	76		5
3	21.5	81.52	.86		288	244	247	56	66	77	76		5
4	32.6	85.41	.79		287	244	246	56	66	78	76		5
5	43.2	89.41	.72		287	244	247	56	66	78	76		5
6	52.9	92.93	.60		286	244	248	57	66	77	76		5
	62.0	96.25											
1	0	96.25	.73		286	242	246	59	69	76	76		5
2	9.8	99.72	.70		286	242	240	56	65	77	77		5
3	19.6	103.26	.74		286	240	246	56	65	76	76		5
4	29.7	106.75	.71		286	244	249	56	64	77	76		5
5	39.3	110.29	.66		286	243	248	55	61	76	76		5
6	48.8	113.52	.63		286	249	248	56	65	76	76		5
	58.0	116.90											

Traverse:	2	Initial Leak Check:	.003	cfm@	15	"Hg
Start Time:	1640					
Finish Time:	1742					

Traverse:	1
Start Time:	1744
Finish Time:	1844

Project No.: 21880

Operator :

APPENDIX 6

SVOC Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	9/13/18
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6D
Meter Box No.:	Team 2
Impinger Box No.:	10

Pitot Factor	.840	
DGMCF	.991	
Barometric Pressure	29.98	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	0.2194	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	573.8	g
WCBDA	12.6	g

Combustion Gas Concentration

Oxygen	8.39	%
Carbon Dioxide	11.00	%
Carbon Monoxide	13.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	SPS COE20109
Trendicator	
Control Box Team 2	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2200
2	.2200
3	.2190
4	.2185
Average:	.2194

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: 9/13/18	Plant: Covanta DYEC	Test No.: SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No.	

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	~~186.5~~ 18.65	.66	.51	268	263	256	70	69	72	71	~~.785~~	3.3
	5	21.28	.66	.52	272	264	258	61	90	76	74	.75	3.5
2	10	23.72	.68	.53	282	263	258	56	94	77	74	.85	4.0
	15	26.27	.72	.54	282	263	259	53	98	77	75	.95	4.5
3	20	29.00	.78	.56	286	263	259	50	83	77	75	1.05	4.5
	25	31.85	.77	.55	288	263	259	49	69	78	75	1.00	4.3
4	30	34.64	.77	.55	288	263	259	49	49	78	75	1.00	4.3
	35	37.46	.76	.55	289	264	260	49	50	79	76	1.00	4.3
5	40	40.25	.76	.55	289	264	260	49	50	79	76	1.00	4.3
	45	43.03	.75	.55	289	264	260	48	50	80	77	1.00	4.3
6	50	45.82	.74	.55	289	264	260	47	49	80	77	.95	4.3
	55	48.58	.72	.54	289	265	261	48	49	81	78	.95	4.3
7	60	51.31	.68	.52	289	264	260	48	49	81	78	.90	4.0
	65	53.97	.68	.52	289	265	260	48	50	81	79	.90	4.0
8	70	56.63	.76	.55	289	264	260	49	50	82	79	1.05	4.5
	75	59.48	.75	.55	289	265	261	48	52	82	79	1.00	4.3
9	80	62.28	.82	.58	289	265	261	49	51	82	79	1.10	4.5
	85	65.17	.82	.58	289	265	261	49	49	82	80	1.10	4.5
10	90	68.05	.89	.60	289	265	261	49	48	83	80	1.25	4.5
	95	71.11	.88	.60	289	265	261	50	48	83	81	1.20	4.5
11	100	74.15	.88	.60	289	264	261	50	49	83	81	1.20	4.5

Traverse: 2			
Start Time: 10:28	Initial Leak Check: .002	cfm@ 14.5	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

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

Project No.: 21880

Operator : JB

Field Data Sheet

Date: 9/13/18	Plant: Covanta DYEC	Test No.: SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	77.22	.87	.60	288	265	262	50	51	83	81	1.20	4.5
12	110	80.25	.88	.66	288	265	261	50	53	83	81	1.20	4.5
	115	83.26	.88	.60	288	265	261	51	54	84	82	1.20	4.5
	120	86.37											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 12:24	Final Leak Check: .001	cfm@ 13	"Hg

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

Project No.: 21880

Operator : JB

Field Data Sheet

Date: 9/13/18	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	86.82	.94	.62	284	266	261	65	50	83	82	1.35	5.0
	5	90.06	.93	.62	288	265	260	50	47	83	82	1.30	5.0
2	10	93.25	.93	.62	287	264	261	47	45	84	82	1.25	5.0
	15	96.38	.90	.61	288	264	260	47	45	84	82	1.20	4.8
3	20	99.45	.89	.60	287	265	260	47	45	84	83	1.20	4.8
	25	102.50	.89	.60	287	264	261	47	45	84	83	1.20	4.8
4	30	105.52	.87	.60	288	264	260	48	47	85	83	1.20	4.8
	35	108.55	.84	.59	288	265	261	48	48	85	83	1.15	4.5
5	40	111.53	.71	.54	288	265	261	49	49	85	83	.90	4.3
	45	114.25	.71	.54	288	264	261	49	50	86	84	.90	4.3
6	50	116.93	~~1.0~~.70	.584	287	264	261	49	46	86	84	.95	4.5
	55	119.68	.59	.49	288	265	261	50	46	86	84	.70	4.0
7	60	122.09	.70	.54	287	264	261	52	46	86	84	.95	4.0
	65	124.81	.67	.53	287	265	261	50	47	86	84	.90	4.0
8	70	127.56	.73	.55	286	265	261	50	48	86	84	1.00	4.3
	75	130.30	.74	.55	286	265	261	51	50	86	84	1.00	4.3
9	80	133.14	.76	.56	286	265	261	51	52	86	84	1.00	4.3
	85	135.97	.76	.56	296	265	261	49	50	86	84	1.00	4.3
10	90	138.79	.75	.56	285	265	261	49	47	86	85	.96	4.3
	95	141.58	.75	.56	285	265	261	49	47	86	85	.95	4.3
11	100	144.32	.74	.55	288	265	260	49	48	86	84	.95	4.3

Traverse: 1				
Start Time: 12:44	Initial Leak Check: .002	cfm@ 13	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

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

Project No.: 21880

Operator: JB, DP

Field Data Sheet

Date: 9/13/18	Plant: Covanta DYEC	Test No.: SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp		Meter Temp		Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
								Outlet °F	Inlet/Trap °F	Outlet °F	Inlet °F		
	105	147.07	.75	.56	281	263	260	49	50	86	85	0.95	4.3
12	110	149.81	.71	.54	283	264	261	49	52	86	85	.90	4.2
	115	152.50	.70	.54	284	265	261	50	54	87	85	.88	4.2
	120	155.14											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 14:44	Final Leak Check: .001	cfm@ 15	"Hg

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

Project No.: 21880

Operator : JB, DP

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	Sept 14/18 13/18
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6P
Meter Box No.:	Team 2
Impinger Box No.:	11

Pitot Factor	.840	
DGMCF	.991	
Barometric Pressure	29.91	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2194	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	602.4	g
WCBDA	13.5	g

Combustion Gas Concentration

Oxygen	8.08	%
Carbon Dioxide	11.15	%
Carbon Monoxide	11.4	ppm

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Sept 12/13	Plant: Covanta DYEC	Test No.: SVOC 12-1	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No.	

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	158.12	.70	.54	280	245	244	65	56	85	85	.86	5
	5	160.74	.70	.54	280	243	268	63	52	86	85	.85	4.5
2	10	163.43	.70	.54	280	242	257	57	54	86	85	.90	5
	15	166.13	.69	.54	280	241	260	57	55	86	85	.90	5
3	20	168.77	.80	.58	287	241	260	54	55	87	85	1.1	6
	25	171.76	.82	.58	288	241	259	53	57	87	85	1.1	6
4	30	174.71	.76	.56	287	241	259	53	56	87	85	1.0	6
	35	177.53	.79	.57	286	241	260	53	56	87	85	1.05	6
5	40	180.41	.76	.56	286	241	259	53	55	87	85	1.0	6
	45	183.26	.75	.56	285	241	259	53	41	87	85	1.0	5
6	50	186.10	.71	.54	285	241	259	52	43	87	85	.90	5
	55	188.81	.72	.54	285	240	259	51	41	87	85	.90	5
7	60	191.41	.60	.50	285	240	259	53	42	87	86	.70	4.5
	65	193.85	.70	.54	285	240	259	54	42	87	86	.95	5
8	70	196.57	.72	.55	285	239	259	53	43	88	86	.90	5
	75	199.27	.75	.56	285	240	261	55	44	88	87	1.0	5.1
9	80	202.09	.83	.59	285	241	261	54	45	89	87	1.2	6
	85	205.19	.82	.59	286	241	261	56	48	89	88	1.2	6
10	90	208.23	.86	.60	285	242	261	53	48	89	88	1.1	6
	95	211.23	.88	.61	285	242	262	51	45	89	88	1.2	6
11	100	214.26	.86	.60	284	242	261	51	46	89	88	1.2	6

Traverse:					
Start Time:	17:09	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.: 21880

Operator : AS

Field Data Sheet

Date: Sept 13/18	Plant: Covanta DYEC	Test No.: SVOC T2	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	217.28	.83	.59	283	242	261	54	49	89	88	1.2	6
12	110	220.27	.83	.59	283	252	261	55	50	89	88	1.1	5.8
	115	223.23	.82	.59	282	250	263	55	49	89	88	1.1	5.8
	120	226.17											

Traverse: 1				
Start Time:	Initial Leak Check:	cfm@ 46	"Hg
Finish Time: 19:09	Final Leak Check: .001	cfm@ 16	"Hg

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

Project No.: 21880

Operator : AS

Field Data Sheet

Date:	Sept 13/18	Plant:	Covanta DYEC	Test No.:	SVOC T2	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	226.57	.80	.58	276	251	260	68	56	88	87	1.2	6
	5	229.49	.82	.59	283	250	260	52	50	88	87	1.2	6
2	10	232.39	.90	.61	284 ~~88~~	250	261	51	47	~~88~~	87	1.3	6
	15	235.49	.87	.60	284	250	261	50	46	87	87	1.2	6
3	20	238.51	.83	.59	284	249	260	50	48	87	87	1.2	6
	25	241.50	.86	.60	285	250	261	51	51	87	87	1.2	6
4	30	244.54	.82	.58	288	251	263	52	54	88	87	1.1	6
	35	247.52	.80	.58	285	249	260	50	47	87	86	1.1	6
5	40	250.54	.78	.57	285	249	260	50	43	87	86	1.05	6
	45	253.49	.78	.57	285	249	260	50	43	86	86	1.05	6
6	50	256.32	.70	.54	286	249	260	50	44	86	85	.93	5.5
	55	259.04	.69	.53	286	249	259	50	46	85	85	.93	5.5
7	60	261.73	.73	.55	286	249	261	51	48	85	85	.98	6
	65	264.51	.76	.56	286	249	259	50	51	85	85	1.0	6
8	70	267.33	.78	.57	287	249	260	50	45	85	84	1.1	6
	75	270.17	.77	.56	287	249	260	50	42	85	84	1.1	6
9	80	272.97	.80	.57	286	249	261	51	41	84	84	1.1	6
	85	275.91	.78	.57	285	248	258	50	42	83	83	1.05	6
10	90	278.76	.77	.56	285	246	257	48	41	81	81	1.05	6
	95	281.57	.77	.56	281	244	254	40	37	75	74	1.05	6
11	100	284.39	.72	.54	281	243	254	46	43	79	78	~~1.05~~	6

Traverse:	2				
Start Time:	19:18	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.: 21880

Operator : AS

Field Data Sheet

Date: Sept 13/18	Plant: Covanta DYEC	Test No.: SVOC T2	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	281.09	.75	.54	281	233	243	35	35	68	67	1.0	6
12	110	289.85	.74	.55	283	248	258	51	49	84	83	1.0	6
	115	292.57	.73	.55	283	248	259	51	44	84	83	.95	6
	120	295.28											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 21:18	Final Leak Check: .001	cfm@ 20	"Hg

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

Project No.: 21880

Operator: TS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds T3
Test Date	Sept 14/18
Test Location	APC Outlet No. 1
Operator Signature	AS

Project No.:	21880
Page	1 of 5
Probe No.:	6D
Meter Box No.:	Team 2
Impinger Box No.:	11

Pitot Factor	.840	
DGMCF	.991	
Barometric Pressure	29.89	"Hg
Static Pressure	-0.9	"H2O
Nozzle Size	.2194	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	574.0	g
WCBDA	13.2	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	10.95	%
Carbon Monoxide	10.5	ppm

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Rev. November 27, 2014

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: SVOC T3	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	~~296.36~~ ~~296.24~~	.93	.61	284	250	257	65	65	77	76	1.2	6
	5	299.41	.91	.60	286	247	258	52	43	79	77	1.2	6
2	10	302.39	.89	.60	286	246	258	47	44	80	77	1.2	6
	15	305.38	.88	.60	286	246	258	45	44	80	78	1.2	6
3	20	308.31	.88	.60	285	246	258	44	43	80	78	1.2	6.5
	25	311.26	.87	.59	285	247	259	45	41	80	78	1.2	6.5
4	30	314.24	.80	.57	285	247	259	45	43	81	78	1.05	6.5
	35	317.12	.81	.57	285	247	259	46	44	81	79	1.1	6.5
5	40	319.92	.73	.54	285	247	259	47	47	81	79	.95	6.5
	45	322.62	.73	.54	285	247	258	48	50	82	79	.95	6.5
6	50	325.3	.60	.49	285	248	259	48	54	82	79	.70	6.0
	55	327.7	~~.57~~	~~.49~~	286	248	259	49	57	82	80	.70	6.0
7	60	330.07	.71	.54	286	248	259	50	60	83	80	.93	6.5
	65	332.72	.70	.53	286	248	259	49	42	83	80	1.0	6.5
8	70	~~335.49~~	.74	.55	284	246	257	49	40	83	80	1.0	6.5
	75	338.27	.75	.55	286	248	259	49	40	83	80	1.0	6.5
9	80	341.01	.75	.55	282	248	258	49	40	83	81	1.0	6.5
	85	343.78	.77	.56	282	248	259	49	40	83	81	1.1	7
10	90	346.74	.75	.56	283	249	258	49	41	83	81	1.05	7
	95	349.57	.75	.55	284	248	259	49	42	84	81	1.05	7
11	100	352.36	.68	.67	284	249	259	52	43	84	81	.95	7

Traverse: 1			
Start Time: 9:36	Initial Leak Check: .005	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.: 21880

Operator : AJ

Field Data Sheet

Date: Sept 19/18	Plant: Covanta DYEC	Test No.: SVOC T3	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	355.06	.69	~~.853~~	284	249	258	50	45	84	82	.95	7
12	110	357.77	.70	.54	284	248	259	50	48	84	82	.95	7
	115	360.43	.68	.53	284	249	259	250	50	84	82	.95	7
	120	363.11											

Traverse:			
Start Time: 1	Initial Leak Check:	cfm@	"Hg
Finish Time: 13:36	Final Leak Check: .006	cfm@ 15	"Hg

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

Project No.: 21880

Operator : AS

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: SVOC T3	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	363.52	.87	.60	282	248	259	64	54	84	82	1.2	8
	5	366.51	.84	.59	284	248	259	48	46	84	82	1.15	8
2	10	369.51	.86	.59	283	249	258	47	42	84	82	1.2	8
	15	372.54	.83	.58	284	248	259	47	43	84	82	1.15	8
3	20	375.52	.82	.58	283	248	258	47	42	84	82	1.15	8
	25	378.50	.82	.58	284	248	259	48	42	84	83	1.15	8
4	30	381.44	.77	.56	284	248	259	48	43	85	82	1.10	8
	35	384.34	.76	.56	284	249	259	49	44	85	83	1.10	8
5	40	387.19	.70	.54	284	248	258	49	44	85	83	1.0	7.5
	45	389.99	.70	.54	284	248	259	50	46	85	83	.95	7.5
6	50	392.74	.67	.53	284	248	259	49	48	85	83	.90	7.5
	55	395.41	.68	.53	284	248	259	50	46	85	83	.90	7.5
7	60	398.12	.69	.53	285	249	259	50	44	85	83	.90	7.5
	65	400.80	.69	.53	284	249	259	50	43	85	83	.90	7.5
8	70	403.48	.70	.54	285	249	259	51	43	85	83	.90	7.5
	75	406.17	.68	.53	284	248	259	51	43	86	83	.90	7.5
9	80	408.85	.67	.53	284	248	259	51	43	86	84	.85	7.0
	85	411.48	.70	.54	284	248	259	52	45	86	83	.95	7.5
10	90	414.23	.68	.53	284	248	259	48	47	86	84	.90	7.5
	95	416.91	.67	.53	283	248	260	47	42	86	84	.90	7.5
11	100	419.60	.61	.50	283	253	264	50	43	87	85	.83	7

Traverse: 2		
Start Time: 11:46	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.: 21880

Operator : AS

Field Data Sheet

Date: Sept 14/18	Plant: Covanta DYEC	Test No.: SVOC T3	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	422.16	.63	.51	283	248	260	49	43	86	84	.85	7
12	110	424.76	.63	.51	283	248	259	50	46	86	84	.85	7
	115	427.38	.61	.50	283	248	260	51	43	86	84	.85	7
	120	429.94											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 13:46	Final Leak Check: .004	cfm@ 17	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	September 13 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 series
Meter Box No.:	Team 4
Impinger Box No.:	11

Pitot Factor	.846	
DGMCF	.996	
Barometric Pressure	30.00	"Hg
Static Pressure	-9.95	"H2O
Nozzle Size	.2321	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	566.7	g
WCBDA	11.2	g

Combustion Gas Concentration

Oxygen	8.12	%
Carbon Dioxide	11.01	%
Carbon Monoxide	17.7	ppm

Measuring Device	MII Numbers
Probe / Pitot 15E	COE 20113
Trendicator	COE 20090
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2325
2	.2320
3	.2321
4	.2315
Average:	0.2321

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes: Josh ~ covanta contact

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot 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	38.82	.72	.59	285	253	249	62	45	71	72	1.1	7
	5	41.91	.81	.62	289	258	252	47	41	73	72	1.2	7
2	10	44.94	.81	.62	290	256	256	46	42	76	72	1.3	7.5
	15	48.04	.82	.63	290	256	246	46	44	77	73	1.35	8
3	20	51.24	.82	.63	291	253	253	45	44	79	73	1.3	8
	25	54.41	.83	.60	291	256	257	45	45	80	74	1.3	8
4	30	57.55	.78	.61	291	254	247	46	45	81	74	1.25	8
	35	60.65	.75	.60	291	258	254	46	45	81	74	1.2	8
5	40	63.70	.68	.58	290	257	255	47	46	82	75	1.0	8
	45	66.58	.69	.58	290	256	247	48	46	82	75	1.05	8
6	50	69.37	.61	.55	290	255	256	48	47	83	76	.95	8
	55	72.12	.61	.55	290	258	253	49	46	83	76	.95	8
7	60	74.86	.64	.56	289	253	250	49	47	83	76	1.0	8
	65	77.67	.62	.55	290	255	256	49	49	84	76	.95	8
8	70	80.47	.62	.55	289	253	254	50	50	84	77	.95	8
	75	83.19	.61	.55	289	256	252	50	52	84	77	.97	8
9	80	85.97	.66	.57	289	257	258	51	54	84	77	1.05	8
	85	88.81	.66	.57	289	258	248	51	55	84	77	1.05	8
10	90	91.67	.66	.57	288	257	252	51	57	84	78	1.05	8
	95	94.57	.70	.59	288	254	255	51	51	83	78	1.15	8.5
11	100	97.55	.73	.60	289	258	249	51	47	83	78	1.2	8.5

Traverse: 2				
Start Time: 8:53	Initial Leak Check: .008	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

Josh

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	100.58	.71	.60	278	257	257	51	47	83	78	1.2	8.5
12	110	103.61	.71	.59	278	258	253	51	47	82	78	1.2	8.5
	115	106.62	.71	.59	279	254	253	52	49	82	78	1.2	8.5
	120	109.63											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 10:53	Final Leak Check: .005	cfm@ 15	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	110.0	.85	.65	288	254	256	68	54	78	78	1.4	18
	5	113.19	.91	.67	291	254	248	51	49	79	78	1.55	10.5
2	10	116.61	.86	.65	291	259	257	49	46	80	78	1.45	10
	15	119.97	.87	.65	291	259	254	49	46	80	78	1.4	10
3	20	123.27	.89	.66	292	259	250	49	46	81	78	1.45	11
	25	126.61	.85	.64	292	259	258	49	46	81	78	1.35	10
4	30	129.85	.79	.62	292	254	249	50	48	82	79	1.25	9.5
	35	132.99	.80	.63	292	259	254	50	46	83	79	1.3	9.5
5	40	136.16	.71	.59	291	258	258	50	45	83	79	1.05	9
	45	139.05	.69	.58	291	259	248	51	44	84	79	1.1	9
6	50	141.98	.63	.56	291	259	256	51	45	85	80	1.0	9
	55	144.77	.64	.56	291	257	255	51	45	85	80	1.0	9
7	60	147.59	.70	.59	291	259	252	51	46	85	80	1.15	9
	65	150.58	.71	.59	291	258	259	51	48	85	80	1.15	9
8	70	153.57	.73	.60	291	257	249	51	50	85	81	1.2	9.5
	75	156.63	.71	.59	291	257	255	51	49	85	80	1.15	9.5
9	80	159.65	.71	.59	291	259	259	51	46	85	81	1.1	9.5
	85	162.61	.68	.58	290	258	249	52	57	85	81	1.15	10
10	90	165.52	.68	.58	283	255	257	52	57	85	81	1.15	10
	95	168.57	.66	.57	290	255	254	52	43	85	81	1.05	9
11	100	171.47	.59	.55	279	256	252	51	42	86	82	.95	9

Traverse:	1				
Start Time:	11:09	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.: 21880

Operator : [signature]

Field Data Sheet

Date: Sept, 13 2018	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	174,27	.57	.54	274	258	259	50	42	86	82	.92	9
12	110	176.99	.58	.55	267	250	251	53	42	87	82	.95	9
	115	179,74	.54	.53	265	258	255	53	42	87	82	.87	8.5
	120	182,41											

Traverse: 1			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 13:09	Final Leak Check: .004	cfm@ 14	"Hg

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

Project No.: 21880

Operator : PLP

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	September 13 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 Series
Meter Box No.:	Team 4
Impinger Box No.:	1

Pitot Factor	.846	
DGMCF	.996	
Barometric Pressure	29.92	"Hg
Static Pressure	-9.95	"H2O
Nozzle Size	.2321	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	626.3	g
WCBDA	15.2	g

Combustion Gas Concentration

Oxygen	8.06	%
Carbon Dioxide	10.98	%
Carbon Monoxide	10.3	ppm

Measuring Device	MII Numbers
Probe / Pitot ISE	COE 20113
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	2325
2	2320
3	2325
4	2315
Average:	2321

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: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	82.81	.54	.53	285	249	251	81	56	82	84	.84	5
	5	85.43	.63	.56	281	256	252	63	43	84	83	1.0	6
2	10	88.24	.65	.57	281	256	257	58	43	86	83	1.05	6
	15	91.12	.67	.58	281	253	249	55	45	88	83	1.1	6.5
3	20	94.05	.72	.60	287	258	256	54	47	89	84	1.2	7
	25	97.10	.72	.60	288	258	254	53	49	90	85	1.2	7
4	30	100.13	.72	.60	290	258	250	53	51	91	85	1.2	7
	35	103.20	.74	.61	290	253	258	53	48	91	85	1.25	7
5	40	106.34	.70	.60	290	253	250	53	47	92	86	1.15	7
	45	109.39	.70	.60	289	254	259	53	46	92	86	1.1	6.5
6	50	112.35	.68	.59	289	255	251	54	46	92	86	1.1	6.5
	55	115.25	.68	.59	290	253	257	54	47	93	86	1.15	7
7	60	118.23	.64	.57	290	259	255	54	47	93	87	1.0	6.5
	65	121.08	.63	.57	290	257	253	55	46	93	86	1.0	6.5
8	70	123.93	.73	.61	290	258	258	55	45	93	87	1.15	7
	75	126.95	.71	.60	290	259	252	55	46	93	87	1.2	7
9	80	130.0	.82	.65	290	256	255	55	47	93	87	1.35	8
	85	133.25	.82	.65	290	256	255	55	47	93	87	1.35	8
10	90	136.59	.89	.67	290	257	251	56	50	93	88	1.5	8
	95	139.98	.88	.67	290	259	256	55	52	93	87	1.5	8
11	100	143.35	.92	.68	290	259	256	55	55	92	87	1.5	8

Traverse:					
Start Time:	N/A 15:17	Initial Leak Check:	.004	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	146.84	.93	.69	290	259	254	56	57	92	87	1.53	8
12	110	150.28	.94	.69	291	260	257	56	59	92	87	1.55	8
	115	153.75	.91	.68	290	260	252	56	52	92	87	1.50	8
	120	157.19											

Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: 17:17	Final Leak Check:	.002	cfm@ 16	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	157.62	.65	.59	261	257	258	69	42	88	88	1.15	7
	5	160.60	.72	.61	265	254	258	57	39	89	87	1.2	8
2	10	163.68	.69	.60	264	259	251	55	39	90	87	1.15	8
	15	166.70	.67	.59	263	259	251	56	40	91	87	1.1	7.5
3	20	169.67	.67	.59	278	258	257	56	40	92	87	1.1	7.5
	25	172.62	.67	.59	284	258	254	56	40	92	87	1.1	7.5
4	30	175.59	.71	.60	286	257	250	56	40	92	87	1.15	7.5
	35	178.62	.68	.59	287	254	257	56	41	93	87	1.1	8
5	40	181.60	.66	.58	287	259	257	56	41	93	87	1.05	7.5
	45	184.50	.68	.59	287	258	248	56	40	93	87	1.1	8
6	50	187.51	.70	.60	288	256	254	56	40	93	87	1.15	8
	55	190.51	.70	.60	288	259	257	56	40	92	87	1.15	8
7	60	193.49	.65	.59	288	255	251	56	40	92	87	1.0	8
	65	196.38	.66	.58	289	259	254	56	40	93	87	1.05	8
8	70	199.27	.71	.60	288	259	258	57	40	92	87	1.15	8
	75	202.29	.71	.60	289	255	249	56	41	92	87	1.15	8
9	80	205.32	.72	.61	288	254	253	57	41	92	87	1.2	8
	85	208.38	.79	.63	289	259	257	57	41	92	86	1.3	8.5
10	90	211.57	.83	.65	289	258	256	57	41	91	87	1.35	8.5
	95	214.82	.83	.65	289	259	254	57	42	91	86	1.35	8.5
11	100	218.08	.86	.66	290	260	258	57	43	90	86	1.4	8.5

Traverse: 2				
Start Time: 17:33	Initial Leak Check: .006	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 13 2018	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	221.38	.89	.67	290	256	249	57	43	90	86	1.45	9
12	110	224.74	.90	.67	291	260	255	57	43	90	86	1.45	9
	115	228.12	.90	.67	290	257	257	57	43	89	86	1.45	9
	120	231.57											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@	"Hg
Finish Time: 19:33	Final Leak Check: .005	cfm@ 20	"Hg

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

Project No.: 21880

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	September 14 2018
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21880
Page	1 of 5
Probe No.:	6 Series
Meter Box No.:	Team 4
Impinger Box No.:	10

Pitot Factor	.846	
DGMCF	.996	
Barometric Pressure	29.89	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	.2321	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	615.1	g
WCBDA	12.6	g

Combustion Gas Concentration

Oxygen	7.79	%
Carbon Dioxide	11.23	%
Carbon Monoxide	10.0	ppm

Measuring Device	MII Numbers
Probe / Pitot ISE	CoE 20113
Trendicator	CoE 20090
Control Box	CoE 20090
Incline Manometer	CoE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2321
2	.2320
3	.2325
4	.2315
Average:	.2321

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: Sept. 14 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot 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
		34.53											
1	0	~~34.24~~	.88	.66	289	254	254	78	52	78	78	1.5	8
	5	37.70	.88	.66	289	257	254	65	47	80	78	1.4	8
2	10	40.97	.84	.66	289	258	243	63	47	81	78	1.9	8
	15	44.15	.85	.65	288	255	250	59	47	82	79	1.45	8
3	20	47.43	.83	.64	289	258	250	56	47	83	80	1.4	8
	25	50.68	.81	.63	288	256	244	55	47	84	79	1.35	8
4	30	53.89	.75	.61	288	258	247	54	47	84	80	1.25	8
	35	57.01	.75	.61	289	25[illegible]	250	55	47	85	80	1.25	8
5	40	60.12	.65	.57	289	259	245	55	47	85	80	1.0	8
	45	62.95	.65	.57	288	256	251	55	46	86	80	1.0	8
6	50	65.77	.62	.55	288	259	246	55	47	86	80	1.0	8
	55	68.57	.65	.57	289	257	251	56	48	86	80	1.0	8
7	60	71.39	.68	.58	290	257	245	55	48	86	81	1.10	8
	65	74.29	.67	.58	290	253	248	55	48	87	81	1.10	8
8	70	77.20	.64	.57	289	257	250	55	48	87	81	1.05	8
	75	80.07	.64	.57	288	258	248	55	49	87	81	1.05	8
9	80	82.92	.63	.56	288	258	252	56	50	87	81	1.05	8
	85	85.76	.64	.57	288	254	245	56	51	87	81	1.05	8
10	90	88.60	.58	.54	288	257	251	56	47	87	81	.90	~~8~~ 7.5
	95	91.28	.59	.55	276	254	245	57	44	87	81	.95	7.5
11	100	94.07	.58	.54	276	258	250	57	43	87	81	.95	7.5

Traverse:					
Start Time:	8:29	Initial Leak Check:	.003	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

Static - 9.2

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept, 14 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

*	*	*	*	*	*	*	*	*	*	*	*	*

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	96.75	.57	.54	265	255	249	57	44	88	81	.95	7.5
12	110	99.49	.56	.54	265	256	248	57	44	88	82	.95	7.5
	115	102.22	.57	.54	264	253	251	57	44	89	82	.95	7.5
	120	104.94											

Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: 10:29	Final Leak Check:	.002	cfm@ 15	"Hg

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

Project No.: 21880

Operator :

Field Data Sheet

Date: Sept. 14 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	105.35	.82	.64	288	251	247	70	51	83	81	1.4	11
	5	108.5	.83	.64	288	258	246	60	55	83	91	1.4	9
2	10	111.84	.84	.65	289	257	252	59	49	84	82	1.35	9
	15	115.09	.82	.64	289	258	246	59	47	85	82	1.4	9
3	20	118.35	.78	.62	288	252	248	60	46	85	82	1.25	9
	25	121.46	.79	.63	288	253	251	60	46	86	82	1.3	9
4	30	124.62	.79	.63	288	257	245	60	45	87	83	1.3	9
	35	127.79	.73	.60	288	256	250	60	46	87	82	1.15	9
5	40	130.83	.74	.61	288	255	250	60	45	87	82	1.2	9
	45	133.87	.72	.60	288	255	247	60	45	87	83	1.15	9
6	50	136.92	.67	.58	289	259	253	60	46	88	83	1.0	8.5
	55	139.73	.66	.58	289	258	245	61	46	88	83	1.05	8.5
7	60	142.62	.68	.58	288	255	252	60	46	88	83	1.05	8.5
	65	145.52	.67	.58	289	254	246	61	47	88	83	1.1	9
8	70	148.46	.67	.58	289	252	249	61	47	88	83	1.1	9
	75	151.42	.69	.59	288	256	251	61	46	88	83	1.15	9
9	80	154.41	.69	.59	289	255	248	61	47	88	83	1.15	9
	85	157.40	.70	.59	289	252	252	61	48	88	83	1.15	9
10	90	160.43	.69	.59	288	254	247	61	49	88	84	1.15	9
	95	163.43	.70	.59	288	255	254	61	49	88	84	1.15	9
11	100	166.43	.69	.59	288	258	247	61	50	88	84	1.15	9

Traverse: 2				
Start Time: 10:41	Initial Leak Check: .003	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.: 21880

Operator :

Field Data Sheet

Date: Sept. 14 2018	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	169.42	.69	.60	258	252	253	62	51	88	84	1.2	9
12	110	172.48	.66	.59	257	.254	245	62	52	88	84	1.15	9
	115	175.50	.68	.60	258	257	254	62	54	88	84	1.2	9
	120	178.55											

Traverse: 2					Traverse:			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg		Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time: 12:41	Final Leak Check: .002	cfm@ 14.5	"Hg		Finish Time: /	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21880

Operator :

APPENDIX 7

Acid Gas Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	DYEC
Plant Location	Courtice, On
Test No.:	M26A T1
Test Date	Sept 11/18
Test Location	unit 1 outlet
Operator Signature	AS

Project No.:	21880
Page	1 of 2
Probe No.:	6B
Meter Box No.:	Team 2
Impinger Box No.:	4

Pitot Factor	.846	
DGMCF	.991	
Barometric Pressure	29.81	"Hg
Static Pressure	~~9.81~~ ~~10.5~~	"H2O
Nozzle Size	.2753	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		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	203.4	g
WCBDA	12.2	g

Combustion Gas Concentration

Oxygen	8.20	%
Carbon Dioxide	11.30	%
Carbon Monoxide	13.1	ppm

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

Nozzle Measurements	
1	.2750
2	.2750
3	.2760
4	.2750
Average:	2753

Site Diagram

Notes:

Field Data Sheet

Date:	Sept 11/18	Plant:	DYEC	Test No.:	1 M26A	Page 2 of 2
		Plant Location:	Courtice, On	Test Location:	Unit 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
FW 1	0	740.78	.77	.85	278	258	255	62	65	69	68	2.4	3
2	5	745.04	.77	.85	279	258	255	58	211	70	68	2.4	3
3	10	749.29	.80	.87	279	265	255	59	216	70	68	2.5	3
4	15	753.60	.78	.86	280	259	255	61	219	71	69	2.4	3
5	20	757.89	.71	.82	281	265	255	63	220	71	69	2.3	3
6	25	762.09	.62	.76	283	264	256	55	219	71	69	2.0	3
7	30	766.052	.68	.80	283	260	255	51	219	71	69	2.1	3
8	35	770.03	.68	.80	282	258	256	47	220	71	69	2.1	3
9	40	774.06773	.65	.78	278	260	256	45	220	71	69	2.0	3
10	45	778.01	.61	.76	278	262	256	45	220	72	70	1.9	3
11	50	781.90	.62	.77	278	263	256	45	220	72	70	1.9	3
12	55	785.76	.64	.78	278	264	256	46	220	73	70	2.0	3
	60	789.66											
HF													

Traverse:	1					
Start Time:	9:17	Initial Leak Check:	.002	cfm@	20	"Hg
Finish Time:	10:17	Final Leak Check:	.002	cfm@	15	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A 2
Test Date	Sept 11/18
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21880
Page	1 of 2
Probe No.:	GB
Meter Box No.:	Team 2
Impinger Box No.:	2

Pitot Factor	.846	
DGMCF	.991	
Barometric Pressure	29.84	"Hg
Static Pressure	-9.81 ~~-10.5~~	"H2O
Nozzle Size	.2753	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	200.1	g
WCBDA	13.6	g

Combustion Gas Concentration

Oxygen	8.22	%
Carbon Dioxide	11.1	%
Carbon Monoxide	11.9	ppm

Site Diagram

see T1

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date:	Sept 11/18	Plant:	Covanta DYEC	Test No.:	M26A T2	Page 2 of 2
		Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	790.10	.78	.85	279	254	233	68	75	72	70	2.4	3
2	5	794.32	.79	.86	280	252	251	68	181	72	71	2.4	3
3	10	798.63	.79	.86	281	264	249	60	172	73	71	2.4	3
4	15	802.91	.74	.83	281	262	249	54	246	73	71	2.3	3
5	20	807.15	.71	.81	282	259	249	50	247	73	71	2.2	3
6	25	811.30	.65	.78	281	263	251	48	247	73	71	2.0	3
7	30	815.26	.68	.79	281	265	250	48	246	73	71	2.1	3
8	35	819.24	.68	.79	281	264	251	49	247	74	71	2.1	3
9	40	823.21	.69	.80	282	264	250	49	247	74	71	2.1	3
10	45	827.20	.69	.80	281	260	250	50	247	74	72	2.1	3
11	50	831.17	.68	.80	281	261	250	51	246	74	72	2.1	3
12	55	835.15	.67	.79	281	262	251	53	246	75	72	2.1	3
	60	839.13											

Traverse:	2					
Start Time:	11:12	Initial Leak Check:	.002	cfm@	15	"Hg
Finish Time:	12:12	Final Leak Check:	.001	cfm@	16	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T3
Test Date	Sept 11/18
Test Location	APC Outlet No. 1
Operator Signature	AS

Project No.:	21880
Page	1 of 2
Probe No.:	6B
Meter Box No.:	Team 2
Impinger Box No.:	4

Pitot Factor	.846	
DGMCF	.991	
Barometric Pressure	29.84	"Hg
Static Pressure	-9.81 ~~-10.5~~	"H2O
Nozzle Size	.2753	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	210.4	g
WCBDA	11.1	g

Combustion Gas Concentration

Oxygen	8.18	%
Carbon Dioxide	11.20	%
Carbon Monoxide	12.0	ppm

Site Diagram

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

See T1

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date: Sept 11/18	Plant: Covanta DYEC	Test No.: M26A T3	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
NW 1	0	839.64	.70	.81	280	261	262	66	108	74	73	2.2	3
2	5	843.75	.68	.80	280	266	257	63	184	74	73	2.1	3
3	10	847.78	.68	.80	278	265	257	56	196	74	73	2.1	3
4	15	851.82	.68	.80	280	263	257	50	206	75	73	2.1	3
5	20	855.86	.67	.79	283	266	257	48	212	75	73	2.1	3
6	25	859.88	.66	.78	282	266	257	48	215	75	73	2.0	3
7	30	863.80	.62	.76	282	266	256	47	217	75	73	1.9	3
8	35	867.64	.71	.81	283	265	257	48	218	76	74	2.2	3
9	40	871.71	.73	.82	283	266	256	49	219	75	74	2.3	3
10	45	875.87	.79	.86	283	264	257	51	220	76	74	2.4	3
11	50	880.11	.86	.90	284	261	257	51	221	76	74	2.6	3.5
12	55	884.52	.84	.88	283	263	257	54	222	77	74	2.6	3.5
	60	889.00											

Traverse: 2					
Start Time: 12:43	Initial Leak Check:	.008	cfm@	16	"Hg
Finish Time: 13:43	Final Leak Check:	.001	cfm@	21	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T1
Test Date	Sept 12/18
Test Location	APC Outlet No. 2
Operator Signature	AS

Project No.:	21880
Page	1 of 2
Probe No.:	BB
Meter Box No.:	Team 1
Impinger Box No.:	2

Pitot Factor	.846	
DGMCF	1.206	
Barometric Pressure	29.98	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2753	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	160.5	g
WCBDA	14.2	g

Combustion Gas Concentration

Oxygen	8.39	%
Carbon Dioxide	10.75	%
Carbon Monoxide	17.1	ppm

Measuring Device	MII Numbers
Probe / Pitot	15E
Trendicator	
Control Box	COE 20094
Incline Manometer	COE 20094
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2750
2	.2750
3	.2760
4	.2750
Average:	.2753

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: Sept 12/18	Plant: Covanta DYEC	Test No.: M26A T1
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	617.20	.74	.82	277	255	242	68	75	69	68	2.4	2.5
2	5	621.50	.73	.82	283	260	253	57	250	71	70	2.3	2.5
3	10	625.65	.70	.80	284	261	254	56	252	71	70	2.2	2.5
4	15	629.70	.64	.76	284	260	254	56	252	72	70	2.0	2
5	20	633.54	.60	.74	284	260	254	58	252	73	71	1.9	2
6	25	637.31	.57	.72	284	261	254	55	251	74	71	1.8	2
7	30	640.96	.61	.75	284	259	254	54	250	75	72	1.9	2
8	35	644.66	.64	.77	285	261	255	53	251	76	72	2.1	2
9	40	648.56	.64	.77	286	258	255	52	252	77	72	2.1	2
10	45	652.49	.62	.76	284	258	254	54	252	78	73	2.0	2
11	50	656.35	.64	.77	284	258	255	54	252	79	73	2.1	2
12	55	660.27	.58	.73	284	258	254	55	251	79	73	2.0	2
	60	664.14											

Traverse: T2					
Start Time: 9:24	Initial Leak Check:	.002	cfm@	15	"Hg
Finish Time: 10:24	Final Leak Check:	.001	cfm@	15	"Hg

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

Project No.: 21880

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T2
Test Date	Sept 12/18
Test Location	APC Outlet No. 2
Operator Signature	AS

Project No.:	21880
Page	1 of 2
Probe No.:	6B
Meter Box No.:	Team 1
Impinger Box No.:	4

Pitot Factor	.846	
DGMCF	1.006	
Barometric Pressure	29.99	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2753	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	168.4	g
WCBDA	14.8	g

Combustion Gas Concentration

Oxygen	8.11	%
Carbon Dioxide	10.71	%
Carbon Monoxide	160.9	ppm

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Sept 12/18	Plant: Covanta DYEC	Test No.: M26A T2	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/~~Trap~~ °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	664.57	.77	.85	281	253	259	68	123	76	75	2.5	2
2	5	668.01	.77	.85	287	255	259	68	209	75	74	2.4	2
3	10	673.28	.74	.83	288	258	261	65	215	76	75	2.3	2
4	15	677.47	.68	.79	287	259	260	59	219	77	75	2.2	2
5	20	681.55	~~.59~~ .74	.74	287	261	260	55	220	78	75	2.0	2
6	25	685.41	.54	.71	286	261	261	53	219	79	76	1.8	2
7	30	689.08	.59	.74	286	262	261	53	219	80	76	1.9	2
8	35	692.91	.54	.71	285	261	260	53	220	81	76	1.7	2
9	40	696.51	.59	.74	286	261	260	53	219	80	77	2.05	2
10	45	700.41	.58	.74	285	261	261	54	221	81	77	2.00	2
11	50	704.28	.57	.73	282	258	260	55	221	81	77	1.80	2
12	55	707.94	.59	.75	279	261	261	56	221	82	78	2.60	2
	60	711.80											

Traverse:	Z					
Start Time:	11:49	Initial Leak Check:	.001	cfm@	15	"Hg
Finish Time:	12:49	Final Leak Check:	.001	cfm@	15	"Hg

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

Project No.: 21880

Operator: AS, JB

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T3
Test Date	Sept 12/18
Test Location	APC Outlet No. 2
Operator Signature	AS

Project No.:	21880
Page	1 of 2
Probe No.:	6A
Meter Box No.:	Team 1
Impinger Box No.:	2

See T1

Pitot Factor	.846	
DGMCF	1.006	
Barometric Pressure	29.98	"Hg
Static Pressure	-10.5	"H2O
Nozzle Size	.2753	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	176.3	g
WCBDA	11.7	g

Combustion Gas Concentration

Oxygen	7.40	%
Carbon Dioxide	11.34	%
Carbon Monoxide	15.8	ppm

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Sept 12/18	Plant: Covanta DYEC	Test No.: M26A 3	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	712.977~~12.51~~	.73	.83	276	255	233	65	83	80	79	2.4	3
2	5	717.21	.71	.82	284	260	258	51	83	79	78	2.3	3
3	10	721.42	.71	.82	284	263	257	49	181	79	78	2.3	3
4	15	725.62	.64	.78	285	261	258	51	228	80	79	2.1	3
5	20	729.53	.58	.74	285	262	258	52	227	80	78	1.8	2
6	25	733.21	.51	.69	285	262	258	53	227	81	79	1.7	3
7	30	736.78	.57	.73	285	259	257	52	227	81	79	1.8	3
8	35	740.44	.59	.75	285	261	258	53	228	82	80	1.9	3
9	40	744.25	.57	.73	286	261	258	53	229	83	79	1.9	3
10	45	747.95	.58	.74	283	262	258	53	229	83	80	1.9	3
11	50	751.71	.55	.72	283	258	257	54	229	83	80	1.8	3
12	55	755.39	.53	.71	283	260	258	54	229	83	80	1.7	~~3~~ 2.5
	60	759.02											

Traverse: 1					
Start Time: ~~13:37~~ 13:38	Initial Leak Check:	.008	cfm@	15	"Hg
Finish Time: 14:38	Final Leak Check:	.001	cfm@	15	"Hg

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

12 168.4 14.8

Project No.: 21880

Operator : AS

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	0.995	74.00	95.65	21.65	29.98	1.00	44.8	20.29	0.0203
1-2	0.995	95.80	117.00	21.20	29.98	1.00	45.0	19.86	0.0199
1-3	0.995	17.55	38.20	20.65	29.98	1.00	45.8	19.29	0.0193
1-4	0.995	38.65	61.20	22.55	29.98	1.00	46.8	21.00	0.0210
2-1	0.995	98.80	118.00	19.20	29.92	1.00	39.0	18.29	0.0183
2-2	0.995	17.55	38.70	21.15	29.92	1.00	42.8	19.91	0.0199
2-3	0.995	39.50	60.00	20.50	29.92	1.00	46.2	19.09	0.0191
2-4	0.995	60.45	82.70	22.25	29.92	1.00	47.8	20.62	0.0206
3-1	0.995	82.80	102.60	19.80	29.90	1.00	31.8	19.30	0.0193
3-2	0.995	3.00	23.10	20.10	29.90	1.00	38.2	19.19	0.0192
3-3	0.995	23.50	43.80	20.30	29.90	1.00	42.2	19.13	0.0191
3-4	0.995	44.25	64.50	20.25	29.90	1.00	44.4	18.95	0.0190

* 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	0.980	91.85	113.20	21.35	29.99	2.00	26.0	21.00	0.0210
1-2	0.980	13.40	33.90	20.50	29.99	2.00	26.4	20.14	0.0201
1-3	0.980	34.00	56.80	22.80	29.99	2.00	27.6	22.31	0.0223
1-4	0.980	57.00	78.00	21.00	29.99	2.00	26.4	20.63	0.0206
2-1	0.980	78.30	98.10	19.80	29.97	2.00	30.0	19.21	0.0192
2-2	0.980	98.30	119.20	20.90	29.97	2.00	30.2	20.26	0.0203
2-3	0.980	119.30	140.50	21.20	29.97	2.00	29.0	20.64	0.0206
2-4	0.980	40.90	61.50	20.60	29.97	2.00	29.6	20.01	0.0200
3-1	0.980	57.60	79.60	22.00	29.90	2.00	27.4	21.48	0.0215
3-2	0.980	79.70	100.60	20.90	29.90	2.00	28.8	20.31	0.0203
3-3	0.980	0.80	20.30	19.50	29.90	2.00	29.0	18.94	0.0189
3-4	0.980	20.60	41.30	20.70	29.90	2.00	29.6	20.06	0.0201

* Dry at 25°C and 1 atmosphere

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		#3
Plant Location Courtice, ON	Test No: 1		Control Box ID: AZ2010
Test location: APC Outlet No. 1	DGMCF: 0.995		Operator: KG
Date: SEPTEMBER 6, 2018	Barometric Pressure: 29.98 "Hg		Project No: 21880
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: KGAB	

L2145992 L2145992-

Tube Pair 1 Start Time: 1237.	Initial Leak Check NDL @ 13.5 "Hg	Sample ID: 1A, 1B	
Tube Pair 1 End Time: 1257.	Final Leak Check NDL @ 13.0 "Hg	Lab ID: L2145992-38	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	9874.0	120	150	17	45	1.0	3.0
5	9880.0	120	154	13	44	1.0	3.0
10	9885.0	128	155	12	44	1.0	3.0
15	9890.0	124	156	12	44	1.0	3.0
20	9895.65	125	157	13	47	1.0	3.0

Tube Pair 2 Start Time: 1303.	Initial Leak Check NDL @ 13.5 "Hg	Sample ID: 2A, 2B	
Tube Pair 2 End Time: 1323	Final Leak Check NDL @ 18 "Hg	Lab ID: L2145992-39	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	9895.8	125	154	11	43	1.0	2.0
5	9901.75	121	155	10	45	1.0	2.0
10	9907.0	125	155	11	46	1.0	2.0
15	9912.0	125	155	11	46	1.0	2.0
20	9917.0	123	155	11	46	1.0	2.0

Tube Pair 3 Start Time: 1328	Initial Leak Check NDL @ 18 "Hg	Sample ID: 3A, 3B	
Tube Pair 3 End Time: 1348	Final Leak Check NDL @ 20 "Hg	Lab ID: L2145992-40	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	9917.55	130	154	10	45	1.0	2.0
5	9922.7	130	154	11	45	1.0	2.0
10	9927.8	130	158	13	47	1.0	2.0
15	9933.0	130	153	11	46	1.0	2.0
20	9938.2	130	150	11	46	1.0	2.0

Tube Pair 4 Start Time: 1353	Initial Leak Check NDL @ 20 "Hg	Sample ID: 4A, 4B	
Tube Pair 4 End Time: 1413	Final Leak Check NDL @ 17 "Hg	Lab ID: L2145992-41	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	9938.65	130	154	10	46	1.0	2.
5	9944.70	131	154	10	46	1.0	2
10	9950.40	130	156	11	46	1.0	2
15	9955.90	133	156	10	48	1.0	2.
20	9961.20	132.	155	10	48	1.0	2

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		#3
Plant Location Courtice, ON	Test No: 2	Control Box ID:	A22010
Test location: APC Outlet No. 1	DGMCF: 0.995	Operator:	JG.
Date: SEPTEMBER 13, 2018	Barometric Pressure: 29.90 "Hg	Project No:	21880
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID:	9A, 9B

L2145992-46

Tube Pair 1 Start Time: 1709	Initial Leak Check NDL @ 16 "Hg	Sample ID:	5A, 5B.
Tube Pair 1 End Time: 1729	Final Leak Check NDL @ 14 "Hg	Lab ID:	L2145992-42

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	98.80	130	162	20	40	1.0	3.
5	100.1039	130	161	11	37	1.0	3.
10	107.95	131	162	11	38	1.0	3.
15	112.26	131	163	11	40	1.0	3.
20	118.00	131	163	11	40	1.0	3.

Tube Pair 2 Start Time: 1734	Initial Leak Check NDL @ 14 "Hg	Sample ID:	6A, 6B
Tube Pair 2 End Time: 1754	Final Leak Check NDL @ 17 "Hg	Lab ID:	L2146992-43

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	17.56	129	161	11	41	1.0	20.
5	23.00	129	161	13	42	1.0	20
10	28.30	129	161	11	41	1.0	20.
15	33.45	127	161	11	45	1.0	20.
20	38.70	128.	162	10	46	1.0	20.

Tube Pair 3 Start Time: 1800	Initial Leak Check NDL @ 17. "Hg	Sample ID:	7A, 7B
Tube Pair 3 End Time: 1820	Final Leak Check NDL @ 15 "Hg	Lab ID:	L2145992-44

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	39.5	130	160	4	45	1.0	3
5	44.65	126	160	4	45	1.0	3.
10	49.70	126	160	10	47	1.0	3.
15	54.9	125	162	10	47	1.0	3.
20	60.0	130	162	10	47	1.0	3

Tube Pair 4 Start Time: 1824	Initial Leak Check NDL @ 16 "Hg	Sample ID:	8A, 8B
Tube Pair 4 End Time: 1845	Final Leak Check NDL @ 16 "Hg	Lab ID:	L2146992-45

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	60.45	127	161	10	47	1.0	3.
5	66.30	131	162	10	47	1.0	3
10	71.70	132	162	9	48.	1.0	3
15	77.30	132.	162	11	48	1.0	3.
20	82.30	132	162	10	49	1.0	3.

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		#3
Plant Location Courtice, ON	Test No: 3		Control Box ID: A22018
Test location: APC Outlet No. 1	DGMCF: 0.995		Operator: IG
Date: SEPTEMBER 14, 2018	Barometric Pressure: 29.90 "Hg		Project No: 21880
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID:	30A, 30B. L2145992-67.

Tube Pair 1 Start Time: 0938	Initial Leak Check NDL @ 16 "Hg	Sample ID:	10A, 10B
Tube Pair 1 End Time: 0958	Final Leak Check NDL @ 15 "Hg	Lab ID:	L2145992-47

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	82.80	133	162	19	28	1.0	3
5	88.0	126	163	13	30	1.0	3
10	92.85	128	163	11	32	1.0	3
15	97.50	129	165	11	34	1.0	3
20	102.60	129	164	11	35	1.0	3

Tube Pair 2 Start Time: 1010	Initial Leak Check NDL @ 15 "Hg	Sample ID:	11A, 11B
Tube Pair 2 End Time: 1030	Final Leak Check @ 17 "Hg	Lab ID:	L2145992-48

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	103.0	127	162	10	35	1.0	2.0
5	107.6	130	165	10	36	1.0	2.5
10	112.8	134	167	10	40	1.0	2.5
15	118.0	128	163	10	39	1.0	2.5
20	123.10	128	162	11	41	1.0	2.5

Tube Pair 3 Start Time: 1036	Initial Leak Check NDL @ 17 "Hg	Sample ID:	12A, 12B
Tube Pair 3 End Time: 1056	Final Leak Check NDL @ 17 "Hg	Lab ID:	L2145992-49

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	123.5	126	162	11	40	1.0	2.5
5	128.8	128	162	10	41	1.0	2.5
10	134.9	129	163	10	42	1.0	2.5
15	139.9	129	163	10	44	1.0	2.5
20	143.8	126	162	10	44	1.0	2.5

Tube Pair 4 Start Time: 1101	Initial Leak Check NDL @ 17 "Hg	Sample ID:	13A, 13B
Tube Pair 4 End Time: 1121	Final Leak Check NDL @ 21 "Hg	Lab ID:	L2145992-50

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	144.25	124	161	11	43	1.0	3
5	149.40	127	162	11	43	1.0	5
10	~~154~~ 154.2	128	163	12	45	1.0	5
15	159.40	128	162	10	46	1.0	6
20	164.50	128	162	10	46	1.0	6

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 1		Control Box ID: MD5498
Test location: APC Outlet No. 2	DGMCF: 0.980		Operator: QA
Date: SEPT 13/18	Barometric Pressure: 29.99 "Hg		Project No: 21880
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 19A/B	L2145992-58

Tube Pair 1 Start Time: 1023	Initial Leak Check NDL @ 14 "Hg	Sample ID: 16A 16B					
Tube Pair 1 End Time: 1043	Final Leak Check NDL @ 11 "Hg	Lab ID: L2145992-53					
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	91.85	122	138	10	24	2.0	4
5	97.6	122	138	10	26	2.0	4
10	103.0	123	142	11	26	2.0	4
15	108.5	123	142	11	26	2.0	4
20	113.2	123	142	11	26	2.0	4

Tube Pair 2 Start Time: 1052	Initial Leak Check NDL @ 11 "Hg	Sample ID: 17A, 17B					
Tube Pair 2 End Time: 1112	Final Leak Check NDL @ 11 "Hg	Lab ID: L2145992-54					
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	13.4	122	142	16	26	2.0	4
5	18.7	123	141	10	26	2.0	4
10	23.7	124	141	10	26	2.0	4
15	28.4	124	141	10	27	2.0	4.5
20	33.9	124	141	10	27	2.0	5

Tube Pair 3 Start Time: 1122	Initial Leak Check NDL @ 11 "Hg	Sample ID: 18A 18B					
Tube Pair 3 End Time: 1142	Final Leak Check NDL @ 11 "Hg	Lab ID: L2145992-55					
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	34.0	123	140	16	27	2.0	4
5	39.0	124	140	16	27	2.0	4
10	45.5	125	140	10	28	2.0	4
15	51.0	125	143	9	28	2.0	4
20	56.8	125	142	9	28	2.0	4

Tube Pair 4 Start Time: 1155	Initial Leak Check NDL @ 11 "Hg	Sample ID: 20A, 20B					
Tube Pair 4 End Time: 1215	Final Leak Check NDL @ 11 "Hg	Lab ID: L2145992-57					
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	57.0	123	141	13	26	2.0	4
5	62.1	123	140	10	26	2.0	4.5
10	67.0	124	141	10	26	2.0	4.5
15	72.7	124	141	10	27	2.0	4.5
20	78.0	124	141	10	27	2.0	4.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 2		Control Box ID: M05498
Test location: APC Outlet No. 2	DGMCF: 0.981		Operator: RM
Date: SEPT 13/18	Barometric Pressure: 29.97 "Hg		Project No: 21880
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID:	9A/B L2145992-46

Tube Pair 1 Start Time: 1228	Initial Leak Check NDL @ 11 "Hg				Sample ID: 21 A/B
Tube Pair 1 End Time: 1248	Final Leak Check NDL @ 10 "Hg				Lab ID: L2145992-58

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	78.3	125	140	16	28	2.0	4
5	83.0	125	140	13	30	2.0	4
10	87.6	125	141	13	30	2.0	4.5
15	93.3	125	141	13	31	2.0	4.5
20	98.1	124	140	13	31	2.0	4.5

Tube Pair 2 Start Time: 1253	Initial Leak Check NDL @ 11 "Hg				Sample ID: 22 A/B
Tube Pair 2 End Time: 1313	Final Leak Check NDL @ 14 "Hg				Lab ID: L2145992-59

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	98.3	124	141	16	29	2.0	4
5	103.5	125	142	14	30	2.0	4
10	109.1	125	141	13	30	2.0	4
15	113.2	125	141	12	31	2.0	4
20	119.2	125	141	12	31	2.0	4

Tube Pair 3 Start Time: 1410	Initial Leak Check NDL @ 13 "Hg				Sample ID: 23 A/B
Tube Pair 3 End Time: 1430	Final Leak Check NDL @ 15 "Hg				Lab ID: L2145992-60

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	119.3	125	141	21	29	2.0	4
5	124.3	125	141	16	29	2.0	4
10	129.3	126	141	17	29	2.0	4.5
15	135.2	126	141	13	29	2.0	4.5
20	140.5	126	141	13	29	2.0	4.5

Tube Pair 4 Start Time: 1451	Initial Leak Check NDL @ 15 "Hg				Sample ID: 24 A/B
Tube Pair 4 End Time: 1511	Final Leak Check NDL @ 14 "Hg				Lab ID: L2145992-61

Clock Time	Dry Gas Meter 440.9	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	~~446.5~~ 441.5	124	140	20	29	2.0	4.5
5	446.1	125	140	20	29	2.0	4.5
10	451.2	124	141	14	30	2.0	4.5
15	456.1	125	141	13	30	2.0	4.5
20	461.5	125	141	12	30	2.0	4.5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 3	Control Box ID: M05498	
Test location: APC Outlet No. 2	DGMCF: 0.981	Operator: RW	
Date: SEPT 14/16	Barometric Pressure: 29.90 "Hg	Project No: 21880	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 30 A/B	L2145992-61

Tube Pair 1 Start Time: 952	Initial Leak Check NDL @ 22 "Hg	Sample ID: 25A/B	
Tube Pair 1 End Time: 1012	Final Leak Check NDL @ 12 "Hg	Lab ID:	L2145992-62

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	51.6	125	141	12	27	2.0	4
5	63.3	125	141	11	27	2.0	4
10	68.7	125	141	11	27	2.0	4
15	73.7	126	141	11	28	2.0	4.5
20	79.6	126	141	11	28	2.0	4.5

Tube Pair 2 Start Time: 1019	Initial Leak Check NDL @ 12 "Hg	Sample ID: 26A/B	
Tube Pair 2 End Time: 1039	Final Leak Check NDL @ 12 "Hg	Lab ID:	L2145992-63

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	79.7	125	141	12	28	2.0	4
5	85.0	125	141	12	28	2.0	4
10	90.0	126	140	12	29	2.0	4
15	95.0	126	140	12	29	2.0	4
20	9100.6	126	140	12	30	2.0	4

Tube Pair 3 Start Time: 1046	Initial Leak Check NDL @ 12 "Hg	Sample ID: 27A/B	
Tube Pair 3 End Time: 1106	Final Leak Check NDL @ 12 "Hg	Lab ID:	L2145992-64

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	0.8	125	141	13	28	2.0	4.5
5	6.0	126	141	12	28	2.0	4.5
10	10.8	126	140	11	29	2.0	4.5
15	15.5	126	141	11	30	2.0	4.5
20	20.3	125	141	11	30	2.0	5

Tube Pair 4 Start Time: 1112	Initial Leak Check NDL @ 12 "Hg	Sample ID: 28A/B	
Tube Pair 4 End Time: 1132	Final Leak Check NDL @ 21 "Hg	Lab ID:	L2145992-65

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	20.6	127	141	15	29	2.0	4.5
5	25.6	127	141	15	29	2.0	4.5
10	31.0	127	141	14	29	2.0	4.5
15	36.0	127	141	14	30	2.0	5
20	41.3	126	140	14	31	2.0	5

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	0.997	35.60	68.90	33.30	29.99	0.42	39.9	31.72	0.0317
2	0.997	62.20	97.30	35.10	29.95	0.50	47.5	32.62	0.0326
3	0.997	65.60	101.30	35.70	29.98	0.50	43.6	33.61	0.0336

* 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	0.970	63.00	94.40	31.40	29.94	1.20	31.0	29.97	0.0300
2	0.970	49.48	77.90	28.42	29.92	1.20	31.8	27.03	0.0270
3	0.970	27.30	57.40	30.10	29.90	1.20	26.6	29.11	0.0291

* 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:	SEPTEMBER 13, 2018
Project No.:	21880

Measuring Device	MII Number
Control Module	A22010.
Barometer	Environment Canada

Barometric Pressure:	29.99	"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	9835.6	139	145	134	14	33	0.5	0.5
5	9839.05	137	147	134	15	35	0.5	0.5
10	9841.65	139	149	136	15	35	0.4	0.5
15	9843.6	141	148	133	17	38	0.4	0.5
20	9846.0	140	148	132	18	39	0.4	0.5
25	9848.95	140	148	132	18	40	0.4	0.5
30	9851.50	140	147	133	15	41	0.4	0.5
35	9854.20	144	148	133	15	42	0.4	0.5
40	9856.65	144	148	133	14	41	0.4	0.5
45	9859.80	140	147	134	14	43	0.4	0.5
50	9862.85	141	147	133	13	44	0.4	0.5
55	9865.80	140	147	135	13	44	0.4	0.5
60	9868.90	144	160	138	13	44	0.4	0.5

Start Time:	1114		
Finish Time:	1214		
Initial Leak Check:	4.02	Lpm @ 13	"Hg

DGMCF:	0.997
Sample Volume:	33.3
Average DGM Temp:	39.92
Average DGM Δ H:	0.415

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.:	2
Test location:	APC Outlet No. 1
Date:	SEPTEMBER 13, 2018
Project No.:	21880

Measuring Device	MII Number
Control Module	#3 A22010
Barometer	Environment Canada

Barometric Pressure:	29.95	"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	9962.20	137	140	137	21	43	0.5	0.5
5	9965.9	139	148	136	21	44	0.5	0.5
10	9969.75	142	150	134	21	46	0.5	0.5
15	9972.10	143	150	135	22	46	0.5	0.5
20	9974.90	140	150	134	22	47	0.5	0.5
25	9977.90	141	150	135	21	47	0.5	0.5
30	9980.60	142	150	132	21	48	0.5	0.5
35	9983.70	147	150	132	21	48	0.5	0.5
40	9986.20	143	150	133	22	49	0.5	0.5
45	9989.00	150	150	131	21	49	0.5	0.5
50	9991.90	150	150	131	21	50	0.5	0.5
55	9994.45	144	150	131	21	50	0.5	0.5
60	9997.30	141	149	130	22	50	0.5	0.5

Start Time:	1427	
Finish Time:	1537	
Initial Leak Check:	2.01	Lpm @ 17. "Hg

DGMCF:	0.992
Sample Volume:	35.1
Average DGM Temp:	47.46
Average DGM Δ H:	0.5

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:	SEPTEMBER 14, 2018
Project No.:	21880

Measuring Device	MII Number
Control Module	#3 0.997 AZ010
Barometer	Environment Canada

Barometric Pressure:	29.98	"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	165.6	138	140	134	21	40	0.5	0.5
5	169.1	139	140	134	21	41	0.5	0.5
10	172.0	141	141	134	21	41	0.5	0.5
15	175.9	141	141	132	21	42	0.5	0.5
20	178.0	141	141	131	21	42	0.5	0.5
25	180.85	142	141	130	20	43	0.5	0.5
30	183.80	142	141	130	21	43	0.5	0.5
35	186.85	144	143	130	20	43	0.5	0.5
40	189.70	142	141	127	20	46	0.5	0.5
45	192.60	145	141	131	20	45	0.5	0.5
50	195.60	142	141	128	21	45	0.5	0.5
55	198.35	144	143	128	20	46	0.5	0.5
60	201.30	142	141	127	21	46	0.5	0.5

Start Time:	1147	
Finish Time:	1247	
Initial Leak Check:	2.01	Lpm @ 21 "Hg

DGMCF:	0.997
Sample Volume:	37.5
Average DGM Temp:	43.62
Average DGM Δ H:	0.5

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:	SEPT 13 /18
Project No.:	21880

Measuring Device	MII Number
Control Module	M054994
Barometer	Environment Canada

Barometric Pressure:	29.94	"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	63.0	122	141	126	24	29	1.2	2
5	65.5	122	141	126	19	30	1.2	2
10	68.2	122	142	126	17	31	1.2	2
15	70.8	122	142	126	17	30	1.2	2
20	73.3	123	141	126	17	30	1.2	2
25	76.0	123	140	126	17	31	1.2	2
30	78.6	123	141	126	17	31	1.2	2
35	81.6	124	141	126	17	31	1.2	2
40	84.1	124	141	126	17	32	1.2	2
45	86.8	124	141	126	16	32	1.2	2
50	89.5	124	140	127	16	32	1.2	2
55	91.9	124	141	126	16	32	1.2	2
60	94.4	124	141	126	16	32	1.2	2

Start Time:	1531
Finish Time:	1631
Initial Leak Check:	<.01 Lpm @ 18 "Hg

DGMCF:	0.970
Sample Volume:	31.9
Average DGM Temp:	31
Average DGM Δ H:	1.2

Comments:

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

Operator: RM

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No.
Date:	SEPT 13/18
Project No.:	21880

Measuring Device	MII Number
Control Module	M054998
Barometer	Environment Canada

Barometric Pressure:	29.92	"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	49.498	127	142	121	27	30	1.2	2
5	51.9	121	142	127	17	31	1.2	2
10	54.5	123	142	127	17	32	1.2	2
15	56.9	123	142	126	17	32	1.2	2
20	58.5	123	141	127	17	32	1.2	2
25	60.0	123	141	127	17	32	1.2	2
30	62.3	123	141	127	17	32	1.2	2
35	64.9	123	141	127	17	32	1.2	2
40	67.5	123	141	127	17	32	1.2	2
45	70.1	124	142	127	16	32	1.2	2
50	72.6	124	142	126	16	32	1.2	2
55	75.2	124	142	126	16	32	1.2	2
60	77.9	125	142	126	16	32	1.2	

Start Time:	ST 1711		
Finish Time:	1811		
Initial Leak Check:	0.01	Lpm @ 6	"Hg

DGMCF:	0.970
Sample Volume:	28.42
Average DGM Temp:	32 31.8
Average DGM Δ H:	1.2

Comments:

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

Operator: RDH

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 2
Date:	SEPT 14/18
Project No.:	21880

Measuring Device	MII Number
Control Module	M05498
Barometer	Environment Canada

Barometric Pressure: 29.90 "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	27.3	128	141	145	24	24	1.2	2
5	30.2	123	142	126	20	25	1.2	2
10	32.9	123	141	126	19	25	1.2	2
15	35.3	124	141	124	19	26	1.2	2
20	38.0	123	141	129	19	26	1.2	2
25	40.5	123	141	127	19	27	1.2	2
30	43.0	123	141	126	19	27	1.2	2
35	45.5	123	141	127	19	27	1.2	2
40	47.0	123	141	127	19	27	1.2	2
45	49.5	123	141	125	19	28	1.2	2
50	452.0	123	141	125	19	28	1.2	2
55	55.1	123	141	125	19	28	1.2	2
60	57.4	123	141	125	19	28	1.2	2

Start Time:	832
Finish Time:	932
Initial Leak Check:	<0.01 Lpm @ 10 "Hg

DGMCF:	0.970
Sample Volume:	30.1
Average DGM Temp:	26.6
Average DGM Δ H:	1.2

Comments:

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

Operator: [signature]

APPENDIX 10

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

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

L2163580

Client: Covanta
Project Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21880 - J2521

	ORTECH Sample ID 18-21880-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
1	1	Sept 11, 18	#1 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
	2				Probe Rinse Nitric	0.1N Nitric	Metals
	3				Filter	Particulate	Particulate & Metals
	4				Impinger 1-5 Solution	Nitric/Peroxide	Metals
	5				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	6				Impinger 6-7 Rinse	8N HCl	Mercury
2	7	Sept 11, 18	#1 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
	8				Probe Rinse Nitric	0.1N Nitric	Metals
	9				Filter	Particulate	Particulate & Metals
	10				Impinger 1-5 Solution	Nitric/Peroxide	Metals
	11				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	12				Impinger 6-7 Rinse	8N HCl	Mercury
3	19	Sept 12, 18	Blank 1	Blank 1	Probe Rinse Acetone	Acetone	Particulate & Metals
	20				Probe Rinse Nitric	0.1N Nitric	Metals
	21				Filter	Particulate	Particulate & Metals
	22				Impinger 1-5 Solution	Nitric/Peroxide	Metals
	23				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	24				Impinger 6-7 Rinse	8N HCl	Mercury

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21880 - J2521

	ORTECH Sample ID 18-21880-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
4	25	Sept 12, 18	#2 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
	26				Probe Rinse Nitric	0.1N Nitric	Metals
	27				Filter	Particulate	Particulate & Metals
	28				Impinger 1-5 Solution	Nitric/Peroxide	Metals
	29				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	30				Impinger 6-7 Rinse	8N HCl	Mercury
5	31	Sept 12, 18	#2 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
	32				Probe Rinse Nitric	0.1N Nitric	Metals
	33				Filter	Particulate	Particulate & Metals
	34				Impinger 1-5 Solution	Nitric/Peroxide	Metals
	35				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	36				Impinger 6-7 Rinse	8N HCl	Mercury
6	43	Sept 12, 18	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 1-5 Solution	Nitric/Peroxide	Metals
	47				Impinger 6-7 Solution	Acid. KMnO4	Mercury
	48				Impinger 6-7 Rinse	8N HCl	Mercury

Relinquished By: [signature] [signature] Date: Sept 13, 18

ORTECH Environmental Sample Log

Particulate and Metals Samples

Covanta

Client: Covanta
Project Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21880 - J2521

ORTECH Sample ID 18-21880-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
13	Sept 13/18	#1 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
14				Probe Rinse Nitric	0.1N Nitric	Metals
15				Filter	Particulate	Particulate & Metals
16				Impinger 1-5 Solution	Nitric/Peroxide	Metals
17				Impinger 6-7 Solution	Acid. KMnO4	Mercury
18				Impinger 6-7 Rinse	8N HCl	Mercury
37	Sept 13/18	#2 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
38				Probe Rinse Nitric	0.1N Nitric	Metals
39				Filter	Particulate	Particulate & Metals
40				Impinger 1-5 Solution	Nitric/Peroxide	Metals
41				Impinger 6-7 Solution	Acid. KMnO4	Mercury
42				Impinger 6-7 Rinse	8N HCl	Mercury

Relinquished By: [signature] Date: Sept 17, 18

Relinquished To: L. Nova Date: Sept 17, 2018 9:4[illegible]

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
b/Report Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21880 - J2521

L2163600

ORTECH Sample ID 18-21880-M201A-		Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
	1	Sept 12, 18	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	5				Impinger Soln & rinse	Water	Particulate
	6				Secondary Filter	Filter	Particulate*
	7				Impinger Rinse	Acetone & Hexane	Particulate
6	8	Sept 12, 18	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	Sept 12, 18	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	Sept 11, 18	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	Sept 11, 18	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

Client: Covanta
b/Report Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21880 - 12521

ORTECH Sample ID 18-21880-M201A-		Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
26	36	Sept 11, 18	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
	40				Impinger Soln & rinse	Water	Particulate
30	41				Secondary Filter	Filter	Particulate*
	42				Impinger Rinse	Acetone & Hexane	Particulate
31	43	Sept 12, 18	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
	47				Impinger Soln & rinse	Water	Particulate
35	48				Secondary Filter	Filter	Particulate*
	49				Impinger Rinse	Acetone & Hexane	Particulate
36	50	Sept 12, 18	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
	54				Impinger Soln & rinse	Water	Particulate
40	55				Secondary Filter	Filter	Particulate*
	56				Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

Relinquished To: [signature] Date: 13-Sept-18 10:4

Relinquished By: [signature] Date: Sept 13, 18

Received by
Aaron Burton
13-Sept-2018
12:25
17.6°

ORTECH Environmental Sample Log

Acid Gases

Covanta

Client: Covanta
Job/Report Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO #: 21880-J2521

L2163592

ORTECH Sample ID 18-21880-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Final Volume(ml)	Sample Analysis
1	Sept 11, 18	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	533	HCl, HF & Ammonia
2	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	501	HCl, HF & Ammonia
3		APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	525	HCl, HF & Ammonia
4	Sept 12, 18	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	532	HCl, HF & Ammonia
5		APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	478	HCl, HF & Ammonia
6		APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	471	HCl, HF & Ammonia
Blank 1	↓	APC # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	479	HCl, HF & Ammonia
Blank 2		APC # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	475	HCl, HF & Ammonia

Analyze for HCl, HF and Ammonia

Relinquished By: [signature] Date: Sept 13, 18

Relinquished To: [signature] Date: 13 Sept. 18 10:45

Received by
Aaron Burton
13-Sept-2018
12:25
17.8°C

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21880 - J2521

ORTECH Sample ID 18 - 21880 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
21	Sept 13/18	Test 1 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
22		Test 1 Filter		Particulate	SVOC
23		Test 1 XAD-II Trap		N.A.	SVOC
24		Test 1 Impinger Solution		Ethylene Glycol	SVOC
25		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
26	Sept 13/18	Test 2 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
27		Test 2 Filter		Particulate	SVOC
28		Test 2 XAD-II Trap		N.A.	SVOC
29		Test 2 Impinger Solution		Ethylene Glycol	SVOC
30		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
31	Sept 14/18	Test 3 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
32		Test 3 Filter		Particulate	SVOC
33		Test 3 XAD-II Trap		N.A.	SVOC
34		Test 3 Impinger Solution		Ethylene Glycol	SVOC
35		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
36	Sept 14/18	Blank 2 Probe Rinse	Blank	Hexane/Acetone	SVOC
37		Blank 2 Filter		Particulate	SVOC
38		Blank 2 XAD-II Trap		N.A.	SVOC
39		Blank 2 Impinger Solution		Ethylene Glycol	SVOC
40		Blank 2 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated August 20, 2018 for lists of analytes.

Relinquished To: L. Arora Date: Sept 17, 2018

Relinquished By: [signature] Date: Sept 17, 18

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21880 - J2521

ORTECH Sample ID 18 - 21880 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1	Sept 13/18	Test 1 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
2		Test 1 Filter		Particulate	SVOC
3		Test 1 XAD-II Trap		N.A.	SVOC
4		Test 1 Impinger Solution		Ethylene Glycol	SVOC
5		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
6	Sept 13/18	Test 2 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
7		Test 2 Filter		Particulate	SVOC
8		Test 2 XAD-II Trap		N.A.	SVOC
9		Test 2 Impinger Solution		Ethylene Glycol	SVOC
10		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
11	Sept 14/18	Test 3 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
12		Test 3 Filter		Particulate	SVOC
13		Test 3 XAD-II Trap		N.A.	SVOC
14		Test 3 Impinger Solution		Ethylene Glycol	SVOC
15		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
16	Sept 14/18	Blank 1 Probe Rinse	Blank	Hexane/Acetone	SVOC
17		Blank 1 Filter		Particulate	SVOC
18		Blank 1 XAD-II Trap		N.A.	SVOC
19		Blank 1 Impinger Solution		Ethylene Glycol	SVOC
20		Blank 1 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated August 20, 2018 for lists of analytes.

Relinquished To: L. Strona Date: Sept 17, 2018

Relinquished By: Date: Sept 17, 18

ORTECH Sample Log
VOCs

Client: Covanta
Project Number: 21880
Received By:
Job Assigned To: ALS
Quote / PO : ORTECH PO: 21880 - J2521

Test Location	Test Number	Pair Number	ORTECH Sample ID 18-21880-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet	1	1	1a,1b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	2a, 2b		Tenax and Tenax/Charcoal	VOCs
		3	3a,3b		Tenax and Tenax/Charcoal	VOCs
		4	4a,4b		Tenax and Tenax/Charcoal	archive
	2	1	5a,5b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	6a,6b		Tenax and Tenax/Charcoal	VOCs
		3	7a,7b		Tenax and Tenax/Charcoal	VOCs
		4	8a,8b		Tenax and Tenax/Charcoal	archive
		Field Blank	9a,9b		Tenax and Tenax/Charcoal	VOCs
	3	1	10a,10b	14-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	11a,11b		Tenax and Tenax/Charcoal	VOCs
		3	12a,12b		Tenax and Tenax/Charcoal	VOCs
		4	13a,13b		Tenax and Tenax/Charcoal	archive
		Trip Blank			Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	
# 2 APC Outlet	1	1	16a,16b ✓	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	17a,17b ✓		Tenax and Tenax/Charcoal	VOCs
		3	18a,18b ✓		Tenax and Tenax/Charcoal	VOCs
		4	~~19a,19b~~ 20A, 20B		Tenax and Tenax/Charcoal	archive
		Field Blank	~~30a,30b~~ 19A, 19B		Tenax and Tenax/Charcoal	VOCs
				13-Sep-18		
	2	1	~~20a,20b~~ 21		Tenax and Tenax/Charcoal	VOCs
		2	~~21a,21b~~ 22		Tenax and Tenax/Charcoal	VOCs
		3	~~22a,22b~~ 23		Tenax and Tenax/Charcoal	VOCs
		4	~~23a,23b~~ 24		Tenax and Tenax/Charcoal	archive
	3	1	~~24a,24b~~ 25	14-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	~~25a,25b~~ 26		Tenax and Tenax/Charcoal	VOCs
		3	~~26a,26b~~ 27		Tenax and Tenax/Charcoal	~~archive~~
		4	~~27a,27b~~ ~~28~~ 29		Tenax and Tenax/Charcoal	~~VOCs~~ archive
		Field Blank	~~29a,29b~~ 30		Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	

Refer to letter dated August 20, 2018 for lists of analytes.

Custody Relinquished by: [signature] Date: Sept 17, 18

L. Nova Sept 17, 2018 9:4

ORTECH Sample Log
VOCs

Client: Covanta
Project Number: 21880
Received By:
Job Assigned To: ALS
Quote / PO : ORTECH PO: 21880 - J2521

Test Location	Test Number	Pair Number	ORTECH Sample ID 18-21880-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet	1	1	1a,1b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	2a, 2b		Tenax and Tenax/Charcoal	VOCs
		3	3a,3b		Tenax and Tenax/Charcoal	VOCs
		4	4a,4b		Tenax and Tenax/Charcoal	archive
	2	1	5a,5b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	6a,6b		Tenax and Tenax/Charcoal	VOCs
		3	7a,7b		Tenax and Tenax/Charcoal	VOCs
		4	8a,8b		Tenax and Tenax/Charcoal	archive
		Field Blank	9a,9b		Tenax and Tenax/Charcoal	VOCs
	3	1	10a,10b	14-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	11a,11b		Tenax and Tenax/Charcoal	VOCs
		3	12a,12b		Tenax and Tenax/Charcoal	VOCs
		4	13a,13b		Tenax and Tenax/Charcoal	archive
		Trip Blank			Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	
# 2 APC Outlet	1	1	16a,16b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	17a,17b		Tenax and Tenax/Charcoal	VOCs
		3	18a,18b		Tenax and Tenax/Charcoal	VOCs
		4	20a,20b		Tenax and Tenax/Charcoal	archive
		Field Blank	19a,19b		Tenax and Tenax/Charcoal	VOCs
	2	1	21a,21b	13-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	22a,22b		Tenax and Tenax/Charcoal	VOCs
		3	23a,23b		Tenax and Tenax/Charcoal	VOCs
		4	24a,24b		Tenax and Tenax/Charcoal	archive
	3	1	25a,25b	14-Sep-18	Tenax and Tenax/Charcoal	VOCs
		2	26a,26b		Tenax and Tenax/Charcoal	VOCs
		3	27a,27b		Tenax and Tenax/Charcoal	VOCs
		4	29a,29b		Tenax and Tenax/Charcoal	archive
		Field Blank	30a,30b		Tenax and Tenax/Charcoal	VOCs
	Combined Condesate				Archived @ ORTECH	

Refer to letter dated August 20, 2018 for lists of analytes.

Custody Relinquished by: Date:

ORTECH Sample Log
Method 430 Samples
Covanta

Client: Covanta
Project Number: 21880
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/P.O.: Ortech P.O. : 21880 - J2521

Test Location	Test Number	ORTECH Sample ID 18-21880-M430-	Sample Date	Sample Media
#1 APC Outlet	1	1	September 13, 2018	DNPH & Toluene
	2	2	September 13, 2018	DNPH & Toluene
	3	3	September 14, 2018	DNPH & Toluene
	Blank 1	Blank 1	September 14, 2018	DNPH & Toluene
#2 APC Outlet	1	4	September 13, 2018	DNPH & Toluene
	2	5	September 13, 2018	DNPH & Toluene
	3	6	September 14, 2018	DNPH & Toluene
	Blank 2	Blank 2	September 14, 2018	DNPH & Toluene
	Trip Spike			

Analyse for: **Formaldehyde**
Acetaldehyde
Acrolein

Relinquished To: L. Strona Date: Sept 17, 2018 9:45

Relinquished By: [signature] Date: Sept 17/18

APPENDIX 11

Particulate and Metals Train Recovery Data Sheets
(8 pages)

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Date:	Sept 11, 18
Test No.:	1
Test Location:	Unit 1

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	232.6
After Act. Rinse:	359.7
Total TS1:	77.1

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.4
After 0.1N HNO_3 Rinse:	481.0
Total TS2:	198.6

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 18 GF -8

CONTAINER TS3

Initial Wt:	.7490
Final Wt:	
Gain:	
Colour:	White

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty		
Empty Wt:	605.4	
Final Wt:	844.5	
1 Gain:	239.1	
Colour:	clear	

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	689.5
Initial Wt:	786.9
Final Wt:	1001.1
2 Gain:	214.2
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	566.3
Initial Wt:	685.4
Final Wt:	852.6
3 Gain:	167.2
Colour:	clear

Impinger #4 Empty	
Empty Wt:	613.9
Final Wt:	621.3
4 Gain:	7.4
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.8
w/ Imp. 1-4 Soln:	1369.7
Imp. 1 to 4 Volume:	942.9
After HNO_3 Rinse:	1392.6
Total TS4:	965.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	665.8
Initial Wt:	783.1
Final Wt:	794.4
5 Gain:	11.3
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	671.5
Initial Wt:	779.1
Final Wt:	787.4
6 Gain:	8.3
Colour:	Purple

CWTR = 1 to 6: 677.5 ✓

WCBDA= 7: 33.7

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	427.1
With Imp. 5&6 Soln:	669.9
Imp. 5&6 Volume:	242.8
After $KMnO_4$ Rinse:	780.0
After100g H_2O Rinse:	876.6
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:	430.4
After HCl Rinse:	469.9
After DI H_2O Rinse:	588.9
Total TS5-B:	305.8

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	954.3
Final Wt:	988.0
7 Gain:	33.7

Impinger Box ID: 14

SAMPLE IDENTIFICATION	18-21880-PM-
TS1 (Probe Rinse-Acetone)	1
TS2 (Probe Rinse-0.1N HNO_3)	2
TS3 (Filter)	3
TS4 (Impinger 1-4 Sol'n-HNO_3)	4
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	5
TS5-B (Impinger 5,6 Rinse-HCl)	6

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	Sept 11, 18

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Date:	SEPT 11, 18
Test No.:	2
Test Location:	UNIT 1

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.9
After Act. Rinse:	422.5
Total TS1:	139.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.7
After 0.1N HNO_3 Rinse:	426.0
Total TS2:	144.3

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 18-QF-7

CONTAINER TS3

Initial Wt:	.7481
Final Wt:	
Gain:	
Colour:	

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	618.0
Final Wt:	891.8
1 Gain:	273.8 ~~-73.8~~
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	587.0
Initial Wt:	686.3
Final Wt:	923.1
2 Gain:	236.8
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	670.1
Initial Wt:	777.3
Final Wt:	893.6
3 Gain:	116.3
Colour:	clear

Impinger #4 Empty	
Empty Wt:	619.2
Final Wt:	626.0
4 Gain:	6.8
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.6
w/ Imp. 1-4 Soln:	1270.9
Imp. 1 to 4 Volume:	943.3
After HNO_3 Rinse:	1398.6
Total TS4:	971.0

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	670.2
Initial Wt:	784.4
Final Wt:	798.5
5 Gain:	13.6
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	648.6
Initial Wt:	760.9
Final Wt:	770.3
6 Gain:	9.4
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.2
With Imp. 5&6 Soln:	669.1
Imp. 5&6 Volume:	113.1
After $KMnO_4$ Rinse:	782.2
After100g H_2O Rinse:	877.8
Total TS5-A:	

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	~~280.3~~ 282.3
With 150 mL DI H_2O:	429.4
After HCl Rinse:	464.3
After DI H_2O Rinse:	604.0
Total TS5-B:	321.7

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	986.8
Final Wt:	1018.3
7 Gain:	31.5

Impinger Box ID: 3

SAMPLE IDENTIFICATION	18-21880-PM-
TS1 (Probe Rinse-Acetone)	7
TS2 (Probe Rinse-0.1N HNO_3)	8
TS3 (Filter)	9
TS4 (Impinger 1-4 Sol'n-HNO_3)	10
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	11
TS5-B (Impinger 5,6 Rinse-HCl)	12

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:	~~SEPT~~ 11, 18

CWTR = 1 to 6:	~~656.7~~ 656.7 ✓
WCBDA= 7:	31.5

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 13, 18
Test No.: 3
Test Location: UNIT #7

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	382.6
After Act. Rinse:	395.0
Total TS1:	112.4

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.6
After 0.1N HNO_3 Rinse:	425.4
Total TS2:	142.8

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: #6 18 OF - 115

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	606.1
Final Wt:	837.6
1 Gain:	231.5
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	689.4
Initial Wt:	802.1
Final Wt:	981.7
2 Gain:	179.6
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	565.9
Initial Wt:	669.0
Final Wt:	858.7
3 Gain:	189.7
Colour:	clear

Impinger #4 Empty	
Empty Wt:	614.4
Final Wt:	623.8
4 Gain:	9.4
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	729.0
w/ Imp. 1-4 Soln:	1303.4
Imp. 1 to 4 Volume:	574.4
After HNO_3 Rinse:	1402.0
Total TS4:	972.0

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	662.9
Initial Wt:	765.5
Final Wt:	766.9
5 Gain:	1.4
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	670.6
Initial Wt:	794.3
Final Wt:	798.6
6 Gain:	4.3
Colour:	Purple

CWTR = 1 to 6: 664.9 ✓

WCBDA= 7: 28.3

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	429.4
With Imp. 5&6 Soln:	656.7
Imp. 5&6 Volume:	227.3
After $KMnO_4$ Rinse:	765.0
After100g H_2O Rinse:	863.7
Total TS5-A:	434.3

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.8
With 150 mL DI H_2O:	434.0
After HCl Rinse:	480.4
After DI H_2O Rinse:	578.2
Total TS5-B:	294.4

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	934.0
Final Wt:	962.3
7 Gain:	28.3

Impinger Box ID: 14

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21880-PM-
TS1 (Probe Rinse-Acetone)	13
TS2 (Probe Rinse-0.1N HNO_3)	14
TS3 (Filter)	15
TS4 (Impinger 1-4 Sol'n-HNO_3)	16
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	17
TS5-B (Impinger 5,6 Rinse-HCl)	18

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 13, 18

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 12/13
Test No.:
Test Location: BLANK

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	287.6
After Act. Rinse:	931.2
Total TS1:	1144.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	286.6
After 0.1N HNO_3 Rinse:	571.8
Total TS2:	285.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: #7 18AE16

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Empty	
Empty Wt:	
Final Wt:	
4 Gain:	
Colour:	

CONTAINER TS4 WEIGHTS	
Empty Wt:	424.8
w/ Imp. 1-4 Soln:	686.5
Imp. 1 to 4 Volume:	211.7
After HNO_3 Rinse:	769.7
Total TS4:	344.9

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:	424.2
With Imp. 5&6 Soln:	646.2
Imp. 5&6 Volume:	222
After $KMnO_4$ Rinse:	761.0
After100g H_2O Rinse:	867.2
Total TS5-A:	443.0

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.7
With 150 mL DI H_2O:	433.0
After HCl Rinse:	483.0
After DI H_2O Rinse:	600.8
Total TS5-B:	318.1

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
7 Gain:	

Impinger Box ID:

SAMPLE IDENTIFICATION	18-21880-PM-
TS1 (Probe Rinse-Acetone)	19
TS2 (Probe Rinse-0.1N HNO_3)	20
TS3 (Filter)	21
TS4 (Impinger 1-4 Sol'n-HNO_3)	22
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	23
TS5-B (Impinger 5,6 Rinse-HCl)	24

Train Loaded By: BT
Train Recovered By: BL
Recovery Witnessed By:
Date: Sept 12/13

CWTR = 1 to 6:

WCBDA= 7:

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Date:	SEPT 12, 18
Test No.:	1
Test Location:	UNIT 2

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.6
After Act. Rinse:	457.7
Total TS1:	775.1

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.1
After 0.1N HNO_3 Rinse:	452.8
Total TS2:	170.7

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 57

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	606.1
Final Wt:	889.5
1 Gain:	283.4
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	689.4
Initial Wt:	794.7
Final Wt:	984.4
2 Gain:	189.7
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	665.9
Initial Wt:	671.7
Final Wt:	750.2
3 Gain:	78.5
Colour:	clear

Impinger #4 Empty	
Empty Wt:	614.4
Final Wt:	616.6
4 Gain:	2.2
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	425.3
w/ Imp. 1-4 Soln:	1189.3
Imp. 1 to 4 Volume:	764.0
After HNO_3 Rinse:	1404.8
Total TS4:	979.5

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	663.9
Initial Wt:	792.6
Final Wt:	794.5
5 Gain:	1.9
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	670.6
Initial Wt:	773.9
Final Wt:	777.5
6 Gain:	3.6
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.3
With Imp. 5&6 Soln:	657.1
Imp. 5&6 Volume:	230.8
After $KMnO_4$ Rinse:	774.7
After100g H_2O Rinse:	872.4
Total TS5-A:	446.1

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	282.5
With 150 mL DI H_2O:	429.1
After HCl Rinse:	467.7
After DI H_2O Rinse:	603.9
Total TS5-B:	321.4

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	906.9
Final Wt:	934.0
7 Gain:	27.1

Impinger Box ID: 14

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21880-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

Train Loaded By:	DT
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	SEPT 12/18

CWTR = 1 to 6:	559.3 ✓
WCBDA= 7:	27.1

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 24/18
Test No.: 2
Test Location: UNIT 2

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	332.6
After Act. Rinse:	364.5
Total TS1:	31.9

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.6
After 0.1N HNO_3 Rinse:	485.6
Total TS2:	203.0

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter
Filter ID: 4

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	618.3
Final Wt:	922.8
1 Gain:	304.5
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	583.2
Initial Wt:	695.7
Final Wt:	917.9
2 Gain:	222.2
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	669.3
Initial Wt:	769.1
Final Wt:	874.3
3 Gain:	105.3
Colour:	clear

Impinger #4 Empty	
Empty Wt:	619.2
Final Wt:	623.0
4 Gain:	3.8
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	422.3
w/ Imp. 1-4 Soln:	1268.1
Imp. 1 to 4 Volume:	845.8
After HNO_3 Rinse:	1385.0
Total TS4:	963.7

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	650.6
Initial Wt:	766.9
Final Wt:	768.6
5 Gain:	1.7
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	672.5
Initial Wt:	781.8
Final Wt:	783.5
6 Gain:	1.7
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	431.5
With Imp. 5&6 Soln:	658.1
Imp. 5&6 Volume:	226.6
After $KMnO_4$ Rinse:	774.7
After100g H_2O Rinse:	872.8
Total TS5-A:	441.3

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	292.1
With 150 mL DI H_2O:	443.1
After HCl Rinse:	476.2
After DI H_2O Rinse:	593.7
Total TS5-B:	301.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	979.2
Final Wt:	1009.6
7 Gain:	30.4

Impinger Box ID: 3

SAMPLE IDENTIFICATION	18-21880-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

Train Loaded By: BT/AS
Train Recovered By: BT
Recovery Witnessed By:
Date: Sept 24/18

CWTR = 1 to 6: 639.8 ✓

WCBDA= 7: 30.4

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 13, 18
Test No.: 3
Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3, and 4	Impinger 5 & 6	Impinger 5 & 6	Impinger 7
CONTAINER TS1	Filter ID: #9	CONTAINER TS4		CONTAINER TS5-A & TS5-B	

Container TS1 Weights

Empty Wt:	283.0
After Act. Rinse:	470.7
Total TS1:	187.7

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights

Empty Wt:	283.1
After 0.1N HNO_3 Rinse:	553.3
Total TS2:	270.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impinger #1 Empty

Empty Wt:	618.0
Final Wt:	924.9
1 Gain:	306.9
Colour:	clear

Impinger #2 HNO_3/H_2O_2

Empty Wt:	583.4
Initial Wt:	686.9
Final Wt:	886.5
2 Gain:	199.6
Colour:	clear

Impinger #3 HNO_3/H_2O_2

Empty Wt:	669.4
Initial Wt:	776.5
Final Wt:	874.6
3 Gain:	98.1
Colour:	Clear

Impinger #4 Empty

Empty Wt:	619.4
Final Wt:	624.4
4 Gain:	5.0
Colour:	clear

CONTAINER TS4 WEIGHTS

Empty Wt:	429.4
w/ Imp. 1-4 Soln:	1241.9
Imp. 1 to 4 Volume:	812.5
After HNO_3 Rinse:	1350.4
Total TS4:	921.0

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger #5 $KMnO_4/H_2SO_4$

Empty Wt:	650.0
Initial Wt:	751.3
Final Wt:	755.8
5 Gain:	4.5
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$

Empty Wt:	672.0
Initial Wt:	795.1
Final Wt:	797.1
6 Gain:	2
Colour:	Purple

CONTAINER TS5-A

Empty Wt:	430.5
With Imp. 5&6 Soln:	658.5
Imp. 5&6 Volume:	228.0
After $KMnO_4$ Rinse:	766.6
After100g H_2O Rinse:	863.8
Total TS5-A:	433.3

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B

Empty Wt:	283.2
With 150 mL DI H_2O:	433.2
After HCl Rinse:	483.2
After DI H_2O Rinse:	615.7
Total TS5-B:	332.5

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger #7 Silica Gel

Initial Wt:	977.0
Final Wt:	1006.1
7 Gain:	29.1

Impinger Box ID: 3

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21880-PM-
TS1 (Probe Rinse-Acetone)	37
TS2 (Probe Rinse-0.1N HNO_3)	38
TS3 (Filter)	39
TS4 (Impinger 1-4 Sol'n-HNO_3)	40
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	41
TS5-B (Impinger 5,6 Rinse-HCl)	42

Train Loaded By:
Train Recovered By:
Recovery Witnessed By:
Date: Sept 13, 18

CWTR = 1 to 6: 816.1 ✓

WCBDA= 7: 29.1

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 12, 18
Test No.:
Test Location: BLANKS

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

Filter

Filter ID: #3 18 QF-17

Impingers 1, 2, 3, and 4

Impinger 5 & 6

Impinger 5 & 6

Impinger 7

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	283.3
After Act. Rinse:	549.7
Total TS1:	266.4

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	283.5
After 0.1N HNO_3 Rinse:	533.8
Total TS2:	250.3

MARK FLUID LEVEL

SEAL AND LABEL TS2

CONTAINER TS3

Initial Wt:	
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

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:	

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:	

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	423.7
With Imp. 5&6 Soln:	646.4
Imp. 5&6 Volume:	222.7
After $KMnO_4$ Rinse:	759.3
After100g H_2O Rinse:	857.0
Total TS5-A:	433.3

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.5
With 150 mL DI H_2O:	430.2
After HCl Rinse:	476.6
After DI H_2O Rinse:	585.1
Total TS5-B:	301.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
7 Gain:	

Impinger Box ID:

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	18-21880-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

CONTAINER TS4 WEIGHTS

Empty Wt:	476.4
w/ Imp. 1-4 Soln:	639.8
Imp. 1 to 4 Volume:	213.4
After HNO_3 Rinse:	740.7
Total TS4:	314.3

MARK FLUID LEVEL

SEAL AND LABEL TS4

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: SEPT 12/18

CWTR = 1 to 6:

WCBDA= 7:

ORTECH Enivronmental

APPENDIX 12

Inorganics Analytical Reports
(38 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#:	L2163580		Mississauga, ON L5J 2Y4
Date of Report	20-Sep-18		Canada
Date of Sample Receipt	13-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 COVANTA

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 20-Sep-18)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1		18-21880-PM-(7 THRU 12) #1 APC OUTLET TEST#2		18-21880-PM-(19 THRU 24) BLANK #1		18-21880-PM-(25 THRU 30) #2 APC OUTLET TEST#1		18-21880-PM-(31 THRU 36) #2 APC OUTLET TEST#2
ALS Sample ID		L2163580-1		L2163580-2		L2163580-3		L2163580-4		L2163580-5
Matrix		Stack		Stack		Stack		Stack		Stack
Analysis type		Sample		Sample		Sample		Sample		Sample
Sampling Date/Time		11-Sep-18		11-Sep-18		12-Sep-18		12-Sep-18		12-Sep-18
Date of Receipt		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18
PM via Gravimetric Analysis	**LOR**									
Method 5	**mg**	**mg**		**mg**		**mg**		**mg**		**mg**
Filter Particulate Matter	0.8	<0.1		0.4	J	0.8		0.2	J	<0.1
Acetone Particulate Matter	0.4	1.2		2.9		0.3	J	2.3		1.5
	g	**g**		**g**		**g**		**g**		**g**
Acetone Mass	0.02	76.1		139		244		173		81.1

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-PM-(43 THRU 48) BLANK#2		MB	
ALS Sample ID	L2163580-6		L2163580-MB	
Matrix	Stack		n/a	
Analysis type	Sample		Sample	
Sampling Date/Time	12-Sep-18		n/a	
Date of Receipt	13-Sep-18		n/a	
PM via Gravimetric Analysis Method 5	**LOR**			
	mg	**mg**		**mg**	
Filter Particulate Matter	0.8	0.3	J	<0.1	
Acetone Particulate Matter	0.4	0.3	J	0.1	J
	g	**g**		**g**	
Acetone Mass	0.02	266		32.0	

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#:	L2165276		Mississauga, ON L5J 2Y4
Date of Report	26-Sep-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 25-Sep-18)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3		18-21880-PM-(37 THRU 42) #2 APC OUTLET TEST#3		MB	
ALS Sample ID		L2165276-1		L2165276-2		L2165276-MB	
Matrix		Stack		Stack		n/a	
Analysis type		Sample		Sample		Sample	
Sampling Date/Time		13-Sep-18		13-Sep-18		n/a	
Date of Receipt		17-Sep-18		17-Sep-18		n/a	
PM via Gravimetric Analysis Method 5	**LOR**						
	mg	**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	0.4	J	<0.1		0.5	J
Acetone Particulate Matter	0.4	0.8		1.2		<0.1	
	g	**g**		**g**		**g**	
Acetone Mass	0.02	111		186		31.6	

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#:	L2163600		Mississauga, ON L5J 2Y4
Date of Report	27-Sep-18		Canada
Date of Sample Receipt	13-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 201A (SR 21-Sep-18)
Sample Particulate Analysis via Gravimetric USEPA Method 202 (SR 26-Sep-18)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-1 #1 APC OUTLET TEST#1		18-21880-M201A-2 #1 APC OUTLET TEST#1		18-21880-M201A-3 #1 APC OUTLET TEST#1	18-21880-M201A-4 #1 APC OUTLET TEST#1	18-21880-M201A-(5-7) #1 APC OUTLET TEST#1
ALS Sample ID		L2163600-1		L2163600-2		L2163600-3	L2163600-4	L2163600-5
Matrix		Stack		Stack		Stack	Stack	Stack
Analysis type		Sample		Sample		Sample	Sample	Sample
Sampling Date/Time		12-Sep-18		12-Sep-18		12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt		13-Sep-18		13-Sep-18		13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**							
	mg	**mg**		**mg**		**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-		-		-	<0.1	-
Acetone Particulate Matter	0.4	0.5		0.3	J	0.5	-	-
	g	**g**		**g**		**g**	**g**	**g**
Acetone Mass	0.02	39.4		25.5		6.8	-	-
PM via Gravimetric Analysis Method 202	**LOR**							
	mg	**mg**		**mg**		**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-		-		-	-	2.7
Non-Extractale Condensable Particulates	0.4	-		-		-	-	3.4
	g	**g**		**g**		**g**	**g**	**g**
Water Mass	0.02	-		-		-	-	151

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-8 #1 APC OUTLET TEST#2	18-21880-M201A-9 #1 APC OUTLET TEST#2	18-21880-M201A-10 #1 APC OUTLET TEST#2	18-21880-M201A-11 #1 APC OUTLET TEST#2	18-21880-M201A-(12-14) #1 APC OUTLET TEST#2
ALS Sample ID		L2163600-6	L2163600-7	L2163600-8	L2163600-9	L2163600-10
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		12-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.6	0.3 J	3.8	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	41.4	38.1	13.6	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	2.8
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.3
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	266

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-15 #1 APC OUTLET TEST#3	18-21880-M201A-16 #1 APC OUTLET TEST#3	18-21880-M201A-17 #1 APC OUTLET TEST#3		18-21880-M201A-18 #1 APC OUTLET TEST#3	18-21880-M201A-(19-21) #1 APC OUTLET TEST#3
ALS Sample ID		L2163600-11	L2163600-12	L2163600-13		L2163600-14	L2163600-15
Matrix		Stack	Stack	Stack		Stack	Stack
Analysis type		Sample	Sample	Sample		Sample	Sample
Sampling Date/Time		12-Sep-18	12-Sep-18	12-Sep-18		12-Sep-18	12-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18		13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**						
	mg	**mg**	**mg**	**mg**		**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-		<0.1	-
Acetone Particulate Matter	0.4	0.4	0.4	0.2	J	-	-
	g	**g**	**g**	**g**		**g**	**g**
Acetone Mass	0.02	33.4	17.5	12.7		-	-
PM via Gravimetric Analysis Method 202	**LOR**						
	mg	**mg**	**mg**	**mg**		**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-		-	2.1
Non-Extractale Condensable Particulates	0.4	-	-	-		-	3.7
	g	**g**	**g**	**g**		**g**	**g**
Water Mass	0.02	-	-	-		-	178

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-22 #2 APC OUTLET TEST#1	18-21880-M201A-23 #2 APC OUTLET TEST#1	18-21880-M201A-24 #2 APC OUTLET TEST#1	18-21880-M201A-25 #2 APC OUTLET TEST#1	18-21880-M201A-(26-28) #2 APC OUTLET TEST#1
ALS Sample ID		L2163600-16	L2163600-17	L2163600-18	L2163600-19	L2163600-20
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.2 J	-
Acetone Particulate Matter	0.4	0.6	0.5	0.2 J	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	38.0	38.5	11.7	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.7
Non-Extractale Condensable Particulates	0.4	-	-	-	-	4.1
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	244

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-29 #2 APC OUTLET TEST#2	18-21880-M201A-30 #2 APC OUTLET TEST#2	18-21880-M201A-31 #2 APC OUTLET TEST#2	18-21880-M201A-32 #2 APC OUTLET TEST#2	18-21880-M201A-(33-35) #2 APC OUTLET TEST#2
ALS Sample ID		L2163600-21	L2163600-22	L2163600-23	L2163600-24	L2163600-25
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	LOR					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.9	0.8	0.5	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	57.8	39.1	10.2	-	-
PM via Gravimetric Analysis Method 202	LOR					
	mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	2.3
Non-Extractale Condensable Particulates	0.4	-	-	-	-	4.1
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	274

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-36 #2 APC OUTLET TEST#3	18-21880-M201A-37 #2 APC OUTLET TEST#3	18-21880-M201A-38 #2 APC OUTLET TEST#3	18-21880-M201A-39 #2 APC OUTLET TEST#3	18-21880-M201A-(40-42) #2 APC OUTLET TEST#3
ALS Sample ID		L2163600-26	L2163600-27	L2163600-28	L2163600-29	L2163600-30
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.8	0.8	0.4	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	73.1	29.7	12.9	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	2.0
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.3
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	302

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-43 #1 APC OUTLET BLANK		18-21880-M201A-44 #1 APC OUTLET BLANK		18-21880-M201A-45 #1 APC OUTLET BLANK		18-21880-M201A-46 #1 APC OUTLET BLANK		18-21880-M201A-(47-49) #1 APC OUTLET BLANK	
ALS Sample ID		L2163600-31		L2163600-32		L2163600-33		L2163600-34		L2163600-35	
Matrix		Stack		Stack		Stack		Stack		Stack	
Analysis type		Sample		Sample		Sample		Sample		Sample	
Sampling Date/Time		12-Sep-18		12-Sep-18		12-Sep-18		12-Sep-18		12-Sep-18	
Date of Receipt		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18	
PM via Gravimetric Analysis Method 201A	LOR										
	mg	mg		mg		mg		mg		mg	
Filter Particulate Matter	0.8	-		-		-		0.3	J	-	
Acetone Particulate Matter	0.4	0.3	J	<0.1		0.1	J	-		-	
	g	g		g		g		g		g	
Acetone Mass	0.02	23.2		19.8		22.0		-		-	
PM via Gravimetric Analysis Method 202	LOR										
	mg	mg		mg		mg		mg		mg	
Extractable Condensable Particulates	0.4	-		-		-		-		1.3	
Non-Extractale Condensable Particulates	0.4	-		-		-		-		1.3	
	g	g		g		g		g		g	
Water Mass	0.02	-		-		-		-		139	

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-M201A-50 #2 APC OUTLET BLANK	18-21880-M201A-51 #2 APC OUTLET BLANK	18-21880-M201A-52 #2 APC OUTLET BLANK	18-21880-M201A-53 #2 APC OUTLET BLANK	18-21880-M201A-(54-56) #2 APC OUTLET BLANK
ALS Sample ID		L2163600-36	L2163600-37	L2163600-38	L2163600-39	L2163600-40
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		12-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	0.3 J	-
Acetone Particulate Matter	0.4	0.2 J	0.4	0.1 J	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	15.6	15.5	16.2	-	-
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.6
Non-Extractale Condensable Particulates	0.4	-	-	-	-	1.3
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	195

ALS Environmental

Sample Analysis Summary Report

Sample Name		MB	
ALS Sample ID		L2163600-MB	
Matrix		n/a	
Analysis type		Sample	
Sampling Date/Time		n/a	
Date of Receipt		n/a	
PM via Gravimetric Analysis Method 201A	**LOR**		
	mg	**mg**	
Filter Particulate Matter	0.8	0.9	
Acetone Particulate Matter	0.4	0.9	
	g	**g**	
Acetone Mass	0.02	31.4	
PM via Gravimetric Analysis Method 202	**LOR**		
	mg	**mg**	
Extractable Condensable Particulates	0.4	0.1	J
Non-Extractale Condensable Particulates	0.4	1.0	
	g	**g**	
Water Mass	0.02	180	

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#:	L2163592		Mississauga, ON L5J 2Y4
Date of Report	21-Sep-18		(905)822-4120
Date of Sample Receipt	13-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Cl as HCl Anion Analysed via Ion Chromatography USEPA Method 26A (FE 20-Sep-2018)
F as HF Anion Analysed via Ion Chromatography USEPA Method 26A
Ammonia, Total (as NH_3) via Ion Chromatography USEPA Method CTM-027

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	18-21880-M26A-1 APC OUTLET #1	18-21880-M26A-2 APC OUTLET #1	18-21880-M26A-3 APC OUTLET #1	18-21880-M26A-4 APC OUTLET #2	18-21880-M26A-5 APC OUTLET #2
ALS Sample ID	L2163592-1	L2163592-2	L2163592-3	L2163592-4	L2163592-5
Matrix	Stack	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample	Sample
Sampling Date/Time	11-Sep-18	11-Sep-18	11-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.193	<0.182	<0.191	<0.193	<0.175
Analysis 1	<0.193	<0.182	<0.191	<0.193	<0.175
Analysis 2	<0.193	<0.182	<0.191	<0.193	<0.175
Total Cl^- as HCl (ave)	10.4	10.5	10.9	4.18	4.25
Analysis 1	10.4	10.5	10.9	4.27	4.26
Analysis 2	10.4	10.5	10.9	4.10	4.23
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**mg**	**mg**
Total Ammonia as NH_3	1.01	0.851	0.815	1.84	1.60

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-M26A-6 APC OUTLET #2	18-21880-M26A-BLANK 1 APC OUTLET #1	18-21880-M26A-BLANK 2 APC OUTLET #2
ALS Sample ID	L2163592-6	L2163592-7	L2163592-8
Matrix	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample
Sampling Date/Time	12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt	13-Sep-18	13-Sep-18	13-Sep-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.172	<0.175	<0.174
Analysis 1	<0.172	<0.175	<0.174
Analysis 2	<0.172	<0.175	<0.174
Total Cl^- as HCl (ave)	4.61	0.453	0.444
Analysis 1	4.58	0.452	0.449
Analysis 2	4.63	0.455	0.439
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**
Total Ammonia as NH_3	1.19	<0.453	<0.448

ALS Environmental

Sample QC Summary Report

Sample Name	LCB	LCS	LCS
ALS Sample ID	LCB	LCS	LCS
Matrix	Stack	Stack	Stack
Analysis type	Method Blank	Blank Spike	Blank Spike
Sampling Date/Time	n/a	n/a	n/a
Date of Receipt	n/a	n/a	n/a
Ion Chromatography Analysis			
USEPA Method 26A	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.0175	0.495	92%
Analysis 1	<0.0175	0.494	
Analysis 2	<0.0175	0.496	
Total Cl^- as HCl (ave)	<0.0309	0.753	94%
Analysis 1	<0.0309	0.753	
Analysis 2	<0.0309	0.753	
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.0472	0.508	108%

ALS Environmental

Sample QC Summary Report

Sample Name	18-21880-M26A-1 APC OUTLET #1	18-21880-M26A-1 APC OUTLET #1	18-21880-M26A-1 APC OUTLET #1	18-21880-M26A-1 APC OUTLET #1
ALS Sample ID	L2163592-1	L2163592-1DUP	L2163592-1MS	L2163592-1MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Spike	Matrix Spike
Sampling Date/Time	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Ion Chromatography Analysis USEPA Method 26A	**mg**	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.193	<0.193	5.52	94%
Analysis 1	<0.193	<0.193	5.54	
Analysis 2	<0.193	<0.193	5.50	
Total Cl^- as HCl (ave)	10.4	10.2	18.5	96%
Analysis 1	10.4	10.2	18.5	
Analysis 2	10.4	10.2	18.6	
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	1.01	1.06	6.30	106%

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#:	L2163580		Mississauga, ON L5J 2Y4
Date of Report	24-Sep-18		Canada
Date of Sample Receipt	13-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 21-Sep-18)

Sample Preparation via USEPA Method 29 (SR 20-Sep-18)

ANALYST COMMENTS:

1A:

Sb observed in the reagent blank (RB) above the LOR. This target, as well as Cr, Mo, and Ni were also observed in the method blank (MB). Data for these target analytes may be biased high as a result of this background, contributed by the reagents, and reagents + filter, respectively.

Ag recovery in the LCS/LCSD is outside ALS DQOs (found: 56% ,57%). This may be due to silver binding other elements in solution. MS recoveries are within range, however data may still be biased low for is target, in this fraction.

2A:

Cr, Pb, Ni observed in the reagent blank (RB) above the LOR. Data for these target analytes may be biased high. **PE 24-Sep-18**

LCB = Laboratory Control Blank

LCS = Laboratory Control Sample

LCSD = Laboratory Control Sample Duplicate

LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(7 THRU 12) #1 APC OUTLET TEST#2	18-21880-PM-(19 THRU 24) BLANK #1	18-21880-PM-(25 THRU 30) #2 APC OUTLET TEST#1	18-21880-PM-(31 THRU 36) #2 APC OUTLET TEST#2	18-21880-PM-(43 THRU 48) BLANK#2
ALS Sample ID		L2163580-1	L2163580-2	L2163580-3	L2163580-4	L2163580-5	L2163580-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		11-Sep-18	11-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A							
Antimony	0.2	<	0.386	<	<	<	<
Arsenic	1	<	<	<	<	<	<
Barium	5	5.32	5.82	5.98	5.27	5.03	6.30
Beryllium	0.2	<	<	0.299	<	<	<
Cadmium	0.1	0.273	1.60	0.120	<	0.151	<
Chromium	1	5.00	8.85	4.27	1.35	1.77	4.56
Cobalt	0.2	<	<	<	0.218	<	<
Copper	1	2.00	1.94	1.06	1.12	1.40	1.27
Lead	0.5	0.507	<	<	<	<	<
Molybdenum	0.2	41.7	45.3	46.0	22.1	22.7	44.4
Nickel	0.2	15.9	17.8	15.9	1.53	1.53	15.1
Selenium	2	<	<	<	<	<	<
Silver	0.2	<	<	<	<	<	<
Thallium	0.2	0.377	<	<	<	<	<
Vanadium	1	<	<	<	<	<	<
Zinc	6	12.1	21.3	<	10.2	6.73	<
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	<	<	<	<
Arsenic	0.2	0.480	0.344	0.347	0.201	0.275	<
Barium	0.5	1.55	1.66	<	1.04	0.863	0.810
Beryllium	0.1	0.104	0.157	0.255	0.121	0.189	0.147
Cadmium	0.05	0.111	0.0798	<	0.0735	0.0543	<
Chromium	0.15	1.29	1.07	0.483	3.00	0.658	0.591
Cobalt	0.1	0.158	<	<	0.130	<	<
Copper	0.3	3.42	3.92	1.60	1.33	2.87	0.516
Lead	0.05	0.578	0.776	0.388	1.36	0.577	0.479
Molybdenum	0.1	<	<	<	<	<	<
Nickel	0.1	2.68	2.47	1.08	3.44	0.775	0.254
Selenium	1	<	<	<	<	<	<
Silver	0.1	<	0.101	<	<	<	<
Thallium	0.05	0.221	0.0894	<	<	<	<
Vanadium	0.1	<	0.238	<	<	<	<
Zinc	3	9.65	8.59	<	6.08	4.02	<

ALS Environmental

Sample Analysis Summary Report

Sample Name		MB
ALS Sample ID		L2163580-MB
Matrix		n/a
Analysis Type		Sample
Sampling Date		n/a
Date of Receipt		n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**
Front Half HF Fraction 1A		
Antimony	0.2	1.08
Arsenic	1	<
Barium	5	<
Beryllium	0.2	0.215
Cadmium	0.1	<
Chromium	1	3.20
Cobalt	0.2	<
Copper	1	<
Lead	0.5	<
Molybdenum	0.2	22.7
Nickel	0.2	8.35
Selenium	2	<
Silver	0.2	<
Thallium	0.2	<
Vanadium	1	<
Zinc	6	<

ALS Environmental

Sample QC Summary Report

Sample Name		RB	LCS	LCS	LCSD	LCSD
ALS Sample ID		RB	LCS	LCS	LCSD	LCSD
Matrix		STACK	STACK	STACK	STACK	STACK
Analysis Type		Blank	LCS	LCS	LCS	LCS
Sampling Date		n/a	n/a	n/a	n/a	n/a
Date of Receipt		n/a	n/a	n/a	n/a	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A						
Antimony	0.2	0.535	11.7	93	11.3	89
Arsenic	1	<	59.7	99	58.3	97
Barium	5	<	56.3	94	54.6	91
Beryllium	0.2	<	64.5	107	60.5	101
Cadmium	0.1	<	28.1	93	27.2	91
Chromium	1	<	61.3	101	59.5	98
Cobalt	0.2	<	58.4	97	57.0	95
Copper	1	<	58.9	98	57.8	96
Lead	0.5	<	58.8	98	56.6	94
Molybdenum	0.2	<	29.6	100	29.0	98
Nickel	0.2	<	58.7	98	56.6	94
Selenium	2	<	59.4	99	56.3	94
Silver	0.2	<	16.9	56	17.1	57
Thallium	0.2	<	58.9	98	52.9	88
Vanadium	1	<	61.3	102	58.9	98
Zinc	6	<	116	97	112	94
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	<	5.64	93	5.19	85
Arsenic	0.2	<	31.3	104	28.6	95
Barium	0.5	<	28.6	95	25.1	84
Beryllium	0.1	<	29.3	97	26.7	89
Cadmium	0.05	<	13.1	87	12.0	80
Chromium	0.15	0.232	33.5	111	30.4	101
Cobalt	0.1	<	32.9	110	30.3	101
Copper	0.3	<	34.3	114	31.5	105
Lead	0.05	0.209	30.8	102	28.1	93
Molybdenum	0.1	<	16.0	106	14.5	96
Nickel	0.1	1.76	33.8	107	30.9	97
Selenium	1	<	26.7	90	25.5	85
Silver	0.1	<	15.9	106	14.3	95
Thallium	0.05	<	31.6	105	28.4	95
Vanadium	0.1	<	33.3	111	30.1	100
Zinc	3	<	62.0	103	56.1	93

ALS Environmental

Sample QC Summary Report

Sample Name		18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1
ALS Sample ID		L2163580-1	L2163580-1	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		11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	<	<	23.0	96	22.4	93
Arsenic	1	<	<	116	96	114	95
Barium	5	5.32	6.02	126	100	123	98
Beryllium	0.2	<	0.236	116	97	116	96
Cadmium	0.1	0.273	0.294	58.8	97	55.9	93
Chromium	1	5.00	5.09	111	89	112	89
Cobalt	0.2	<	<	112	94	110	91
Copper	1	2.00	2.18	117	96	116	95
Lead	0.5	0.507	0.507	111	92	103	85
Molybdenum	0.2	41.7	45.1	108	110	108	111
Nickel	0.2	15.9	16.8	129	95	125	91
Selenium	2	<	<	116	97	110	92
Silver	0.2	<	<	60.5	101	63.3	105
Thallium	0.2	0.377	0.237	111	92	104	87
Vanadium	1	<	<	102	86	103	86
Zinc	6	12.1	13.6	245	97	246	98
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	10.8	90	11.1	92
Arsenic	0.2	0.480	0.220	59.3	98	60.4	100
Barium	0.5	1.55	1.30	53.6	87	54.2	88
Beryllium	0.1	0.104	0.120	55.4	92	55.3	92
Cadmium	0.05	0.111	0.0921	25.3	84	25.7	85
Chromium	0.15	1.29	1.01	65.1	106	66.2	108
Cobalt	0.1	0.158	0.147	63.2	105	63.5	106
Copper	0.3	3.42	2.95	68.8	109	69.6	110
Lead	0.05	0.578	0.480	59.3	98	61.0	101
Molybdenum	0.1	<	<	30.5	102	29.7	99
Nickel	0.1	2.68	2.26	67.3	108	67.5	108
Selenium	1	<	<	51.8	85	48.8	81
Silver	0.1	<	<	30.3	101	29.9	99
Thallium	0.05	0.221	0.0588	60.6	101	62.6	104
Vanadium	0.1	<	<	64.2	107	64.8	108
Zinc	3	9.65	8.54	129	99	129	100

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#:	L2165276		Mississauga, ON L5J 2Y4
Date of Report	27-Sep-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 26-Sep-18)

Sample Preparation via USEPA Method 29 (SR 25-Sep-18))

ANALYST COMMENTS:

1A:

Sb, Cr, Ni observed in the reagent blank (RB) above the LOR). These same target analytes, as well as Mo, were observed in the method blank (MB). The difference in these levels can be attributed the the presence of a filter in the method blank, whereas the reagent blank contains only the reagents used during digestion. Data is likely biased high as a result of these background levels.

Ag recovery in the LCSD is outside ALS DQOs (found: 41%, limits: 85-115%). This may be due to silver binding other elements in solution. MS and MSD recoveries for this target are within ranges, indicating that matrix-containing samples are unlikely to show any bias.

2A:

Pb observed in the reagent blank (RB) above the LOR). Data is likely biased high as a result of this background level.

PE 28-Sep-18

LCB = Laboratory Control Blank

LCS = Laboratory Control Sample

LCSD = Laboratory Control Sample Duplicate

LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(37 THRU 42) #2 APC OUTLET TEST#3	MB
ALS Sample ID		L2165276-1	L2165276-2	L2165276-MB
Matrix		Stack	Stack	n/a
Analysis Type		Sample	Sample	Sample
Sampling Date		13-Sep-18	13-Sep-18	n/a
Date of Receipt		17-Sep-18	17-Sep-18	n/a
Multi-Metals via ICP-MS	**LOR**			
	ug	**ug**	**ug**	**ug**
Front Half HF Fraction 1A				
Antimony	0.2	0.220	0.205	2.60
Arsenic	1	<	<	<
Barium	5	6.56	8.34	<
Beryllium	0.2	<	<	<
Cadmium	0.1	0.289	0.311	<
Chromium	1	6.09	5.53	2.66
Cobalt	0.2	<	<	<
Copper	1	1.81	2.02	<
Lead	0.5	0.812	0.620	<
Molybdenum	0.2	42.7	43.1	25.2
Nickel	0.2	17.2	17.2	9.22
Selenium	2	<	<	<
Silver	0.2	<	<	<
Thallium	0.2	<	<	<
Vanadium	1	<	<	<
Zinc	6	13.1	11.9	<
Back Half (HNO3 / H2O2) Fraction 2A				
Antimony	0.1	<	<	-
Arsenic	0.2	<	<	-
Barium	0.5	1.49	1.47	-
Beryllium	0.1	<	<	-
Cadmium	0.05	<	<	-
Chromium	0.15	1.07	0.628	-
Cobalt	0.1	<	<	-
Copper	0.3	0.745	1.53	-
Lead	0.05	0.473	1.03	-
Molybdenum	0.1	<	<	-
Nickel	0.1	1.21	0.789	-
Selenium	1	<	<	-
Silver	0.1	<	<	-
Thallium	0.05	0.0505	<	-
Vanadium	0.1	0.182	<	-
Zinc	3	4.50	5.20	-

ALS Environmental

Sample QC Summary Report

Sample Name		RB	LCS	LCS	LCSD	LCSD
ALS Sample ID		RB	LCS	LCS	LCSD	LCSD
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis Type		Blank	LCS	LCS	LCS	LCS
Sampling Date		n/a	n/a	n/a	n/a	n/a
Date of Receipt		n/a	n/a	n/a	n/a	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A						
Antimony	0.2	0.920	11.5	88	11.9	92
Arsenic	1	<	57.0	95	57.8	96
Barium	5	<	56.7	95	57.8	96
Beryllium	0.2	<	54.4	91	54.4	91
Cadmium	0.1	<	27.9	93	29.0	97
Chromium	1	1.53	57.2	93	58.1	94
Cobalt	0.2	<	57.9	96	58.6	98
Copper	1	<	57.8	96	58.8	98
Lead	0.5	<	56.5	94	58.5	97
Molybdenum	0.2	<	27.1	91	27.4	92
Nickel	0.2	0.563	57.2	94	57.5	95
Selenium	2	<	54.2	90	55.1	91
Silver	0.2	<	27.6	92	12.4	41
Thallium	0.2	<	57.5	96	58.7	98
Vanadium	1	<	57.2	95	58.0	96
Zinc	6	<	113	94	114	95
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	<	5.64	93	5.49	91
Arsenic	0.2	<	31.4	105	30.1	100
Barium	0.5	<	30.8	102	29.8	99
Beryllium	0.1	<	31.7	105	30.1	100
Cadmium	0.05	<	14.0	93	13.3	89
Chromium	0.15	0.155	33.1	110	31.3	104
Cobalt	0.1	<	32.3	108	31.2	104
Copper	0.3	<	32.6	108	31.2	104
Lead	0.05	0.474	29.4	96	28.4	93
Molybdenum	0.1	<	15.6	104	15.0	100
Nickel	0.1	0.104	32.3	107	31.6	105
Selenium	1	<	28.3	94	27.4	92
Silver	0.1	<	16.3	109	15.8	105
Thallium	0.05	<	30.0	100	29.1	97
Vanadium	0.1	<	33.3	111	31.4	105
Zinc	3	<	57.9	96	54.6	91

ALS Environmental

Sample QC Summary Report

Sample Name		18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3
ALS Sample ID		L2165276-1	L2165276-1	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		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Date of Receipt		17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	0.220	0.203	24.3	100	24.2	100
Arsenic	1	<	<	120	100	121	101
Barium	5	6.56	7.03	120	95	121	96
Beryllium	0.2	<	<	119	99	122	102
Cadmium	0.1	0.289	0.352	61.9	103	60.3	100
Chromium	1	6.09	6.37	127	101	130	104
Cobalt	0.2	<	<	119	99	122	102
Copper	1	1.81	1.90	120	99	124	102
Lead	0.5	0.812	0.859	116	96	116	96
Molybdenum	0.2	42.7	45.0	103	101	107	108
Nickel	0.2	17.2	17.9	133	96	140	102
Selenium	2	<	<	114	95	114	96
Silver	0.2	<	<	59.8	100	62.8	105
Thallium	0.2	<	<	120	100	120	100
Vanadium	1	<	<	121	101	124	103
Zinc	6	13.1	13.5	247	97	249	98
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	12.1	101	12.0	99
Arsenic	0.2	<	<	63.7	106	64.4	107
Barium	0.5	1.49	1.60	62.0	101	61.4	100
Beryllium	0.1	<	<	62.0	103	65.3	109
Cadmium	0.05	<	<	28.7	96	28.6	95
Chromium	0.15	1.07	1.16	69.2	114	70.9	116
Cobalt	0.1	<	<	67.6	113	68.6	114
Copper	0.3	0.745	0.794	67.6	111	69.4	114
Lead	0.05	0.473	0.500	60.0	99	59.2	98
Molybdenum	0.1	<	<	33.1	112	33.2	112
Nickel	0.1	1.21	1.37	69.3	113	70.4	115
Selenium	1	<	<	61.7	103	59.9	100
Silver	0.1	<	<	34.1	113	34.9	116
Thallium	0.05	0.0505	<	61.8	103	61.3	102
Vanadium	0.1	0.182	<	69.3	115	71.2	118
Zinc	3	4.50	4.62	122	98	126	101

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#:	L2163580		Mississauga, ON L5J 2Y4
Date of Report	27-Sep-18		(905)822-4120
Date of Sample Receipt	13-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Mercury Analysis via CVAA using Method USEPA 7470A (Gamini 25-Sep-2018)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name			18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(7 THRU 12) #1 APC OUTLET TEST#2	18-21880-PM-(19 THRU 24) BLANK #1	18-21880-PM-(25 THRU 30) #2 APC OUTLET TEST#1	18-21880-PM-(31 THRU 36) #2 APC OUTLET TEST#2
ALS Sample ID			L2163580-1	L2163580-2	L2163580-3	L2163580-4	L2163580-5
Matrix			Stack	Stack	Stack	Stack	Stack
Analysis type			Sample	Sample	Sample	Sample	Sample
Sampling Date/Time			11-Sep-18	11-Sep-18	12-Sep-18	12-Sep-18	12-Sep-18
Date of Receipt			13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Mercury via CVAA		LOR					
	Method 29	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
	Analytical Fraction 1B	0.015	<	<	<	<	<
	Analytical Fraction 2B	0.050	1.32	1.04	0.125	0.638	0.494
	Analytical Fraction 3B	0.025	<	0.0520	<	<	<
	Analytical Fraction 3C	0.025	0.460	0.425	0.110	0.180	0.180

ALS Environmental

Sample Analysis Summary Report

Sample Name	**18-21880-PM-(43 THRU 48) BLANK#2**
ALS Sample ID	L2163580-6
Matrix	Stack
Analysis type	Sample
Sampling Date/Time	12-Sep-18
Date of Receipt	13-Sep-18

Mercury via CVAA	**LOR**	
Method 29	**ug**	**ug**
Analytical Fraction 1B	0.015	<
Analytical Fraction 2B	0.050	0.108
Analytical Fraction 3B	0.025	<
Analytical Fraction 3C	0.025	0.100

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	<	0.296	99%	0.309	103%
Analytical Fraction 2B	0.050	<	1.03	105%	1.05	107%
Analytical Fraction 3B	0.025	<	0.520	102%	0.505	99%
Analytical Fraction 3C	0.025	<	0.520	102%	0.525	103%

ALS Environmental

Sample QC Summary Report

Sample Name		18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1	18-21880-PM-(1 THRU 6) #1 APC OUTLET TEST#1
ALS Sample ID		L2163580-1	L2163580-1DUP	L2163580-1MS	L2163580-1MS	L2163580-1MSD	L2163580-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18	11-Sep-18
Date of Receipt		13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Mercury via CVAA	LOR						
Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<	<	0.321	104%	0.315	102%
Analytical Fraction 2B	0.050	1.32	1.25	10.8	100%	10.8	100%
Analytical Fraction 3B	0.025	<	<	0.500	96%	0.482	93%
Analytical Fraction 3C	0.025	0.460	0.465	5.60	103%	5.35	98%

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#:	L2165276		Mlssissauga, ON L5J 2Y4
Date of Report	28-Sep-18		(905)822-4120
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS:

Mercury Analysis via CVAA using Method USEPA 7470A (Gamini 27-Sep-2018)

ANALYST COMMENTS:

LCSD for fraction 1B is outside ALS DQOs (observed: 81%). Sample was re-analyzed and found to be consistent. LCS is within range, as well as MS and MSD for this fraction. Likely the LCSD is compromised, however these other QC samples provide sufficient evidence of control that there is no anticipated impact on data quality. **PE 28-Sep-18**

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name			18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(37 THRU 42) #2 APC OUTLET TEST#3
ALS Sample ID			L2165276-1	L2165276-2
Matrix			Stack	Stack
Analysis type			Sample	Sample
Sampling Date/Time			13-Sep-18	13-Sep-18
Date of Receipt			17-Sep-18	17-Sep-18
Mercury via CVAA		**LOR**		
	Method 29	**ug**	**ug**	**ug**
	Analytical Fraction 1B	0.015	<	<
	Analytical Fraction 2B	0.050	1.57	0.546
	Analytical Fraction 3B	0.025	<	<
	Analytical Fraction 3C	0.025	0.215	0.170

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	<	0.309	102%	0.246	81%
Analytical Fraction 2B	0.050	<	0.987	98%	0.951	94%
Analytical Fraction 3B	0.025	<	0.487	97%	0.494	99%
Analytical Fraction 3C	0.025	<	0.498	100%	0.510	102%

ALS Environmental

Sample QC Summary Report

Sample Name			18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3	18-21880-PM-(13 THRU 18) #1 APC OUTLET TEST#3
ALS Sample ID			L2165276-1	L2165276-1DUP	L2165276-1MS	L2165276-1MS	L2165276-1MSD	L2165276-1MSD
Matrix			Stack	Stack	Stack	Stack	Stack	Stack
Analysis type			Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time			13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18	13-Sep-18
Date of Receipt			17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Mercury via CVAA		**LOR**						
	Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
	Analytical Fraction 1B	0.015	<	<	0.299	97%	0.303	98%
	Analytical Fraction 2B	0.050	1.57	1.51	10.9	98%	11.1	100%
	Analytical Fraction 3B	0.025	<	<	0.486	97%	0.479	96%
	Analytical Fraction 3C	0.025	0.215	0.205	5.05	97%	5.05	97%

APPENDIX 13

Particle Size Distribution Train Recovery Data Sheets
(8 pages)

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 12, 18

Test No.: 1
Test Location: UNIT #1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER T55 & TS6	CONTAINER TS7
			Filter ID: QZ 5569	Impinger #1 Knock Out Empty Wt: 488.8 Final Wt: 580.6 1 Gain: 91.8 Colour: clear	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 168.5 After Act. Rinse: 209.9 Total TS1: 41.6	Container TS2 Weights Empty Wt: 169.4 After Act. Rinse: 195.7 Total TS2: 27.3	Container TS3 Weights Empty Wt: 163.9 After Act. Rinse: 176.8 Total TS3: 12.9	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 675.2 Final Wt: 675.2 2 Gain: 0 Colour:	Purge On: 11:20 Purge Off: 12:20	Acetone/Hexane Rinse Empty Wt: 282.0 After Acetone Rinse: 390.9 After Hexane Rinse: 497.3
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: 674.4 Initial Wt: 771.6 Final Wt: 766.9 3 Gain: -4.7 Colour: clear	CONTAINER TS5 Empty Wt: 282.9 With Imp 2: 364.3 After H_2O Rinse: 439.0 Total Volume TS5: 152.1	
				Impinger #4 Silica Gel Initial Wt: 980.7 Final Wt: 994.9 4 Gain: 14.2 % Spent: 20	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	18-21880-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: SEPT 12/18

CWTR=1+2+3:	87.1 ✓
WCBDA=4:	14.2

7

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 12, 18

Test No.: 2
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ5569			

Impinger #1 Knock Out

Empty Wt:	491.0
Final Wt:	654.4
1 Gain:	163.4
Colour:	clear

Impinger #2 Empty

Empty Wt:	660.3
Final Wt:	660.3
2 Gain:	0
Colour:	clear

Secondary Filter

Impinger #3 H_2O

Empty Wt:	662.6
Initial Wt:	752.4
Final Wt:	745.8
3 Gain:	-6.6
Colour:	clear

Impinger #4 Silica Gel

Initial Wt:	933.4
Final Wt:	945.7
4 Gain:	12.3
% Spent:	50%

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: 15:30
Purge Off: 16:30

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Empty Wt:	281.6
With Imp 2:	432.8
After H_2O Rinse:	549.3
Total Volume TS5:	267.7

CONTAINER TS6
Secondary Filter

Seal and label container TS6

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Empty Wt:	282.1
After Acetone Rinse:	368.8
After Hexane Rinse:	402.0

Mark Fluid Level and Seal and Label Container

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4

Container TS1 Weights		Container TS2 Weights		Container TS3 Weights		Initial Wt:	
Empty Wt:	167.4	Empty Wt:	167.4	Empty Wt:	167.6	Final Wt:	
After Act. Rinse:	209.8	After Act. Rinse:	206.0	After Act. Rinse:	182.1	Gain:	
Total TS1:	46.4	Total TS2:	38.6	Total TS3:	14.5	Colour:	WHITE

Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4

SAMPLE IDENTIFICATION	18-21880-M201A-
TS1 (Part. > 10)	~~13~~ 8
TS2 (Part. > 2.5)	~~14~~ 9
TS3 (Part. < 2.5)	~~15~~ 10
TS4 (Back Up Filter, <2.5)	~~16~~ 11
TS5 (Imp 2 H_2O and rinse)	~~17~~ 12
TS6 (Secondary Filter)	~~18~~ 13
TS7 (Acetone / Hexane rinse)	~~19~~ 14

Train Loaded By: DU
Train Recovered By: DU / BT
Recovery Witnessed By:
Date: SE

CWTR=1+2+3:	156.8 ✓
WCBDA=4:	12.3

5

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 12, 18

Test No.: 3
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	
Empty Wt: 20	Empty Wt: 170.0	Empty Wt: 170.0	Initial Wt:
After Act. Rinse: 207.8	After Act. Rinse: 185.0	After Act. Rinse: 461.4	Final Wt:
Total TS1: 37.8	Total TS2: 15.0	Total TS3: 81.4	Gain:
			Colour: WHITE
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4

Filter ID: QZ5603

SAMPLE IDENTIFICATION	18-21880-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_20 and rinse)	19
TS6 (Secondary Filter)	20
TS7 (Acetone / Hexane rinse)	21

Train Loaded By: DT
Train Recovered By: DH/DT
Recovery Witnessed By:
Date: SEPT 12, 18

Impingers 1, 2, 3, 4

	Impinger #1 Knock Out	
	Empty Wt:	488.8
	Final Wt:	604.8
1	Gain:	116.0
	Colour:	clear

	Impinger #2 Empty	
	Empty Wt:	675.2
	Final Wt:	675.2
2	Gain:	0
	Colour:	—

Secondary Filter

	Impinger #3 H_2O	
	Empty Wt:	674.4
	Initial Wt:	766.9
	Final Wt:	761.1
3	Gain:	-5.8
	Colour:	clear

	Impinger #4 Silica Gel	
	Initial Wt:	994.9
	Final Wt:	1010.6
4	Gain:	15.7
	% Spent:	—

CWTR=1+2+3:	110.2 ✓
WCBDA=4:	15.7

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:	17:40
Purge Off:	18:40

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5	
Empty Wt:	283.2
With Imp 2:	392.3
After H_2O Rinse:	462.3
Total Volume TS5:	179.1

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse	
Empty Wt:	283.5
After Acetone Rinse:	373.0
After Hexane Rinse:	443.6

Mark Fluid Level and Seal and Label Container

7

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 12, 18

Test No.: UNIT 1
Test Location: BLANK 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ5601	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt:	* *if there is no gain purge is not required.*	
				Final Wt:		
				1 Gain:		
				Colour:		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:	Impinger #2 Empty	Purge On:	Acetone/Hexane Rinse
Empty Wt: 75.0	Empty Wt: 75.1	Empty Wt: 75.2	Final Wt:	Empty Wt:	Purge Off:	Empty Wt: 283.0
After Act. Rinse: 98.6	After Act. Rinse: 95.1	After Act. Rinse: 97.5	Gain:	Final Wt:		After Acetone Rinse: 333.9
Total TS1: 23.6	Total TS2: 20.0	Total TS3: 22.3	Colour: WHITE	2 Gain:	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	After Hexane Rinse: 377.7
				Colour:		Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter		
				Impinger #3 H_2O	CONTAINER TS5	
				Empty Wt:	Empty Wt: 282.2	
				Initial Wt:	With Imp 2: 382.2	
				Final Wt:	After H_2O Rinse: 421.5	
				3 Gain:	Total Volume TS5: 739.3	
				Colour:		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt:	Secondary Filter	
				Final Wt:		
				4 Gain:	Seal and label container TS6	
				% Spent:		
				CWTR=1+2+3:		
				WCBDA=4:		

SAMPLE IDENTIFICATION	18-21880-M201A-
TS1 (Part. > 10)	43
TS2 (Part. > 2.5)	44
TS3 (Part. < 2.5)	45
TS4 (Back Up Filter, <2.5)	46
TS5 (Imp 2 H_20 and rinse)	47
TS6 (Secondary Filter)	48
TS7 (Acetone / Hexane rinse)	49

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By: —
Date: Sept 12, 18

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 11/18

Test No.: 1
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter
			L2145992-2
			Filter ID: QZ5566
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:
Empty Wt: 291.0	Empty Wt: 291.0	Empty Wt: 291.0	Final Wt:
After Act. Rinse: 333.1	After Act. Rinse: 336.1	After Act. Rinse: 297.6	Gain:
Total TS1: 42.1	Total TS2: 45.1	Total TS3: 16.6	Colour: WHITE
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4

Impingers 1, 2, 3, 4		CONTAINER TS5 & TS6	CONTAINER TS7
Impinger #1 Knock Out		Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
Empty Wt:	490.8	* *if there is no gain purge is not required.*	
Final Wt:	645.7		
1 Gain:	154.9		
Colour:	clear		
Impinger #2 Empty		Purge On: 12:25	Acetone/Hexane Rinse
Empty Wt:	659.5	Purge Off: 13:25	Empty Wt: 282.4
Final Wt:	~~760.0~~ 659.5		After Acetone Rinse: 338.1
2 Gain:	0	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	After Hexane Rinse: 366.2
Colour:	—		Mark Fluid Level and Seal and Label Container
Secondary Filter			
Impinger #3 H_2O		CONTAINER TS5	
Empty Wt:	662.8	Empty Wt:	282.4
Initial Wt:	760.0	With Imp 2:	426.6
Final Wt:	756.8	After H_2O Rinse:	527.7
3 Gain:	-3.2	Total Volume TS5:	245.3
Colour:	clear		
Impinger #4 Silica Gel		CONTAINER TS6	
Initial Wt:	909.0	Secondary Filter	
Final Wt:	920.4		
4 Gain:	11.4	Seal and label container TS6	
% Spent:	—		

SAMPLE IDENTIFICATION	18-21880-M201A-
TS1 (Part. > 10)	22
TS2 (Part. > 2.5)	23
TS3 (Part. < 2.5)	24
TS4 (Back Up Filter, <2.5)	25
TS5 (Imp 2 H_20 and rinse)	26
TS6 (Secondary Filter)	27
TS7 (Acetone / Hexane rinse)	28

CWTR=1+2+3:	151.7 ✓
WCBDA=4:	11.4

Train Loaded By: DM
Train Recovered By: DM / DT
Recovery Witnessed By:
Date: SEPT 11/18

5

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 11, 18

Test No.: 2
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ5567	Impinger #1 Knock Out Empty Wt: 488.8 Final Wt: 666.7 1 Gain: 177.9 Colour: clear	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 168.3 After Act. Rinse: 228.1 Total TS1: 59.8	Container TS2 Weights Empty Wt: 167.1 After Act. Rinse: 207.9 Total TS2: 40.8	Container TS3 Weights Empty Wt: 169.2 After Act. Rinse: 181.7 Total TS3: 12.7	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 675.2 Final Wt: 675.2 2 Gain: 0 Colour:	Purge On: 16:05 Purge Off: 17:20	Acetone/Hexane Rinse Empty Wt: 282.9 After Acetone Rinse: 377.0 After Hexane Rinse: 441.0
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: 674.4 Initial Wt: 774.7 Final Wt: 771.6 3 Gain: 73.1 Colour: clear	CONTAINER TS5 Empty Wt: 281.6 With Imp 2: 955.6 After H_2O Rinse: 556.8 Total Volume TS5: 275.2	
				Impinger #4 Silica Gel Initial Wt: 969.5 Final Wt: 980.7 4 Gain: 11.2 % Spent:	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	18-21880-M201A-
TS1 (Part. > 10)	29
TS2 (Part. > 2.5)	30
TS3 (Part. < 2.5)	31
TS4 (Back Up Filter, <2.5)	32
TS5 (Imp 2 H_20 and rinse)	33
TS6 (Secondary Filter)	34
TS7 (Acetone / Hexane rinse)	35

CWTR=1+2+3:	174.8 ✓
WCBDA=4:	11.2

Train Loaded By: DU
Train Recovered By: DU/DT
Recovery Witnessed By:
Date: SEPT 11, 18

7

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: SEPT 11/19

Test No.: 3
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: QZ5560	Impinger #1 Knock Out Empty Wt: 490.8 Final Wt: 670.1 1 Gain: 179.3 Colour: CLEAR	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 70.0 After Act. Rinse: 248.1 Total TS1: 78.1	Container TS2 Weights Empty Wt: 70.0 After Act. Rinse: 203.4 Total TS2: 33.4	Container TS3 Weights Empty Wt: 70.0 After Act. Rinse: 155.6 Total TS3: 15.6	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 659.5 Final Wt: 659.9 2 Gain: 0.4 Colour: —	Purge On: 1900 Purge Off: 2000	Acetone/Hexane Rinse Empty Wt: 425.0 After Acetone Rinse: 495.1 After Hexane Rinse: 559.4
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
				Impinger #3 H_2O Empty Wt: 662.8 Initial Wt: 756.8 Final Wt: 752.4 3 Gain: -4.4 Colour: —	CONTAINER TS5 Empty Wt: 282.2 With Imp 2: — After H_2O Rinse: 585.8 Total Volume TS5: 303.6	
				Impinger #4 Silica Gel Initial Wt: 920.4 Final Wt: 933.4 4 Gain: 13.0 % Spent: 10	CONTAINER TS6 Secondary Filter Seal and label container TS6	

SAMPLE IDENTIFICATION	18-21880-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

CWTR=1+2+3:	175.3
WCBDA=4:	13.0

Train Loaded By: DT
Train Recovered By:
Recovery Witnessed By:
Date: SEPT 11/19

5

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21880
Date: Sept 12, 18

Test No.: BLNK 2
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: RZ5602	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt:	* *if there is no gain purge is not required.*	
				Final Wt:		
				1 Gain:		
				Colour:		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Impinger #2 Empty	Purge On:	Acetone/Hexane Rinse
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:	Empty Wt:	Purge Off:	Empty Wt: 282.6
Empty Wt: 75.3	Empty Wt: 75.4	Empty Wt: 75.5	Final Wt:	Final Wt:		After Acetone Rinse: 340.3
After Act. Rinse: 90.9	After Act. Rinse: 90.6	After Act. Rinse: 91.5	Gain:	2 Gain:	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	After Hexane Rinse: 414.7
Total TS1: 15.6	Total TS2: 15.2	Total TS3: 16.0	Colour: WHITE	Colour:		Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Secondary Filter		
				Impinger #3 H_2O	CONTAINER TS5	
				Empty Wt:	Empty Wt: 282.3	
				Initial Wt:	With Imp 2: 383.2	
				Final Wt:	After H_2O Rinse: 477.8	
				3 Gain:	Total Volume TS5: 195.5	
				Colour:		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt:	Secondary Filter	
				Final Wt:		
				4 Gain:	Seal and label container TS6	
				% Spent:		
				CWTR=1+2+3:		
				WCBDA=4:		

SAMPLE IDENTIFICATION	18-21880-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: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 12, 18

APPENDIX 14

SVOC Train Recovery Data Sheets
(8 pages)

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 1
Test Date: SEPT 13, 18
Test Location: UNIT 1

Sample ID 1	Sample ID 2	Sample ID 3	Sample ID 4	Sample ID 5	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 729.5	Colour: WHITE	Initial Wt: 326.5	Impinger #1 Empty	Empty Wt: 431.2	Initial Wt: 876.5
After Acetone/ Hexane Rinse: 648.0	FOLD IN FOIL	Final Wt: 333.0	Empty Wt: 500.7	After Acetone Rinse: 583.2	Final Wt: 889.1
Total TS1: 218.5		1 Gain: 6.5	Final Wt: 1029.2	After Hexane Rinse: 682.4	5 Gain: 12.6
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 528.5	Total TS5: 255.2	% Spent:
		SEAL TRAP	Colour: clear		
MARK FLUID LEVEL		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
			Empty Wt: ~~644.9~~ 653.1		
SEAL AND LABEL CONTAINER TS1		LABEL AS CONTAINER TS3	Initial Wt: ~~760.1~~ 756.4		
			Final Wt: 794.7		
			3 Gain: 38.3		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 612.8		
			Final Wt: 673.3		
			4 Gain: 0.5		
			Colour: clear		
			Container TS4 Weights		
			Empty Wt: 430.4		
			With Imp Soln: 1090.0		
			Imp Volume: 659.6		
			After ~100g H_2O Rinse: 708.3		
			Total TS4: 777.9		

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.:	177179
Hexane Batch No.:	183263
Acetone Batch No.:	182572

Train Loaded By: AS
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 13, 18

CWTR = 1 + 2 + 3 + 4: 5738

WCBDA=5: 12.6

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 2
Test Date: Sept 13, 18
Test Location: Unit 1

Sample ID 6	Sample ID 7	Sample ID 8	Sample ID 9	Sample ID 10	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 425.1	Colour: WHITE	Initial Wt: 415.6	Impinger #1 Empty	Empty Wt: 429.8	Initial Wt: 896.8
After Acetone/ Hexane Rinse: 817.8	FOLD IN FOIL	Final Wt: 421.1	Empty Wt: 656.1	After Acetone Rinse: 529.0	Final Wt: 910.3
Total TS1: 392.7	SEAL AND LABEL CONTAINER TS2	1 Gain: 5.5	Final Wt: 1018.0	After Hexane Rinse: 834.7	5 Gain: 13.5
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 361.9	Total TS5: 204.9	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: clear		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 657.7		
			Initial Wt: 784.1		
			Final Wt: 941.6		
			3 Gain: 157.5		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 540.5		
			Final Wt: 618.0		
			4 Gain: 77.5		
			Colour: clear		

Impinger Box ID: 11

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	AA
Trap ID:	6
HPLC Batch No.:	
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	430.8
With Imp Soln:	1135.0
Imp Volume:	
After ~100g H_2O Rinse:	1252.8
Total TS4:	

CWTR = 1 + 2 + 3 + 4: 606.4 ✓

WCBDA=S: 13.5

Train Loaded By: DT/AS
Train Recovered By: DT/AS
Recovery Witnessed By:
Date: Sept 13/18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 3
Test Date: SEPT 14, 18
Test Location: UNIT 9

Sample ID 11	Sample ID 12	Sample ID 13	Sample ID 14	Sample ID 15	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 428.3	Colour: WHITE	Initial Wt: 355.5	Impinger #1 Empty	Empty Wt: 428.0	Initial Wt: 832.6
After Acetone/ Hexane Rinse: 706.9	FOLD IN FOIL	1 Final Wt: 362.1	Empty Wt: 672.0	After Acetone Rinse: 530.5	Final Wt: 845.8
Total TS1: 280.6	SEAL AND LABEL CONTAINER TS2	Gain: 6.6	Final Wt: 1017.6	After Hexane Rinse: 829.1	5 Gain: 13.2
MARK FLUID LEVEL	SEAL TRAP	Colour: WHITE	2 Gain: 345.6	Total TS5: 201.1	% Spent:
SEAL AND LABEL CONTAINER TS1	WRAP IN FOIL	LABEL AS CONTAINER TS3	Colour: Clear		
			Impinger #2 Ethylene Glycol		
			Empty Wt: 655.7		
			Initial Wt: 763.1		
			Final Wt: 983.4		
			3 Gain: 220.3		
			Colour: Clear		
			Impinger #3 Empty		
			Empty Wt: 655.0		
			Final Wt: 656.5		
			4 Gain: 1.5		
			Colour: Clear		
			Container TS4 Weights		
			Empty Wt: 427.5		
			With Imp Soln: 1091.5		
			Imp Volume: 664.0		
			After ~100g H_2O Rinse: 1203.9		
			Total TS4: 776.4		

Impinger Box ID: 11

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	X
Trap ID:	3
HPLC Batch No.:	~~177179~~ A25
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	
Acetone Batch No.:	

CWTR = 1 + 2 + 3 + 4: 574.0

WCBDA=5: 13.2

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: SEPT 14/18

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: BLANK 1
Test Date: Sept 14, 18
Test Location:

Sample ID 16	Sample ID 17	Sample ID 18	Sample ID 19	Sample ID 20	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 427.7	Colour: WHITE	Initial Wt: 379.3	Impinger #1 Empty	Empty Wt: 429.2	Initial Wt:
After Acetone/ Hexane Rinse: 730.9	FOLD IN FOIL	1 Final Wt: 379.3	Empty Wt: 660.0	After Acetone Rinse: 533.4	Final Wt:
Total TS1: 303.2	SEAL AND LABEL CONTAINER TS2	Gain:	Final Wt: 660.0	After Hexane Rinse: 643.7	5 Gain:
MARK FLUID LEVEL		Colour: WHITE	2 Gain:	Total TS5: 214.5	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour:		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL A5 CONTAINER TS3	Empty Wt: 675.3		
			Initial Wt: 780.2		
			Final Wt: 780.2		
			3 Gain: 0		
			Colour:		
			Impinger #3 Empty		
			Empty Wt: 652.3		
			Final Wt: 652.3		
			4 Gain:		
			Colour:		
			Container TS4 Weights		
			Empty Wt: 429.6		
			With Imp Soln: 533.4		
			Imp Volume: 103.8		
			After ~100g H_2O Rinse: 658.3		
			Total TS4: 228.7		

Impinger Box ID:

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	M
Trap ID:	12
HPLC Batch No.:	
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 14, 18

CWTR = 1 + 2 + 3 + 4:

WCBDA=5:

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 1
Test Date: Sept 13, 18
Test Location: UNIT 2

Sample ID 21	Sample ID 22	Sample ID 23	Sample ID 24	Sample ID 25	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 431.0	Colour: WHITE	Initial Wt: 394.0	Impinger #1 Empty	Empty Wt: 424.7	Initial Wt: 848.2
After Acetone/ Hexane Rinse: 574.6	FOLD IN FOIL	Final Wt: 401.2	Empty Wt: 649.3	After Acetone Rinse: 497.7	Final Wt: 859.4
Total TS1: 143.6	SEAL AND LABEL CONTAINER TS2	1 Gain: 7.2	Final Wt: 1021.6	After Hexane Rinse: 642.0	Gain: 11.2
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 372.3	Total TS5: 217.3	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: clear	642.0 5	
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 535.0		
			Initial Wt: 625.1		
			Final Wt: 811.7		
			3 Gain: 186.6		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 479.7		
			Final Wt: 480.3		
			4 Gain: 0.6		
			Colour: clear		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	W
Trap ID:	7
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	183263
Acetone Batch No.:	182572

Container TS4 Weights	
Empty Wt:	424.0
With Imp Soln:	1067.7
Imp Volume:	643.7
After ~100g H_2O Rinse:	1170.4
Total TS4:	746.4

Impinger Box ID: 11

Train Loaded By: AS
Train Recovered By: AS
Recovery Witnessed By:
Date: Sept 13, 18

CWTR = 1 + 2 + 3 + 4: 966.7

WCBDA=S: 11.2

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 2
Test Date: Sept 13, 18
Test Location: UNIT 2

Sample ID 26	Sample ID 27	Sample ID 28	Sample ID 29	Sample ID 30	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 430.1	Colour: WHITE	Initial Wt: 396.3	Impinger #1 Empty	Empty Wt: 431.0	Initial Wt: 930.1
After Acetone/ Hexane Rinse: 651.7	FOLD IN FOIL	Final Wt: 402.0	Empty Wt: 659.5	After Acetone Rinse: 539.2	Final Wt: 945.3
Total TS1: 221.6	SEAL AND LABEL CONTAINER TS2	1 Gain: 5.7	Final Wt: 977.0	After Hexane Rinse: 712.3	5 Gain: 15.2
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 317.5	Total TS5: 281.3	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: clear		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 674.6		
			Initial Wt: 790.8		
			Final Wt: 1012.0		
			3 Gain: 221.2		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 667.1		
			Final Wt: 749.0		
			4 Gain: 81.9		
			Colour: clear		

Impinger Box ID: 13

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	CC
Trap ID:	1
HPLC Batch No.:	ALS 177179
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	431.0
With Imp Soln:	1152.2
Imp Volume:	721.2
After ~100g H_2O Rinse:	1328.5
Total TS4:	897.5

CWTR = 1 + 2 + 3 + 4: 826.3

WCBDA=5: 15.2

Train Loaded By: AS
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 13/18

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: 3
Test Date: Sept 14/18
Test Location: UNIT 2

Sample ID 31	Sample ID 32	Sample ID 33	Sample ID 34	Sample ID 35	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 425.9	Colour: WHITE	Initial Wt: 354.0	Impinger #1 Empty	Empty Wt: 428.1	Initial Wt: 889.0
After Acetone/ Hexane Rinse: 594.4	FOLD IN FOIL	1 Final Wt: 358.7	Empty Wt: 564.8	After Acetone Rinse: 537.2	Final Wt: 901.6
Total TS1: 1685		Gain: 4.7	Final Wt: 966.5	After Hexane Rinse: 633.3	5 Gain: 12.6
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 401.7	Total TS5: 2071.2	% Spent:
		SEAL TRAP	Colour: clear		
MARK FLUID LEVEL		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
			Empty Wt: 364.7		
SEAL AND LABEL CONTAINER TS1		LABEL AS CONTAINER TS3	Initial Wt: 680.9		
			Final Wt: 887.0		
			3 Gain: 206.1		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 655.9		
			Final Wt: 658.5		
			4 Gain: 2.6		
			Colour: clear		

Impinger Box ID: 10

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	BTS
Trap ID:	10
HPLC Batch No.:	A25
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	426.5
With Imp Soln:	1140.0
Imp Volume:	713.5
After ~100g H_2O Rinse:	1240.2
Total TS4:	813.7

CWTR = 1 + 2 + 3 + 4: 815.1

WCBDA=5: 12.6

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: DT
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 14/18

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21880
Sample Batch No.: 18-21880-SVOC-

Test No.: BLANK 2
Test Date: Sept 14, 18
Test Location:

Sample ID 36	Sample ID 37	Sample ID 38	Sample ID 39	Sample ID 40	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 428.9	Colour: WHITE	Initial Wt: 382.1	Impinger #1 Empty	Empty Wt: 427.8	Initial Wt:
After Acetone/ Hexane Rinse: 616.0	FOLD IN FOIL	1 Final Wt: 382.1	Empty Wt: 502.3	After Acetone Rinse: 532.8	Final Wt:
Total TS1: 187.1		Gain:	Final Wt: 502.3	After Hexane Rinse: 638.4	5 Gain:
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 0	Total TS5: 210.6	% Spent:
		SEAL TRAP	Colour:		
MARK FLUID LEVEL		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
			Empty Wt: 647.7		
SEAL AND LABEL CONTAINER TS1		LABEL AS CONTAINER TS3	Initial Wt: 750.7		
			Final Wt: 750.7		
			3 Gain:		
			Colour:		
			Impinger #3 Empty		
			Empty Wt: 674.5		
			Final Wt: 674.5		
			4 Gain:		
			Colour:		

Impinger Box ID:

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	N
Trap ID:	S
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	426.3
With Imp Soln:	528.5
Imp Volume:	102.2
After ~100g H_2O Rinse:	641.7
Total TS4:	214.8

Train Loaded By: DT
Train Recovered By: BT
Recovery Witnessed By:
Date: Sept 14/18

CWTR = 1 + 2 + 3 + 4:

WCBDA=5:

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

APPENDIX 15

SVOC Analytical Report
(68 pages)

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2164450		Mississauga ON
Date of Report	1-Oct-18		L5J 2Y4
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **PCDD/F by EPA M23**

During the runs, the mass resolution dropped below 10,000 for selected targets. The mass resolution is of value as a mass filter to remove potential interferences where the masses are close to those being monitored for target and labelled analytes. Since there was no evidence for signiticant chemical interferences, therefore there is no significant impact to the data quality due to the mass resolution exceedences.

Certified by:

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

ALS Life Sciences

Sample Analysis summary Report

Sample Name	18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1	18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2	18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3	18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK	18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1	18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2
ALS Sample ID	L2164450-1	L2164450-2	L2164450-3	L2164450-4	L2164450-5	L2164450-6
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	13-Sep-18	13-Sep-18	14-Sep-18	14-Sep-18	13-Sep-18	13-Sep-18
Extraction Date	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
2,3,7,8-TCDD	<4.2	<1.8	<3.3	<2.9	<1.2	<2.0
1,2,3,7,8-PeCDD	<5.0	<5.5	5.37	<1.8	<3.0	3.82
1,2,3,4,7,8-HxCDD	<13	12.2	<10	<3.3	11.1	9.09
1,2,3,6,7,8-HxCDD	22.5	24.3	<18	<2.2	19.9	21.9
1,2,3,7,8,9-HxCDD	<14	17.3	14.9	<2.4	12.3	<8.4
1,2,3,4,6,7,8-HpCDD	219	226	224	25.5	254	269
OCDD	227	211	208	37.6	510	519
2,3,7,8-TCDF	<8.0	<8.5	<3.0	<2.2	2.12	<1.8
1,2,3,7,8-PeCDF	<4.5	7.31	<3.6	<2.5	<3.2	<3.6
2,3,4,7,8-PeCDF	14.6	13.3	11.0	<2.2	6.42	6.53
1,2,3,4,7,8-HxCDF	9.60	10.2	5.97	<2.4	7.83	7.28
1,2,3,6,7,8-HxCDF	<8.4	<7.5	6.34	<1.9	<6.5	<6.4
2,3,4,6,7,8-HxCDF	20.6	<2.4	<16	<2.2	13.4	12.7
1,2,3,7,8,9-HxCDF	<4.7	<4.5	<4.3	<2.7	<3.3	4.18
1,2,3,4,6,7,8-HpCDF	44.4	41.3	36.8	<6.5	40.2	40.2
1,2,3,4,7,8,9-HpCDF	<9.6	11.5	10.2	<2.5	7.55	9.68
OCDF	26.0	20.8	22.5	<5.2	33.6	29.8
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	98	107	99	101	109	105
13C12-1,2,3,4,7,8-HxCDD	85	98	99	107	107	110
13C12-2,3,4,7,8-PeCDF	98	97	95	100	100	98
13C12-1,2,3,4,7,8-HxCDF	84	95	87	89	102	92
13C12-1,2,3,4,7,8,9-HpCDF	96	102	99	100	104	103
Extraction Standards						
13C12-2,3,7,8-TCDD	40	61	64	55	67	84
13C12-1,2,3,7,8-PeCDD	46	69	74	70	74	94
13C12-1,2,3,6,7,8-HxCDD	59	77	81	80	81	100
13C12-1,2,3,4,6,7,8-HpCDD	58	83	89	92	88	111
13C12-OCDD	57	86	92	93	91	119
13C12-2,3,7,8-TCDF	40	60	64	54	67	82
13C12-1,2,3,7,8-PeCDF	46	66	72	67	71	93
13C12-1,2,3,6,7,8-HxCDF	59	77	84	83	78	106
13C12-1,2,3,4,6,7,8-HpCDF	57	79	85	88	84	109
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	104	106	102	99	95	103
Homologue Group Totals	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
Total-TCDD	152	159	150	<2.9	106	114
Total-PeCDD	289	321	286	<1.8	200	101
Total-HxCDD	448	533	536	41.8	559	558
Total-HpCDD	465	467	450	57.9	539	568
Total-TCDF	30.4	68.8	73.1	<2.2	47.5	43.1
Total-PeCDF	84.6	137	98.7	<2.5	62.7	47.8
Total-HxCDF	73.4	66.2	66.2	<2.7	69.1	68.7
Total-HpCDF	61.3	68.1	61.9	<2.5	74.6	82.4
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	12.4	13.5	14.2	0.266	11.8	14.6
Mid Point PCDD/F TEQ (WHO 2005)	21.0	22.0	20.7	4.03	16.4	17.3
Upper Bound PCDD/F TEQ (WHO 2005)	26.6	23.1	22.7	7.72	17.0	18.4

ALS Life Sciences

Sample Analysis summary Report

Sample Name	18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3	18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK
ALS Sample ID	L2164450-7	L2164450-8
Sample Size	1	1
Sample size units	sample	sample
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	14-Sep-18	14-Sep-18
Extraction Date	17-Sep-18	17-Sep-18
Target Analytes	**pg**	**pg**
2,3,7,8-TCDD	<1.5	<5.7
1,2,3,7,8-PeCDD	<3.2	<4.4
1,2,3,4,7,8-HxCDD	<5.8	<6.0
1,2,3,6,7,8-HxCDD	21.7	<3.9
1,2,3,7,8,9-HxCDD	11.4	<4.3
1,2,3,4,6,7,8-HpCDD	213	23.0
OCDD	378	<46
2,3,7,8-TCDF	<1.5	<4.6
1,2,3,7,8-PeCDF	2.95	<3.4
2,3,4,7,8-PeCDF	<5.3	<3.0
1,2,3,4,7,8-HxCDF	5.26	<4.0
1,2,3,6,7,8-HxCDF	5.37	<3.2
2,3,4,6,7,8-HxCDF	<11	<3.7
1,2,3,7,8,9-HxCDF	<4.0	<4.5
1,2,3,4,6,7,8-HpCDF	28.6	<2.9
1,2,3,4,7,8,9-HpCDF	<5.5	<3.9
OCDF	22.7	<5.6
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	101	100
13C12-1,2,3,4,7,8-HxCDD	111	76
13C12-2,3,4,7,8-PeCDF	96	102
13C12-1,2,3,4,7,8-HxCDF	93	78
13C12-1,2,3,4,7,8,9-HpCDF	103	98
Extraction Standards		
13C12-2,3,7,8-TCDD	65	46
13C12-1,2,3,7,8-PeCDD	74	58
13C12-1,2,3,6,7,8-HxCDD	79	74
13C12-1,2,3,4,6,7,8-HpCDD	88	75
13C12-OCDD	95	79
13C12-2,3,7,8-TCDF	64	48
13C12-1,2,3,7,8-PeCDF	73	55
13C12-1,2,3,6,7,8-HxCDF	83	74
13C12-1,2,3,4,6,7,8-HpCDF	87	73
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	117	75
Homologue Group Totals	**pg**	**pg**
Total-TCDD	108	<5.7
Total-PeCDD	196	<4.4
Total-HxCDD	501	<6.0
Total-HpCDD	459	23.0
Total-TCDF	31.3	<4.6
Total-PeCDF	22.7	<3.4
Total-HxCDF	47.1	<4.5
Total-HpCDF	51.5	<3.9
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	7.00	0.230
Mid Point PCDD/F TEQ (WHO 2005)	14.7	7.54
Upper Bound PCDD/F TEQ (WHO 2005)	15.6	14.8

ALS Life Sciences

Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2878273-1	WG2878273-2
Sample Size	1	1
Sample size units	sample	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	17-Sep-18	17-Sep-18
Target Analytes	**pg**	**% Rec**
2,3,7,8-TCDD	<29	85
1,2,3,7,8-PeCDD	<5.6	102
1,2,3,4,7,8-HxCDD	<13	96
1,2,3,6,7,8-HxCDD	<8.7	126
1,2,3,7,8,9-HxCDD	<9.7	123
1,2,3,4,6,7,8-HpCDD	34.9	92
OCDD	47.3	89
2,3,7,8-TCDF	<7.3	75
1,2,3,7,8-PeCDF	<5.0	98
2,3,4,7,8-PeCDF	<4.5	91
1,2,3,4,7,8-HxCDF	<8.8	87
1,2,3,6,7,8-HxCDF	<7.0	117
2,3,4,6,7,8-HxCDF	<8.1	112
1,2,3,7,8,9-HxCDF	<9.9	107
1,2,3,4,6,7,8-HpCDF	<4.0	89
1,2,3,4,7,8,9-HpCDF	<5.3	88
OCDF	<12	88
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	N/S	N/S
13C12-1,2,3,4,7,8-HxCDD	N/S	N/S
13C12-2,3,4,7,8-PeCDF	N/S	N/S
13C12-1,2,3,4,7,8-HxCDF	N/S	N/S
13C12-1,2,3,4,7,8,9-HpCDF	N/S	N/S
Extraction Standards		
13C12-2,3,7,8-TCDD	6	66
13C12-1,2,3,7,8-PeCDD	26	87
13C12-1,2,3,6,7,8-HxCDD	27	82
13C12-1,2,3,4,6,7,8-HpCDD	35	109
13C12-OCDD	33	112
13C12-2,3,7,8-TCDF	22	66
13C12-1,2,3,7,8-PeCDF	26	82
13C12-1,2,3,6,7,8-HxCDF	29	89
13C12-1,2,3,4,6,7,8-HpCDF	38	112
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	88	104
Homologue Group Totals	**pg**	
Total-TCDD	148	
Total-PeCDD	21.3	
Total-HxCDD	186	
Total-HpCDD	76.6	
Total-TCDF	<7.3	
Total-PeCDF	<5.0	
Total-HxCDF	<9.9	
Total-HpCDF	<5.3	
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.363	
Mid Point PCDD/F TEQ (WHO 2005)	22.1	
Upper Bound PCDD/F TEQ (WHO 2005)	43.8	

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1**	Sampling Date	13-Sep-18		Approved:
ALS Sample ID	L2164450-1	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	Stack	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A08
Run Date	29-Sep-18 21:17
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<4.2	4.2	U		40
1,2,3,7,8-PeCDD	1	31.92	<5.0	5.0	M,U	4.4	200
1,2,3,4,7,8-HxCDD	0.1	34.01	<13	13	M,U		200
1,2,3,6,7,8-HxCDD	0.1	34.08	22.5	8.4	M,J		200
1,2,3,7,8,9-HxCDD	0.1	34.20	<14	9.4	M,J,R	14	200
1,2,3,4,6,7,8-HpCDD	0.01	35.71	219	7.0	B		200
OCDD	0.0003	37.22	227	11	M,J,B		400
2,3,7,8-TCDF	0.1	26.68	<8.0	4.4	M,J,R	8.0	40
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.5	4.5	U		200
2,3,4,7,8-PeCDF	0.3	31.62	14.6	4.0	J		200
1,2,3,4,7,8-HxCDF	0.1	33.51	9.60	4.2	M,J		200
1,2,3,6,7,8-HxCDF	0.1	33.58	<8.4	3.4	M,J,R	8.4	200
2,3,4,6,7,8-HxCDF	0.1	33.92	20.6	3.9	J		200
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<4.7	4.7	U		200
1,2,3,4,6,7,8-HpCDF	0.01	35.15	44.4	3.5	J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<9.6	4.5	M,J,R	9.6	200
OCDF	0.0003	37.32	26.0	5.2	J		400

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	800	27.62	98	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	34.01	85	70-130
13C12-2,3,4,7,8-PeCDF	8000	31.68	98	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	33.51	84	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.94	96	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	8000	27.59	40	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.90	46	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.06	59	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.70	58	25-130
13C12-OCDD	16000	37.22	57	25-130
13C12-2,3,7,8-TCDF	8000	26.67	40	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.95	46	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.58	59	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.14	57	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	104	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	4	152	4.2	40
Total-PeCDD	5	289	5.0	200
Total-HxCDD	5	448	13	200
Total-HpCDD	2	465	7.0	200
Total-TCDF	3	30.4	4.4	40
Total-PeCDF	4	84.6	4.5	200
Total-HxCDF	4	73.4	4.7	200
Total-HpCDF	2	61.3	4.5	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	12.4
Mid Point PCDD/F TEQ (WHO 2005)	21.0
Upper Bound PCDD/F TEQ (WHO 2005)	26.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2**	Sampling Date	13-Sep-18		Approved:
ALS Sample ID	L2164450-2	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	Stack	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A09
Run Date	29-Sep-18 22:00
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<1.8	1.8	U		40
1,2,3,7,8-PeCDD	1	31.92	<5.5	1.6	J,R	5.5	200
1,2,3,4,7,8-HxCDD	0.1	34.02	12.2	3.9	J		200
1,2,3,6,7,8-HxCDD	0.1	34.06	24.3	2.5	J		200
1,2,3,7,8,9-HxCDD	0.1	34.19	17.3	2.8	M,J		200
1,2,3,4,6,7,8-HpCDD	0.01	35.70	226	2.7	B		200
OCDD	0.0003	37.20	211	3.1	J,B		400
2,3,7,8-TCDF	0.1	26.61	<8.5	2.0	M,J,R	8.5	40
1,2,3,7,8-PeCDF	0.03	30.95	7.31	1.6	J		200
2,3,4,7,8-PeCDF	0.3	31.60	13.3	1.4	J		200
1,2,3,4,7,8-HxCDF	0.1	33.51	10.2	2.6	J		200
1,2,3,6,7,8-HxCDF	0.1	33.57	<7.5	2.1	J,R	7.5	200
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.4	2.4	M,U		200
1,2,3,7,8,9-HxCDF	0.1	34.35	<4.5	3.0	M,J,R	4.5	200
1,2,3,4,6,7,8-HpCDF	0.01	35.13	41.3	0.95	J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.94	11.5	1.3	J		200
OCDF	0.0003	37.29	20.8	2.7	M,J		400

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	800	27.60	107	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	98	70-130
13C12-2,3,4,7,8-PeCDF	8000	31.67	97	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	33.50	95	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.93	102	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	8000	27.57	61	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.90	69	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	77	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.69	83	25-130
13C12-OCDD	16000	37.20	86	25-130
13C12-2,3,7,8-TCDF	8000	26.65	60	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.94	66	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.57	77	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.13	79	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	106	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	6	159	1.8	40
Total-PeCDD	7	321	1.6	200
Total-HxCDD	8	533	3.9	200
Total-HpCDD	2	467	2.7	200
Total-TCDF	4	68.8	2.0	40
Total-PeCDF	9	137	1.6	200
Total-HxCDF	4	66.2	3.0	200
Total-HpCDF	3	68.1	1.3	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	13.5
Mid Point PCDD/F TEQ (WHO 2005)	22.0
Upper Bound PCDD/F TEQ (WHO 2005)	23.1

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3**	Sampling Date	14-Sep-18		Approved:
ALS Sample ID	L2164450-3	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	Stack	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A10
Run Date	29-Sep-18 22:42
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.3	3.3	U		40
1,2,3,7,8-PeCDD	1	31.92	5.37	2.1	M,J		200
1,2,3,4,7,8-HxCDD	0.1	34.01	<10	5.3	J,R	10	200
1,2,3,6,7,8-HxCDD	0.1	34.06	<18	3.4	J,R	18	200
1,2,3,7,8,9-HxCDD	0.1	34.19	14.9	3.8	M,J		200
1,2,3,4,6,7,8-HpCDD	0.01	35.70	224	4.8	B		200
OCDD	0.0003	37.20	208	4.1	J,B		400
2,3,7,8-TCDF	0.1	NotFnd	<3.0	3.0	U		40
1,2,3,7,8-PeCDF	0.03	30.94	<3.6	2.8	M,J,R	3.6	200
2,3,4,7,8-PeCDF	0.3	31.60	11.0	2.5	J		200
1,2,3,4,7,8-HxCDF	0.1	33.51	5.97	3.8	J		200
1,2,3,6,7,8-HxCDF	0.1	33.58	6.34	3.0	J		200
2,3,4,6,7,8-HxCDF	0.1	33.90	<16	3.5	J,R	16	200
1,2,3,7,8,9-HxCDF	0.1	34.33	<4.3	4.3	U	3.9	200
1,2,3,4,6,7,8-HpCDF	0.01	35.13	36.8	1.5	J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.93	10.2	1.9	J		200
OCDF	0.0003	37.29	22.5	3.2	M,J		400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.60	99	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	99	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.67	95	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.50	87	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.93	99	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.57	64	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.89	74	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	81	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.69	89	25-130			
13C12-OCDD	16000	37.20	92	25-130			
13C12-2,3,7,8-TCDF	8000	26.65	64	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.94	72	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.56	84	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.13	85	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.32	102	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	2	150	3.3	40
Total-PeCDD	5	286	2.1	200
Total-HxCDD	4	536	5.3	200
Total-HpCDD	2	450	4.8	200
Total-TCDF	4	73.1	3.0	40
Total-PeCDF	6	98.7	2.8	200
Total-HxCDF	5	66.2	4.3	200
Total-HpCDF	3	61.9	1.9	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	14.2
Mid Point PCDD/F TEQ (WHO 2005)	20.7
Upper Bound PCDD/F TEQ (WHO 2005)	22.7

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK**	Sampling Date	14-Sep-18		Approved:
ALS Sample ID	L2164450-4	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	Stack	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A11
Run Date	29-Sep-18 23:25
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<2.9	2.9	U		40
1,2,3,7,8-PeCDD	1	NotFnd	<1.8	1.8	U		200
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<3.3	3.3	U		200
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<2.2	2.2	U		200
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<2.4	2.4	U		200
1,2,3,4,6,7,8-HpCDD	0.01	35.70	25.5	2.8	M,J,B		200
OCDD	0.0003	37.21	37.6	2.5	M,J,B		400
2,3,7,8-TCDF	0.1	NotFnd	<2.2	2.2	U		40
1,2,3,7,8-PeCDF	0.03	NotFnd	<2.5	2.5	U		200
2,3,4,7,8-PeCDF	0.3	NotFnd	<2.2	2.2	U		200
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.4	2.4	U		200
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.9	1.9	U		200
2,3,4,6,7,8-HxCDF	0.1	33.91	<2.2	2.2	M,U	2.2	200
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<2.7	2.7	U		200
1,2,3,4,6,7,8-HpCDF	0.01	35.15	<6.5	1.9	J,R	6.5	200
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.5	2.5	U		200
OCDF	0.0003	37.29	<5.2	1.8	M,J,R	5.2	400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.60	101	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	107	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.68	100	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.51	89	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.94	100	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.59	55	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.90	70	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	80	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.70	92	25-130			
13C12-OCDD	16000	37.21	93	25-130			
13C12-2,3,7,8-TCDF	8000	26.67	54	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.94	67	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.57	83	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.13	88	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	99	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<2.9	2.9	U	40
Total-PeCDD	0	<1.8	1.8	U	200
Total-HxCDD	1	41.8	3.3		200
Total-HpCDD	2	57.9	2.8		200
Total-TCDF	0	<2.2	2.2	U	40
Total-PeCDF	0	<2.5	2.5	U	200
Total-HxCDF	0	<2.7	2.7	U	200
Total-HpCDF	0	<2.5	2.5	U	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.266
Mid Point PCDD/F TEQ (WHO 2005)	4.03
Upper Bound PCDD/F TEQ (WHO 2005)	7.72

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1**	Sampling Date	13-Sep-18		
ALS Sample ID	L2164450-5	Extraction Date	17-Sep-18		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*B. Reimer*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	4		30-Sep-2018

Run Information	**Run 1**
Filename	7-180929A12
Run Date	30-Sep-18 00:08
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<1.2	1.2	U		40
1,2,3,7,8-PeCDD	1	31.90	<3.0	0.98	J,R	3.0	200
1,2,3,4,7,8-HxCDD	0.1	34.00	11.1	2.3	M,J		200
1,2,3,6,7,8-HxCDD	0.1	34.05	19.9	1.5	M,J		200
1,2,3,7,8,9-HxCDD	0.1	34.18	12.3	1.7	M,J		200
1,2,3,4,6,7,8-HpCDD	0.01	35.69	254	2.4	B		200
OCDD	0.0003	37.20	510	2.9			400
2,3,7,8-TCDF	0.1	26.65	2.12	1.3	M,J		40
1,2,3,7,8-PeCDF	0.03	30.94	<3.2	1.2	J,R	3.2	200
2,3,4,7,8-PeCDF	0.3	31.60	6.42	1.1	J		200
1,2,3,4,7,8-HxCDF	0.1	33.51	7.83	1.7	J		200
1,2,3,6,7,8-HxCDF	0.1	33.58	<6.5	1.3	M,J,R	6.5	200
2,3,4,6,7,8-HxCDF	0.1	33.91	13.4	1.5	J		200
1,2,3,7,8,9-HxCDF	0.1	34.33	<3.3	1.9	J,R	3.3	200
1,2,3,4,6,7,8-HpCDF	0.01	35.13	40.2	1.5	M,J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.93	7.55	2.0	J		200
OCDF	0.0003	37.27	33.6	1.1	M,J		400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.59	109	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.99	107	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.66	100	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.49	102	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.92	104	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.57	67	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.89	74	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.04	81	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.68	88	25-130			
13C12-OCDD	16000	37.19	91	25-130			
13C12-2,3,7,8-TCDF	8000	26.65	67	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.93	71	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.56	78	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.12	84	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.31	95	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	4	106	1.2	40
Total-PeCDD	5	200	0.98	200
Total-HxCDD	7	559	2.3	200
Total-HpCDD	2	539	2.4	200
Total-TCDF	8	47.5	1.3	40
Total-PeCDF	6	62.7	1.2	200
Total-HxCDF	6	69.1	1.9	200
Total-HpCDF	4	74.6	2.0	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	11.8
Mid Point PCDD/F TEQ (WHO 2005)	16.4
Upper Bound PCDD/F TEQ (WHO 2005)	17.0

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2**	Sampling Date	13-Sep-18		Approved:
ALS Sample ID	L2164450-6	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	Stack	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A13
Run Date	30-Sep-18 00:51
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<2.0	2.0	U		40
1,2,3,7,8-PeCDD	1	31.90	3.82	1.7	M,J		200
1,2,3,4,7,8-HxCDD	0.1	34.00	9.09	6.4	J		200
1,2,3,6,7,8-HxCDD	0.1	34.05	21.9	4.2	J		200
1,2,3,7,8,9-HxCDD	0.1	34.18	<8.4	4.6	J,R	8.4	200
1,2,3,4,6,7,8-HpCDD	0.01	35.70	269	3.1	B		200
OCDD	0.0003	37.20	519	3.6			400
2,3,7,8-TCDF	0.1	NotFnd	<1.8	1.8	U		40
1,2,3,7,8-PeCDF	0.03	30.95	<3.6	1.8	J,R	3.6	200
2,3,4,7,8-PeCDF	0.3	31.60	6.53	1.6	J		200
1,2,3,4,7,8-HxCDF	0.1	33.51	7.28	2.7	J		200
1,2,3,6,7,8-HxCDF	0.1	33.57	<6.4	2.1	J,R	6.4	200
2,3,4,6,7,8-HxCDF	0.1	33.91	12.7	2.5	J		200
1,2,3,7,8,9-HxCDF	0.1	34.33	4.18	3.0	J		200
1,2,3,4,6,7,8-HpCDF	0.01	35.13	40.2	1.8	J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.94	9.68	2.4	M,J		200
OCDF	0.0003	37.30	29.8	1.8	M,J		400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.60	105	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	110	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.67	98	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.50	92	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.93	103	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.57	84	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.89	94	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	100	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.69	111	25-130			
13C12-OCDD	16000	37.20	119	25-130			
13C12-2,3,7,8-TCDF	8000	26.65	82	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.94	93	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.56	106	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.13	109	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.32	103	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	4	114	2.0	40
Total-PeCDD	5	101	1.7	200
Total-HxCDD	5	558	6.4	200
Total-HpCDD	2	568	3.1	200
Total-TCDF	4	43.1	1.8	40
Total-PeCDF	5	47.8	1.8	200
Total-HxCDF	6	68.7	3.0	200
Total-HpCDF	4	82.4	2.4	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	14.6
Mid Point PCDD/F TEQ (WHO 2005)	17.3
Upper Bound PCDD/F TEQ (WHO 2005)	18.4

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3**	Sampling Date	14-Sep-18		
ALS Sample ID	L2164450-7	Extraction Date	17-Sep-18		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*B. Reimer*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	4		30-Sep-2018

Run Information	**Run 1**
Filename	7-180929A14
Run Date	30-Sep-18 01:33
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<1.5	1.5	U		40
1,2,3,7,8-PeCDD	1	31.92	<3.2	1.1	M,J,R	3.2	200
1,2,3,4,7,8-HxCDD	0.1	34.00	<5.8	3.2	J,R	5.8	200
1,2,3,6,7,8-HxCDD	0.1	34.06	21.7	2.1	J		200
1,2,3,7,8,9-HxCDD	0.1	34.20	11.4	2.3	J		200
1,2,3,4,6,7,8-HpCDD	0.01	35.70	213	3.3	B		200
OCDD	0.0003	37.20	378	3.3	J,B		400
2,3,7,8-TCDF	0.1	NotFnd	<1.5	1.5	U		40
1,2,3,7,8-PeCDF	0.03	30.96	2.95	1.1	M,J		200
2,3,4,7,8-PeCDF	0.3	31.60	<5.3	0.96	J,R	5.3	200
1,2,3,4,7,8-HxCDF	0.1	33.51	5.26	2.1	M,J		200
1,2,3,6,7,8-HxCDF	0.1	33.58	5.37	1.7	M,J		200
2,3,4,6,7,8-HxCDF	0.1	33.91	<11	1.9	J,R	11	200
1,2,3,7,8,9-HxCDF	0.1	34.34	<4.0	2.3	M,J,R	4.0	200
1,2,3,4,6,7,8-HpCDF	0.01	35.14	28.6	0.93	M,J		200
1,2,3,4,7,8,9-HpCDF	0.01	35.96	<5.5	1.2	M,J,R	5.5	200
OCDF	0.0003	37.29	22.7	1.6	M,J		400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.60	101	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	111	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.67	96	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.51	93	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.94	103	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.57	65	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.90	74	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	79	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.70	88	25-130			
13C12-OCDD	16000	37.20	95	25-130			
13C12-2,3,7,8-TCDF	8000	26.67	64	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.94	73	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.57	83	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.13	87	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	117	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	6	108	1.5	40
Total-PeCDD	4	196	1.1	200
Total-HxCDD	6	501	3.2	200
Total-HpCDD	2	459	3.3	200
Total-TCDF	4	31.3	1.5	40
Total-PeCDF	3	22.7	1.1	200
Total-HxCDF	5	47.1	2.3	200
Total-HpCDF	3	51.5	1.2	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	7.00
Mid Point PCDD/F TEQ (WHO 2005)	14.7
Upper Bound PCDD/F TEQ (WHO 2005)	15.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK**	Sampling Date	14-Sep-18		
ALS Sample ID	L2164450-8	Extraction Date	17-Sep-18		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*B. Reimer*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	4		30-Sep-2018

Run Information	**Run 1**
Filename	7-180929A07
Run Date	29-Sep-18 20:34
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<5.7	5.7	U		40
1,2,3,7,8-PeCDD	1	NotFnd	<4.4	4.4	U		200
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<6.0	6.0	U		200
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<3.9	3.9	U		200
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<4.3	4.3	U		200
1,2,3,4,6,7,8-HpCDD	0.01	35.72	23.0	4.6	J,B		200
OCDD	0.0003	37.22	<46	7.0	M,J,R	46	400
2,3,7,8-TCDF	0.1	NotFnd	<4.6	4.6	U		40
1,2,3,7,8-PeCDF	0.03	NotFnd	<3.4	3.4	U		200
2,3,4,7,8-PeCDF	0.3	31.68	<3.0	3.0	M,U	2.7	200
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<4.0	4.0	U		200
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<3.2	3.2	U		200
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<3.7	3.7	U		200
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<4.5	4.5	U		200
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<2.9	2.9	U		200
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<3.9	3.9	U		200
OCDF	0.0003	NotFnd	<5.6	5.6	U		400
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	800	27.62	100	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	34.00	76	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.68	102	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.51	78	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.94	98	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.60	46	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.90	58	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.05	74	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.70	75	25-130			
13C12-OCDD	16000	37.21	79	25-130			
13C12-2,3,7,8-TCDF	8000	26.68	48	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.95	55	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.57	74	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.14	73	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	75	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	0	<5.7	5.7	U	40
Total-PeCDD	0	<4.4	4.4	U	200
Total-HxCDD	0	<6.0	6.0	U	200
Total-HpCDD	1	23.0	4.6		200
Total-TCDF	0	<4.6	4.6	U	40
Total-PeCDF	0	<3.4	3.4	U	200
Total-HxCDF	0	<4.5	4.5	U	200
Total-HpCDF	0	<3.9	3.9	U	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.230
Mid Point PCDD/F TEQ (WHO 2005)	7.54
Upper Bound PCDD/F TEQ (WHO 2005)	14.8

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.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank (Media)**	Sampling Date	n/a		Approved:
ALS Sample ID	WG2878273-1	Extraction Date	17-Sep-18		*B. Reimer*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Blank	Percent Moisture	n/a		30-Sep-2018
Sample Matrix	QC	Split Ratio	4		

Run Information	**Run 1**
Filename	7-180929A05
Run Date	29-Sep-18 19:09
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<29	29	U		40
1,2,3,7,8-PeCDD	1	NotFnd	<5.6	5.6	U		200
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<13	13	U		200
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<8.7	8.7	U		200
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<9.7	9.7	U		200
1,2,3,4,6,7,8-HpCDD	0.01	35.73	34.9	8.4	M,J		200
OCDD	0.0003	37.23	47.3	10	M,J		400
2,3,7,8-TCDF	0.1	NotFnd	<7.3	7.3	U		40
1,2,3,7,8-PeCDF	0.03	NotFnd	<5.0	5.0	U		200
2,3,4,7,8-PeCDF	0.3	NotFnd	<4.5	4.5	U		200
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<8.8	8.8	U		200
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<7.0	7.0	U		200
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<8.1	8.1	U		200
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<9.9	9.9	U		200
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<4.0	4.0	U		200
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<5.3	5.3	U		200
OCDF	0.0003	NotFnd	<12	12	U		400

Field Spike Standards	**pg**	**% Rec**	**Limits**
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	8000	27.60	6	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.90	26	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.06	27	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.71	35	25-130
13C12-OCDD	16000	37.22	33	25-130
13C12-2,3,7,8-TCDF	8000	26.68	22	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.95	26	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.58	29	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.15	38	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	88	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	1	148	29		40
Total-PeCDD	1	21.3	5.6		200
Total-HxCDD	1	186	13		200
Total-HpCDD	2	76.6	8.4		200
Total-TCDF	0	<7.3	7.3	U	40
Total-PeCDF	0	<5.0	5.0	U	200
Total-HxCDF	0	<9.9	9.9	U	200
Total-HpCDF	0	<5.3	5.3	U	200

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.363
Mid Point PCDD/F TEQ (WHO 2005)	22.1
Upper Bound PCDD/F TEQ (WHO 2005)	43.8

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.
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 has not been spiked

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG2878273-2	Extraction Date	17-Sep-18		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*B. Reimer*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	4		30-Sep-2018

Run Information	**Run 1**
Filename	7-180929A02
Run Date	29-Sep-18 17:00
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MS#USR512427H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	800	27.62	85	70-130	
1,2,3,7,8-PeCDD	4000	31.92	102	70-130	
1,2,3,4,7,8-HxCDD	4000	34.02	96	70-130	
1,2,3,6,7,8-HxCDD	4000	34.07	126	70-130	
1,2,3,7,8,9-HxCDD	4000	34.20	123	70-130	
1,2,3,4,6,7,8-HpCDD	4000	35.72	92	70-130	
OCDD	8000	37.23	89	70-130	
2,3,7,8-TCDF	800	26.69	75	70-130	M
1,2,3,7,8-PeCDF	4000	30.96	98	70-130	
2,3,4,7,8-PeCDF	4000	31.69	91	70-130	
1,2,3,4,7,8-HxCDF	4000	33.52	87	70-130	
1,2,3,6,7,8-HxCDF	4000	33.58	117	70-130	
2,3,4,6,7,8-HxCDF	4000	33.92	112	70-130	
1,2,3,7,8,9-HxCDF	4000	34.34	107	70-130	
1,2,3,4,6,7,8-HpCDF	4000	35.15	89	70-130	
1,2,3,4,7,8,9-HpCDF	4000	35.96	88	70-130	
OCDF	8000	37.30	88	70-130	
Field Spike Standards	**pg**		**% Rec**	**Limits**	
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	8000	27.60	66	40-130	
13C12-1,2,3,7,8-PeCDD	8000	31.90	87	40-130	
13C12-1,2,3,6,7,8-HxCDD	8000	34.06	82	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.71	109	25-130	
13C12-OCDD	16000	37.22	112	25-130	
13C12-2,3,7,8-TCDF	8000	26.68	66	40-130	
13C12-1,2,3,7,8-PeCDF	8000	30.95	82	40-130	
13C12-1,2,3,6,7,8-HxCDF	8000	33.58	89	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.14	112	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	8000	34.33	104	40-130	

M	Indicates that a peak has been manually integrated.
NS	Indicates that this standard has not been spiked

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#:	L2164450		Mississauga, ON L5J 2Y4
Date of Report	1-Oct-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **Toxic PCB Congeners by GC/HRMS (EPA 1668C)**

For the samples 18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3 and 18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK, there appear to have been losses of selected PCBs during laboratory preparation, particularly for the poly-ortho substituted congeners. Each toxic PCB target has been calculated against an exact 13C-labelled extraction standard. These data are not expected to be biased. However, the reported recoveries of the 13C12-PCB-111 cleanup standard and the 13C12-PCB-153 field standard appear to be biased low.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1	18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2	18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3	18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK
ALS Sample ID	L2164450-1	L2164450-2	L2164450-3	L2164450-4
Sample Size	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack
Sampling Date	13-Sep-18	13-Sep-18	14-Sep-18	14-Sep-18
Extraction Date	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**	**pg**	**pg**
PCB-81	<71	<20	<23	<30
PCB-77	1700	<35	<75	<35
PCB-123	613	96.0	<120	<17
PCB-118	3160	<740	1290	<20
PCB-114	<83	<30	<50	<14
PCB-105	1400	308	463	<36
PCB-126	<91	<34	<28	<17
PCB-167	261	<17	<19	<16
PCB-156	<130	<33	<30	<17
PCB-157	<37	<13	24.5	<17
PCB-169	<22	<14	<8.1	<18
PCB-189	8.62	<6.2	<5.2	<9.7
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-153	89	100	82	86
Extraction Standards				
13C12-PCB-81	37	56	70	46
13C12-PCB-77	34	58	68	42
13C12-PCB-123	32	65	59	46
13C12-PCB-118	36	62	58	49
13C12-PCB-114	35	61	59	50
13C12-PCB-105	36	61	58	49
13C12-PCB-126	38	64	72	65
13C12-PCB-167	42	55	72	57
13C12-PCB-156	37	55	61	55
13C12-PCB-157	38	53	61	53
13C12-PCB-169	42	61	74	60
13C12-PCB-189	43	56	67	63
Cleanup Standards				
13C12-PCB-28	59	62	67	62
13C12-PCB-111	51	61	61	45
Toxic Equivalency (WHO 2005)				
Lower Bound PCB TEQ	0.333	0.0121	0.0533	0.00
Mid Point PCB TEQ	5.23	1.95	1.59	1.98
Upper Bound PCB TEQ	10.1	3.87	3.12	2.26

ALS Life Sciences

Sample Analysis summary Report

Sample Name	18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1	18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2	18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3	18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK
ALS Sample ID	L2164450-5	L2164450-6	L2164450-7	L2164450-8
Sample Size	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack
Sampling Date	13-Sep-18	13-Sep-18	14-Sep-18	14-Sep-18
Extraction Date	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**	**pg**	**pg**
PCB-81	<57	<92	<19	<20
PCB-77	<74	1200	367	<25
PCB-123	344	1410	<88	<8.6
PCB-118	2330	10400	713	<42
PCB-114	71.0	<360	30.4	<7.0
PCB-105	615	3160	328	26.1
PCB-126	<80	<350	<16	<7.2
PCB-167	<19	<21	<54	<23
PCB-156	<46	<73	<36	<11
PCB-157	<12	<25	<17	<5.1
PCB-169	<12	<24	<19	<5.4
PCB-189	<8.3	<11	<15	<3.2
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-153	76	90	22	54
Extraction Standards				
13C12-PCB-81	57	99	52	64
13C12-PCB-77	56	88	52	62
13C12-PCB-123	51	71	40	45
13C12-PCB-118	50	66	47	52
13C12-PCB-114	52	67	45	52
13C12-PCB-105	51	66	45	51
13C12-PCB-126	58	76	54	60
13C12-PCB-167	62	80	16	44
13C12-PCB-156	60	76	50	59
13C12-PCB-157	58	72	51	61
13C12-PCB-169	66	87	53	66
13C12-PCB-189	62	81	32	54
Cleanup Standards				
13C12-PCB-28	75	104	44	52
13C12-PCB-111	39	55	1	9
Toxic Equivalency (WHO 2005)				
Lower Bound PCB TEQ	0.101	0.569	0.0688	0.000783
Mid Point PCB TEQ	4.30	18.5	1.96	0.449
Upper Bound PCB TEQ	8.49	36.3	2.25	0.894

ALS Life Sciences

Sample Analysis summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2878273-1	WG2878273-2
Sample Size	1	1
Sample size units	Sample	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	17-Sep-18	17-Sep-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**% Rec**
PCB-81	<81	79
PCB-77	<100	107
PCB-123	<52	97
PCB-118	<41	100
PCB-114	<46	99
PCB-105	<48	106
PCB-126	<49	104
PCB-167	<42	84
PCB-156	<44	96
PCB-157	<47	95
PCB-169	<52	97
PCB-189	<34	92
Field Spikes	**% Rec**	**% Rec**
13C12-PCB-153	NS	NS
Extraction Standards		
13C12-PCB-81	16	45
13C12-PCB-77	16	44
13C12-PCB-123	19	58
13C12-PCB-118	20	59
13C12-PCB-114	19	60
13C12-PCB-105	19	60
13C12-PCB-126	22	68
13C12-PCB-167	23	77
13C12-PCB-156	23	72
13C12-PCB-157	22	72
13C12-PCB-169	24	79
13C12-PCB-189	24	79
Cleanup Standards		
13C12-PCB-28	29	26
13C12-PCB-111	31	35
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.00	
Mid Point PCB TEQ	3.25	
Upper Bound PCB TEQ	6.50	

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(1 THRU S) #1 APC OUTLET TEST#1**	Sampling Date	13-Sep-18	
ALS Sample ID	L2164450-1	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS021
Run Date	24-Sep-18 21:55
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<71	71	U
PCB-77	0.0001	7.06	1700	90	
PCB-123	0.00003	7.34	613	95	
PCB-118	0.00003	7.41	3160	76	
PCB-114	0.00003	NotFnd	<83	83	U
PCB-105	0.00003	7.80	1400	83	
PCB-126	0.1	NotFnd	<91	91	U
PCB-167	0.00003	8.56	261	19	
PCB-156	0.00003	8.96	<130	22	M,R
PCB-157	0.00003	9.04	<37	21	J,R
PCB-169	0.03	NotFnd	<22	22	U
PCB-189	0.00003	10.12	8.62	6.6	M,J
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.72	89	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.91	37	10-145	
13C12-PCB-77	8000	7.06	34	10-145	
13C12-PCB-123	8000	7.35	32	10-145	
13C12-PCB-118	8000	7.40	36	10-145	
13C12-PCB-114	8000	7.56	35	10-145	M,R
13C12-PCB-105	8000	7.79	36	10-145	
13C12-PCB-126	8000	8.31	38	10-145	
13C12-PCB-167	8000	8.59	42	10-145	
13C12-PCB-156	8000	8.94	37	10-145	
13C12-PCB-157	8000	9.02	38	10-145	M,R
13C12-PCB-169	8000	9.56	42	10-145	
13C12-PCB-189	8000	10.13	43	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	59	5-145	
13C12-PCB-111	10000	6.84	51	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.333
Mid Point PCB TEQ	5.23
Upper Bound PCB TEQ	10.1

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2**	Sampling Date	13-Sep-18	
ALS Sample ID	L2164450-2	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS022
Run Date	24-Sep-18 22:13
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<20	20	U
PCB-77	0.0001	7.07	<35	22	M,J,R
PCB-123	0.00003	7.34	96.0	32	
PCB-118	0.00003	7.42	<740	27	M,R
PCB-114	0.00003	7.57	<30	30	J,R
PCB-105	0.00003	7.80	308	31	
PCB-126	0.1	NotFnd	<34	34	U
PCB-167	0.00003	8.61	<17	12	M,J,R
PCB-156	0.00003	8.95	<33	13	M,J,R
PCB-157	0.00003	NotFnd	<13	13	U
PCB-169	0.03	NotFnd	<14	14	U
PCB-189	0.00003	10.14	<6.2	5.2	M,J,R
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.72	100	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.92	56	10-145	
13C12-PCB-77	8000	7.06	58	10-145	
13C12-PCB-123	8000	7.36	65	10-145	
13C12-PCB-118	8000	7.41	62	10-145	
13C12-PCB-114	8000	7.57	61	10-145	
13C12-PCB-105	8000	7.80	61	10-145	
13C12-PCB-126	8000	8.32	64	10-145	
13C12-PCB-167	8000	8.60	55	10-145	
13C12-PCB-156	8000	8.95	55	10-145	
13C12-PCB-157	8000	9.02	53	10-145	
13C12-PCB-169	8000	9.56	61	10-145	M,R
13C12-PCB-189	8000	10.14	56	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	62	5-145	
13C12-PCB-111	10000	6.84	61	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0121
Mid Point PCB TEQ	1.95
Upper Bound PCB TEQ	3.87

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3**	Sampling Date	14-Sep-18	
ALS Sample ID	L2164450-3	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS023
Run Date	24-Sep-18 22:31
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<23	23	U
PCB-77	0.0001	7.06	<75	28	R
PCB-123	0.00003	7.34	<120	34	M,R
PCB-118	0.00003	7.42	1290	27	M
PCB-114	0.00003	7.59	<50	31	M,J,R
PCB-105	0.00003	7.80	463	32	M
PCB-126	0.1	8.32	<28	28	U
PCB-167	0.00003	8.60	<19	6.7	M,J,R
PCB-156	0.00003	8.97	<30	8.2	J,R
PCB-157	0.00003	9.03	24.5	8.3	J
PCB-169	0.03	9.61	<8.1	8.1	M,U
PCB-189	0.00003	10.14	<5.2	5.2	M,U

Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.71	82	70-130	

Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.91	70	10-145	
13C12-PCB-77	8000	7.06	68	10-145	
13C12-PCB-123	8000	7.36	59	10-145	
13C12-PCB-118	8000	7.41	58	10-145	
13C12-PCB-114	8000	7.56	59	10-145	
13C12-PCB-105	8000	7.80	58	10-145	
13C12-PCB-126	8000	8.32	72	10-145	
13C12-PCB-167	8000	8.60	72	10-145	
13C12-PCB-156	8000	8.95	61	10-145	R
13C12-PCB-157	8000	9.03	61	10-145	
13C12-PCB-169	8000	9.57	74	10-145	
13C12-PCB-189	8000	10.14	67	10-145	

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.03	67	5-145
13C12-PCB-111	10000	6.84	61	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0533
Mid Point PCB TEQ	1.59
Upper Bound PCB TEQ	3.12

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK**	Sampling Date	14-Sep-18	
ALS Sample ID	L2164450-4	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS024
Run Date	24-Sep-18 22:49
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<30	30	U
PCB-77	0.0001	NotFnd	<35	35	U
PCB-123	0.00003	NotFnd	<17	17	U
PCB-118	0.00003	7.43	<20	13	J,R
PCB-114	0.00003	NotFnd	<14	14	U
PCB-105	0.00003	7.81	<36	15	J,R
PCB-126	0.1	8.30	<17	13	M,J,R
PCB-167	0.00003	NotFnd	<16	16	U
PCB-156	0.00003	NotFnd	<17	17	U
PCB-157	0.00003	NotFnd	<17	17	U
PCB-169	0.03	NotFnd	<18	18	U
PCB-189	0.00003	NotFnd	<9.7	9.7	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-153	8000	7.72	86	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.92	46	10-145
13C12-PCB-77	8000	7.06	42	10-145
13C12-PCB-123	8000	7.36	46	10-145
13C12-PCB-118	8000	7.41	49	10-145
13C12-PCB-114	8000	7.57	50	10-145
13C12-PCB-105	8000	7.80	49	10-145
13C12-PCB-126	8000	8.32	65	10-145
13C12-PCB-167	8000	8.59	57	10-145
13C12-PCB-156	8000	8.95	55	10-145
13C12-PCB-157	8000	9.03	53	10-145
13C12-PCB-169	8000	9.56	60	10-145
13C12-PCB-189	8000	10.14	63	10-145

Cleanup Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-28	10000	5.03	62	5-145
13C12-PCB-111	10000	6.84	45	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	1.98
Upper Bound PCB TEQ	2.26

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
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1**	Sampling Date	13-Sep-18	
ALS Sample ID	L2164450-5	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS025
Run Date	24-Sep-18 23:07
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<57	57	U
PCB-77	0.0001	7.07	<74	65	R
PCB-123	0.00003	7.34	344	40	
PCB-118	0.00003	7.42	2330	32	
PCB-114	0.00003	7.57	71.0	36	M
PCB-105	0.00003	7.80	615	37	
PCB-126	0.1	NotFnd	<80	80	U
PCB-167	0.00003	8.60	<19	11	M,J,R
PCB-156	0.00003	8.95	<46	12	J,R
PCB-157	0.00003	NotFnd	<12	12	U
PCB-169	0.03	NotFnd	<12	12	U
PCB-189	0.00003	NotFnd	<8.3	8.3	U
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.72	76	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.92	57	10-145	
13C12-PCB-77	8000	7.06	56	10-145	
13C12-PCB-123	8000	7.36	51	10-145	
13C12-PCB-118	8000	7.41	50	10-145	
13C12-PCB-114	8000	7.57	52	10-145	
13C12-PCB-105	8000	7.80	51	10-145	
13C12-PCB-126	8000	8.32	58	10-145	
13C12-PCB-167	8000	8.60	62	10-145	
13C12-PCB-156	8000	8.95	60	10-145	R
13C12-PCB-157	8000	9.03	58	10-145	
13C12-PCB-169	8000	9.56	66	10-145	M
13C12-PCB-189	8000	10.14	62	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	75	5-145	
13C12-PCB-111	10000	6.84	39	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.101
Mid Point PCB TEQ	4.30
Upper Bound PCB TEQ	8.49

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2**	Sampling Date	13-Sep-18	
ALS Sample ID	L2164450-6	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS026
Run Date	24-Sep-18 23:26
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.93	<92	92	U
PCB-77	0.0001	7.06	1200	120	
PCB-123	0.00003	7.34	1410	400	
PCB-118	0.00003	7.42	10400	310	
PCB-114	0.00003	7.57	<360	360	U
PCB-105	0.00003	7.80	3160	380	
PCB-126	0.1	NotFnd	<350	350	U
PCB-167	0.00003	NotFnd	<21	21	U
PCB-156	0.00003	8.95	<73	23	R
PCB-157	0.00003	NotFnd	<25	25	U
PCB-169	0.03	NotFnd	<24	24	U
PCB-189	0.00003	10.14	<11	11	M,U
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.71	90	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.91	99	10-145	
13C12-PCB-77	8000	7.05	88	10-145	
13C12-PCB-123	8000	7.36	71	10-145	
13C12-PCB-118	8000	7.41	66	10-145	
13C12-PCB-114	8000	7.56	67	10-145	
13C12-PCB-105	8000	7.80	66	10-145	
13C12-PCB-126	8000	8.32	76	10-145	
13C12-PCB-167	8000	8.59	80	10-145	
13C12-PCB-156	8000	8.95	76	10-145	R
13C12-PCB-157	8000	9.02	72	10-145	
13C12-PCB-169	8000	9.56	87	10-145	M,R
13C12-PCB-189	8000	10.14	81	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	104	5-145	
13C12-PCB-111	10000	6.84	55	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.569
Mid Point PCB TEQ	18.5
Upper Bound PCB TEQ	36.3

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 DL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3**	Sampling Date	14-Sep-18	
ALS Sample ID	L2164450-7	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS027
Run Date	24-Sep-18 23:43
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<19	19	U
PCB-77	0.0001	7.07	367	22	
PCB-123	0.00003	7.35	<88	17	M,R
PCB-118	0.00003	7.42	713	13	
PCB-114	0.00003	7.59	30.4	14	J
PCB-105	0.00003	7.81	328	14	
PCB-126	0.1	8.33	<16	14	M,J,R
PCB-167	0.00003	8.58	<54	52	M,J,R
PCB-156	0.00003	8.97	<36	17	J,R
PCB-157	0.00003	NotFnd	<17	17	U
PCB-169	0.03	NotFnd	<19	19	U
PCB-189	0.00003	NotFnd	<15	15	U
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.73	22	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.92	52	10-145	
13C12-PCB-77	8000	7.07	52	10-145	
13C12-PCB-123	8000	7.36	40	10-145	
13C12-PCB-118	8000	7.41	47	10-145	
13C12-PCB-114	8000	7.57	45	10-145	
13C12-PCB-105	8000	7.80	45	10-145	
13C12-PCB-126	8000	8.32	54	10-145	
13C12-PCB-167	8000	8.60	16	10-145	M,R
13C12-PCB-156	8000	8.95	50	10-145	R
13C12-PCB-157	8000	9.03	51	10-145	M,R
13C12-PCB-169	8000	9.58	53	10-145	M,R
13C12-PCB-189	8000	10.14	32	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.04	44	5-145	
13C12-PCB-111	10000	6.85	1	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0688
Mid Point PCB TEQ	1.96
Upper Bound PCB TEQ	2.25

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK**	Sampling Date	14-Sep-18	
ALS Sample ID	L2164450-8	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*N. Vithanage*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS028
Run Date	24-Sep-18 00:02
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags
PCB-81	0.0003	NotFnd	<20	20	U
PCB-77	0.0001	NotFnd	<25	25	U
PCB-123	0.00003	NotFnd	<8.6	8.6	U
PCB-118	0.00003	7.41	<42	6.8	J,R
PCB-114	0.00003	NotFnd	<7.0	7.0	U
PCB-105	0.00003	7.80	26.1	7.3	J
PCB-126	0.1	8.32	<7.2	7.2	M,U
PCB-167	0.00003	8.58	<23	6.9	M,J,R
PCB-156	0.00003	8.95	<11	5.2	M,J,R
PCB-157	0.00003	NotFnd	<5.1	5.1	U
PCB-169	0.03	NotFnd	<5.4	5.4	U
PCB-189	0.00003	10.12	<3.2	2.6	M,J,R
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	8000	7.71	54	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.91	64	10-145	
13C12-PCB-77	8000	7.06	62	10-145	
13C12-PCB-123	8000	7.34	45	10-145	
13C12-PCB-118	8000	7.41	52	10-145	
13C12-PCB-114	8000	7.56	52	10-145	
13C12-PCB-105	8000	7.79	51	10-145	
13C12-PCB-126	8000	8.31	60	10-145	
13C12-PCB-167	8000	8.58	44	10-145	
13C12-PCB-156	8000	8.94	59	10-145	
13C12-PCB-157	8000	9.02	61	10-145	
13C12-PCB-169	8000	9.56	66	10-145	M
13C12-PCB-189	8000	10.12	54	10-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.02	52	5-145	
13C12-PCB-111	10000	6.83	9	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.000783
Mid Point PCB TEQ	0.449
Upper Bound PCB TEQ	0.894

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2878273-1	Extraction Date	17-Sep-18		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Sample	*N. Vithanage*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS007
Run Date	24-Sep-18 17:42
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<81	81	U
PCB-77	0.0001	NotFnd	<100	100	U
PCB-123	0.00003	NotFnd	<52	52	U
PCB-118	0.00003	7.41	<41	41	M,U
PCB-114	0.00003	NotFnd	<46	46	U
PCB-105	0.00003	NotFnd	<48	48	U
PCB-126	0.1	NotFnd	<49	49	U
PCB-167	0.00003	NotFnd	<42	42	U
PCB-156	0.00003	NotFnd	<44	44	U
PCB-157	0.00003	NotFnd	<47	47	U
PCB-169	0.03	NotFnd	<52	52	U
PCB-189	0.00003	NotFnd	<34	34	U

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-153	0	NS	

Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.92	16	10-145	
13C12-PCB-77	8000	7.07	16	10-145	M,R
13C12-PCB-123	8000	7.36	19	10-145	
13C12-PCB-118	8000	7.41	20	10-145	
13C12-PCB-114	8000	7.57	19	10-145	
13C12-PCB-105	8000	7.80	19	10-145	
13C12-PCB-126	8000	8.32	22	10-145	
13C12-PCB-167	8000	8.60	23	10-145	M,R
13C12-PCB-156	8000	8.95	23	10-145	
13C12-PCB-157	8000	9.02	22	10-145	
13C12-PCB-169	8000	9.56	24	10-145	
13C12-PCB-189	8000	10.13	24	10-145	

Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.04	29	5-145	R
13C12-PCB-111	10000	6.85	31	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	3.25
Upper Bound PCB TEQ	6.50

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this standard has not been spiked.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a	
ALS Sample ID	WG2878273-2	Extraction Date	17-Sep-18	Approved:
Analysis Method	EPA 1668C	Sample Size	1 n/a	*N. Vithanage*
Analysis Type	LCS	Percent Moisture	n/a	--e-signature--
Sample Matrix	QC	Split Ratio	1	28-Sep-2018

Run Information	**Run 1**
Filename	1-180924AS003
Run Date	24-Sep-18 16:30
Final Volume	25 uL
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS-1 DB5MSUSP758026H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-81	4000	6.92	79	60-135	M,R
PCB-77	4000	7.07	107	60-135	
PCB-123	4000	7.37	97	60-135	M
PCB-118	4000	7.42	100	60-135	M
PCB-114	4000	7.57	99	60-135	
PCB-105	4000	7.80	106	60-135	
PCB-126	4000	8.32	104	60-135	
PCB-167	4000	8.60	84	60-135	
PCB-156	4000	8.95	96	60-135	
PCB-157	4000	9.03	95	60-135	
PCB-169	4000	9.56	97	60-135	
PCB-189	4000	10.14	92	60-135	
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-153	0		NS		
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.92	45	40-145	
13C12-PCB-77	8000	7.06	44	40-145	
13C12-PCB-123	8000	7.36	58	40-145	
13C12-PCB-118	8000	7.41	59	40-145	
13C12-PCB-114	8000	7.57	60	40-145	M,R
13C12-PCB-105	8000	7.80	60	40-145	
13C12-PCB-126	8000	8.32	68	40-145	
13C12-PCB-167	8000	8.60	77	40-145	
13C12-PCB-156	8000	8.95	72	40-145	R
13C12-PCB-157	8000	9.02	72	40-145	M,R
13C12-PCB-169	8000	9.56	79	40-145	
13C12-PCB-189	8000	10.13	79	40-145	
Cleanup Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-28	10000	5.03	26	15-145	
13C12-PCB-111	10000	6.84	35	40-145	

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 standard has not been spiked.

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#:	L2164450		Mississauga, ON L5J 2Y4
Date of Report	28-Sep-18		(905)822-4120
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **CB by LRGC/MS - Isotope dilution**

For the XAD-containing method blank, the mono- and dichlorobenzenes were not recovered and have not been reported. The tri- and tetrachlorobenzenes were poorly recovered. As a result, the detection limit has been elevated. However, the recoveries for the reagent method blank, which has been though the entire analytical procedure, but without the addition of XAD, are within limits. In addition, there are two field blanks that demonstrate that there is no undue laboratory background.

Certified by: Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank		18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1		18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2		18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3		18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK	
ALS Sample ID	WG2878273-1		WG2878273-4		L2164450-1		L2164450-2		L2164450-3		L2164450-4	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	QC		QC		Stack		Stack		Stack		Stack	
Sampling Date	n/a		n/a		13-Sep-18		13-Sep-18		14-Sep-18		14-Sep-18	
Extraction Date	17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	-	NQ	<10	U	1970		1430		1370		<10	U
1,3-Dichlorobenzene	-	NQ	<10	U	274		251		276		<10	U
1,4-Dichlorobenzene	-	NQ	<10	U	184		166		160		31.7	
1,2-Dichlorobenzene	-	NQ	<10	U	147		132		116		<10	U
1,3,5-Trichlorobenzene	<50	U	<10	U	19.7		18.9		19.5		<10	U
1,2,4-Trichlorobenzene	<50	U	<10	U	35.7	M	38.3	M	49.1	M	<10	U
1,2,3-Trichlorobenzene	<50	U	<10	U	19.1		26.8		17.4		<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<50	U	<10	U	17.4		20.1		18.5		<10	U
1,2,3,4-Tetrachlorobenzene	<50	U	<10	U	<10	U	<10	U	<10	U	<10	U
Pentachlorobenzene	<10	U	<10	U	13.3		17.5		14.3		<10	U
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	NS		NS		114		118		116		112	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	2		97		43		42		124		47	
13C6-1,4-Dichlorobenzene	0		94		60		48		66		52	
13C6-1,2,3-Trichlorobenzene	7		80		56		46		124		49	
13C6-1,2,3,4-Tetrachlorobenzene	8		67		48		38		44		44	
13C6-Pentachlorobenzene	16		92		69		55		60		60	
13C6-Hexachlorobenzene	24		95		75		60		64		64	

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.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1		18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2		18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3		18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK		Laboratory Control Sample	
ALS Sample ID	L2164450-5		L2164450-6		L2164450-7		L2164450-8		WG2878273-2	
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	13-Sep-18		13-Sep-18		14-Sep-18		14-Sep-18		n/a	
Extraction Date	17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
Chlorobenzene	2160		1820		1380		<10	U	NS	
1,3-Dichlorobenzene	299		230		195		<10	U	118	
1,4-Dichlorobenzene	248		173		130		42.3		101	
1,2-Dichlorobenzene	270		120		90.5		<10	U	90	
1,3,5-Trichlorobenzene	14.2		14.1		13.2	M	<10	U	94	
1,2,4-Trichlorobenzene	46.3		47.2		24	M	<10	U	100	
1,2,3-Trichlorobenzene	15.3		14.3		<10	U	<10	U	96	
1,2,3,5/1,2,4,5-Tetrachlorobenzene	12.7		12.7		11.1		<10	U	117	
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	115	
Pentachlorobenzene	<10	U	10.4		<10	U	<10	U	118	
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	116	
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	111		117		110		117		NS	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	48		60		103		64		79	
13C6-1,4-Dichlorobenzene	32		84		72		69		76	
13C6-1,2,3-Trichlorobenzene	56		79		123		63		79	R
13C6-1,2,3,4-Tetrachlorobenzene	49		69		52		53		57	
13C6-Pentachlorobenzene	71		94		71		73		79	
13C6-Hexachlorobenzene	79		104		77		79		85	

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**	Sampling Date	n/a
ALS Sample ID	WG2878273-1	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	XAD		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092607.D
Run Date	9/26/2018 17:38
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	-	NQ
1,3-Dichlorobenzene	NotFnd	-	NQ
1,4-Dichlorobenzene	6.72	-	NQ
1,2-Dichlorobenzene	NotFnd	-	NQ
1,3,5-Trichlorobenzene	NotFnd	<50	U
1,2,4-Trichlorobenzene	NotFnd	<50	U
1,2,3-Trichlorobenzene	NotFnd	<50	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<50	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<50	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	0		NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	200	4.54	2 M	R
13C6-1,4-Dichlorobenzene	200	NotFnd	0 M	R
13C6-1,2,3-Trichlorobenzene	200	9.06	7	
13C6-1,2,3,4-Tetrachlorobenzene	200	10.76	8	
13C6-Pentachlorobenzene	200	12.06	16	
13C6-Hexachlorobenzene	200	13.68	24	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
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**	Sampling Date	n/a
ALS Sample ID	WG2878273-4	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Reagent		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092608.D
Run Date	9/26/2018 18:00
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	6.75	<10	U
1,2-Dichlorobenzene	6.93	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	9.05	<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	0		NS

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.58	97
13C6-1,4-Dichlorobenzene	200	6.75	94
13C6-1,2,3-Trichlorobenzene	200	9.06	80
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	67
13C6-Pentachlorobenzene	200	12.06	92
13C6-Hexachlorobenzene	200	13.68	95

U	Indicates that this compound was not detected above the MDL.
NS	Indicates that this compound was not spiked in.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-1	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092611.D
Run Date	9/26/2018 19:05
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.52	1970	
1,3-Dichlorobenzene	6.65	274	
1,4-Dichlorobenzene	6.74	184	
1,2-Dichlorobenzene	7.02	147	
1,3,5-Trichlorobenzene	8.15	19.7	
1,2,4-Trichlorobenzene	8.66	35.7	M
1,2,3-Trichlorobenzene	9.06	19.1	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.26	17.4	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	13.3	
Hexachlorobenzene	13.68	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.06	114

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.52	43
13C6-1,4-Dichlorobenzene	200	6.74	60
13C6-1,2,3-Trichlorobenzene	200	9.06	56
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	48
13C6-Pentachlorobenzene	200	12.06	69
13C6-Hexachlorobenzene	200	13.68	75

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-2	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092612.D
Run Date	9/26/2018 19:27
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.53	1430	
1,3-Dichlorobenzene	6.65	251	
1,4-Dichlorobenzene	6.74	166	
1,2-Dichlorobenzene	7.02	132	
1,3,5-Trichlorobenzene	8.15	18.9	
1,2,4-Trichlorobenzene	8.66	38.3	M
1,2,3-Trichlorobenzene	9.05	26.8	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.26	20.1	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	17.5	
Hexachlorobenzene	13.68	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.05	118

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.53	42
13C6-1,4-Dichlorobenzene	200	6.73	48
13C6-1,2,3-Trichlorobenzene	200	9.06	46
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	38
13C6-Pentachlorobenzene	200	12.06	55
13C6-Hexachlorobenzene	200	13.68	60

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-3	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092613.D
Run Date	9/26/2018 19:49
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.59	1370	
1,3-Dichlorobenzene	6.66	276	
1,4-Dichlorobenzene	6.74	160	
1,2-Dichlorobenzene	7.02	116	
1,3,5-Trichlorobenzene	8.15	19.5	
1,2,4-Trichlorobenzene	8.67	49.1	M
1,2,3-Trichlorobenzene	9.06	17.4	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.26	18.5	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	14.3	
Hexachlorobenzene	13.69	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.05	116

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.58	124
13C6-1,4-Dichlorobenzene	200	6.74	66
13C6-1,2,3-Trichlorobenzene	200	9.06	124
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	44
13C6-Pentachlorobenzene	200	12.06	60
13C6-Hexachlorobenzene	200	13.68	64

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-4	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092609.D
Run Date	9/26/2018 18:22
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	6.68	<10	U
1,4-Dichlorobenzene	6.75	31.7	
1,2-Dichlorobenzene	7.03	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	9.05	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.24	<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	400	10.06	112

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.55	47
13C6-1,4-Dichlorobenzene	200	6.75	52
13C6-1,2,3-Trichlorobenzene	200	9.06	49
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	44
13C6-Pentachlorobenzene	200	12.06	60
13C6-Hexachlorobenzene	200	13.68	64

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-5	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092614.D
Run Date	9/26/2018 20:11
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.61	2160	
1,3-Dichlorobenzene	6.67	299	
1,4-Dichlorobenzene	6.75	248	
1,2-Dichlorobenzene	7.03	270	
1,3,5-Trichlorobenzene	8.15	14.2	
1,2,4-Trichlorobenzene	8.67	46.3	
1,2,3-Trichlorobenzene	9.06	15.3	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.24	12.7	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	<10	U
Hexachlorobenzene	13.68	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.05	111

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.61	48
13C6-1,4-Dichlorobenzene	200	6.75	32
13C6-1,2,3-Trichlorobenzene	200	9.06	56
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	49
13C6-Pentachlorobenzene	200	12.06	71
13C6-Hexachlorobenzene	200	13.68	79

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-6	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092615.D
Run Date	9/26/2018 20:33
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.59	1820	
1,3-Dichlorobenzene	6.68	230	
1,4-Dichlorobenzene	6.75	173	
1,2-Dichlorobenzene	7.03	120	
1,3,5-Trichlorobenzene	8.15	14.1	
1,2,4-Trichlorobenzene	8.67	47.2	
1,2,3-Trichlorobenzene	9.06	14.3	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.26	12.7	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	10.4	
Hexachlorobenzene	13.68	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.05	117

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.58	60
13C6-1,4-Dichlorobenzene	200	6.75	84
13C6-1,2,3-Trichlorobenzene	200	9.06	79
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	69
13C6-Pentachlorobenzene	200	12.06	94
13C6-Hexachlorobenzene	200	13.68	104

U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-7	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092616.D
Run Date	9/26/2018 20:56
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.59	1380	
1,3-Dichlorobenzene	6.67	195	
1,4-Dichlorobenzene	6.75	130	
1,2-Dichlorobenzene	7.02	90.5	
1,3,5-Trichlorobenzene	8.15	13.2	M
1,2,4-Trichlorobenzene	8.67	24	M
1,2,3-Trichlorobenzene	9.06	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.25	11.1	
1,2,3,4-Tetrachlorobenzene	10.75	<10	U
Pentachlorobenzene	12.06	<10	U
Hexachlorobenzene	13.68	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.05	110

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.59	103
13C6-1,4-Dichlorobenzene	200	6.75	72
13C6-1,2,3-Trichlorobenzene	200	9.06	123
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	52
13C6-Pentachlorobenzene	200	12.06	71
13C6-Hexachlorobenzene	200	13.68	77

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-8	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092610.D
Run Date	9/26/2018 18:43
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	6.76	42.3	
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	400	10.06	117

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.55	64
13C6-1,4-Dichlorobenzene	200	6.75	69
13C6-1,2,3-Trichlorobenzene	200	9.07	63
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	53
13C6-Pentachlorobenzene	200	12.06	73
13C6-Hexachlorobenzene	200	13.68	79

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	WG2878273-2	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
28-Sep-2018

Run Information	**Run 1**
Filename	18092605.D
Run Date	9/26/2018 16:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR326465H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	200	6.69	118	
1,4-Dichlorobenzene	200	6.77	101	
1,2-Dichlorobenzene	200	7.04	90	
1,3,5-Trichlorobenzene	200	8.16	94	
1,2,4-Trichlorobenzene	200	8.67	100	
1,2,3-Trichlorobenzene	200	9.07	96	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	400	10.26	117	
1,2,3,4-Tetrachlorobenzene	200	10.75	115	
Pentachlorobenzene	200	12.06	118	
Hexachlorobenzene	200	13.68	116	
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	0		NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	200	4.58	79	
13C6-1,4-Dichlorobenzene	200	6.77	76	
13C6-1,2,3-Trichlorobenzene	200	9.07	79	M R
13C6-1,2,3,4-Tetrachlorobenzene	200	10.75	57	
13C6-Pentachlorobenzene	200	12.06	79	
13C6-Hexachlorobenzene	200	13.68	85	

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.

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#:	L2164450		Mlssissauga, ON L5J 2Y4
Date of Report	1-Oct-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Data are not corrected for extraction standard recoveries.
Poor LCS recoveries on 2,6-Dichlorophenol indicates a potential low bias to this target in the sample data.

The Unit #2 Test 1 and 2 samples showed poor and inconsistent extraction standard recoveries. They also showed an absence of field spike recoveries. Therefore the overall target chlorophenol values are suspect and maybe compromised.
Poor recoveries of phenols from XAD2 is commonly observed.

Certified by:

Ron McLeod, PhD
Laboratory Manager and Technical Director

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank	18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1	18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2	18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3	18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK
ALS Sample ID	WG2878273-4	L2164450-1	L2164450-2	L2164450-3	L2164450-4
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	13-Sep-18	13-Sep-18	14-Sep-18	14-Sep-18
Extraction Date	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18
Target Analytes	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**
2-Chlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
3-Chlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
4-Chlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,6-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,4/2,5-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
3,5-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,3-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
3,4-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,4,6-Trichlorophenol	<50 U	71.3	64.5	64.6	<50 U
2,3,6-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,4,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,4-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
3,4,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,4,5-Tetrachlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
Pentachlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U
Extraction Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
2-Fluorophenol	11	38 M	26	36 M	27 M
d5-Phenol	27 M	40 M	33 M,R	39 M,R	65 M,R
d4-2-Chlorophenol	27	53	42	46 M	33 M
2,4,6-Tribromophenol	12	45	40	40	40 M
13C-Pentachlorophenol	27	11	13	25	33 M
Field Spike	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	n/s	42	37	38	31 M

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.
n/s	Not Spiked

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1		18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2		18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3		18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK		Laboratory Control Sample	
ALS Sample ID	L2164450-5		L2164450-6		L2164450-7		L2164450-8		WG2878273-2	
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	Stack		Stack		Stack		Stack		QC	
Sampling Date	13-Sep-18		13-Sep-18		14-Sep-18		14-Sep-18		n/a	
Extraction Date	17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
2-Chlorophenol	<50	U	<50	U, X	<50	U	<50	U	21	
3-Chlorophenol	<50	U	<50	U, X	<50	U	<50	U	60	
4-Chlorophenol	<50	U	<50	U, X	<50	U	<50	U	48	
2,6-Dichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	5	M,R
2,4/2,5-Dichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	41	
3,5-Dichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	69	
2,3-Dichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	69	
3,4-Dichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	65	
2,4,6-Trichlorophenol	<50	U, X	<50	U, X	61.6		<50	U	30	
2,3,6-Trichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	42	
2,3,5-Trichlorophenol	75.4	EMPC, X	69.2	EMPC, X	<50	U	<50	U	69	M,R
2,4,5-Trichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	56	
2,3,4-Trichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	57	
3,4,5-Trichlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	66	
2,3,5,6/2,3,4,6-Tetrachlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	65	M
2,3,4,5-Tetrachlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	64	
Pentachlorophenol	<50	U, X	<50	U, X	<50	U	<50	U	57	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2-Fluorophenol	7	M	3	M,R	48	M	33		9	
d5-Phenol	28	M	4	R	73	M,R	38	R	38	M
d4-2-Chlorophenol	29	R	18	R	69	M	46		35	R
2,4,6-Tribromophenol	1		1		54		54		34	
13C-Pentachlorophenol	26		9	M	38		53		47	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	1	R	0	M,R	38		21			

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
EMPC	This result is an Estimated Maximum Possible Concentration (EMPC) due to interference or positive id criterion failure
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
X	Value suspect due to poor recoveries of selected extraction standard and absence of recovery of field spikes

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2878273-4	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092812.D
Run Date	9/28/2018 15:45
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.03	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	8.37	<50	U
2,6-Dichlorophenol	9.32	<50	U
2,4/2,5-Dichlorophenol	NotFnd	<50	U
3,5-Dichlorophenol	9.67	<50	U
2,3-Dichlorophenol	NotFnd	<50	U
3,4-Dichlorophenol	NotFnd	<50	U
2,4,6-Trichlorophenol	NotFnd	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	13.58	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.31	11	
d5-Phenol	800	6.42	27	M
d4-2-Chlorophenol	800	8.02	27	
2,4,6-Tribromophenol	800	12.94	12	
13C-Pentachlorophenol	800	13.59	27	

Field Spike		**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	0	n/s

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
n/s	Not Spiked

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-1	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092815.D
Run Date	9/28/2018 17:00
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		8.04	<50	U
3-Chlorophenol		8.34	<50	U
4-Chlorophenol		8.40	<50	U
2,6-Dichlorophenol		9.36	<50	U
2,4/2,5-Dichlorophenol		9.56	<50	U
3,5-Dichlorophenol		9.68	<50	U
2,3-Dichlorophenol		9.90	<50	U
3,4-Dichlorophenol		NotFnd	<50	U
2,4,6-Trichlorophenol		10.48	71.3	
2,3,6-Trichlorophenol		10.90	<50	U
2,3,5-Trichlorophenol		10.94	<50	U
2,4,5-Trichlorophenol		NotFnd	<50	U
2,3,4-Trichlorophenol		NotFnd	<50	U
3,4,5-Trichlorophenol		11.51	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		12.13	<50	U
2,3,4,5-Tetrachlorophenol		12.62	<50	U
Pentachlorophenol		13.55	<50	U
Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.44	38	M
d5-Phenol	800	6.53	40	M
d4-2-Chlorophenol	800	8.05	53	
2,4,6-Tribromophenol	800	12.94	45	
13C-Pentachlorophenol	800	13.59	11	
Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	800	8.67	42	

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	**18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-2	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092816.D
Run Date	9/28/2018 17:25
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<50	U
3-Chlorophenol		8.33	<50	U
4-Chlorophenol		8.39	<50	U
2,6-Dichlorophenol		9.38	<50	U
2,4/2,5-Dichlorophenol		9.56	<50	U
3,5-Dichlorophenol		9.68	<50	U
2,3-Dichlorophenol		9.88	<50	U
3,4-Dichlorophenol		10.13	<50	U
2,4,6-Trichlorophenol		10.48	64.5	
2,3,6-Trichlorophenol		NotFnd	<50	U
2,3,5-Trichlorophenol		10.94	<50	U
2,4,5-Trichlorophenol		11.02	<50	U
2,3,4-Trichlorophenol		NotFnd	<50	U
3,4,5-Trichlorophenol		11.51	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		12.12	<50	U
2,3,4,5-Tetrachlorophenol		12.62	<50	U
Pentachlorophenol		13.58	<50	U
Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.39	26	
d5-Phenol	800	6.48	33	M R
d4-2-Chlorophenol	800	8.04	42	
2,4,6-Tribromophenol	800	12.94	40	
13C-Pentachlorophenol	800	13.59	13	
Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	800	8.66	37	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-3	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092817.D
Run Date	9/28/2018 17:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.06	<50	U
3-Chlorophenol	8.37	<50	U
4-Chlorophenol	8.43	<50	U
2,6-Dichlorophenol	9.38	<50	U
2,4/2,5-Dichlorophenol	9.57	<50	U
3,5-Dichlorophenol	9.69	<50	U
2,3-Dichlorophenol	9.89	<50	U
3,4-Dichlorophenol	10.12	<50	U
2,4,6-Trichlorophenol	10.49	64.6	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	10.95	<50	U
2,4,5-Trichlorophenol	11.02	<50	U
2,3,4-Trichlorophenol	11.42	<50	U
3,4,5-Trichlorophenol	11.51	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.13	<50	U
2,3,4,5-Tetrachlorophenol	12.63	<50	U
Pentachlorophenol	13.59	<50	U

Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.56	36	M	
d5-Phenol	800	6.64	39	M	R
d4-2-Chlorophenol	800	8.09	46	M	
2,4,6-Tribromophenol	800	12.94	40		
13C-Pentachlorophenol	800	13.59	25		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.69	38

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-4	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092813.D
Run Date	9/28/2018 16:10
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	NotFnd	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	NotFnd	<50	U
2,6-Dichlorophenol	NotFnd	<50	U
2,4/2,5-Dichlorophenol	9.59	<50	U
3,5-Dichlorophenol	9.70	<50	U
2,3-Dichlorophenol	NotFnd	<50	U
3,4-Dichlorophenol	10.15	<50	U
2,4,6-Trichlorophenol	10.50	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	10.96	<50	U
2,4,5-Trichlorophenol	11.03	<50	U
2,3,4-Trichlorophenol	11.38	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	12.62	<50	U
Pentachlorophenol	13.56	<50	U

Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.80	27	M	
d5-Phenol	800	6.85	65	M	R
d4-2-Chlorophenol	800	8.14	33	M	
2,4,6-Tribromophenol	800	12.94	40	M	
13C-Pentachlorophenol	800	13.16	33	M	

Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	800	8.73	31	M	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-5	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092818.D
Run Date	9/28/2018 18:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol	8.04	<50	U	
3-Chlorophenol	8.34	<50	U	
4-Chlorophenol	8.40	<50	U	X
2,6-Dichlorophenol	9.38	<50	U	X
2,4/2,5-Dichlorophenol	9.56	<50	U	X
3,5-Dichlorophenol	9.68	<50	U	X
2,3-Dichlorophenol	9.88	<50	U	X
3,4-Dichlorophenol	10.15	<50	U	X
2,4,6-Trichlorophenol	10.47	<50	U	X
2,3,6-Trichlorophenol	10.90	<50	U	X
2,3,5-Trichlorophenol	10.94	75.4	R	X
2,4,5-Trichlorophenol	11.02	<50	U	X
2,3,4-Trichlorophenol	NotFnd	<50	U	X
3,4,5-Trichlorophenol	11.51	<50	U	X
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U	X
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U	X
Pentachlorophenol	13.59	<50	U	X

Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.43	7	M	
d5-Phenol	800	6.52	28	M	
d4-2-Chlorophenol	800	8.05	29	R	
2,4,6-Tribromophenol	800	12.94	1		
13C-Pentachlorophenol	800	13.59	26		

Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	800	8.58	1	R

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
EMPC	This result is an Estimated Maximum Possible Concentration (EMPC) due to interference or positive id criterion failure
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
X	Value suspect due to poor recoveries of selected extraction standard and absence of recovery of field spikes

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-6	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092819.D
Run Date	9/28/2018 18:40
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
2-Chlorophenol	8.04	<50	U	X
3-Chlorophenol	8.33	<50	U	X
4-Chlorophenol	8.38	<50	U	X
2,6-Dichlorophenol	9.33	<50	U	X
2,4/2,5-Dichlorophenol	9.54	<50	U	X
3,5-Dichlorophenol	9.68	<50	U	X
2,3-Dichlorophenol	9.88	<50	U	X
3,4-Dichlorophenol	10.15	<50	U	X
2,4,6-Trichlorophenol	10.47	<50	U	X
2,3,6-Trichlorophenol	10.90	<50	U	X
2,3,5-Trichlorophenol	10.94	69.2	R	X
2,4,5-Trichlorophenol	11.02	<50	U	X
2,3,4-Trichlorophenol	11.38	<50	U	X
3,4,5-Trichlorophenol	11.51	<50	U	X
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U	X
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U	X
Pentachlorophenol	NotFnd	<50	U	X

Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.40	3	M	R
d5-Phenol	800	6.50	4		R
d4-2-Chlorophenol	800	8.06	18		R
2,4,6-Tribromophenol	800	12.94	1		
13C-Pentachlorophenol	800	13.15	9	M	

Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	0	M	R

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
EMPC	This result is an Estimated Maximum Possible Concentration (EMPC) due to interference or positive id criterion failure
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
X	Value suspect due to poor recoveries of selected extraction standard and absence of recovery of field spikes

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-7	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092820.D
Run Date	9/28/2018 19:05
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.06	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	8.39	<50	U
2,6-Dichlorophenol	9.38	<50	U
2,4/2,5-Dichlorophenol	9.58	<50	U
3,5-Dichlorophenol	9.70	<50	U
2,3-Dichlorophenol	NotFnd	<50	U
3,4-Dichlorophenol	NotFnd	<50	U
2,4,6-Trichlorophenol	10.49	61.6	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	10.95	<50	U
2,4,5-Trichlorophenol	11.02	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	11.51	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.13	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	13.59	<50	U

Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.65	48	M	
d5-Phenol	800	6.72	73	M	R
d4-2-Chlorophenol	800	8.12	69	M	
2,4,6-Tribromophenol	800	12.94	54		
13C-Pentachlorophenol	800	13.59	38		

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.71	38

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-8	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092814.D
Run Date	9/28/2018 16:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.03	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	8.39	<50	U
2,6-Dichlorophenol	9.38	<50	U
2,4/2,5-Dichlorophenol	9.54	<50	U
3,5-Dichlorophenol	9.67	<50	U
2,3-Dichlorophenol	9.88	<50	U
3,4-Dichlorophenol	10.13	<50	U
2,4,6-Trichlorophenol	10.48	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	11.02	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	12.63	<50	U
Pentachlorophenol	NotFnd	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.38	33	
d5-Phenol	800	6.48	38	R
d4-2-Chlorophenol	800	8.04	46	
2,4,6-Tribromophenol	800	12.94	54	
13C-Pentachlorophenol	800	13.59	53	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.66	21

U	Indicates that this compound was not detected above the LOR.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2878273-2	Extraction Date	17-Sep-18
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092809.D
Run Date	9/28/2018 14:30
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-4
Column	HP-5MS USR326446H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**	
2-Chlorophenol	800	8.04	21		
3-Chlorophenol	800	8.31	60		
4-Chlorophenol	800	8.38	48		
2,6-Dichlorophenol	800	9.35	5	M	R
2,4/2,5-Dichlorophenol	1600	9.55	41		
3,5-Dichlorophenol	800	9.68	69		
2,3-Dichlorophenol	800	9.87	69		
3,4-Dichlorophenol	800	10.11	65		
2,4,6-Trichlorophenol	800	10.48	30		
2,3,6-Trichlorophenol	800	10.89	42		
2,3,5-Trichlorophenol	800	10.96	69	M	R
2,4,5-Trichlorophenol	800	11.02	56		
2,3,4-Trichlorophenol	800	11.41	57		
3,4,5-Trichlorophenol	800	11.53	66		
2,3,5,6/2,3,4,6-Tetrachlorophenol	1600	12.12	65	M	
2,3,4,5-Tetrachlorophenol	800	12.62	64		
Pentachlorophenol	800	13.59	57		
Extraction Standards			**% Rec**		
2-Fluorophenol	800	6.32	9		
d5-Phenol	800	6.43	38	M	
d4-2-Chlorophenol	800	8.03	35		R
2,4,6-Tribromophenol	800	12.93	34		
13C-Pentachlorophenol	800	13.59	47		
Field Spike			**% Rec**		
2,6-Dichloro-4-Fluorophenol(FS)	0		n/s		

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.
n/s	Not Spiked

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#:	L2164450		Mississauga, ON L5J 2Y4
Date of Report	1-Oct-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

Certified by:

Ron McLeod, Ph.D.
Technical Director

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank	18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1	18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2	18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3	18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK
ALS Sample ID	WG2878273-4	L2164450-1	L2164450-2	L2164450-3	L2164450-4
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	13-Sep-18	13-Sep-18	14-Sep-18	14-Sep-18
Extraction Date	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18	17-Sep-18

Target Analytes	ng/sample		ng/sample		ng/sample		ng/sample		ng/sample	
Naphthalene	<10	U	111	M	388		116		42.6	M
2-Methylnaphthalene	<10	U	29.3		41.9	M,R	27.6	R	<10	U
1-Methylnaphthalene	<10	U	18.4		26.0		23.2		<10	U
Acenaphthylene	<10	U	<10	U	<10	U	<10	U	<10	U
Acenaphthene	<10	U	21.4	M,R	11.4	M	10.6	R	14.8	R
Fluorene	<10	U	51.7		19.4	M	27.4		<10	U
Phenanthrene	13.4	R	219		65.6		66.3		37.2	M
Anthracene	<10	U	13.2	M	<10	U	11.0	R	<10	U
Fluoranthene	20.4		55.0		29.0		21.2	M	30.0	M
Pyrene	20.2	M	43.4	R	47.1	R	38.5	M,R	35.2	M
Benzo(a)Anthracene	<10	U	<10	U	<10	U	<10	U	<10	U
Chrysene/Triphenylene/Benzo(b)anthr	<10	U	16.9	R	<10	U	<10	U	11.2	M,R
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(j/k)Fluoranthene	<10	U	10.7	M,R	60.5	R	38.5	R	<10	U
Benzo(e)Pyrene	<10	U	22.3	M	20.3	M,R	14.2	M,R	<10	U
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	<10	U
Perylene	<10	U	<10	U	62.6	R	34.6	R	<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	55.6	M	39.3	M	87.0		<10	U
Additional Analytes										
Tetralin	<10	U	210	M,R	176	R	107	R	73.4	R
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U	<10	U
Biphenyl	<10	U	48.2	M	149		23.0		<10	U
o-Terphenyl	<10	U	<10	U	<10	U	<10	U	<10	U
1-Methylphenanthrene	<10	U	19.8	R	35.2	R	31.1	R	<10	U
9-Methylphenanthrene	<10	U	15.8		<10	U	25.8	R	<10	U
2-methylanthracene	<10	U	31.2		<10	U	<10	U	<10	U
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U	<10	U
m-terphenyl	<10	U	55.2		<10	U	<10	U	<10	U
p-terphenyl	<10	U	11.9	R	<10	U	13.6		<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	n/s		103.3		106.7		97.4		105	
Fluorene D10	n/s		102.6		100.9		102.2		107.5	
Terphenyl D14(Surr.)	n/s		110.5	M	111.7	M	110.6		112.4	
Extraction Standards	% Rec		% Rec		% Rec		% Rec		% Rec	
Naphthalene D8	102.0		63.3	M	55.3	M	65.2		63.4	
2-Methylnaphthalene-D10	95.8		69.2		59.6		71.9		66.5	
Acenaphthylene D8	100.2		78.4		62.2		72.6		67.1	
Phenanthrene D10	102.8		67.3		56.1		61.2		62.8	
Anthracene-D10	110.0		85.6		68.1		74.4		66.6	
Fluoranthene D10	100.5		80.9	M	63.7	M	72.6		67.6	
Benz(a)Anthracene-D12	90.1		87.3		76.1	M	94.3		68.6	
Chrysene D12	81.1		73.2		59.6	M	71.1		59.7	
Benzo(b)Fluoranthene-D12	94.7		81.4		62.8	M	68.1		66.5	
Benzo(k)Fluoranthene-D12	112.2		92.6		76.1	M	82.7		70.9	M
Benzo(a)Pyrene D12	114.9	M	97.5		85.9	M	91.1	M	89.1	M
Perylene D12	123.3		106.3		101.5	M	98.8		95.8	
Indeno(1,2,3,cd)Pyrene-D12	107.4		79.7	M	69.0	M	68.3	M	69.6	M
Dibenz(a,h)Anthracene-D14	103.9		73.5		63.5		68.6		64.4	
Benzo(g,h,i)Perylene D12	108.2		75.9		63.3		64.6		65.9	

U Indicates that this compound was not detected above the LOD.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1		18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2		18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3		18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK		Laboratory Control Sample	
ALS Sample ID	L2164450-5		L2164450-6		L2164450-7		L2164450-8		WG2878273-2	
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	13-Sep-18		13-Sep-18		14-Sep-18		14-Sep-18		n/a	
Extraction Date	17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18		17-Sep-18	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**%**	
Naphthalene	79.8	M	175	M	92.5		34.6	M	102.2	
2-Methylnaphthalene	17.6		38.5	M	20.0	M	<10	U	108.7	
1-Methylnaphthalene	14.8		21.8		17.1		<10	U	88.6	
Acenaphthylene	<10	U	<10	U	<10	U	<10	U	96.7	
Acenaphthene	<10	U	17.7	M,R	10.5	R	10.0	M	108.8	
Fluorene	19.7	R	57.7		10.0	M	<10	U	97.3	
Phenanthrene	86.8		305		54.5		72.1		98.5	
Anthracene	11.1	M	23.2		<10	U	<10	U	92.9	
Fluoranthene	29.8		72.3		23.4	M	53.9	M	98.2	
Pyrene	36.6	R	52.8	R	31.8	R	66.9	M	96.1	
Benzo(a)Anthracene	<10	U	<10	U	<10	U	13.3	M	92.6	
Chrysene/Triphenylene/Benzo(b)anthr	<10	U	<10	U	<10	U	17.8	M	101.4	
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	94.4	
Benzo(j/k)Fluoranthene	22.0	R	22.5	M,R	<10	U	<10	U	107.2	
Benzo(e)Pyrene	14.3	R	17.7	R	<10	U	<10	U	94.6	
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	95.6	
Perylene	<10	U	<10	U	<10	U	<10	U	97.7	
Indeno(1,2,3-cd)Pyrene	<10	U	<10	U	14.0	M,R	<10	U	91.7	
Dibenzo(a,c/a,h)Anthracene	<10	U	<10	U	<10	U	<10	U	98.5	
Benzo(g,h,i)Perylene	27.9		18.7	M	17.8		<10	U	91.3	
Additional Analytes										
Tetralin	198	R	182	R	137	M,R	69.1	R		
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U		
Biphenyl	20.8	R	46.3	M	29.2	M	<10	U		
o-Terphenyl	<10	U	<10	U	<10	U	<10	U		
1-Methylphenanthrene	24.8	R	32.4	R	26.2	R	<10	U		
9-Methylphenanthrene	25.5	M	41.8	R	34.7	R	<10	U		
2-methylanthracene	<10	U	<10	U	<10	U	<10	U		
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U		
m-terphenyl	<10	U	15.1	M	<10	U	<10	U		
p-terphenyl	<10	U	<10	U	<10	U	<10	U		
Benzo(a)fluorene	<10	U	<10	U	<10	U	<10	U		
Benzo(b)fluorene	<10	U	<10	U	<10	U	<10	U		
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U	<10	U		
3-Methylcholanthrene	<50	U	<50	U	<50	U	<50	U		
Picene	<50	U	<50	U	<50	U	<50	U		
dibenzo(a,i)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**	
1-Methylnaphthalene-D10	105.4		106.2		100.2		104.2			
Fluorene D10	99.1		101.4		101.3		104.3			
Terphenyl D14(Surr.)	119		104	M	111.9		114.3			
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	70.9		85.7		75.1	M	79.4		90.9	
2-Methylnaphthalene-D10	75.5		90.4		76.3		79.4		99.7	
Acenaphthylene D8	84		109.7		94.5		84.3		90.7	
Phenanthrene D10	64.3		86.3		64.8		75.7		89.2	
Anthracene-D10	59.6		59.6		81.6		80.8		93.1	
Fluoranthene D10	76.3		107.1		82.4		84		90.6	
Benz(a)Anthracene-D12	95.7	M	111.2		101		98.6		85.4	
Chrysene D12	79		92.6		78.4	M	82.6		75.8	M
Benzo(b)Fluoranthene-D12	79.3	M	107.7	M	81.9	M	80.6	M	89.4	
Benzo(k)Fluoranthene-D12	93.5		126.6	M	102.4	M	94.8		99.4	
Benzo(a)Pyrene D12	79.5	M	70.8	M	106	M	107.4	M	103.7	M
Perylene D12	97.4		105.4	M	112.7	M	108.6		110.5	
Indeno(1,2,3,cd)Pyrene-D12	79.3	M	103.6		81	M	82.8	M	98.3	
Dibenz(a,h)Anthracene-D14	78.4		99		78.2		77.2		92.1	
Benzo(g,h,i)Perylene D12	76.8		93.4		73.9		81.1		97.1	

U Indicates that this compound was not detected above the LOD.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2878273-4	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092706.D
Run Date	9/27/2018 14:38
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	NotFnd	<10	U
2-Methylnaphthalene	NotFnd	<10	U
1-Methylnaphthalene	NotFnd	<10	U
Acenaphthylene	NotFnd	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	NotFnd	<10	U
Phenanthrene	14.19	13.4	R
Anthracene	NotFnd	<10	U
Fluoranthene	16.25	20.4	
Pyrene	16.64	20.2	M
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)ar	19.15	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/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	NotFnd	<10	U
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	NotFnd	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**	**% Rec**
1-Methylnaphthalene-D10	0	n/s
Fluorene D10	0	n/s
Terphenyl D14(Surr.)	0	n/s

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	102.0	50-150
2-Methylnaphthalene-D10	320	9.82	95.8	50-150
Acenaphthylene D8	320	11.36	100.2	50-150
Phenanthrene D10	320	14.16	102.8	50-150
Anthracene-D10	320	14.24	110.0	50-150
Fluoranthene D10	320	16.22	100.5	50-150
Benz(a)Anthracene-D12	320	19.03	90.1	50-150
Chrysene D12	320	19.10	81.1	50-150
Benzo(b)Fluoranthene-D12	320	21.24	94.7	50-150
Benzo(k)Fluoranthene-D12	320	21.30	112.2	50-150
Benzo(a)Pyrene D12	320	21.85	114.9 M	50-150
Perylene D12	320	22.00	123.3	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.87	107.4	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	103.9	50-150
Benzo(g,h,i)Perylene D12	320	24.27	108.2	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
n/s	Indicates that this standard has not been spiked

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(1 THRU 5) #1 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-1	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092709.D
Run Date	9/27/2018 16:29
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.67	111	M
2-Methylnaphthalene	9.87	29.3	
1-Methylnaphthalene	10.04	18.4	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	11.71	21.4	M R
Fluorene	12.58	51.7	
Phenanthrene	14.19	219	
Anthracene	14.27	13.2	M
Fluoranthene	16.25	55.0	
Pyrene	16.64	43.4	R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)ai	19.15	16.9	R
Benzo(b)Fluoranthene	21.30	<10	U
Benzo(j/k)Fluoranthene	21.34	10.7	M R
Benzo(e)Pyrene	21.80	22.3	M
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	22.01	<10	U
Indeno(1,2,3-cd)Pyrene	23.91	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.31	55.6	M
Additional Analytes			
Tetralin	8.43	210	M R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.70	48.2	M
o-Terphenyl	14.99	<10	U
1-Methylphenanthrene	15.16	19.8	R
9-Methylphenanthrene	15.24	15.8	
2-methylanthracene	15.28	31.2	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.84	55.2	
p-terphenyl	17.15	11.9	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	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.80	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	400	9.98	103.3	
Fluorene D10	400	12.53	102.6	
Terphenyl D14(Surr.)	400	17.10	110.5	M

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	320	8.64	63.3	M	50-150
2-Methylnaphthalene-D10	320	9.82	69.2		50-150
Acenaphthylene D8	320	11.36	78.4		50-150
Phenanthrene D10	320	14.16	67.3		50-150
Anthracene-D10	320	14.24	85.6		50-150
Fluoranthene D10	320	16.22	80.9	M	50-150
Benz(a)Anthracene-D12	320	19.03	87.3		50-150
Chrysene D12	320	19.10	73.2		50-150
Benzo(b)Fluoranthene-D12	320	21.24	81.4		50-150
Benzo(k)Fluoranthene-D12	320	21.30	92.6		50-150
Benzo(a)Pyrene D12	320	21.85	97.5		50-150
Perylene D12	320	22.01	106.3		50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	79.7	M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	73.5		50-150
Benzo(g,h,i)Perylene D12	320	24.27	75.9		50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(6 THRU 10) #1 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-2	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092710.D
Run Date	9/27/2018 17:05
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.67	388	
2-Methylnaphthalene	9.87	41.9	M R
1-Methylnaphthalene	10.04	26.0	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	11.71	11.4	M
Fluorene	12.58	19.4	M
Phenanthrene	14.19	65.6	
Anthracene	14.28	<10	U
Fluoranthene	16.25	29.0	
Pyrene	16.64	47.1	R
Benzo(a)Anthracene	19.07	<10	U
Chrysene/Triphenylene/Benzo(b)a	19.15	<10	U
Benzo(b)Fluoranthene	21.28	<10	U
Benzo(j/k)Fluoranthene	21.34	60.5	R
Benzo(e)Pyrene	21.78	20.3	M R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	22.01	62.6	R
Indeno(1,2,3-cd)Pyrene	23.92	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.32	39.3	M
Additional Analytes			
Tetralin	8.43	176	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.70	149	
o-Terphenyl	14.99	<10	U
1-Methylphenanthrene	15.16	35.2	R
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.84	<10	U
p-terphenyl	17.14	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.82	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	400	9.98	106.7
Fluorene D10	400	12.54	100.9
Terphenyl D14(Surr.)	400	17.10	111.7 M

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	55.3 M	50-150
2-Methylnaphthalene-D10	320	9.82	59.6	50-150
Acenaphthylene D8	320	11.36	62.2	50-150
Phenanthrene D10	320	14.16	56.1	50-150
Anthracene-D10	320	14.24	68.1	50-150
Fluoranthene D10	320	16.23	63.7 M	50-150
Benz(a)Anthracene-D12	320	19.03	76.1 M	50-150
Chrysene D12	320	19.10	59.6 M	50-150
Benzo(b)Fluoranthene-D12	320	21.24	62.8 M	50-150
Benzo(k)Fluoranthene-D12	320	21.30	76.1 M	50-150
Benzo(a)Pyrene D12	320	21.85	85.9 M	50-150
Perylene D12	320	22.01	101.5 M	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	69.0 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	63.5	50-150
Benzo(g,h,i)Perylene D12	320	24.28	63.3	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(11 THRU 15) #1 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-3	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092711.D
Run Date	9/27/2018 17:42
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.67	116	
2-Methylnaphthalene	9.87	27.6	R
1-Methylnaphthalene	10.04	23.2	
Acenaphthylene	11.39	<10	U
Acenaphthene	11.71	10.6	R
Fluorene	12.58	27.4	
Phenanthrene	14.19	66.3	
Anthracene	14.28	11.0	R
Fluoranthene	16.26	21.2	M
Pyrene	16.65	38.5	M R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)a	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/k)Fluoranthene	21.34	38.5	R
Benzo(e)Pyrene	21.79	14.2	M R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	22.01	34.6	R
Indeno(1,2,3-cd)Pyrene	23.92	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.32	87.0	
Additional Analytes			
Tetralin	8.43	107	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.71	23.0	
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.16	31.1	R
9-Methylphenanthrene	15.25	25.8	R
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.84	<10	U
p-terphenyl	17.17	13.6	
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.80	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	400	9.99	97.4
Fluorene D10	400	12.54	102.2
Terphenyl D14(Surr.)	400	17.10	110.6

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	65.2	50-150
2-Methylnaphthalene-D10	320	9.82	71.9	50-150
Acenaphthylene D8	320	11.37	72.6	50-150
Phenanthrene D10	320	14.16	61.2	50-150
Anthracene-D10	320	14.24	74.4	50-150
Fluoranthene D10	320	16.23	72.6	50-150
Benz(a)Anthracene-D12	320	19.03	94.3	50-150
Chrysene D12	320	19.11	71.1	50-150
Benzo(b)Fluoranthene-D12	320	21.24	68.1	50-150
Benzo(k)Fluoranthene-D12	320	21.30	82.7	50-150
Benzo(a)Pyrene D12	320	21.85	91.1 M	50-150
Perylene D12	320	22.01	98.8	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	68.3 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	68.6	50-150
Benzo(g,h,i)Perylene D12	320	24.28	64.6	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(16 THRU 20) #1 APC OUTLET BLANK**		Sampling Date	14-Sep-18	
ALS Sample ID	L2164450-4		Extraction Date	17-Sep-18	
Analysis Method	PAH by CARB 429				
Analysis Type	sample				
Sample Matrix	Stack				
Sample Size	1	sample			
Percent Moisture	n/a				
Split Ratio	4		Workgroup	WG2878273	

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092707.D
Run Date	9/27/2018 15:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.67	42.6	M
2-Methylnaphthalene	9.87	<10	U
1-Methylnaphthalene	10.04	<10	U
Acenaphthylene	NotFnd	<10	U
Acenaphthene	11.71	14.8	R
Fluorene	NotFnd	<10	U
Phenanthrene	14.20	37.2	M
Anthracene	14.27	<10	U
Fluoranthene	16.26	30.0	M
Pyrene	16.64	35.2	M
Benzo(a)Anthracene	19.07	<10	U
Chrysene/Triphenylene/Benzo(b)a	19.16	11.2	M R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/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	24.32	<10	U
Additional Analytes			
Tetralin	8.43	73.4	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.72	<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

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	400	9.98	105
Fluorene D10	400	12.54	107.5
Terphenyl D14(Surr.)	400	17.10	112.4

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	63.4	50-150
2-Methylnaphthalene-D10	320	9.82	66.5	50-150
Acenaphthylene D8	320	11.36	67.1	50-150
Phenanthrene D10	320	14.15	62.8	50-150
Anthracene-D10	320	14.24	66.6	50-150
Fluoranthene D10	320	16.22	67.6	50-150
Benz(a)Anthracene-D12	320	19.03	68.6	50-150
Chrysene D12	320	19.10	59.7	50-150
Benzo(b)Fluoranthene-D12	320	21.24	66.5	50-150
Benzo(k)Fluoranthene-D12	320	21.30	70.9 M	50-150
Benzo(a)Pyrene D12	320	21.84	89.1 M	50-150
Perylene D12	320	22.00	95.8	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	69.6 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.92	64.4	50-150
Benzo(g,h,i)Perylene D12	320	24.27	65.9	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**18-21880-SVOC-(21 THRU 25) #2 APC OUTLET TEST#1**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-5	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	Blank		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092712.D
Run Date	9/27/2018 18:19
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.67	79.8	M
2-Methylnaphthalene	9.87	17.6	
1-Methylnaphthalene	10.04	14.8	
Acenaphthylene	11.39	<10	U
Acenaphthene	11.71	<10	U
Fluorene	12.58	19.7	R
Phenanthrene	14.19	86.8	
Anthracene	14.27	11.1	M
Fluoranthene	16.26	29.8	
Pyrene	16.65	36.6	R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)ar	19.14	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/k)Fluoranthene	21.35	22.0	R
Benzo(e)Pyrene	21.80	14.3	R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.91	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.33	27.9	
Additional Analytes			
Tetralin	8.43	198	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.70	20.8	R
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.16	24.8	R
9-Methylphenanthrene	15.24	25.5	M
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.84	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	26.81	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	400	9.98	105.4
Fluorene D10	400	12.54	99.1
Terphenyl D14(Surr.)	400	17.10	119

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	70.9	50-150
2-Methylnaphthalene-D10	320	9.82	75.5	50-150
Acenaphthylene D8	320	11.37	84.0	50-150
Phenanthrene D10	320	14.16	64.3	50-150
Anthracene-D10	320	14.24	59.6	50-150
Fluoranthene D10	320	16.23	76.3	50-150
Benz(a)Anthracene-D12	320	19.03	95.7 M	50-150
Chrysene D12	320	19.10	79.0	50-150
Benzo(b)Fluoranthene-D12	320	21.25	79.3 M	50-150
Benzo(k)Fluoranthene-D12	320	21.31	93.5	50-150
Benzo(a)Pyrene D12	320	21.86	79.5 M	50-150
Perylene D12	320	22.01	97.4	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	79.3 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	78.4	50-150
Benzo(g,h,i)Perylene D12	320	24.28	76.8	50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(26 THRU 30) #2 APC OUTLET TEST#2**	Sampling Date	13-Sep-18
ALS Sample ID	L2164450-6	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092713.D
Run Date	9/27/2018 18:56
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.68	175	M
2-Methylnaphthalene	9.87	38.5	M
1-Methylnaphthalene	10.04	21.8	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	11.71	17.7	M R
Fluorene	12.58	57.7	
Phenanthrene	14.19	305	
Anthracene	14.28	23.2	
Fluoranthene	16.26	72.3	
Pyrene	16.64	52.8	R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)a	19.15	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/k)Fluoranthene	21.34	22.5	M R
Benzo(e)Pyrene	21.79	17.7	R
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.89	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.32	18.7	M
Additional Analytes			
Tetralin	8.43	182	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.70	46.3	M
o-Terphenyl	14.99	<10	U
1-Methylphenanthrene	15.16	32.4	R
9-Methylphenanthrene	15.25	41.8	R
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	16.84	15.1	M
p-terphenyl	17.14	<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	400	9.98	106.2	
Fluorene D10	400	12.54	101.4	
Terphenyl D14(Surr.)	400	17.10	104	M

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	85.7	50-150
2-Methylnaphthalene-D10	320	9.82	90.4	50-150
Acenaphthylene D8	320	11.37	109.7	50-150
Phenanthrene D10	320	14.16	86.3	50-150
Anthracene-D10	320	14.24	59.6	50-150
Fluoranthene D10	320	16.23	107.1	50-150
Benz(a)Anthracene-D12	320	19.03	111.2	50-150
Chrysene D12	320	19.11	92.6	50-150
Benzo(b)Fluoranthene-D12	320	21.25	107.7 M	50-150
Benzo(k)Fluoranthene-D12	320	21.30	126.6 M	50-150
Benzo(a)Pyrene D12	320	21.85	70.8 M	50-150
Perylene D12	320	22.01	105.4 M	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	103.6	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	99.0	50-150
Benzo(g,h,i)Perylene D12	320	24.28	93.4	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(31 THRU 35) #2 APC OUTLET TEST#3**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-7	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092714.D
Run Date	9/27/2018 19:33
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.68	92.5	
2-Methylnaphthalene	9.87	20.0	M
1-Methylnaphthalene	10.04	17.1	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	11.71	10.5	R
Fluorene	12.57	10.0	M
Phenanthrene	14.19	54.5	
Anthracene	14.27	<10	U
Fluoranthene	16.26	23.4	M
Pyrene	16.65	31.8	R
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)ar	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/k)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	21.78	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	23.93	14.0	M R
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	24.32	17.8	
Additional Analytes			
Tetralin	8.43	137	M R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.70	29.2	M
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	15.16	26.2	R
9-Methylphenanthrene	15.25	34.7	R
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	400	9.98	100.2
Fluorene D10	400	12.53	101.3
Terphenyl D14(Surr.)	400	17.10	111.9

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	75.1 M	50-150
2-Methylnaphthalene-D10	320	9.82	76.3	50-150
Acenaphthylene D8	320	11.36	94.5	50-150
Phenanthrene D10	320	14.15	64.8	50-150
Anthracene-D10	320	14.23	81.6	50-150
Fluoranthene D10	320	16.22	82.4	50-150
Benz(a)Anthracene-D12	320	19.03	101.0	50-150
Chrysene D12	320	19.11	78.4 M	50-150
Benzo(b)Fluoranthene-D12	320	21.24	81.9 M	50-150
Benzo(k)Fluoranthene-D12	320	21.30	102.4 M	50-150
Benzo(a)Pyrene D12	320	21.85	106.0 M	50-150
Perylene D12	320	22.01	112.7 M	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.89	81.0 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	78.2	50-150
Benzo(g,h,i)Perylene D12	320	24.28	73.9	50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**18-21880-SVOC-(36 THRU 40) #2 APC OUTLET BLANK**	Sampling Date	14-Sep-18
ALS Sample ID	L2164450-8	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092708.D
Run Date	9/27/2018 15:52
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	8.68	34.6	M
2-Methylnaphthalene	9.87	<10	U
1-Methylnaphthalene	10.04	<10	U
Acenaphthylene	11.39	<10	U
Acenaphthene	11.71	10.0	M
Fluorene	12.59	<10	U
Phenanthrene	14.19	72.1	
Anthracene	14.26	<10	U
Fluoranthene	16.25	53.9	M
Pyrene	16.64	66.9	M
Benzo(a)Anthracene	19.07	13.3	M
Chrysene/Triphenylene/Benzo(b)ar	19.15	17.8	M
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(j/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	8.43	69.1	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	10.71	<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

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	400	9.98	104.2
Fluorene D10	400	12.54	104.3
Terphenyl D14(Surr.)	400	17.09	114.3

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	79.4	50-150
2-Methylnaphthalene-D10	320	9.82	79.4	50-150
Acenaphthylene D8	320	11.36	84.3	50-150
Phenanthrene D10	320	14.16	75.7	50-150
Anthracene-D10	320	14.24	80.8	50-150
Fluoranthene D10	320	16.23	84.0	50-150
Benz(a)Anthracene-D12	320	19.03	98.6	50-150
Chrysene D12	320	19.10	82.6	50-150
Benzo(b)Fluoranthene-D12	320	21.24	80.6 M	50-150
Benzo(k)Fluoranthene-D12	320	21.30	94.8	50-150
Benzo(a)Pyrene D12	320	21.85	107.4 M	50-150
Perylene D12	320	22.01	108.6	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.88	82.8 M	50-150
Dibenz(a,h)Anthracene-D14	320	23.93	77.2	50-150
Benzo(g,h,i)Perylene D12	320	24.27	81.1	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2878273-2	Extraction Date	17-Sep-18
Analysis Method	PAH by CARB 429		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	4	Workgroup	WG2878273

Approved:
S. Jin
--e-signature--
29-Sep-2018

Run Information	**Run 1**
Filename	18092703.D
Run Date	9/27/2018 12:48
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-1
Column	HP-5MS USR326447H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	400	8.68	102.2		50-150
2-Methylnaphthalene	400	9.87	108.7		50-150
1-Methylnaphthalene	400	10.04	88.6		50-150
Acenaphthylene	400	11.38	96.7		50-150
Acenaphthene	400	11.71	108.8		50-150
Fluorene	400	12.57	97.3		50-150
Phenanthrene	400	14.19	98.5		50-150
Anthracene	400	14.27	92.9		50-150
Fluoranthene	400	16.25	98.2		50-150
Pyrene	400	16.64	96.1		50-150
Benzo(a)Anthracene	400	19.07	92.6		50-150
Chrysene/Triphenylene/Benzo(b)ar	400	19.14	101.4		50-150
Benzo(b)Fluoranthene	400	21.28	94.4		50-150
Benzo(j/k)Fluoranthene	400	21.33	107.2		50-150
Benzo(e)Pyrene	400	21.79	94.6		50-150
Benzo(a)Pyrene	400	21.88	95.6		50-150
Perylene	400	22.04	97.7		50-150
Indeno(1,2,3-cd)Pyrene	400	23.91	91.7		50-150
Dibenzo(a,c/a,h)Anthracene	400	23.97	98.5		50-150
Benzo(g,h,i)Perylene	400	24.31	91.3		50-150

Additional Analytes

Tetralin
2-Chloronaphthalene
Biphenyl
o-Terphenyl
1-Methylphenanthrene
9-Methylphenanthrene
2-methylanthracene
9,10-dimethylanthracene
m-terphenyl
p-terphenyl
Benzo(a)fluorene
Benzo(b)fluorene
7,12-Dimethylbenzo(a)anthracene
3-Methylcholanthrene
Picene
Dibenzo(a,e)pyrene
Coronene

Field Sampling Standards	**ng spiked**	**% Rec**
1-Methylnaphthalene-D10	0	n/s
Fluorene D10	0	n/s
Terphenyl D14(Surr.)	0	n/s

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	320	8.65	90.9	30-150
2-Methylnaphthalene-D10	320	9.82	99.7	30-150
Acenaphthylene D8	320	11.36	90.7	30-150
Phenanthrene D10	320	14.15	89.2	50-150
Anthracene-D10	320	14.24	93.1	50-150
Fluoranthene D10	320	16.22	90.6	50-150
Benz(a)Anthracene-D12	320	19.02	85.4	50-150
Chrysene D12	320	19.10	75.8 M	50-150
Benzo(b)Fluoranthene-D12	320	21.24	89.4	50-150
Benzo(k)Fluoranthene-D12	320	21.29	99.4	50-150
Benzo(a)Pyrene D12	320	21.84	103.7 M	30-150
Perylene D12	320	22.00	110.5	50-150
Indeno(1,2,3,cd)Pyrene-D12	320	23.87	98.3	50-150
Dibenz(a,h)Anthracene-D14	320	23.92	92.1	50-150
Benzo(g,h,i)Perylene D12	320	24.27	97.1	50-150

M	Indicates that a peak has been manually integrated.
n/s	Indicates that this standard has not been spiked

APPENDIX 16

Acid Gas Recovery Data Sheets
(8 pages)

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 11, 18
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_2SO_4	
Empty Wt:	664.2
Initial Wt:	775.0
Final Wt:	916.5
1 Gain:	141.5
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	581.4
Initial Wt:	682.0
Final Wt:	741.3
2 Gain:	59.3
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	612.0
Final Wt:	614.6
3 Gain:	2.6
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	426.2
With Imp. 1,2,3 Soln:	840.1
Imp. 1,2,3 Volume:	413.9
After Rinse:	959.1
Total TS3:	532.9

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	915.2
Final Wt:	927.4
4 Gain:	12.2

CWTR = 1+2+3:	203.4 ✓
WCBDA= 4:	12.2

SAMPLE ID: 18-21880-M26A- 1

Box 4

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

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 11, 18
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_2SO_4	
Empty Wt:	668.0
Initial Wt:	770.2
Final Wt:	926.5
1 Gain:	156.3
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	579.3
Initial Wt:	679.0
Final Wt:	717.9
2 Gain:	38.9
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	616.4
Final Wt:	621.3
3 Gain:	4.9
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	426.3
With Imp. 1,2,3 Soln:	827.3
Imp. 1,2,3 Volume:	401.0
After Rinse:	927.3
Total TS3:	501.0

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	973.9
Final Wt:	987.5
4 Gain:	13.6

CWTR = 1+2+3:	200.1 ✓
WCBDA= 4:	13.6

SAMPLE ID: 18-21880-M26A- 2

Bx 2

Train Loaded By:	BT
Train Recovered By:	BT
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 11/18
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_2SO_4	
Empty Wt:	664.2
Initial Wt:	771.0
Final Wt:	936.7
1 Gain:	165.7
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	581.4
Initial Wt:	679.9
Final Wt:	717.5
2 Gain:	39.6
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	612.0
Final Wt:	617.1
3 Gain:	5.1
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	426.2
With Imp. 1,2,3 Soln:	839.2
Imp. 1,2,3 Volume:	413.0
After Rinse:	951.1
Total TS3:	524.9

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	927.4
Final Wt:	938.5
4 Gain:	11.1

CWTR = 1+2+3:	210.4 ✓
WCBDA= 4:	11.1
SAMPLE ID: 18-21880-M26A-	3

Box 4

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

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 12/18
Test No.:	Blank 1
Test Location:	Blank

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:	

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	

CWTR = 1+2+3:	
WCBDA= 4:	

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.1
With Imp. 1,2,3 Soln:	384.7
Imp. 1,2,3 Volume:	102.6
After Rinse:	760.9
Total TS3:	478.8

SAMPLE ID: 18-21880-M26A- Blank 1

Train Loaded By:	AS
Train Recovered By:	AS
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 12/18
Test No.:	1
Test Location:	Unit 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	668.0
Initial Wt:	769.0
Final Wt:	877.9
1 Gain:	108.9
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	579.3
Initial Wt:	679.8
Final Wt:	725.7
2 Gain:	45.9
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	616.4
Final Wt:	622.1
3 Gain:	5.7
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	426.1
With Imp. 1,2,3 Soln:	786.4
Imp. 1,2,3 Volume:	~~146.9~~ 360.3
After Rinse:	~~833.3~~ 958.5
Total TS3:	~~507.2~~ 532.4

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	987.5
Final Wt:	1001.7
4 Gain:	14.2

CWTR = 1+2+3:	160.5 ✓
WCBDA= 4:	14.2

SAMPLE ID: 18-21880-M26A- 4

Box x 2

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

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	SEPT 12, 18
Test No.:	2
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	664.9
Initial Wt:	767.8
Final Wt:	904.8
1 Gain:	137.0
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	582.7
Initial Wt:	682.4
Final Wt:	711.1
2 Gain:	28.7
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	612.5
Final Wt:	615.2
3 Gain:	2.7
Colour:	clear

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	847.1
Final Wt:	861.9
4 Gain:	14.8

Box 4

CWTR = 1+2+3:	168.4
WCBDA= 4:	14.8

CONTAINER TS3 WEIGHTS	
Empty Wt:	427.7
With Imp. 1,2,3 Soln:	801.0
Imp. 1,2,3 Volume:	373.3
After Rinse:	906.0
Total TS3:	478.3

SAMPLE ID: 18-21880-M26A- 5

Train Loaded By:	AH
Train Recovered By:	
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 12/18
Test No.:	M26A-T3
Test Location:	Unit 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	668.8
Initial Wt:	759.1
Final Wt:	902.0
1 Gain:	142.9
Colour:	clear

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	580.9
Initial Wt:	674.7
Final Wt:	703.9
2 Gain:	29.2
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	617.9
Final Wt:	622.1
3 Gain:	4.2
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	426.7
With Imp. 1,2,3 Soln:	788.4
Imp. 1,2,3 Volume:	361.7
After Rinse:	897.2
Total TS3:	470.5

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	837.1
Final Wt:	848.8
4 Gain:	11.7

Box 2

CWTR = 1+2+3:	176.3 ✓
WCBDA= 4:	11.7

SAMPLE ID: 18-21880-M26A- 6

Train Loaded By:	AS
Train Recovered By:	AS
Recovery Witnessed By:	

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21880
Date:	Sept 12/18
Test No.:	Blank 2
Test Location:	Blank

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:	281.5
With Imp. 1,2,3 Soln:	421.7
Imp. 1,2,3 Volume:	140.2
After Rinse:	756.6
Total TS3:	475.1

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 18-21880-M26A- Blank 2

Train Loaded By:	AS
Train Recovered By:	AS
Recovery Witnessed By:	

APPENDIX 17

VOST Analytical Reports
(7 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#:	L2165270		Mississauga, ON L5J 2Y4
Date of Report	1-Oct-18		Canada
Date of Sample Receipt	17-Sep-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only

Samples L2165270-12 & L2165270-27 showed low internal standard recoveries due to instrument suppression from high levels of desorbed water. Reported values for targets on these samples are estimates.

Certified by:

Ron McLeod, Ph.D.
Technical Director

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-VOST-(1A,1B) TEST#1 PAIR#1 (#1 APC OUTLET)		18-21880-VOST-(2A,2B) TEST#1 PAIR#2 (#1 APC OUTLET)		18-21880-VOST-(3A,3B) TEST#1 PAIR#3 (#1 APC OUTLET)		18-21880-VOST-(5A,5B) TEST#2 PAIR#1 (#1 APC OUTLET)		18-21880-VOST-(6A,6B) TEST#2 PAIR#2 (#1 APC OUTLET)		18-21880-VOST-(7A,7B)TEST#2 PAIR#3 (#1 APC OUTLET)	
ALS Sample ID	L2165270-1		L2165270-2		L2165270-3		L2165270-5		L2165270-6		L2165270-7	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18	
Extraction Date	28-Sep-18		30-Sep-18		30-Sep-18		28-Sep-18		30-Sep-18		30-Sep-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	0.029		0.02		<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	0.026		<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	0.19		0.161		0.245		0.315		0.414		0.216	
Methylene Chloride	1.09		0.412		1.29		1.94		1.76		0.617	
trans,1,2-Dichloroethene	0.023		0.037		0.041		0.040		0.030		0.034	
2-Butanone	0.041		0.041		0.076		0.092		0.071		0.068	
Chloroform	0.038		0.049		0.038		0.037		0.030		0.035	
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	0.053		<0.05	U	<0.05	U
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	0.014		0.015		0.015		0.014		0.012		0.012	
Toluene	0.259		<0.05	U	<0.05	U	0.051		0.187		<0.05	U
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.022		0.022		0.014		0.012		0.010		0.012	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
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)	45.9		83.4		89.0		88.2		90.3		81.7	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	142.0		106.0		119.1		143.2		118.5		111.1	
d8-Toluene(SURR)	104.8		109.6	M	104.7		95.6		102.7		107.4	
4-Bromofluorobenzene(SURR)	68.5		65.7		74.9		75.1		67.6		66.2	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	94.8		79.6		106.5		89.7		135.1		110.9	
1,4-Difluorobenzene	87.6		99.1		123.2		87.5		138.2		123.0	
d5-Chlorobenzene	88.8		86.0		119.6		99.1		136.6		122.2	

U Indicates that this compound was not detected above the RL.

M Indicates that a peak has been manually integrated.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-VOST-(9A,9B) TEST#2 FIELD BLANK (#1 APC OUTLET)		18-21880-VOST-(10A,10B) TEST#3 PAIR#1 (#1 APC OUTLET)		18-21880-VOST-(11A,11B) TEST#3 PAIR#2 (#1 APC OUTLET)		18-21880-VOST-(12A,12B) TEST#3 PAIR#3 (#1 APC OUTLET)		18-21880-VOST-(14A,14B)TEST #3 TRIP BLANK (#1 APC OUTLET)		18-21880-VOST-(16A,16B) TEST#1 PAIR#1 (#2 APC OUTLET)	
ALS Sample ID	L2165270-9		L2165270-10		L2165270-11		L2165270-12		L2165270-14		L2165270-16	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	13-Sep-18		14-Sep-18		14-Sep-18		14-Sep-18		14-Sep-18		13-Sep-18	
Extraction Date	30-Sep-18		30-Sep-18		30-Sep-18		30-Sep-18		30-Sep-18		30-Sep-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	<0.02	U	0.051		<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	<0.1	U	0.207		0.245		0.416	X	<0.1	U	0.424	
Methylene Chloride	<0.1	U	1.88		1.85		1.66	X	<0.1	U	1.35	
trans,1,2-Dichloroethene	<0.01	U	0.026		0.024		0.025	X	<0.01	U	0.017	
2-Butanone	<0.01	U	0.14		0.107		0.322	X	<0.01	U	0.137	
Chloroform	<0.01	U	<0.01	U	0.034		0.046		<0.01	U	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	0.012	X	<0.01	U	<0.01	U
Benzene	<0.05	U	<0.05	U	<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	<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	0.013		0.011		0.022	X	<0.01	U	<0.01	U
Toluene	<0.05	U	0.183		0.304		0.062	X	<0.05	U	0.244	
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	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.058	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U	0.037	
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.019	
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)	69.1		82.2		100.7		93.3		68.5		91.4	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	104.4		119.2		118.9		116.2		111.3		115.6	
d8-Toluene(SURR)	113.5		112.1		101.6		97.8		104.0		120.6	
4-Bromofluorobenzene(SURR)	62.4		66.6		69.0		76.4		68.0		68.5	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	155.0		137.3		125.3		20.1	L	140.5		90.0	
1,4-Difluorobenzene	166.4		130.9		127.9		21.9	L	149.5		97.5	
d5-Chlorobenzene	142.2		117.1		128.4		28.5	L	151.7		85.3	

U Indicates that this compound was not detected above the RL.

L Indicates this value is below the control limit.

X Value estimated due to the low internal standard recoveries

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-VOST-(17A,17B) TEST#1 PAIR#2 (#2 APC OUTLET)		18-21880-VOST-(18A,18B) TEST#1 PAIR#3 (#2 APC OUTLET)		18-21880-VOST-(19A,19B) TEST#1 FIELD BLANK (#2 APC OUTLET)		18-21880-VOST-(21A,21B) TEST#2 PAIR#1 (#2 APC OUTLET)		18-21880-VOST-(22A,22B) TEST#2 PAIR#2 (#2 APC OUTLET)		18-21880-VOST-(23A,23B) TEST#2 PAIR#3 (#2 APC OUTLET)	
ALS Sample ID	L2165270-17		L2165270-18		L2165270-20		L2165270-21		L2165270-22		L2165270-23	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18		13-Sep-18	
Extraction Date	30-Sep-18		30-Sep-18		28-Sep-18		1-Oct-18		1-Oct-18		1-Oct-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	0.0440		<0.02	U	<0.02	U	<0.02	U	0.046	
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	0.114		0.187		<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	0.025		<0.02	U	<0.02	U	<0.02	U	0.02	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	0.02		<0.01	U	<0.01	U
Acetone	0.349		0.223		<0.1	U	0.33		0.22		0.75	
Methylene Chloride	0.274		0.395		<0.1	U	0.42		1.05		0.50	
trans,1,2-Dichloroethene	<0.01	U	0.011		<0.01	U	0.013		0.013		<0.01	U
2-Butanone	0.136		0.171		<0.01	U	0.20		0.21		0.25	
Chloroform	0.030		0.036		<0.01	U	0.028		0.033		0.028	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	0.013		<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	0.055		0.056		<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	<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	0.015		<0.01	U	0.011		0.013		<0.01	U
Toluene	0.087		0.080		<0.05	U	0.071		<0.05	U	0.070	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.047		0.047		<0.01	U	0.028		0.03		0.032	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
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)	97.1		89.7		68.1		107.9		91.9		73.8	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	111.2		127.1		116.2		120.9		116.3		106.7	
d8-Toluene(SURR)	117.9		117.7		102.8		115.3		111.4		107.7	
4-Bromofluorobenzene(SURR)	72.8		66.8		67.7		73.1		74.6		68.0	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	101.7		107.4		140.7		119.6		102.7		93.7	
1,4-Difluorobenzene	104.8		104.8		145.8		125.7		113.5		123.1	
d5-Chlorobenzene	79.9		97.8		149.4		103.9		104.2		115.4	

U Indicates that this compound was not detected above the RL.

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-21880-VOST-(25A,25B) TEST#3 PAIR#1 (#2 APC OUTLET)		18-21880-VOST-(26A,26B) TEST#3 PAIR#2 (#2 APC OUTLET)		18-21880-VOST-(27A,27B) TEST#3 PAIR#3 (#2 APC OUTLET)		18-21880-VOST-(30A,30B) TEST#3 FIELD BLANK (#2 APC OUTLET)	
ALS Sample ID	L2165270-25		L2165270-26		L2165270-27		L2165270-29	
Sample Size	1		1		1		1	
Sample units	sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a	
Matrix	VOST		VOST		VOST		VOST	
Sampling Date	14-Sep-18		14-Sep-18		14-Sep-18		14-Sep-18	
Extraction Date	1-Oct-18		1-Oct-18		1-Oct-18		28-Sep-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	0.02		<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.206		0.30		0.93	X	<0.1	U
Methylene Chloride	1.33		1.07		0.39	X	<0.1	U
trans,1,2-Dichloroethene	0.018		0.011		<0.01	U	<0.01	U
2-Butanone	0.23		0.38		0.99	X	<0.01	U
Chloroform	0.035		0.045		0.05	X	<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	0.083		0.18	X	<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	0.014		0.015		0.03	X	<0.01	U
Toluene	0.108		0.050		<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)	69.4		109.6		127.0		72.2	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	119.5		102.6		136.4		114.7	
d8-Toluene(SURR)	120.9		103.6		64.8		100.5	
4-Bromofluorobenzene(SURR)	60.8		71.7		61.4		69.3	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	78.8		74.4		7.1	L	138.1	
1,4-Difluorobenzene	91.0		104.0		6.8	L	148.9	
d5-Chlorobenzene	92.9		130.8		13.6	LR	159.0	

U Indicates that this compound was not detected above the RL.

L Indicates this value is below the control limit.

X Value estimated due to the low internal standard recoveries

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank		Laboratory Control Sample		Laboratory Control Sample	
ALS Sample ID	WG2886858-1		WG2886858-3		WG2886858-2		WG2886858-4	
Sample Size	1		1		1		1	
Sample units	sample		sample		n/a		n/a	
Moisture Content	n/a		n/a		n/a		n/a	
Matrix	QC		QC		QC		QC	
Sampling Date	n/a		n/a		n/a		n/a	
Extraction Date	28-Sep-18		30-Sep-18		28-Sep-18		30-Sep-18	
Target Analytes	**ug/sample**		**ug/sample**		**% Rec**		**% Rec**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	135.1		118	
Vinyl Chloride	<0.02	U	<0.02	U	102.6		99.5	
Bromomethane	<0.09	U	<0.09	U	103.2		140.2	
Trichlorofluoromethane	<0.02	U	<0.02	U	117		107.6	
1,1-Dichloroethene	<0.01	U	<0.01	U	77.8		88.4	
Acetone	<0.1	U	<0.1	U	66		116.6	
Methylene Chloride	<0.1	U	<0.1	U	73		86.1	
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	65.1		96.9	
2-Butanone	<0.01	U	<0.01	U	51.3		130.5	
Chloroform	<0.01	U	<0.01	U	65.7		99.9	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	75.5		110	
Carbon Tetrachloride	<0.01	U	<0.01	U	98.7		116.8	
Benzene	<0.05	U	<0.05	U	90.7		89.9	
1,2-Dichloroethane	<0.01	U	<0.01	U	75.2		102.5	
Trichloroethene	<0.01	U	<0.01	U	98.6		104.4	
1,2-Dichloropropane	<0.01	U	<0.01	U	90.8		97.8	
Bromodichloromethane	<0.01	U	<0.01	U	93		112.6	
Toluene	<0.05	U	<0.05	U	83.2		87.9	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	87.7		98.2	
Tetrachloroethene	<0.01	U	<0.01	U	86.5		104.4	
Chlorodibromomethane	<0.01	U	<0.01	U	91		104.3	
Ethylene Dibromide	<0.02	U	<0.02	U	88.4		104	
Ethylbenzene	<0.01	U	<0.01	U	99.2		94.5	
M&P-Xylene	<0.03	U	<0.03	U	101.4		92.9	
O-Xylene	<0.01	U	<0.01	U	99.3		91.6	
Styrene	<0.02	U	<0.02	U	89.4		85.5	
Bromoform	<0.01	U	<0.01	U	83.3		120	
Isopropylbenzene	<0.02	U	<0.02	U	98.7		92	
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	100.6		89.5	
1,3-Butadiene	<0.02	U	<0.02	U	n/s		n/s	
Trichlorotrifluoroethane	<0.02	U	<0.02	U	n/s		n/s	
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	70.2		60.5		125.1		90.5	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	115.3		105.7		91.2		100.4	
d8-Toluene(SURR)	106.2		112.7		110.5		104.2	
4-Bromofluorobenzene(SURR)	68.6		66.5		110.5	M	108.9	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	139.9		203.3	H	146.6		146.7	
1,4-Difluorobenzene	144.7		208.8	H	130.5		154.2	
d5-Chlorobenzene	144.6		179.2		163.8	M	188.0	

U Indicates that this compound was not detected above the RL.

M Indicates that a peak has been manually integrated.

H Indicates this value is above the control limit.

Industry Canada Industrie Canada

Certificate of Incorporation

Canada Business Corporations Act

Certificat de constitution

Loi canadienne sur les sociétés par actions

9029672 CANADA INC.

Corporate name / Dénomination sociale

902967-2

Corporation number / Numéro de société

I HEREBY CERTIFY that the above-named corporation, the articles of incorporation of which are attached, is incorporated under the *Canada Business Corporations Act*.

JE CERTIFIE que la société susmentionnée, dont les statuts constitutifs sont joints, est constituée en vertu de la *Loi canadienne sur les sociétés par actions*.

Virginie Ethier

Director / Directeur

2014-09-24

Date of Incorporation (YYYY-MM-DD)
Date de constitution (AAAA-MM-JJ)

Canada

APPENDIX 18

Aldehydes Recovery Data Sheets
(8 pages)

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	1
Test Location:	UNIT 1
Test Date:	SEPT 13, 18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.0.
Initial Mass:	118.2.
Final Mass:	121.3
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	112.4
Mass with impingers:	177.2
With Toluene rinse:	179.2
Total sample:	66.8

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.6
Initial Mass:	109.8.
Final Mass:	110.0
Gain:	0.2

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	97.9.
Initial Mass:	118.4
Final Mass:	118.2
Gain:	-0.2

Impinger 4 (Silica Gel)	
Initial Mass:	106.1.
Final Mass:	107.7
Gain:	1.6

Note: Load and recover train away from acetone

Train Loaded By:	JG/DT
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	Sept 13, 18

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	2
Test Location:	APC OUTLET UNIT #1
Test Date:	SEPTEMBER 13, 2018

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	97.9
Initial Mass:	117.7
Final Mass:	121.0
Gain:	3.3

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	111.7
Mass with impingers:	174.1
With Toluene rinse:	179.5
Total sample:	67.8

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.2
Initial Mass:	107.9
Final Mass:	108.2
Gain:	0.3

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	97.4
Initial Mass:	117.5
Final Mass:	117.7
Gain:	0.2

Impinger 4 (Silica Gel)	
Initial Mass:	107.7
Final Mass:	109.4
Gain:	1.7

Note: Load and recover train away from acetone

Train Loaded By:	
Train Recovered By:	
Recovery Witnessed By:	
Date:	SEPTEMBER 13, 2018

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	SEPT 14 18
Test Location:	UNIT 1
Test Date:	TEST 3

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	98.2
Initial Mass:	121.5
Final Mass:	124.6
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	112.3
Mass with impingers:	181.2
With Toluene rinse:	189.4
Total sample:	82.0

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.6
Initial Mass:	110.4
Final Mass:	110.7
Gain:	0.3

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	97.5
Initial Mass:	121.1
Final Mass:	120.1
Gain:	-1.0

Impinger 4 (Silica Gel)	
Initial Mass:	109.3
Final Mass:	111.4
Gain:	2.1

1 VRM

Note: Load and recover train away from acetone

Train Loaded By:	DU
Train Recovered By:	DT
Recovery Witnessed By:	
Date:	SEPT 14, 18

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	BLANK 1
Test Location:	
Test Date:	SEPT 14/18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430- BLANK 1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	117.0
Mass with impingers:	175.0
With Toluene rinse:	179.0
Total sample:	62.0

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

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	1
Test Location:	UNIT 2
Test Date:	SEPT 13/18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	90.6
Initial Mass:	110.9
Final Mass:	113.1
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	111.6
Mass with impingers:	174.6
With Toluene rinse:	191.4
Total sample:	

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.0
Initial Mass:	120.7
Final Mass:	120.8
Gain:	

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	91.8
Initial Mass:	115.3
Final Mass:	113.2
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	123.0
Final Mass:	125.4
Gain:	

2.

Note: Load and recover train away from acetone

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

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	2
Test Location:	UNIT 2
Test Date:	SEPT 13/18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430-

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	90.7~~13.9~~
Initial Mass:	112.8~~43.9~~
Final Mass:	115.0
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	111.7
Mass with impingers:	175.6
With Toluene rinse:	184.5
Total sample:	

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	91.8
Initial Mass:	113.4
Final Mass:	113.7
Gain:	

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.4
Initial Mass:	120.1
Final Mass:	120.1
Gain:	

Impinger 4 (Silica Gel)	
Initial Mass:	125.4
Final Mass:	127.5
Gain:	

2 ABS

Note: Load and recover train away from acetone

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

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	3
Test Location:	UNIT 2
Test Date:	~~Sept~~ 14/18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430- 6

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	90.7
Initial Mass:	~~91.8~~ 114.2
Final Mass:	116.8
Gain:	2.6

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	112.3
Mass with impingers:	181.0
With Toluene rinse:	186.4
Total sample:	74.1

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	~~100.4~~ 91.8
Initial Mass:	111.8
Final Mass:	111.8
Gain:	0

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	100.4
Initial Mass:	123.4
Final Mass:	123.4
Gain:	0

Impinger 4 (Silica Gel)	
Initial Mass:	127.5
Final Mass:	129.6
Gain:	1.1

ZABS

Note: Load and recover train away from acetone

Train Loaded By:	DH
Train Recovered By:	DT
Recovery Witnessed By:	—
Date:	~~Sept~~ 14/18

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21880
Test No.:	BLANK 2
Test Location:	
Test Date:	Sept 14/18

Impingers 1, 2, 3 & 4

Sample ID: 18-21880-M430- BLANK 2

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Bottle empty:	112.3
Mass with impingers:	169.8
With Toluene rinse:	174.2
Total sample:	61.9

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

APPENDIX 19

Aldehydes Analytical Reports
(22 pages)

ALS Environmental

03-Oct-2018

Lynne Wrona
ALS
1435 Norjohn Court
Unit 1
Burlington, Ontario L7L0E6

Tel: (905) 331-3111
Fax:

Re: Covanta Work Order: **1809698**

Dear Lynne,

ALS Environmental received 9 samples on 19-Sep-2018 09:46 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 21.

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: 03-Oct-18

Client: ALS
Project: Covanta
Work Order: 1809698

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1809698-01	L2165274-1	Air		9/13/2018	9/19/2018 09:46	☐
1809698-02	L2165274-2	Air		9/14/2018	9/19/2018 09:46	☐
1809698-03	L2165274-3	Air		9/14/2018	9/19/2018 09:46	☐
1809698-04	L2165274-4	Air		9/14/2018	9/19/2018 09:46	☐
1809698-05	L2165274-5	Air		9/14/2018	9/19/2018 09:46	☐
1809698-06	L2165274-6	Air		9/14/2018	9/19/2018 09:46	☐
1809698-07	L2165274-7	Air		9/14/2018	9/19/2018 09:46	☐
1809698-08	L2165274-8	Air		9/14/2018	9/19/2018 09:46	☐
1809698-09	L2165274-9	Air		9/14/2018	9/19/2018 09:46	☐

Client:	ALS
Project:	Covanta
Work Order:	1809698

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.

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-1
Collection Date: 9/13/2018

Work Order: 1809698
Lab ID: 1809698-01
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-2
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-02
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-3
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-03
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-4
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-04
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-5
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-05
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	**14**		**8.0**	**µg/sample**	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-6
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-06
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	**8.2**		**8.0**	**µg/sample**	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-7
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-07
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	**4.3**		**4.0**	**µg/sample**	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-8
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-08
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	ND		1.0	µg/sample	1	9/21/2018
Acrolein	ND		8.0	µg/sample	1	9/21/2018
formaldehyde	ND		4.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: *03-Oct-18*

Client: ALS
Project: Covanta
Sample ID: L2165274-9
Collection Date: 9/14/2018

Work Order: 1809698
Lab ID: 1809698-09
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **9/21/2018**	Analyst: **MHW**
Acetaldehyde	4.0		1.0	µg/sample	1	9/21/2018
Acrolein	2.0		1.0	µg/sample	1	9/21/2018
formaldehyde	4.3		1.0	µg/sample	1	9/21/2018

Note:

ALS Environmental

Date: 03-Oct-18

Client: ALS

Work Order: 1809698

Project: Covanta

QC BATCH REPORT

Batch ID: **53666** Instrument ID **HPLC2** Method: **CARB430**

MBLK Sample ID **MBLK-53666-53666** Units: **µg/sample** Analysis Date: **9/21/2018**

Client ID: Run ID: **HPLC2_180921D** SeqNo: **1838279** Prep Date: **9/21/2018** 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	2.0								
formaldehyde	ND	1.0								

LCS Sample ID **LCS-53666-53666** Units: **µg/sample** Analysis Date: **9/21/2018**

Client ID: Run ID: **HPLC2_180921D** SeqNo: **1838280** Prep Date: **9/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.738	1.0	4	0	68.4	70-130	0			S
Acrolein	1.002	1.0	4	0	25	70-130	0			S
formaldehyde	2.738	1.0	4	0	68.4	70-130	0			S

LCSD Sample ID **LCSD-53666-53666** Units: **µg/sample** Analysis Date: **9/21/2018**

Client ID: Run ID: **HPLC2_180921D** SeqNo: **1838289** Prep Date: **9/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.465	1.0	4	0	61.6	70-130	2.738	10.5	20	S
Acrolein	1.066	1.0	4	0	26.6	70-130	1.002	6.21	20	S
formaldehyde	2.309	1.0	4	0	57.7	70-130	2.738	17	20	S

The following samples were analyzed in this batch:

1809698-01A	1809698-02A	1809698-03A
1809698-04A	1809698-05A	1809698-06A
1809698-07A	1809698-08A	1809698-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: *03-Oct-18*

Analytical Comments

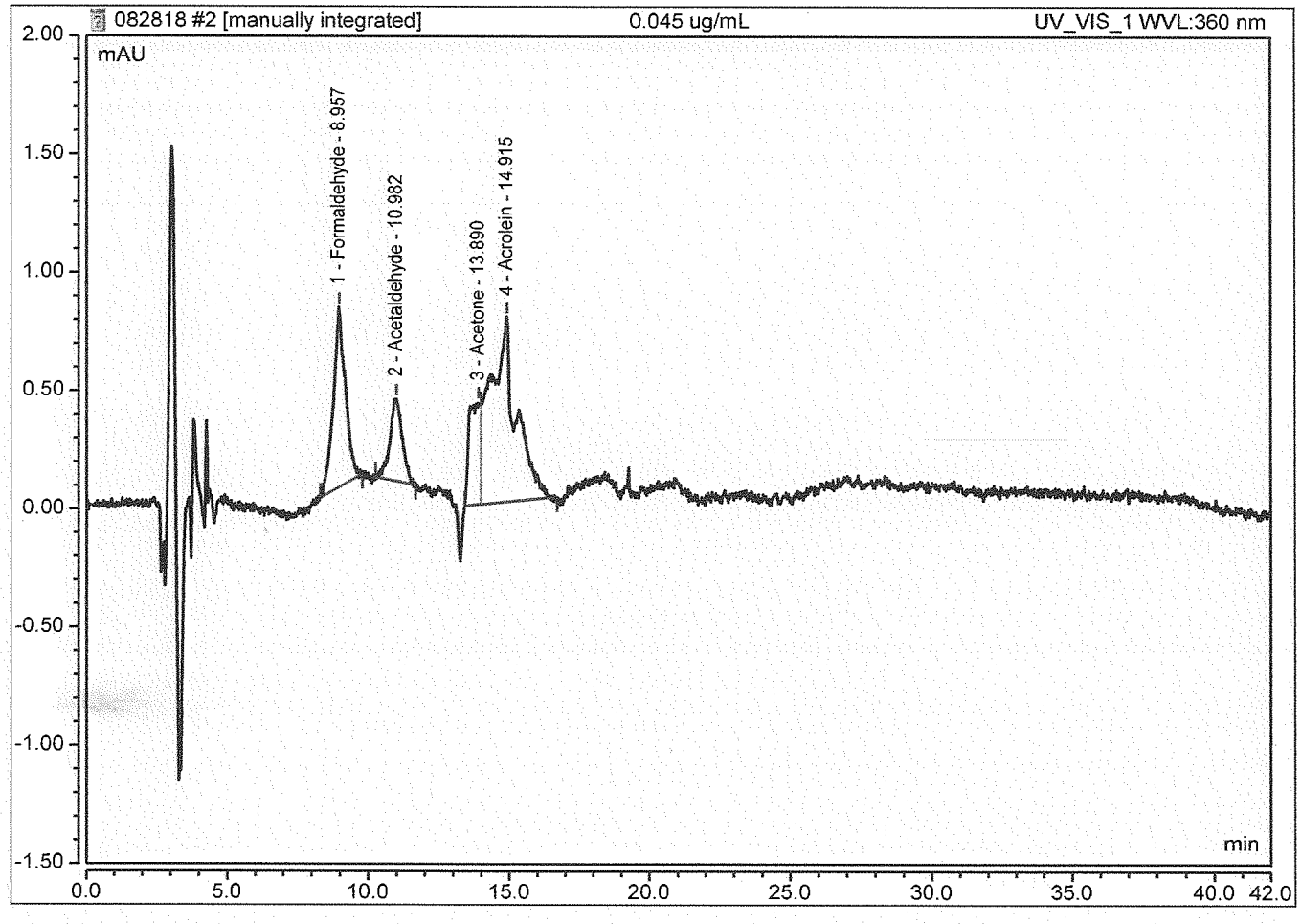
Client: ALS
Project: Covanta
Work Order: 1809698

Method	Type:	SampID	SeqNo	Analysis	Comments
Batch 53666					
	Prep	1809698-01A	0	Prep analyte(s) Liquid Chromatography	51mL DNPH solution, 17mL Toluene
	Prep	1809698-02A	0	Prep analyte(s) Liquid Chromatography	48mL DNPH, 20mL Tol
	Prep	1809698-03A	0	Prep analyte(s) Liquid Chromatography	57mL DNPH, 21mL Tol
	Prep	1809698-04A	0	Prep analyte(s) Liquid Chromatography	43mL DNPH, 20mL Tol
	Prep	1809698-05A	0	Prep analyte(s) Liquid Chromatography	65mL DNPH, 35mL Tol
	Prep	1809698-06A	0	Prep analyte(s) Liquid Chromatography	53mL DNPH, 21mL Tol
	Prep	1809698-07A	0	Prep analyte(s) Liquid Chromatography	55mL DNPH, 19mL Tol
	Prep	1809698-08A	0	Prep analyte(s) Liquid Chromatography	43mL DNPH, 19mL Tol

Peak Integration Report

Sample Name:	**0.045 ug/mL**	*Inj. Vol.:*	**25.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Instrument Method:	**Aldehyde Scan_THF Ultracarb**	*Operator:*	**ALCNC.HPLC01**
Inj. Date / Time:	**28-Aug-2018 / 17:16**	*Run Time:*	**42.01**

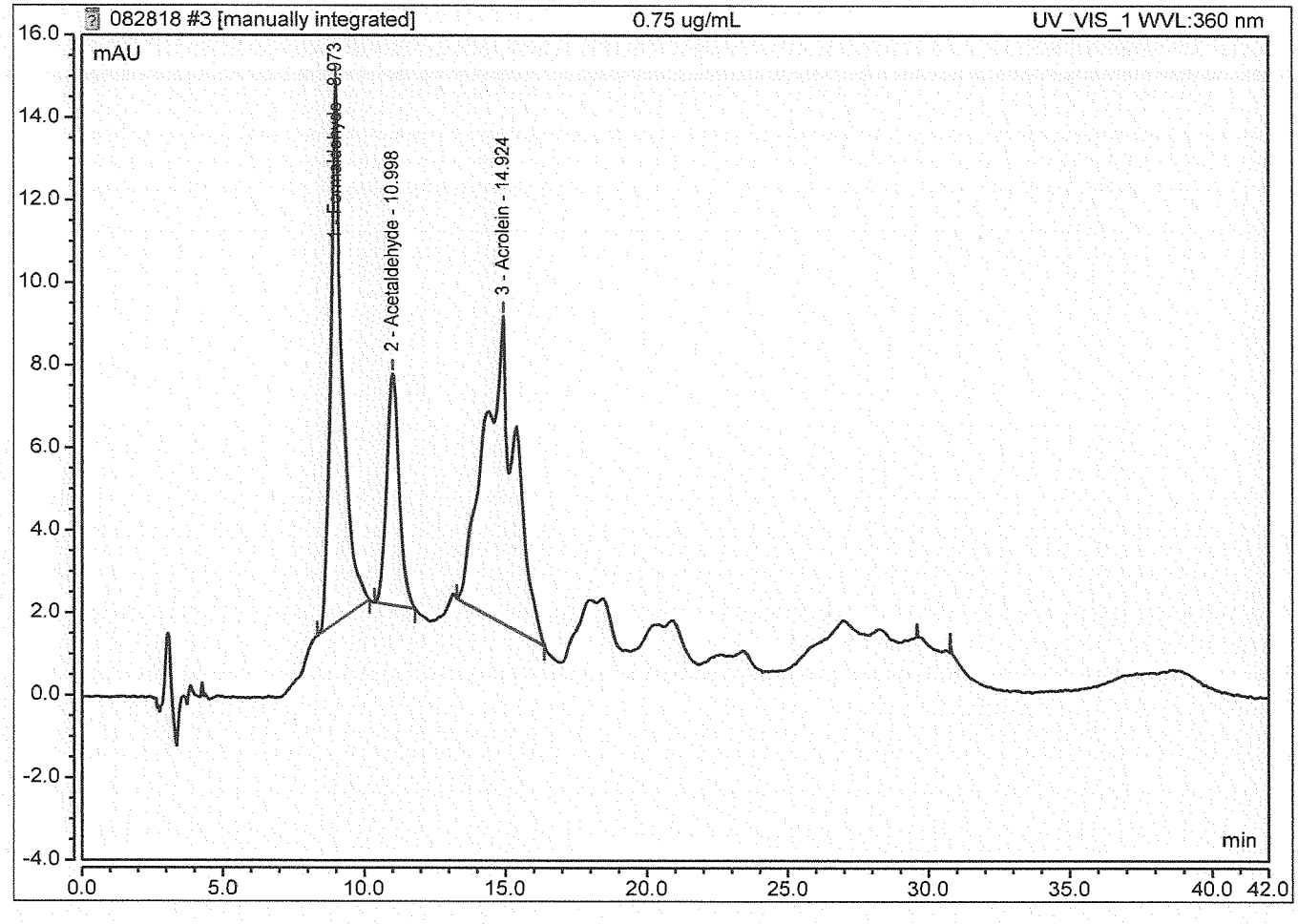
No.	Time min	Peak Name	Peak Type	Area mAU*min	Height mAU	Amount ug/mL
1	8.96	Formaldehyde	BMB*	0.371	0.761	n.a.
2	10.98	Acetaldehyde	BMB*	0.174	0.349	n.a.
3	13.89	Acetone	BM *	0.200	0.436	n.a.
4	14.92	Acrolein	MB*	0.826	0.783	n.a.
TOTAL:				1.57	2.33	0.00



Peak Integration Report

Sample Name:	**0.75 ug/mL**	*Inj. Vol.:*	**25.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Instrument Method:	**Aldehyde Scan_THF Ultracarb**	*Operator:*	**ALCNC.HPLC01**
Inj. Date / Time:	**28-Aug-2018 / 17:59**	*Run Time:*	**42.01**

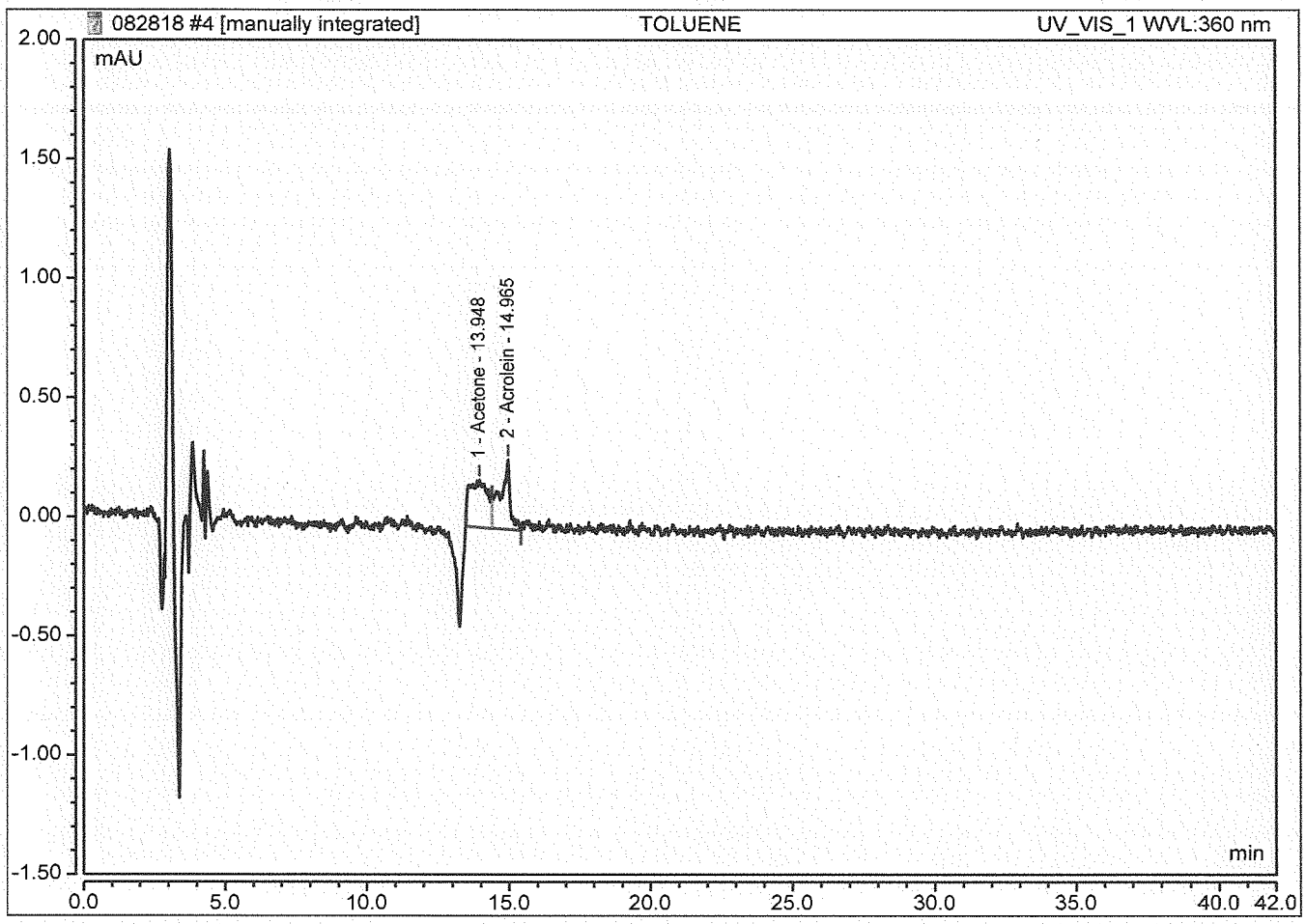
No.	Time min	Peak Name	Peak Type	Area mAU*min	Height mAU	Amount ug/mL
1	8.97	Formaldehyde	BMB*	6.197	13.135	n.a.
2	11.00	Acetaldehyde	BMB*	2.850	5.615	n.a.
3	14.92	Acrolein	BMB*	9.319	7.463	n.a.
TOTAL:				18.37	26.21	0.00



Peak Integration Report

Sample Name:	**TOLUENE**	*Inj. Vol.:*	**25.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Instrument Method:	**Aldehyde Scan_THF Ultracarb**	*Operator:*	**ALCNC.HPLC01**
Inj. Date / Time:	**28-Aug-2018 / 18:42**	*Run Time:*	**42.01**

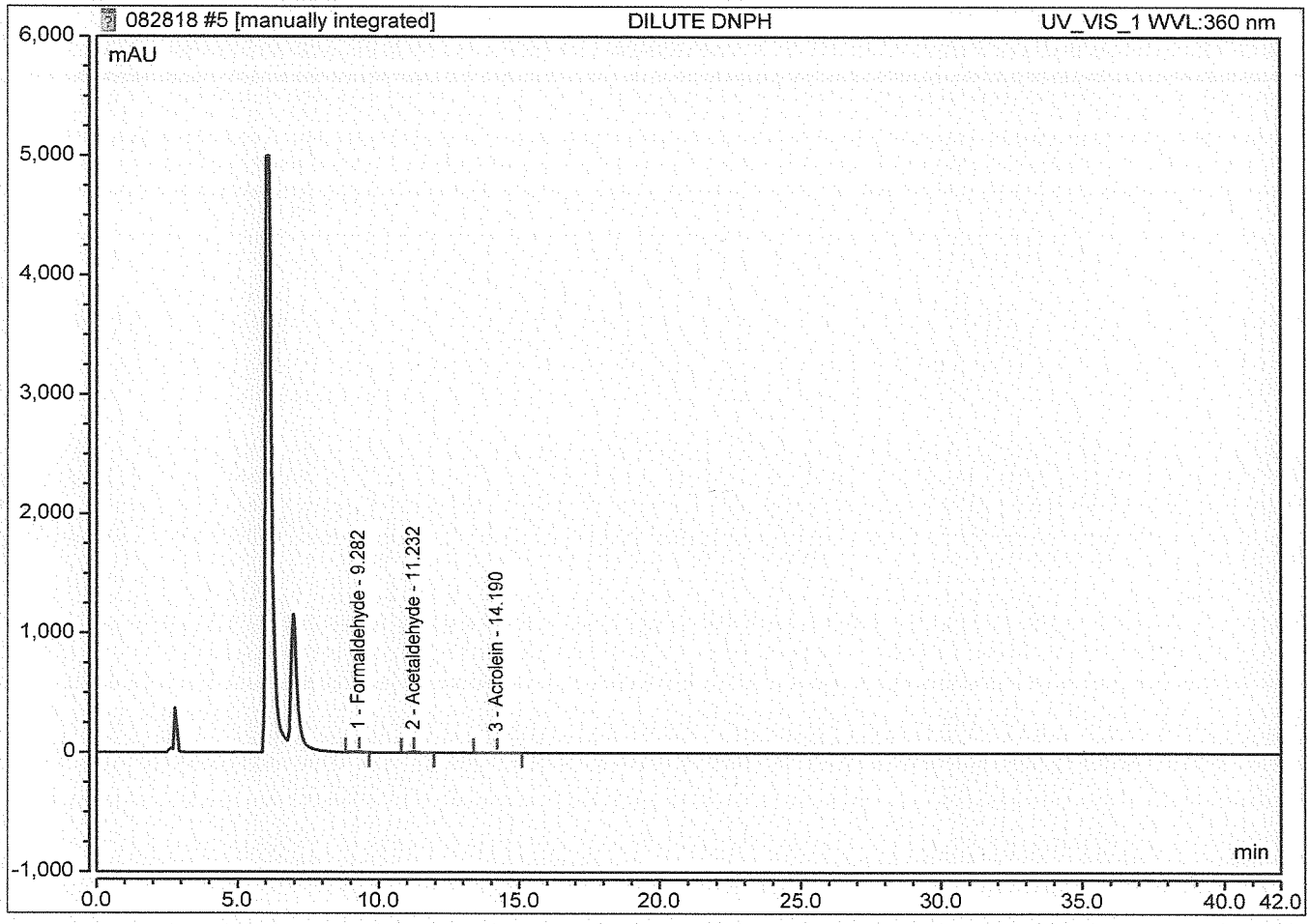
No.	Time min	Peak Name	Peak Type	Area mAU*min	Height mAU	Amount ug/mL
1	13.95	Acetone	BM *	0.147	0.201	n.a.
2	14.97	Acrolein	MB*	0.123	0.294	n.a.
TOTAL:				0.27	0.50	0.00



Peak Integration Report

Sample Name:	**DILUTE DNPH**	*Inj. Vol.:*	**25.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Instrument Method:	**Aldehyde Scan_THF Ultracarb**	*Operator:*	**ALCNC.HPLC01**
Inj. Date / Time:	**28-Aug-2018 / 19:25**	*Run Time:*	**42.01**

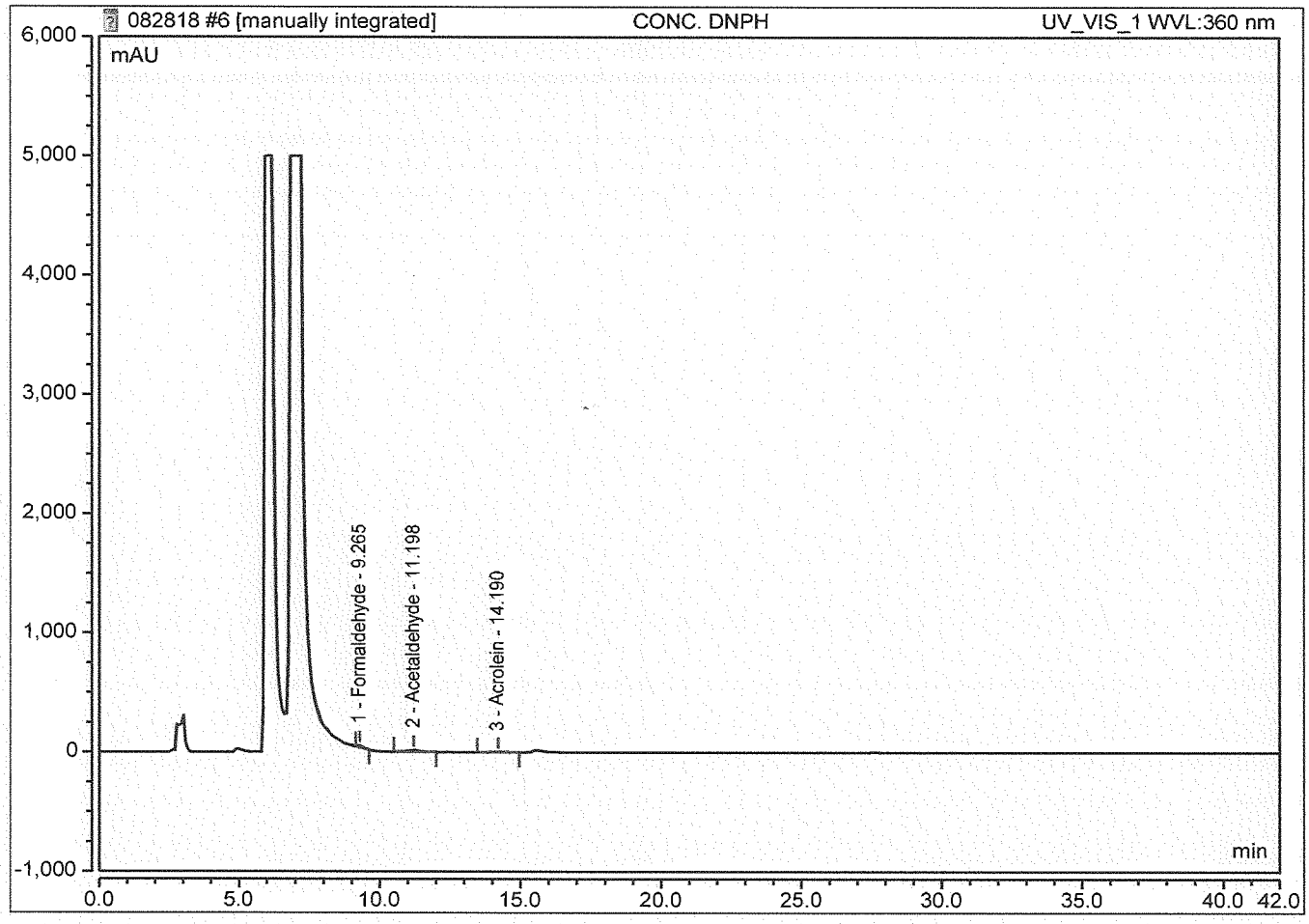
No.	Time min	Peak Name	Peak Type	Area mAU*min	Height mAU	Amount ug/mL
1	9.28	Formaldehyde	BMB*	1.071	2.612	n.a.
2	11.23	Acetaldehyde	BMB*	1.718	4.565	n.a.
3	14.19	Acrolein	BMB*	0.196	0.260	n.a.
TOTAL:				2.98	7.44	0.00



Peak Integration Report

Sample Name:	**CONC. DNPH**	*Inj. Vol.:*	**25.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Instrument Method:	**Aldehyde Scan_THF Ultracarb**	*Operator:*	**ALCNC.HPLC01**
Inj. Date / Time:	**28-Aug-2018 / 20:08**	*Run Time:*	**42.01**

No.	Time min	Peak Name	Peak Type	Area mAU*min	Height mAU	Amount ug/mL
1	9.27	**Formaldehyde**	BMB*	2.501	12.969	n.a.
2	11.20	**Acetaldehyde**	BMB*	6.697	15.851	n.a.
3	14.19	**Acrolein**	BMB*	1.210	1.564	n.a.
TOTAL:				10.41	30.38	0.00



Client: ALS
Project: Covanta
WorkOrder: 1809698

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: **19-Sep-18 09:46**

Work Order: **1809698** Received by: **DNS**

Checklist completed by Stephanie Harrington (eSignature) 19-Sep-18 (Date) Reviewed by: Shawn Smythe (eSignature) 20-Sep-18 (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):	7.8		
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:

1809698

ALS Environmental

Chain of Custody / Analytical Request Form

1435 Norjohn Court, Unit 1, Burlington, Ontario, Canada, L7L 0E6

Tel +1-905-331-3111 Fax +1-905-331-4567 www.alsglobal.com

Report To		Report Format / Distribution		Service Requested
Company:	ALS Environmental	☑ Standard ☐ Other:		☐ Regular Service
Contact:	Lynne Wrona	☑ PDF ☑ Excel ☐ Digital ☐ Fax		☑ Rush Service (with prior consultation) - surcharge applies
Address:	1435 Norjohn Court, Unit 1	Email 1:	lynne.wrona@alsglobal.com	☐ Other - Please contact ALS
Phone:	905-331-311 Fax: 905-331-4567	Email 2:		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		
Company:		Job #:	Covanta	
Contact:		Location:		
Address:		PO:		
Phone:	Fax:	Sampled by:		
Lab Work Order #		ALS Contact:	Lynne Wrona	

Sample #	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	CARB Method 430	Hazardous? Provide Details	Highly Contaminated?	Number of Containers
01	1	L2165274-1	18-21880-M430-1 TEST#1 (#1 APC OUTLET)	13-Sep-2018		DNPH/Toluene	X			1
02	2	L2165274-2	18-21880-M430-2 TEST#2 (#1 APC OUTLET)	13-Sep-2018		DNPH/Toluene	X			1
03	3	L2165274-3	18-21880-M430-3 TEST#3 (#1 APC OUTLET)	14-Sep-2018		DNPH/Toluene	X			1
04	4	L2165274-4	18-21880-M430-Blank 1 (#1 APC OUTLET)	14-Sep-2018		DNPH/Toluene	X			1
05	5	L2165274-5	18-21880-M430-4 TEST#1 (#2 APC OUTLET)	13-Sep-2018		DNPH/Toluene	X			1
06	6	L2165274-6	18-21880-M430-5 TEST#2 (#2 APC OUTLET)	13-Sep-2018		DNPH/Toluene	X			1
07	7	L2165274-7	18-21880-M430-6 TEST#3 (#2 APC OUTLET)	14-Sep-2018		DNPH/Toluene	X			1
08	8	L2165274-8	18-21880-M430-Blank 2 (#2 APC OUTLET)	14-Sep-2018		DNPH/Toluene	X			1
09	9	L2165274-9	18-21880-M430-Trip Spike			DNPH/Toluene	X			1

Special Instructions / Regulations / Hazardous Details

Targets: Formaldehyde, Acetaldehyde & Acrolein. RESULTS ON SEPTEMBER 26TH PLEASE.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided by ALS

Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date	Time	Temperature:	Verified by:	Date	Time	Observations: Yes / No ? If Yes add SIF
Aaron Burton	18-Sep-2018	14:00		9/19/18	09:46	7.8 °C				

APPENDIX 20

SVOC and VOST Proof Data
(13 pages)

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2145992		Mississauga, ON L5J 2Y4
Date of Report	28-Aug-18		Canada
Date of Sample Receipt	14-Aug-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **CB by LRGC/MS - Isotope dilution**

Certified by

Ron McLeod
Technical Director

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2854143-1		L2145992-29	
Sample Size	1		1	
Sample units	sample		n/a	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	n/a		n/a	
Target Analytes	**ng/sample**		**n/a**	
Chlorobenzene	<8	U	<8	U
1,3-Dichlorobenzene	<8	U	<8	U
1,4-Dichlorobenzene	17.4		21.2	B
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	91		83	
13C6-1,4-Dichlorobenzene	83		85	
13C6-1,2,3-Trichlorobenzene	74		77	
13C6-1,2,3,4-Tetrachlorobenzene	58		57	
13C6-Pentachlorobenzene	76		79	
13C6-Hexachlorobenzene	83		85	

U	Indicates that this compound was not detected above the LOD.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

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#:	L2145992		Mississauga, ON L5J 2Y4
Date of Report	29-Aug-18		Canada
Date of Sample Receipt	14-Aug-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Certified by:

Ron McLeod, PhD
Laboratory Manager and Technical Director

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2854143-1		L2145992-29	
Sample Size	1		1	
Sample units	sample		sample	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	24-Aug-18		24-Aug-18	
Target Analytes	**ng/sample**		**ng/sample**	
2-Chlorophenol	<40	U	<40	U
3-Chlorophenol	<40	U	<40	U
4-Chlorophenol	<40	U	<40	U
2,6-Dichlorophenol	<40	U	<40	U
2,4/2,5-Dichlorophenol	<40	U	<40	U
3,5-Dichlorophenol	<40	U	<40	U
2,3-Dichlorophenol	<40	U	<40	U
3,4-Dichlorophenol	<40	U	<40	U
2,4,6-Trichlorophenol	<40	U	<40	U
2,3,6-Trichlorophenol	<40	U	<40	U
2,3,5-Trichlorophenol	<40	U	<40	U
2,4,5-Trichlorophenol	<40	U	<40	U
2,3,4-Trichlorophenol	<40	U	<40	U
3,4,5-Trichlorophenol	<40	U	<40	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<40	U	<40	U
2,3,4,5-Tetrachlorophenol	<40	U	<40	U
Pentachlorophenol	<40	U	<40	U
Hexachlorophene	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**	
2-Fluorophenol	67		38	
d5-Phenol	73		39	
d4-2-Chlorophenol	71		44	
2,4,6-Tribromophenol	72		61	
13C-Pentachlorophenol	126		82	

U Indicates that this compound was not detected above the LOR.

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#:	L2145992		Mississauga, ON L5J 2Y4
Date of Report	10-Sep-18		Canada
Date of Sample Receipt	14-Aug-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **PCDD/F by EPA M23**

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

ALS Life Sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF
ALS Sample ID	L2145992-29
Sample Size	1
Sample size units	Proof
Percent Moisture	n/a
Sample Matrix	Media Prep
Sampling Date	n/a
Extraction Date	24-Aug-18

Target Analytes	pg
2,3,7,8-TCDD	<2.2
1,2,3,7,8-PeCDD	<2.9
1,2,3,4,7,8-HxCDD	<1.2
1,2,3,6,7,8-HxCDD	<1.1
1,2,3,7,8,9-HxCDD	<1.2
1,2,3,4,6,7,8-HpCDD	<3.3
OCDD	4.85
2,3,7,8-TCDF	<2.5
1,2,3,7,8-PeCDF	<1.9
2,3,4,7,8-PeCDF	<1.9
1,2,3,4,7,8-HxCDF	<1.4
1,2,3,6,7,8-HxCDF	<1.3
2,3,4,6,7,8-HxCDF	<1.4
1,2,3,7,8,9-HxCDF	<1.6
1,2,3,4,6,7,8-HpCDF	<0.77
1,2,3,4,7,8,9-HpCDF	<0.98
OCDF	2.59
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	76
13C12-1,2,3,7,8-PeCDD	97
13C12-1,2,3,6,7,8-HxCDD	68
13C12-1,2,3,4,6,7,8-HpCDD	83
13C12-OCDD	76
13C12-2,3,7,8-TCDF	79
13C12-1,2,3,7,8-PeCDF	86
13C12-1,2,3,6,7,8-HxCDF	60
13C12-1,2,3,4,6,7,8-HpCDF	73
Cleanup Standard	
13C12-1,2,3,7,8,9-HxCDF	NS
Homologue Group Totals	**pg**
Total-TCDD	5.92
Total-PeCDD	<2.9
Total-HxCDD	<1.2
Total-HpCDD	<2.0
Total-TCDF	<2.5
Total-PeCDF	<1.9
Total-HxCDF	<1.6
Total-HpCDF	<0.98
Toxic Equivalency - (WHO 2005)	
Lower Bound PCDD/F TEQ (WHO 2005)	0.00223
Mid Point PCDD/F TEQ (WHO 2005)	3.49
Upper Bound PCDD/F TEQ (WHO 2005)	6.95

ALS Life Sciences

Quality Control Summary Report

Sample Name	Method Blank
ALS Sample ID	WG2854143-1
Sample Size	1
Sample size units	Proof
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	24-Aug-18
Target Analytes	**pg**
2,3,7,8-TCDD	<3.6
1,2,3,7,8-PeCDD	<1.7
1,2,3,4,7,8-HxCDD	<2.3
1,2,3,6,7,8-HxCDD	<2.2
1,2,3,7,8,9-HxCDD	<2.2
1,2,3,4,6,7,8-HpCDD	3.37
OCDD	<9.3
2,3,7,8-TCDF	<2.0
1,2,3,7,8-PeCDF	<1.3
2,3,4,7,8-PeCDF	<1.3
1,2,3,4,7,8-HxCDF	<1.6
1,2,3,6,7,8-HxCDF	<1.5
2,3,4,6,7,8-HxCDF	2.20
1,2,3,7,8,9-HxCDF	<1.8
1,2,3,4,6,7,8-HpCDF	<2.2
1,2,3,4,7,8,9-HpCDF	<1.1
OCDF	4.64
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	75
13C12-1,2,3,7,8-PeCDD	79
13C12-1,2,3,6,7,8-HxCDD	73
13C12-1,2,3,4,6,7,8-HpCDD	79
13C12-OCDD	78
13C12-2,3,7,8-TCDF	74
13C12-1,2,3,7,8-PeCDF	78
13C12-1,2,3,6,7,8-HxCDF	64
13C12-1,2,3,4,6,7,8-HpCDF	83
Cleanup Standard	
13C12-1,2,3,7,8,9-HxCDF	NS
Homologue Group Totals	**pg**
Total-TCDD	6.58
Total-PeCDD	7.59
Total-HxCDD	6.24
Total-HpCDD	3.37
Total-TCDF	<2.0
Total-PeCDF	<1.3
Total-HxCDF	2.20
Total-HpCDF	<1.1
Toxic Equivalency - (WHO 2005)	
Lower Bound PCDD/F TEQ (WHO 2005)	0.255
Mid Point PCDD/F TEQ (WHO 2005)	3.83
Upper Bound PCDD/F TEQ (WHO 2005)	7.38

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#:	L2145992		Mississauga, ON L5J 2Y4
Date of Report	28-Aug-18		Canada
Date of Sample Receipt	14-Aug-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: PAH by CARB method 429 (LR option)- Isotope dilution

Certified by: _____
Ron McLeod
Technical Director

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF	
ALS Sample ID	WG2854143-1		L2145992-29	
Sample Size	1		1	
Sample units	sample		sample	
Moisture Content	n/a		n/a	
Matrix	QC		Media Prep	
Sampling Date	n/a		n/a	
Extraction Date	24-Aug-18		24-Aug-18	
Target Analytes	**ng/sample**		**ng/sample**	
Naphthalene	<8.0	U	<8.0	U
2-Methylnaphthalene	<8.0	U	<8.0	U
1-Methylnaphthalene	<8.0	U	<8.0	U
Acenaphthylene	<8.0	U	<8.0	U
Acenaphthene	<8.0	U	<8.0	U
Fluorene	<8.0	U	<8.0	U
Phenanthrene	<8.0	U	8.32	M
Anthracene	<8.0	U	<8.0	U
Fluoranthene	<8.0	U	<8.0	U
Pyrene	<8.0	U	<8.0	U
Benzo(a)Anthracene	<8.0	U	<8.0	U
Chrysene	<8.0	U	<8.0	U
Benzo(b)Fluoranthene	<8.0	U	<8.0	U
Benzo(k)Fluoranthene	<8.0	U	<8.0	U
Benzo(e)Pyrene	<8.0	U	<8.0	U
Benzo(a)Pyrene	<8.0	U	<8.0	U
Perylene	<8.0	U	<8.0	U
Indeno(1,2,3-cd)Pyrene	<8.0	U	<8.0	U
Dibenzo(a,h)Anthracene	<8.0	U	<8.0	U
Benzo(g,h,i)Perylene	<8.0	U	<8.0	U
Extraction Standards	**% Rec**		**% Rec**	
Naphthalene D8	90.7		83.0	
2-Methylnaphthalene-D10	71.9		78.2	
Acenaphthylene D8	79.5		91.8	
Phenanthrene D10	67.3		81.3	
Anthracene-D10	103.2		112.6	
Fluoranthene D10	82.6		91.7	
Benz(a)Anthracene-D12	54.6		64.1	
Chrysene D12	56.9		52.3	
Benzo(b)Fluoranthene-D12	64.4		70.6	
Benzo(k)Fluoranthene-D12	83.5		101.1	
Benzo(a)Pyrene D12	117.3		112.0	
Perylene D12	125.3		129.1	
Indeno(1,2,3,cd)Pyrene-D12	88.6		81.5	
Dibenz(a,h)Anthracene-D14	57.7		67.5	
Benzo(g,h,i)Perylene D12	72.5		75.2	

U Indicates that this compound was not detected above the LOD.

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#:	L2145992		Mississauga, ON L5J 2Y4
Date of Report	26-Sep-18		Canada
Date of Sample Receipt	24-Aug-18	**Client Contact:**	Chris Belore
		Client Project ID:	21880 Covanta

COMMENTS: **Toxic PCB Congeners by GC/HRMS (EPA 1668C)**

Low levels of selected PCBs were detected in the proof
Glassware is approved for collection of samples for toxic PCB congener analysis.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis summary Report

Sample Name	Method Blank	GLASSWARE PROOF
ALS Sample ID	WG2854143-1	L2145992-29
Sample Size	1	1
Sample size units	Media prep	Media Prep
Percent Moisture	n/a	n/a
Sample Matrix	QC	Media Prep
Sampling Date	n/a	n/a
Extraction Date	24-Sep-18	24-Sep-18
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**
PCB-81	<2.0	<1.6
PCB-77	<2.3	<10
PCB-123	<2.7	<4.5
PCB-118	<8.1	78.3
PCB-114	<2.6	<4.2
PCB-105	7.39	<31
PCB-126	<3.0	<1.4
PCB-167	<2.3	<1.1
PCB-156	<1.3	3.18
PCB-157	<0.77	<1.1
PCB-169	<0.92	<1.1
PCB-189	<1.1	<0.71
Extraction Standards		
13C12-PCB-81	68	85
13C12-PCB-77	68	82
13C12-PCB-123	88	95
13C12-PCB-118	90	102
13C12-PCB-114	91	102
13C12-PCB-105	84	96
13C12-PCB-126	89	105
13C12-PCB-167	110	121
13C12-PCB-156	117	114
13C12-PCB-157	122	117
13C12-PCB-169	106	122
13C12-PCB-189	98	127
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.000222	0.00244
Mid Point PCB TEQ	0.165	0.0914
Upper Bound PCB TEQ	0.329	0.178

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#:	L2145992		
Date of Report	30-Aug-18	**Client Contact:**	Chris Belore
Date of Sample Receipt	14-Aug-18	**Client Project ID:**	21880 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only

Certified by: _____
Ron McLeod, Ph.D.
Technical Director

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	WG2862682-1		L2145992-68		L2145992-69		L2145992-70	
Sample Size	1		1		1		1	
Sample units	sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a		n/a	
Extraction Date	29-Aug-18		29-Aug-18		29-Aug-18		29-Aug-18	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	<0.1	U	<0.1	U	<0.1	U	<0.1	U
Methylene Chloride	<0.1	U	<0.1	U	<0.1	U	<0.1	U
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
2-Butanone	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chloroform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,2-Dichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Dibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
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)	102.1		101.3		86.3		82.3	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	95.1		94.5		95.3		94.1	
d8-Toluene(SURR)	83.5		83.2		81.9		81.4	
4-Bromofluorobenzene(SURR)	76.1		74.3		76.6		75.5	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	124.4		119.9		126.4		119.2	
1,4-Difluorobenzene	102.3		100.7		108.8		103.8	
d5-Chlorobenzene	100		100.1		110.3		105.4	

U Indicates that this compound was not detected above the RL.

APPENDIX 21

ORTECH Equipment Calibration Data
(36 pages)

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2018
Probe/Pitot ID	S8
Mil Number	B03769
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	**93-T62-SP-012**

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.74	0.145	0.205	0.841	0.0003
(0.25")	9.86	0.235	0.330	0.843	0.0032
	11.94	0.345	0.490	0.839	0.0016
	14.38	0.500	0.715	0.836	0.0045
	16.27	0.640	0.900	0.843	0.0026
			Mean	0.840	0.0024
Without Nozzle	7.47	0.135	0.190	0.842	0.0014
	9.43	0.215	0.300	0.846	0.0022
	11.50	0.320	0.450	0.843	0.0011
	13.94	0.470	0.660	0.843	0.0005
	15.75	0.600	0.840	0.845	0.0008
			Mean	0.844	0.0012

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2018
Probe/Pitot ID	15D
Mil Number	B03778
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	0.0020
(0.25")	9.54	0.220	0.310	0.842	0.0094
	11.68	0.330	0.455	0.851	0.0002
	14.23	0.490	0.670	0.855	0.0034
	15.88	0.610	0.825	0.859	0.0081
			Mean	0.851	0.0046

Without Nozzle	7.33	0.130	0.180	0.849	0.0015
	9.54	0.220	0.310	0.842	0.0059
	11.59	0.325	0.450	0.849	0.0015
	13.94	0.470	0.650	0.850	0.0020
	16.01	0.620	0.860	0.849	0.0008
			Mean	0.848	0.0024

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 23, 2018
Probe/Pitot ID	15E
MII Number	COE 20113
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	**93-T62-SP-012**

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.74	0.145	0.200	0.851	0.0053
(0.25")	10.07	0.245	0.340	0.848	0.0027
	12.20	0.360	0.500	0.848	0.0023
	14.52	0.510	0.720	0.841	0.0046
	16.39	0.650	0.920	0.840	0.0057
			Mean	0.846	0.0041
Without Nozzle	7.74	0.145	0.200	0.851	0.0013
	9.96	0.240	0.330	0.852	0.0000
	12.12	0.355	0.490	0.851	0.0016
	14.80	0.530	0.730	0.852	0.0007
	16.52	0.660	0.900	0.856	0.0036
			Mean	0.852	0.0014

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 22, 2018
Probe/Pitot ID	SP5
Mil 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	7.88	0.150	0.210	0.845	0.0048
(0.25")	9.86	0.235	0.330	0.843	0.0036
	12.12	0.355	0.500	0.842	0.0023
	14.52	0.510	0.730	0.835	0.0045
	16.27	0.640	0.920	0.834	0.0062
			Mean	0.840	0.0043
Without Nozzle	7.69	0.143	0.205	0.835	0.0016
	9.75	0.230	0.330	0.834	0.0013
	11.86	0.340	0.490	0.833	0.0006
	14.09	0.480	0.700	0.828	0.0055
	16.14	0.630	0.900	0.836	0.0031
			Mean	0.833	0.0024

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 22, 2018
Probe/Pitot ID	PM 10 2.5
MII Number	COE 20132
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Nozzle Size inches	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
NA	7.47	0.135	0.190	0.842	0.0021
	9.32	0.210	0.295	0.843	0.0013
	11.41	0.315	0.440	0.846	0.0011
	13.64	0.450	0.630	0.845	0.0001
	15.55	0.585	0.815	0.847	0.0022
			Mean	0.845	0.0014

Note: Pitots must always be used in the orientation that they are calibrated in.

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Manometer Calibration Data

Date	June 15, 2018	Calibrated By	JB
Manometer Number	5	Signature	
Manometer MII Number	B00717	Reviewed/Accepted By	
Calibrated Against	HHP-100A		
MII Number	B02679		
Calibration Procedure	03-3010		

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.405		0.403	-0.5
0-0.5	0.285		0.288	1.0
	0.142		0.144	1.4
	0.772		0.763	-1.2
0-1.0	0.609		0.603	-1.0
	0.243		0.245	0.8
	1.76		1.74	-1.1
0-2.0	1.26		1.25	-0.8
	0.58		0.58	-0.7
	9.03		9.02	-0.1
0-10.0	5.32		5.30	-0.4
	2.28		2.28	0.0

Percent Difference = (Ref. Manometer - Instrument Reading) x 100
Ref. Manometer

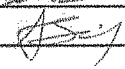
Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 1
Date	June 13, 2018
Barometric Pressure	29.30
System Leak Check	< 0.001 cfm @ 24 "Hg

MII NUMBERS	
DGM	COE 20094
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Dillon Berimbau
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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.
81.20	18.10	63.10	2.968	23.0	848.665	851.632	2.967	74.5	0.77	73	1.001	6
81.10	17.90	63.20	2.973	23.0	851.632	854.580	2.948	74.5	0.77	73	1.009	6
81.20	17.90	63.30	2.978	23.0	854.580	857.550	2.970	73.5	0.77	73	1.001	6
81.00	16.70	64.30	3.025	23.0	859.070	862.075	3.005	73.5	1.9	73	1.002	4
80.90	16.60	64.30	3.025	23.0	862.075	865.071	2.996	73.5	1.9	73	1.005	4
81.10	16.80	64.30	3.025	23.0	865.071	868.069	2.998	73.5	1.9	73	1.004	4
81.00	16.40	64.60	3.039	23.0	869.250	872.248	2.998	73.5	3.4	73	1.005	3
81.10	16.60	64.50	3.034	23.0	872.248	875.217	2.969	73.5	3.4	73	1.013	3
81.10	16.20	64.90	3.053	23.0	875.216	878.210	2.994	74	3.4	73	1.012	3

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.006
BEFORE	0.995

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Team 1**
MII	**COE 20094**
Date	**June 13, 2018**
Calibrated By	**Dillon Berimbau**
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	201		-0.5
250	251		-0.4
300	301		-0.3
400	400		0.0
500	500		0.0
600	600		0.0
700	700		0.0
800	799		0.1
900	900		0.0
1000	1000		0.0
1100	1100		0.0
1200	1200		0.0
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. O the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	June 13, 2018	Calibrated By	Dillon Berimbau
Manometer Number	Team 1	Signature	
Manometer MII Number	COE 20094	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.831		0.834	0.4
0-1.0	0.500		0.500	0.0
	0.240		0.241	0.4
	8.45		8.42	-0.4
1.0-10.0	5.30		5.28	-0.4
	2.45		2.47	0.8

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 2
Date	June 13, 2018
Barometric Pressure	29.38
System Leak Check	<0.001 cfm @ 21"Hg

MII NUMBERS	
DGM	COE 20092
Gasometer	A01463
Barometer	COE20028

Calibrated By	Dillon Berimbau
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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.
80.10	17.40	62.70	2.949	22.8	17.241	20.199	2.958	72.5	0.74	72	0.994	6
81.40	18.80	62.60	2.945	22.8	11.220	14.167	2.947	72.5	0.74	72	0.996	6
80.80	18.00	62.80	2.954	22.8	14.167	17.135	2.968	72.5	0.74	72	0.992	6
80.40	17.10	63.30	2.978	22.8	21.405	24.395	2.990	72.5	1.8	72	0.990	4
81.20	18.00	63.20	2.973	22.8	24.395	27.386	2.991	72.5	1.8	72	0.988	4
80.80	17.60	63.20	2.973	22.8	27.386	30.383	2.997	72.5	1.8	72	0.987	4
81.20	17.80	63.40	2.982	22.8	44.152	47.137	2.985	72.5	3.2	72	0.990	3
81.00	17.70	63.30	2.978	22.8	38.175	41.162	2.987	72.5	3.2	72	0.988	3
81.10	17.60	63.50	2.987	22.8	41.160	44.152	2.992	72.5	3.2	72	0.989	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.991
BEFORE	0.981

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 2
MII	COE 20092
Date	June 13, 2018
Calibrated By	Dillon Berimbau
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	250		0.0
300	300		0.0
400	400		0.0
500	499		0.2
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	1201		-0.1
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. 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	June 13, 2018	Calibrated By	Dillon Berimbau
Manometer Number	Team 2	Signature	
Manometer MII Number	COE 20092	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.841		0.844	0.4
0-1.0	0.506		0.508	0.4
	0.241		0.242	0.4
	8.50		8.51	0.1
1.0-10.0	5.29		5.30	0.2
	2.04		2.02	-1.0

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 3
Date	June 12. 2018
Barometric Pressure	29.65
System Leak Check	<0.001 cfm @ 27 "Hg

MII NUMBERS	
DGM	COE 20093
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Dillon Berimbau
signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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.
80.80	17.80	63.00	2.963	21.5	69.465	72.436	2.971	73.5	0.84	73	1.001	6
79.40	16.30	63.10	2.968	21.5	63.575	66.515	2.940	73.5	0.84	73	1.013	6
80.60	17.70	62.90	2.959	21.5	66.515	69.465	2.950	73.5	0.84	73	1.006	6
79.80	17.00	62.80	2.954	21.5	89.825	92.766	2.941	76	2	74	1.009	4
80.20	17.60	62.60	2.945	21.5	83.926	86.871	2.945	75.5	2	74	1.004	4
79.60	16.70	62.90	2.959	21.5	86.871	89.825	2.954	76	2	74	1.007	4
81.40	18.00	63.40	2.982	21.5	93.619	96.590	2.971	75.5	3.5	74	1.004	3
79.50	16.70	62.80	2.954	21.5	96.590	99.573	2.983	75.5	3.5	74	0.991	3
80.00	17.60	62.40	2.935	21.5	99.573	102.539	2.966	75.5	3.5	74	0.990	3

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.003
BEFORE	0.998

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 3
MII	COE 20093
Date	June 12, 2018
Calibrated By	Dillon Berimbau
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	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	1102		-0.2
1200	1201		-0.1
1250	1251		-0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. 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	June 12, 2018	Calibrated By	Dillon Berimbau
Manometer Number	Team 3	Signature	
Manometer MII Number	COE 20093	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Back Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.884		0.891	0.8
0-1.0	0.529		0.533	0.8
	0.225		0.226	0.4
	8.09		8.07	-0.2
1.0-10.0	5.29		5.25	-0.8
	2.30		2.28	-0.9

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Manometer Calibration Data

Date	June 12 2018	Calibrated By	Dillon Berimbau
Manometer Number	Team 4	Signature	
Manometer MII Number	COE 20090	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.796		0.787	-1.1
0-1.0	0.520		0.516	-0.8
	0.231		0.233	0.9
	8.21		8.190	-0.2
1.0-10.0	5.30		5.330	0.6
	2.49		2.500	0.4

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 4
Date	June 12, 2018
Barometric Pressure	29.68
System Leak Check	0.001 cfm @ 29 "Hg

MII NUMBERS	
DGM	COE 20090
Gasometer	A01463
Barometer	COE20028

Calibrated By	Dillon Berimbau
signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

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.
80.00	13.20	66.80	3.142	21.5	335.910	339.030	3.120	72	3.4	71	1.001	3
81.40	16.90	64.50	3.034	21.5	340.156	343.194	3.038	72	3.4	71	0.993	3
81.40	16.10	65.30	3.072	21.5	345.733	348.783	3.050	71.5	3.4	71	1.000	3
81.20	19.40	61.80	2.907	21.5	349.054	351.986	2.932	71.5	1.8	71	0.989	4
81.30	19.10	62.20	2.926	21.5	351.986	354.904	2.918	71.5	1.8	71	1.000	4
80.90	18.60	62.30	2.931	21.5	354.904	357.833	2.929	71.5	1.8	71	0.998	4
81.00	19.40	61.60	2.898	21.5	358.927	361.860	2.933	72.5	0.74	72	0.989	6
81.00	19.10	61.90	2.912	21.5	361.860	364.780	2.920	72.5	0.74	72	0.999	6
80.30	18.40	61.90	2.912	21.5	364.780	367.697	2.917	72.5	0.74	72	1.000	6

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	0.996
BEFORE	0.988

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Omega DP 116
MII	COE 20090
Date	June 12, 2018
Calibrated By	Dillon Berimbau
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	201		-0.5
250	252		-0.8
300	301		-0.3
400	400		0.0
500	499		0.2
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

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Control Box # 7
Date	July 16, 2018
Barometric Pressure	29.53
System Leak Check	<0.001 cfm @ 22 "Hg

MII NUMBERS	
DGM	A09072
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Dillon Berimbau
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.20	18.20	66.00	3.105	23.2	921.182	924.223	3.041	75	0.8	74	1.021	6
82.90	17.80	65.10	3.062	23.0	924.223	927.250	3.027	76	0.8	75	1.015	6
83.60	18.10	65.50	3.081	23.0	927.250	930.284	3.034	77	0.8	76	1.020	6
82.90	18.90	64.00	3.011	23.2	930.671	933.630	2.959	78.5	1.7	77	1.022	4
83.00	18.90	64.10	3.015	23.0	933.630	936.626	2.996	78	1.7	77	1.011	4
83.30	18.50	64.80	3.048	23.2	936.626	939.630	3.004	78.5	1.7	77	1.019	4
81.80	17.60	64.20	3.020	23.5	940.444	943.415	2.971	79	3	77	1.018	3
82.50	18.30	64.20	3.020	23.5	943.415	946.365	2.950	79	3	77	1.025	3
82.30	17.80	64.50	3.034	23.2	946.365	949.331	2.966	80	3	78	1.027	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.020
BEFORE	1.005

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Omega DP116**
MII	**A09072**
Date	**July 16, 2018**
Calibrated By	**Dillon Berimbau**
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	201		-0.5
250	251		-0.4
300	301		-0.3
400	400		0.0
500	499		0.2
600	600		0.0
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	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. 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	M05498
Date	September 7, 2018
Barometric Pressure	29.77
System Leak Check	NDL @ 21' Hg

MII NUMBERS	
DGM	M05498
Gasometer	A01463
Barometer	COE 20028

Calibrated By	David Utley
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ ("Hg)}{(Pbar\ "Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
75.10	44.10	12.80	0.602	22.0	98.58	141.48	0.622	26.0	2.0	25.0	0.976	40	1.1
65.20	50.10	15.10	0.710	22.0	140.47	181.24	0.733	26.0	2.0	25.0	0.977	40	1.0
50.10	34.80	15.30	0.720	22.0	181.24	202.12	0.737	27.0	2.0	26.0	0.989	20	1.0
82.60	70.60	12.00	0.564	21.0	42.50	59.23	0.591	27.0	1.2	26.0	0.972	34.5	0.5
71.40	64.00	7.40	0.348	21.5	191.91	202.25	0.365	28.5	1.2	27.0	0.973	20	0.5
63.80	56.40	7.40	0.348	21.5	202.00	212.45	0.369	29.5	1.2	28.0	0.966	20	0.5

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	
2Lpm	0.981
0.5Lpm	0.970

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03-J005**
Trendicator Type	**Nutech**
MII	**M05498**
Date	**September 7, 2018**
Calibrated By	**David Utley**
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	199		0.5
300	299		0.3
400	399		0.3
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	Vost 3
Date	September 7, 2018
Barometric Pressure	29.77
System Leak Check	< 0 | LPM @ 7 Hg

MII NUMBERS	
DGM	A12010
Gasometer	A01463
Barometer	COE 20028

Calibrated By	David Utley
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
70.80	54.50	16.30	0.767	23.0	51.29	73.88	0.798	34.0	1.0	34.0	0.994	20	1.1
71.00	54.70	16.30	0.767	23.0	73.88	96.43	0.796	35.0	1.0	35.0	0.999	20	1.1
69.20	53.00	16.20	0.762	23.0	96.43	118.99	0.797	35.0	1.0	35.0	0.993	20	1.1
75.70	49.80	25.90	1.218	23.0	74.57	110.46	1.267	35.0	0.5	35.0	0.999	57	0.6
69.70	61.70	8.00	0.376	23.0	7511.39	7522.61	0.396	35.0	0.5	35.0	0.987	20	0.6
60.90	53.20	7.70	0.362	23.0	12.80	23.40	0.374	35.0	0.5	35.0	1.006	20	0.5

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05,
otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	
1Lpm	0.995
0.5Lpm	0.997

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03-J005**
Trendicator Type	**Nutech**
MII	**A12010**
Date	**September 7, 2018**
Calibrated By	**David Utley**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	**Tredicator Display Value**		**Percent Difference**
	Before Adjustment (°C)	**After Adjustment (°C)**	**(%)**
0	0	NA	0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	125		0.0
150	151		-0.7
200	199		0.5
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.007				
High	90.09	A2	90.72	B2	C				
Mid	51.6	A4	51.2	B4		52.0	D4	-1.5	E4
Low	30.3	A3	29.9	B3		30.5	D3	-2.0	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.9	30.1	-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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.007		
High	90.09	A2	90.72	B2	C		
Mid	51.6	A4	51.2	B4		52.0 D4	-1.5 E4
Low	30.3	A3	29.9	B3		30.5 D3	-2.0 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	30.07	29.7	0.4

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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 B1	1.006 C		
High	90.09 A2	90.67 B2			
Mid	51.6 A4	51.5 B4		51.9 D4	-0.8 E4
Low	30.3 A3	29.83 B3		30.5 D3	-2.2 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	0.12	-0.02
Mid	29.6	29.2	0.4

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	0.04	B1	1.006					
High	90.09	A2	90.69	B2		C				
Mid	51.6	A4	51.3	B4			51.9	D4	-1.2	E4
Low	30.3	A3	30.1	B3			30.5	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	0.04	0.05	-0.01
Mid	30.1	30.1	0.0

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	0.04	B1	1.006	C				
High	90.09	A2	90.69	B2						
Mid	51.6	A4	51.3	B4			51.9	D4	-1.2	E4
Low	30.3	A3	30.1	B3			30.5	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	0.05	0.15	-0.1
Mid	30.1	29.5	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**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	0.04	B1	1.006					
High	90.09	A2	90.69	B2		C				
Mid	51.6	A4	51.3	B4			51.9	D4	-1.2	E4
Low	30.3	A3	30.1	B3			30.5	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	0.15	0	0.15
Mid	29.5	30.1	-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**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.001		
High	90.09	A2	90.2	B2	C		
Mid	51.6	A4	51.8	B4		51.7 D4	0.3 E4
Low	30.3	A3	29.77	B3		30.3 D3	-1.9 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.2	-0.2
Mid	29.77	29.5	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:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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 B1	1.005 C		
High	90.09 A2	90.53 B2			
Mid	51.6 A4	51.38 B4		51.9 D4	-0.9 E4
Low	30.3 A3	29.5 B3		30.4 D3	-3.1 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	0.3	-0.1
Mid	29.5	29.5	0.0

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21880	Date:	September 11, 2018
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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 B1	0.999 C		
High	90.09 A2	90 B2			
Mid	51.6 A4	51.9 B4		51.5 D4	0.7 E4
Low	30.3 A3	30.17 B3		30.3 D3	-0.3 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.07	-0.07
Mid	29.5	29.4	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:	21880	Date:	September 11, 2108
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.002					
High	90.09	A2	90.3	B2		C				
Mid	51.6	A4	51.1	B4			51.7	D4	-1.2	E4
Low	30.1	A3	29.9	B3			30.2	D3	-0.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.2	-0.2
Mid	29.9	30.4	-0.5

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21880	Date:	September 11, 2108
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.002					
High	90.09	A2	90.3	B2		C				
Mid	51.6	A4	51.1	B4			51.7	D4	-1.2	E4
Low	30.1	A3	29.9	B3			30.2	D3	-0.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.2	0.2	0
Mid	30.4	30.4	0.0

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21880	Date:	September 11, 2108
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
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	B1	1.002				
High	90.09	A2	90.3	B2	C				
Mid	51.6	A4	51.1	B4		51.7	D4	-1.2	E4
Low	30.1	A3	29.9	B3		30.2	D3	-0.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.2	0.2	0
Mid	30.4	30.0	0.4

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

APPENDIX 22

Particulate and Metals Test Emission Calculations
(24 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 - Metals and Particulate
Date:	September 11, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	7.03 mm
DRY REF GAS VOLUME SAMPLED	4.419 m^3
AVGERGE ISOKINETICITY	101.0 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	137.9 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	17.90 m/s
BAROMETRIC PRESSURE (Station)	100.982 Kpa
STATIC PRESSURE	-2.443 Kpa
ABSOLUTE GAS PRESSURE	98.539 Kpa
OXYGEN CONCENTRATION	8.23 %
CARBON DIOXIDE CONCENTRATION	11.15 %
CARBON MONOXIDE CONCENTRATION	11.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.44 m^3/s
DRY REF GAS FLOWRATE	15.42 Rm^3/s
DRY ADJ GAS FLOWRATE	19.73 Rm^3/s
WET REF GAS FLOWRATE	18.66 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		4.419 m^3
PARTICULATE CONC. - ACTUAL		0.172 mg/m^3
PARTICULATE CONC. - DRY REF		0.294 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.230 mg/m^3
PARTICULATE CONC. - WET REF		0.243 mg/m^3
PARTICULATE EMISSION RATE		0.004536 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	647.5		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	33.7		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 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%	11.15
COppm	11.4

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 %
1	0	47.12	0.65	262	72	72	74	2.4	6.0		16.77	
	2.5	49.24	0.65	261	57	72	72	2.4			16.75	**103.5**
	5	51.43	0.65	261	56	73	74	2.3	6.0		16.75	**107.0**
2	7.5	53.50	0.67	262	55	74	72	2.4	6.0		17.02	**100.8**
	10	55.64	0.68	263	56	74	73	2.45	6.0		17.16	**102.9**
	12.5	57.78	0.71	263	58	75	72	2.6	6.5		17.54	**102.1**
3	15	59.99	0.75	263	59	76	73	2.7	6.5		18.02	**103.2**
	17.5	62.24	0.75	283	61	77	73	2.65	6.5		18.27	**102.1**
	20	64.49	0.75	283	61	77	73	2.6	6.5		18.27	**103.4**
4	22.5	66.71	0.81	284	61	77	73	2.75	7.0		19.00	**102.0**
	25	68.99	0.76	285	60	77	73	2.6	7.0		18.42	**100.9**
	27.5	71.21	0.76	285	58	78	73	2.6	7.0		18.42	**101.5**
5	30	73.46	0.73	284	58	78	73	2.5	6.5		18.04	**102.7**
	32.5	75.65	0.73	286	56	78	73	2.5	6.5		18.06	**101.9**
	35	77.82	0.71	286	56	78	73	2.45	6.5		17.81	**101.1**
6	37.5	79.99	0.69	286	55	78	73	2.4	6.5		17.56	**102.5**
	40	82.14	0.67	286	54	78	74	2.35	6.5		17.30	**103.0**
	42.5	84.26	0.67	286	54	79	74	2.35	6.5		17.30	**103.0**
7	45	86.39	0.62	285	54	78	74	2.2	6.0		16.63	**103.4**
	47.5	88.44	0.64	285	53	78	74	2.25	6.0		16.90	**103.4**
	50	90.49	0.65	285	53	79	74	2.3	6.0		17.03	**101.8**
8	52.5	92.58	0.71	290	53	79	74	2.4	6.5		17.86	**102.9**
	55	94.73	0.73	286	53	79	74	2.5	7.0		18.06	**101.7**
	57.5	96.91	0.72	286	53	79	74	2.5	7.0		17.94	**101.4**
9	60	99.08	0.72	286	53	79	74	2.5	7.0		17.94	**101.6**
	62.5	101.23	0.76	286	54	79	74	2.6	7.0		18.43	**100.7**
	65	103.45	0.76	286	54	79	74	2.6	7.0		18.43	**101.2**
10	67.5	105.67	0.82	286	54	79	74	2.8	7.0		19.14	**101.2**
	70	107.97	0.8	286	54	79	74	2.75	7.0		18.91	**101.0**
	72.5	110.25	0.81	286	55	78	74	2.75	7.0		19.03	**101.4**
11	75	112.55	0.82	285	55	78	74	2.8	7.0		19.13	**101.7**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	647.5		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	33.7		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 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%	8.23
CO2%	11.15
COppm	11.4

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 %
	77.5	114.85	0.83	285	55	79	74	2.85	7.0		19.25	**101.1**
	80	117.17	0.83	285	55	79	74	2.85	7.0		19.25	**101.2**
12	82.5	119.50	0.84	285	55	78	74	2.85	7.0		19.36	**101.7**
	85	121.83	0.84	285	56	79	74	2.85	7.0		19.36	**101.2**
	87.5	124.17	0.82	286	56	78	74	2.8	7.0		19.14	**101.5**
	90	126.54								0.6		**104.2**
1	0	127.14	0.65	285	66	73	74	2.2	6.5		17.03	
	2.5	129.41	0.65	251	49	74	73	2.3	6.5		16.64	**112.4**
	5	131.51	0.66	255	46	75	73	2.25	6.5		16.81	**101.6**
2	7.5	133.60	0.66	255	46	76	73	2.25	6.5		16.81	**100.5**
	10	135.67	0.67	255	46	77	73	2.35	6.5		16.94	**99.5**
	12.5	137.77	0.67	256	47	77	74	2.35	6.5		16.95	**100.1**
3	15	139.86	0.71	256	47	78	74	2.4	7.0		17.45	**99.6**
	17.5	141.98	0.7	283	47	79	74	2.3	7.0		17.65	**98.0**
	20	144.07	0.7	283	47	79	74	2.3	7.0		17.65	**99.0**
4	22.5	146.15	0.7	283	47	80	74	2.3	7.0		17.65	**98.6**
	25	148.24	0.7	284	47	80	74	2.3	7.0		17.66	**98.9**
	27.5	150.33	0.68	284	47	80	75	2.25	7.0		17.41	**99.0**
5	30	152.42	0.67	284	47	80	75	2.25	7.0		17.28	**100.4**
	32.5	154.50	0.67	285	48	81	75	2.25	7.0		17.29	**100.6**
	35	156.59	0.67	285	48	81	75	2.25	7.0		17.29	**101.1**
6	37.5	158.65	0.64	285	48	81	75	2.1	6.5		16.90	**99.6**
	40	160.64	0.65	285	49	81	75	2.15	7.0		17.03	**98.4**
	42.5	162.66	0.65	285	49	81	76	2.15	7.0		17.03	**99.2**
7	45	164.67	0.61	285	49	82	76	2	6.5		16.50	**98.6**
	47.5	166.63	0.62	285	49	82	76	2.05	6.5		16.63	**99.1**
	50	168.59	0.6	285	49	82	76	2	6.5		16.36	**98.3**
8	52.5	170.53	0.7	285	49	82	76	2.3	7.0		17.67	**98.9**
	55	172.60	0.68	285	49	82	76	2.25	7.0		17.42	**97.8**
	57.5	174.69	0.61	285	50	82	76	2	6.5		16.50	**100.1**
9	60	176.69	0.78	285	50	82	76	2.6	7.0		18.66	**101.1**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	647.5		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	33.7		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 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%	11.15
COppm	11.4

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 %
	62.5	178.85	0.78	285	50	82	76	2.6	7.0		18.66	**96.7**
	65	181.07	0.77	285	51	82	76	2.55	7.0		18.54	**99.4**
10	67.5	183.28	0.82	285	51	82	76	2.75	7.5		19.13	**99.6**
	70	185.57	0.83	285	51	81	77	2.75	7.5		19.25	**100.0**
	72.5	187.87	0.8	285	52	81	77	2.6	7.0		18.89	**99.9**
11	75	190.10	0.8	284	52	81	77	2.6	7.0		18.88	**98.6**
	77.5	192.35	0.83	284	52	81	77	2.7	7.0		19.23	**99.4**
	80	194.65	0.82	284	52	81	77	2.7	7.0		19.12	**99.8**
12	82.5	196.87	0.82	284	52	81	77	2.75	7.0		19.12	**96.9**
	85	199.16	0.84	284	53	82	77	2.75	7.0		19.35	**100.0**
	87.5	201.46	0.81	285	53	82	77	2.6	7.0		19.01	**99.1**
	90	203.75										**100.5**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 - Metals and Particulate
Date:	September 11, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	7.03 mm
DRY REF GAS VOLUME SAMPLED	4.421 m^3
AVGERGE ISOKINETICITY	100.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.5 %
AVERAGE GAS VELOCITY	18.09 m/s
BAROMETRIC PRESSURE (Station)	101.084 Kpa
STATIC PRESSURE	-2.443 Kpa
ABSOLUTE GAS PRESSURE	98.641 Kpa
OXYGEN CONCENTRATION	8.28 %
CARBON DIOXIDE CONCENTRATION	11.09 %
CARBON MONOXIDE CONCENTRATION	12.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.73 m^3/s
DRY REF GAS FLOWRATE	15.55 Rm^3/s
DRY ADJ GAS FLOWRATE	19.82 Rm^3/s
WET REF GAS FLOWRATE	18.84 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.9 mg
	-FILTER	0.4 mg
	-TOTAL	3.3 mg
DRY REF GAS VOLUME SAMPLED		4.421 m^3
PARTICULATE CONC. - ACTUAL		0.434 mg/m^3
PARTICULATE CONC. - DRY REF		0.746 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.586 mg/m^3
PARTICULATE CONC. - WET REF		0.616 mg/m^3
PARTICULATE EMISSION RATE		0.011604 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	0.996	**Probe (mg)**	2.9		
Barometric Pressure	29.85 "Hg	**CWTR (g)**	656.7		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	31.5		
Nozzle	0.2768 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%	8.28
CO2%	11.09
COppm	12.7

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	4.33	0.64	251	76	75	75	2.25	6.0		16.51	
	2.5	6.38	0.7	257	66	76	75	2.4	6.0		17.34	**99.8**
	5	8.52	0.65	260	64	77	75	2.25	6.0		16.74	**100.0**
2	7.5	10.59	0.66	260	62	77	75	2.25	6.0		16.87	**100.5**
	10	12.65	0.67	260	61	78	75	2.35	6.5		17.00	**99.2**
	12.5	14.75	0.67	260	61	79	76	2.35	6.5		17.00	**100.3**
3	15	16.87	0.66	260	62	80	76	2.3	6.5		16.87	**101.1**
	17.5	18.97	0.7	260	63	80	76	2.45	6.5		17.37	**100.8**
	20	21.13	0.68	283	63	81	76	2.35	6.5		17.39	**100.7**
4	22.5	23.26	0.7	284	61	81	76	2.35	6.5		17.66	**102.2**
	25	25.37	0.67	285	60	81	76	2.25	6.5		17.29	**99.9**
	27.5	27.45	0.69	285	59	81	76	2.3	6.5		17.55	**100.7**
5	30	29.55	0.69	285	58	81	77	2.3	6.5		17.55	**100.2**
	32.5	31.66	0.69	285	58	82	77	2.3	6.5		17.55	**100.6**
	35	33.63	0.69	285	57	82	77	2.3	6.5		17.55	**93.8**
6	37.5	35.83	0.67	286	57	82	77	2.25	6.5		17.30	**104.7**
	40	37.94	0.67	286	56	82	77	2.25	6.5		17.30	**102.0**
	42.5	40.02	0.67	286	55	82	77	2.25	6.5		17.30	**100.6**
7	45	42.09	0.62	286	55	82	77	2.05	6.0		16.64	**100.1**
	47.5	44.08	0.65	286	55	82	77	2.2	6.5		17.04	**100.0**
	50	46.12	0.64	286	55	83	77	2.15	6.5		16.91	**100.1**
8	52.5	48.16	0.71	286	55	83	77	2.35	6.5		17.81	**100.8**
	55	50.29	0.74	286	54	83	77	2.45	7.0		18.18	**100.0**
	57.5	52.46	0.72	287	54	82	77	2.35	6.5		17.95	**99.8**
9	60	54.61	0.8	286	54	82	77	2.65	7.0		18.91	**100.4**
	62.5	56.86	0.78	286	54	82	77	2.6	7.0		18.67	**99.6**
	65	59.09	0.79	286	54	82	77	2.6	7.0		18.79	**100.0**
10	67.5	61.34	0.82	285	54	82	77	2.7	7.0		19.13	**100.3**
	70	63.62	0.84	285	55	82	78	2.75	7.0		19.36	**99.7**
	72.5	65.92	0.85	285	55	82	77	2.75	7.0		19.47	**99.3**
11	75	68.23	0.86	285	54	82	77	2.8	7.0		19.59	**99.2**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	0.996	**Probe (mg)**	2.9		
Barometric Pressure	29.85 "Hg	**CWTR (g)**	656.7		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	31.5		
Nozzle	0.2768 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%	8.28
CO2%	11.09
COppm	12.7

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 %
	77.5	70.56	0.85	285	55	82	77	2.8	7.0		19.47	**99.5**
	80	72.90	0.87	285	55	81	78	2.85	7.5		19.70	**100.5**
12	82.5	75.25	0.87	285	55	81	77	2.85	7.5		19.70	**99.8**
	85	77.61	0.86	286	56	81	78	2.85	7.5		19.60	**100.3**
	87.5	79.95	0.88	286	56	81	77	2.9	7.5		19.83	**100.0**
	90	82.33								0.73		**100.6**
1	0	83.06	0.91	287	66	77	77	2.9	7.5		20.18	
	2.5	85.37	0.93	287	57	78	77	2.9	7.5		20.40	**96.5**
	5	87.70	0.93	289	53	78	77	3	7.5		20.42	**96.2**
2	7.5	90.10	0.92	289	52	79	78	3	7.5		20.31	**99.2**
	10	92.48	0.94	289	52	79	77	3.1	7.5		20.53	**98.8**
	12.5	94.91	0.94	290	52	80	77	3.1	7.5		20.55	**99.9**
3	15	97.34	0.88	290	52	80	77	2.85	7.5		19.88	**99.8**
	17.5	99.69	0.89	290	52	80	77	2.85	7.5		19.99	**99.7**
	20	102.04	0.89	290	52	81	77	2.9	7.5		19.99	**99.2**
4	22.5	104.40	0.81	290	52	81	77	2.7	7.0		19.07	**99.5**
	25	106.70	0.81	289	52	81	77	2.7	7.0		19.06	**101.6**
	27.5	108.98	0.79	289	52	81	77	2.65	7.0		18.82	**100.7**
5	30	111.25	0.74	289	52	81	77	2.5	7.0		18.22	**101.5**
	32.5	113.47	0.74	288	52	81	77	2.45	7.0		18.21	**102.5**
	35	115.67	0.74	288	52	82	77	2.45	7.0		18.21	**101.5**
6	37.5	117.86	0.67	288	52	82	77	2.25	7.0		17.32	**100.9**
	40	119.97	0.67	288	52	82	77	2.2	7.0		17.32	**102.1**
	42.5	122.05	0.71	287	52	82	77	2.3	7.0		17.82	**100.7**
7	45	124.17	0.69	288	53	82	77	2.25	7.0		17.58	**99.6**
	47.5	126.27	0.7	288	52	82	77	2.35	7.0		17.71	**100.2**
	50	128.42	0.66	288	53	82	78	2.2	6.5		17.19	**101.8**
8	52.5	130.49	0.68	288	53	82	78	2.25	7.0		17.45	**100.9**
	55	132.58	0.7	288	53	82	78	2.3	7.0		17.71	**100.3**
	57.5	134.71	0.66	287	53	82	78	2.2	7.0		17.18	**100.8**
9	60	136.78	0.71	287	53	82	78	2.3	7.0		17.82	**100.8**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	0.996	**Probe (mg)**	2.9		
Barometric Pressure	29.85 "Hg	**CWTR (g)**	656.7		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	31.5		
Nozzle	0.2768 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%	8.28
CO2%	11.09
COppm	12.7

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 %
	62.5	138.89	0.67	286	53	83	78	2.2	7.0		17.30	**99.1**
	65	140.96	0.7	286	53	83	78	2.3	7.0		17.68	**99.9**
10	67.5	143.06	0.7	286	53	83	78	2.3	7.0		17.68	**99.2**
	70	145.17	0.69	285	54	83	78	2.3	7.0		17.55	**99.6**
	72.5	147.24	0.67	284	54	83	7	2	6.5		17.28	**98.4**
11	75	149.23	0.64	284	54	83	78	2.1	6.5		16.89	**102.6**
	77.5	151.23	0.63	259	54	83	78	2.2	6.5		16.47	**98.6**
	80	153.29	0.63	258	54	83	78	2.2	6.5		16.46	**100.6**
12	82.5	155.35	0.63	258	55	82	78	2.2	6.5		16.46	**100.6**
	85	157.42	0.62	257	55	82	78	2.2	6.5		16.32	**101.1**
	87.5	159.50	0.64	257	55	82	78	2.25	6.5		16.58	**102.4**
	90	161.60										**101.7**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 1
Test No.:	3 - Metals and Particulate
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.02
NOZZLE DIAMETER	7.03 mm
DRY REF GAS VOLUME SAMPLED	4.550 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	141.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	18.50 m/s
BAROMETRIC PRESSURE (Station)	101.524 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.909 Kpa
OXYGEN CONCENTRATION	8.4 %
CARBON DIOXIDE CONCENTRATION	10.99 %
CARBON MONOXIDE CONCENTRATION	13.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.34 m^3/s
DRY REF GAS FLOWRATE	15.90 Rm^3/s
DRY ADJ GAS FLOWRATE	20.07 Rm^3/s
WET REF GAS FLOWRATE	19.20 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0.8 mg
	-FILTER	0.4 mg
	-TOTAL	1.2 mg
DRY REF GAS VOLUME SAMPLED		4.550 m^3
PARTICULATE CONC. - ACTUAL		0.153 mg/m^3
PARTICULATE CONC. - DRY REF		0.264 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.209 mg/m^3
PARTICULATE CONC. - WET REF		0.218 mg/m^3
PARTICULATE EMISSION RATE		0.004194 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 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	1.02	**Probe (mg)**	0.8		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	664.9		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.61 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%	8.4
CO2%	10.99
COppm	13.6

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	570.03	0.8	281	65	75	75	2.3	4.0		18.81	
	2.5	572.75	0.85	287	67	77	80	2.2	4.0		19.46	123.8
	5	574.89	0.85	288	70	77	81	2.4	4.0		19.48	**94.3**
2	7.5	577.01	0.84	287	68	77	82	2.4	4.0		19.35	**93.4**
	10	579.20	0.85	287	70	78	84	2.5	4.0		19.46	**96.9**
	12.5	581.41	0.86	290	69	79	85	2.6	4.0		19.62	**97.0**
3	15	583.68	0.86	288	68	79	86	2.6	4.0		19.59	**99.1**
	17.5	585.95	0.86	288	66	79	87	2.6	4.0		19.59	**98.8**
	20	588.21	0.88	288	63	80	88	2.8	4.0		19.82	**98.3**
4	22.5	590.56	0.83	288	59	80	89	2.6	4.0		19.25	**100.9**
	25	592.83	0.83	289	59	81	90	2.6	4.0		19.26	**100.2**
	27.5	595.10	0.81	289	57	82	90	2.5	4.0		19.03	**100.1**
5	30	597.33	0.73	289	55	82	91	2.3	4.0		18.06	**99.5**
	32.5	599.49	0.71	289	55	83	92	2.2	4.0		17.81	**101.3**
	35	601.58	0.72	289	54	83	92	2.2	4.0		17.94	**99.2**
6	37.5	603.69	0.59	289	54	84	93	1.9	3.0		16.24	**99.5**
	40	605.65	0.6	289	53	84	93	1.9	3.0		16.37	**101.8**
	42.5	607.62	0.59	289	53	85	94	1.9	3.0		16.24	**101.5**
7	45	609.57	0.72	289	52	85	94	2.2	3.5		17.94	**101.1**
	47.5	611.66	0.73	289	52	86	95	2.4	4.0		18.06	**98.2**
	50	613.86	0.74	289	51	86	96	2.4	4.0		18.19	**102.5**
8	52.5	616.06	0.74	289	51	87	96	2.4	4.0		18.19	**101.7**
	55	618.27	0.74	288	51	87	96	2.4	4.0		18.17	**102.1**
	57.5	620.48	0.74	288	51	88	97	2.4	4.0		18.17	**102.0**
9	60	622.68	0.75	287	51	88	98	2.4	4.0		18.28	**101.3**
	62.5	624.88	0.76	287	51	88	98	2.5	4.0		18.40	**100.5**
	65	627.13	0.8	287	51	89	99	2.6	4.0		18.88	**102.1**
10	67.5	629.43	0.75	287	51	89	99	2.5	4.0		18.28	**101.6**
	70	631.69	0.74	287	51	90	99	2.4	4.0		18.16	**103.1**
	72.5	633.88	0.74	287	52	90	99	2.4	4.0		18.16	**100.5**
11	75	636.07	0.67	287	52	90	100	2.2	4.0		17.28	**100.5**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	1.02	**Probe (mg)**	0.8		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	664.9		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.61 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%	8.4
CO2%	10.99
COppm	13.6

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	638.18	0.68	287	52	91	100	2.2	4.0		17.41	**101.6**
	80	640.27	0.68	287	52	91	100	2.2	4.0		17.41	**99.8**
12	82.5	642.36	0.7	287	52	91	100	2.3	4.0		17.66	**99.8**
	85	644.52	0.7	287	52	91	100	2.3	4.0		17.66	**101.7**
	87.5	646.69	0.7	287	52	91	101	2.3	4.0		17.66	**102.1**
	90	648.88								1.61		**103.0**
1	0	650.49	0.7	278	65	87	86	2.4	4.0		17.56	
	2.5	652.65	0.73	278	55	86	88	2.5	4.0		17.93	**102.7**
	5	654.89	0.75	278	50	86	89	2.5	4.0		18.17	**104.3**
2	7.5	657.12	0.78	279	49	86	91	2.6	4.5		18.55	**102.3**
	10	659.39	0.77	279	50	86	92	2.5	4.5		18.43	**102.0**
	12.5	661.62	0.75	278	50	86	92	2.4	4.5		18.17	**100.8**
3	15	663.83	0.76	279	51	86	93	2.4	4.5		18.31	**101.1**
	17.5	666.02	0.8	287	51	86	94	2.6	4.5		18.88	**99.5**
	20	668.30	0.77	287	52	87	95	2.5	4.5		18.53	**101.5**
4	22.5	670.54	0.78	288	51	87	96	2.5	4.5		18.66	**101.4**
	25	672.76	0.79	288	51	88	96	2.5	4.5		18.78	**99.8**
	27.5	675.02	0.79	287	52	88	97	2.5	4.5		18.76	**100.9**
5	30	677.26	0.75	287	51	88	97	2.4	4.0		18.28	**99.8**
	32.5	679.47	0.76	287	52	89	98	2.4	4.0		18.40	**101.1**
	35	681.67	0.77	287	52	89	98	2.4	4.0		18.53	**99.8**
6	37.5	683.87	0.74	287	53	89	99	2.4	4.0		18.16	**99.1**
	40	686.04	0.72	286	53	90	99	2.3	4.0		17.90	**99.6**
	42.5	688.17	0.69	285	53	90	100	2.2	4.0		17.51	**99.0**
7	45	690.28	0.65	285	53	90	100	2.1	4.0		17.00	**100.0**
	47.5	692.34	0.67	285	53	91	100	2.2	4.0		17.26	**100.5**
	50	694.47	0.68	286	54	91	100	2.2	4.0		17.40	**102.3**
8	52.5	696.62	0.74	286	54	91	101	2.4	4.0		18.15	**102.6**
	55	698.86	0.76	286	52	92	101	2.4	4.0		18.39	**102.4**
	57.5	701.09	0.76	286	52	92	101	2.4	4.0		18.39	**100.5**
9	60	703.35	0.82	286	53	92	102	2.7	4.5		19.10	**101.9**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - Metals and Particulate	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.851	**Filter (mg)**	0.4		
DGMCF	1.02	**Probe (mg)**	0.8		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	664.9		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	28.3		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.61 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%	8.4
CO2%	10.99
COppm	13.6

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	705.68	0.83	287	52	93	103	2.7	4.5		19.23	**101.1**
	65	708.01	0.81	286	52	93	103	2.6	4.5		18.99	**100.4**
10	67.5	710.32	0.88	287	52	93	103	2.8	5.0		19.80	**100.6**
	70	712.71	0.87	287	52	94	104	2.8	5.0		19.69	**100.0**
	72.5	715.10	0.88	286	53	94	104	2.8	5.0		19.79	**100.4**
11	75	717.49	0.91	287	53	94	104	2.9	5.0		20.14	**99.8**
	77.5	719.93	0.89	286	52	94	104	2.8	5.0		19.90	**100.2**
	80	722.34	0.91	287	53	94	104	2.9	5.0		20.14	**100.0**
12	82.5	724.77	0.88	287	53	95	104	2.8	5.0		19.80	**99.8**
	85	727.18	0.9	286	53	95	105	2.8	5.0		20.01	**100.6**
	87.5	729.58	0.9	287	53	95	105	2.9	5.0		20.03	**98.9**
	90	732.02										**100.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 - Metals and Particulate
Date:	September 12, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	7.03 mm
DRY REF GAS VOLUME SAMPLED	4.245 m^3
AVGERGE ISOKINETICITY	98.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.1 °C
AVERAGE GAS MOISTURE BY VOLUME	15.8 %
AVERAGE GAS VELOCITY	17.17 m/s
BAROMETRIC PRESSURE (Station)	101.558 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.943 Kpa
OXYGEN CONCENTRATION	8.11 %
CARBON DIOXIDE CONCENTRATION	10.88 %
CARBON MONOXIDE CONCENTRATION	15.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.37 m^3/s
DRY REF GAS FLOWRATE	15.12 Rm^3/s
DRY ADJ GAS FLOWRATE	19.53 Rm^3/s
WET REF GAS FLOWRATE	17.96 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.3 mg
	-FILTER	0.2 mg
	-TOTAL	2.5 mg
DRY REF GAS VOLUME SAMPLED		4.245 m^3
PARTICULATE CONC. - ACTUAL		0.351 mg/m^3
PARTICULATE CONC. - DRY REF		0.589 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.456 mg/m^3
PARTICULATE CONC. - WET REF		0.496 mg/m^3
PARTICULATE EMISSION RATE		0.008903 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.2		
DGMCF	0.996	**Probe (mg)**	2.3		
Barometric Pressure	29.99 "Hg	**CWTR (g)**	559.3		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	27.1		
Nozzle	0.2768 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%	8.11
CO2%	10.88
COppm	15.7

Measured H2O
15.8 %

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	28.90	0.61	261	71	70	70	2.25	4.0		16.16	
	2.5	30.82	0.59	263	52	73	73	2.2	4.0		15.91	**96.0**
	5	32.77	0.59	265	52	73	73	2.2	4.0		15.93	**98.7**
2	7.5	34.70	0.57	271	47	72	73	2.1	4.0		15.73	**97.8**
	10	36.61	0.57	266	46	72	73	2.15	4.0		15.67	**99.0**
	12.5	38.51	0.57	266	46	73	73	2.15	4.0		15.67	**98.2**
3	15	40.41	0.63	265	46	75	73	2.35	4.5		16.46	**98.1**
	17.5	42.41	0.64	285	46	74	74	2.3	4.5		16.82	**98.0**
	20	44.40	0.64	285	46	73	74	2.3	4.5		16.82	**98.0**
4	22.5	46.39	0.66	285	46	73	74	2.35	4.5		17.08	**98.1**
	25	48.40	0.65	286	48	73	74	2.35	4.5		16.96	**97.6**
	27.5	50.39	0.65	286	48	73	74	2.35	4.5		16.96	**97.4**
5	30	52.01	0.64	287	47	76	75	2.3	4.5		16.84	**79.3**
	32.5	54.00	0.64	288	47	74	75	2.3	4.5		16.86	**97.9**
	35	56.01	0.64	287	47	74	75	2.3	4.5		16.84	**99.1**
6	37.5	58.00	0.65	288	46	75	76	2.35	4.5		16.99	**98.1**
	40	60.00	0.6	288	47	75	76	2.2	4.5		16.32	**97.7**
	42.5	61.80	0.6	286	49	75	76	2.2	4.5		16.30	**91.5**
7	45	63.80	0.56	285	49	73	71	1.85	4.0		15.74	**101.5**
	47.5	65.67	0.56	288	47	74	72	1.85	6.0		15.77	**98.7**
	50	67.52	0.56	288	47	75	72	1.85	6.0		15.77	**97.7**
8	52.5	69.35	0.56	287	47	77	72	1.85	6.0		15.76	**96.6**
	55	71.22	0.67	288	47	78	73	2.3	6.5		17.25	**98.4**
	57.5	73.28	0.67	288	47	80	73	2.3	6.5		17.25	**99.1**
9	60	75.36	0.76	288	47	81	74	2.55	7.0		18.37	**99.9**
	62.5	77.55	0.76	288	47	81	74	2.55	7.0		18.37	**98.6**
	65	79.75	0.74	288	48	82	74	2.5	7.0		18.12	**99.1**
10	67.5	81.94	0.79	288	48	82	75	2.65	7.0		18.73	**99.8**
	70	84.18	0.79	288	48	83	75	2.65	7.0		18.73	**98.8**
	72.5	86.43	0.81	288	48	83	76	2.7	7.5		18.96	**99.1**
11	75	88.70	0.83	288	49	83	76	2.8	7.5		19.20	**98.7**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.2		
DGMCF	0.996	**Probe (mg)**	2.3		
Barometric Pressure	29.99 "Hg	**CWTR (g)**	559.3		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	27.1		
Nozzle	0.2768 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%	8.11
CO2%	10.88
COppm	15.7

Measured H2O
15.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	90.99	0.86	288	49	84	76	2.85	7.5		19.54	**98.4**
	80	93.36	0.88	289	49	84	76	2.95	7.5		19.78	**99.9**
12	82.5	95.73	0.88	289	49	84	77	2.95	7.5		19.78	**98.9**
	85	98.10	0.88	289	49	84	77	2.95	7.5		19.78	**98.8**
	87.5	100.46	0.88	289	50	84	77	2.95	7.5		19.78	**98.4**
	90	102.87								0.61		**100.5**
1	0	103.48	0.63	252	63	78	77	2.2	6.5		16.32	
	2.5	105.69	0.66	239	49	79	77	2.35	7.0		16.55	**106.6**
	5	107.80	0.66	241	47	80	77	2.35	7.0		16.57	**98.4**
2	7.5	109.92	0.62	240	47	81	77	2.2	7.0		16.05	**98.9**
	10	111.99	0.64	238	47	82	77	2.3	7.0		16.28	**99.5**
	12.5	114.09	0.61	237	48	83	78	2.25	7.0		15.88	**99.1**
3	15	116.18	0.62	238	48	83	78	2.25	7.0		16.03	**100.8**
	17.5	118.27	0.61	284	48	84	78	2.1	6.5		16.41	**100.0**
	20	120.28	0.62	284	48	84	78	2.15	6.5		16.55	**100.0**
4	22.5	122.30	0.64	284	49	85	78	2.2	7.0		16.81	**99.7**
	25	124.37	0.61	287	49	85	78	2.1	6.5		16.44	**100.5**
	27.5	126.38	0.59	286	49	86	79	2.05	6.5		16.16	**100.1**
5	30	128.36	0.63	286	49	86	79	2.15	6.5		16.70	**100.0**
	32.5	130.40	0.61	287	49	86	79	2.1	6.5		16.44	**99.7**
	35	132.39	0.64	287	50	86	79	2.2	6.5		16.84	**98.9**
6	37.5	134.45	0.62	287	50	86	79	2.15	6.5		16.58	**100.0**
	40	136.49	0.62	287	50	87	79	2.1	6.5		16.58	**100.6**
	42.5	138.50	0.61	287	50	87	80	2.05	6.5		16.44	**99.0**
7	45	140.50	0.61	287	50	87	80	2.05	6.5		16.44	**99.2**
	47.5	142.44	0.59	287	51	87	80	2.05	6.5		16.17	**96.3**
	50	144.40	0.61	287	51	87	80	2.1	6.5		16.44	**98.9**
8	52.5	146.40	0.68	288	51	87	80	2.35	7.0		17.37	**99.2**
	55	148.51	0.65	288	51	87	80	2.25	7.0		16.99	**99.3**
	57.5	150.63	0.65	288	51	87	80	2.25	7.0		16.99	**102.0**
9	60	152.69	0.73	288	52	87	81	2.5	7.0		18.00	**99.1**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.2		
DGMCF	0.996	**Probe (mg)**	2.3		
Barometric Pressure	29.99 "Hg	**CWTR (g)**	559.3		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	27.1		
Nozzle	0.2768 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%	8.11
CO2%	10.88
COppm	15.7

Measured H2O
15.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	154.89	0.73	288	52	87	81	2.5	7.0		18.00	**99.9**
	65	157.10	0.75	288	52	87	81	2.55	7.0		18.25	**100.3**
10	67.5	159.34	0.74	288	52	87	81	2.5	7.0		18.12	**100.3**
	70	161.55	0.74	288	52	87	81	2.5	7.0		18.12	**99.6**
	72.5	163.74	0.75	288	53	87	81	2.55	7.0		18.25	**98.7**
11	75	165.96	0.75	288	53	87	81	2.55	7.0		18.25	**99.4**
	77.5	168.18	0.75	288	53	87	81	2.55	7.0		18.25	**99.4**
	80	170.43	0.75	288	53	87	81	2.55	7.0		18.25	**100.8**
12	82.5	172.63	0.71	287	54	87	81	2.4	7.0		17.74	**98.5**
	85	174.81	0.74	287	54	87	81	2.5	7.0		18.11	**100.3**
	87.5	177.02	0.71	287	54	87	81	2.4	7.0		17.74	**99.6**
	90	179.27										**103.5**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - Metals and Particulate
Date:	September 12, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	7.03 mm
DRY REF GAS VOLUME SAMPLED	4.400 m^3
AVGERGE ISOKINETICITY	102.1 %
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	140.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	17.65 m/s
BAROMETRIC PRESSURE (Station)	101.456 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.842 Kpa
OXYGEN CONCENTRATION	7.74 %
CARBON DIOXIDE CONCENTRATION	10.98 %
CARBON MONOXIDE CONCENTRATION	14.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.08 m^3/s
DRY REF GAS FLOWRATE	15.19 Rm^3/s
DRY ADJ GAS FLOWRATE	20.19 Rm^3/s
WET REF GAS FLOWRATE	18.34 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.5 mg
	-FILTER	0.1 mg
	-TOTAL	1.6 mg
DRY REF GAS VOLUME SAMPLED		4.400 m^3
PARTICULATE CONC. - ACTUAL		0.212 mg/m^3
PARTICULATE CONC. - DRY REF		0.364 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.274 mg/m^3
PARTICULATE CONC. - WET REF		0.301 mg/m^3
PARTICULATE EMISSION RATE		0.005522 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.5		
Barometric Pressure	29.96 "Hg	**CWTR (g)**	639.8		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	30.4		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.02 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.74
CO2%	10.98
COppm	14.8

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	79.83	0.62	255	80	80	80	2.25	6.0		16.28	
	2.5	81.92	0.61	254	74	81	80	2.2	6.0		16.13	102.6
	5	83.99	0.59	255	71	82	80	2.15	6.0		15.88	102.3
2	7.5	86.04	0.65	256	69	83	81	2.4	6.0		16.68	103.0
	10	88.17	0.64	256	66	84	81	2.4	6.0		16.55	101.9
	12.5	90.30	0.64	256	65	85	81	2.4	6.0		16.55	102.6
3	15	92.43	0.64	256	65	86	81	2.4	6.0		16.55	102.5
	17.5	94.56	0.63	283	64	87	81	2.25	6.0		16.72	102.4
	20	96.66	0.65	283	63	88	81	2.3	6.5		16.99	103.5
4	22.5	98.76	0.66	284	63	88	82	2.4	6.5		17.13	101.8
	25	100.92	0.66	287	62	89	82	2.4	6.5		17.16	103.9
	27.5	103.05	0.66	288	62	89	82	2.4	6.0		17.18	102.6
5	30	105.18	0.66	288	62	89	82	2.4	6.0		17.18	102.7
	32.5	107.31	0.63	289	62	89	82	2.25	6.0		16.79	102.7
	35	109.41	0.63	289	62	90	83	2.25	6.0		16.79	103.6
6	37.5	111.49	0.69	288	62	90	83	2.45	6.5		17.56	102.5
	40	113.67	0.68	289	60	90	83	2.4	6.5		17.45	102.6
	42.5	115.83	0.68	289	58	90	83	2.4	6.5		17.45	102.5
7	45	117.98	0.65	290	57	90	83	2.3	6.3		17.07	102.0
	47.5	120.09	0.67	290	56	90	84	2.3	6.3		17.33	102.4
	50	122.19	0.66	291	55	90	84	2.3	6.3		17.21	100.3
8	52.5	124.30	0.68	291	55	90	84	2.4	6.5		17.47	101.6
	55	126.47	0.69	291	55	91	84	2.4	6.5		17.60	103.0
	57.5	128.64	0.7	290	54	91	84	2.45	6.5		17.71	102.1
9	60	130.84	0.74	290	54	91	84	2.6	6.8		18.21	102.8
	62.5	133.08	0.77	290	54	90	84	2.7	6.8		18.58	101.8
	65	135.37	0.77	290	54	90	84	2.7	6.8		18.58	102.1
10	67.5	137.65	0.8	291	54	90	84	2.8	7.0		18.95	101.7
	70	139.99	0.82	290	54	90	84	2.85	7.0		19.17	102.5
	72.5	142.35	0.81	290	54	90	84	2.8	7.0		19.05	102.0
11	75	144.69	0.84	290	54	90	84	2.9	7.0		19.40	101.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.5		
Barometric Pressure	29.96 "Hg	**CWTR (g)**	639.8		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	30.4		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.02 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.74
CO2%	10.98
COppm	14.8

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	147.06	0.84	291	54	90	84	2.9	7.0		19.42	**101.3**
	80	149.44	0.83	291	54	90	84	2.9	7.0		19.30	**101.7**
12	82.5	151.81	0.83	290	55	89	84	2.9	7.0		19.29	**101.9**
	85	154.18	0.81	290	55	89	84	2.8	7.0		19.05	**102.0**
	87.5	156.54	0.81	290	57	89	84	2.8	7.0		19.05	**102.7**
	90	158.93								1.02		**104.0**
1	0	159.95	0.81	283	65	84	84	2.8	54.0		18.96	
	2.5	162.08	0.84	289	54	85	84	2.5	6.5		19.39	**92.7**
	5	164.28	0.85	290	52	86	83	2.95	7.0		19.52	**94.3**
2	7.5	166.63	0.85	290	50	87	83	3	7.0		19.52	**100.3**
	10	169.03	0.83	290	51	87	83	2.95	7.0		19.29	**102.3**
	12.5	171.43	0.83	290	51	88	83	2.9	7.0		19.29	**103.5**
3	15	173.80	0.8	290	51	88	84	2.75	7.0		18.93	**102.1**
	17.5	176.13	0.79	290	53	89	84	2.75	7.0		18.82	**102.2**
	20	178.44	0.84	290	53	89	84	2.95	7.0		19.40	**101.8**
4	22.5	180.84	0.82	291	53	89	84	2.85	7.0		19.18	**102.6**
	25	183.17	0.82	292	54	89	84	2.85	7.0		19.20	**100.9**
	27.5	185.52	0.83	292	54	90	84	2.9	7.0		19.31	**101.8**
5	30	187.88	0.81	292	54	90	84	2.8	7.0		19.08	**101.6**
	32.5	190.24	0.7	292	54	90	84	2.45	7.0		17.74	**102.8**
	35	192.44	0.71	292	55	90	84	2.5	7.0		17.86	**103.0**
6	37.5	194.65	0.59	292	55	90	84	2.1	6.5		16.28	**102.7**
	40	196.67	0.61	291	55	90	84	2.15	6.5		16.54	**102.9**
	42.5	198.71	0.57	291	55	91	84	2.05	6.5		15.99	**102.2**
7	45	200.70	0.57	291	55	91	84	2	6.5		15.99	**103.0**
	47.5	202.66	0.57	290	55	91	84	2	6.5		15.98	**101.4**
	50	204.65	0.65	290	55	91	84	2.3	6.0		17.07	**102.9**
8	52.5	206.77	0.64	290	55	91	84	2.3	6.5		16.94	**102.7**
	55	208.92	0.65	290	55	91	84	2.3	6.5		17.07	**105.0**
	57.5	211.03	0.65	289	56	91	84	2.3	6.5		17.06	**102.2**
9	60	213.15	0.66	289	56	91	85	2.35	6.5		17.19	**102.6**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.1		
DGMCF	0.996	**Probe (mg)**	1.5		
Barometric Pressure	29.96 "Hg	**CWTR (g)**	639.8		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	30.4		
Nozzle	0.2768 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		1.02 ft°	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.74
CO2%	10.98
COppm	14.8

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	215.28	0.66	289	56	91	85	2.35	6.5		17.19	**102.3**
	65	217.42	0.68	289	56	91	85	2.4	7.0		17.45	**102.7**
10	67.5	219.60	0.64	289	57	91	85	2.2	7.0		16.92	**103.1**
	70	221.69	0.64	286	57	91	85	2.2	7.0		16.89	**101.9**
	72.5	223.78	0.67	286	57	91	85	2.4	7.0		17.28	**101.7**
11	75	225.93	0.62	286	58	91	85	2.2	6.5		16.62	**102.3**
	77.5	228.01	0.62	276	58	91	85	2.2	6.5		16.51	**102.8**
	80	230.08	0.62	276	58	91	85	2.2	6.5		16.51	**101.6**
12	82.5	232.15	0.6	275	59	91	85	2.15	6.5		16.23	**101.6**
	85	234.19	0.6	275	59	91	85	2.15	6.5		16.23	**101.7**
	87.5	236.24	0.6	275	59	91	84	2.15	6.5		16.23	**102.2**
	90	238.28										**101.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 2
Test No.:	3 - Metals and Particulate
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.92 mm
DRY REF GAS VOLUME SAMPLED	4.220 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	141.1 °C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	18.13 m/s
BAROMETRIC PRESSURE (Station)	101.321 Kpa
STATIC PRESSURE	-2.478 Kpa
ABSOLUTE GAS PRESSURE	98.843 Kpa
OXYGEN CONCENTRATION	8.07 %
CARBON DIOXIDE CONCENTRATION	10.98 %
CARBON MONOXIDE CONCENTRATION	10.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.78 m^3/s
DRY REF GAS FLOWRATE	15.57 Rm^3/s
DRY ADJ GAS FLOWRATE	20.17 Rm^3/s
WET REF GAS FLOWRATE	18.81 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		4.220 m^3
PARTICULATE CONC. - ACTUAL		0.179 mg/m^3
PARTICULATE CONC. - DRY REF		0.308 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.238 mg/m^3
PARTICULATE CONC. - WET REF		0.255 mg/m^3
PARTICULATE EMISSION RATE		0.004795 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 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0.1		
DGMCF	1.006	**Probe (mg)**	1.2		
Barometric Pressure	29.92 "Hg	**CWTR (g)**	616.1		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	29.1		
Nozzle	0.2725 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.85 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%	10.98
COppm	10.4

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	59.55	0.82	286	83	82	81	2.6	3.0		18.87	
	2.5	61.66	0.83	286	75	82	81	2.6	3.0		18.98	96.9
	5	63.86	0.81	286	70	82	81	2.55	3.0		18.75	100.4
2	7.5	66.05	0.81	286	66	82	81	2.5	3.0		18.75	101.2
	10	68.25	0.84	286	63	83	82	2.5	3.0		19.10	101.6
	12.5	70.42	0.83	286	62	82	81	2.5	3.0		18.98	98.3
3	15	72.60	0.81	286	60	83	82	2.4	3.0		18.75	99.5
	17.5	74.75	0.82	287	60	83	82	2.4	3.0		18.88	99.1
	20	76.88	0.82	287	59	83	82	2.4	3.0		18.88	97.7
4	22.5	79.00	0.8	288	59	83	82	2.35	3.0		18.66	97.2
	25	81.12	0.8	288	59	84	82	2.35	3.0		18.66	98.5
	27.5	83.24	0.78	288	57	84	82	2.3	3.0		18.43	98.4
5	30	85.33	0.72	288	57	84	82	2.15	3.0		17.71	98.2
	32.5	87.33	0.71	289	57	85	82	2.15	3.0		17.59	97.8
	35	89.32	0.71	288	57	85	83	2.15	3.0		17.58	98.0
6	37.5	91.32	0.69	288	57	86	83	2.1	3.0		17.33	98.3
	40	93.29	0.69	288	57	86	83	2.1	3.0		17.33	98.1
	42.5	95.28	0.68	288	57	86	83	2.05	3.0		17.21	99.1
7	45	97.24	0.73	288	56	87	83	2.2	3.0		17.83	98.3
	47.5	99.28	0.72	287	56	87	83	2.15	3.0		17.69	98.7
	50	101.31	0.74	288	56	88	84	2.2	3.0		17.95	98.8
8	52.5	103.36	0.76	288	57	88	84	2.3	3.0		18.19	98.3
	55	105.43	0.76	288	57	88	84	2.3	3.0		18.19	98.0
	57.5	107.53	0.77	288	56	88	84	2.3	3.0		18.31	99.4
9	60	109.62	0.8	288	57	88	84	2.35	3.0		18.66	98.3
	62.5	111.71	0.79	288	57	88	85	2.35	3.0		18.55	96.5
	65	113.81	0.79	288	57	88	85	2.35	3.0		18.55	97.4
10	67.5	115.92	0.78	288	57	88	85	2.35	3.0		18.43	97.9
	70	118.03	0.78	288	56	89	85	2.35	3.0		18.43	98.5
	72.5	120.14	0.8	288	56	88	85	2.4	3.0		18.66	98.4
11	75	122.27	0.76	288	56	89	85	2.3	3.0		18.19	98.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0.1		
DGMCF	1.006	**Probe (mg)**	1.2		
Barometric Pressure	29.92 "Hg	**CWTR (g)**	616.1		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	29.1		
Nozzle	0.2725 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.85 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%	10.98
COppm	10.4

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	124.36	0.77	284	56	88	85	2.3	3.0		18.26	98.8
	80	126.45	0.76	284	56	89	85	2.3	3.0		18.14	98.0
12	82.5	128.54	0.76	284	57	88	85	2.3	3.0		18.14	98.5
	85	130.64	0.76	284	57	89	86	2.3	3.0		18.14	99.1
	87.5	132.74	0.76	284	57	89	85	2.3	3.0		18.14	98.9
	90	134.82								0.85		98.0
1	0	135.67	0.85	284	75	85	85	2.7	3.5		19.19	
	2.5	137.97	0.84	285	66	85	85	2.5	3.0		19.09	103.0
	5	140.17	0.84	285	64	85	85	2.5	3.0		19.09	99.1
2	7.5	142.38	0.82	285	64	85	85	2.45	3.0		18.86	99.6
	10	144.43	0.83	285	64	85	85	2.5	3.0		18.97	93.5
	12.5	146.60	0.8	284	64	85	85	2.4	3.0		18.61	98.3
3	15	148.76	0.75	284	65	85	85	2.25	3.0		18.02	99.6
	17.5	150.83	0.76	285	65	87	85	2.25	3.0		18.15	98.6
	20	152.90	0.75	288	67	88	87	2.25	3.0		18.07	97.8
4	22.5	154.94	0.7	285	66	87	85	2.1	3.0		17.42	96.9
	25	156.93	0.71	285	65	87	85	2.15	3.0		17.55	97.9
	27.5	158.93	0.72	284	65	87	85	2.2	3.0		17.66	97.7
5	30	160.96	0.67	285	66	88	85	2.05	3.0		17.05	98.5
	32.5	162.94	0.67	285	66	88	86	2.05	3.0		17.05	99.5
	35	164.92	0.65	285	66	89	86	2	3.0		16.79	99.4
6	37.5	166.87	0.67	284	66	89	86	2.05	3.0		17.03	99.3
	40	168.81	0.7	285	65	89	86	2.1	3.0		17.42	97.2
	42.5	170.79	0.68	285	65	89	86	2.1	3.0		17.17	97.2
7	45	172.78	0.72	285	64	89	86	2.2	3.0		17.67	99.1
	47.5	174.82	0.74	285	64	89	86	2.25	3.0		17.91	98.7
	50	176.87	0.73	286	64	89	86	2.25	3.0		17.80	97.9
8	52.5	178.92	0.76	286	64	89	86	2.3	3.0		18.17	98.6
	55	181.02	0.76	286	63	90	86	2.3	3.0		18.17	99.0
	57.5	183.12	0.76	286	63	90	86	2.3	3.0		18.17	98.9
9	60	185.21	0.76	286	63	90	86	2.3	3.0		18.17	98.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - Metals and Particulate	**Test Location:**	APC Outlet No. 2
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0.1		
DGMCF	1.006	**Probe (mg)**	1.2		
Barometric Pressure	29.92 "Hg	**CWTR (g)**	616.1		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	29.1		
Nozzle	0.2725 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.85 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%	10.98
COppm	10.4

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	187.30	0.76	286	63	89	86	2.3	3.0		18.17	**98.5**
	65	189.40	0.76	286	63	89	86	2.3	3.0		18.17	**99.0**
10	67.5	191.50	0.78	286	64	89	86	2.35	3.0		18.40	**99.0**
	70	193.61	0.76	283	64	89	86	2.3	3.0		18.13	**98.2**
	72.5	195.70	0.76	286	64	89	86	2.3	3.0		18.17	**98.4**
11	75	197.79	0.72	284	64	89	86	2.2	3.0		17.66	**98.6**
	77.5	199.87	0.72	284	64	89	86	2.15	3.0		17.66	**100.6**
	80	201.90	0.72	284	65	89	86	2.15	3.0		17.66	**98.2**
12	82.5	203.92	0.72	284	65	89	86	2.15	3.0		17.66	**97.7**
	85	205.95	0.72	285	64	89	86	2.15	3.0		17.67	**98.2**
	87.5	207.97	0.72	284	65	89	86	2.15	3.0		17.66	**97.8**
	90	210.01										**98.7**

APPENDIX 23

Particle Size Distribution Test Emission Calculations
(12 pages)

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 12, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 1

Project No.: 21880
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	0.991
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.98
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	8.49
Carbon Dioxide Content (%)	11.01
Carbon Monoxide Content (ppm)	11.7
Assumed Moisture (%)	16.0
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	10.0 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.7 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.2 Rft^{3}*	1.196 Rm^{3}*
Average Cyclone I Cut Diameter		10.17 µm
Average Cyclone IV Cut Diameter		2.32 µm
Average Isokineticity		98.3 %
Stack Gas Physical Parameters		
B_{ws}	16.0 % v/v	
Average m	220.0 (dimensionless)	
M_d	30.10 lbs/lbs mole	
M_w	28.17 lbs/lbs mole	
Average T_s	283 °F	140 °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	55738 ACFM	26.3 m^3/s
Wet Reference Q_s	39506 SCFM*	18.6 Rm^3/s*
Dry Reference Q_s	33185 SCFM*	15.7 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	1.17 mg/Rm^3*	0.0183 g/s
Total Part. (b)	6.27 mg/Rm^3*	0.098 g/s
PM_{10} Part. (b)	5.85 mg/Rm^3*	0.092 g/s
$PM_{2.5}$ Part. (b)	5.60 mg/Rm^3*	0.088 g/s
Cond. Part.	5.10 mg/Rm^3*	0.080 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.8	675.2	771.6	980.7	
final volume or weight (ml or mg)	580.6	675.2	766.9	994.9	
gain in volume or weight (ml or mg)	91.8	0.0	-4.7	14.2	0.0
				TOTAL	101.3

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.5	0.3	0.5	<0.1	6.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 12, 2018	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21880
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	10.40	89.60	0.67	0.35	282	68	66	0.38	4.0	55.9	10.11	2.30	103.1
	2	10.4	10.70	93.24	0.73	0.35	282	69	66	0.38	4.0	58.4	10.26	2.36	96.7
	3	21.1	10.80	96.91	0.75	0.35	282	70	67	0.38	4.0	59.2	10.15	2.31	96.9
	4	31.9	10.40	100.68	0.70	0.35	284	72	67	0.38	4.0	57.2	10.01	2.26	102.4
	5	42.3	9.80	104.39	0.62	0.35	284	73	68	0.38	4.0	53.9	10.18	2.33	106.3
	6	52.1	9.20	107.81	0.53	0.35	283	74	68	0.38	4.0	49.8	10.23	2.35	114.0
		61.3		111.00											
2	1	0.00	10.80	111.00	0.80	0.35	281	75	70	0.38	4.0	61.1	10.16	2.32	93.5
	2	10.8	10.70	114.79	0.87	0.35	283	75	71	0.38	4.0	63.8	10.20	2.34	89.4
	3	21.5	10.10	118.53	0.90	0.35	285	77	72	0.38	4.0	64.9	10.13	2.31	89.0
	4	31.6	9.40	122.11	0.83	0.35	285	77	72	0.38	4.0	62.4	10.17	2.33	92.0
	5	41.0	8.90	125.42	0.73	0.35	285	78	73	0.38	4.0	58.5	10.20	2.34	97.8
	6	49.9	8.90	128.55	0.64	0.35	284	79	74	0.38	4.0	54.7	10.28	2.37	103.2
		58.8		131.65											
Averages					**0.73**		**283**	**71**		**0.38**		**58.3**	**10.17**	**2.32**	**98.3**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 12, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 1

Project No.: 21880
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	0.991
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.99
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	8.48
Carbon Dioxide Content (%)	10.88
Carbon Monoxide Content (PPM)	19.5
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	10.0 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	16.9 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.5 Rft^3*	1.203 Rm^3*
Average Cyclone I Cut Diameter		10.12 µm
Average Cyclone IV Cut Diameter		2.31 µm
Average Isokineticity		104.4 %
Stack Gas Physical Parameters		
B_{ws}	16.0 % v/v	
Average m	220.2 (dimensionless)	
M_d	30.08 lbs/lbs mole	
M_w	28.14 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	55.2 ft/s	16.8 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52731 ACFM	24.9 m^3/s
Wet Reference Q_s	37337 SCFM*	17.6 Rm^3/s*
Dry Reference Q_s	31349 SCFM*	14.8 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	3.99 mg/Rm^3*	0.0590 g/s
Total Part. (b)	9.06 mg/Rm^3*	0.134 g/s
PM_{10} Part. (b)	8.56 mg/Rm^3*	0.127 g/s
$PM_{2.5}$ Part. (b)	8.31 mg/Rm^3*	0.123 g/s
Cond. Part.	5.07 mg/Rm^3*	0.075 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)	491.0	660.3	752.4	933.4	
final volume or weight (ml or mg)	654.4	660.3	745.8	945.7	
gain in volume or weight (ml or mg)	163.4	0.0	-6.6	12.3	0.0
				TOTAL	169.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.6	0.3	3.8	<0.1	6.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 12, 2018	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21880
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	31.75	0.61	0.35	284	78	75	0.38	5.0	53.4	10.05	2.28	109.1
	2	9.6	10.00	35.20	0.66	0.35	284	80	76	0.38	5.0	55.6	10.26	2.36	101.9
	3	19.6	10.20	38.70	0.68	0.35	284	81	76	0.38	5.0	56.4	9.84	2.19	106.5
	4	29.8	9.80	42.49	0.68	0.35	284	82	77	0.38	5.0	56.4	10.11	2.30	102.4
	5	39.6	9.20	46.00	0.58	0.35	284	82	77	0.38	5.0	52.1	10.06	2.28	111.7
	6	48.8	8.50	49.32	0.51	0.35	284	83	78	0.38	5.0	48.9	9.97	2.25	120.6
		57.3		52.43											
2	1	0.00	10.50	52.43	0.78	0.35	283	83	79	0.38	5.0	60.4	10.13	2.31	95.3
	2	10.5	10.90	56.19	0.72	0.35	285	83	79	0.38	5.0	58.1	10.22	2.34	98.2
	3	21.4	11.10	60.05	0.71	0.35	285	84	80	0.38	5.0	57.7	10.19	2.34	99.2
	4	32.5	10.70	64.00	0.69	0.35	285	85	80	0.38	5.0	56.9	10.18	2.33	100.9
	5	43.2	10.00	67.82	0.64	0.35	285	85	80	0.38	5.0	54.8	10.36	2.40	102.1
	6	53.2	9.40	71.30	0.56	0.35	285	85	81	0.38	5.0	51.2	10.01	2.26	114.7
		62.6		74.74											
Averages					**0.65**		**284**	**80**		**0.38**		**55.2**	**10.12**	**2.31**	**104.4**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 12, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 1

Project No.: 21880
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	0.991
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.96
Static Pressure ("H_2O)	-8.50
Oxygen Content (%)	8.20
Carbon Dioxide Content (%)	11.07
Carbon Monoxide Content (PPM)	10.8
Assumed Moisture (%)	16.0
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.1 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	16.9 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.6 Rft^3*	1.206 Rm^3*
Average Cyclone I Cut Diameter		10.10 µm
Average Cyclone IV Cut Diameter		2.30 µm
Average Isokineticity		103.1 %
Stack Gas Physical Parameters		
B_{ws}	16.0 % v/v	
Average m	220.3 (dimensionless)	
M_d	30.10 lbs/lbs mole	
M_w	28.16 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	55.9 ft/s	17.0 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53432 ACFM	25.2 m^3/s
Wet Reference Q_s	37756 SCFM*	17.8 Rm^3/s*
Dry Reference Q_s	31715 SCFM*	15.0 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.91 mg/Rm^3*	0.0137 g/s
Total Part. (b)	5.72 mg/Rm^3*	0.086 g/s
PM_{10} Part. (b)	5.39 mg/Rm^3*	0.081 g/s
$PM_{2.5}$ Part. (b)	5.06 mg/Rm^3*	0.076 g/s
Cond. Part.	4.81 mg/Rm^3*	0.072 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.8	675.2	766.9	994.9	
final volume or weight (ml or mg)	604.8	675.2	761.1	1010.6	
gain in volume or weight (ml or mg)	116.0	0.0	-5.8	15.7	0.0
				TOTAL	125.9

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.4	0.4	0.2	<0.1	5.8

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 12, 2018	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21880
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	9.70	75.01	0.62	0.35	282	83	81	0.38	4.0	53.8	10.32	2.38	104.0
	2	9.7	10.10	78.40	0.71	0.35	283	84	80	0.38	4.0	57.6	9.89	2.21	103.3
	3	19.8	10.20	82.15	0.69	0.35	284	84	81	0.38	4.0	56.9	10.02	2.27	102.9
	4	30.0	10.20	85.87	0.65	0.35	285	85	81	0.38	4.0	55.2	10.17	2.32	104.0
	5	40.2	9.40	89.52	0.58	0.35	285	85	81	0.38	4.0	52.2	10.18	2.33	110.0
	6	49.6	8.90	92.88	0.53	0.35	286	86	81	0.38	4.0	49.9	10.28	2.37	113.5
		58.5		96.02											
2	1	0.00	11.00	96.02	0.72	0.35	285	86	82	0.38	4.0	58.1	10.01	2.26	101.0
	2	11.0	10.50	100.05	0.77	0.35	285	86	82	0.38	4.0	60.1	10.35	2.40	93.2
	3	21.5	10.40	103.72	0.77	0.35	287	86	82	0.38	4.0	60.2	9.82	2.19	100.6
	4	31.9	10.30	107.64	0.74	0.35	287	87	82	0.38	4.0	59.0	10.30	2.38	95.9
	5	42.2	9.90	111.27	0.67	0.35	287	87	83	0.38	4.0	56.1	9.93	2.23	106.2
	6	52.1	9.30	114.95	0.57	0.35	285	87	83	0.38	4.0	51.7	9.94	2.23	114.7
		61.4		118.40											
Averages					**0.67**		**285**	**83**		**0.38**		**55.9**	**10.10**	**2.30**	**103.1**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 11, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 2

Project No.: 21880
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	1.006
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.82
Static Pressure ("H_2O)	-8.60
Oxygen Content (%)	7.88
Carbon Dioxide Content (%)	11.24
Carbon Monoxide Content (PPM)	12.5
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.37 Rft^3/min*	10.4 l/min*
Cyclone Qs_{actual}	0.62 ft^3/min	17.4 l/min
Stack Gas Sampling Parameters		
V_{ms}	44.1 Rft^3*	1.249 Rm^3*
Average Cyclone I Cut Diameter		9.94 µm
Average Cyclone IV Cut Diameter		2.23 µm
Average Isokineticity		102.2 %
Stack Gas Physical Parameters		
B_{ws}	15.1 % v/v	
Average m	220.9 (dimensionless)	
M_d	30.11 lbs/lbs mole	
M_w	28.29 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	55481 ACFM	26.2 m^3/s
Wet Reference Q_s	39004 SCFM*	18.4 Rm^3/s*
Dry Reference Q_s	33124 SCFM*	15.6 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	**Emission Rate**
Total Part. (a)	1.20 mg/Rm^3*	0.0188 g/s
Total Part. (b)	5.84 mg/Rm^3*	0.091 g/s
PM_{10} Part. (b)	5.36 mg/Rm^3*	0.084 g/s
$PM_{2.5}$ Part. (b)	4.96 mg/Rm^3*	0.078 g/s
Cond. Part.	4.64 mg/Rm^3*	0.073 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	659.5	760.0	909.0	
final volume or weight (ml or mg)	645.7	659.5	756.8	920.4	
gain in volume or weight (ml or mg)	154.9	0.0	-3.2	11.4	0.0
				TOTAL	163.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.6	0.5	0.2	0.2	5.8

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 11, 2018	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21880
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	10.80	86.90	0.81	0.35	287	72	71	0.38	5.0	61.7	8.74	1.78	115.9
	2	10.8	10.80	91.58	0.82	0.35	287	71	70	0.38	5.0	62.1	10.15	2.32	93.2
	3	21.6	10.90	95.36	0.79	0.35	287	72	72	0.38	5.0	61.0	10.12	2.31	95.3
	4	32.5	10.60	99.20	0.72	0.35	287	73	72	0.38	5.0	58.2	10.01	2.26	101.5
	5	43.1	10.00	103.00	0.67	0.35	285	73	71	0.38	5.0	56.1	9.96	2.24	105.6
	6	53.1	9.30	106.60	0.58	0.35	285	74	72	0.38	5.0	52.2	9.81	2.18	116.1
		62.4		110.03											
2	1	0.00	10.28	110.03	0.78	0.35	282	74	72	0.38	5.0	60.4	10.05	2.28	96.4
	2	10.3	10.28	113.69	0.77	0.35	285	74	72	0.38	5.0	60.1	10.16	2.32	95.9
	3	20.6	9.79	117.30	0.76	0.35	285	74	73	0.38	5.0	59.7	9.99	2.25	98.8
	4	30.4	9.41	120.82	0.72	0.35	284	75	73	0.38	5.0	58.1	10.22	2.35	98.2
	5	39.8	9.18	124.10	0.64	0.35	284	75	73	0.38	5.0	54.8	10.00	2.26	107.4
	6	48.9	8.62	127.40	0.58	0.35	284	75	73	0.38	5.0	52.1	10.02	2.27	112.5
		57.6		130.49											
Averages					**0.72**		**285**	**73**		**0.38**		**58.0**	**9.94**	**2.23**	**102.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 11, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 2

Project No.: 21880
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	1.006
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.85
Static Pressure ("H_2O)	-8.60
Oxygen Content (%)	7.96
Carbon Dioxide Content (%)	11.38
Carbon Monoxide Content (PPM)	14.3
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.2 l/min*
Cyclone Qs_{actual}	0.62 ft^3/min	17.5 l/min
Stack Gas Sampling Parameters		
V_{ms}	43.2 Rft^3*	1.224 Rm^3*
Average Cyclone I Cut Diameter		9.86 µm
Average Cyclone IV Cut Diameter		2.22 µm
Average Isokineticity		103.7 %
Stack Gas Physical Parameters		
B_{ws}	17.1 % v/v	
Average m	219.7 (dimensionless)	
M_d	30.14 lbs/lbs mole	
M_w	28.06 lbs/lbs mole	
Average T_s	286 °F	141 °C
Average U_s	57.5 ft/s	17.5 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	54982 ACFM	25.9 m^3/s
Wet Reference Q_s	38641 SCFM*	18.2 Rm^3/s*
Dry Reference Q_s	32026 SCFM*	15.1 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	1.88 mg/Rm^3*	0.0284 g/s
Total Part. (b)	7.11 mg/Rm^3*	0.107 g/s
PM_{10} Part. (b)	6.37 mg/Rm^3*	0.096 g/s
$PM_{2.5}$ Part. (b)	5.72 mg/Rm^3*	0.086 g/s
Cond. Part.	5.23 mg/Rm^3*	0.079 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.8	675.2	774.7	969.5	
final volume or weight (ml or mg)	666.7	675.2	771.6	980.7	
gain in volume or weight (ml or mg)	177.9	0.0	-3.1	11.2	0.0
				TOTAL	186.0

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.9	0.8	0.5	<0.1	6.4

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 11, 2018	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21880
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	10.60	30.66	0.78	0.35	286	75	75	0.38	5.0	60.8	9.76	2.17	100.1
	2	10.6	10.70	34.50	0.83	0.35	286	75	75	0.38	5.0	62.7	9.94	2.24	94.6
	3	21.3	10.50	38.28	0.86	0.35	288	75	75	0.38	5.0	63.9	10.03	2.28	91.8
	4	31.8	10.00	41.94	0.79	0.35	288	76	74	0.38	5.0	61.2	9.79	2.18	99.2
	5	41.8	9.70	45.55	0.66	0.35	288	76	75	0.38	5.0	56.0	9.80	2.19	108.4
	6	51.5	9.00	49.05	0.58	0.35	287	77	75	0.38	5.0	52.4	10.08	2.30	110.9
		60.5		52.17											
2	1	0.00	10.40	52.17	0.67	0.35	286	77	76	0.38	5.0	56.3	9.81	2.19	107.2
	2	10.4	10.40	55.92	0.67	0.35	286	77	75	0.38	5.0	56.3	9.82	2.20	107.0
	3	20.8	10.30	59.66	0.71	0.35	285	77	76	0.38	5.0	57.9	10.03	2.28	100.9
	4	31.1	10.00	63.26	0.65	0.35	285	78	76	0.38	5.0	55.4	9.69	2.15	110.6
	5	41.1	9.40	66.93	0.63	0.35	285	78	76	0.38	5.0	54.6	9.86	2.21	109.7
	6	50.5	9.00	70.30	0.59	0.35	284	78	76	0.38	5.0	52.8	9.70	2.15	115.9
		59.5		73.60											
Averages					**0.70**		**286**	**76**		**0.38**		**57.5**	**9.86**	**2.22**	**103.7**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 11, 2018
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 2

Project No.: 21880
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	1.006
Pitot Factor	0.845
Barometric Pressure (" Hg)	29.86
Static Pressure ("H_2O)	-8.60
Oxygen Content (%)	8.06
Carbon Dioxide Content (%)	11.17
Carbon Monoxide Content (PPM)	11.7
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.3 l/min*
Cyclone Qs_{actual}	0.62 ft^3/min	17.6 l/min
Stack Gas Sampling Parameters		
V_{ms}	43.5 Rft^{3*}	1.231 Rm^{3*}
Average Cyclone I Cut Diameter		9.82 µm
Average Cyclone IV Cut Diameter		2.20 µm
Average Isokineticity		101.6 %
Stack Gas Physical Parameters		
B_{ws}	17.2 % v/v	
Average m	219.7 (dimensionless)	
M_d	30.11 lbs/lbs mole	
M_w	28.02 lbs/lbs mole	
Average T_s	287 °F	141 °C
Average U_s	59.0 ft/s	18.0 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	56437 ACFM	26.6 m^3/s
Wet Reference Q_s	39659 SCFM*	18.7 Rm^3/s*
Dry Reference Q_s	32831 SCFM*	15.5 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	1.71 mg/Rm^{3*}	0.0264 g/s
Total Part. (b)	6.01 mg/Rm^{3*}	0.093 g/s
PM_{10} Part. (b)	5.36 mg/Rm^{3*}	0.083 g/s
$PM_{2.5}$ Part. (b)	4.71 mg/Rm^{3*}	0.073 g/s
Cond. Part.	4.31 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	659.5	756.8	920.4	
final volume or weight (ml or mg)	670.1	659.9	752.4	933.4	
gain in volume or weight (ml or mg)	179.3	0.4	-4.4	13.0	0.0
				TOTAL	188.3

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.8	0.8	0.4	<0.1	5.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 11, 2018	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21880
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	10.60	73.69	0.77	0.35	286	76	76	0.38	5.0	60.4	9.89	2.22	98.8
	2	10.6	10.90	77.46	0.87	0.35	288	77	76	0.38	5.0	64.3	9.59	2.11	97.4
	3	21.5	11.10	81.52	0.86	0.35	288	77	76	0.38	5.0	63.9	10.01	2.27	92.1
	4	32.6	10.60	85.41	0.79	0.35	287	78	76	0.38	5.0	61.2	9.50	2.07	103.4
	5	43.2	9.70	89.41	0.72	0.35	287	78	76	0.38	5.0	58.4	9.77	2.18	104.1
	6	52.9	9.10	92.93	0.60	0.35	286	77	76	0.38	5.0	53.3	9.72	2.16	114.7
		62.0		96.25											
2	1	0.00	9.80	96.25	0.73	0.35	286	76	76	0.38	5.0	58.8	9.93	2.24	101.0
	2	9.8	9.80	99.72	0.77	0.35	286	77	77	0.38	5.0	60.4	9.80	2.19	100.1
	3	19.6	10.10	103.26	0.74	0.35	286	76	76	0.38	5.0	59.2	10.10	2.31	97.9
	4	29.7	9.60	106.75	0.71	0.35	286	77	76	0.38	5.0	58.0	9.83	2.20	103.9
	5	39.3	9.50	110.20	0.66	0.35	286	78	76	0.38	5.0	55.9	10.03	2.28	104.6
	6	48.8	9.20	113.52	0.63	0.35	286	78	76	0.38	5.0	54.6	9.68	2.14	112.6
		58.0		116.90											
Averages					**0.74**		**287**	**77**		**0.38**		**59.0**	**9.82**	**2.20**	**101.6**

APPENDIX 24

Acid Gases Test Emission Calculations
(12 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 1
Test No.:	1 - M26A
Date:	September 11, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.991
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.393 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	137.6 °C
AVERAGE GAS MOISTURE BY VOLUME	17.4 %
AVERAGE GAS VELOCITY	17.41 m/s
BAROMETRIC PRESSURE (Station)	100.948 Kpa
STATIC PRESSURE	-2.443 Kpa
ABSOLUTE GAS PRESSURE	98.506 Kpa
OXYGEN CONCENTRATION	8.2 %
CARBON DIOXIDE CONCENTRATION	11.30 %
CARBON MONOXIDE CONCENTRATION	13.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.73 m^3/s
DRY REF GAS FLOWRATE	15.00 Rm^3/s
DRY ADJ GAS FLOWRATE	19.24 Rm^3/s
WET REF GAS FLOWRATE	18.16 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.393 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	AS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.81 "Hg	**CWTR (g)**	203.4		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	12.2		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.2
CO2%	11.30
COppm	13.1

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	740.78	0.77	278	62	69	68	2.4	3.0		18.34	
2	5	745.04	0.77	279	58	70	68	2.4	3.0		18.35	**98.6**
3	10	749.29	0.8	279	59	70	68	2.5	3.0		18.71	**98.4**
4	15	753.60	0.78	280	61	71	69	2.4	3.0		18.48	**97.9**
5	20	757.89	0.71	281	63	71	69	2.3	3.0		17.65	**98.5**
6	25	762.09	0.62	283	55	71	69	2	3.0		16.51	**101.1**
7	30	766.02	0.68	283	51	71	69	2.1	3.0		17.29	**101.3**
8	35	770.03	0.68	282	47	71	69	2.1	3.0		17.28	**98.8**
9	40	774.06	0.65	278	45	71	69	2	3.0		16.85	**99.2**
10	45	778.01	0.61	278	45	72	70	1.9	3.0		16.32	**99.1**
11	50	781.90	0.62	278	45	72	70	1.9	3.0		16.46	**100.6**
12	55	785.76	0.64	278	46	73	70	2	3.0		16.72	**99.0**
	60	789.66										**98.4**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 1
Test No.:	2 - M26A
Date:	September 11, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.991
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.393 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	138.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	17.66 m/s
BAROMETRIC PRESSURE (Station)	101.050 Kpa
STATIC PRESSURE	-2.443 Kpa
ABSOLUTE GAS PRESSURE	98.607 Kpa
OXYGEN CONCENTRATION	8.22 %
CARBON DIOXIDE CONCENTRATION	11.12 %
CARBON MONOXIDE CONCENTRATION	11.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.09 m^3/s
DRY REF GAS FLOWRATE	15.22 Rm^3/s
DRY ADJ GAS FLOWRATE	19.50 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		1.393 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	AS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.84 "Hg	**CWTR (g)**	200.1		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	13.6		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.22
CO2%	11.12
COppm	11.9

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 %
1	0	790.10	0.78	279	68	72	70	2.4	3.0		18.46	
2	5	794.32	0.79	280	68	72	71	2.4	3.0		18.60	**96.6**
3	10	798.63	0.79	281	60	73	71	2.4	3.0		18.61	**98.0**
4	15	802.91	0.74	281	54	73	71	2.3	3.0		18.01	**97.3**
5	20	807.15	0.71	282	50	73	71	2.2	3.0		17.65	**99.5**
6	25	811.30	0.65	281	48	73	71	2	3.0		16.88	**99.5**
7	30	815.26	0.68	281	48	73	71	2.1	3.0		17.26	**99.1**
8	35	819.24	0.68	281	49	74	71	2.1	3.0		17.26	**97.4**
9	40	823.21	0.69	282	49	74	71	2.1	3.0		17.40	**97.1**
10	45	827.20	0.69	281	50	74	72	2.1	3.0		17.39	**96.9**
11	50	831.17	0.68	281	51	74	72	2.1	3.0		17.26	**96.3**
12	55	835.15	0.67	281	53	75	72	2.1	3.0		17.14	**97.2**
	60	839.13										**97.9**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 1
Test No.:	3 - M26A
Date:	September 11, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.991
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.397 m^3
AVGERGE ISOKINETICITY	98.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.8 °C
AVERAGE GAS MOISTURE BY VOLUME	17.7 %
AVERAGE GAS VELOCITY	17.75 m/s
BAROMETRIC PRESSURE (Station)	101.050 Kpa
STATIC PRESSURE	-2.443 Kpa
ABSOLUTE GAS PRESSURE	98.607 Kpa
OXYGEN CONCENTRATION	8.18 %
CARBON DIOXIDE CONCENTRATION	11.20 %
CARBON MONOXIDE CONCENTRATION	12.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.22 m^3/s
DRY REF GAS FLOWRATE	15.19 Rm^3/s
DRY ADJ GAS FLOWRATE	19.52 Rm^3/s
WET REF GAS FLOWRATE	18.48 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.397 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - M26A	**Test Location:**	APC Outlet No. 1
Date:	September 11, 2018	**Operator:**	AS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.84 "Hg	**CWTR (g)**	210.4		
Static Pressure	-9.810 "H_2O	**WCBDA (g)**	11.1		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.18
CO2%	11.20
COppm	12.0

Measured H2O
17.7 %

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	839.64	0.7	280	66	74	73	2.2	3.0		17.52	
2	5	843.75	0.68	280	63	74	73	2.1	3.0		17.27	**99.3**
3	10	847.78	0.68	278	56	74	73	2.1	3.0		17.24	**98.8**
4	15	851.82	0.68	280	50	75	73	2.1	3.0		17.27	**98.9**
5	20	855.86	0.67	283	48	75	73	2.1	3.0		17.17	**98.9**
6	25	859.88	0.66	282	48	75	73	2	3.0		17.03	**99.4**
7	30	863.80	0.62	282	47	75	73	1.9	3.0		16.51	**97.5**
8	35	867.64	0.71	283	48	76	74	2.2	3.0		17.68	**98.6**
9	40	871.71	0.73	283	49	75	74	2.3	3.0		17.93	**97.6**
10	45	875.87	0.79	283	51	76	74	2.4	3.0		18.65	**98.5**
11	50	880.11	0.86	284	51	76	74	2.6	3.5		19.47	**96.4**
12	55	884.52	0.84	283	54	77	74	2.6	3.5		19.23	**96.2**
	60	889.00										**98.7**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 2
Test No.:	1 - M26A
Date:	September 12, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.358 m^3
AVGERGE ISOKINETICITY	98.0 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.8 °C
AVERAGE GAS MOISTURE BY VOLUME	14.9 %
AVERAGE GAS VELOCITY	16.70 m/s
BAROMETRIC PRESSURE (Station)	101.524 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.909 Kpa
OXYGEN CONCENTRATION	8.39 %
CARBON DIOXIDE CONCENTRATION	10.75 %
CARBON MONOXIDE CONCENTRATION	17.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.67 m^3/s
DRY REF GAS FLOWRATE	14.80 Rm^3/s
DRY ADJ GAS FLOWRATE	18.70 Rm^3/s
WET REF GAS FLOWRATE	17.39 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.358 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	AS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	160.5		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	14.2		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.39
CO2%	10.75
COppm	17.1

Measured H2O
14.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	617.20	0.74	277	68	69	68	2.4	2.5		17.86	
2	5	621.50	0.73	283	57	71	70	2.3	2.5		17.81	**100.8**
3	10	625.65	0.7	284	56	71	70	2.2	2.5		17.45	**97.9**
4	15	629.70	0.64	284	56	72	70	2	2.0		16.68	**97.6**
5	20	633.54	0.6	284	58	73	71	1.9	2.0		16.15	**96.7**
6	25	637.31	0.57	284	55	74	71	1.8	2.0		15.75	**97.8**
7	30	640.96	0.61	284	54	75	72	1.9	2.0		16.29	**97.0**
8	35	644.66	0.64	285	53	76	72	2.1	2.0		16.70	**94.9**
9	40	648.56	0.64	286	52	77	72	2.1	2.0		16.71	**97.7**
10	45	652.49	0.62	284	54	78	73	2	2.0		16.42	**98.4**
11	50	656.35	0.64	284	54	79	73	2.1	2.0		16.68	**97.9**
12	55	660.27	0.58	284	55	79	73	2	2.0		15.88	**97.8**
	60	664.14										**101.4**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 2
Test No.:	2 - M26A
Date:	September 12, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.356 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	140.5 °C
AVERAGE GAS MOISTURE BY VOLUME	15.5 %
AVERAGE GAS VELOCITY	16.54 m/s
BAROMETRIC PRESSURE (Station)	101.558 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.943 Kpa
OXYGEN CONCENTRATION	8.11 %
CARBON DIOXIDE CONCENTRATION	10.71 %
CARBON MONOXIDE CONCENTRATION	16.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.44 m^3/s
DRY REF GAS FLOWRATE	14.53 Rm^3/s
DRY ADJ GAS FLOWRATE	18.77 Rm^3/s
WET REF GAS FLOWRATE	17.21 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.356 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	AS, JB

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.99 "Hg	**CWTR (g)**	168.4		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	14.8		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.11
CO2%	10.71
COppm	16.9

Measured H2O
15.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	664.57	0.77	281	68	76	75	2.5	2.0		18.29	
2	5	669.01	0.77	287	68	75	74	2.4	2.0		18.36	**101.6**
3	10	673.28	0.74	288	65	76	75	2.3	2.0		18.01	**98.2**
4	15	677.47	0.68	287	59	77	75	2.2	2.0		17.26	**98.2**
5	20	681.55	0.59	287	55	78	75	2	2.0		16.07	**99.6**
6	25	685.41	0.54	286	53	79	73	1.8	2.0		15.37	**101.0**
7	30	689.08	0.59	286	53	80	76	1.9	2.0		16.06	**100.3**
8	35	692.91	0.54	285	53	81	76	1.7	2.0		15.36	**99.8**
9	40	696.51	0.59	286	53	80	77	2.05	2.0		16.06	**97.9**
10	45	700.41	0.58	285	54	81	77	2	2.0		15.92	**101.6**
11	50	704.28	0.57	282	55	81	77	1.8	2.0		15.75	**101.5**
12	55	707.94	0.59	279	56	82	78	2	2.0		15.99	**96.6**
	60	711.80										**99.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No. 2
Test No.:	3 - M26A
Date:	September 12, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.99 mm
DRY REF GAS VOLUME SAMPLED	1.314 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	139.8 °C
AVERAGE GAS MOISTURE BY VOLUME	16.3 %
AVERAGE GAS VELOCITY	16.24 m/s
BAROMETRIC PRESSURE (Station)	101.524 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.909 Kpa
OXYGEN CONCENTRATION	7.4 %
CARBON DIOXIDE CONCENTRATION	11.34 %
CARBON MONOXIDE CONCENTRATION	15.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	23.99 m^3/s
DRY REF GAS FLOWRATE	14.15 Rm^3/s
DRY ADJ GAS FLOWRATE	19.30 Rm^3/s
WET REF GAS FLOWRATE	16.91 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.314 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, On
Test No.:	3 - M26A	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2018	**Operator:**	AS, JB

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	176.3		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	11.7		
Nozzle	0.2753 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**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.4
CO2%	11.34
COppm	15.8

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	712.97	0.73	276	65	80	79	2.4	3.0		17.76	
2	5	717.21	0.71	284	51	79	78	2.3	3.0		17.61	**99.3**
3	10	721.42	0.71	284	49	79	78	2.3	3.0		17.61	**100.7**
4	15	725.62	0.64	285	51	80	79	2.1	3.0		16.73	**100.5**
5	20	729.53	0.58	285	52	80	78	1.8	3.0		15.93	**98.4**
6	25	733.21	0.51	285	53	81	79	1.7	3.0		14.94	**97.3**
7	30	736.78	0.57	285	52	81	79	1.8	3.0		15.79	**100.4**
8	35	740.44	0.59	285	53	82	80	1.9	3.0		16.06	**97.4**
9	40	744.25	0.57	286	53	83	79	1.9	3.0		15.80	**99.5**
10	45	747.95	0.58	283	53	83	80	1.9	3.0		15.91	**98.4**
11	50	751.71	0.55	283	54	83	80	1.8	3.0		15.49	**98.8**
12	55	755.39	0.53	283	54	83	80	1.7	2.5		15.21	**99.3**
	60	759.02										**99.8**

APPENDIX 25

SVOC Test Emission Calculations
(18 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	1 - SVOC
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84	
DGM CORRECTION FACTOR	0.991	
NOZZLE DIAMETER	5.57	mm
DRY REF GAS VOLUME SAMPLED	3.804	m^3
AVGERGE ISOKINETICITY	101.7	%
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	141.4	°C
AVERAGE GAS MOISTURE BY VOLUME	17.3	%
AVERAGE GAS VELOCITY	18.32	m/s
BAROMETRIC PRESSURE (Station)	101.524	Kpa
STATIC PRESSURE	-2.614	Kpa
ABSOLUTE GAS PRESSURE	98.909	Kpa
OXYGEN CONCENTRATION	8.39	%
CARBON DIOXIDE CONCENTRATION	11.00	%
CARBON MONOXIDE CONCENTRATION	13.6	ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.07	m^3/s
DRY REF GAS FLOWRATE	15.71	Rm^3/s
DRY ADJ GAS FLOWRATE	19.85	Rm^3/s
WET REF GAS FLOWRATE	19.01	Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0	mg
	-FILTER	0	mg
	-TOTAL	0	mg
DRY REF GAS VOLUME SAMPLED		3.804	m^3
PARTICULATE CONC. - ACTUAL		0.000	mg/m^3
PARTICULATE CONC. - DRY REF		0.000	mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000	mg/m^3
PARTICULATE CONC. - WET REF		0.000	mg/m^3
PARTICULATE EMISSION RATE		0.000000	g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	JB, DP

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	573.8		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	12.6		
Nozzle	0.2194 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%	8.39
CO2%	11.00
COppm	13.6

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 %
1	0	18.65	0.66	268	70	72	71	0.75	3.3		16.72	
	5	21.28	0.66	272	61	76	74	0.75	3.5		16.76	102.8
2	10	23.72	0.68	282	56	77	74	0.85	4.0		17.13	95.0
	15	26.27	0.72	282	53	77	75	0.95	4.5		17.63	98.4
3	20	29.00	0.78	286	50	77	75	1.05	4.5		18.40	102.3
	25	31.85	0.77	288	49	78	75	1	4.3		18.30	103.0
4	30	34.64	0.77	288	49	78	75	1	4.3		18.30	101.5
	35	37.46	0.76	289	49	79	76	1	4.3		18.20	102.6
5	40	40.25	0.76	289	49	79	76	1	4.3		18.20	102.0
	45	43.03	0.75	289	48	80	77	1	4.3		18.08	101.6
6	50	45.82	0.74	289	47	80	77	0.95	4.3		17.96	102.5
	55	48.58	0.72	289	48	81	78	0.95	4.3		17.71	102.1
7	60	51.31	0.68	289	48	81	78	0.9	4.0		17.21	102.2
	65	53.97	0.68	289	48	81	79	0.9	4.0		17.21	102.4
8	70	56.63	0.76	289	49	82	79	1.05	4.5		18.20	102.3
	75	59.48	0.75	289	48	82	79	1	4.3		18.08	103.6
9	80	62.28	0.82	289	49	82	79	1.1	4.5		18.90	102.5
	85	65.17	0.82	289	49	82	80	1.1	4.5		18.90	101.2
10	90	68.05	0.89	289	49	83	80	1.25	4.5		19.69	100.7
	95	71.11	0.88	289	50	83	81	1.2	4.5		19.58	102.7
11	100	74.15	0.88	289	50	83	81	1.2	4.5		19.58	102.5
	105	77.22	0.87	288	50	83	81	1.2	4.5		19.46	103.5
12	110	80.25	0.88	288	50	83	81	1.2	4.5		19.57	102.7
	115	83.26	0.88	288	51	84	82	1.2	4.5		19.57	101.4
	120	86.37								0.45		104.6
1	0	86.82	0.94	284	65	83	82	1.35	5.0		20.17	
	5	90.06	0.93	288	50	83	82	1.3	5.0		20.12	105.3
2	10	93.25	0.93	287	47	84	82	1.25	5.0		20.10	104.5
	15	96.38	0.9	288	47	84	82	1.2	4.8		19.79	102.3
3	20	99.45	0.89	287	47	84	83	1.2	4.8		19.67	102.1

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	JB, DP

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	573.8		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	12.6		
Nozzle	0.2194 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%	8.39
CO2%	11.00
COppm	13.6

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	102.50	0.89	287	47	84	83	1.2	4.8		19.67	**101.8**
4	30	105.52	0.87	288	48	85	83	1.2	4.8		19.46	**100.8**
	35	108.55	0.84	288	48	85	83	1.2	4.8		19.12	**102.3**
5	40	111.53	0.71	288	49	85	83	0.9	4.3		17.58	**102.4**
	45	114.25	0.71	288	49	86	84	0.9	4.3		17.58	**101.6**
6	50	116.93	0.7	287	49	86	84	0.95	4.3		17.44	**99.9**
	55	119.68	0.59	288	50	86	84	0.7	4.0		16.02	**103.2**
7	60	122.09	0.7	287	52	86	84	0.95	4.0		17.44	**98.5**
	65	124.81	0.67	287	50	86	84	0.9	4.0		17.06	**102.1**
8	70	127.50	0.73	286	50	86	84	1	4.3		17.80	**103.1**
	75	130.30	0.74	286	51	86	84	1	4.3		17.92	**102.8**
9	80	133.14	0.76	286	51	86	84	1	4.3		18.16	**103.6**
	85	135.97	0.76	286	49	86	84	1	4.3		18.16	**101.8**
10	90	138.79	0.75	285	49	86	85	0.96	4.3		18.03	**101.5**
	95	141.58	0.75	285	49	86	85	0.95	4.3		18.03	**100.9**
11	100	144.32	0.74	288	49	86	84	0.95	4.3		17.94	**99.1**
	105	147.07	0.75	285	49	86	85	0.95	4.3		18.03	**100.4**
12	110	149.81	0.71	283	49	86	85	0.9	4.2		17.52	**99.1**
	115	152.50	0.7	284	50	87	85	0.88	4.2		17.41	**99.8**
	120	155.14										**98.7**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	2 - SVOC
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	0.991
NOZZLE DIAMETER	5.57 mm
DRY REF GAS VOLUME SAMPLED	3.790 m^3
AVGERGE ISOKINETICITY	102.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.1 °C
AVERAGE GAS MOISTURE BY VOLUME	18.1 %
AVERAGE GAS VELOCITY	18.34 m/s
BAROMETRIC PRESSURE (Station)	101.287 Kpa
STATIC PRESSURE	-2.614 Kpa
ABSOLUTE GAS PRESSURE	98.672 Kpa
OXYGEN CONCENTRATION	8.08 %
CARBON DIOXIDE CONCENTRATION	11.15 %
CARBON MONOXIDE CONCENTRATION	11.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.09 m^3/s
DRY REF GAS FLOWRATE	15.59 Rm^3/s
DRY ADJ GAS FLOWRATE	20.18 Rm^3/s
WET REF GAS FLOWRATE	19.04 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.790 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.91 "Hg	**CWTR (g)**	602.4		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	13.5		
Nozzle	0.2194 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.4 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%	8.08
CO2%	11.15
COppm	11.4

Measured H2O
18.1 %

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	158.12	0.7	280	65	85	85	0.85	4.0		17.41	
	5	160.79	0.7	280	63	86	85	0.85	4.5		17.41	100.4
2	10	163.43	0.7	280	57	86	85	0.9	5.0		17.41	99.1
	15	166.13	0.69	280	57	86	85	0.9	5.0		17.28	101.4
3	20	168.77	0.8	287	54	87	85	1.1	6.0		18.70	99.9
	25	171.76	0.82	288	53	87	85	1.1	6.0		18.94	105.5
4	30	174.71	0.76	287	53	87	85	1	6.0		18.22	102.9
	35	177.53	0.79	286	53	87	85	1.05	6.0		18.57	102.1
5	40	180.41	0.76	286	53	87	85	1	6.0		18.21	102.2
	45	183.26	0.75	285	53	87	85	1	5.0		18.08	103.1
6	50	186.10	0.71	285	52	87	85	0.9	5.0		17.59	103.3
	55	188.81	0.71	285	51	87	85	0.9	5.0		17.59	101.3
7	60	191.46	0.6	285	53	87	86	0.67	4.5		16.17	99.1
	65	193.85	0.7	285	54	87	86	0.95	5.0		17.46	97.0
8	70	196.57	0.72	285	53	88	86	0.9	5.0		17.71	102.3
	75	199.27	0.75	285	55	88	87	1	5.1		18.08	100.0
9	80	202.09	0.82	285	54	89	87	1.2	6.0		18.90	102.3
	85	205.19	0.82	286	56	89	88	1.2	6.0		18.92	107.5
10	90	208.23	0.86	285	53	89	88	1.1	6.0		19.36	105.4
	95	211.23	0.88	285	51	89	88	1.2	6.0		19.58	101.5
11	100	214.26	0.86	284	51	89	88	1.2	6.0		19.35	101.4
	105	217.28	0.83	283	54	89	88	1.2	6.0		18.99	102.1
12	110	220.27	0.83	283	55	89	88	1.1	5.8		18.99	102.8
	115	223.23	0.82	282	55	89	88	1.1	5.8		18.86	101.8
	120	226.17								0.4		101.6
1	0	226.57	0.8	276	68	88	87	1.2	6.0		18.56	
	5	229.49	0.82	283	52	88	87	1.2	6.0		18.88	102.0
2	10	232.39	0.9	284	51	88	87	1.3	6.0		19.79	100.5
	15	235.49	0.87	284	50	87	87	1.2	6.0		19.46	102.7
3	20	238.51	0.83	284	50	87	87	1.2	6.0		19.00	101.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.91 "Hg	**CWTR (g)**	602.4		
Static Pressure	-10.500 "H_2O	**WCBDA (g)**	13.5		
Nozzle	0.2194 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.4 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%	8.08
CO2%	11.15
COppm	11.4

Measured H2O
18.1 %

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	241.50	0.86	285	51	87	87	1.2	6.0		19.36	103.2
4	30	244.54	0.82	288	52	88	87	1.1	6.0		18.94	103.1
	35	247.52	0.8	285	50	87	86	1.1	6.0		18.67	103.6
5	40	250.54	0.78	285	50	87	86	1.05	6.0		18.44	106.3
	45	253.49	0.78	285	50	86	86	1.05	6.0		18.44	105.2
6	50	256.32	0.7	286	50	86	85	0.93	5.5		17.48	101.0
	55	259.04	0.69	286	50	85	85	0.93	5.5		17.35	102.6
7	60	261.73	0.73	286	51	85	85	0.98	6.0		17.85	102.3
	65	264.56	0.76	286	51	85	85	1	6.0		18.21	104.6
8	70	267.33	0.78	287	50	85	84	1.1	6.0		18.46	100.4
	75	270.17	0.77	287	50	85	84	1.1	6.0		18.34	101.8
9	80	272.97	0.8	286	51	84	84	1.1	6.0		18.68	101.0
	85	275.91	0.78	285	50	83	83	1.05	6.0		18.44	104.0
10	90	278.76	0.77	285	48	81	81	1.05	6.0		18.32	102.2
	95	281.57	0.77	281	40	75	74	1.05	6.0		18.27	101.8
11	100	284.39	0.72	281	46	79	78	0.95	6.0		17.66	103.2
	105	287.09	0.75	281	35	68	67	1	6.0		18.03	101.4
12	110	289.85	0.74	283	51	84	83	1	6.0		17.93	103.7
	115	292.57	0.73	283	51	84	83	0.95	6.0		17.81	99.9
	120	295.28										100.2

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	3 - SVOC
Date:	September 14, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.84
DGM CORRECTION FACTOR	0.991
NOZZLE DIAMETER	5.57 mm
DRY REF GAS VOLUME SAMPLED	3.707 m^3
AVGERGE ISOKINETICITY	102.0 %
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	140.1 °C
AVERAGE GAS MOISTURE BY VOLUME	17.7 %
AVERAGE GAS VELOCITY	17.93 m/s
BAROMETRIC PRESSURE (Station)	101.219 Kpa
STATIC PRESSURE	-2.714 Kpa
ABSOLUTE GAS PRESSURE	98.505 Kpa
OXYGEN CONCENTRATION	8.26 %
CARBON DIOXIDE CONCENTRATION	10.95 %
CARBON MONOXIDE CONCENTRATION	10.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.49 m^3/s
DRY REF GAS FLOWRATE	15.29 Rm^3/s
DRY ADJ GAS FLOWRATE	19.52 Rm^3/s
WET REF GAS FLOWRATE	18.59 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.707 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 14, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.89 "Hg	**CWTR (g)**	574		
Static Pressure	-10.900 "H_2O	**WCBDA (g)**	13.2		
Nozzle	0.2194 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 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%	8.26
CO2%	10.95
COppm	10.5

Measured H2O
17.7 %

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	296.36	0.93	284	65	77	76	1.2	6.0		20.12	
	5	299.41	0.91	287	52	79	77	1.2	6.0		19.95	**101.0**
2	10	302.39	0.89	286	47	80	77	1.2	6.0		19.71	**99.7**
	15	305.38	0.88	286	45	80	78	1.2	6.0		19.60	**101.0**
3	20	308.31	0.88	285	44	80	78	1.2	6.5		19.59	**99.4**
	25	311.26	0.87	285	45	80	78	1.2	6.5		19.48	**100.0**
4	30	314.24	0.8	285	45	81	78	1.05	6.5		18.68	**101.6**
	35	317.12	0.81	285	46	81	79	1.1	6.5		18.79	**102.3**
5	40	319.92	0.73	285	47	81	79	0.95	6.5		17.84	**98.7**
	45	322.62	0.73	285	48	82	79	0.95	6.5		17.84	**100.3**
6	50	325.30	0.6	285	48	82	79	0.7	6.0		16.18	**99.4**
	55	327.70	0.57	286	49	82	80	0.7	6.0		15.78	**98.2**
7	60	330.07	0.71	286	50	83	80	0.93	6.5		17.61	**99.4**
	65	332.72	0.7	286	49	83	80	1	6.5		17.48	**99.6**
8	70	335.49	0.74	284	49	83	80	1	6.5		17.95	**104.8**
	75	338.27	0.75	286	49	83	80	1	6.5		18.10	**102.2**
9	80	341.01	0.75	282	49	83	81	1	6.5		18.05	**100.2**
	85	343.78	0.77	282	49	93	81	1.1	7.0		18.29	**100.9**
10	90	346.74	0.75	283	49	83	81	1.05	7.0		18.06	**105.5**
	95	349.57	0.75	284	49	84	81	1.05	7.0		18.07	**103.2**
11	100	352.36	0.68	284	52	84	81	0.95	7.0		17.21	**101.7**
	105	355.06	0.69	284	50	84	82	0.95	7.0		17.33	**103.3**
12	110	357.77	0.7	284	50	84	82	0.95	7.0		17.46	**102.9**
	115	360.43	0.68	284	50	84	82	0.95	7.0		17.21	**100.2**
	120	363.11								0.41		**102.5**
1	0	363.52	0.87	282	64	84	82	1.2	8.0		19.44	
	5	366.51	0.84	284	48	84	82	1.15	8.0		19.13	**101.0**
2	10	369.51	0.86	283	47	84	82	1.2	8.0		19.34	**103.3**
	15	372.54	0.83	284	47	84	82	1.15	8.0		19.01	**103.0**
3	20	375.52	0.82	283	47	84	82	1.15	8.0		18.88	**103.2**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 14, 2018	**Operator:**	AS

Pitot Factor	0.84	**Filter (mg)**	0		
DGMCF	0.991	**Probe (mg)**	0		
Barometric Pressure	29.89 "Hg	**CWTR (g)**	574		
Static Pressure	-10.900 "H_2O	**WCBDA (g)**	13.2		
Nozzle	0.2194 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 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%	8.26
CO2%	10.95
COppm	10.5

Measured H2O
17.7 %

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 %
	25	378.50	0.82	284	47	84	83	1.15	8.0		18.90	**103.7**
4	30	381.44	0.77	284	48	85	82	1.1	8.0		18.31	**102.3**
	35	384.34	0.76	284	49	85	83	1.1	8.0		18.19	**104.1**
5	40	387.19	0.7	284	49	85	83	1	7.5		17.46	**102.9**
	45	389.99	0.7	284	50	85	83	0.95	7.5		17.46	**105.3**
6	50	392.74	0.67	284	49	85	83	0.9	7.5		17.08	**103.4**
	55	395.41	0.68	284	50	85	83	0.9	7.5		17.21	**102.6**
7	60	398.12	0.69	285	50	85	83	0.9	7.5		17.35	**103.4**
	65	400.80	0.69	284	50	85	83	0.9	7.5		17.33	**101.6**
8	70	403.48	0.7	285	51	85	83	0.9	7.5		17.47	**101.5**
	75	406.17	0.68	284	51	86	83	0.9	7.5		17.21	**101.2**
9	80	408.85	0.67	284	51	86	84	0.85	7.0		17.08	**102.2**
	85	411.48	0.7	284	52	86	83	0.95	7.5		17.46	**100.9**
10	90	414.23	0.68	284	48	86	84	0.9	7.5		17.21	**103.4**
	95	416.91	0.67	283	47	86	84	0.9	7.5		17.07	**102.1**
11	100	419.60	0.61	283	50	87	85	0.8	7.0		16.29	**103.2**
	105	422.16	0.63	283	49	86	84	0.85	7.0		16.55	**102.7**
12	110	424.76	0.63	283	50	86	84	0.85	7.0		16.55	**102.8**
	115	427.38	0.61	283	51	86	84	0.85	7.0		16.29	**103.6**
	120	429.94										**102.9**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 - SVOC
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	5.90 mm
DRY REF GAS VOLUME SAMPLED	4.041 m^3
AVGERGE ISOKINETICITY	98.9 %
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	142.0 °C
AVERAGE GAS MOISTURE BY VOLUME	16.3 %
AVERAGE GAS VELOCITY	17.67 m/s
BAROMETRIC PRESSURE (Station)	101.592 Kpa
STATIC PRESSURE	-2.478 Kpa
ABSOLUTE GAS PRESSURE	99.114 Kpa
OXYGEN CONCENTRATION	8.12 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	17.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.11 m^3/s
DRY REF GAS FLOWRATE	15.35 Rm^3/s
DRY ADJ GAS FLOWRATE	19.82 Rm^3/s
WET REF GAS FLOWRATE	18.34 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.041 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:	September 13, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	566.7		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	11.2		
Nozzle	0.2321 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%	8.12
CO2%	11.01
COppm	17.7

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	38.82	0.72	285	62	71	72	1.1	7.0		17.73	
	5	41.91	0.81	289	47	73	72	1.2	7.0		18.86	103.3
2	10	44.94	0.81	290	46	76	72	1.3	7.5		18.87	95.6
	15	48.04	0.82	290	46	77	73	1.35	8.0		18.99	97.6
3	20	51.24	0.82	291	45	79	73	1.3	8.0		19.00	100.0
	25	54.41	0.83	291	45	80	74	1.3	8.0		19.12	98.9
4	30	57.55	0.78	291	46	81	74	1.25	8.0		18.53	97.2
	35	60.65	0.75	291	46	81	74	1.2	8.0		18.17	98.9
5	40	63.70	0.68	290	47	82	75	1	8.0		17.29	99.2
	45	66.58	0.69	290	48	82	75	1.05	8.0		17.42	98.1
6	50	69.37	0.61	290	48	83	76	0.95	8.0		16.38	94.3
	55	72.12	0.61	290	49	83	76	0.95	8.0		16.38	98.7
7	60	74.86	0.64	289	49	83	76	1	8.0		16.76	98.3
	65	77.67	0.62	290	49	84	76	0.95	8.0		16.51	98.4
8	70	80.47	0.62	289	50	84	77	0.95	8.0		16.50	99.6
	75	83.19	0.61	289	50	84	77	0.97	8.0		16.37	96.6
9	80	85.97	0.66	289	51	84	77	1.05	8.0		17.02	99.5
	85	88.81	0.66	289	51	84	77	1.05	8.0		17.02	97.8
10	90	91.67	0.66	288	51	84	78	1.05	8.0		17.01	98.4
	95	94.57	0.7	288	51	83	78	1.15	8.5		17.52	99.7
11	100	97.55	0.73	289	51	83	78	1.2	8.5		17.91	99.6
	105	100.58	0.71	278	51	83	78	1.2	8.5		17.53	99.2
12	110	103.61	0.71	278	51	82	78	1.2	8.5		17.53	99.9
	115	106.62	0.71	279	52	82	78	1.2	8.5		17.54	99.3
	120	109.63								0.37		99.4
1	0	110.00	0.85	288	68	78	78	1.4	10.0		19.31	
	5	113.19	0.91	291	51	79	78	1.55	10.5		20.02	97.2
2	10	116.61	0.86	291	49	80	78	1.45	10.0		19.46	100.9
	15	119.97	0.87	291	49	80	78	1.4	10.0		19.57	101.8
3	20	123.27	0.89	292	49	81	78	1.45	11.0		19.81	99.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 13, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	566.7		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	11.2		
Nozzle	0.2321 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%	8.12
CO2%	11.01
COppm	17.7

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 %
	25	126.61	0.85	292	49	81	78	1.35	10.0		19.36	99.5
4	30	129.85	0.79	292	50	82	79	1.25	9.5		18.66	98.7
	35	132.99	0.8	292	50	83	79	1.3	9.5		18.78	99.0
5	40	136.16	0.71	291	50	83	79	1.05	9.0		17.68	99.3
	45	139.05	0.69	291	51	84	79	1.1	9.0		17.43	96.0
6	50	141.98	0.63	291	51	85	80	1	9.0		16.66	98.6
	55	144.77	0.64	291	51	85	80	1	9.0		16.79	98.1
7	60	147.59	0.7	291	51	85	80	1.15	9.0		17.56	98.3
	65	150.58	0.71	291	51	85	80	1.15	9.0		17.68	99.7
8	70	153.57	0.73	291	51	85	81	1.2	9.5		17.93	99.0
	75	156.63	0.71	291	51	85	80	1.15	9.5		17.68	99.9
9	80	159.65	0.71	291	51	85	81	1.1	9.5		17.68	100.0
	85	162.61	0.68	290	52	85	81	1.15	10.0		17.29	97.9
10	90	165.52	0.68	283	52	85	81	1.15	10.0		17.21	98.3
	95	168.57	0.66	290	52	85	81	1.05	9.0		17.04	102.6
11	100	171.47	0.59	279	53	86	82	0.95	9.0		15.99	99.4
	105	174.27	0.57	274	53	86	82	0.92	9.0		15.66	100.6
12	110	176.99	0.58	267	53	87	82	0.95	9.0		15.72	99.1
	115	179.74	0.54	265	53	87	82	0.87	8.5		15.15	98.7
	120	182.41										99.2

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 - SVOC
Date:	September 13, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	5.90 mm
DRY REF GAS VOLUME SAMPLED	4.109 m^3
AVGERGE ISOKINETICITY	99.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.7 °C
AVERAGE GAS MOISTURE BY VOLUME	17.5 %
AVERAGE GAS VELOCITY	18.05 m/s
BAROMETRIC PRESSURE (Station)	101.321 Kpa
STATIC PRESSURE	-2.478 Kpa
ABSOLUTE GAS PRESSURE	98.843 Kpa
OXYGEN CONCENTRATION	8.06 %
CARBON DIOXIDE CONCENTRATION	10.98 %
CARBON MONOXIDE CONCENTRATION	10.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.67 m^3/s
DRY REF GAS FLOWRATE	15.46 Rm^3/s
DRY ADJ GAS FLOWRATE	20.05 Rm^3/s
WET REF GAS FLOWRATE	18.74 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.109 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:	September 13, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.92 "Hg	**CWTR (g)**	626.3		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	15.2		
Nozzle	0.2321 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 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%	8.06
CO2%	10.98
COppm	10.3

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	82.81	0.54	248	81	82	82	0.84	5.0		15.03	
	5	85.43	0.63	281	63	84	83	1	6.0		16.61	**97.7**
2	10	88.24	0.65	281	58	86	83	1.05	6.0		16.87	**99.0**
	15	91.12	0.67	281	55	88	83	1.1	6.5		17.13	**99.7**
3	20	94.05	0.72	287	54	89	84	1.2	7.0		17.83	**99.7**
	25	97.10	0.72	288	53	90	85	1.2	7.0		17.84	**100.4**
4	30	100.13	0.72	290	53	91	85	1.2	7.0		17.87	**99.6**
	35	103.20	0.74	290	53	91	85	1.25	7.0		18.11	**101.0**
5	40	106.34	0.7	290	53	92	86	1.15	7.0		17.62	**101.9**
	45	109.39	0.7	289	53	92	86	1.1	6.5		17.61	**101.5**
6	50	112.35	0.68	289	54	92	86	1.1	6.5		17.35	**98.5**
	55	115.25	0.68	290	54	93	86	1.15	7.0		17.36	**97.9**
7	60	118.23	0.64	290	54	93	87	1	6.5		16.85	**100.6**
	65	121.08	0.63	290	55	93	86	1	6.5		16.71	**99.0**
8	70	123.93	0.73	290	55	93	87	1.15	7.0		17.99	**99.9**
	75	126.95	0.71	290	55	93	87	1.2	7.0		17.74	**98.3**
9	80	130.00	0.82	290	55	93	87	1.35	8.0		19.07	**100.7**
	85	133.25	0.82	290	55	93	87	1.35	8.0		19.07	**99.8**
10	90	136.59	0.89	290	56	93	88	1.5	8.0		19.87	**102.6**
	95	139.98	0.88	290	55	93	87	1.5	8.0		19.75	**99.9**
11	100	143.35	0.92	290	55	92	87	1.5	8.0		20.20	**100.0**
	105	146.84	0.93	290	56	92	87	1.5	8.0		20.31	**101.3**
12	110	150.28	0.94	291	56	92	87	1.55	8.0		20.43	**99.4**
	115	153.75	0.91	290	56	92	87	1.5	8.0		20.09	**99.8**
	120	157.19								0.43		**100.4**
1	0	157.62	0.65	261	9	88	88	1.15	7.0		16.65	
	5	160.60	0.72	265	57	89	87	1.2	8.0		17.57	**101.1**
2	10	163.68	0.69	264	55	90	87	1.15	8.0		17.19	**99.6**
	15	166.70	0.67	263	56	91	87	1.1	7.5		16.92	**99.6**
3	20	169.67	0.67	278	56	92	87	1.1	7.5		17.10	**99.2**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 13, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.92 "Hg	**CWTR (g)**	626.3		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	15.2		
Nozzle	0.2321 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 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%	8.06
CO2%	10.98
COppm	10.3

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	172.62	0.67	284	56	92	87	1.1	7.5		17.17	**99.5**
4	30	175.59	0.71	286	56	92	87	1.15	7.5		17.70	**100.6**
	35	178.62	0.68	287	56	93	87	1.1	8.0		17.33	**99.8**
5	40	181.60	0.66	287	56	93	87	1.05	7.5		17.07	**100.3**
	45	184.50	0.68	287	56	93	87	1.1	8.0		17.33	**99.0**
6	50	187.51	0.7	288	56	93	87	1.15	8.0		17.59	**101.3**
	55	190.51	0.7	288	56	92	87	1.15	8.0		17.59	**99.6**
7	60	193.49	0.65	288	56	92	87	1	8.0		16.95	**99.0**
	65	196.38	0.66	289	56	93	87	1	8.0		17.10	**99.6**
8	70	199.27	0.71	288	57	92	87	1.15	8.0		17.72	**98.8**
	75	202.29	0.71	289	56	92	87	1.15	8.0		17.73	**99.6**
9	80	205.32	0.72	288	57	92	87	1.2	8.0		17.84	**100.0**
	85	208.38	0.79	289	57	92	86	1.3	8.5		18.70	**100.2**
10	90	211.57	0.83	289	57	91	87	1.35	8.5		19.17	**99.9**
	95	214.82	0.83	289	57	91	86	1.35	8.5		19.17	**99.3**
11	100	218.08	0.86	290	57	90	86	1.4	8.5		19.53	**99.7**
	105	221.38	0.89	290	57	90	86	1.45	9.0		19.87	**99.4**
12	110	224.74	0.9	291	57	90	86	1.45	9.0		19.99	**99.5**
	115	228.12	0.9	290	57	89	86	1.45	9.0		19.98	**99.6**
	120	231.57										**101.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 - SVOC
Date:	September 14, 2018

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	5.90 mm
DRY REF GAS VOLUME SAMPLED	4.010 m^3
AVGERGE ISOKINETICITY	99.9 %
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 °C
AVERAGE GAS MOISTURE BY VOLUME	17.6 %
AVERAGE GAS VELOCITY	17.59 m/s
BAROMETRIC PRESSURE (Station)	101.219 Kpa
STATIC PRESSURE	-2.291 Kpa
ABSOLUTE GAS PRESSURE	98.928 Kpa
OXYGEN CONCENTRATION	7.79 %
CARBON DIOXIDE CONCENTRATION	11.23 %
CARBON MONOXIDE CONCENTRATION	10.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.99 m^3/s
DRY REF GAS FLOWRATE	15.09 Rm^3/s
DRY ADJ GAS FLOWRATE	19.98 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		4.010 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:	September 14, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.89 "Hg	**CWTR (g)**	615.1		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	12.6		
Nozzle	0.2321 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 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%	7.79
CO2%	11.23
COppm	10.0

Measured H2O
17.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	34.53	0.88	289	78	78	78	1.5	8.0		19.73	
	5	37.70	0.88	289	65	80	78	1.4	8.0		19.73	96.0
2	10	40.97	0.84	289	63	81	78	1.3	8.0		19.27	98.8
	15	44.15	0.85	288	59	82	79	1.45	8.0		19.37	98.3
3	20	47.43	0.83	289	56	83	80	1.4	8.0		19.16	100.5
	25	50.68	0.81	288	55	84	79	1.35	8.0		18.91	100.7
4	30	53.89	0.75	288	54	84	80	1.25	8.0		18.20	100.6
	35	57.01	0.75	289	55	85	80	1.25	8.0		18.21	101.5
5	40	60.12	0.65	289	55	85	80	1	8.0		16.95	101.1
	45	62.95	0.65	288	55	86	80	1	8.0		16.94	98.8
6	50	65.77	0.62	288	55	86	80	1	8.0		16.55	98.3
	55	68.57	0.65	289	56	86	80	1	8.0		16.95	99.9
7	60	71.39	0.68	290	55	86	81	1.1	8.0		17.35	98.3
	65	74.29	0.67	290	55	87	81	1.1	8.0		17.22	98.9
8	70	77.20	0.64	289	55	87	81	1.05	8.0		16.82	99.9
	75	80.07	0.64	288	55	87	81	1.05	8.0		16.81	100.7
9	80	82.92	0.63	288	56	87	81	1.05	8.0		16.68	99.9
	85	85.76	0.64	288	56	87	81	1.05	8.0		16.81	100.4
10	90	88.60	0.58	288	56	87	81	0.9	7.5		16.00	99.6
	95	91.28	0.59	276	57	87	81	0.95	7.5		16.01	98.7
11	100	94.02	0.58	276	57	87	81	0.95	7.5		15.87	99.2
	105	96.75	0.57	265	57	88	81	0.95	7.5		15.62	99.7
12	110	99.49	0.56	265	57	88	82	0.95	7.5		15.48	100.1
	115	102.22	0.57	264	57	89	82	0.95	7.5		15.61	100.5
	120	104.94								0.41		99.1
1	0	105.35	0.82	281	70	83	81	1.4	11.0		18.94	
	5	108.50	0.83	288	60	83	81	1.4	9.0		19.14	97.6
2	10	111.84	0.84	289	59	84	82	1.35	9.0		19.27	103.3
	15	115.09	0.82	289	59	85	82	1.4	9.0		19.04	99.8
3	20	118.35	0.78	288	60	85	82	1.25	9.0		18.56	101.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 14, 2018	**Operator:**	TT

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.89 "Hg	**CWTR (g)**	615.1		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	12.6		
Nozzle	0.2321 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 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%	7.79
CO2%	11.23
COppm	10.0

Measured H2O
17.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	121.46	0.79	288	60	86	82	1.3	9.0		18.68	98.9
4	30	124.62	0.79	288	60	87	83	1.3	9.0		18.68	99.8
	35	127.79	0.73	288	60	87	82	1.15	9.0		17.95	99.9
5	40	130.83	0.74	288	60	87	82	1.2	9.0		18.08	99.7
	45	133.87	0.72	288	60	87	83	1.15	9.0		17.83	99.1
6	50	136.92	0.67	289	60	88	83	1	8.5		17.21	100.7
	55	139.73	0.66	289	61	88	83	1.05	8.5		17.08	96.1
7	60	142.62	0.68	288	60	88	83	1.05	8.5		17.33	99.6
	65	145.52	0.67	289	61	88	83	1.1	9.0		17.21	98.4
8	70	148.46	0.67	289	61	88	83	1.1	9.0		17.21	100.5
	75	151.42	0.69	288	61	88	83	1.15	9.0		17.45	101.2
9	80	154.41	0.69	289	61	88	83	1.15	9.0		17.47	100.7
	85	157.40	0.7	289	61	88	83	1.15	9.0		17.59	100.8
10	90	160.43	0.69	288	61	88	83	1.15	9.0		17.45	101.4
	95	163.43	0.7	288	61	88	84	1.15	9.0		17.58	101.0
11	100	166.43	0.69	288	61	88	84	1.15	9.0		17.45	100.2
	105	169.42	0.69	258	62	88	84	1.2	9.0		17.10	100.6
12	110	172.48	0.66	257	62	88	84	1.15	9.0		16.71	100.9
	115	175.50	0.68	258	62	88	84	1.2	9.0		16.98	101.7
	120	178.55										101.3

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 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
10:32	1.1	
10:33	1.2	
10:34	1.0	
10:35	1.1	
10:36	1.0	
10:37	1.0	
10:38	1.0	
10:39	1.0	
10:40	1.1	
10:41	1.0	1.1
10:42	0.8	1.0
10:43	1.0	1.0
10:44	1.1	1.0
10:45	1.0	1.0
10:46	1.0	1.0
10:47	1.0	1.0
10:48	0.9	1.0
10:49	0.9	1.0
10:50	1.1	1.0
10:51	0.9	1.0
10:52	0.9	1.0
10:53	0.9	1.0
10:54	0.8	0.9
10:55	0.7	0.9
10:56	0.7	0.9
10:57	0.8	0.9
10:58	1.0	0.9
10:59	0.8	0.9
11:00	0.8	0.8
11:01	0.8	0.8
11:02	0.7	0.8
11:03	0.8	0.8
11:04	0.9	0.8
11:05	1.0	0.8
11:06	0.9	0.8
11:07	0.8	0.8
11:08	0.9	0.8
11:09	0.9	0.8
11:10	1.0	0.9
11:11	0.8	0.9
11:12	0.7	0.9
11:13	0.7	0.9
11:14	0.8	0.8
11:15	0.9	0.8
11:16	0.7	0.8
11:17	0.7	0.8
11:18	0.7	0.8
11:19	0.7	0.8
11:20	0.8	0.7
11:21	0.7	0.7
11:22	0.7	0.7
11:23	0.7	0.7
11:24	0.8	0.7
11:25	0.7	0.7
11:26	0.8	0.7
11:27	0.6	0.7
11:28	0.8	0.7
11:29	0.7	0.7
11:30	0.7	0.7
11:31	0.8	0.7
11:32	0.6	0.7
Min	0.6	0.7
Max	1.2	1.1
Avg	0.9	0.9

Test No. 2 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
11:40	0.6	
11:41	0.5	
11:42	0.4	
11:43	0.5	
11:44	0.5	
11:45	0.5	
11:46	0.5	
11:47	0.5	
11:48	0.5	
11:49	0.5	0.5
11:50	0.6	0.5
11:51	0.6	0.5
11:52	0.6	0.5
11:53	0.5	0.5
11:54	0.5	0.5
11:55	0.5	0.5
11:56	0.5	0.5
11:57	0.5	0.5
11:58	0.5	0.5
11:59	0.6	0.5
12:00	0.5	0.5
12:01	0.5	0.5
12:02	0.5	0.5
12:03	0.5	0.5
12:04	0.5	0.5
12:05	0.5	0.5
12:06	0.4	0.5
12:07	0.4	0.5
12:08	0.4	0.5
12:09	0.5	0.5
12:10	0.5	0.5
12:11	0.4	0.5
12:12	0.5	0.5
12:13	0.5	0.5
12:14	0.5	0.5
12:15	0.5	0.5
12:16	0.5	0.5
12:17	0.4	0.5
12:18	0.4	0.5
12:19	0.4	0.5
12:20	0.5	0.5
12:21	0.6	0.5
12:22	0.6	0.5
12:23	0.6	0.5
12:24	0.6	0.5
12:25	0.6	0.5
12:26	0.6	0.5
12:27	0.5	0.5
12:28	0.5	0.6
12:29	0.5	0.6
12:30	0.5	0.6
12:31	0.5	0.6
12:32	0.5	0.6
12:33	0.5	0.6
12:34	0.5	0.5
12:35	0.5	0.5
12:36	0.6	0.5
12:37	0.6	0.5
12:38	0.5	0.5
12:39	0.5	0.5
12:40	0.5	0.5
Min	0.4	0.5
Max	0.6	0.6
Avg	0.5	0.5

Test No. 3 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
12:52	0.6	
12:53	0.5	
12:54	0.5	
12:55	0.5	
12:56	0.5	
12:57	0.7	
12:58	0.6	
12:59	0.5	
13:00	0.5	
13:01	0.5	0.5
13:02	0.4	0.5
13:03	0.2	0.5
13:04	0.4	0.5
13:05	0.6	0.5
13:06	0.5	0.5
13:07	0.6	0.5
13:08	0.6	0.5
13:09	0.6	0.5
13:10	0.6	0.5
13:11	0.7	0.5
13:12	0.7	0.6
13:13	0.7	0.6
13:14	0.7	0.6
13:15	0.4	0.6
13:16	0.8	0.6
13:17	0.7	0.6
13:18	0.7	0.7
13:19	0.6	0.7
13:20	0.6	0.7
13:21	0.6	0.7
13:22	0.6	0.7
13:23	0.6	0.6
13:24	0.6	0.6
13:25	0.6	0.7
13:26	0.5	0.6
13:27	0.5	0.6
13:28	0.6	0.6
13:29	0.5	0.6
13:30	0.6	0.6
13:31	0.8	0.6
13:32	0.6	0.6
13:33	0.6	0.6
13:34	0.7	0.6
13:35	0.5	0.6
13:36	0.7	0.6
13:37	0.6	0.6
13:38	0.6	0.6
13:39	0.6	0.6
13:40	0.6	0.6
13:41	0.5	0.6
13:42	0.6	0.6
13:43	0.6	0.6
13:44	0.6	0.6
13:45	0.6	0.6
13:46	0.6	0.6
13:47	0.5	0.6
13:48	0.6	0.6
13:49	0.5	0.6
13:50	0.5	0.5
13:51	0.5	0.6
13:52	0.5	0.6
Min	0.2	0.5
Max	0.8	0.7
Avg	0.6	0.6

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 APC Outlet

Test No. 1 September 11, 2018			Test No. 2 September 11, 2018			Test No. 3 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:32	1.3		17:43	0.0		18:53	0.3	
16:33	0.4		17:44	0.1		18:54	0.6	
16:34	0.7		17:45	0.0		18:55	0.7	
16:35	0.7		17:46	0.0		18:56	0.6	
16:36	0.6		17:47	0.0		18:57	0.6	
16:37	0.5		17:48	0.0		18:58	0.6	
16:38	0.2		17:49	0.0		18:59	0.6	
16:39	0.2		17:50	0.0		19:00	0.6	
16:40	0.2		17:51	0.0		19:01	0.5	
16:41	0.2	0.5	17:52	0.0	0.0	19:02	0.4	0.5
16:42	0.2	0.4	17:53	0.0	0.0	19:03	0.5	0.6
16:43	0.0	0.3	17:54	0.0	0.0	19:04	0.5	0.5
16:44	0.2	0.3	17:55	0.0	0.0	19:05	0.5	0.5
16:45	0.0	0.2	17:56	0.0	0.0	19:06	0.4	0.5
16:46	0.2	0.2	17:57	0.0	0.0	19:07	0.4	0.5
16:47	0.3	0.2	17:58	0.0	0.0	19:08	0.5	0.5
16:48	0.1	0.2	17:59	0.0	0.0	19:09	0.5	0.5
16:49	0.1	0.1	18:00	0.0	0.0	19:10	0.5	0.5
16:50	0.0	0.1	18:01	0.0	0.0	19:11	0.2	0.4
16:51	0.0	0.1	18:02	0.0	0.0	19:12	0.5	0.5
16:52	0.0	0.1	18:03	0.0	0.0	19:13	0.5	0.4
16:53	0.0	0.1	18:04	0.1	0.0	19:14	0.5	0.5
16:54	0.0	0.1	18:05	0.2	0.0	19:15	0.7	0.5
16:55	0.0	0.1	18:06	0.0	0.0	19:16	0.5	0.5
16:56	0.0	0.0	18:07	0.1	0.0	19:17	0.1	0.4
16:57	0.0	0.0	18:08	0.8	0.1	19:18	0.5	0.4
16:58	0.0	0.0	18:09	0.8	0.2	19:19	0.4	0.4
16:59	0.0	0.0	18:10	0.8	0.3	19:20	0.4	0.4
17:00	0.0	0.0	18:11	0.5	0.3	19:21	0.5	0.4
17:01	0.0	0.0	18:12	0.5	0.4	19:22	0.4	0.4
17:02	0.0	0.0	18:13	0.5	0.4	19:23	0.5	0.4
17:03	0.0	0.0	18:14	0.5	0.5	19:24	0.5	0.4
17:04	0.0	0.0	18:15	0.4	0.5	19:25	0.4	0.4
17:05	0.0	0.0	18:16	0.6	0.6	19:26	0.5	0.4
17:06	0.2	0.0	18:17	0.4	0.6	19:27	0.4	0.4
17:07	0.0	0.0	18:18	0.4	0.5	19:28	0.5	0.4
17:08	0.0	0.0	18:19	0.4	0.5	19:29	0.4	0.4
17:09	0.0	0.0	18:20	0.7	0.5	19:30	0.5	0.4
17:10	0.1	0.0	18:21	0.4	0.5	19:31	0.4	0.4
17:11	0.0	0.0	18:22	0.2	0.5	19:32	0.5	0.5
17:12	0.0	0.0	18:23	0.5	0.4	19:33	0.4	0.4
17:13	0.0	0.0	18:24	0.4	0.4	19:34	0.4	0.4
17:14	0.0	0.0	18:25	0.5	0.4	19:35	0.4	0.4
17:15	0.0	0.0	18:26	0.4	0.4	19:36	0.4	0.4
17:16	0.0	0.0	18:27	0.5	0.4	19:37	0.4	0.4
17:17	0.0	0.0	18:28	0.5	0.4	19:38	0.4	0.4
17:18	0.0	0.0	18:29	0.5	0.4	19:39	0.4	0.4
17:19	0.0	0.0	18:30	0.5	0.4	19:40	0.4	0.4
17:20	0.2	0.0	18:31	0.5	0.4	19:41	0.5	0.4
17:21	0.0	0.0	18:32	0.6	0.5	19:42	0.4	0.4
17:22	0.2	0.0	18:33	0.5	0.5	19:43	0.4	0.4
17:23	0.1	0.1	18:34	0.5	0.5	19:44	0.4	0.4
17:24	0.2	0.1	18:35	0.4	0.5	19:45	0.4	0.4
17:25	0.2	0.1	18:36	0.5	0.5	19:46	0.4	0.4
17:26	0.2	0.1	18:37	0.6	0.5	19:47	0.5	0.4
17:27	0.2	0.1	18:38	0.5	0.5	19:48	0.5	0.4
17:28	0.0	0.1	18:39	0.2	0.5	19:49	0.5	0.4
17:29	0.0	0.1	18:40	0.4	0.5	19:50	0.4	0.4
17:30	0.3	0.1	18:41	0.4	0.5	19:51	0.4	0.4
17:31	0.0	0.1	18:42	0.5	0.4	19:52	0.6	0.4
17:32	0.2	0.1	18:43	0.5	0.4	19:53	0.4	0.4
Min	0.0	0.0	Min	0.0	0.0	Min	0.1	0.4
Max	1.3	0.5	Max	0.8	0.6	Max	0.7	0.6
Avg	0.1	0.1	Avg	0.3	0.3	Avg	0.5	0.5

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 Quench Inlet

Test No. 1 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
10:32	1.3	
10:33	1.3	
10:34	1.2	
10:35	1.5	
10:36	1.8	
10:37	1.8	
10:38	1.7	
10:39	1.6	
10:40	1.3	
10:41	1.2	1.5
10:42	1.2	1.5
10:43	1.1	1.4
10:44	1.1	1.4
10:45	1.5	1.4
10:46	1.3	1.4
10:47	1.7	1.4
10:48	1.6	1.3
10:49	1.2	1.3
10:50	1.0	1.3
10:51	0.8	1.2
10:52	1.0	1.2
10:53	0.9	1.2
10:54	1.1	1.2
10:55	1.2	1.2
10:56	1.0	1.1
10:57	0.8	1.1
10:58	0.8	1.0
10:59	0.9	1.0
11:00	1.2	1.0
11:01	1.3	1.0
11:02	1.2	1.0
11:03	1.1	1.1
11:04	1.0	1.1
11:05	0.9	1.0
11:06	0.9	1.0
11:07	1.1	1.0
11:08	1.2	1.1
11:09	1.1	1.1
11:10	1.5	1.1
11:11	1.4	1.1
11:12	1.4	1.2
11:13	1.5	1.2
11:14	1.4	1.2
11:15	1.4	1.3
11:16	1.2	1.3
11:17	1.1	1.3
11:18	1.2	1.3
11:19	1.3	1.3
11:20	1.2	1.3
11:21	1.2	1.3
11:22	1.1	1.3
11:23	1.0	1.2
11:24	1.1	1.2
11:25	1.1	1.2
11:26	1.0	1.1
11:27	1.0	1.1
11:28	0.8	1.1
11:29	0.8	1.0
11:30	0.7	1.0
11:31	0.7	0.9
11:32	0.9	0.9
Min	0.7	0.9
Max	1.8	1.5
Avg	1.2	1.2

Test No. 2 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
11:40	0.6	
11:41	0.7	
11:42	0.7	
11:43	0.7	
11:44	0.9	
11:45	0.8	
11:46	0.7	
11:47	0.6	
11:48	0.8	
11:49	0.6	0.7
11:50	0.5	0.7
11:51	0.5	0.7
11:52	0.6	0.7
11:53	0.7	0.7
11:54	0.5	0.6
11:55	0.7	0.6
11:56	0.7	0.6
11:57	0.5	0.6
11:58	0.6	0.6
11:59	0.5	0.6
12:00	0.4	0.6
12:01	0.4	0.6
12:02	0.2	0.5
12:03	0.5	0.5
12:04	0.7	0.5
12:05	0.7	0.5
12:06	0.7	0.5
12:07	0.6	0.5
12:08	0.7	0.5
12:09	0.6	0.5
12:10	1.3	0.6
12:11	0.8	0.7
12:12	0.6	0.7
12:13	0.8	0.7
12:14	0.9	0.8
12:15	1.0	0.8
12:16	1.0	0.8
12:17	1.1	0.9
12:18	1.1	0.9
12:19	1.1	1.0
12:20	0.9	0.9
12:21	0.5	0.9
12:22	0.9	0.9
12:23	0.9	0.9
12:24	1.0	1.0
12:25	1.2	1.0
12:26	0.9	1.0
12:27	0.9	1.0
12:28	0.8	0.9
12:29	1.0	0.9
12:30	1.4	1.0
12:31	1.3	1.0
12:32	1.0	1.1
12:33	0.9	1.0
12:34	0.8	1.0
12:35	1.1	1.0
12:36	1.0	1.0
12:37	1.0	1.0
12:38	1.0	1.0
12:39	1.1	1.1
12:40	1.2	1.0
Min	0.2	0.5
Max	1.4	1.1
Avg	0.8	0.8

Test No. 3 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
12:52	0.8	
12:53	1.0	
12:54	1.0	
12:55	0.6	
12:56	0.7	
12:57	0.6	
12:58	0.6	
12:59	1.0	
13:00	1.0	
13:01	0.9	0.8
13:02	0.8	0.8
13:03	0.9	0.8
13:04	0.9	0.8
13:05	0.9	0.8
13:06	0.9	0.8
13:07	0.8	0.9
13:08	0.8	0.9
13:09	0.9	0.9
13:10	0.8	0.9
13:11	0.8	0.9
13:12	0.7	0.9
13:13	0.7	0.8
13:14	0.7	0.8
13:15	0.7	0.8
13:16	0.7	0.8
13:17	0.8	0.8
13:18	0.5	0.7
13:19	0.5	0.7
13:20	0.8	0.7
13:21	0.8	0.7
13:22	0.9	0.7
13:23	0.9	0.7
13:24	1.0	0.8
13:25	1.1	0.8
13:26	1.1	0.8
13:27	1.0	0.9
13:28	1.1	0.9
13:29	1.0	1.0
13:30	1.0	1.0
13:31	1.1	1.0
13:32	1.0	1.0
13:33	1.0	1.0
13:34	1.2	1.0
13:35	1.3	1.1
13:36	1.2	1.1
13:37	1.0	1.1
13:38	0.9	1.1
13:39	0.8	1.0
13:40	1.1	1.1
13:41	0.9	1.0
13:42	0.9	1.0
13:43	0.8	1.0
13:44	0.8	1.0
13:45	0.8	0.9
13:46	0.7	0.9
13:47	0.9	0.9
13:48	0.7	0.8
13:49	0.6	0.8
13:50	0.5	0.8
13:51	0.6	0.7
13:52	0.7	0.7
Min	0.5	0.7
Max	1.3	1.1
Avg	0.9	0.9

Covanta - Durham York Energy Centre

Total Hydrocarbon Sampling at the Boiler No. 2 APC Outlet

Test No. 1 September 11, 2018			Test No. 2 September 11, 2018			Test No. 3 September 11, 2018		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
16:32	0.5		17:43	0.2		18:53	0.5	
16:33	0.5		17:44	0.2		18:54	0.5	
16:34	0.5		17:45	0.2		18:55	0.5	
16:35	0.5		17:46	0.2		18:56	0.6	
16:36	0.7		17:47	0.3		18:57	0.6	
16:37	0.8		17:48	0.3		18:58	0.6	
16:38	0.8		17:49	0.3		18:59	0.5	
16:39	0.9		17:50	0.3		19:00	0.5	
16:40	0.8		17:51	0.2		19:01	0.5	
16:41	0.5	0.6	17:52	0.2	0.2	19:02	0.5	0.5
16:42	0.5	0.6	17:53	0.2	0.2	19:03	0.6	0.5
16:43	0.4	0.6	17:54	0.2	0.2	19:04	0.6	0.6
16:44	0.4	0.6	17:55	0.2	0.2	19:05	0.5	0.5
16:45	0.3	0.6	17:56	0.2	0.2	19:06	0.5	0.5
16:46	0.3	0.6	17:57	0.1	0.2	19:07	0.6	0.5
16:47	0.3	0.5	17:58	0.2	0.2	19:08	0.6	0.5
16:48	0.4	0.5	17:59	0.3	0.2	19:09	0.5	0.5
16:49	0.4	0.4	18:00	0.3	0.2	19:10	0.4	0.5
16:50	0.2	0.4	18:01	0.2	0.2	19:11	0.4	0.5
16:51	0.3	0.4	18:02	0.2	0.2	19:12	0.4	0.5
16:52	0.1	0.3	18:03	0.2	0.2	19:13	0.4	0.5
16:53	0.0	0.3	18:04	0.3	0.2	19:14	0.4	0.5
16:54	0.2	0.3	18:05	0.2	0.2	19:15	0.4	0.5
16:55	0.0	0.2	18:06	0.2	0.2	19:16	0.4	0.5
16:56	0.0	0.2	18:07	0.3	0.2	19:17	0.4	0.4
16:57	0.0	0.2	18:08	0.3	0.2	19:18	0.4	0.4
16:58	0.0	0.1	18:09	0.3	0.2	19:19	0.4	0.4
16:59	0.0	0.1	18:10	0.3	0.2	19:20	0.3	0.4
17:00	0.0	0.1	18:11	0.3	0.3	19:21	0.3	0.4
17:01	0.0	0.0	18:12	0.2	0.3	19:22	0.3	0.4
17:02	0.0	0.0	18:13	0.2	0.3	19:23	0.3	0.4
17:03	0.0	0.0	18:14	0.3	0.3	19:24	0.3	0.4
17:04	0.0	0.0	18:15	0.3	0.3	19:25	0.3	0.4
17:05	0.0	0.0	18:16	0.3	0.3	19:26	0.3	0.3
17:06	0.1	0.0	18:17	0.4	0.3	19:27	0.3	0.3
17:07	0.3	0.0	18:18	0.3	0.3	19:28	0.4	0.3
17:08	0.2	0.1	18:19	0.3	0.3	19:29	0.4	0.3
17:09	0.3	0.1	18:20	0.2	0.3	19:30	0.2	0.3
17:10	0.4	0.1	18:21	0.2	0.3	19:31	0.3	0.3
17:11	0.3	0.2	18:22	0.3	0.3	19:32	0.3	0.3
17:12	0.2	0.2	18:23	0.3	0.3	19:33	0.2	0.3
17:13	0.2	0.2	18:24	0.2	0.3	19:34	0.1	0.3
17:14	0.2	0.2	18:25	0.3	0.3	19:35	0.1	0.3
17:15	0.2	0.2	18:26	0.3	0.3	19:36	0.1	0.2
17:16	0.2	0.2	18:27	0.3	0.3	19:37	0.3	0.2
17:17	0.2	0.2	18:28	0.3	0.3	19:38	0.3	0.2
17:18	0.1	0.2	18:29	0.4	0.3	19:39	0.3	0.2
17:19	0.1	0.2	18:30	0.4	0.3	19:40	0.3	0.2
17:20	0.1	0.2	18:31	0.4	0.3	19:41	0.4	0.2
17:21	0.0	0.1	18:32	0.4	0.3	19:42	0.3	0.2
17:22	0.1	0.1	18:33	0.3	0.3	19:43	0.3	0.3
17:23	0.0	0.1	18:34	0.3	0.3	19:44	0.3	0.3
17:24	0.0	0.1	18:35	0.2	0.3	19:45	0.3	0.3
17:25	0.0	0.1	18:36	0.3	0.3	19:46	0.2	0.3
17:26	0.0	0.1	18:37	0.3	0.3	19:47	0.2	0.3
17:27	0.0	0.0	18:38	0.3	0.3	19:48	0.2	0.3
17:28	0.0	0.0	18:39	0.3	0.3	19:49	0.3	0.3
17:29	0.0	0.0	18:40	0.3	0.3	19:50	0.2	0.3
17:30	0.0	0.0	18:41	0.3	0.3	19:51	0.4	0.3
17:31	0.0	0.0	18:42	0.3	0.3	19:52	0.3	0.3
17:32	0.1	0.0	18:43	0.2	0.3	19:53	0.3	0.3
Min	0.0	0.0	Min	0.1	0.2	Min	0.1	0.2
Max	0.9	0.6	Max	0.4	0.3	Max	0.6	0.6
Avg	0.2	0.2	Avg	0.3	0.3	Avg	0.4	0.4

APPENDIX 27

Dispersion Modelling Results
for the Fall 2018 Testing Program
(17 pages)

GOLDER

TECHNICAL MEMORANDUM

DATE October 30, 2018 **Project No.** 181033225

TO Amanda Huxter
Covanta Durham York Renewable Energy LP

CC Anthony Ciccone

FROM Katie Armstrong **EMAIL ksarmstrong@golder.com**

CALPUFF MODELLING FOR 2018 COMPLIANCE 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 October 2018 compliance source testing program using the same CALPUFF model and other input data sets used in the ESDM Report, however, the results are compared to O.Reg. 419/05 limits last updated in April 2018.

Golder Associates Ltd.
6925 Century Avenue, Suite #100 Mississauga, Ontario, L5N 7K2 Canada T: +1 905 567 4444 +1 905 567 6561

2.0 EMISSION RATES

Compliance source testing was completed by Ortech Environmental in October 2018 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 in pursuant to Schedule "D" of the ECA, the condensable content of PM_{10} was used as a surrogate.

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 previous EA for maximum POI predictions.

3.6 Thermal Internal Boundary Layer

CALPUFF contains an option to account for sub-grid coastal influences on plume dispersion such as the development of a thermal internal boundary layer (TIBL). Given the proximity of the proposed Facility to Lake Ontario (approximately 500m) and the grid size (250m), variations in coastline location within the grid cells near the proposed facility were accounted for in the dispersion modelling. To achieve this, a digitized sub-grid coastline, extending to the boundaries of the air quality study area was included as an additional input. This is consistent with the approach used in the ESDM report.

3.7 Averaging Times and Conversions

CALPUFF can predict 1-hour average values. Many of the relevant Schedule 3 standards are based on a 24-hour averaging time, which is also provided by CALPUFF. Several of the modelled contaminants have averaging periods less than 1 hour. For these contaminants, the 1 hour average concentration was converted using the conversion factors listed in Table 4-1 of Air Dispersion Modelling Guidance for Ontario (ADMGO). For example, the hourly concentrations can be converted to a 10-min average by multiplying the hour value by 1.65. This is consistent with the approach used in the ESDM report.

In 2016, a number of O.Reg 419/05 standards were updated or modified to include Point of Impingement (POI) limits based on an annual averaging period. CALPUFF can predict annual average values, therefore the CALPOST input file was modified to provide this output in addition to outputs for the 1 hour, 24 hour and 30 day averaging periods already provided.

3.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary Particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling of particulate matter. To model the chemical transformation of emitted NO, NO_2 and SO_2 into HNO_3, NO_3 and SO_4, CALPUFFs RIVAD/ARM3 mechanism was used. The flag MCHEM is set to 3 for model runs used to produce concentrations of particulate matter. This setting requires the input of monthly background ozone concentrations. The monthly background ozone data used in the modelling of secondary particulate matter is consistent with that used in the EA and is summarised below in Table 1.

Table 1: Background Ozone Concentrations used for Chemical Transformation Modelling

Month	Ozone Concentrations (ppb)
January	13.70
February	18.50
March	24.22
April	11.09
May	32.29
June	33.63
July	16.32
August	21.33
September	12.63
October	15.39
November	17.10
December	20.91

Chemical transformations were only modelled to calculate additional concentrations of particulate matter that is created as part of secondary transformations. Reported concentrations of NO_2 and SO_2 do not include the effects of depletion due to chemical transformation. The flag MCHEM is set to 0 for model runs used to produce concentrations of all other contaminants. This is consistent with the approach used in the ESDM report

3.9 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are summarized in 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	3 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	3 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	Chemical Transformation Scheme 0 = chemical transformation not modeled 3 = transformation rates computed internally (RIVAD/ARM3 scheme)
MAQCHEM	0	0	Aqueous phase transformation flag (only used if MCHEM =1 or 3)
MWET	0	0	Wet removal modelled 0 = NO; 1 = Yes
MDRY	0	0	Dry deposition modelled 0 = NO; 1 = Yes
MTILT	0	0	Gravitational settling (plume tilt) modelled
MDISP	2	2	Methods used to compute dispersion coefficients 2 = (dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.)

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MTURBVW	3	3	Sigma measurements used (Used only if MDISP = 1or 5)
MDISP2	3	3	Back-up method used to compute dispersion when measured turbulence data are missing (Used only if MDISP=1 or 5)
MTAULY	0	0	Method used for Lagrangian timescale for Sigma-y (used only if MDISP=1,2 or MSIDP2=1,2)
MTAUADV	0	0	Method used for Advective-Decay timescale for Turbulence (used only if MDISP=2 or MDISP2=2)
MCTURB	1	1	Method used to compute turbulence sigma-v & sigma-w using micrometeorological variables (Used only if MDISP = 2 or MDISP2 = 2)
MROUGH	0	0	PG sigma y,z adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion
MTINV	0	0	Strength of temp inversion provided in PROFILE.DAT extended records
MPDF	1	1	Probability Distribution Function used for dispersion under convective conditions 0 = NO; 1 = Yes
MSGTIBL	1	1	Sub-grid TIBL module used for shore line
MBCON	0	0	Boundary conditions (concentration) modeled
MFOG	0	0	Configure for FOG Model output
MREG	0	0	Test options specified to see if they conform to regulatory values

3.10 Source Parameters

Stack Exhaust temperature and flow rate were updated to match the stack characteristics at the time of source testing. All other source parameters are consistent with those used in the ESDM Report. The source parameters modelled are provided in Table 3, below:

Table 3: Modelled Source Parameters

Source ID	Stack Height [m]	Stack Diameter [m]	Exit velocity [m/s]	Exhaust Temperature [K]
STCK1	87.6 (No Change)	1.7 (No Change)	23.17 (UPDATED)	413.5 (UPDATED)

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

4.0 MODELLING RESULTS

Modelling was completed for emissions from the main stack only, using a unit emission rate to generate dispersion factors in µg/m³ per g/s for 10-minute, ½ - hour, 1 hour, 24 hour, 30 day and annual averaging periods. The resulting dispersion factors are presented in Table 4, below:

Table 4: Modelling Dispersion Factors

Averaging Period	10-min	½- hr	1-hr	24-hr	30-day	Annual
Dispersion Factor [µg/m³ per g/s]	31.67	23.03	19.19	1.02	0.11	0.03

The average emission rate for each contaminant presented in Appendix A was multiplied by the applicable dispersion factor above to calculate the maximum point of impingement concentration for emissions from the main stack. The modelled POI concentrations were compared to the Schedule 3 standards listed in O.Reg. 419/05 and in the case of $PM_{2.5}$ and PM_{10}, the 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 '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 (Appendix B). It has been modified to include reference to the new ACB List as well as 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).

The contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 21% of the relevant limit (400 µg/m³).

5.0 SUMMARY OF MODELLING UPDATES

The dispersion modelling for the DYEC was updated to reflect data obtained from October 2018 compliance source testing. A summary of the changes made to the modelling are provided in Table 5, below.

Table 5: ECA Concordance Table

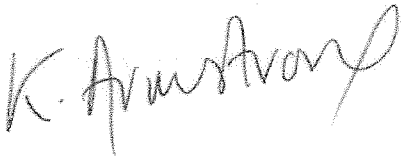
Modelling Inputs	Changes from ESDM Report
Emission Rates	Updated to use October 2018 Source Testing Data. List of contaminants assessed expanded to include all contaminants for which source testing data was performed.
Model and Model Version	No Change
Meteorology and Terrain data	No Change
Receptors	No Change
Building Downwash	No Change
Deposition	No Change
Chemical Transformations	No Change
Thermal Internal Boundary Layer	No Change
Averaging Times and Conversions	CALPOST input file was modified to generate annual averaging to account for new O.Reg. 419/05 standards introduced in 2016 that include annual averaging periods.
Dispersion Modelling Options	No Change
Background Air Quality Concentrations	Ozone background data used in secondary particulate modelling updated to match EA (Previously updated in 2017).
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.



Katherine Armstrong, M.Sc.
Air Quality Specialist

Anthony Ciccone, Ph.D., P.Eng.
Principal

KSA/ADC/ng

https://golderassociates.sharepoint.com/sites/28322g/deliverables/october st/final/18103322-tm-rev0 30oct2018 covanta updated modelling memo.docx

APPENDIX A

Site-Wide Emission Inventory

Appendix A
Site-Wide Emission Inventory

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - Oct 2018 Source Testing Conditions	52.59	140	1.7	87.6	(680538, 4860346)	1 – methylnaphthalene	90-12-0	3.52E-06	1,24, annual	ST	Above-Average	100%
							1,1,2-Trichloroethane	79-00-5	1.55E-05	1,24, annual	ST	Above-Average	100%
							1,2,3,4-tetrachlorobenzene	634-66-2	7.91E-08	1,24, annual	ST	Above-Average	100%
							1,2,3-trichlorobenzene	87-61-6	1.37E-07	1,24, annual	ST	Above-Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	3.18E-07	1,24, annual	ST	Above-Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.23E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichlorobenzene	95-50-1	1.15E-06	1,24, annual	ST	Above-Average	100%
							1,2-Dichloroethane	107-06-2	1.55E-05	1,24, annual	ST	Above-Average	100%
							1,2-Dichloropropane	78-87-5	1.55E-05	1,24, annual	ST	Above-Average	100%
							1,3,5-trichlorobenzene	108-70-3	1.32E-07	1,24, annual	ST	Above-Average	100%
							1,3-Butadiene	106-99-0	3.10E-05	1,24, annual	ST	Above-Average	100%
							1,3-Dichlorobenzene	541-73-1	2.01E-06	1,24, annual	ST	Above-Average	100%
							1,4-Dichlorobenzene	106-46-7	1.40E-06	1,24, annual	ST	Above-Average	100%
							1-Methylphenanthrene	832-69-9	4.51E-06	1,24, annual	ST	Above-Average	100%
							2 – methylnaphthalene	91-57-6	5.14E-06	1,24, annual	ST	Above-Average	100%
							2,3,4,5-tetrachlorophenol	4901-51-3	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,3,4-trichlorophenol	15950-66-0	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,3,5,6-tetrachlorophenol	935-95-5	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,3,5-trichlorophenol	933-78-8	4.52E-07	1,24, annual	ST	Above-Average	100%
							2,3,6-trichlorophenol	933-75-5	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,3-dichlorophenol	576-24-9	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,4,5-trichlorophenol	95-95-4	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,4,6-Trichlorophenol	88-06-2	4.79E-07	1,24, annual	ST	Above-Average	100%
							2,4-Dichlorophenol	120-83-2	3.95E-07	1,24, annual	ST	Above-Average	100%
							2,6-dichlorophenol	87-65-0	3.95E-07	1,24, annual	ST	Above-Average	100%
							2-Butanone	78-93-3	3.10E-04	1,24, annual	ST	Above-Average	100%
							2-Chloronaphthalene	91-58-7	1.57E-06	1,24, annual	ST	Above-Average	100%
							2-Methylanthracene	613-12-7	2.65E-06	1,24, annual	ST	Above-Average	100%
							2-monochlorophenol	95-57-8	5.68E-07	1,24, annual	ST	Above-Average	100%
							3,4,5-trichlorophenol	609-19-8	3.95E-07	1,24, annual	ST	Above-Average	100%
							3,4-dichlorophenol	95-77-2	3.95E-07	1,24, annual	ST	Above-Average	100%
							3,5-dichlorophenol	591-35-5	3.95E-07	1,24, annual	ST	Above-Average	100%
							3-Methylchloranthene	56-49-5	7.85E-06	1,24, annual	ST	Above-Average	100%
							3-monochlorophenol	108-43-0	5.70E-07	1,24, annual	ST	Above-Average	100%
							4-monochlorophenol	106-48-9	5.52E-07	1,24, annual	ST	Above-Average	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	1.57E-06	1,24, annual	ST	Above-Average	100%
							9,10-Dimethylanthracene	781-43-1	1.57E-06	1,24, annual	ST	Above-Average	100%
							9-Methylphenanthrene	883-20-5	2.78E-06	1,24, annual	ST	Above-Average	100%
							Acenaphthene	83-32-9	2.26E-06	1,24, annual	ST	Above-Average	60%
							Acenaphthylene	208-96-8	1.57E-06	1,24, annual	ST	Above-Average	34%
							Acetaldehyde	75-07-0	1.02E-03	1,24, annual	ST	Above-Average	99%
							Acetone	67-64-1	5.25E-04	1,24, annual	ST	Above-Average	100%
							Acrolein	107-02-8	9.16E-03	1,24, annual	ST	Above-Average	100%
							Ammonia	7664-41-7	2.72E-02	1,24, annual	ST	Above-Average	100%
							Anthracene	120-12-7	1.80E-06	1,24, annual	ST	Above-Average	82%
							Antimony	7440-36-0	1.66E-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	2.00E-06	1,24, annual	ST	Above-Average	100%
							Barium	7440-39-3	5.25E-05	1,24, annual	ST	Above-Average	100%
							Benzene	71-43-2	9.21E-05	1,24, annual	ST	Above-Average	27%
							Benzo(a)anthracene	56-55-3	1.57E-06	1,24, annual	ST	Above-Average	89%
							Benzo(a)fluorene	238-84-6	1.57E-06	1,24, annual	ST	Above-Average	100%
							Benzo(a)pyrene	50-32-8	1.57E-06	1,24, annual	ST	Above-Average	95%
							Benzo(b)fluoranthene	205-99-2	1.57E-06	1,24, annual	ST	Above-Average	81%
							Benzo(b)fluorene	243-17-4	1.57E-06	1,24, annual	ST	Above-Average	100%
							Benzo(e)pyrene	192-97-2	2.95E-06	1,24, annual	ST	Above-Average	100%
							Benzo(g,h,i)perylene	191-24-2	9.41E-06	1,24, annual	ST	Above-Average	100%
							Benzo(k)fluoranthene	207-08-9	5.67E-06	1,24, annual	ST	Above-Average	99%
							Beryllium	7440-41-7	1.15E-06	1,24, annual	ST	Above-Average	100%
							Biphenyl	92-51-3	1.13E-05	1,24, annual	ST	Above-Average	100%
							Bromodichloromethane	75-27-4	2.17E-05	1,24, annual	ST	Above-Average	100%
							Bromoform	75-25-2	1.55E-05	1,24, annual	ST	Above-Average	100%
							Bromomethane	74-83-9	1.49E-04	1,24, annual	ST	Above-Average	100%
							Cadmium	7440-43-9	3.47E-06	1,24, annual	ST	Above-Average	100%
							Carbon Monoxide	630-08-0	5.15E-01	1,24, annual	ST	Above-Average	67%
							Carbon tetrachloride	56-23-5	1.57E-05	1,24, annual	ST	Above-Average	100%
							Chlorobenzene	108-90-7	1.33E-05	1,24, annual	ST	Above-Average	100%
							Chloroform	67-66-3	5.40E-05	1,24, annual	ST	Above-Average	100%
							Chromium (hexavalent)	18540-29-9	4.29E-05	1,24, annual	ST	Above-Average	100%
							Chrysene	218-01-9	1.92E-06	1,24, annual	ST	Above-Average	79%
							Cobalt	7440-48-4	2.93E-06	1,24, annual	ST	Above-Average	100%
							Copper	7440-50-8	2.82E-05	1,24, annual	ST	Above-Average	100%
							Coronene	191-07-1	7.85E-06	1,24, annual	ST	Above-Average	100%
							Cumene (Isopropylbenzene)	98-82-8	3.10E-05	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,c)anthracene	215-58-7	1.57E-06	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,e)pyrene	192-65-4	7.85E-06	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,h)anthracene	53-70-3	1.57E-06	1,24, annual	ST	Above-Average	93%
							Dibromochloromethane	124-48-1	1.55E-05	1,24, annual	ST	Above-Average	100%
							Dichlorodifluoromethane	75-71-8	3.89E-05	1,24, annual	ST	Above-Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.60E-05	1,24, annual	ST	Above-Average	100%
							Dichloromethane	75-09-2	1.68E-03	1,24, annual	ST	Above-Average	100%
							Dioxins, Furans and Dioxin- like PCBs	N/A	0.0002 µg TEQ/s	1,24, annual	ST	Above-Average	100%
							Ethylbenzene	100-41-4	1.55E-05	1,24, annual	ST	Above-Average	100%
							Ethylene Dibromide	106-93-4	3.10E-05	1,24, annual	ST	Above-Average	100%
							Fluoranthene	206-44-0	5.52E-06	1,24, annual	ST	Above-Average	81%
							Fluorides	7664-39-3	4.10E-03	1,24, annual	ST	Above-Average	100%
							Fluorine	86-73-7	5.14E-06	1,24, annual	ST	Above-Average	100%
							Formaldehyde	50-00-0	4.09E-03	1,24, annual	ST	Above-Average	99%
							Hexachlorobenzene	118-74-1	7.91E-08	1,24, annual	ST	Above-Average	100%
							Hydrogen Chloride	7647-01-0	1.66E-01	1,24, annual	ST	Above-Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.58E-06	1,24, annual	ST	Above-Average	92%
							Lead	7439-92-1	7.98E-06	1,24, annual	ST	Above-Average	100%
							M&P-Xylene	179601-23-1	4.71E-05	1,24, annual	ST	Above-Average	100%
							Mercury	7439-97-6	8.56E-06	1,24, annual	ST	Above-Average	100%
							Mesitylene (1,3,5-Trimethylbenzene)	108-67-8	3.10E-05	1,24, annual	ST	Above-Average	100%
							Molybdenum	7439-98-7	2.57E-04	1,24, annual	ST	Above-Average	100%
							m-Terphenyl	92-06-8	3.87E-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 [%]
							Naphthalene	91-20-3	3.17E-05	1,24, annual	ST	Above-Average	43%
							Nickel	7440-02-0	9.76E-05	1,24, annual	ST	Above-Average	100%
							Nitrogen Oxides	10102-44-0	4.36E+00	1,24, annual	ST	Above-Average	44%
							Nitrogen Oxides	10102-44-0	4.36E+00	1,24, annual	ST	Above-Average	44%
							O-terphenyl	84-15-1	1.57E-06	1,24, annual	ST	Above-Average	100%
							O-Xylene	95-47-6	1.62E-05	1,24, annual	ST	Above-Average	100%
							Pentachlorobenzene	608-93-5	1.00E-07	1,24, annual	ST	Above-Average	100%
							Pentachlorophenol	87-86-5	3.95E-07	1,24, annual	ST	Above-Average	100%
							Perylene	198-55-0	5.51E-06	1,24, annual	ST	Above-Average	100%
							Phenanthrene	85-01-8	1.84E-05	1,24, annual	ST	Above-Average	58%
							Picene	213-46-7	7.85E-06	1,24, annual	ST	Above-Average	100%
							PM10 (Condensable and Filterable)	N/A	1.88E-01	1,24, annual	ST	Above-Average	100%
							PM10 (Filterable Only)	N/A	3.91E-02	1,24, annual	ST	Above-Average	100%
							PM2.5 (Condensable and Filterable)	N/A	1.75E-01	1,24, annual	ST	Above-Average	100%
							PM2.5 (Filterable Only)	N/A	2.61E-02	1,24, annual	ST	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	2.47E-10	1,24, annual	ST	Above-Average	100%
							p-Terphenyl	92-94-4	1.85E-06	1,24, annual	ST	Above-Average	100%
							Pyrene	129-00-0	6.74E-06	1,24, annual	ST	Above-Average	85%
							Selenium	7782-49-2	7.07E-06	1,24, annual	ST	Above-Average	100%
							Silver	7440-22-4	1.30E-06	1,24, annual	ST	Above-Average	100%
							Styrene	100-42-5	3.10E-05	1,24, annual	ST	Above-Average	100%
							Sulphur Dioxide	7446-09-5	1.40E-03	1,24, annual	ST	Above-Average	7%
							Tetrachloroethene	127-18-4	3.31E-05	1,24, annual	ST	Above-Average	100%
							Tetralin	119-64-2	2.58E-05	1,24, annual	ST	Above-Average	100%
							Thallium	7440-28-0	1.57E-06	1,24, annual	ST	Above-Average	100%
							Toluene	108-88-3	1.73E-04	1,24, annual	ST	Above-Average	65%
							Total Chromium (and compounds)	7440-47-3	4.29E-05	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Condensable and Filterable)	N/A	1.62E-01	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Filterable Only)	N/A	1.32E-02	1,24, annual	ST	Above-Average	100%
							trans,1,2-Dichloroethene	156-60-5	3.44E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	1.58E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethene	86-42-0	1.55E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	3.31E-05	1,24, annual	ST	Above-Average	100%
							Trichlorofluoromethane	75-69-4	3.21E-05	1,24, annual	ST	Above-Average	100%
							Trichlorotrifluoroethane	76-13-1	3.10E-05	1,24, annual	ST	Above-Average	100%
							Triphenylene	217-59-4	1.92E-06	1,24, annual	ST	Above-Average	100%
							Vanadium	7440-62-2	9.65E-07	1,24, annual	ST	Above-Average	100%
							Vinyl chloride	75-01-4	3.10E-05	1,24, annual	ST	Above-Average	100%
							Xylenes, m-, p- and o-	1330-20-7	6.33E-05	1,24, annual	ST	Above-Average	50%
							Zinc	7440-66-6	1.34E-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 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 [%]
							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	33%
							Nitrogen Oxides	10102-44-0	1.12E+00	½	EF	Marginal	11%
							Sulphur Dioxide	7446-09-5	1.88E-02	½	EF	Above-Average	93%
							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	73%
							Toluene	108-88-3	9.21E-05	½	EF	Marginal	35%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	½	EF	Marginal	50%
							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	57%
							Acenaphthylene	208-96-8	3.02E-06	½	EF	Marginal	66%
							Acenaphthene	83-32-9	1.53E-06	½	EF	Marginal	40%
							Fluorene	86-73-7	4.19E-06	½	EF	Marginal	100%
							Phenanthrene	85-01-8	1.34E-05	½	EF	Marginal	42%
							Anthracene	120-12-7	4.03E-07	½	EF	Marginal	18%
							Fluoranthene	206-44-0	1.32E-06	½	EF	Marginal	19%
							Pyrene	129-00-0	1.22E-06	½	EF	Marginal	15%
							Benzo(a)anthracene	56-55-3	2.04E-07	½	EF	Marginal	11%
							Chrysene	218-01-9	5.01E-07	½	EF	Marginal	21%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	½	EF	Marginal	19%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	½	EF	Marginal	1%
							Benzo(a)pyrene	50-32-8	8.42E-08	½	EF	Marginal	5%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	½	EF	Marginal	8%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	½	EF	Marginal	7%
							Benzo(ghi)perylene	191-24-2	1.82E-07	½	EF	Marginal	100%

APPENDIX B

Emission Summary Table

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	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	3.52E-06	Calpuff	3.59E-06	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2,4 – Trichlorobenzene	120-82-1	3.18E-07	Calpuff	3.23E-07	24-hour	400	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
1,2,4,5-Tetrachlorobenzene	95-94-3	1.23E-07	Calpuff	1.25E-07	24-hour	1	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2-Dichlorobenzene	95-50-1	1.15E-06	Calpuff	2.21E-05	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
2 – methylnaphthalene	91-57-6	5.14E-06	Calpuff	5.23E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
2,3,4,6-Tetrachlorophenol	58-90-2	3.95E-07	Calpuff	4.02E-07	24-hour	0.75	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4,6-Trichlorophenol	88-06-2	4.79E-07	Calpuff	4.88E-07	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4-Dichlorophenol	120-83-2	3.95E-07	Calpuff	4.02E-07	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
3-Methylchloranthene	56-49-5	7.85E-06	Calpuff	7.99E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
7,12-Dimethylbenz(a)anthracene	57-97-6	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
Acenaphthene	83-32-9	2.26E-06	Calpuff	2.30E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acenaphthylene	208-96-8	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acetaldehyde	75-07-0	1.02E-03	Calpuff	1.04E-03	24-hour	500	Health	Sch. 3	Standard	B1	<1%	Note 20, URT - Note 4, Table 4	Apr-18
Acetaldehyde	75-07-0	1.02E-03	Calpuff	1.04E-03	24-hour	5000	—	Sch. 6	URT	—	<1%	—	
Acrolein	107-02-8	9.16E-03	Calpuff	9.32E-03	24-hour	0.4	Health	Sch. 3	Standard	B1	2%	Note 20, URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	9.16E-03	Calpuff	1.76E-01	1-hour	4.5	Health	Sch. 3	Standard	B1	4%	Note 20, URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	9.16E-03	Calpuff	9.32E-03	24-hour	4	Health	Sch. 6	URT	—	<1%	—	Apr-18
Ammonia	7664-41-7	2.72E-02	Calpuff	2.76E-02	24-hour	100	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Ammonia	7664-41-7	2.72E-02	Calpuff	2.76E-02	24-hour	1000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Anthracene	120-12-7	1.80E-06	Calpuff	1.84E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Antimony	7440-36-0	1.66E-06	Calpuff	1.69E-06	24-hour	25	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Arsenic	7440-38-2	2.00E-06	Calpuff	2.03E-06	24-hour	0.3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Barium	7440-39-3	5.25E-05	Calpuff	5.34E-05	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Benzene	71-43-2	9.21E-05	Calpuff	2.91E-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	9.21E-05	Calpuff	9.38E-05	24-hour	100	Health	Sch. 6	URT/DAV	B1	<1%	—	
Benzene	71-43-2	9.21E-05	Calpuff	2.91E-06	Annual	4.5	Health	—	AAV	—	<1%	—	Apr-18
Benzo(a)anthracene	56-55-3	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)fluorene	238-84-6	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)pyrene	50-32-8	1.57E-06	Calpuff	4.95E-08	Annual	0.00001	Health	Sch. 3	Standard	B1	<1%	Note 7, 19, Table 2, 3, URT - Note 4, Table 4	Apr-18
Benzo(a)pyrene	50-32-8	1.57E-06	Calpuff	1.60E-06	24-hour	0.005	Health	Sch. 6	URT	—	<1%	—	Apr-18
Benzo(a)pyrene	50-32-8	1.57E-06	Calpuff	4.95E-08	Annual	0.0001	Health	—	AAV	—	<1%	—	Apr-18
Benzo(b)fluoranthene	205-99-2	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(b)fluorene	243-17-4	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(e)pyrene	192-97-2	2.95E-06	Calpuff	3.00E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(g,h,i)perylene	191-24-2	9.41E-06	Calpuff	9.58E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(k)fluoranthene	207-08-9	5.67E-06	Calpuff	5.77E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Beryllium	7440-41-7	1.15E-06	Calpuff	1.17E-06	24-hour	0.01	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Biphenyl	92-51-3	1.13E-05	Calpuff	1.15E-05	24-hour	175	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromodichloromethane	75-27-4	2.17E-05	Calpuff	2.21E-05	24-hour	350	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromoform	75-25-2	1.55E-05	Calpuff	1.58E-05	24-hour	55	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Bromomethane	74-83-9	1.49E-04	Calpuff	1.52E-04	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Cadmium	7440-43-9	3.47E-06	Calpuff	3.53E-06	24-hour	0.025	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Cadmium	7440-43-9	3.47E-06	Calpuff	3.53E-06	24-hour	0.25	Health	Sch. 6	URT	—	<1%	—	Apr-18
Carbon Monoxide	630-08-0	5.15E-01	Calpuff	1.19E+01	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	Note 9	Apr-18
Carbon tetrachloride	56-23-5	1.57E-05	Calpuff	1.60E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Carbon tetrachloride	56-23-5	1.57E-05	Calpuff	1.60E-05	24-hour	24	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chlorobenzene	108-90-7	1.33E-05	Calpuff	2.56E-04	1-hour	3500	Health	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chlorobenzene	108-90-7	1.33E-05	Calpuff	4.22E-04	10-minute	4500	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chloroform	67-66-3	5.40E-05	Calpuff	5.49E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Chloroform	67-66-3	5.40E-05	Calpuff	5.49E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chromium (hexavalent)	18540-29-9	4.29E-05	Calpuff	1.35E-06	Annual	0.00014	Health	Sch. 3	Standard	B1	<1%	Notes 11, 19, Table 2, 3, URT - Note 4, Table 4	Apr-18
Chromium (hexavalent)	18540-29-9	4.29E-05	Calpuff	4.36E-05	24-hour	0.07	Health	Sch. 6	URT	—	<1%	—	
Chrysene	218-01-9	1.92E-06	Calpuff	1.96E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Cobalt	7440-48-4	2.93E-06	Calpuff	2.98E-06	24-hour	0.1	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Copper	7440-50-8	2.82E-05	Calpuff	2.87E-05	24-hour	50	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Dibenzo(a,c)anthracene	215-58-7	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dibenzo(a,h)anthracene	53-70-3	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dichlorodifluoromethane	75-71-8	3.89E-05	Calpuff	3.96E-05	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.60E-05	Calpuff	1.63E-05	24-hour	165	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.60E-05	Calpuff	1.63E-05	24-hour	1650	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dichloromethane	75-09-2	1.68E-03	Calpuff	1.71E-03	24-hour	220	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloromethane	75-09-2	1.68E-03	Calpuff	1.71E-03	24-hour	22000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dioxins, Furans and Dioxin- like PCBs	N/A	0.0002 µg TEQ/s	Calpuff	0.0003 pg TEQ/m³	24-hour	0.1 pg TEQ/m³	Health	Sch. 3	Guideline	B1	<1%	Note 8, 8a, Table 1, URT - Note 4, Table 4	Apr-18
Ethylbenzene	100-41-4	1.55E-05	Calpuff	1.58E-05	24-hour	1000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.55E-05	Calpuff	4.91E-04	10-minute	1900	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	1.55E-05	Calpuff	1.58E-05	24-hour	14000	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Ethylene Dibromide	106-93-4	3.10E-05	Calpuff	3.15E-05	24-hour	3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Fluoranthene	206-44-0	5.52E-06	Calpuff	5.62E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Fluorides	7664-39-3	4.10E-03	Calpuff	4.17E-03	24-hour	0.86	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	4.10E-03	Calpuff	4.68E-04	30-day	0.34	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	4.10E-03	Calpuff	4.17E-03	24-hour	1.74	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	4.10E-03	Calpuff	4.68E-04	30-day	0.69	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 [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
Fluorides	7664-39-3	4.10E-03	Calpuff	4.17E-03	24-hour	3.44	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	4.10E-03	Calpuff	4.68E-04	30-day	1.38	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorine	86-73-7	5.14E-06	Calpuff	5.23E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Formaldehyde	50-00-0	4.09E-03	Calpuff	4.16E-03	24-hour	65	Odour & Irritation	Sch. 3	Standard	B1	<1%	—	Apr-18
Hexachlorobenzene	118-74-1	7.91E-08	Calpuff	8.05E-08	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Hydrogen Chloride	7647-01-0	1.66E-01	Calpuff	1.69E-01	24-hour	20	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Hydrogen Chloride	7647-01-0	1.66E-01	Calpuff	1.69E-01	24-hour	200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Indeno(1,2,3 – cd)pyrene	193-39-5	1.58E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Lead	7439-92-1	7.98E-06	Calpuff	8.13E-06	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 20URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	7.98E-06	Calpuff	9.11E-07	30-day	0.2	Health	Sch. 3	Standard	B1	<1%	Note 20URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	7.98E-06	Calpuff	8.13E-06	24-hour	2	Health	Sch. 6	URT	—	<1%	Note 20URT - Note 4, Table 4	Apr-18
Mercury	7439-97-6	8.56E-06	Calpuff	8.71E-06	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Molybdenum	7439-98-7	2.57E-04	Calpuff	2.61E-04	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Naphthalene	91-20-3	3.17E-05	Calpuff	3.23E-05	24-hour	22.5	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Naphthalene	91-20-3	3.17E-05	Calpuff	1.01E-03	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Nickel	7440-02-0	9.76E-05	Calpuff	3.08E-06	Annual	0.04	Health	Sch. 3	Standard	B1	<1%	Note 19, Table 2, 30URT - Note 4, Table 4	Apr-18
Nickel	7440-02-0	9.76E-05	Calpuff	9.93E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	—	Apr-18
Nickel	7440-02-0	9.76E-05	Calpuff	3.08E-06	Annual	0.4	Health	—	AAV	—	<1%	—	Apr-18
Nitrogen Oxides	10102-44-0	4.36E+00	Calpuff	4.44E+00	24-hour	200	Health	Sch. 3	Standard	B1	2%	Notes 2, 17	Apr-18
Nitrogen Oxides	10102-44-0	4.36E+00	Calpuff	8.37E+01	1-hour	400	Health	Sch. 3	Standard	B1	21%	Notes 2, 17	Apr-18
O-terphenyl	84-15-1	1.57E-06	Calpuff	1.60E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
PM_{10} (Condensable and Filterable)	N/A	1.88E-01	Calpuff	4.43E-01	24-hour	50	—	—	AAQC	—	<1%	—	Apr-18
PM_{10} (Filterable Only)	N/A	3.91E-02	Calpuff	2.92E-01	24-hour	50	—	—	AAQC	—	<1%	—	Apr-18
$PM_{2.5}$ (Condensable and Filterable)	N/A	1.75E-01	Calpuff	4.30E-01	24-hour	30	—	—	AAQC	—	1%	—	Apr-18
$PM_{2.5}$ (Filterable Only)	N/A	2.61E-02	Calpuff	2.78E-01	24-hour	30	—	—	AAQC	—	<1%	—	Apr-18
Pentachlorobenzene	608-93-5	1.00E-07	Calpuff	1.02E-07	24-hour	80	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Pentachlorophenol	87-86-5	3.95E-07	Calpuff	4.02E-07	24-hour	20	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Perylene	198-55-0	5.51E-06	Calpuff	5.61E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Phenanthrene	85-01-8	1.84E-05	Calpuff	1.88E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Pyrene	129-00-0	6.74E-06	Calpuff	6.86E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Selenium	7782-49-2	7.07E-06	Calpuff	7.20E-06	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Silver	7440-22-4	1.30E-06	Calpuff	1.32E-06	24-hour	1	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Sulphur Dioxide	7446-09-5	1.40E-03	Calpuff	1.42E-03	24-hour	275	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 20URT - Note 4, Table 4	Apr-18
Sulphur Dioxide	7446-09-5	1.40E-03	Calpuff	2.69E-02	1-hour	690	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 20URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	3.31E-05	Calpuff	3.36E-05	24-hour	360	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	3.31E-05	Calpuff	3.36E-05	24-hour	3600	Health	Sch. 6	URT	—	<1%	—	
Tetralin	119-64-2	2.58E-05	Calpuff	2.62E-05	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Thallium	7440-28-0	1.57E-06	Calpuff	1.60E-06	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Toluene	108-88-3	1.73E-04	Calpuff	1.76E-04	24-hour	2000	Not Applicable	Sch. 3	Guideline	B1	<1%	To be updated - Note 5	Apr-18
Total Chromium (and compounds)	7440-47-3	4.29E-05	Calpuff	4.36E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 11a20URT - Note 4, Table 4	Apr-18
Total Chromium (and compounds)	7440-47-3	4.29E-05	Calpuff	4.36E-05	24-hour	5	Health	Sch. 6	URT	—	<1%	—	Apr-18
Total Particulate Matter (Condensable and Filterable)	N/A	1.62E-01	Calpuff	4.16E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Total Particulate Matter (Filterable only)	N/A	1.32E-02	Calpuff	2.65E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Trichloroethane, 1,1,1 -	71-55-6	1.58E-05	Calpuff	1.60E-05	24-hour	115000	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Trichloroethene	86-42-0	1.55E-05	Calpuff	1.58E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	3.31E-05	Calpuff	3.36E-05	24-hour	12	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	3.31E-05	Calpuff	3.36E-05	24-hour	1200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Trichlorofluoromethane	75-69-4	3.21E-05	Calpuff	3.27E-05	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Vanadium	7440-62-2	9.65E-07	Calpuff	9.82E-07	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Vinyl chloride	75-01-4	3.10E-05	Calpuff	3.15E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Vinyl chloride	75-01-4	3.10E-05	Calpuff	3.15E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Xylenes, m-, p- and o-	1330-20-7	6.33E-05	Calpuff	6.44E-05	24-hour	730	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	6.33E-05	Calpuff	2.00E-03	10-minute	3000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	6.33E-05	Calpuff	6.44E-05	24-hour	7300	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Zinc	7440-66-6	1.34E-04	Calpuff	1.36E-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
11-Sep-18	9:00	8.18	12		0		110		2		0	8
11-Sep-18	10:00	8.29	9		0		111		3		0	8
11-Sep-18	11:00	8.27	11		0		117		2		0	8
11-Sep-18	12:00	8.19	9	10.3	0		105		3		0	8
11-Sep-18	13:00	8.18	10	9.8	0		113		3		0	8
11-Sep-18	14:00	8.08	11	10.3	0		110		3		0	8
11-Sep-18	15:00	8.30	11	10.3	0		114		3		0	8
11-Sep-18	16:00	8.50	12	11.0	0		108		3		0	8
11-Sep-18	17:00	7.93	8	10.5	0		111		2		0	8
11-Sep-18	18:00	8.22	17	12.0	0		111		3		0	8
11-Sep-18	19:00	8.34	9	11.5	0		117		3		0	8
11-Sep-18	20:00	8.28	9	10.8	0		104		3		0	8
11-Sep-18	21:00	8.33	11	11.5	0		108		2		0	8
11-Sep-18	22:00	8.61	26	13.8	0		113		2		0	9
11-Sep-18	23:00	8.78	14	15.0	0		103		2		0	8
12-Sep-18	0:00	8.67	13	16.0	0		114		2		0	8
12-Sep-18	1:00	9.27	23	19.0	0		109		2		0	9
12-Sep-18	2:00	8.80	12	15.5	0		113		3		0	8
12-Sep-18	3:00	8.77	14	15.5	0		104		3		0	9
12-Sep-18	4:00	8.78	24	18.3	0		100		3		0	8
12-Sep-18	5:00	8.65	26	19.0	0		118		2		0	8
12-Sep-18	6:00	8.44	16	20.0	0		105		2		0	8
12-Sep-18	7:00	8.68	8	18.5	0		123		3		0	9
12-Sep-18	8:00	8.61	10	15.0	0	0.0	105	110	3	2.6	0	8
12-Sep-18	9:00	8.38	12	11.5	0	0.0	109	110	3	2.6	0	8
12-Sep-18	10:00	8.68	10	10.0	0	0.0	111	110	3	2.6	0	9
12-Sep-18	11:00	8.47	16	12.0	0	0.0	105	110	3	2.7	0	8
12-Sep-18	12:00	8.42	21	14.8	0	0.0	110	110	3	2.7	0	8
12-Sep-18	13:00	8.64	11	14.5	0	0.0	113	110	3	2.7	0	9
12-Sep-18	14:00	8.53	10	14.5	0	0.0	104	110	3	2.7	0	8
12-Sep-18	15:00	8.08	9	12.8	0	0.0	112	110	3	2.7	0	8
12-Sep-18	16:00	8.08	10	10.0	0	0.0	107	110	3	2.7	0	8
12-Sep-18	17:00	8.83	11	10.0	0	0.0	110	110	3	2.7	0	9
12-Sep-18	18:00	8.86	7	9.3	0	0.0	117	110	3	2.7	0	9
12-Sep-18	19:00	8.50	10	9.5	0	0.0	99	109	2	2.7	0	8
12-Sep-18	20:00	8.30	17	11.3	0	0.0	110	109	2	2.6	0	8
12-Sep-18	21:00	8.59	15	12.3	0	0.0	109	109	3	2.7	0	8
12-Sep-18	22:00	8.36	20	15.5	0	0.0	106	109	3	2.7	0	8
12-Sep-18	23:00	7.92	22	18.5	0	0.0	107	109	3	2.8	0	8
13-Sep-18	0:00	8.18	12	17.3	0	0.0	110	109	3	2.8	0	8
13-Sep-18	1:00	8.30	15	17.3	0	0.0	112	109	3	2.8	0	8
13-Sep-18	2:00	8.28	17	16.5	0	0.0	109	109	3	2.8	0	8
13-Sep-18	3:00	8.34	16	15.0	0	0.0	108	109	3	2.8	0	8
13-Sep-18	4:00	8.57	18	16.5	0	0.0	95	109	3	2.8	0	8
13-Sep-18	5:00	9.17	18	17.3	0	0.0	115	109	3	2.9	0	8
13-Sep-18	6:00	8.78	15	16.8	0	0.0	117	109	3	2.9	0	8
13-Sep-18	7:00	8.38	14	16.3	0	0.0	116	109	3	2.9	0	8
13-Sep-18	8:00	8.67	11	14.5	0	0.0	105	109	3	2.9	0	8
13-Sep-18	9:00	8.84	18	14.5	0	0.0	110	109	3	2.9	0	9
13-Sep-18	10:00	8.30	23	16.5	0	0.0	108	109	3	2.9	0	8
13-Sep-18	11:00	8.21	15	16.8	0	0.0	107	109	3	2.9	0	8
13-Sep-18	12:00	8.58	10	16.5	0	0.0	114	109	3	2.9	0	9
13-Sep-18	13:00	8.45	9	14.3	0	0.0	109	109	3	2.9	0	8
13-Sep-18	14:00	8.24	10	11.0	0	0.0	106	109	3	2.9	0	8
13-Sep-18	15:00	8.30	12	10.3	0	0.0	108	109	3	2.9	0	8
13-Sep-18	16:00	8.27	14	11.3	0	0.0	107	109	3	2.9	0	8
13-Sep-18	17:00	8.19	12	12.0	0	0.0	112	109	3	2.9	0	8
13-Sep-18	18:00	8.23	9	11.8	0	0.0	113	109	3	2.9	0	8
13-Sep-18	19:00	7.84	10	11.3	0	0.0	106	109	3	3.0	0	8
13-Sep-18	20:00	8.00	10	10.3	0	0.0	105	109	3	3.0	0	8
13-Sep-18	21:00	8.21	13	10.5	0	0.0	109	109	3	3.0	0	8
13-Sep-18	22:00	8.33	13	11.5	0	0.0	109	109	3	3.0	0	8
13-Sep-18	23:00	8.33	13	12.3	0	0.0	108	109	3	3.0	0	8
14-Sep-18	0:00	8.04	21	15.0	0	0.0	110	109	3	3.0	0	8
14-Sep-18	1:00	8.08	11	14.5	0	0.0	113	109	3	3.0	0	8
14-Sep-18	2:00	8.29	12	14.3	0	0.0	105	109	3	3.0	0	8
14-Sep-18	3:00	8.28	7	12.8	0	0.0	114	109	4	3.0	0	8
14-Sep-18	4:00	7.95	9	9.8	0	0.0	96	109	3	3.0	0	8
14-Sep-18	5:00	8.19	7	8.8	0	0.0	113	109	2	3.0	0	8
14-Sep-18	6:00	7.83	9	8.0	0	0.0	103	109	6	3.1	0	8
14-Sep-18	7:00	7.99	9	8.5	0	0.0	123	109	5	3.2	0	8
14-Sep-18	8:00	8.40	9	8.5	0	0.0	104	109	4	3.3	0	8

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	%
	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
14-Sep-18	9:00	8.32	10	9.3	0	0.0	106	109	3	3.3	0	8
14-Sep-18	10:00	8.41	12	10.0	0	0.0	110	109	3	3.3	0	8
14-Sep-18	11:00	8.18	7	9.5	0	0.0	108	109	2	3.2	0	8
14-Sep-18	12:00	8.08	9	9.5	0	0.0	111	109	2	3.2	0	8
14-Sep-18	13:00	8.26	9	9.3	0	0.0	108	109	2	3.1	0	8
	Min	7.83	7	8.0	0	0.0	95	109	2	2.6	0	8
	Max	9.27	26	20.0	0	0.0	123	110	6	3.3	0	9
	Avg	8.38	13	13.0	0	0.00	109	109	3	2.9	0	8
	Std Dev	0.29	4.6	3.1	-	0.00	5.08	0.4	0.6	0.2	-	0.3

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
11-Sep-18	9:00	7.91	12		0		109		7		0	8
11-Sep-18	10:00	7.88	9		0		113		7		0	8
11-Sep-18	11:00	7.86	12		0		109		7		0	8
11-Sep-18	12:00	7.99	8	10.3	0		111		6		0	8
11-Sep-18	13:00	8.00	10	9.8	0		115		6		0	8
11-Sep-18	14:00	8.07	15	11.3	0		115		6		0	8
11-Sep-18	15:00	7.66	9	10.5	0		109		5		0	7
11-Sep-18	16:00	7.86	9	10.8	0		114		5		0	8
11-Sep-18	17:00	8.15	11	11.0	0		109		5		0	8
11-Sep-18	18:00	8.17	11	10.0	0		109		5		0	8
11-Sep-18	19:00	8.04	8	9.8	0		113		5		0	8
11-Sep-18	20:00	8.13	12	10.5	0		108		5		0	8
11-Sep-18	21:00	8.24	13	11.0	0		112		4		0	8
11-Sep-18	22:00	9.63	46	19.8	0		105		4		0	10
11-Sep-18	23:00	8.21	19	22.5	0		111		4		0	8
12-Sep-18	0:00	8.04	21	24.8	0		109		5		0	8
12-Sep-18	1:00	7.92	22	27.0	0		110		5		0	8
12-Sep-18	2:00	8.10	26	22.0	0		106		5		0	8
12-Sep-18	3:00	8.66	14	20.8	0		110		5		0	8
12-Sep-18	4:00	8.43	17	19.8	0		103		4		0	8
12-Sep-18	5:00	8.43	17	18.5	0		121		4		0	8
12-Sep-18	6:00											8
12-Sep-18	7:00											8
12-Sep-18	8:00											8
12-Sep-18	9:00	8.28	15		0		122		4		0	8
12-Sep-18	10:00	8.18	14		0		112		5		0	8
12-Sep-18	11:00	8.16	13		0		109		4		0	8
12-Sep-18	12:00	7.98	15	14.3	0		108		2		0	8
12-Sep-18	13:00	7.63	16	14.5	0		110		2		0	8
12-Sep-18	14:00	7.36	11	13.8	0		112		2		0	7
12-Sep-18	15:00	7.45	9	12.8	0		107		2		0	7
12-Sep-18	16:00	8.17	19	13.8	0		113		2		0	8
12-Sep-18	17:00	7.68	11	12.5	0		113		2		0	8
12-Sep-18	18:00	7.41	7	11.5	0		113		2		0	7
12-Sep-18	19:00	8.12	17	13.5	0		106		1		0	8
12-Sep-18	20:00	7.73	14	12.3	0		109		1		0	8
12-Sep-18	21:00	8.24	15	13.3	0		113		3		0	8
12-Sep-18	22:00	7.93	21	16.8	3		109		3		0	8
12-Sep-18	23:00	7.21	21	17.8	0		108		2		0	7
13-Sep-18	0:00	7.90	18	18.8	0		109		2		0	8
13-Sep-18	1:00	7.95	11	17.8	0		111		2		0	8
13-Sep-18	2:00	7.91	16	16.5	0		106		2		0	8
13-Sep-18	3:00	8.11	12	14.3	0		111		2		0	8
13-Sep-18	4:00	8.30	23	15.5	0		113		1		0	8
13-Sep-18	5:00	7.66	15	16.5	0		122		2		0	8
13-Sep-18	6:00	8.29	14	16.0	0		108		5		1	8
13-Sep-18	7:00	8.06	16	17.0	1		117		5		0	8
13-Sep-18	8:00	8.08	17	15.5	0	0.2	110	111	5	2.6	0	8
13-Sep-18	9:00	8.21	15	15.5	1	0.2	112	111	6	2.7	0	8
13-Sep-18	10:00	8.09	21	17.3	0	0.2	108	111	6	2.8	0	8
13-Sep-18	11:00	8.00	16	17.3	0	0.2	106	111	5	2.8	0	8
13-Sep-18	12:00	8.13	12	16.0	0	0.2	113	111	5	2.9	0	8
13-Sep-18	13:00	8.09	11	15.0	0	0.2	108	111	4	3.0	0	8
13-Sep-18	14:00	7.96	10	12.3	0	0.2	113	111	5	3.1	0	8
13-Sep-18	15:00	7.99	10	10.8	0	0.2	111	111	6	3.3	0	8
13-Sep-18	16:00	8.18	11	10.5	0	0.2	107	111	6	3.5	0	8
13-Sep-18	17:00	8.20	9	10.0	0	0.2	111	111	5	3.6	0	8
13-Sep-18	18:00	7.90	8	9.5	0	0.2	113	111	5	3.7	0	8
13-Sep-18	19:00	8.15	8	9.0	0	0.2	109	111	5	3.9	0	8
13-Sep-18	20:00	8.22	12	9.3	0	0.2	104	111	5	4.0	0	8
13-Sep-18	21:00	8.22	10	9.5	0	0.2	108	110	5	4.1	0	8
13-Sep-18	22:00	8.45	10	10.0	0	0.1	115	111	4	4.2	0	8
13-Sep-18	23:00	8.64	12	11.0	0	0.1	108	111	4	4.3	0	9
14-Sep-18	0:00	8.41	9	10.3	0	0.1	110	111	4	4.3	0	8
14-Sep-18	1:00	8.12	9	10.0	0	0.1	107	110	4	4.4	0	8
14-Sep-18	2:00	7.98	10	10.0	0	0.1	111	111	5	4.5	0	8
14-Sep-18	3:00	8.30	14	10.5	0	0.1	106	110	5	4.7	0	8
14-Sep-18	4:00	7.71	10	10.8	0	0.1	111	110	4	4.8	0	8
14-Sep-18	5:00	7.76	9	10.8	0	0.1	125	110	5	4.9	0	8
14-Sep-18	6:00	7.72	10	10.8	0	0.1	101	110	6	5.0	1	8
14-Sep-18	7:00	7.94	7	9.0	0	0.0	119	110	6	5.0	0	8
14-Sep-18	8:00	7.75	10	9.0	0	0.0	109	110	5	5.0	0	8

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	%
	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
14-Sep-18	9:00	7.61	9	9.0	0	0.0	107	110	7	5.0	0	8
14-Sep-18	10:00	7.81	10	9.0	0	0.0	112	110	7	5.1	0	8
14-Sep-18	11:00	7.97	7	9.0	0	0.0	110	110	7	5.2	0	8
14-Sep-18	12:00	7.92	9	8.8	0	0.0	110	110	6	5.2	0	8
14-Sep-18	13:00	7.82	10	9.0	0	0.0	111	110	6	5.3	0	8
	Min	7.21	7	8.8	0	0.0	101	110	1	2.3	0	7
	Max	9.63	46	27.0	3	0.2	125	111	7	5.8	1	10
	Avg	8.03	13	13.5	0.07	0.1	111	111	4	4.0	0.03	8
	Std Dev	0.33	5.7	4.1	0.4	0.1	4.21	0.3	1.6	1.2	0.2	0.4