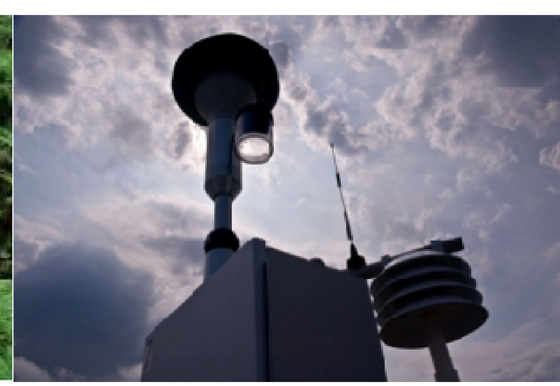
Report No. 21960

Report:

Covanta Durham York Renewable Energy Limited Partnership Durham York Energy Centre 2019 Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX

Date: November 18, 2019





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Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre 2019 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 Project Manager, 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
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LICENSED PROFESSIONAL ENGINEER
H. R. VAN BAKEL
PROVINCE OF ONTARIO

Revision History

Version	Date	Summary Changes/Purpose of Revision
1	November 18, 2019	None

NOTICE:

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EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between September 9 and September 13, 2019. 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 ninth comprehensive Schedule E source testing program conducted at the facility. A list of the test programs conducted by ORTECH to date is provided below:

Test Program	Test Date	ORTECH Report No.
2015 Compliance	September/October 2015	21546
2016 Voluntary	May 2016	21656
2016 Compliance	October/November 2016	21698
2017 Voluntary	May 2017	21754
2017 Compliance	October 2017	21800
2018 Voluntary	May/June 2018	21840
2018 Compliance	September 2018	21880
2019 Voluntary	June 2019	21936
2019 Compliance	September 2019	21960

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 July 2019, 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 9 to September 13, 2019 for Boiler No. 1 and September 9 to September 12, 2019 for Boiler No. 2) 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 9, 2019 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

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

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

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	369	-
Average Combustion Zone Temp. (°C)*	-	-	-	1239	-
Steam (tonnes/day)*	-	-	-	798	-
MSW Combusted (tonnes/day)*	-	-	-	210	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	624	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4279	-
Filterable Particulate (mg/Rm^3) (1)	0.78	0.46	<0.58	<0.61	9
PM_{10} with Condensable (mg/Rm^3) (1)	<1.29	<3.11	<1.60	<2.00	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<1.23	<2.99	<1.54	<1.92	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.076	<0.11	<0.12	<0.10	-
Ammonia (mg/Rm^3) (1)	0.33	0.40	0.34	0.36	-
Cadmium (µg/Rm^3) (1)	0.42	0.058	0.058	0.18	7
Lead (µg/Rm^3) (1)	0.41	0.41	0.82	0.54	50
Mercury (µg/Rm^3) (1)	0.44	0.25	0.19	0.29	15
Antimony (µg/Rm^3) (1)	0.048	0.063	<0.039	<0.050	-
Arsenic (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Barium (µg/Rm^3) (1)	1.81	1.41	1.75	1.66	-
Beryllium (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Chromium (µg/Rm^3) (1)	0.66	0.84	0.60	0.70	-
Cobalt (µg/Rm^3) (1)	0.096	<0.040	<0.039	<0.058	-
Copper (µg/Rm^3) (1)	1.18	0.69	0.55	0.81	-
Molybdenum (µg/Rm^3) (1)	1.87	1.89	1.90	1.89	-
Nickel (µg/Rm^3) (1)	1.05	1.15	0.93	1.04	-
Selenium (µg/Rm^3) (1)	<0.20	<0.20	<0.19	<0.20	-
Silver (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Thallium (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Vanadium (µg/Rm^3) (1)	<0.020	<0.020	<0.019	<0.020	-
Zinc (µg/Rm^3) (1)	5.67	7.89	5.44	6.33	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<1.53	<1.33	<1.67	<1.51	60
Total Chlorobenzenes (ng/Rm^3) (1)	<465	<610	<527	<534	-
Total Chlorophenols (ng/Rm^3) (1)	<367	<278	<251	<298	-
Total PAHs (ng/Rm^3) (1)	<358	<166	<233	<253	-
VOCs (µg/Rm^3) (1)	<325	<291	<337	<318	-
Aldehydes (µg/Rm^3) (1)	<753	<662	<855	<758	-
Total VOCs (µg/Rm^3) (1) (4)	<1078	<953	<1192	<1076	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.9	0.6	0.8	0.8	50

* based on process data provided by Covanta

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

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

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

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

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	369	-
Average Combustion Zone Temp. (°C)*	-	-	-	1240	-
Steam (tonnes/day)*	-	-	-	794	-
MSW Combusted (tonnes/day)*	-	-	-	207	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	535	-
Carbon Injection (kg/day)*	-	-	-	127	-
Lime Injection (kg/day)*	-	-	-	5175	-
Filterable Particulate (mg/Rm^3) (1)	0.89	<0.36	<0.37	<0.54	9
PM_{10} with Condensable (mg/Rm^3) (1)	<2.06	<3.55	<2.70	<2.77	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<1.99	<3.49	<2.63	<2.70	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.074	<0.11	<0.12	<0.10	-
Ammonia (mg/Rm^3) (1)	0.67	0.60	0.57	0.61	-
Cadmium (µg/Rm^3) (1)	0.15	0.054	0.040	0.080	7
Lead (µg/Rm^3) (1)	0.70	0.52	0.50	0.57	50
Mercury (µg/Rm^3) (1)	0.12	<0.087	<0.079	<0.097	15
Antimony (µg/Rm^3) (1)	0.075	<0.045	<0.047	<0.055	-
Arsenic (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Barium (µg/Rm^3) (1)	1.85	1.63	1.45	1.64	-
Beryllium (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Chromium (µg/Rm^3) (1)	0.72	0.61	2.08	1.14	-
Cobalt (µg/Rm^3) (1)	0.042	<0.045	<0.047	<0.044	-
Copper (µg/Rm^3) (1)	0.66	0.47	0.51	0.55	-
Molybdenum (µg/Rm^3) (1)	1.97	2.08	1.98	2.01	-
Nickel (µg/Rm^3) (1)	0.88	0.78	1.01	0.89	-
Selenium (µg/Rm^3) (1)	<0.21	<0.22	<0.23	<0.22	-
Silver (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Thallium (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Vanadium (µg/Rm^3) (1)	<0.021	<0.022	<0.023	<0.022	-
Zinc (µg/Rm^3) (1)	6.57	4.84	6.99	6.13	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.92	<3.74	<2.06	<3.24	60
Total Chlorobenzenes (ng/Rm^3) (1)	<901	<751	<677	<776	-
Total Chlorophenols (ng/Rm^3) (1)	<289	<357	<281	<309	-
Total PAHs (ng/Rm^3) (1)	<239	<185	<227	<217	-
VOCs (µg/Rm^3) (1)	<334	<239	<416	<330	-
Aldehydes (µg/Rm^3) (1)	<654	<581	<609	<614	-
Total VOCs (µg/Rm^3) (1) (4)	<988	<820	<1025	<944	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.2	0.2	0.4	0.3	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)	7.0	11.2	19.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.7	3.0	3.6	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	111	112	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	7.3	12.1	19.5	40
	Hydrogen Chloride (mg/Rm^3) (2)	4.6	5.1	5.5	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	110	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.01	0.1	35

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

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

The CALPUFF dispersion modelling (using Version 6.263 as requested by the MECP) for the September 2019 emission testing program was performed by Golder Associates. A summary of the results are provided in the tables appended to this report (Appendix 27) based on calculated ground level Point of Impingement (POI) concentrations for the average total Main Stack emissions. As shown in the tables, the calculated impingement concentrations for all of the contaminants were well below the relevant MECP standards.

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

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 791 tonnes of steam per day for each Boiler (approximately 98.0% 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 9 and September 13, 2019. 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 ninth 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
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2017 Compliance	October 2017	21800
2018 Voluntary	May/June 2018	21840
2018 Compliance	September 2018	21880
2019 Voluntary	June 2019	21936
2019 Compliance	September 2019	21960

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 August 14, 2019, 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 9 and September 13, 2019.

2. PROCESS DESCRIPTION

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

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

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

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

2.1 Control Equipment

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

2.2 Continuous Emission Monitoring Systems

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

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

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

3. SAMPLING LOCATIONS

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

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

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

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

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

The results for the cyclonic flow checks are summarized below:

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

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

4. SAMPLING PROCEDURES

4.1 General

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

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

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

Since relative accuracy and system bias testing was performed in July 2019, 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 9 to September 13, 2019 for Boiler No. 1 and September 9 to September 12, 2019 for Boiler No. 2) 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 9, 2019 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

4.2 Particulate and Metals

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

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

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

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

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

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

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

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

4.3 Particle Size Distribution

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

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

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

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

4.4 Semi-Volatile Organic Compounds

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

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

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

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

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

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

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

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

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

4.5 Acid Gases

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

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

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 July 2019, 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 9, 2019 at 00:00 to September 13, 2019 at 23:00, was used to assess against the in-stack emission limit stated in the ECA for Boiler No. 1. The data measured by the DYEC CEMS, from September 9, 2019 at 00:00 to September 12, 2019 at 23:00, was used to assess against the in-stack emission limit stated in the ECA for Boiler No. 2.

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 9, 2019. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA.

5. SAMPLE RECOVERY AND ANALYSIS

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

5.1 Particulate and Metals

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

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

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

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

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

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

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

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

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

The test samples were prepared and analyzed for metals according to US EPA Method 29 (modified). The inorganic analytical reports are provided in Appendix 12.

5.2 Particle Size Distribution

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

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

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

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

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

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

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

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

5.3 Semi-Volatile Organic Compounds

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

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

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

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

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

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

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

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

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

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

The SVOC analytical reports are provided in Appendix 15.

5.4 Acid Gases

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

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

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

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

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

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

5.5 Volatile Organics Train Recovery

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

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

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

The VOST analytical report is provided in Appendix 17.

5.6 Aldehydes

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

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

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

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

6. INTERNAL AND EXTERNAL QA/QC PROGRAM

6.1 General

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

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

6.2 Pre-Test Activities

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

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

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

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

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

The proof data for the semi-volatile organics glassware and VOST tubes is provided in Appendix 20. 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/or at least twice during sampling each traverse point.
- Any unusual occurrences were noted during each test on the appropriate data form.
- The field team leader reviewed all calibration and sampling data forms daily.
- Only tapered edge sampling nozzles and S-type pitot tubes that had been visually inspected and caliper measured, and deemed acceptable, were used for sampling.
- Each leg of the S-type pitot was leak-checked before the start of testing. The leak-checks were all acceptable (no leak detected).
- Each entire sampling train met acceptable leak-check criteria before and after each test, and during any move from one sampling traverse to another. If a test did not meet the leak-check criteria the test was voided and repeated.
- The S-type pitot tube and sampling nozzle were maintained parallel to the flow during testing and care was taken to ensure that they did not scrape the ports when being inserted and removed from the stack.
- The probe and filter components were maintained at 120°C ± 14°C during testing. If the probe or filter temperature was outside of the acceptable range the test was halted until the temperature could be brought back into the acceptable range.
- Covanta was responsible for monitoring process operations during testing and notified ORTECH when testing was to proceed.

6.4 Sample Recovery, Handling and Custody

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

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

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

6.5 Analytical Results

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

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

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

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

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

6.5.1 Metals Sample Analysis QA/QC

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

ICPMS Analysis

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

- One duplicate sample analysis was performed for the test program. The relative percent difference was less than 3.1% 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 91-105%, except for silver in the front half sample (71%). 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 84-98%. 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.

Chromium, molybdenum and nickel were observed by the analytical laboratory in the method blank at levels greater than the limit of reporting. Chromium and lead were 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 2% 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 91-96% within the acceptable limit of 90-110% of the true value.
- A matrix spike (performed as a post digestion spike) was analyzed with the test samples. All of the recovery results were between 89-99% 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 4.6%, 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 98% for hydrogen chloride, 101% for hydrogen fluoride and 103% for ammonia, within the acceptable range of 90-110%.
- A matrix spike (spike confirmation) sample was analyzed with every 20 samples to confirm the identity of each peak. The recovery results of the matrix spike sample were 101% for hydrogen chloride, 95% for hydrogen fluoride and 98% for ammonia, within the acceptable range of 80-120%.

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

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

6.5.3 Aldehyde Sample Analysis QA/QC

Analysis for formaldehyde, acetaldehyde and acrolein was performed via Liquid Chromatography (LC). Laboratory control samples were analyzed with the test samples. A trip spike sample was prepared by the analytical laboratory, taken to the site and submitted for analysis with the test samples. The analytical laboratory stated that the trip spike was initially prepared with 1000 µg/mL each of acetaldehyde and formaldehyde, and 500 µg/mL of acrolein. The analysis of the trip spike, conducted with the test samples, showed 1.9 µg/sample of acetaldehyde and 1.1 µg/ sample of formaldehyde. Acrolein was not detected in quantities greater than the analytical detection limit. The laboratory was unable to provide an explanation as to why the recoveries were so poor and ORTECH cannot verify that the trip spike sample was prepared correctly. As a result, recovery data for the trip spike sample could not be confirmed.

Acrolein and formaldehyde were not detected in the blank samples in quantities greater than the reported detection limit. Acetaldehyde was detected in both blank samples in quantities greater than the test samples.

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 71-108% 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 chlorophenols, the Blank No. 1 sample appeared to have selective losses for some of the labelled extraction standards, in particular the 13C6-4-Chlorophenol and the 13C6-2,4-dichlorophenol. The losses may be related to volatility or extraction efficiency. Due to the losses chlorophenol and dichlorophenol target analytes could not be quantified for the sample.

6.5.5 Volatile Organic Compound Analysis QA/QC

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

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

The analytical report includes the field standards, internal standards and surrogate standards used. The surrogate recoveries for each of the surrogates should be between 50-150%. The recoveries for each sample were between 59-134%.

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 9 to September 13, 2019 for Boiler No. 1 and September 9 to September 12, 2019 for Boiler No. 2) by the DYEC CEMS. Total hydrocarbon concentrations were also measured at the BH Outlet and Quench Inlet by ORTECH on September 9, 2019.

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

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

7.1 Stack Gas Sampling Parameters

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

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

7.2 Stack Gas Physical Parameters

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

Stack Gas Parameter	Boiler No. 1 BH Outlet*	Boiler No. 2 BH Outlet*
Gas Temperature (°C)	139	140
Moisture by Volume (%)	17.0	16.7
Velocity (m/s)	17.4	17.2
Static Pressure (kPa)	-2.17	-2.37
Absolute Pressure (kPa)	99.3	98.9
Carbon Dioxide by Volume (%)**	11.2	11.0
Oxygen by Volume (%)**	8.17	8.24

* 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)	25.7	25.4
Dry Reference Flowrate (Rm^3/s)**	15.1	14.9
Dry Adjusted Flowrate (Rm^3/s)***	19.4	19.1
Wet Reference Flowrate (Rm^3/s)**	18.2	17.9

* 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)	<0.46	<0.41
Dry Reference Conc. (mg/Rm^3)*	<0.78	<0.69
Dry Adjusted Conc. (mg/Rm^3)**	<0.61	<0.54
Wet Reference Conc. (mg/Rm^3)*	<0.64	<0.58
Emission Rate (mg/s)	<12.2	<10.5

* 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 (<0.61 mg/Rm^3, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (<0.54 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 0.1 mg and <0.1 mg, respectively. The amount of particulate detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 2 BH Outlet was 0.6 mg and <0.1 mg, respectively. Although these levels are significant relative to the amount detected in the test trains, the blank analysis was not subtracted from the test sample analyses during calculation of the particulate emission data.

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

PM_{10} and $PM_{2.5}$ Emission Parameter	PM_{10}		$PM_{2.5}$	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	<0.16	<0.15	<0.098	<0.097
Dry Reference Conc. (mg/Rm^3)*	<0.28	<0.25	<0.17	<0.17
Dry Adjusted Conc. (mg/Rm^3)**	<0.21	<0.20	<0.13	<0.13
Wet Reference Conc. (mg/Rm^3)*	<0.23	<0.21	<0.14	<0.14
Emission Rate (mg/s)	<4.03	<3.70	<2.42	<2.47

* 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)	0.87	1.13	0.51	0.78
Dry Reference Conc. (mg/Rm^3)*	1.46	1.95	0.86	1.33
Dry Adjusted Conc. (mg/Rm^3)**	1.13	1.53	0.66	1.04
Wet Reference Conc. (mg/Rm^3)*	1.22	1.61	0.72	1.10
Emission Rate (mg/s)	21.4	28.8	12.5	19.7

* at 25°C and 1 atmosphere

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

The amount of condensable particulate detected in the blank sampling train for Boiler No. 1 was 0.4 mg for the inorganic fraction and <0.1 mg for the organic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was <0.1 mg for the inorganic fraction and 1.0 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)	<1.54	<2.06	<1.48	<2.01
Dry Reference Conc. (mg/Rm^3)*	<2.60	<3.53	<2.49	<3.45
Dry Adjusted Conc. (mg/Rm^3)**	<2.00	<2.77	<1.92	<2.70
Wet Reference Conc. (mg/Rm^3)*	<2.17	<2.92	<2.08	<2.85
Emission Rate (mg/s)	<37.9	<52.2	<36.3	<51.0

* 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)	5.16	1.74	<0.077	<0.076	0.27	0.46
Dry Reference Conc. (mg/Rm^3)*	8.76	2.93	<0.13	<0.13	0.46	0.78
Dry Adjusted Conc. (mg/Rm^3)**	6.86	2.30	<0.10	<0.10	0.36	0.61
Wet Reference Conc. (mg/Rm^3)*	7.22	2.46	<0.11	<0.11	0.38	0.66
Emission Rate (mg/s)	136	44.8	<2.03	<1.96	7.08	12.0
Dry Adjusted Conc. (ppm)**	4.60	1.54	0.13	0.12	0.51	0.88

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

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

7.6 Combustion Gas Emission Data

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

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from September 9, 2019 at 00:00 to September 13, 2019 at 23:00 for Boiler No. 1 and from September 9, 2019 at 00:00 to September 12, 2019 at 23:00 for Boiler No. 2.

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)	-	10.13	10.12
	Carbon Monoxide (mg/Rm^3, 4-hr)*	≤ 40	19.3	19.5
	Sulphur Dioxide (mg/Rm^3, 24-hr)*	≤ 35	0	0.1
	Nitrogen Oxides (mg/Rm^3, 24-hr)*	≤ 121	112	111
	Hydrogen Chloride (mg/Rm^3, 24-hr)*	≤ 9	3.6	5.5
	Total Hydrocarbons (mg/Rm^3, 1-hr)*	-	0	2
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 9, 2019 at the Quench Inlet and BH Outlet sampling locations. The results of the total hydrocarbons tests are summarized in Table 10 (Appendix 1 and Appendix 2). The average THC concentration for each location, along with the in-stack limit stated in the ECA, is summarized in the following table.

Combustion Gases Emission Parameter		Limit	Average Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Total Hydrocarbons (1-minute)*	-	0.5	0.9
	Total Hydrocarbons (10-minute)**	-	0.5	0.9
Quench Inlet	Total Hydrocarbons (1-minute)*	-	0.8	0.3
	Total Hydrocarbons (10-minute)**	50	0.8	0.3

* 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)	0.13	0.060
Dry Reference Conc. (µg/Rm^3)*	0.23	0.10
Dry Adjusted Conc. (µg/Rm^3)**	0.18	0.080
Wet Reference Conc. (µg/Rm^3)*	0.19	0.086
Emission Rate (mg/s)	0.0036	0.0016

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

The average lead emission data is summarized below:

Lead Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.41	0.43
Dry Reference Conc. (µg/Rm^3)*	0.70	0.73
Dry Adjusted Conc. (µg/Rm^3)**	0.54	0.57
Wet Reference Conc. (µg/Rm^3)*	0.58	0.61
Emission Rate (mg/s)	0.011	0.011

* 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	<0.073
Dry Reference Conc. (µg/Rm^3)*	0.37	<0.12
Dry Adjusted Conc. (µg/Rm^3)**	0.29	<0.097
Wet Reference Conc. (µg/Rm^3)*	0.31	<0.10
Emission Rate (mg/s)	0.0058	<0.0019

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

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

7.9 Semi-Volatile Organic Emission Data

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

7.9.1 Dioxins and Furans Emission Data

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

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

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

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

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

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

Dioxin Congener Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	0.040	0.25
Dry Reference Conc. (ng/Rm^3)*	0.067	0.43
Dry Adjusted Conc. (ng/Rm^3)**	0.052	0.34
Wet Reference Conc. (ng/Rm^3)*	0.056	0.36
Emission Rate (ng/s)	1.02	6.43

* 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)	<0.019	0.059
Dry Reference Conc. (ng/Rm^3)*	<0.033	0.10
Dry Adjusted Conc. (ng/Rm^3)**	<0.026	0.078
Wet Reference Conc. (ng/Rm^3)*	<0.027	0.084
Emission Rate (ng/s)	<0.50	1.50

* 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)	1.10	2.39
Dry Reference Conc. (pg TEQ/Rm^3)*	1.87	4.09
Dry Adjusted Conc. (pg TEQ/Rm^3)**	1.45	3.17
Wet Reference Conc. (pg TEQ/Rm^3)*	1.55	3.41
Emission Rate (ng TEQ/s)	0.028	0.061

* 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)*	<1.51	<3.24

* 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)	<404	<585
Dry Reference Conc. (ng/Rm^3)*	<688	<1001
Dry Adjusted Conc. (ng/Rm^3)**	<534	<776
Wet Reference Conc. (ng/Rm^3)*	<570	<834
Emission Rate (µg/s)	<10.4	<14.8

* 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)	<226	<233
Dry Reference Conc. (ng/Rm^3)*	<384	<398
Dry Adjusted Conc. (ng/Rm^3)**	<298	<309
Wet Reference Conc. (ng/Rm^3)*	<319	<332
Emission Rate (µg/s)	<5.82	<5.89

* 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)	<191	<164
Dry Reference Conc. (ng/Rm^3)*	<325	<280
Dry Adjusted Conc. (ng/Rm^3)**	<253	<217
Wet Reference Conc. (ng/Rm^3)*	<270	<233
Emission Rate (µg/s)	<4.92	<4.14

* 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.

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)	101	71.0	<43.0	<35.8	<430	<358
Dry Reference Conc. (µg/Rm^3)*	172	121	<73.0	<61.0	<730	<610
Dry Adjusted Conc. (µg/Rm^3)**	134	93.8	<56.7	<47.3	<567	<473
Wet Reference Conc. (µg/Rm^3)*	143	101	<60.8	<51.0	<608	<510
Emission Rate (mg/s)	2.57	1.80	<1.09	<0.91	<10.9	<9.09

* at 25°C and 1 atmosphere

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

Acrolein and formaldehyde were not detected in any of the test samples or in the blank samples in quantities greater than the reported detection limit. Acetaldehyde was detected in both blank samples in quantities greater than the detection limit and the test samples.

Note the detection limit for acrolein is four times higher than the detection limit from the June 2019 voluntary program. Since the detection limit was used to calculate emission data, the acrolein concentration and emission rate was also four times higher than previous testing.

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)	<241	<247
Dry Reference Conc. (µg/Rm^3)*	<413	<427
Dry Adjusted Conc. (µg/Rm^3)**	<318	<330
Wet Reference Conc. (µg/Rm^3)*	<341	<354
Emission Rate (mg/s)	<6.23	<6.23

* 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)*	<1388	<1219
Dry Adjusted Conc. (µg/Rm^3)**	<1076	<944
Emission Rate (mg/s)	<20.8	<18.0

* 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 2019 emission testing program was well below the applicable standard, guideline or upper risk threshold. The contaminant with the highest predicted concentration relative to the standard was nitrogen oxides (6% of the 1-hour standard with meteorological anomaly removal), all other contaminants were less than 5% of the relevant standard with meteorological anomaly removal.

9. FACILITY PROCESS DATA

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

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

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from September 9, 2019 at 00:00 to September 13, 2019 at 23:00 for Boiler No. 1 and from September 9, 2019 at 00:00 to September 12, 2019 at 23:00 for Boiler No. 2. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

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

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

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

Test Date	Total Power Output* (MWh/d)	Aux. Fuel Combusted** (m^3/d)		Avg. Combustion Zone Temp. (°C)		Steam (tonnes/d)		MSW Combusted*** (tonnes/d)		NO_X Reagent Inj. Rate (liters/d)		Carbon Inj. Rate (kg/d)		Lime Inj. Rate (kg/d)	
		Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
9 Sep 19	368	0	0	1250	1245	801	793	215	211	584	610	125	127	4147	5421
10 Sep 19	369	0	0	1253	1233	800	796	213	207	603	506	125	127	4629	5526
11 Sep 19	369	0	0	****	1221	****	797	****	206	****	461	****	126	****	5010
12 Sep 19	369	0	0	1260	1261	799	791	209	204	615	563	123	127	4155	4742
13 Sep 19	369	0	0	1193	****	792	****	203	****	696	****	126	****	4185	****
Average	369	0	0	1239	1240	798	794	210	207	624	535	125	127	4279	5175

* Gross turbine output
** Auxiliary fuel was not combusted during the conduct of reference test runs to demonstrate ECA compliance.
*** Calculated by crane scales.
**** No testing conducted.

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 791 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 July 2019 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 9, 2019 at the Quench Inlet and BH Outlet sampling locations. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was well below the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	369	-
Average Combustion Zone Temp. (°C)*	-	-	-	1239	-
Steam (tonnes/day)*	-	-	-	798	-
MSW Combusted (tonnes/day)*	-	-	-	210	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	624	-
Carbon Injection (kg/day)*	-	-	-	125	-
Lime Injection (kg/day)*	-	-	-	4279	-
Filterable Particulate (mg/Rm^3) (1)	0.78	0.46	<0.58	<0.61	9
PM_{10} with Condensable (mg/Rm^3) (1)	<1.29	<3.11	<1.60	<2.00	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<1.23	<2.99	<1.54	<1.92	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.076	<0.11	<0.12	<0.10	-
Ammonia (mg/Rm^3) (1)	0.33	0.40	0.34	0.36	-
Cadmium (µg/Rm^3) (1)	0.42	0.058	0.058	0.18	7
Lead (µg/Rm^3) (1)	0.41	0.41	0.82	0.54	50
Mercury (µg/Rm^3) (1)	0.44	0.25	0.19	0.29	15
Antimony (µg/Rm^3) (1)	0.048	0.063	<0.039	<0.050	-
Arsenic (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Barium (µg/Rm^3) (1)	1.81	1.41	1.75	1.66	-
Beryllium (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Chromium (µg/Rm^3) (1)	0.66	0.84	0.60	0.70	-
Cobalt (µg/Rm^3) (1)	0.096	<0.040	<0.039	<0.058	-
Copper (µg/Rm^3) (1)	1.18	0.69	0.55	0.81	-
Molybdenum (µg/Rm^3) (1)	1.87	1.89	1.90	1.89	-
Nickel (µg/Rm^3) (1)	1.05	1.15	0.93	1.04	-
Selenium (µg/Rm^3) (1)	<0.20	<0.20	<0.19	<0.20	-
Silver (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Thallium (µg/Rm^3) (1)	<0.040	<0.040	<0.039	<0.040	-
Vanadium (µg/Rm^3) (1)	<0.020	<0.020	<0.019	<0.020	-
Zinc (µg/Rm^3) (1)	5.67	7.89	5.44	6.33	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<1.53	<1.33	<1.67	<1.51	60
Total Chlorobenzenes (ng/Rm^3) (1)	<465	<610	<527	<534	-
Total Chlorophenols (ng/Rm^3) (1)	<367	<278	<251	<298	-
Total PAHs (ng/Rm^3) (1)	<358	<166	<233	<253	-
VOCs (µg/Rm^3) (1)	<325	<291	<337	<318	-
Aldehydes (µg/Rm^3) (1)	<753	<662	<855	<758	-
Total VOCs (µg/Rm^3) (1) (4)	<1078	<953	<1192	<1076	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.9	0.6	0.8	0.8	50

* based on process data provided by Covanta

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

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

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

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

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

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	369	-
Average Combustion Zone Temp. (°C)*	-	-	-	1240	-
Steam (tonnes/day)*	-	-	-	794	-
MSW Combusted (tonnes/day)*	-	-	-	207	-
NO_X Reagent Injection Rate (liters/day)*	-	-	-	535	-
Carbon Injection (kg/day)*	-	-	-	127	-
Lime Injection (kg/day)*	-	-	-	5175	-
Filterable Particulate (mg/Rm^3) (1)	0.89	<0.36	<0.37	<0.54	9
PM_{10} with Condensable (mg/Rm^3) (1)	<2.06	<3.55	<2.70	<2.77	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<1.99	<3.49	<2.63	<2.70	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.074	<0.11	<0.12	<0.10	-
Ammonia (mg/Rm^3) (1)	0.67	0.60	0.57	0.61	-
Cadmium (µg/Rm^3) (1)	0.15	0.054	0.040	0.080	7
Lead (µg/Rm^3) (1)	0.70	0.52	0.50	0.57	50
Mercury (µg/Rm^3) (1)	0.12	<0.087	<0.079	<0.097	15
Antimony (µg/Rm^3) (1)	0.075	<0.045	<0.047	<0.055	-
Arsenic (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Barium (µg/Rm^3) (1)	1.85	1.63	1.45	1.64	-
Beryllium (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Chromium (µg/Rm^3) (1)	0.72	0.61	2.08	1.14	-
Cobalt (µg/Rm^3) (1)	0.042	<0.045	<0.047	<0.044	-
Copper (µg/Rm^3) (1)	0.66	0.47	0.51	0.55	-
Molybdenum (µg/Rm^3) (1)	1.97	2.08	1.98	2.01	-
Nickel (µg/Rm^3) (1)	0.88	0.78	1.01	0.89	-
Selenium (µg/Rm^3) (1)	<0.21	<0.22	<0.23	<0.22	-
Silver (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Thallium (µg/Rm^3) (1)	<0.042	<0.045	<0.047	<0.045	-
Vanadium (µg/Rm^3) (1)	<0.021	<0.022	<0.023	<0.022	-
Zinc (µg/Rm^3) (1)	6.57	4.84	6.99	6.13	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<3.92	<3.74	<2.06	<3.24	60
Total Chlorobenzenes (ng/Rm^3) (1)	<901	<751	<677	<776	-
Total Chlorophenols (ng/Rm^3) (1)	<289	<357	<281	<309	-
Total PAHs (ng/Rm^3) (1)	<239	<185	<227	<217	-
VOCs (µg/Rm^3) (1)	<334	<239	<416	<330	-
Aldehydes (µg/Rm^3) (1)	<654	<581	<609	<614	-
Total VOCs (µg/Rm^3) (1) (4)	<988	<820	<1025	<944	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.2	0.2	0.4	0.3	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)	7.0	11.2	19.3	40
	Hydrogen Chloride (mg/Rm^3) (2)	2.7	3.0	3.6	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	111	112	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0	0	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	7.3	12.1	19.5	40
	Hydrogen Chloride (mg/Rm^3) (2)	4.6	5.1	5.5	9
	Nitrogen Oxides (mg/Rm^3) (2)	109	110	111	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	0.01	0.1	35

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

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

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APPENDIX 1

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

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

Particulate and Metals Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 9, 2019	11:12	14:28	180
2	September 9, 2019	15:17	18:28	180
3	September 10, 2019	9:35	12:40	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 10, 2019	8:10	10:12	120
2	September 10, 2019	11:41	13:48	120
3	September 10, 2019	14:41	16:44	120

Acid Gases Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 9, 2019	8:11	10:28	120
2	September 9, 2019	11:19	12:19	60
3	September 9, 2019	13:07	14:07	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 12, 2019	8:14	12:23	240
2	September 12, 2019	13:07	17:46	240
3	September 13, 2019	8:25	12:40	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 12, 2019	8:13	9:13	60
2	September 12, 2019	9:48	10:48	60
3	September 12, 2019	10:51	11:51	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	September 12, 2019	12:06	12:26	20
	2	September 12, 2019	12:30	12:50	20
	3	September 12, 2019	12:54	13:14	20
	4	September 12, 2019	13:19	13:39	20
2	1	September 12, 2019	13:43	14:03	20
	2	September 12, 2019	14:10	14:30	20
	3	September 12, 2019	14:34	14:54	20
	4	September 12, 2019	14:59	15:19	20
3	1	September 12, 2019	15:22	15:42	20
	2	September 12, 2019	15:46	16:06	20
	3	September 12, 2019	16:10	16:30	20
	4	September 12, 2019	16:34	16:54	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	September 9, 2019	14:16	15:16	60
BH Outlet	2	September 9, 2019	15:27	16:27	60
BH Outlet	3	September 9, 2019	16:35	17:35	60
Quench Inlet	1	September 9, 2019	8:33	9:33	60
Quench Inlet	2	September 9, 2019	9:43	10:43	60
Quench Inlet	3	September 9, 2019	10:50	11:50	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	1.006	6.51	3.905	103.2
2	0.851	1.006	6.51	3.864	104.2
3	0.851	1.006	6.51	4.030	102.9

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.848	1.018	4.51	1.209	103.9
2	0.848	1.018	4.51	1.208	106.2
3	0.848	1.018	4.51	1.209	105.2

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.849	1.018	6.37	2.221	98.0
2	0.849	1.018	6.37	1.194	101.1
3	0.849	1.018	6.37	1.123	99.3

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.849	1.006	6.37	4.600	99.6
2	0.849	1.006	6.37	4.708	100.5
3	0.851	1.006	6.48	5.003	100.2

* Dry at 25°C and 1 atmosphere

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

Particulate and Metals Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	137	17.3	17.8	-2.19	99.5	11.2	8.27
2	139	18.4	17.8	-2.19	99.4	11.2	8.08
3	138	16.8	18.4	-2.19	99.2	11.1	8.26
Average	138	17.5	18.0	-2.19	99.4	11.2	8.20

Particle Size Distribution Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	139	16.0	16.5	-2.19	99.3	11.1	8.28
2	138	16.0	16.5	-2.19	99.1	11.3	8.02
3	140	16.8	16.9	-2.22	98.9	11.1	8.14
Average	139	16.3	16.6	-2.20	99.1	11.2	8.15

Acid Gases Trains **

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	16.5	16.7	-2.17	99.6	11.2	8.13
2	141	18.3	17.8	-2.17	99.6	11.0	8.30
3	139	17.3	16.8	-2.17	99.5	11.3	8.18
Average	140	17.4	17.1	-2.17	99.5	11.2	8.20

Semi-Volatile Organics Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	16.9	17.1	-2.12	99.3	11.2	8.16
2	139	17.7	17.5	-2.12	99.3	11.2	8.07
3	138	16.9	17.7	-2.10	99.5	11.1	8.26
Average	139	17.2	17.4	-2.11	99.4	11.2	8.16

* 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	26.3	15.5	19.8	18.8
2	26.3	15.2	19.7	18.7
3	27.2	16.1	20.5	19.3
Average	26.6	15.6	20.0	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	24.4	14.5	18.5	17.3
2	24.5	14.6	19.0	17.4
3	25.1	14.7	18.9	17.7
Average	24.7	14.6	18.8	17.5

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	14.6	18.9	17.5
2	26.3	15.2	19.4	18.6
3	24.8	14.6	18.7	17.6
Average	25.3	14.8	19.0	17.9

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.3	14.9	19.2	17.9
2	25.9	15.1	19.6	18.3
3	26.2	15.5	19.8	18.7
Average	25.8	15.2	19.5	18.3

* At 25°C and 1 atmosphere

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

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

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

Test No.	Particulate Collected Probe Rinse mg	Main Filter mg	Total mg	Dry Gas Volume Sampled Rm^3*	Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Particulate Emission Rate mg/s
1	2.9	1.0	3.9	3.905	0.59	1.00	0.78	0.83	15.5
2	1.8	0.5	2.3	3.864	0.35	0.60	0.46	0.49	9.06
3	2.9	<0.1	3.0	4.030	<0.44	<0.75	<0.58	<0.62	<12.0
Average					<0.46	<0.78	<0.61	<0.64	<12.2
Blank	<0.1	0.1							

* 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	<0.2	1.209	<0.098	<0.17	<0.13	<0.14	<2.40
2	<0.2	1.208	<0.099	<0.17	<0.13	<0.14	<2.42
3	<0.2	1.209	<0.097	<0.17	<0.13	<0.14	<2.43
Average			<0.098	<0.17	<0.13	<0.14	<2.42
Blank	<0.2						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.3	1.209	<0.15	<0.25	<0.19	<0.21	<3.60
2	<0.4	1.208	<0.20	<0.33	<0.25	<0.28	<4.83
3	<0.3	1.209	<0.15	<0.25	<0.19	<0.21	<3.65
Average			<0.16	<0.28	<0.21	<0.23	<4.03
Blank	<0.3						

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

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

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

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	0.6	1.209	0.29	0.50	0.39	0.42	7.20
2	3.0	1.208	1.48	2.48	1.91	2.08	36.3
3	1.7	1.209	0.82	1.41	1.09	1.17	20.7
Average			0.87	1.46	1.13	1.22	21.4
Blank	0.4						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	1.1	1.209	0.54	0.91	0.71	0.76	13.2
2	1.5	1.208	0.74	1.24	0.95	1.04	18.1
3	0.5	1.209	0.24	0.41	0.32	0.34	6.08
Average			0.51	0.86	0.66	0.72	12.5
Blank	<0.1						

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

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

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled 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	21.0	2.221	5.57	9.46	7.40	7.80	147
2	10.8	1.194	5.33	9.05	7.08	7.46	140
3	8.73	1.123	4.58	7.77	6.09	6.41	120
Average			5.16	8.76	6.86	7.22	136
Blank	<1.03						

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	<0.217	2.221	<0.058	<0.098	<0.076	<0.081	<1.51
2	<0.175	1.194	<0.086	<0.15	<0.11	<0.12	<2.27
3	<0.168	1.123	<0.088	<0.15	<0.12	<0.12	<2.32
Average			<0.077	<0.13	<0.10	<0.11	<2.03
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	0.942	2.221	0.25	0.42	0.33	0.35	6.57
2	0.613	1.194	0.30	0.51	0.40	0.42	7.96
3	0.486	1.123	0.26	0.43	0.34	0.36	6.71
Average			0.27	0.46	0.36	0.38	7.08
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 9 to September 13, 2019

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.60	8.29	10.13
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	6	11	24
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	7.0	11.2	19.3
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0	0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0	0
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	96	111	127
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	110	111	112
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	2	3	7
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	2.7	3.0	3.6
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0	0
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	9

Data measured by the ORTECH CEMS on September 9, 2019

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

* Reference conditions, dry basis adjusted to 11% oxygen

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

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.24	<0.1	0.24
Arsenic	<1	<0.2	<0.20
Barium	6.39	2.65	9.04
Beryllium	<0.2	<0.1	<0.20
Cadmium	2.01	0.094	2.10
Chromium	2.35	0.93	3.28
Cobalt	0.27	0.21	0.48
Copper	2.14	3.76	5.90
Lead	1.52	0.53	2.05
Mercury *	<0.015	2.19	2.19
Molybdenum	9.22	0.10	9.32
Nickel	3.23	2.02	5.25
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	15.3	13.0	28.3
Total			<70.1

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.22	0.10	0.32
Arsenic	<1	<0.2	<0.20
Barium	5.52	1.52	7.04
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.29	<0.05	0.29
Chromium	3.36	0.83	4.19
Cobalt	<0.2	<0.1	<0.20
Copper	1.80	1.66	3.46
Lead	1.32	0.72	2.04
Mercury *	<0.015	1.27	1.27
Molybdenum	9.46	<0.1	9.46
Nickel	3.55	2.21	5.76
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	26.9	12.6	39.5
Total			<75.4

* 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	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	7.65	1.32	8.97
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.30	<0.05	0.30
Chromium	2.32	0.78	3.10
Cobalt	<0.2	<0.1	<0.20
Copper	1.69	1.11	2.80
Lead	1.12	3.07	4.19
Mercury *	<0.015	0.95	0.95
Molybdenum	9.74	<0.1	9.74
Nickel	3.56	1.22	4.78
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	18.8	9.09	27.9
Total			<65.0

* Includes the permanganate impingers

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

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

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.24	0.036	0.061	0.048	0.050	0.00094
Arsenic	<0.20	<0.030	<0.051	<0.040	<0.042	<0.00079
Barium	9.04	1.36	2.31	1.81	1.91	0.036
Beryllium	<0.20	<0.030	<0.051	<0.040	<0.042	<0.00079
Cadmium	2.10	0.32	0.54	0.42	0.44	0.0084
Chromium	3.28	0.50	0.84	0.66	0.69	0.013
Cobalt	0.48	0.072	0.12	0.096	0.10	0.0019
Copper	5.90	0.89	1.51	1.18	1.25	0.023
Lead	2.05	0.31	0.52	0.41	0.43	0.0081
Mercury	2.19	0.33	0.56	0.44	0.46	0.0087
Molybdenum	9.32	1.41	2.39	1.87	1.97	0.037
Nickel	5.25	0.79	1.34	1.05	1.11	0.021
Selenium	<1.00	<0.15	<0.26	<0.20	<0.21	<0.0040
Silver	<0.20	<0.030	<0.051	<0.040	<0.042	<0.00079
Thallium	<0.20	<0.030	<0.051	<0.040	<0.042	<0.00079
Vanadium	<0.10	<0.015	<0.026	<0.020	<0.021	<0.00040
Zinc	28.3	4.27	7.25	5.67	5.98	0.11
Total	<70.1	<10.6	<17.9	<14.0	<14.8	<0.28

Dry Gas Volume Sampled (Rm³*) :	3.905
Actual Flowrate (m³/s) :	26.3
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.8
Wet Reference Flowrate (Rm³/s*) :	18.8

* At 25°C and 1 atmosphere

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

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

Metal	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Antimony	0.32	0.047	0.082	0.063	0.066	0.0012
Arsenic	<0.20	<0.030	<0.052	<0.040	<0.042	<0.00079
Barium	7.04	1.05	1.82	1.41	1.48	0.028
Beryllium	<0.20	<0.030	<0.052	<0.040	<0.042	<0.00079
Cadmium	0.29	0.043	0.075	0.058	0.061	0.0011
Chromium	4.19	0.63	1.08	0.84	0.88	0.016
Cobalt	<0.20	<0.030	<0.052	<0.040	<0.042	<0.00079
Copper	3.46	0.52	0.90	0.69	0.73	0.014
Lead	2.04	0.30	0.53	0.41	0.43	0.0080
Mercury	1.27	0.19	0.33	0.25	0.27	0.0050
Molybdenum	9.46	1.41	2.45	1.89	1.99	0.037
Nickel	5.76	0.86	1.49	1.15	1.21	0.023
Selenium	<1.00	<0.15	<0.26	<0.20	<0.21	<0.0039
Silver	<0.20	<0.030	<0.052	<0.040	<0.042	<0.00079
Thallium	<0.20	<0.030	<0.052	<0.040	<0.042	<0.00079
Vanadium	<0.10	<0.015	<0.026	<0.020	<0.021	<0.00039
Zinc	39.5	5.91	10.2	7.89	8.31	0.16
Total	<75.4	<11.3	<19.5	<15.1	<15.9	<0.30

Dry Gas Volume Sampled (Rm^3*) :	3.864
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.2
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 16
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 3

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Arsenic	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Barium	8.97	1.32	2.23	1.75	1.86	0.036
Beryllium	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Cadmium	0.30	0.044	0.074	0.058	0.062	0.0012
Chromium	3.10	0.45	0.77	0.60	0.64	0.012
Cobalt	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Copper	2.80	0.41	0.69	0.55	0.58	0.011
Lead	4.19	0.62	1.04	0.82	0.87	0.017
Mercury	0.95	0.14	0.24	0.19	0.20	0.0038
Molybdenum	9.74	1.43	2.42	1.90	2.02	0.039
Nickel	4.78	0.70	1.19	0.93	0.99	0.019
Selenium	<1.00	<0.15	<0.25	<0.19	<0.21	<0.0040
Silver	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Thallium	<0.20	<0.029	<0.050	<0.039	<0.041	<0.00080
Vanadium	<0.10	<0.015	<0.025	<0.019	<0.021	<0.00040
Zinc	27.9	4.10	6.92	5.44	5.77	0.11
Total	<65.0	<9.55	<16.1	<12.7	<13.5	<0.26

Dry Gas Volume Sampled (Rm³*) :	4.030
Actual Flowrate (m³/s) :	27.2
Dry Reference Flowrate (Rm³/s*) :	16.1
Dry Adjusted Flowrate (Rm³/s**) :	20.5
Wet Reference Flowrate (Rm³/s*) :	19.3

* 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	µg/m³	µg/m³	µg/m³	µg/m³	%
Antimony	0.036	0.047	<0.029	<0.037	24.2
Arsenic	<0.030	<0.030	<0.029	<0.030	1.4
Barium	1.36	1.05	1.32	1.24	13.5
Beryllium	<0.030	<0.030	<0.029	<0.030	1.4
Cadmium	0.32	0.043	0.044	0.13	117
Chromium	0.50	0.63	0.45	0.53	17.1
Cobalt	0.072	<0.030	<0.029	<0.044	56.1
Copper	0.89	0.52	0.41	0.61	41.5
Lead	0.31	0.30	0.62	0.41	43.4
Mercury	0.33	0.19	0.14	0.22	44.9
Molybdenum	1.41	1.41	1.43	1.42	0.8
Nickel	0.79	0.86	0.70	0.79	10.2
Selenium	<0.15	<0.15	<0.15	<0.15	1.4
Silver	<0.030	<0.030	<0.029	<0.030	1.4
Thallium	<0.030	<0.030	<0.029	<0.030	1.4
Vanadium	<0.015	<0.015	<0.015	<0.015	1.4
Zinc	4.27	5.91	4.10	4.76	21.0
Total	<10.6	<11.3	<9.55	<10.5	8.3

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

Metal	Dry Reference Concentration Test No. 1 µg/Rm³*	 Test No. 2 µg/Rm³*	 Test No. 3 µg/Rm³*	 Average µg/Rm³*	Coefficient of Variation %
Antimony	0.061	0.082	<0.050	<0.064	25.5
Arsenic	<0.051	<0.052	<0.050	<0.051	2.2
Barium	2.31	1.82	2.23	2.12	12.4
Beryllium	<0.051	<0.052	<0.050	<0.051	2.2
Cadmium	0.54	0.075	0.074	0.23	117
Chromium	0.84	1.08	0.77	0.90	18.4
Cobalt	0.12	<0.052	<0.050	<0.075	55.7
Copper	1.51	0.90	0.69	1.03	41.1
Lead	0.52	0.53	1.04	0.70	42.5
Mercury	0.56	0.33	0.24	0.37	44.6
Molybdenum	2.39	2.45	2.42	2.42	1.3
Nickel	1.34	1.49	1.19	1.34	11.4
Selenium	<0.26	<0.26	<0.25	<0.25	2.2
Silver	<0.051	<0.052	<0.050	<0.051	2.2
Thallium	<0.051	<0.052	<0.050	<0.051	2.2
Vanadium	<0.026	<0.026	<0.025	<0.025	2.2
Zinc	7.25	10.2	6.92	8.13	22.4
Total	<17.9	<19.5	<16.1	<17.9	9.5

* 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	0.048	0.063	<0.039	<0.050	24.5
Arsenic	<0.040	<0.040	<0.039	<0.040	1.5
Barium	1.81	1.41	1.75	1.66	13.2
Beryllium	<0.040	<0.040	<0.039	<0.040	1.5
Cadmium	0.42	0.058	0.058	0.18	117
Chromium	0.66	0.84	0.60	0.70	17.4
Cobalt	0.096	<0.040	<0.039	<0.058	56.0
Copper	1.18	0.69	0.55	0.81	41.4
Lead	0.41	0.41	0.82	0.54	43.2
Mercury	0.44	0.25	0.19	0.29	44.8
Molybdenum	1.87	1.89	1.90	1.89	0.8
Nickel	1.05	1.15	0.93	1.04	10.5
Selenium	<0.20	<0.20	<0.19	<0.20	1.5
Silver	<0.040	<0.040	<0.039	<0.040	1.5
Thallium	<0.040	<0.040	<0.039	<0.040	1.5
Vanadium	<0.020	<0.020	<0.019	<0.020	1.5
Zinc	5.67	7.89	5.44	6.33	21.4
Total	<14.0	<15.1	<12.7	<13.9	8.6

** 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.050	0.066	<0.041	<0.053	24.2
Arsenic	<0.042	<0.042	<0.041	<0.042	1.0
Barium	1.91	1.48	1.86	1.75	13.3
Beryllium	<0.042	<0.042	<0.041	<0.042	1.0
Cadmium	0.44	0.061	0.062	0.19	117
Chromium	0.69	0.88	0.64	0.74	17.1
Cobalt	0.10	<0.042	<0.041	<0.062	55.7
Copper	1.25	0.73	0.58	0.85	41.1
Lead	0.43	0.43	0.87	0.58	43.7
Mercury	0.46	0.27	0.20	0.31	44.5
Molybdenum	1.97	1.99	2.02	1.99	1.2
Nickel	1.11	1.21	0.99	1.10	10.1
Selenium	<0.21	<0.21	<0.21	<0.21	1.0
Silver	<0.042	<0.042	<0.041	<0.042	1.0
Thallium	<0.042	<0.042	<0.041	<0.042	1.0
Vanadium	<0.021	<0.021	<0.021	<0.021	1.0
Zinc	5.98	8.31	5.77	6.69	21.1
Total	<14.8	<15.9	<13.5	<14.7	8.2

* 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	0.00094	0.0012	<0.00080	<0.00099	22.8
Arsenic	<0.00079	<0.00079	<0.00080	<0.00079	0.8
Barium	0.036	0.028	0.036	0.033	14.2
Beryllium	<0.00079	<0.00079	<0.00080	<0.00079	0.8
Cadmium	0.0084	0.0011	0.0012	0.0036	116
Chromium	0.013	0.016	0.012	0.014	15.8
Cobalt	0.0019	<0.00079	<0.00080	<0.0012	55.1
Copper	0.023	0.014	0.011	0.016	40.3
Lead	0.0081	0.0080	0.017	0.011	45.6
Mercury	0.0087	0.0050	0.0038	0.0058	43.7
Molybdenum	0.037	0.037	0.039	0.038	2.8
Nickel	0.021	0.023	0.019	0.021	8.5
Selenium	<0.0040	<0.0039	<0.0040	<0.0040	0.8
Silver	<0.00079	<0.00079	<0.00080	<0.00079	0.8
Thallium	<0.00079	<0.00079	<0.00080	<0.00079	0.8
Vanadium	<0.00040	<0.00039	<0.00040	<0.00040	0.8
Zinc	0.11	0.16	0.11	0.13	19.9
Total	<0.28	<0.30	<0.26	<0.28	6.6

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

Metal	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	<0.037	<0.064	<0.050	<0.053	<0.00099
Arsenic	<0.030	<0.051	<0.040	<0.042	<0.00079
Barium	1.24	2.12	1.66	1.75	0.033
Beryllium	<0.030	<0.051	<0.040	<0.042	<0.00079
Cadmium	0.13	0.23	0.18	0.19	0.0036
Chromium	0.53	0.90	0.70	0.74	0.014
Cobalt	<0.044	<0.075	<0.058	<0.062	<0.0012
Copper	0.61	1.03	0.81	0.85	0.016
Lead	0.41	0.70	0.54	0.58	0.011
Mercury	0.22	0.37	0.29	0.31	0.0058
Molybdenum	1.42	2.42	1.89	1.99	0.038
Nickel	0.79	1.34	1.04	1.10	0.021
Selenium	<0.15	<0.25	<0.20	<0.21	<0.0040
Silver	<0.030	<0.051	<0.040	<0.042	<0.00079
Thallium	<0.030	<0.051	<0.040	<0.042	<0.00079
Vanadium	<0.015	<0.025	<0.020	<0.021	<0.00040
Zinc	4.76	8.13	6.33	6.69	0.13
Total	<10.5	<17.9	<13.9	<14.7	<0.28

* 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	<0.2	<0.20
Barium	5.46	0.77	6.23
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	1.53	0.31	1.84
Cobalt	<0.2	<0.1	<0.20
Copper	<1	0.58	0.58
Lead	0.51	1.84	2.35
Mercury *	<0.015	<0.15	<0.15
Molybdenum	9.48	<0.1	9.48
Nickel	1.84	0.32	2.16
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			<31.2

* Includes the permanganate impingers.

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

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

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	31.0	0.0040	0.0067	0.0052	0.0056	0.10
Pentachlorodibenzo-p-dioxins	25.5	0.0033	0.0055	0.0043	0.0046	0.083
Hexachlorodibenzo-p-dioxins	91.7	0.012	0.020	0.015	0.017	0.30
Heptachlorodibenzo-p-dioxins	96.6	0.012	0.021	0.016	0.017	0.31
Octachlorodibenzo-p-dioxin	89.4	0.011	0.019	0.015	0.016	0.29
Total	334	0.043	0.073	0.056	0.060	1.08

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	145	0.019	0.032	0.024	0.026	0.47
Pentachlorodibenzofurans	43.5	0.0056	0.0095	0.0073	0.0079	0.14
Hexachlorodibenzofurans	21.9	0.0028	0.0048	0.0037	0.0040	0.071
Heptachlorodibenzofurans	27.9	0.0036	0.0061	0.0047	0.0050	0.090
Octachlorodibenzofuran	27.5	0.0035	0.0060	0.0046	0.0050	0.089
Total	266	0.034	0.058	0.045	0.048	0.86

Dry Gas Volume Sampled (Rm³*) :	4.600
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	25.7	0.0032	0.0055	0.0042	0.0045	0.082
Pentachlorodibenzo-p-dioxins	22.9	0.0028	0.0049	0.0037	0.0040	0.073
Hexachlorodibenzo-p-dioxins	86.1	0.011	0.018	0.014	0.015	0.28
Heptachlorodibenzo-p-dioxins	96.2	0.012	0.020	0.016	0.017	0.31
Octachlorodibenzo-p-dioxin	77.6	0.0096	0.016	0.013	0.014	0.25
Total	309	0.038	0.066	0.050	0.054	0.99

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	41.5	0.0051	0.0088	0.0068	0.0073	0.13
Pentachlorodibenzofurans	19.2	0.0024	0.0041	0.0031	0.0034	0.062
Hexachlorodibenzofurans	20.3	0.0025	0.0043	0.0033	0.0036	0.065
Heptachlorodibenzofurans	20.8	0.0026	0.0044	0.0034	0.0036	0.067
Octachlorodibenzofuran	<10	<0.0012	<0.0021	<0.0016	<0.0018	<0.032
Total	<112	<0.014	<0.024	<0.018	<0.020	<0.36

Dry Gas Volume Sampled (Rm³*) :	4.708
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* At 25°C and 1 atmosphere

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

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

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

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	23.8	0.0028	0.0048	0.0037	0.0039	0.074
Pentachlorodibenzo-p-dioxins	28.4	0.0034	0.0057	0.0044	0.0047	0.088
Hexachlorodibenzo-p-dioxins	92.5	0.011	0.018	0.014	0.015	0.29
Heptachlorodibenzo-p-dioxins	97.0	0.011	0.019	0.015	0.016	0.30
Octachlorodibenzo-p-dioxin	79.0	0.0093	0.016	0.012	0.013	0.24
Total	321	0.038	0.064	0.050	0.053	0.99

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzofurans	<3.5	<0.00041	<0.00070	<0.00055	<0.00058	<0.011
Pentachlorodibenzofurans	22.4	0.0026	0.0045	0.0035	0.0037	0.069
Hexachlorodibenzofurans	27.2	0.0032	0.0054	0.0043	0.0045	0.084
Heptachlorodibenzofurans	20.7	0.0024	0.0041	0.0032	0.0034	0.064
Octachlorodibenzofuran	12.0	0.0014	0.0024	0.0019	0.0020	0.037
Total	<85.8	<0.010	<0.017	<0.013	<0.014	<0.27

Dry Gas Volume Sampled (Rm^3*) :	5.003
Actual Flowrate (m^3/s) :	26.2
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
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 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0040	0.0032	0.0028	0.0033	17.8
Pentachlorodibenzo-p-dioxins	0.0033	0.0028	0.0034	0.0032	8.8
Hexachlorodibenzo-p-dioxins	0.012	0.011	0.011	0.011	5.0
Heptachlorodibenzo-p-dioxins	0.012	0.012	0.011	0.012	3.8
Octachlorodibenzo-p-dioxin	0.011	0.0096	0.0093	0.010	11.3
Total	0.043	0.038	0.038	0.040	6.9

Furans

Congener Group	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Tetrachlorodibenzofurans	0.019	0.0051	<0.00041	<0.0080	117
Pentachlorodibenzofurans	0.0056	0.0024	0.0026	0.0035	50.1
Hexachlorodibenzofurans	0.0028	0.0025	0.0032	0.0028	12.4
Heptachlorodibenzofurans	0.0036	0.0026	0.0024	0.0029	21.5
Octachlorodibenzofuran	0.0035	<0.0012	0.0014	<0.0021	61.6
Total	0.034	<0.014	<0.010	<0.019	66.5

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

Dioxins

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0067	0.0055	0.0048	0.0057	17.8
Pentachlorodibenzo-p-dioxins	0.0055	0.0049	0.0057	0.0054	8.1
Hexachlorodibenzo-p-dioxins	0.020	0.018	0.018	0.019	4.8
Heptachlorodibenzo-p-dioxins	0.021	0.020	0.019	0.020	4.0
Octachlorodibenzo-p-dioxin	0.019	0.016	0.016	0.017	11.2
Total	0.073	0.066	0.064	0.067	6.8

Furans

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.032	0.0088	<0.00070	<0.014	117
Pentachlorodibenzofurans	0.0095	0.0041	0.0045	0.0060	49.9
Hexachlorodibenzofurans	0.0048	0.0043	0.0054	0.0048	11.7
Heptachlorodibenzofurans	0.0061	0.0044	0.0041	0.0049	21.4
Octachlorodibenzofuran	0.0060	<0.0021	0.0024	<0.0035	61.4
Total	0.058	<0.024	<0.017	<0.033	66.3

* 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	Test No. 1 ng/Rm³*	Dry Adjusted Concentration Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0052	0.0042	0.0037	0.0044	17.5
Pentachlorodibenzo-p-dioxins	0.0043	0.0037	0.0044	0.0042	8.8
Hexachlorodibenzo-p-dioxins	0.015	0.014	0.014	0.015	4.9
Heptachlorodibenzo-p-dioxins	0.016	0.016	0.015	0.016	3.6
Octachlorodibenzo-p-dioxin	0.015	0.013	0.012	0.013	11.1
Total	0.056	0.050	0.050	0.052	6.7

Furans

Congener Group	Test No. 1 ng/Rm³*	Dry Adjusted Concentration Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.024	0.0068	<0.00055	<0.011	117
Pentachlorodibenzofurans	0.0073	0.0031	0.0035	0.0047	49.9
Hexachlorodibenzofurans	0.0037	0.0033	0.0043	0.0038	12.5
Heptachlorodibenzofurans	0.0047	0.0034	0.0032	0.0038	21.3
Octachlorodibenzofuran	0.0046	<0.0016	0.0019	<0.0027	61.4
Total	0.045	<0.018	<0.013	<0.026	66.3

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

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

Dioxins

Congener Group	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.0056	0.0045	0.0039	0.0047	18.1
Pentachlorodibenzo-p-dioxins	0.0046	0.0040	0.0047	0.0044	8.5
Hexachlorodibenzo-p-dioxins	0.017	0.015	0.015	0.016	5.2
Heptachlorodibenzo-p-dioxins	0.017	0.017	0.016	0.017	4.2
Octachlorodibenzo-p-dioxin	0.016	0.014	0.013	0.014	11.6
Total	0.060	0.054	0.053	0.056	7.2

Furans

Congener Group	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.026	0.0073	<0.00058	<0.011	117
Pentachlorodibenzofurans	0.0079	0.0034	0.0037	0.0050	50.3
Hexachlorodibenzofurans	0.0040	0.0036	0.0045	0.0040	11.9
Heptachlorodibenzofurans	0.0050	0.0036	0.0034	0.0040	21.8
Octachlorodibenzofuran	0.0050	<0.0018	0.0020	<0.0029	61.8
Total	0.048	<0.020	<0.014	<0.027	66.7

* 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	0.10	0.082	0.074	0.086	15.9
Pentachlorodibenzo-p-dioxins	0.083	0.073	0.088	0.081	9.0
Hexachlorodibenzo-p-dioxins	0.30	0.28	0.29	0.29	3.6
Heptachlorodibenzo-p-dioxins	0.31	0.31	0.30	0.31	2.0
Octachlorodibenzo-p-dioxin	0.29	0.25	0.24	0.26	9.5
Total	1.08	0.99	0.99	1.02	5.1

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	0.47	0.13	<0.011	<0.20	116
Pentachlorodibenzofurans	0.14	0.062	0.069	0.091	48.2
Hexachlorodibenzofurans	0.071	0.065	0.084	0.073	13.4
Heptachlorodibenzofurans	0.090	0.067	0.064	0.074	19.6
Octachlorodibenzofuran	0.089	<0.032	0.037	<0.053	59.8
Total	0.86	<0.36	<0.27	<0.50	64.7

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

Dioxins

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	0.0033	0.0057	0.0044	0.0047	0.086
Pentachlorodibenzo-p-dioxins	0.0032	0.0054	0.0042	0.0044	0.081
Hexachlorodibenzo-p-dioxins	0.011	0.019	0.015	0.016	0.29
Heptachlorodibenzo-p-dioxins	0.012	0.020	0.016	0.017	0.31
Octachlorodibenzo-p-dioxin	0.010	0.017	0.013	0.014	0.26
Total	0.040	0.067	0.052	0.056	1.02

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	<0.0080	<0.014	<0.011	<0.011	<0.20
Pentachlorodibenzofurans	0.0035	0.0060	0.0047	0.0050	0.091
Hexachlorodibenzofurans	0.0028	0.0048	0.0038	0.0040	0.073
Heptachlorodibenzofurans	0.0029	0.0049	0.0038	0.0040	0.074
Octachlorodibenzofuran	<0.0021	<0.0035	<0.0027	<0.0029	<0.053
Total	<0.019	<0.033	<0.026	<0.027	<0.50

* 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	<0.85	<1.2
Pentachlorodibenzo-p-dioxins	<0.49	<0.81
Hexachlorodibenzo-p-dioxins	<0.89	<1.6
Heptachlorodibenzo-p-dioxins	<0.96	2.84
Octachlorodibenzo-p-dioxin	<14	<4.2
Total	<17.2	<10.7

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<0.64	<0.81
Pentachlorodibenzofurans	<0.42	<0.66
Hexachlorodibenzofurans	3.26	<1.2
Heptachlorodibenzofurans	<0.69	<0.76
Octachlorodibenzofuran	2.93	<1.8
Total	<7.94	<5.23

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

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

Specific Isomer	Total Collected pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.2	<0.15	<0.26	<0.20	<0.22	<0.0039
12378-pentachlorodibenzo-p-dioxin	2.24	0.29	0.49	0.38	0.41	0.0073
123478-hexachlorodibenzo-p-dioxin	<1.7	<0.22	<0.37	<0.29	<0.31	<0.0055
123678-hexachlorodibenzo-p-dioxin	6.92	0.89	1.50	1.17	1.25	0.022
123789-hexachlorodibenzo-p-dioxin	2.80	0.36	0.61	0.47	0.51	0.0091
1234678-heptachlorodibenzo-p-dioxin	50.1	6.41	10.9	8.45	9.07	0.16
Octachlorodibenzo-p-dioxin	89.4	11.4	19.4	15.1	16.2	0.29
2378-tetrachlorodibenzofuran	<3.1	<0.40	<0.67	<0.52	<0.56	<0.010
12378-pentachlorodibenzofuran	5.17	0.66	1.12	0.87	0.94	0.017
23478-pentachlorodibenzofuran	5.00	0.64	1.09	0.84	0.90	0.016
123478-hexachlorodibenzofuran	4.59	0.59	1.00	0.77	0.83	0.015
123678-hexachlorodibenzofuran	<3.7	<0.47	<0.80	<0.62	<0.67	<0.012
234678-hexachlorodibenzofuran	5.94	0.76	1.29	1.00	1.07	0.019
123789-hexachlorodibenzofuran	3.25	0.42	0.71	0.55	0.59	0.011
1234678-heptachlorodibenzofuran	14.1	1.81	3.07	2.38	2.55	0.046
1234789-heptachlorodibenzofuran	4.35	0.56	0.95	0.73	0.79	0.014
Octachlorodibenzofuran	27.5	3.52	5.98	4.64	4.98	0.089
PCB 81	<17	<2.18	<3.70	<2.87	<3.08	<0.055
PCB 77	294	37.6	63.9	49.6	53.2	0.95
PCB 123	110	14.1	23.9	18.6	19.9	0.36
PCB 118	5070	649	1102	855	917	16.4
PCB 114	<110	<14.1	<23.9	<18.6	<19.9	<0.36
PCB 105	1850	237	402	312	335	5.99
PCB 126	<22	<2.82	<4.78	<3.71	<3.98	<0.071
PCB 167	<65	<8.32	<14.1	<11.0	<11.8	<0.21
PCB 156/157	202	25.9	43.9	34.1	36.6	0.65
PCB 169	<14	<1.79	<3.04	<2.36	<2.53	<0.045
PCB 189	<9.4	<1.20	<2.04	<1.59	<1.70	<0.030
Total Dioxins & Furans Only	<231	<29.6	<50.2	<39.0	<41.8	<0.75
Total PCBs Only	<7763	<994	<1688	<1310	<1405	<25.1
Total Dioxins & Furans and PCBs	<7994	<1024	<1738	<1349	<1447	<25.9

Dry Gas Volume Sampled (Rm³*) :	4.600
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected pg	Actual Concentration pg/m^3	Dry Reference Concentration pg/Rm^3*	Dry Adjusted Concentration pg/Rm^3**	Wet Reference Concentration pg/Rm^3*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.2	<0.15	<0.25	<0.20	<0.21	<0.0038
12378-pentachlorodibenzo-p-dioxin	1.87	0.23	0.40	0.31	0.33	0.0060
123478-hexachlorodibenzo-p-dioxin	2.68	0.33	0.57	0.44	0.47	0.0086
123678-hexachlorodibenzo-p-dioxin	5.71	0.71	1.21	0.93	1.00	0.018
123789-hexachlorodibenzo-p-dioxin	3.59	0.44	0.76	0.59	0.63	0.012
1234678-heptachlorodibenzo-p-dioxin	48.2	5.97	10.2	7.89	8.45	0.15
Octachlorodibenzo-p-dioxin	77.6	9.61	16.5	12.7	13.6	0.25
2378-tetrachlorodibenzofuran	3.57	0.44	0.76	0.58	0.63	0.011
12378-pentachlorodibenzofuran	<2.9	<0.36	<0.62	<0.47	<0.51	<0.0093
23478-pentachlorodibenzofuran	4.09	0.51	0.87	0.67	0.72	0.013
123478-hexachlorodibenzofuran	3.76	0.47	0.80	0.62	0.66	0.012
123678-hexachlorodibenzofuran	<3.0	<0.37	<0.64	<0.49	<0.53	<0.0096
234678-hexachlorodibenzofuran	4.60	0.57	0.98	0.75	0.81	0.015
123789-hexachlorodibenzofuran	<3.6	<0.45	<0.76	<0.59	<0.63	<0.012
1234678-heptachlorodibenzofuran	13.4	1.66	2.85	2.19	2.35	0.043
1234789-heptachlorodibenzofuran	3.48	0.43	0.74	0.57	0.61	0.011
Octachlorodibenzofuran	<10	<1.24	<2.12	<1.64	<1.75	<0.032
PCB 81	<13	<1.61	<2.76	<2.13	<2.28	<0.042
PCB 77	110	13.6	23.4	18.0	19.3	0.35
PCB 123	35.8	4.43	7.60	5.86	6.27	0.11
PCB 118	2020	250	429	331	354	6.48
PCB 114	52.8	6.54	11.2	8.64	9.25	0.17
PCB 105	607	75.2	129	99.3	106	1.95
PCB 126	<14	<1.73	<2.97	<2.29	<2.45	<0.045
PCB 167	<27	<3.34	<5.73	<4.42	<4.73	<0.087
PCB 156/157	73.0	9.04	15.5	11.9	12.8	0.23
PCB 169	10.0	1.24	2.12	1.64	1.75	0.032
PCB 189	<6.8	<0.84	<1.44	<1.11	<1.19	<0.022
Total Dioxins & Furans Only	<193	<23.9	<41.0	<31.6	<33.9	<0.62
Total PCBs Only	<2969	<368	<631	<486	<520	<9.52
Total Dioxins & Furans and PCBs	<3163	<392	<672	<518	<554	<10.1

Dry Gas Volume Sampled (Rm^3*) :	4.708
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	19.6
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 36
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<3.4	<0.40	<0.68	<0.53	<0.56	<0.011
12378-pentachlorodibenzo-p-dioxin	2.90	0.34	0.58	0.45	0.48	0.0090
123478-hexachlorodibenzo-p-dioxin	<2.8	<0.33	<0.56	<0.44	<0.46	<0.0087
123678-hexachlorodibenzo-p-dioxin	<6.0	<0.71	<1.20	<0.94	<0.99	<0.019
123789-hexachlorodibenzo-p-dioxin	<2.7	<0.32	<0.54	<0.42	<0.45	<0.0084
1234678-heptachlorodibenzo-p-dioxin	50.2	5.94	10.0	7.85	8.32	0.16
Octachlorodibenzo-p-dioxin	79.0	9.34	15.8	12.4	13.1	0.24
2378-tetrachlorodibenzofuran	<3.5	<0.41	<0.70	<0.55	<0.58	<0.011
12378-pentachlorodibenzofuran	6.19	0.73	1.24	0.97	1.03	0.019
23478-pentachlorodibenzofuran	<3.0	<0.35	<0.60	<0.47	<0.50	<0.0093
123478-hexachlorodibenzofuran	<3.1	<0.37	<0.62	<0.49	<0.51	<0.0096
123678-hexachlorodibenzofuran	4.66	0.55	0.93	0.73	0.77	0.014
234678-hexachlorodibenzofuran	<3.9	<0.46	<0.78	<0.61	<0.65	<0.012
123789-hexachlorodibenzofuran	5.34	0.63	1.07	0.84	0.88	0.017
1234678-heptachlorodibenzofuran	15.8	1.87	3.16	2.47	2.62	0.049
1234789-heptachlorodibenzofuran	<3.5	<0.41	<0.70	<0.55	<0.58	<0.011
Octachlorodibenzofuran	12.0	1.42	2.40	1.88	1.99	0.037
PCB 81	<17	<2.01	<3.40	<2.66	<2.82	<0.053
PCB 77	490	57.9	97.9	76.7	81.2	1.52
PCB 123	39.0	4.61	7.80	6.10	6.46	0.12
PCB 118	2440	289	488	382	404	7.56
PCB 114	62.1	7.34	12.4	9.72	10.3	0.19
PCB 105	650	76.9	130	102	108	2.01
PCB 126	<13	<1.54	<2.60	<2.03	<2.15	<0.040
PCB 167	<20	<2.36	<4.00	<3.13	<3.31	<0.062
PCB 156/157	<68	<8.04	<13.6	<10.6	<11.3	<0.21
PCB 169	<5.8	<0.69	<1.16	<0.91	<0.96	<0.018
PCB 189	<6.8	<0.80	<1.36	<1.06	<1.13	<0.021
Total Dioxins & Furans Only	<208	<24.6	<41.6	<32.5	<34.5	<0.64
Total PCBs Only	<3812	<451	<762	<596	<632	<11.8
Total Dioxins & Furans and PCBs	<4020	<475	<803	<629	<666	<12.5

Dry Gas Volume Sampled (Rm³*) :	5.003
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.8
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 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/m^3	pg/m^3	pg/m^3	pg/m^3	%
2378-tetrachlorodibenzo-p-dioxin	<0.15	<0.15	<0.40	<0.23	61.7
12378-pentachlorodibenzo-p-dioxin	0.29	0.23	0.34	0.29	19.4
123478-hexachlorodibenzo-p-dioxin	<0.22	0.33	<0.33	<0.29	22.4
123678-hexachlorodibenzo-p-dioxin	0.89	0.71	<0.71	<0.77	13.4
123789-hexachlorodibenzo-p-dioxin	0.36	0.44	<0.32	<0.37	17.1
1234678-heptachlorodibenzo-p-dioxin	6.41	5.97	5.94	6.11	4.4
Octachlorodibenzo-p-dioxin	11.4	9.61	9.34	10.1	11.3
2378-tetrachlorodibenzofuran	<0.40	0.44	<0.41	<0.42	5.5
12378-pentachlorodibenzofuran	0.66	<0.36	0.73	<0.58	33.9
23478-pentachlorodibenzofuran	0.64	0.51	<0.35	<0.50	28.5
123478-hexachlorodibenzofuran	0.59	0.47	<0.37	<0.47	23.4
123678-hexachlorodibenzofuran	<0.47	<0.37	0.55	<0.47	19.3
234678-hexachlorodibenzofuran	0.76	0.57	<0.46	<0.60	25.4
123789-hexachlorodibenzofuran	0.42	<0.45	0.63	<0.50	23.4
1234678-heptachlorodibenzofuran	1.81	1.66	1.87	1.78	6.0
1234789-heptachlorodibenzofuran	0.56	0.43	<0.41	<0.47	16.7
Octachlorodibenzofuran	3.52	<1.24	1.42	<2.06	61.6
PCB 81	<2.18	<1.61	<2.01	<1.93	15.1
PCB 77	37.6	13.6	57.9	36.4	60.9
PCB 123	14.1	4.43	4.61	7.71	71.6
PCB 118	649	250	289	396	55.6
PCB 114	<14.1	6.54	7.34	<9.32	44.4
PCB 105	237	75.2	76.9	130	71.6
PCB 126	<2.82	<1.73	<1.54	<2.03	34.0
PCB 167	<8.32	<3.34	<2.36	<4.68	68.3
PCB 156/157	25.9	9.04	<8.04	<14.3	70.0
PCB 169	<1.79	1.24	<0.69	<1.24	44.7
PCB 189	<1.20	<0.84	<0.80	<0.95	23.2
Total Dioxins & Furans Only	<29.6	<23.9	<24.6	<26.0	11.9
Total PCBs Only	<994	<368	<451	<604	56.3
Total Dioxins & Furans and PCBs	<1024	<392	<475	<630	54.5

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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.26	<0.25	<0.68	<0.40	61.1
12378-pentachlorodibenzo-p-dioxin	0.49	0.40	0.58	0.49	18.7
123478-hexachlorodibenzo-p-dioxin	<0.37	0.57	<0.56	<0.50	22.5
123678-hexachlorodibenzo-p-dioxin	1.50	1.21	<1.20	<1.31	13.2
123789-hexachlorodibenzo-p-dioxin	0.61	0.76	<0.54	<0.64	17.9
1234678-heptachlorodibenzo-p-dioxin	10.9	10.2	10.0	10.4	4.3
Octachlorodibenzo-p-dioxin	19.4	16.5	15.8	17.2	11.2
2378-tetrachlorodibenzofuran	<0.67	0.76	<0.70	<0.71	6.1
12378-pentachlorodibenzofuran	1.12	<0.62	1.24	<0.99	33.3
23478-pentachlorodibenzofuran	1.09	0.87	<0.60	<0.85	28.7
123478-hexachlorodibenzofuran	1.00	0.80	<0.62	<0.81	23.5
123678-hexachlorodibenzofuran	<0.80	<0.64	0.93	<0.79	18.7
234678-hexachlorodibenzofuran	1.29	0.98	<0.78	<1.02	25.4
123789-hexachlorodibenzofuran	0.71	<0.76	1.07	<0.85	22.9
1234678-heptachlorodibenzofuran	3.07	2.85	3.16	3.02	5.3
1234789-heptachlorodibenzofuran	0.95	0.74	<0.70	<0.79	16.6
Octachlorodibenzofuran	5.98	<2.12	2.40	<3.50	61.4
PCB 81	<3.70	<2.76	<3.40	<3.28	14.5
PCB 77	63.9	23.4	97.9	61.7	60.5
PCB 123	23.9	7.60	7.80	13.1	71.4
PCB 118	1102	429	488	673	55.4
PCB 114	<23.9	11.2	12.4	<15.8	44.2
PCB 105	402	129	130	220	71.5
PCB 126	<4.78	<2.97	<2.60	<3.45	33.8
PCB 167	<14.1	<5.73	<4.00	<7.95	68.1
PCB 156/157	43.9	15.5	<13.6	<24.3	69.8
PCB 169	<3.04	2.12	<1.16	<2.11	44.7
PCB 189	<2.04	<1.44	<1.36	<1.62	23.1
Total Dioxins & Furans Only	<50.2	<41.0	<41.6	<44.3	11.6
Total PCBs Only	<1688	<631	<762	<1027	56.1
Total Dioxins & Furans and PCBs	<1738	<672	<803	<1071	54.3

* At 25°C and 1 atmosphere

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

TABLE 39

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<0.20	<0.20	<0.53	<0.31	61.9
12378-pentachlorodibenzo-p-dioxin	0.38	0.31	0.45	0.38	19.5
123478-hexachlorodibenzo-p-dioxin	<0.29	0.44	<0.44	<0.39	22.6
123678-hexachlorodibenzo-p-dioxin	1.17	0.93	<0.94	<1.01	13.2
123789-hexachlorodibenzo-p-dioxin	0.47	0.59	<0.42	<0.49	17.1
1234678-heptachlorodibenzo-p-dioxin	8.45	7.89	7.85	8.06	4.2
Octachlorodibenzo-p-dioxin	15.1	12.7	12.4	13.4	11.1
2378-tetrachlorodibenzofuran	<0.52	0.58	<0.55	<0.55	5.6
12378-pentachlorodibenzofuran	0.87	<0.47	0.97	<0.77	33.9
23478-pentachlorodibenzofuran	0.84	0.67	<0.47	<0.66	28.3
123478-hexachlorodibenzofuran	0.77	0.62	<0.49	<0.62	23.2
123678-hexachlorodibenzofuran	<0.62	<0.49	0.73	<0.61	19.4
234678-hexachlorodibenzofuran	1.00	0.75	<0.61	<0.79	25.2
123789-hexachlorodibenzofuran	0.55	<0.59	0.84	<0.66	23.6
1234678-heptachlorodibenzofuran	2.38	2.19	2.47	2.35	6.1
1234789-heptachlorodibenzofuran	0.73	0.57	<0.55	<0.62	16.5
Octachlorodibenzofuran	4.64	<1.64	1.88	<2.72	61.4
PCB 81	<2.87	<2.13	<2.66	<2.55	15.0
PCB 77	49.6	18.0	76.7	48.1	61.1
PCB 123	18.6	5.86	6.10	10.2	71.4
PCB 118	855	331	382	523	55.4
PCB 114	<18.6	8.64	9.72	<12.3	44.2
PCB 105	312	99.3	102	171	71.4
PCB 126	<3.71	<2.29	<2.03	<2.68	33.7
PCB 167	<11.0	<4.42	<3.13	<6.17	68.1
PCB 156/157	34.1	11.9	<10.6	<18.9	69.7
PCB 169	<2.36	1.64	<0.91	<1.64	44.5
PCB 189	<1.59	<1.11	<1.06	<1.25	23.0
Total Dioxins & Furans Only	<39.0	<31.6	<32.5	<34.4	11.7
Total PCBs Only	<1310	<486	<596	<797	56.1
Total Dioxins & Furans and PCBs	<1349	<518	<629	<832	54.2

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

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

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

Specific Isomer	Wet Reference Concentration Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.22	<0.21	<0.56	<0.33	61.1
12378-pentachlorodibenzo-p-dioxin	0.41	0.33	0.48	0.40	18.9
123478-hexachlorodibenzo-p-dioxin	<0.31	0.47	<0.46	<0.41	22.2
123678-hexachlorodibenzo-p-dioxin	1.25	1.00	<0.99	<1.08	13.6
123789-hexachlorodibenzo-p-dioxin	0.51	0.63	<0.45	<0.53	17.6
1234678-heptachlorodibenzo-p-dioxin	9.07	8.45	8.32	8.61	4.6
Octachlorodibenzo-p-dioxin	16.2	13.6	13.1	14.3	11.6
2378-tetrachlorodibenzofuran	<0.56	0.63	<0.58	<0.59	5.7
12378-pentachlorodibenzofuran	0.94	<0.51	1.03	<0.82	33.6
23478-pentachlorodibenzofuran	0.90	0.72	<0.50	<0.71	28.9
123478-hexachlorodibenzofuran	0.83	0.66	<0.51	<0.67	23.8
123678-hexachlorodibenzofuran	<0.67	<0.53	0.77	<0.66	18.9
234678-hexachlorodibenzofuran	1.07	0.81	<0.65	<0.84	25.7
123789-hexachlorodibenzofuran	0.59	<0.63	0.88	<0.70	22.9
1234678-heptachlorodibenzofuran	2.55	2.35	2.62	2.51	5.6
1234789-heptachlorodibenzofuran	0.79	0.61	<0.58	<0.66	17.0
Octachlorodibenzofuran	4.98	<1.75	1.99	<2.91	61.8
PCB 81	<3.08	<2.28	<2.82	<2.72	14.9
PCB 77	53.2	19.3	81.2	51.2	60.5
PCB 123	19.9	6.27	6.46	10.9	71.8
PCB 118	917	354	404	559	55.8
PCB 114	<19.9	9.25	10.3	<13.1	44.7
PCB 105	335	106	108	183	71.9
PCB 126	<3.98	<2.45	<2.15	<2.86	34.2
PCB 167	<11.8	<4.73	<3.31	<6.60	68.5
PCB 156/157	36.6	12.8	<11.3	<20.2	70.2
PCB 169	<2.53	1.75	<0.96	<1.75	45.0
PCB 189	<1.70	<1.19	<1.13	<1.34	23.5
Total Dioxins & Furans Only	<41.8	<33.9	<34.5	<36.7	12.1
Total PCBs Only	<1405	<520	<632	<852	56.5
Total Dioxins & Furans and PCBs	<1447	<554	<666	<889	54.7

* At 25°C and 1 atmosphere

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

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

Specific Isomer	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.0039	<0.0038	<0.011	<0.0061	63.2
12378-pentachlorodibenzo-p-dioxin	0.0073	0.0060	0.0090	0.0074	20.2
123478-hexachlorodibenzo-p-dioxin	<0.0055	0.0086	<0.0087	<0.0076	23.8
123678-hexachlorodibenzo-p-dioxin	0.022	0.018	<0.019	<0.020	11.6
123789-hexachlorodibenzo-p-dioxin	0.0091	0.012	<0.0084	<0.0096	17.1
1234678-heptachlorodibenzo-p-dioxin	0.16	0.15	0.16	0.16	2.7
Octachlorodibenzo-p-dioxin	0.29	0.25	0.24	0.26	9.5
2378-tetrachlorodibenzofuran	<0.010	0.011	<0.011	<0.011	6.6
12378-pentachlorodibenzofuran	0.017	<0.0093	0.019	<0.015	34.1
23478-pentachlorodibenzofuran	0.016	0.013	<0.0093	<0.013	26.9
123478-hexachlorodibenzofuran	0.015	0.012	<0.0096	<0.012	21.6
123678-hexachlorodibenzofuran	<0.012	<0.0096	0.014	<0.012	20.0
234678-hexachlorodibenzofuran	0.019	0.015	<0.012	<0.015	23.6
123789-hexachlorodibenzofuran	0.011	<0.012	0.017	<0.013	25.0
1234678-heptachlorodibenzofuran	0.046	0.043	0.049	0.046	6.5
1234789-heptachlorodibenzofuran	0.014	0.011	<0.011	<0.012	14.9
Octachlorodibenzofuran	0.089	<0.032	0.037	<0.053	59.8
PCB 81	<0.055	<0.042	<0.053	<0.050	14.3
PCB 77	0.95	0.35	1.52	0.94	61.9
PCB 123	0.36	0.11	0.12	0.20	69.8
PCB 118	16.4	6.48	7.56	10.2	53.7
PCB 114	<0.36	0.17	0.19	<0.24	42.6
PCB 105	5.99	1.95	2.01	3.32	69.8
PCB 126	<0.071	<0.045	<0.040	<0.052	32.1
PCB 167	<0.21	<0.087	<0.062	<0.12	66.5
PCB 156/157	0.65	0.23	<0.21	<0.37	68.1
PCB 169	<0.045	0.032	<0.018	<0.032	43.1
PCB 189	<0.030	<0.022	<0.021	<0.024	21.3
Total Dioxins & Furans Only	<0.75	<0.62	<0.64	<0.67	10.2
Total PCBs Only	<25.1	<9.52	<11.8	<15.5	54.5
Total Dioxins & Furans and PCBs	<25.9	<10.1	<12.5	<16.2	52.6

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	<0.23	<0.40	<0.31	<0.33	<0.0061
12378-pentachlorodibenzo-p-dioxin	0.29	0.49	0.38	0.40	0.0074
123478-hexachlorodibenzo-p-dioxin	<0.29	<0.50	<0.39	<0.41	<0.0076
123678-hexachlorodibenzo-p-dioxin	<0.77	<1.31	<1.01	<1.08	<0.020
123789-hexachlorodibenzo-p-dioxin	<0.37	<0.64	<0.49	<0.53	<0.0096
1234678-heptachlorodibenzo-p-dioxin	6.11	10.4	8.06	8.61	0.16
Octachlorodibenzo-p-dioxin	10.1	17.2	13.4	14.3	0.26
2378-tetrachlorodibenzofuran	<0.42	<0.71	<0.55	<0.59	<0.011
12378-pentachlorodibenzofuran	<0.58	<0.99	<0.77	<0.82	<0.015
23478-pentachlorodibenzofuran	<0.50	<0.85	<0.66	<0.71	<0.013
123478-hexachlorodibenzofuran	<0.47	<0.81	<0.62	<0.67	<0.012
123678-hexachlorodibenzofuran	<0.47	<0.79	<0.61	<0.66	<0.012
234678-hexachlorodibenzofuran	<0.60	<1.02	<0.79	<0.84	<0.015
123789-hexachlorodibenzofuran	<0.50	<0.85	<0.66	<0.70	<0.013
1234678-heptachlorodibenzofuran	1.78	3.02	2.35	2.51	0.046
1234789-heptachlorodibenzofuran	<0.47	<0.79	<0.62	<0.66	<0.012
Octachlorodibenzofuran	<2.06	<3.50	<2.72	<2.91	<0.053
PCB 81	<1.93	<3.28	<2.55	<2.72	<0.050
PCB 77	36.4	61.7	48.1	51.2	0.94
PCB 123	7.71	13.1	10.2	10.9	0.20
PCB 118	396	673	523	559	10.2
PCB 114	<9.32	<15.8	<12.3	<13.1	<0.24
PCB 105	130	220	171	183	3.32
PCB 126	<2.03	<3.45	<2.68	<2.86	<0.052
PCB 167	<4.68	<7.95	<6.17	<6.60	<0.12
PCB 156/157	<14.3	<24.3	<18.9	<20.2	<0.37
PCB 169	<1.24	<2.11	<1.64	<1.75	<0.032
PCB 189	<0.95	<1.62	<1.25	<1.34	<0.024
Total Dioxins & Furans Only	<26.0	<44.3	<34.4	<36.7	<0.67
Total PCBs Only	<604	<1027	<797	<852	<15.5
Total Dioxins & Furans and PCBs	<630	<1071	<832	<889	<16.2

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Blank Train pg	Laboratory Blank pg
2378-tetrachlorodibenzo-p-dioxin	<0.85	<1.2
12378-pentachlorodibenzo-p-dioxin	<0.49	<0.81
123478-hexachlorodibenzo-p-dioxin	<0.89	<1.6
123678-hexachlorodibenzo-p-dioxin	<0.81	<1.4
123789-hexachlorodibenzo-p-dioxin	<0.87	<1.5
1234678-heptachlorodibenzo-p-dioxin	<3.1	2.84
Octachlorodibenzo-p-dioxin	<14	<4.2
2378-tetrachlorodibenzofuran	<0.64	<0.81
12378-pentachlorodibenzofuran	<1.5	<2.1
23478-pentachlorodibenzofuran	<0.50	<0.60
123478-hexachlorodibenzofuran	<0.51	<1.1
123678-hexachlorodibenzofuran	0.53	<1.0
234678-hexachlorodibenzofuran	<0.43	<1.1
123789-hexachlorodibenzofuran	2.73	<3.0
1234678-heptachlorodibenzofuran	<1.6	<1.5
1234789-heptachlorodibenzofuran	<0.69	<0.76
Octachlorodibenzofuran	2.93	<1.8
PCB 81	<15	<9.7
PCB 77	<15	<10
PCB 123	<16	<16
PCB 118	<15	<22
PCB 114	<16	<17
PCB 105	<15	<16
PCB 126	<17	<17
PCB 167	<7.3	<6.5
PCB 156/157	<9.7	<8.6
PCB 169	<8.6	<7.4
PCB 189	<9.5	<8.0
Total Dioxins & Furans Only	<33.1	<27.3
Total PCBs Only	<144	<138
Total Dioxins & Furans and PCBs	<177	<166

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

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

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.15	<0.15	<0.40	<0.23
12378-pentachlorodibenzo-p-dioxin	1.00000	0.29	0.23	0.34	0.29
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.022	0.033	<0.033	<0.029
123678-hexachlorodibenzo-p-dioxin	0.10000	0.089	0.071	<0.071	<0.077
123789-hexachlorodibenzo-p-dioxin	0.10000	0.036	0.044	<0.032	<0.037
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.064	0.060	0.059	0.061
Octachlorodibenzo-p-dioxin	0.00030	0.0034	0.0029	0.0028	0.0030
2378-tetrachlorodibenzofuran	0.10000	<0.040	0.044	<0.041	<0.042
12378-pentachlorodibenzofuran	0.03000	0.020	<0.011	0.022	<0.018
23478-pentachlorodibenzofuran	0.30000	0.19	0.15	<0.11	<0.15
123478-hexachlorodibenzofuran	0.10000	0.059	0.047	<0.037	<0.047
123678-hexachlorodibenzofuran	0.10000	<0.047	<0.037	0.055	<0.047
234678-hexachlorodibenzofuran	0.10000	0.076	0.057	<0.046	<0.060
123789-hexachlorodibenzofuran	0.10000	0.042	<0.045	0.063	<0.050
1234678-heptachlorodibenzofuran	0.01000	0.018	0.017	0.019	0.018
1234789-heptachlorodibenzofuran	0.01000	0.0056	0.0043	<0.0041	<0.0047
Octachlorodibenzofuran	0.00030	0.0011	<0.00037	0.00043	<0.00062
PCB 81	0.00030	<0.00065	<0.00048	<0.00060	<0.00058
PCB 77	0.00010	0.0038	0.0014	0.0058	0.0036
PCB 123	0.00003	0.00042	0.00013	0.00014	0.00023
PCB 118	0.00003	0.019	0.0075	0.0087	0.012
PCB 114	0.00003	<0.00042	0.00020	0.00022	<0.00028
PCB 105	0.00003	0.0071	0.0023	0.0023	0.0039
PCB 126	0.10000	<0.28	<0.17	<0.15	<0.20
PCB 167	0.00003	<0.00025	<0.00010	<0.000071	<0.00014
PCB 156/157	0.00003	0.00078	0.00027	<0.00024	<0.00043
PCB 169	0.03000	<0.054	0.037	<0.021	<0.037
PCB 189	0.00003	<0.000036	<0.000025	<0.000024	<0.000028
Total Dioxins & Furans Only		<1.15	<1.00	<1.34	<1.17
Total PCBs Only		<0.37	<0.22	<0.19	<0.26
Total Dioxins & Furans and PCBs		<1.52	<1.23	<1.53	<1.43

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.26	<0.25	<0.68	<0.40
12378-pentachlorodibenzo-p-dioxin	1.00000	0.49	0.40	0.58	0.49
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.037	0.057	<0.056	<0.050
123678-hexachlorodibenzo-p-dioxin	0.10000	0.15	0.12	<0.12	<0.13
123789-hexachlorodibenzo-p-dioxin	0.10000	0.061	0.076	<0.054	<0.064
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.11	0.10	0.10	0.10
Octachlorodibenzo-p-dioxin	0.00030	0.0058	0.0049	0.0047	0.0052
2378-tetrachlorodibenzofuran	0.10000	<0.067	0.076	<0.070	<0.071
12378-pentachlorodibenzofuran	0.03000	0.034	<0.018	0.037	<0.030
23478-pentachlorodibenzofuran	0.30000	0.33	0.26	<0.18	<0.26
123478-hexachlorodibenzofuran	0.10000	0.10	0.080	<0.062	<0.081
123678-hexachlorodibenzofuran	0.10000	<0.080	<0.064	0.093	<0.079
234678-hexachlorodibenzofuran	0.10000	0.13	0.098	<0.078	<0.10
123789-hexachlorodibenzofuran	0.10000	0.071	<0.076	0.11	<0.085
1234678-heptachlorodibenzofuran	0.01000	0.031	0.028	0.032	0.030
1234789-heptachlorodibenzofuran	0.01000	0.0095	0.0074	<0.0070	<0.0079
Octachlorodibenzofuran	0.00030	0.0018	<0.00064	0.00072	<0.0011
PCB 81	0.00030	<0.0011	<0.00083	<0.0010	<0.00099
PCB 77	0.00010	0.0064	0.0023	0.0098	0.0062
PCB 123	0.00003	0.00072	0.00023	0.00023	0.00039
PCB 118	0.00003	0.033	0.013	0.015	0.020
PCB 114	0.00003	<0.00072	0.00034	0.00037	<0.00048
PCB 105	0.00003	0.012	0.0039	0.0039	0.0066
PCB 126	0.10000	<0.48	<0.30	<0.26	<0.35
PCB 167	0.00003	<0.00042	<0.00017	<0.00012	<0.00024
PCB 156/157	0.00003	0.0013	0.00047	<0.00041	<0.00073
PCB 169	0.03000	<0.091	0.064	<0.035	<0.063
PCB 189	0.00003	<0.000061	<0.000043	<0.000041	<0.000048
Total Dioxins & Furans Only		<1.96	<1.72	<2.26	<1.98
Total PCBs Only		<0.63	<0.38	<0.33	<0.44
Total Dioxins & Furans and PCBs		<2.59	<2.11	<2.59	<2.43

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.20	<0.20	<0.53	<0.31
12378-pentachlorodibenzo-p-dioxin	1.00000	0.38	0.31	0.45	0.38
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.029	0.044	<0.044	<0.039
123678-hexachlorodibenzo-p-dioxin	0.10000	0.12	0.093	<0.094	<0.10
123789-hexachlorodibenzo-p-dioxin	0.10000	0.047	0.059	<0.042	<0.049
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.085	0.079	0.079	0.081
Octachlorodibenzo-p-dioxin	0.00030	0.0045	0.0038	0.0037	0.0040
2378-tetrachlorodibenzofuran	0.10000	<0.052	0.058	<0.055	<0.055
12378-pentachlorodibenzofuran	0.03000	0.026	<0.014	0.029	<0.023
23478-pentachlorodibenzofuran	0.30000	0.25	0.20	<0.14	<0.20
123478-hexachlorodibenzofuran	0.10000	0.077	0.062	<0.049	<0.062
123678-hexachlorodibenzofuran	0.10000	<0.062	<0.049	0.073	<0.061
234678-hexachlorodibenzofuran	0.10000	0.10	0.075	<0.061	<0.079
123789-hexachlorodibenzofuran	0.10000	0.055	<0.059	0.084	<0.066
1234678-heptachlorodibenzofuran	0.01000	0.024	0.022	0.025	0.023
1234789-heptachlorodibenzofuran	0.01000	0.0073	0.0057	<0.0055	<0.0062
Octachlorodibenzofuran	0.00030	0.0014	<0.00049	0.00056	<0.00082
PCB 81	0.00030	<0.00086	<0.00064	<0.00080	<0.00077
PCB 77	0.00010	0.0050	0.0018	0.0077	0.0048
PCB 123	0.00003	0.00056	0.00018	0.00018	0.00031
PCB 118	0.00003	0.026	0.0099	0.011	0.016
PCB 114	0.00003	<0.00056	0.00026	0.00029	<0.00037
PCB 105	0.00003	0.0094	0.0030	0.0031	0.0051
PCB 126	0.10000	<0.37	<0.23	<0.20	<0.27
PCB 167	0.00003	<0.00033	<0.00013	<0.000094	<0.00019
PCB 156/157	0.00003	0.0010	0.00036	<0.00032	<0.00057
PCB 169	0.03000	<0.071	0.049	<0.027	<0.049
PCB 189	0.00003	<0.000048	<0.000033	<0.000032	<0.000038
Total Dioxins & Furans Only		<1.52	<1.33	<1.77	<1.54
Total PCBs Only		<0.49	<0.29	<0.25	<0.34
Total Dioxins & Furans and PCBs		<2.01	<1.62	<2.02	<1.88

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

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	0.10	0.098	0.27	0.16
12378-pentachlorodibenzo-p-dioxin	1.00000	0.38	0.31	0.45	0.38
123478-hexachlorodibenzo-p-dioxin	0.10000	0.014	0.044	0.022	0.027
123678-hexachlorodibenzo-p-dioxin	0.10000	0.12	0.093	0.047	0.086
123789-hexachlorodibenzo-p-dioxin	0.10000	0.047	0.059	0.021	0.042
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.085	0.079	0.079	0.081
Octachlorodibenzo-p-dioxin	0.00030	0.0045	0.0038	0.0037	0.0040
2378-tetrachlorodibenzofuran	0.10000	0.026	0.058	0.027	0.037
12378-pentachlorodibenzofuran	0.03000	0.026	0.0071	0.029	0.021
23478-pentachlorodibenzofuran	0.30000	0.25	0.20	0.070	0.17
123478-hexachlorodibenzofuran	0.10000	0.077	0.062	0.024	0.054
123678-hexachlorodibenzofuran	0.10000	0.031	0.025	0.073	0.043
234678-hexachlorodibenzofuran	0.10000	0.10	0.075	0.031	0.069
123789-hexachlorodibenzofuran	0.10000	0.055	0.029	0.084	0.056
1234678-heptachlorodibenzofuran	0.01000	0.024	0.022	0.025	0.023
1234789-heptachlorodibenzofuran	0.01000	0.0073	0.0057	0.0027	0.0053
Octachlorodibenzofuran	0.00030	0.0014	0.00025	0.00056	0.00073
PCB 81	0.00030	0.00043	0.00032	0.00040	0.00038
PCB 77	0.00010	0.0050	0.0018	0.0077	0.0048
PCB 123	0.00003	0.00056	0.00018	0.00018	0.00031
PCB 118	0.00003	0.026	0.0099	0.011	0.016
PCB 114	0.00003	0.00028	0.00026	0.00029	0.00028
PCB 105	0.00003	0.0094	0.0030	0.0031	0.0051
PCB 126	0.10000	0.19	0.11	0.10	0.13
PCB 167	0.00003	0.00016	0.000066	0.000047	0.000093
PCB 156/157	0.00003	0.0010	0.00036	0.00016	0.00051
PCB 169	0.03000	0.035	0.049	0.014	0.033
PCB 189	0.00003	0.000024	0.000017	0.000016	0.00002
Total Dioxins & Furans Only		1.35	1.17	1.26	1.26
Total PCBs Only		0.26	0.18	0.14	0.19
Total Dioxins & Furans and PCBs		1.61	1.35	1.40	1.45

* 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	<0.20	<0.20	<0.53	<0.31
12378-pentachlorodibenzo-p-dioxin	0.500	0.19	0.15	0.23	0.19
123478-hexachlorodibenzo-p-dioxin	0.100	<0.029	0.044	<0.044	<0.039
123678-hexachlorodibenzo-p-dioxin	0.100	0.12	0.093	<0.094	<0.10
123789-hexachlorodibenzo-p-dioxin	0.100	0.047	0.059	<0.042	<0.049
1234678-heptachlorodibenzo-p-dioxin	0.010	0.085	0.079	0.079	0.081
Octachlorodibenzo-p-dioxin	0.001	0.015	0.013	0.012	0.013
2378-tetrachlorodibenzofuran	0.100	<0.052	0.058	<0.055	<0.055
12378-pentachlorodibenzofuran	0.050	0.044	<0.024	0.048	<0.039
23478-pentachlorodibenzofuran	0.500	0.42	0.33	<0.23	<0.33
123478-hexachlorodibenzofuran	0.100	0.077	0.062	<0.049	<0.062
123678-hexachlorodibenzofuran	0.100	<0.062	<0.049	0.073	<0.061
234678-hexachlorodibenzofuran	0.100	0.10	0.075	<0.061	<0.079
123789-hexachlorodibenzofuran	0.100	0.055	<0.059	0.084	<0.066
1234678-heptachlorodibenzofuran	0.010	0.024	0.022	0.025	0.023
1234789-heptachlorodibenzofuran	0.010	0.0073	0.0057	<0.0055	<0.0062
Octachlorodibenzofuran	0.001	0.0046	<0.0016	0.0019	<0.0027
Total Dioxins & Furans		<1.53	<1.33	<1.67	<1.51
In-Stack Emission Limit					60

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

NATO/CCMS (1989) Toxicity Equivalency Factors

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

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

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.22	<0.21	<0.56	<0.33
12378-pentachlorodibenzo-p-dioxin	1.00000	0.41	0.33	0.48	0.40
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.031	0.047	<0.046	<0.041
123678-hexachlorodibenzo-p-dioxin	0.10000	0.13	0.10	<0.099	<0.11
123789-hexachlorodibenzo-p-dioxin	0.10000	0.051	0.063	<0.045	<0.053
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.091	0.084	0.083	0.086
Octachlorodibenzo-p-dioxin	0.00030	0.0049	0.0041	0.0039	0.0043
2378-tetrachlorodibenzofuran	0.10000	<0.056	0.063	<0.058	<0.059
12378-pentachlorodibenzofuran	0.03000	0.028	<0.015	0.031	<0.025
23478-pentachlorodibenzofuran	0.30000	0.27	0.22	<0.15	<0.21
123478-hexachlorodibenzofuran	0.10000	0.083	0.066	<0.051	<0.067
123678-hexachlorodibenzofuran	0.10000	<0.067	<0.053	0.077	<0.066
234678-hexachlorodibenzofuran	0.10000	0.11	0.081	<0.065	<0.084
123789-hexachlorodibenzofuran	0.10000	0.059	<0.063	0.088	<0.070
1234678-heptachlorodibenzofuran	0.01000	0.026	0.023	0.026	0.025
1234789-heptachlorodibenzofuran	0.01000	0.0079	0.0061	<0.0058	<0.0066
Octachlorodibenzofuran	0.00030	0.0015	<0.00053	0.00060	<0.00087
PCB 81	0.00030	<0.00092	<0.00068	<0.00084	<0.00082
PCB 77	0.00010	0.0053	0.0019	0.0081	0.0051
PCB 123	0.00003	0.00060	0.00019	0.00019	0.00033
PCB 118	0.00003	0.028	0.011	0.012	0.017
PCB 114	0.00003	<0.00060	0.00028	0.00031	<0.00039
PCB 105	0.00003	0.010	0.0032	0.0032	0.0055
PCB 126	0.10000	<0.40	<0.25	<0.22	<0.29
PCB 167	0.00003	<0.00035	<0.00014	<0.000099	<0.00020
PCB 156/157	0.00003	0.0011	0.00038	<0.00034	<0.00061
PCB 169	0.03000	<0.076	0.053	<0.029	<0.052
PCB 189	0.00003	<0.000051	<0.000036	<0.000034	<0.000040
Total Dioxins & Furans Only		<1.63	<1.42	<1.87	<1.64
Total PCBs Only		<0.52	<0.32	<0.27	<0.37
Total Dioxins & Furans and PCBs		<2.15	<1.74	<2.14	<2.01

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.0039	<0.0038	<0.011	<0.0061
12378-pentachlorodibenzo-p-dioxin	1.00000	0.0073	0.0060	0.0090	0.0074
123478-hexachlorodibenzo-p-dioxin	0.10000	<0.00055	0.00086	<0.00087	<0.00076
123678-hexachlorodibenzo-p-dioxin	0.10000	0.0022	0.0018	<0.0019	<0.0020
123789-hexachlorodibenzo-p-dioxin	0.10000	0.00091	0.0012	<0.00084	<0.00096
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.0016	0.0015	0.0016	0.0016
Octachlorodibenzo-p-dioxin	0.00030	0.000087	0.000075	0.000073	0.000078
2378-tetrachlorodibenzofuran	0.10000	<0.0010	0.0011	<0.0011	<0.0011
12378-pentachlorodibenzofuran	0.03000	0.00050	<0.00028	0.00058	<0.00045
23478-pentachlorodibenzofuran	0.30000	0.0049	0.0039	<0.0028	<0.0039
123478-hexachlorodibenzofuran	0.10000	0.0015	0.0012	<0.00096	<0.0012
123678-hexachlorodibenzofuran	0.10000	<0.0012	<0.00096	0.0014	<0.0012
234678-hexachlorodibenzofuran	0.10000	0.0019	0.0015	<0.0012	<0.0015
123789-hexachlorodibenzofuran	0.10000	0.0011	<0.0012	0.0017	<0.0013
1234678-heptachlorodibenzofuran	0.01000	0.00046	0.00043	0.00049	0.00046
1234789-heptachlorodibenzofuran	0.01000	0.00014	0.00011	<0.00011	<0.00012
Octachlorodibenzofuran	0.00030	0.000027	<0.0000096	0.000011	<0.000016
PCB 81	0.00030	<0.000017	<0.000013	<0.000016	<0.000015
PCB 77	0.00010	0.000095	0.000035	0.00015	0.000094
PCB 123	0.00003	0.000011	0.0000034	0.0000036	0.0000059
PCB 118	0.00003	0.00049	0.00019	0.00023	0.00030
PCB 114	0.00003	<0.000011	0.0000051	0.0000058	<0.0000072
PCB 105	0.00003	0.00018	0.000058	0.000060	0.00010
PCB 126	0.10000	<0.0071	<0.0045	<0.0040	<0.0052
PCB 167	0.00003	<0.0000063	<0.0000026	<0.0000019	<0.0000036
PCB 156/157	0.00003	0.000020	0.0000070	<0.0000063	<0.000011
PCB 169	0.03000	<0.0014	0.00096	<0.00054	<0.00095
PCB 189	0.00003	<0.00000091	<0.00000065	<0.00000063	<0.00000073
Total Dioxins & Furans Only		<0.029	<0.026	<0.035	<0.030
Total PCBs Only		<0.0093	<0.0058	<0.0050	<0.0067
Total Dioxins & Furans and PCBs		<0.039	<0.032	<0.040	<0.037

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

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

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

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<0.23	<0.40	<0.31	<0.33	<0.0061
12378-pentachlorodibenzo-p-dioxin	0.29	0.49	0.38	0.40	0.0074
123478-hexachlorodibenzo-p-dioxin	<0.029	<0.050	<0.039	<0.041	<0.00076
123678-hexachlorodibenzo-p-dioxin	<0.077	<0.13	<0.10	<0.11	<0.0020
123789-hexachlorodibenzo-p-dioxin	<0.037	<0.064	<0.049	<0.053	<0.00096
1234678-heptachlorodibenzo-p-dioxin	0.061	0.10	0.081	0.086	0.0016
Octachlorodibenzo-p-dioxin	0.0030	0.0052	0.0040	0.0043	0.000078
2378-tetrachlorodibenzofuran	<0.042	<0.071	<0.055	<0.059	<0.0011
12378-pentachlorodibenzofuran	<0.018	<0.030	<0.023	<0.025	<0.00045
23478-pentachlorodibenzofuran	<0.15	<0.26	<0.20	<0.21	<0.0039
123478-hexachlorodibenzofuran	<0.047	<0.081	<0.062	<0.067	<0.0012
123678-hexachlorodibenzofuran	<0.047	<0.079	<0.061	<0.066	<0.0012
234678-hexachlorodibenzofuran	<0.060	<0.10	<0.079	<0.084	<0.0015
123789-hexachlorodibenzofuran	<0.050	<0.085	<0.066	<0.070	<0.0013
1234678-heptachlorodibenzofuran	0.018	0.030	0.023	0.025	0.00046
1234789-heptachlorodibenzofuran	<0.0047	<0.0079	<0.0062	<0.0066	<0.00012
Octachlorodibenzofuran	<0.00062	<0.0011	<0.00082	<0.00087	<0.000016
PCB 81	<0.00058	<0.00099	<0.00077	<0.00082	<0.000015
PCB 77	0.0036	0.0062	0.0048	0.0051	0.000094
PCB 123	0.00023	0.00039	0.00031	0.00033	0.0000059
PCB 118	0.012	0.020	0.016	0.017	0.00030
PCB 114	<0.00028	<0.00048	<0.00037	<0.00039	<0.0000072
PCB 105	0.0039	0.0066	0.0051	0.0055	0.00010
PCB 126	<0.20	<0.35	<0.27	<0.29	<0.0052
PCB 167	<0.00014	<0.00024	<0.00019	<0.00020	<0.0000036
PCB 156/157	<0.00043	<0.00073	<0.00057	<0.00061	<0.000011
PCB 169	<0.037	<0.063	<0.049	<0.052	<0.00095
PCB 189	<0.000028	<0.000048	<0.000038	<0.000040	<0.00000073
Total Dioxins & Furans Only	<1.17	<1.98	<1.54	<1.64	<0.030
Total PCBs Only	<0.26	<0.44	<0.34	<0.37	<0.0067
Total Dioxins & Furans and PCBs	<1.43	<2.43	<1.88	<2.01	<0.037

* 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	0.12	0.20	0.16	0.17	0.0030
12378-pentachlorodibenzo-p-dioxin	0.29	0.49	0.38	0.40	0.0074
123478-hexachlorodibenzo-p-dioxin	0.020	0.034	0.027	0.029	0.00052
123678-hexachlorodibenzo-p-dioxin	0.065	0.11	0.086	0.092	0.0017
123789-hexachlorodibenzo-p-dioxin	0.032	0.055	0.042	0.045	0.00083
1234678-heptachlorodibenzo-p-dioxin	0.061	0.10	0.081	0.086	0.0016
Octachlorodibenzo-p-dioxin	0.0030	0.0052	0.0040	0.0043	0.000078
2378-tetrachlorodibenzofuran	0.028	0.048	0.037	0.040	0.00073
12378-pentachlorodibenzofuran	0.016	0.027	0.021	0.022	0.00041
23478-pentachlorodibenzofuran	0.13	0.23	0.17	0.19	0.0034
123478-hexachlorodibenzofuran	0.041	0.070	0.054	0.058	0.0011
123678-hexachlorodibenzofuran	0.032	0.055	0.043	0.046	0.00084
234678-hexachlorodibenzofuran	0.052	0.089	0.069	0.073	0.0013
123789-hexachlorodibenzofuran	0.042	0.072	0.056	0.060	0.0011
1234678-heptachlorodibenzofuran	0.018	0.030	0.023	0.025	0.00046
1234789-heptachlorodibenzofuran	0.0040	0.0068	0.0053	0.0056	0.00010
Octachlorodibenzofuran	0.00056	0.00094	0.00073	0.00078	0.000014
PCB 81	0.00029	0.00049	0.00038	0.00041	0.0000075
PCB 77	0.0036	0.0062	0.0048	0.0051	0.000094
PCB 123	0.00023	0.00039	0.00031	0.00033	0.0000059
PCB 118	0.012	0.020	0.016	0.017	0.00030
PCB 114	0.00021	0.00036	0.00028	0.00029	0.0000054
PCB 105	0.0039	0.0066	0.0051	0.0055	0.00010
PCB 126	0.10	0.17	0.13	0.14	0.0026
PCB 167	0.000070	0.00012	0.000093	0.000099	0.0000018
PCB 156/157	0.00039	0.00066	0.00051	0.00055	0.0000099
PCB 169	0.025	0.042	0.033	0.035	0.00064
PCB 189	0.000014	0.000024	0.000019	0.000020	0.00000037
Total Dioxins & Furans Only	0.95	1.62	1.26	1.34	0.025
Total PCBs Only	0.15	0.25	0.19	0.21	0.0038
Total Dioxins & Furans and PCBs	1.10	1.87	1.45	1.55	0.028

* At 25°C and 1 atmosphere

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

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

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

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	2100	269	457	354	380	6.80
1,3-Dichlorobenzene	163	20.9	35.4	27.5	29.5	0.53
1,4-Dichlorobenzene	164	21.0	35.7	27.7	29.7	0.53
1,2-Dichlorobenzene	175	22.4	38.0	29.5	31.7	0.57
Total Dichlorobenzene	502	64.3	109	84.7	90.8	1.63
1,3,5-trichlorobenzene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
1,2,4-trichlorobenzene	77.4	9.91	16.8	13.1	14.0	0.25
1,2,3-trichlorobenzene	14.5	1.86	3.15	2.45	2.62	0.047
Total Trichlorobenzene	104	13.3	22.6	17.5	18.8	0.34
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	13.4	1.72	2.91	2.26	2.42	0.043
1,2,3,4-tetrachlorobenzene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Total Tetrachlorobenzene	<25.4	<3.25	<5.52	<4.29	<4.60	<0.082
Pentachlorobenzene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Hexachlorobenzene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Total Chlorobenzenes	<2755	<353	<599	<465	<499	<8.92

Dry Gas Volume Sampled (Rm³*) :	4.600
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	3010	373	639	493	528	9.65
1,3-Dichlorobenzene	196	24.3	41.6	32.1	34.4	0.63
1,4-Dichlorobenzene	151	18.7	32.1	24.7	26.5	0.48
1,2-Dichlorobenzene	170	21.1	36.1	27.8	29.8	0.55
Total Dichlorobenzene	517	64.0	110	84.6	90.6	1.66
1,3,5-trichlorobenzene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
1,2,4-trichlorobenzene	109	13.5	23.2	17.8	19.1	0.35
1,2,3-trichlorobenzene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Total Trichlorobenzene	133	16.5	28.2	21.8	23.3	0.43
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	28.9	3.58	6.14	4.73	5.07	0.093
1,2,3,4-tetrachlorobenzene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Total Tetrachlorobenzene	<40.9	<5.06	<8.69	<6.69	<7.17	<0.13
Pentachlorobenzene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Hexachlorobenzene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Total Chlorobenzenes	<3725	<461	<791	<610	<653	<11.9

Dry Gas Volume Sampled (Rm³*) :	4.708
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	2460	291	492	385	408	7.62
1,3-Dichlorobenzene	224	26.5	44.8	35.0	37.1	0.69
1,4-Dichlorobenzene	222	26.3	44.4	34.7	36.8	0.69
1,2-Dichlorobenzene	193	22.8	38.6	30.2	32.0	0.60
Total Dichlorobenzene	639	75.6	128	100	106	1.98
1,3,5-trichlorobenzene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
1,2,4-trichlorobenzene	168	19.9	33.6	26.3	27.8	0.52
1,2,3-trichlorobenzene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Total Trichlorobenzene	192	22.7	38.4	30.0	31.8	0.59
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	44.0	5.20	8.79	6.88	7.29	0.14
1,2,3,4-tetrachlorobenzene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Total Tetrachlorobenzene	<56.0	<6.62	<11.2	<8.76	<9.28	<0.17
Pentachlorobenzene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Hexachlorobenzene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Total Chlorobenzenes	<3371	<399	<674	<527	<558	<10.4

Dry Gas Volume Sampled (Rm³*) :	5.003
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.8
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 54
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
Monochlorobenzene	269	373	291	311	17.6
1,3-Dichlorobenzene	20.9	24.3	26.5	23.9	11.9
1,4-Dichlorobenzene	21.0	18.7	26.3	22.0	17.6
1,2-Dichlorobenzene	22.4	21.1	22.8	22.1	4.2
Total Dichlorobenzene	64.3	64.0	75.6	68.0	9.7
1,3,5-trichlorobenzene	<1.54	<1.49	<1.42	<1.48	4.0
1,2,4-trichlorobenzene	9.91	13.5	19.9	14.4	35.0
1,2,3-trichlorobenzene	1.86	<1.49	<1.42	<1.59	14.8
Total Trichlorobenzene	13.3	16.5	22.7	17.5	27.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	1.72	3.58	5.20	3.50	49.9
1,2,3,4-tetrachlorobenzene	<1.54	<1.49	<1.42	<1.48	4.0
Total Tetrachlorobenzene	<3.25	<5.06	<6.62	<4.98	33.9
Pentachlorobenzene	<1.54	<1.49	<1.42	<1.48	4.0
Hexachlorobenzene	<1.54	<1.49	<1.42	<1.48	4.0
Total Chlorobenzenes	<353	<461	<399	<404	13.5

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

Specific Isomer	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	457	639	492	529	18.3
1,3-Dichlorobenzene	35.4	41.6	44.8	40.6	11.7
1,4-Dichlorobenzene	35.7	32.1	44.4	37.4	16.9
1,2-Dichlorobenzene	38.0	36.1	38.6	37.6	3.5
Total Dichlorobenzene	109	110	128	116	9.1
1,3,5-trichlorobenzene	<2.61	<2.55	<2.40	<2.52	4.3
1,2,4-trichlorobenzene	16.8	23.2	33.6	24.5	34.5
1,2,3-trichlorobenzene	3.15	<2.55	<2.40	<2.70	14.8
Total Trichlorobenzene	22.6	28.2	38.4	29.7	26.9
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.91	6.14	8.79	5.95	49.5
1,2,3,4-tetrachlorobenzene	<2.61	<2.55	<2.40	<2.52	4.3
Total Tetrachlorobenzene	<5.52	<8.69	<11.2	<8.5	33.6
Pentachlorobenzene	<2.61	<2.55	<2.40	<2.52	4.3
Hexachlorobenzene	<2.61	<2.55	<2.40	<2.52	4.3
Total Chlorobenzenes	<599	<791	<674	<688	14.1

* At 25°C and 1 atmosphere

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

Specific Isomer	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	354	493	385	411	17.7
1,3-Dichlorobenzene	27.5	32.1	35.0	31.5	12.1
1,4-Dichlorobenzene	27.7	24.7	34.7	29.0	17.7
1,2-Dichlorobenzene	29.5	27.8	30.2	29.2	4.2
Total Dichlorobenzene	84.7	84.6	100	89.8	9.9
1,3,5-trichlorobenzene	<2.02	<1.96	<1.88	<1.96	3.8
1,2,4-trichlorobenzene	13.1	17.8	26.3	19.1	35.1
1,2,3-trichlorobenzene	2.45	<1.96	<1.88	<2.10	14.6
Total Trichlorobenzene	17.5	21.8	30.0	23.1	27.5
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.26	4.73	6.88	4.62	50.0
1,2,3,4-tetrachlorobenzene	<2.02	<1.96	<1.88	<1.96	3.8
Total Tetrachlorobenzene	<4.29	<6.69	<8.76	<6.58	34.1
Pentachlorobenzene	<2.02	<1.96	<1.88	<1.96	3.8
Hexachlorobenzene	<2.02	<1.96	<1.88	<1.96	3.8
Total Chlorobenzenes	<465	<610	<527	<534	13.6

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

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

Specific Isomer	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	380	528	408	438	17.9
1,3-Dichlorobenzene	29.5	34.4	37.1	33.7	11.5
1,4-Dichlorobenzene	29.7	26.5	36.8	31.0	17.0
1,2-Dichlorobenzene	31.7	29.8	32.0	31.1	3.8
Total Dichlorobenzene	90.8	90.6	106	95.8	9.1
1,3,5-trichlorobenzene	<2.17	<2.10	<1.99	<2.09	4.4
1,2,4-trichlorobenzene	14.0	19.1	27.8	20.3	34.4
1,2,3-trichlorobenzene	2.62	<2.10	<1.99	<2.24	15.1
Total Trichlorobenzene	18.8	23.3	31.8	24.6	26.8
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	2.42	5.07	7.29	4.93	49.4
1,2,3,4-tetrachlorobenzene	<2.17	<2.10	<1.99	<2.09	4.4
Total Tetrachlorobenzene	<4.60	<7.17	<9.28	<7.01	33.4
Pentachlorobenzene	<2.17	<2.10	<1.99	<2.09	4.4
Hexachlorobenzene	<2.17	<2.10	<1.99	<2.09	4.4
Total Chlorobenzenes	<499	<653	<558	<570	13.6

* At 25°C and 1 atmosphere

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

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	6.80	9.65	7.62	8.03	18.3
1,3-Dichlorobenzene	0.53	0.63	0.69	0.62	13.6
1,4-Dichlorobenzene	0.53	0.48	0.69	0.57	18.8
1,2-Dichlorobenzene	0.57	0.55	0.60	0.57	4.6
Total Dichlorobenzene	1.63	1.66	1.98	1.75	11.1
1,3,5-trichlorobenzene	<0.039	<0.038	<0.037	<0.038	2.3
1,2,4-trichlorobenzene	0.25	0.35	0.52	0.37	36.5
1,2,3-trichlorobenzene	0.047	<0.038	<0.037	<0.041	13.0
Total Trichlorobenzene	0.34	0.43	0.59	0.45	29.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.043	0.093	0.14	0.091	51.2
1,2,3,4-tetrachlorobenzene	<0.039	<0.038	<0.037	<0.038	2.3
Total Tetrachlorobenzene	<0.082	<0.13	<0.17	<0.13	35.4
Pentachlorobenzene	<0.039	<0.038	<0.037	<0.038	2.3
Hexachlorobenzene	<0.039	<0.038	<0.037	<0.038	2.3
Total Chlorobenzenes	<8.92	<11.9	<10.4	<10.4	14.5

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

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	311	529	411	438	8.03
1,3-Dichlorobenzene	23.9	40.6	31.5	33.7	0.62
1,4-Dichlorobenzene	22.0	37.4	29.0	31.0	0.57
1,2-Dichlorobenzene	22.1	37.6	29.2	31.1	0.57
Total Dichlorobenzene	68.0	116	89.8	95.8	1.75
1,3,5-trichlorobenzene	<1.48	<2.52	<1.96	<2.09	<0.038
1,2,4-trichlorobenzene	14.4	24.5	19.1	20.3	0.37
1,2,3-trichlorobenzene	<1.59	<2.70	<2.10	<2.24	<0.041
Total Trichlorobenzene	17.5	29.7	23.1	24.6	0.45
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.50	5.95	4.62	4.93	0.091
1,2,3,4-tetrachlorobenzene	<1.48	<2.52	<1.96	<2.09	<0.038
Total Tetrachlorobenzene	<4.98	<8.47	<6.58	<7.01	<0.13
Pentachlorobenzene	<1.48	<2.52	<1.96	<2.09	<0.038
Hexachlorobenzene	<1.48	<2.52	<1.96	<2.09	<0.038
Total Chlorobenzenes	<404	<688	<534	<570	<10.4

* 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	<12	<12
1,3-Dichlorobenzene	<12	<12
1,4-Dichlorobenzene	15.7	<12
1,2-Dichlorobenzene	<12	<12
Total Dichlorobenzene	<39.7	<36.0
1,3,5-trichlorobenzene	<12	<12
1,2,4-trichlorobenzene	<12	<12
1,2,3-trichlorobenzene	<12	<12
Total Trichlorobenzene	<36.0	<36.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<12	<12
1,2,3,4-tetrachlorobenzene	<12	<12
Total Tetrachlorobenzene	<24.0	<24.0
Pentachlorobenzene	<12	<12
Hexachlorobenzene	<12	<12
Total Chlorobenzenes	<136	<132

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

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
3-monochlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
4-monochlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Total Monochlorophenols	<180	<23.0	<39.1	<30.4	<32.6	<0.58
2,6-dichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,4 & 2,5-dichlorophenol	446	57.1	97.0	75.2	80.7	1.44
3,5-dichlorophenol	828	106	180	140	150	2.68
2,3-dichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
3,4-dichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Total Dichlorophenols	<1454	<186	<316	<245	<263	<4.71
2,4,6-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,3,6-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,3,5-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,4,5-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,3,4-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
3,4,5-trichlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Total Trichlorophenols	<360	<46.1	<78.3	<60.7	<65.1	<1.17
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Total Tetrachlorophenols	<120	<15.4	<26.1	<20.2	<21.7	<0.39
Pentachlorophenol	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Total Chlorophenols	<2174	<278	<473	<367	<393	<7.04

Dry Gas Volume Sampled (Rm³*) :	4.600
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
3-monochlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
4-monochlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Total Monochlorophenols	<180	<22.3	<38.2	<29.5	<31.5	<0.58
2,6-dichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,4 & 2,5-dichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
3,5-dichlorophenol	738	91.4	157	121	129	2.37
2,3-dichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
3,4-dichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Total Dichlorophenols	<978	<121	<208	<160	<171	<3.14
2,4,6-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,3,6-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,3,5-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,4,5-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,3,4-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
3,4,5-trichlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Total Trichlorophenols	<360	<44.6	<76.5	<58.9	<63.1	<1.15
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Total Tetrachlorophenols	<120	<14.9	<25.5	<19.6	<21.0	<0.38
Pentachlorophenol	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Total Chlorophenols	<1698	<210	<361	<278	<298	<5.45

Dry Gas Volume Sampled (Rm³*) :	4.708
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

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

Specific Isomer	Total Collected ng	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
2-monochlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
3-monochlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
4-monochlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Total Monochlorophenols	<180	<21.3	<36.0	<28.2	<29.8	<0.56
2,6-dichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,4 & 2,5-dichlorophenol	120	14.2	24.0	18.8	19.9	0.37
3,5-dichlorophenol	581	68.7	116	90.9	96.3	1.80
2,3-dichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
3,4-dichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Total Dichlorophenols	<881	<104	<176	<138	<146	<2.73
2,4,6-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,3,6-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,3,5-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,4,5-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,3,4-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
3,4,5-trichlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Total Trichlorophenols	<360	<42.6	<72.0	<56.3	<59.6	<1.12
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Total Tetrachlorophenols	<120	<14.2	<24.0	<18.8	<19.9	<0.37
Pentachlorophenol	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Total Chlorophenols	<1601	<189	<320	<251	<265	<4.96

Dry Gas Volume Sampled (Rm^3*) :	5.003
Actual Flowrate (m^3/s) :	26.2
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
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 64
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
2-monochlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
3-monochlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
4-monochlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
Total Monochlorophenols	<23.0	<22.3	<21.3	<22.2	4.0
2,6-dichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,4 & 2,5-dichlorophenol	57.1	<7.43	14.2	<26.2	103
3,5-dichlorophenol	106	91.4	68.7	88.7	21.2
2,3-dichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
3,4-dichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
Total Dichlorophenols	<186	<121	<104	<137	31.6
2,4,6-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,3,6-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,3,5-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,4,5-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,3,4-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
3,4,5-trichlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
Total Trichlorophenols	<46.1	<44.6	<42.6	<44.4	4.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
2,3,4,5-tetrachlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
Total Tetrachlorophenols	<15.4	<14.9	<14.2	<14.8	4.0
Pentachlorophenol	<7.68	<7.43	<7.09	<7.40	4.0
Total Chlorophenols	<278	<210	<189	<226	20.6

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 Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
3-monochlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
4-monochlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
Total Monochlorophenols	<39.1	<38.2	<36.0	<37.8	4.3
2,6-dichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,4 & 2,5-dichlorophenol	97.0	<12.7	24.0	<44.6	103
3,5-dichlorophenol	180	157	116	151	21.4
2,3-dichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
3,4-dichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
Total Dichlorophenols	<316	<208	<176	<233	31.5
2,4,6-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,3,6-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,3,5-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,4,5-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,3,4-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
3,4,5-trichlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
Total Trichlorophenols	<78.3	<76.5	<72.0	<75.6	4.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
2,3,4,5-tetrachlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
Total Tetrachlorophenols	<26.1	<25.5	<24.0	<25.2	4.3
Pentachlorophenol	<13.0	<12.7	<12.0	<12.6	4.3
Total Chlorophenols	<473	<361	<320	<384	20.6

* 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	<10.1	<9.82	<9.39	<9.78	3.8
3-monochlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
4-monochlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
Total Monochlorophenols	<30.4	<29.5	<28.2	<29.3	3.8
2,6-dichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,4 & 2,5-dichlorophenol	75.2	<9.82	18.8	<34.6	102
3,5-dichlorophenol	140	121	90.9	117	21.0
2,3-dichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
3,4-dichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
Total Dichlorophenols	<245	<160	<138	<181	31.3
2,4,6-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,3,6-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,3,5-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,4,5-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,3,4-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
3,4,5-trichlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
Total Trichlorophenols	<60.7	<58.9	<56.3	<58.7	3.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
2,3,4,5-tetrachlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
Total Tetrachlorophenols	<20.2	<19.6	<18.8	<19.6	3.8
Pentachlorophenol	<10.1	<9.82	<9.39	<9.78	3.8
Total Chlorophenols	<367	<278	<251	<298	20.4

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

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

Specific Isomer	Wet Reference Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
3-monochlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
4-monochlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
Total Monochlorophenols	<32.6	<31.5	<29.8	<31.3	4.4
2,6-dichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,4 & 2,5-dichlorophenol	80.7	<10.5	19.9	<37.0	103
3,5-dichlorophenol	150	129	96.3	125	21.6
2,3-dichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
3,4-dichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
Total Dichlorophenols	<263	<171	<146	<193	31.8
2,4,6-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,3,6-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,3,5-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,4,5-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,3,4-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
3,4,5-trichlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
Total Trichlorophenols	<65.1	<63.1	<59.6	<62.6	4.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
2,3,4,5-tetrachlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
Total Tetrachlorophenols	<21.7	<21.0	<19.9	<20.9	4.4
Pentachlorophenol	<10.9	<10.5	<9.94	<10.4	4.4
Total Chlorophenols	<393	<298	<265	<319	20.9

* 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	<0.19	<0.19	<0.19	<0.19	2.3
3-monochlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
4-monochlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
Total Monochlorophenols	<0.58	<0.58	<0.56	<0.57	2.3
2,6-dichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,4 & 2,5-dichlorophenol	1.44	<0.19	0.37	<0.67	101
3,5-dichlorophenol	2.68	2.37	1.80	2.28	19.6
2,3-dichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
3,4-dichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
Total Dichlorophenols	<4.71	<3.14	<2.73	<3.53	29.7
2,4,6-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,3,6-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,3,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,3,4-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
3,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
Total Trichlorophenols	<1.17	<1.15	<1.12	<1.15	2.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
2,3,4,5-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
Total Tetrachlorophenols	<0.39	<0.38	<0.37	<0.38	2.3
Pentachlorophenol	<0.19	<0.19	<0.19	<0.19	2.3
Total Chlorophenols	<7.04	<5.45	<4.96	<5.82	18.7

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	<7.40	<12.6	<9.78	<10.4	<0.19
3-monochlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
4-monochlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
Total Monochlorophenols	<22.2	<37.8	<29.3	<31.3	<0.57
2,6-dichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,4 & 2,5-dichlorophenol	<26.2	<44.6	<34.6	<37.0	<0.67
3,5-dichlorophenol	88.7	151	117	125	2.28
2,3-dichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
3,4-dichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
Total Dichlorophenols	<137	<233	<181	<193	<3.53
2,4,6-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,3,6-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,3,5-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,4,5-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,3,4-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
3,4,5-trichlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
Total Trichlorophenols	<44.4	<75.6	<58.7	<62.6	<1.15
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
2,3,4,5-tetrachlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
Total Tetrachlorophenols	<14.8	<25.2	<19.6	<20.9	<0.38
Pentachlorophenol	<7.40	<12.6	<9.78	<10.4	<0.19
Total Chlorophenols	<226	<384	<298	<319	<5.82

* 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 No. 1 Total ng	Blank Train No. 2 Total ng
2-monochlorophenol	<60	NQ	<60
3-monochlorophenol	<60	NQ	<60
4-monochlorophenol	<60	NQ	<60
Total Monochlorophenols	<180	NQ	<180
2,6-dichlorophenol	<60	NQ	<60
2,4 & 2,5-dichlorophenol	<60	NQ	<60
3,5-dichlorophenol	<60	NQ	<60
2,3-dichlorophenol	<60	NQ	<60
3,4-dichlorophenol	<60	NQ	<60
Total Dichlorophenols	<300	NQ	<300
2,4,6-trichlorophenol	<60	<60	<60
2,3,6-trichlorophenol	<60	<60	<60
2,3,5-trichlorophenol	<60	<60	<60
2,4,5-trichlorophenol	<60	<60	<60
2,3,4-trichlorophenol	<60	<60	<60
3,4,5-trichlorophenol	<60	<60	<60
Total Trichlorophenols	<360	<360	<360
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<60	<60
2,3,4,5-tetrachlorophenol	<60	<60	<60
Total Tetrachlorophenols	<120	<120	<120
Pentachlorophenol	<60	<60	<60
Total Chlorophenols	<1020	<540	<1020

"<" 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.

NQ - Not quantifiable due to an absence of significant recovery of the extraction standard.

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	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Acenaphthylene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Anthracene	12.2	1.56	2.65	2.06	2.21	0.040
Benzo(a)Anthracene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(b)Fluoranthene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(k)Fluoranthene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(a)fluorene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(b)fluorene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(g,h,i)Perylene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(a)Pyrene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Benzo(e)Pyrene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Biphenyl	50.0	6.40	10.9	8.44	9.05	0.16
2-Chloronaphthalene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Chrysene/Triphenylene	70.4	9.01	15.3	11.9	12.7	0.23
Coronene	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Dibenzo(a,e)pyrene	<60	<7.68	<13.0	<10.1	<10.9	<0.19
9,10-dimethylanthracene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
7,12-Dimethylbenzo(a)anthracene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Fluoranthene	124	15.9	27.0	20.9	22.4	0.40
Fluorene	59.8	7.66	13.0	10.1	10.8	0.19
Indeno(1,2,3-cd)Pyrene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
2-methylanthracene	157	20.1	34.1	26.5	28.4	0.51
3-Methylcholanthrene	<60	<7.7	<13.0	<10.1	<10.9	<0.19
1-Methylnaphthalene	37.3	4.78	8.11	6.29	6.75	0.12
2-Methylnaphthalene	58.1	7.44	12.6	9.80	10.5	0.19
1-Methylphenanthrene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
9-Methylphenanthrene	89.5	11.5	19.5	15.1	16.2	0.29
Naphthalene	229	29.3	49.8	38.6	41.4	0.74
Perylene	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Phenanthrene	534	68.4	116	90.1	96.6	1.73
Picene	<60	<7.68	<13.0	<10.1	<10.9	<0.19
Pyrene	105	13.4	22.8	17.7	19.0	0.34
Tetralin	118	15.1	25.7	19.9	21.4	0.38
m-terphenyl	<12	<1.54	<2.61	<2.02	<2.17	<0.039
o-Terphenyl	<12	<1.54	<2.61	<2.02	<2.17	<0.039
p-terphenyl	<12	<1.54	<2.61	<2.02	<2.17	<0.039
Total	<2124	<272	<462	<358	<384	<6.88

Dry Gas Volume Sampled (Rm³*) :	4.600
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

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

Compound	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Acenaphthylene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Anthracene	21.1	2.61	4.48	3.45	3.70	0.068
Benzo(a)Anthracene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(b)Fluoranthene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(k)Fluoranthene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(a)fluorene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(b)fluorene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(g,h,i)Perylene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(a)Pyrene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Benzo(e)Pyrene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Biphenyl	35.1	4.35	7.46	5.74	6.15	0.11
2-Chloronaphthalene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Chrysene/Triphenylene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Coronene	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Dibenzo(a,e)pyrene	<60	<7.43	<12.7	<9.82	<10.5	<0.19
9,10-dimethylanthracene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
7,12-Dimethylbenzo(a)anthracene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Fluoranthene	23.5	2.91	4.99	3.85	4.12	0.075
Fluorene	18.2	2.25	3.87	2.98	3.19	0.058
Indeno(1,2,3-cd)Pyrene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
2-methylanthracene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
3-Methylcholanthrene	<60	<7.43	<12.7	<9.82	<10.5	<0.19
1-Methylnaphthalene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
2-Methylnaphthalene	23.2	2.87	4.93	3.80	4.07	0.074
1-Methylphenanthrene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
9-Methylphenanthrene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Naphthalene	164	20.3	34.8	26.8	28.7	0.53
Perylene	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Phenanthrene	78.8	9.76	16.7	12.9	13.8	0.25
Picene	<60	<7.43	<12.7	<9.82	<10.5	<0.19
Pyrene	33.7	4.17	7.16	5.51	5.91	0.11
Tetralin	91.4	11.3	19.4	15.0	16.0	0.29
m-terphenyl	<12	<1.49	<2.55	<1.96	<2.10	<0.038
o-Terphenyl	<12	<1.49	<2.55	<1.96	<2.10	<0.038
p-terphenyl	<12	<1.49	<2.55	<1.96	<2.10	<0.038
Total	<1017	<126	<216	<166	<178	<3.26

Dry Gas Volume Sampled (Rm³*) :	4.708
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
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 ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Acenaphthylene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Anthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(a)Anthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(b)Fluoranthene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(k)Fluoranthene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(a)fluorene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(b)fluorene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(g,h,i)Perylene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(a)Pyrene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Benzo(e)Pyrene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Biphenyl	221	26.1	44.2	34.6	36.6	0.68
2-Chloronaphthalene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Chrysene/Triphenylene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Coronene	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Dibenzo(a,e)pyrene	<60	<7.09	<12.0	<9.39	<9.94	<0.19
9,10-dimethylanthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
7,12-Dimethylbenzo(a)anthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Fluoranthene	18.4	2.18	3.68	2.88	3.05	0.057
Fluorene	30.4	3.59	6.08	4.76	5.04	0.094
Indeno(1,2,3-cd)Pyrene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
2-methylanthracene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
3-Methylcholanthrene	<60	<7.09	<12.0	<9.39	<9.94	<0.19
1-Methylnaphthalene	34.0	4.02	6.80	5.32	5.63	0.11
2-Methylnaphthalene	69.5	8.22	13.9	10.9	11.5	0.22
1-Methylphenanthrene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
9-Methylphenanthrene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Naphthalene	313	37.0	62.6	49.0	51.9	0.97
Perylene	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Phenanthrene	122	14.4	24.4	19.1	20.2	0.38
Picene	<60	<7.09	<12.0	<9.39	<9.94	<0.19
Pyrene	20.9	2.47	4.18	3.27	3.46	0.065
Tetralin	131	15.5	26.2	20.5	21.7	0.41
m-terphenyl	<12	<1.42	<2.40	<1.88	<1.99	<0.037
o-Terphenyl	<12	<1.42	<2.40	<1.88	<1.99	<0.037
p-terphenyl	<12	<1.42	<2.40	<1.88	<1.99	<0.037
Total	<1488	<176	<297	<233	<247	<4.61

Dry Gas Volume Sampled (Rm³*) :	5.003
Actual Flowrate (m³/s) :	26.2
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.8
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 74
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	<1.54	<1.49	<1.42	<1.48	4.0
Acenaphthylene	<1.54	<1.49	<1.42	<1.48	4.0
Anthracene	1.56	2.61	<1.42	<1.86	35.0
Benzo(a)Anthracene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(b)Fluoranthene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(k)Fluoranthene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(a)fluorene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(b)fluorene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(g,h,i)Perylene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(a)Pyrene	<1.54	<1.49	<1.42	<1.48	4.0
Benzo(e)Pyrene	<1.54	<1.49	<1.42	<1.48	4.0
Biphenyl	6.40	4.35	26.1	12.3	97.8
2-Chloronaphthalene	<1.54	<1.49	<1.42	<1.48	4.0
Chrysene/Triphenylene	9.01	<1.49	<1.42	<3.97	110
Coronene	<7.68	<7.43	<7.09	<7.40	4.0
Dibenzo(a,c/a,h)Anthracene	<1.54	<1.49	<1.42	<1.48	4.0
Dibenzo(a,e)pyrene	<7.68	<7.43	<7.09	<7.40	4.0
9,10-dimethylanthracene	<1.54	<1.49	<1.42	<1.48	4.0
7,12-Dimethylbenzo(a)anthracene	<1.54	<1.49	<1.42	<1.48	4.0
Fluoranthene	15.9	2.91	2.18	6.99	110
Fluorene	7.66	2.25	3.59	4.50	62.5
Indeno(1,2,3-cd)Pyrene	<1.54	<1.49	<1.42	<1.48	4.0
2-methylanthracene	20.1	<1.49	<1.42	<7.67	140
3-Methylcholanthrene	<7.7	<7.43	<7.09	<7.40	4.0
1-Methylnaphthalene	4.78	<1.49	4.02	<3.43	50.3
2-Methylnaphthalene	7.44	2.87	8.22	6.18	46.7
1-Methylphenanthrene	<1.54	<1.49	<1.42	<1.48	4.0
9-Methylphenanthrene	11.5	<1.49	<1.42	<4.79	121
Naphthalene	29.3	20.3	37.0	28.9	28.9
Perylene	<1.54	<1.49	<1.42	<1.48	4.0
Phenanthrene	68.4	9.76	14.4	30.9	106
Picene	<7.68	<7.43	<7.09	<7.40	4.0
Pyrene	13.4	4.17	2.47	6.70	88.2
Tetralin	15.1	11.3	15.5	14.0	16.5
m-terphenyl	<1.54	<1.49	<1.42	<1.48	4.0
o-Terphenyl	<1.54	<1.49	<1.42	<1.48	4.0
p-terphenyl	<1.54	<1.49	<1.42	<1.48	4.0
Total	<272	<126	<176	<191	38.8

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

Compound	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Acenaphthene	<2.61	<2.55	<2.40	<2.52	4.3
Acenaphthylene	<2.61	<2.55	<2.40	<2.52	4.3
Anthracene	2.65	4.48	<2.40	<3.18	35.8
Benzo(a)Anthracene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(b)Fluoranthene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(k)Fluoranthene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(a)fluorene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(b)fluorene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(g,h,i)Perylene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(a)Pyrene	<2.61	<2.55	<2.40	<2.52	4.3
Benzo(e)Pyrene	<2.61	<2.55	<2.40	<2.52	4.3
Biphenyl	10.9	7.46	44.2	20.8	97.4
2-Chloronaphthalene	<2.61	<2.55	<2.40	<2.52	4.3
Chrysene/Triphenylene	15.3	<2.55	<2.40	<6.75	110
Coronene	<13.0	<12.7	<12.0	<12.6	4.3
Dibenzo(a,c/a,h)Anthracene	<2.61	<2.55	<2.40	<2.52	4.3
Dibenzo(a,e)pyrene	<13.0	<12.7	<12.0	<12.6	4.3
9,10-dimethylanthracene	<2.61	<2.55	<2.40	<2.52	4.3
7,12-Dimethylbenzo(a)anthracene	<2.61	<2.55	<2.40	<2.52	4.3
Fluoranthene	27.0	4.99	3.68	11.9	110
Fluorene	13.0	3.87	6.08	7.65	62.3
Indeno(1,2,3-cd)Pyrene	<2.61	<2.55	<2.40	<2.52	4.3
2-methylanthracene	34.1	<2.55	<2.40	<13.0	140
3-Methylcholanthrene	<13.0	<12.7	<12.0	<12.6	4.3
1-Methylnaphthalene	8.11	<2.55	6.80	<5.82	50.0
2-Methylnaphthalene	12.6	4.93	13.9	10.5	46.3
1-Methylphenanthrene	<2.61	<2.55	<2.40	<2.52	4.3
9-Methylphenanthrene	19.5	<2.55	<2.40	<8.13	121
Naphthalene	49.8	34.8	62.6	49.1	28.3
Perylene	<2.61	<2.55	<2.40	<2.52	4.3
Phenanthrene	116	16.7	24.4	52.4	105
Picene	<13.0	<12.7	<12.0	<12.6	4.3
Pyrene	22.8	7.16	4.18	11.4	88.0
Tetralin	25.7	19.4	26.2	23.8	15.9
m-terphenyl	<2.61	<2.55	<2.40	<2.52	4.3
o-Terphenyl	<2.61	<2.55	<2.40	<2.52	4.3
p-terphenyl	<2.61	<2.55	<2.40	<2.52	4.3
Total	<462	<216	<297	<325	38.5

* At 25°C and 1 atmosphere

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

Compound	Dry Adjusted Concentration				Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<2.02	<1.96	<1.88	<1.96	3.8
Acenaphthylene	<2.02	<1.96	<1.88	<1.96	3.8
Anthracene	2.06	3.45	<1.88	<2.46	35.0
Benzo(a)Anthracene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(b)Fluoranthene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(k)Fluoranthene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(a)fluorene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(b)fluorene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(g,h,i)Perylene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(a)Pyrene	<2.02	<1.96	<1.88	<1.96	3.8
Benzo(e)Pyrene	<2.02	<1.96	<1.88	<1.96	3.8
Biphenyl	8.44	5.74	34.6	16.3	98.0
2-Chloronaphthalene	<2.02	<1.96	<1.88	<1.96	3.8
Chrysene/Triphenylene	11.9	<1.96	<1.88	<5.24	110
Coronene	<10.1	<9.82	<9.39	<9.78	3.8
Dibenzo(a,c/a,h)Anthracene	<2.02	<1.96	<1.88	<1.96	3.8
Dibenzo(a,e)pyrene	<10.1	<9.82	<9.39	<9.78	3.8
9,10-dimethylanthracene	<2.02	<1.96	<1.88	<1.96	3.8
7,12-Dimethylbenzo(a)anthracene	<2.02	<1.96	<1.88	<1.96	3.8
Fluoranthene	20.9	3.85	2.88	9.21	110
Fluorene	10.1	2.98	4.76	5.94	62.3
Indeno(1,2,3-cd)Pyrene	<2.02	<1.96	<1.88	<1.96	3.8
2-methylanthracene	26.5	<1.96	<1.88	<10.1	140
3-Methylcholanthrene	<10.1	<9.82	<9.39	<9.78	3.8
1-Methylnaphthalene	6.29	<1.96	5.32	<4.53	50.2
2-Methylnaphthalene	9.80	3.80	10.9	8.16	46.8
1-Methylphenanthrene	<2.02	<1.96	<1.88	<1.96	3.8
9-Methylphenanthrene	15.1	<1.96	<1.88	<6.31	121
Naphthalene	38.6	26.8	49.0	38.1	29.0
Perylene	<2.02	<1.96	<1.88	<1.96	3.8
Phenanthrene	90.1	12.9	19.1	40.7	105
Picene	<10.1	<9.82	<9.39	<9.78	3.8
Pyrene	17.7	5.51	3.27	8.83	88.0
Tetralin	19.9	15.0	20.5	18.5	16.5
m-terphenyl	<2.02	<1.96	<1.88	<1.96	3.8
o-Terphenyl	<2.02	<1.96	<1.88	<1.96	3.8
p-terphenyl	<2.02	<1.96	<1.88	<1.96	3.8
Total	<358	<166	<233	<253	38.6

* 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	<2.17	<2.10	<1.99	<2.09	4.4
Acenaphthylene	<2.17	<2.10	<1.99	<2.09	4.4
Anthracene	2.21	3.70	<1.99	<2.63	35.4
Benzo(a)Anthracene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(b)Fluoranthene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(k)Fluoranthene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(a)fluorene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(b)fluorene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(g,h,i)Perylene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(a)Pyrene	<2.17	<2.10	<1.99	<2.09	4.4
Benzo(e)Pyrene	<2.17	<2.10	<1.99	<2.09	4.4
Biphenyl	9.05	6.15	36.6	17.3	97.4
2-Chloronaphthalene	<2.17	<2.10	<1.99	<2.09	4.4
Chrysene/Triphenylene	12.7	<2.10	<1.99	<5.61	110
Coronene	<10.9	<10.5	<9.94	<10.4	4.4
Dibenzo(a,c/a,h)Anthracene	<2.17	<2.10	<1.99	<2.09	4.4
Dibenzo(a,e)pyrene	<10.9	<10.5	<9.94	<10.4	4.4
9,10-dimethylanthracene	<2.17	<2.10	<1.99	<2.09	4.4
7,12-Dimethylbenzo(a)anthracene	<2.17	<2.10	<1.99	<2.09	4.4
Fluoranthene	22.4	4.12	3.05	9.87	110
Fluorene	10.8	3.19	5.04	6.35	62.7
Indeno(1,2,3-cd)Pyrene	<2.17	<2.10	<1.99	<2.09	4.4
2-methylanthracene	28.4	<2.10	<1.99	<10.8	141
3-Methylcholanthrene	<10.9	<10.5	<9.94	<10.4	4.4
1-Methylnaphthalene	6.75	<2.10	5.63	<4.83	50.2
2-Methylnaphthalene	10.5	4.07	11.5	8.70	46.5
1-Methylphenanthrene	<2.17	<2.10	<1.99	<2.09	4.4
9-Methylphenanthrene	16.2	<2.10	<1.99	<6.76	121
Naphthalene	41.4	28.7	51.9	40.7	28.5
Perylene	<2.17	<2.10	<1.99	<2.09	4.4
Phenanthrene	96.6	13.8	20.2	43.6	106
Picene	<10.9	<10.5	<9.94	<10.4	4.4
Pyrene	19.0	5.91	3.46	9.46	88.4
Tetralin	21.4	16.0	21.7	19.7	16.2
m-terphenyl	<2.17	<2.10	<1.99	<2.09	4.4
o-Terphenyl	<2.17	<2.10	<1.99	<2.09	4.4
p-terphenyl	<2.17	<2.10	<1.99	<2.09	4.4
Total	<384	<178	<247	<270	38.9

* At 25°C and 1 atmosphere

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

Compound	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Acenaphthene	<0.039	<0.038	<0.037	<0.038	2.3
Acenaphthylene	<0.039	<0.038	<0.037	<0.038	2.3
Anthracene	0.040	0.068	<0.037	<0.048	35.3
Benzo(a)Anthracene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(b)Fluoranthene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(k)Fluoranthene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(a)fluorene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(b)fluorene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(g,h,i)Perylene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(a)Pyrene	<0.039	<0.038	<0.037	<0.038	2.3
Benzo(e)Pyrene	<0.039	<0.038	<0.037	<0.038	2.3
Biphenyl	0.16	0.11	0.68	0.32	99.1
2-Chloronaphthalene	<0.039	<0.038	<0.037	<0.038	2.3
Chrysene/Triphenylene	0.23	<0.038	<0.037	<0.10	108
Coronene	<0.19	<0.19	<0.19	<0.19	2.3
Dibenzo(a,c/a,h)Anthracene	<0.039	<0.038	<0.037	<0.038	2.3
Dibenzo(a,e)pyrene	<0.19	<0.19	<0.19	<0.19	2.3
9,10-dimethylanthracene	<0.039	<0.038	<0.037	<0.038	2.3
7,12-Dimethylbenzo(a)anthracene	<0.039	<0.038	<0.037	<0.038	2.3
Fluoranthene	0.40	0.075	0.057	0.18	109
Fluorene	0.19	0.058	0.094	0.12	60.8
Indeno(1,2,3-cd)Pyrene	<0.039	<0.038	<0.037	<0.038	2.3
2-methylanthracene	0.51	<0.038	<0.037	<0.19	140
3-Methylcholanthrene	<0.19	<0.19	<0.19	<0.19	2.3
1-Methylnaphthalene	0.12	<0.038	0.11	<0.088	49.6
2-Methylnaphthalene	0.19	0.074	0.22	0.16	46.9
1-Methylphenanthrene	<0.039	<0.038	<0.037	<0.038	2.3
9-Methylphenanthrene	0.29	<0.038	<0.037	<0.12	119
Naphthalene	0.74	0.53	0.97	0.75	29.8
Perylene	<0.039	<0.038	<0.037	<0.038	2.3
Phenanthrene	1.73	0.25	0.38	0.79	104
Picene	<0.19	<0.19	<0.19	<0.19	2.3
Pyrene	0.34	0.11	0.065	0.17	86.6
Tetralin	0.38	0.29	0.41	0.36	16.5
m-terphenyl	<0.039	<0.038	<0.037	<0.038	2.3
o-Terphenyl	<0.039	<0.038	<0.037	<0.038	2.3
p-terphenyl	<0.039	<0.038	<0.037	<0.038	2.3
Total	<6.88	<3.26	<4.61	<4.92	37.2

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

Compound	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<1.48	<2.52	<1.96	<2.09	<0.038
Acenaphthylene	<1.48	<2.52	<1.96	<2.09	<0.038
Anthracene	<1.86	<3.18	<2.46	<2.63	<0.048
Benzo(a)Anthracene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(b)Fluoranthene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(k)Fluoranthene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(a)fluorene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(b)fluorene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(g,h,i)Perylene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(a)Pyrene	<1.48	<2.52	<1.96	<2.09	<0.038
Benzo(e)Pyrene	<1.48	<2.52	<1.96	<2.09	<0.038
Biphenyl	12.3	20.8	16.3	17.3	0.32
2-Chloronaphthalene	<1.48	<2.52	<1.96	<2.09	<0.038
Chrysene/Triphenylene	<3.97	<6.75	<5.24	<5.61	<0.10
Coronene	<7.40	<12.6	<9.78	<10.4	<0.19
Dibenzo(a,c/a,h)Anthracene	<1.48	<2.52	<1.96	<2.09	<0.038
Dibenzo(a,e)pyrene	<7.40	<12.6	<9.78	<10.4	<0.19
9,10-dimethylanthracene	<1.48	<2.52	<1.96	<2.09	<0.038
7,12-Dimethylbenzo(a)anthracene	<1.48	<2.52	<1.96	<2.09	<0.038
Fluoranthene	6.99	11.9	9.21	9.87	0.18
Fluorene	4.50	7.65	5.94	6.35	0.12
Indeno(1,2,3-cd)Pyrene	<1.48	<2.52	<1.96	<2.09	<0.038
2-methylanthracene	<7.67	<13.0	<10.1	<10.8	<0.19
3-Methylcholanthrene	<7.40	<12.6	<9.78	<10.4	<0.19
1-Methylnaphthalene	<3.43	<5.82	<4.53	<4.83	<0.088
2-Methylnaphthalene	6.18	10.5	8.16	8.70	0.16
1-Methylphenanthrene	<1.48	<2.52	<1.96	<2.09	<0.038
9-Methylphenanthrene	<4.79	<8.13	<6.31	<6.76	<0.12
Naphthalene	28.9	49.1	38.1	40.7	0.75
Perylene	<1.48	<2.52	<1.96	<2.09	<0.038
Phenanthrene	30.9	52.4	40.7	43.6	0.79
Picene	<7.40	<12.6	<9.78	<10.4	<0.19
Pyrene	6.70	11.4	8.83	9.46	0.17
Tetralin	14.0	23.8	18.5	19.7	0.36
m-terphenyl	<1.48	<2.52	<1.96	<2.09	<0.038
o-Terphenyl	<1.48	<2.52	<1.96	<2.09	<0.038
p-terphenyl	<1.48	<2.52	<1.96	<2.09	<0.038
Total	<191	<325	<253	<270	<4.92

* 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	<12	<12
Acenaphthylene	<12	<12
Anthracene	<12	<12
Benzo(a)Anthracene	<12	<12
Benzo(b)Fluoranthene	<12	<12
Benzo(k)Fluoranthene	<12	<12
Benzo(a)fluorene	<12	<12
Benzo(b)fluorene	<12	<12
Benzo(g,h,i)Perylene	<12	<12
Benzo(a)Pyrene	<12	<12
Benzo(e)Pyrene	<12	<12
Biphenyl	<12	<12
2-Chloronaphthalene	<12	<12
Chrysene/Triphenylene	<12	<12
Coronene	<60	<60
Dibenzo(a,c/a,h)Anthracene	<12	<12
Dibenzo(a,e)pyrene	<60	<60
9,10-dimethylanthracene	<12	<12
7,12-Dimethylbenzo(a)anthracene	<12	<12
Fluoranthene	<12	<12
Fluorene	<12	<12
Indeno(1,2,3-cd)Pyrene	<12	<12
2-methylanthracene	<12	<12
3-Methylcholanthrene	<60	<60
1-Methylnaphthalene	<12	<12
2-Methylnaphthalene	<12	<12
1-Methylphenanthrene	<12	<12
9-Methylphenanthrene	<12	<12
Naphthalene	89.1	104
Perylene	<12	<12
Phenanthrene	<12	<12
Picene	<60	<60
Pyrene	<12	<12
Tetralin	62.6	94.7
m-terphenyl	<12	<12
o-Terphenyl	<12	<12
p-terphenyl	<12	<12
Total	<764	<811

"<" 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*	Actual µg/m^3	Acetaldehyde Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acetaldehyde Emission Rate mg/s
1	5.1	0.0324	92.6	157	122	131	2.34
2	4.9	0.0315	91.5	155	121	129	2.32
3	6.0	0.0294	120	204	158	170	3.04
Average			101	172	134	143	2.57
Blank	8.7						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual µg/m^3	Formaldehyde Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Formaldehyde Emission Rate mg/s
1	<2.4	0.0324	<43.6	<74.0	<57.4	<61.6	<1.10
2	<2.0	0.0315	<37.4	<63.4	<49.2	<52.8	<0.95
3	<2.4	0.0294	<48.1	<81.7	<63.4	<68.0	<1.22
Average			<43.0	<73.0	<56.7	<60.8	<1.09
Blank	<2.6						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual µg/m^3	Acrolein Concentration Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acrolein Emission Rate mg/s
1	<24	0.0324	<436	<740	<574	<616	<11.0
2	<20	0.0315	<374	<634	<492	<528	<9.45
3	<24	0.0294	<481	<817	<634	<680	<12.2
Average			<430	<730	<567	<608	<10.9
Blank	<26						

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

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

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

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

Compound	Cartridge Amount Collected Run No. 1 Tube 14A/14B	Run No. 2 Tube 15A/15B	Run No. 4 Tube 17A/17B	Average	Coefficient of Variation	Total Collected
	µg	µg	µg	µg	%	µg
Acetone	1.46	0.80	2.01	1.42	42.8	4.27
Benzene	0.35	0.14	0.23	0.24	44.8	0.72
Bromodichloromethane	0.058	<0.01	0.038	<0.035	68.2	<0.11
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	1.36	0.073	0.59	0.67	96.2	2.02
Carbon Tetrachloride	0.19	<0.01	0.074	<0.091	99.7	<0.27
Chloroform	0.077	0.054	0.11	0.079	32.5	0.24
Cumene (Isopropylbenzene)	0.072	0.034	0.061	0.056	35.1	0.17
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	0.029	<0.02	<0.02	<0.023	22.6	<0.069
1,2-Dichloroethane	0.057	0.040	0.077	0.058	31.9	0.17
trans,1,2-Dichloroethene	0.031	<0.01	0.016	<0.019	56.9	<0.057
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	0.49	0.22	0.48	0.40	38.8	1.19
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.51	0.49	0.60	0.53	11.5	1.60
Methylene Chloride	1.31	1.48	1.24	1.34	9.3	4.03
Styrene	0.27	0.20	0.31	0.26	19.7	0.78
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	1.90	0.71	0.86	1.16	56.1	3.47
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	0.079	0.026	0.060	0.055	48.8	0.17
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.63	1.65	1.52	1.60	4.2	4.80
O-Xylene	0.73	0.78	0.64	0.71	10.0	2.14
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<10.8	<6.98	<9.17	<9.00	21.5	<27.0

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0212
Run No. 2	0.0198
Run No. 4	0.0229

* 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 of Variation	Total Collected
	Run No. 1 Tube 18A/18B	Run No. 2 Tube 19A/19B	Run No. 3 Tube 20A/20B	Average		
	µg	µg	µg	µg	%	µg
Acetone	0.79	1.89	1.84	1.51	41.1	4.52
Benzene	0.24	0.27	0.16	0.22	25.4	0.67
Bromodichloromethane	0.076	0.037	0.049	0.054	37.0	0.16
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	0.42	0.80	0.33	0.52	48.9	1.55
Carbon Tetrachloride	0.19	0.065	0.11	0.12	49.9	0.36
Chloroform	0.050	0.13	0.048	0.076	62.0	0.23
Cumene (Isopropylbenzene)	0.065	0.089	0.039	0.064	38.9	0.19
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	0.040	<0.02	<0.027	43.3	<0.080
1,2-Dichloroethane	0.096	0.063	0.044	0.068	38.9	0.20
trans,1,2-Dichloroethene	<0.01	0.018	<0.01	<0.013	36.5	<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	0.33	0.61	0.15	0.36	63.9	1.08
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.68	0.64	0.63	0.65	4.4	1.95
Methylene Chloride	1.27	1.86	1.76	1.63	19.4	4.89
Styrene	0.31	0.35	0.23	0.29	21.1	0.88
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	0.76	1.19	0.79	0.91	26.5	2.74
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	0.024	0.063	0.028	0.038	56.0	0.12
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.52	1.15	0.63	1.10	40.8	3.30
O-Xylene	0.63	0.42	0.25	0.43	44.5	1.30
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<7.71	<9.91	<7.34	<8.32	16.7	<25.0

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0221
Run No. 2	0.0224
Run No. 3	0.0215

* At 25°C and 1 atmosphere.

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

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

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 22A/22B	Run No. 2 Tube 23A/23B	Run No. 3 Tube 24A/24B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	1.44	1.51	2.23	1.73	25.3	5.18
Benzene	0.21	0.13	0.29	0.21	37.9	0.63
Bromodichloromethane	0.067	0.020	0.075	0.054	55.0	0.16
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	0.44	1.28	0.79	0.83	50.5	2.50
Carbon Tetrachloride	0.17	0.035	0.17	0.12	61.9	0.37
Chloroform	0.069	0.11	0.075	0.083	23.2	0.25
Cumene (Isopropylbenzene)	0.089	0.037	0.055	0.060	43.8	0.18
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	0.038	0.021	<0.026	38.4	<0.079
1,2-Dichloroethane	0.074	0.019	0.054	0.049	56.8	0.15
trans,1,2-Dichloroethene	0.015	0.018	0.016	0.016	9.4	0.049
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	0.59	0.22	0.28	0.36	54.6	1.08
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.75	0.27	0.50	0.51	47.2	1.52
Methylene Chloride	1.34	0.79	1.75	1.29	37.4	3.87
Styrene	0.36	0.13	0.21	0.23	52.1	0.69
Tetrachloroethene	0.012	0.011	0.014	0.012	12.4	0.037
Toluene	1.43	0.90	1.58	1.30	27.6	3.91
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	0.058	0.059	0.061	0.059	2.6	0.18
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.12	2.78	1.07	1.66	58.7	4.97
O-Xylene	0.40	0.91	0.46	0.59	47.2	1.76
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<8.87	<9.47	<9.91	<9.42	5.5	<28.2

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0200
Run No. 2	0.0217
Run No. 3	0.0227

* 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	4.27	39.0	66.8	51.5	55.1	1.01
Benzene	0.72	6.53	11.2	8.64	9.25	0.17
Bromodichloromethane	<0.11	<0.97	<1.66	<1.28	<1.37	<0.025
Bromoform	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Bromomethane	<0.27	<2.46	<4.23	<3.26	<3.49	<0.064
1,3-Butadiene	<0.060	<0.55	<0.94	<0.72	<0.78	<0.014
2-Butanone	2.02	18.5	31.7	24.4	26.1	0.48
Carbon Tetrachloride	<0.27	<2.49	<4.27	<3.29	<3.53	<0.065
Chloroform	0.24	2.15	3.69	2.85	3.05	0.056
Cumene (Isopropylbenzene)	0.17	1.52	2.61	2.01	2.16	0.039
Dibromochloromethane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Dichlorodifluoromethane	<0.069	<0.63	<1.08	<0.83	<0.89	<0.016
1,2-Dichloroethane	0.17	1.59	2.72	2.10	2.25	0.041
trans,1,2-Dichloroethene	<0.057	<0.52	<0.89	<0.69	<0.74	<0.013
1,1-Dichloroethene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
1,2-Dichloropropane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Ethylbenzene	1.19	10.9	18.7	14.4	15.4	0.28
Ethylene Dibromide	<0.060	<0.55	<0.94	<0.72	<0.78	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	1.60	14.6	25.0	19.3	20.6	0.38
Methylene Chloride	4.03	36.8	63.1	48.6	52.0	0.95
Styrene	0.78	7.09	12.2	9.37	10.0	0.18
Tetrachloroethene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Toluene	3.47	31.7	54.4	41.9	44.9	0.82
1,1,1-Trichloroethane	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.27	<0.47	<0.36	<0.39	<0.0071
Trichlorotrifluoroethane	0.17	1.51	2.58	1.99	2.13	0.039
Trichlorofluoromethane	<0.060	<0.55	<0.94	<0.72	<0.78	<0.014
M&P-Xylene	4.80	43.8	75.2	57.9	62.0	1.14
O-Xylene	2.14	19.5	33.5	25.8	27.6	0.51
Vinyl Chloride	<0.060	<0.55	<0.94	<0.72	<0.78	<0.014
Total	<27.0	<246	<422	<325	<349	<6.38

Dry Gas Volume Sampled (Rm^3*) :	0.0639
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	19.6
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. 1 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	4.52	39.9	68.4	52.7	56.4	1.03
Benzene	0.67	5.90	10.1	7.79	8.35	0.15
Bromodichloromethane	0.16	1.43	2.45	1.89	2.02	0.037
Bromoform	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Bromomethane	<0.27	<2.38	<4.09	<3.15	<3.37	<0.062
1,3-Butadiene	<0.060	<0.53	<0.91	<0.70	<0.75	<0.014
2-Butanone	1.55	13.6	23.4	18.0	19.3	0.35
Carbon Tetrachloride	0.36	3.21	5.50	4.24	4.54	0.083
Chloroform	0.23	2.02	3.47	2.67	2.86	0.052
Cumene (Isopropylbenzene)	0.19	1.70	2.92	2.25	2.41	0.044
Dibromochloromethane	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Dichlorodifluoromethane	<0.080	<0.71	<1.21	<0.93	<1.00	<0.018
1,2-Dichloroethane	0.20	1.79	3.07	2.37	2.54	0.046
trans,1,2-Dichloroethene	<0.038	<0.34	<0.58	<0.44	<0.47	<0.0087
1,1-Dichloroethene	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
1,2-Dichloropropane	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Ethylbenzene	1.08	9.55	16.4	12.6	13.5	0.25
Ethylene Dibromide	<0.060	<0.53	<0.91	<0.70	<0.75	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	1.95	17.2	29.5	22.7	24.3	0.44
Methylene Chloride	4.89	43.2	74.1	57.1	61.1	1.12
Styrene	0.88	7.73	13.3	10.2	10.9	0.20
Tetrachloroethene	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Toluene	2.74	24.2	41.5	32.0	34.3	0.63
1,1,1-Trichloroethane	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.26	<0.45	<0.35	<0.37	<0.0069
Trichlorotrifluoroethane	0.12	1.02	1.74	1.34	1.44	0.026
Trichlorofluoromethane	<0.060	<0.53	<0.91	<0.70	<0.75	<0.014
M&P-Xylene	3.30	29.1	49.9	38.5	41.2	0.75
O-Xylene	1.30	11.5	19.7	15.1	16.2	0.30
Vinyl Chloride	<0.060	<0.53	<0.91	<0.70	<0.75	<0.014
Total	<25.0	<220	<378	<291	<312	<5.71

Dry Gas Volume Sampled (Rm³*) :	0.0660
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	15.1
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*) :	18.3

* At 25°C and 1 atmosphere

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

TABLE 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	5.18	46.8	80.3	61.8	66.2	1.21
Benzene	0.63	5.66	9.71	7.48	8.01	0.15
Bromodichloromethane	0.16	1.46	2.51	1.94	2.07	0.038
Bromoform	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
Bromomethane	<0.27	<2.44	<4.19	<3.23	<3.45	<0.063
1,3-Butadiene	<0.060	<0.54	<0.93	<0.72	<0.77	<0.014
2-Butanone	2.50	22.6	38.8	29.9	32.0	0.59
Carbon Tetrachloride	0.37	3.33	5.71	4.40	4.71	0.086
Chloroform	0.25	2.25	3.86	2.97	3.19	0.058
Cumene (Isopropylbenzene)	0.18	1.64	2.81	2.16	2.32	0.042
Dibromochloromethane	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
Dichlorodifluoromethane	<0.079	<0.71	<1.23	<0.94	<1.01	<0.018
1,2-Dichloroethane	0.15	1.33	2.28	1.76	1.88	0.034
trans,1,2-Dichloroethene	0.049	0.44	0.76	0.59	0.63	0.011
1,1-Dichloroethene	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
1,2-Dichloropropane	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
Ethylbenzene	1.08	9.77	16.8	12.9	13.8	0.25
Ethylene Dibromide	<0.060	<0.54	<0.93	<0.72	<0.77	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	1.52	13.8	23.6	18.2	19.5	0.36
Methylene Chloride	3.87	35.0	60.0	46.2	49.5	0.91
Styrene	0.69	6.25	10.7	8.26	8.84	0.16
Tetrachloroethene	0.037	0.33	0.57	0.44	0.47	0.0087
Toluene	3.91	35.3	60.6	46.7	50.0	0.91
1,1,1-Trichloroethane	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.27	<0.47	<0.36	<0.38	<0.0070
Trichlorotrifluoroethane	0.18	1.61	2.76	2.13	2.28	0.042
Trichlorofluoromethane	<0.060	<0.54	<0.93	<0.72	<0.77	<0.014
M&P-Xylene	4.97	44.9	77.0	59.3	63.6	1.16
O-Xylene	1.76	15.9	27.3	21.0	22.5	0.41
Vinyl Chloride	<0.060	<0.54	<0.93	<0.72	<0.77	<0.014
Total	<28.2	<255	<438	<337	<361	<6.61

Dry Gas Volume Sampled (Rm^3*) :	0.0645
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	19.6
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. 1 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Acetone	39.0	39.9	46.8	41.9
Benzene	6.53	5.90	5.66	6.03
Bromodichloromethane	<0.97	1.43	1.46	<1.29
Bromoform	<0.27	<0.26	<0.27	<0.27
Bromomethane	<2.46	<2.38	<2.44	<2.43
1,3-Butadiene	<0.55	<0.53	<0.54	<0.54
2-Butanone	18.5	13.6	22.6	18.3
Carbon Tetrachloride	<2.49	3.21	3.33	<3.01
Chloroform	2.15	2.02	2.25	2.14
Cumene (Isopropylbenzene)	1.52	1.70	1.64	1.62
Dibromochloromethane	<0.27	<0.26	<0.27	<0.27
Dichlorodifluoromethane	<0.63	<0.71	<0.71	<0.68
1,2-Dichloroethane	1.59	1.79	1.33	1.57
trans,1,2-Dichloroethene	<0.52	<0.34	0.44	<0.43
1,1-Dichloroethene	<0.27	<0.26	<0.27	<0.27
1,2-Dichloropropane	<0.27	<0.26	<0.27	<0.27
Ethylbenzene	10.9	9.55	9.77	10.1
Ethylene Dibromide	<0.55	<0.53	<0.54	<0.54
Mesitylene (1,3,5-Trimethylbenzene)	14.6	17.2	13.8	15.2
Methylene Chloride	36.8	43.2	35.0	38.3
Styrene	7.09	7.73	6.25	7.02
Tetrachloroethene	<0.27	<0.26	0.33	<0.29
Toluene	31.7	24.2	35.3	30.4
1,1,1-Trichloroethane	<0.27	<0.26	<0.27	<0.27
Trichloroethene/1,1,2-Trichloroethene	<0.27	<0.26	<0.27	<0.27
Trichlorotrifluoroethane	1.51	1.02	1.61	1.38
Trichlorofluoromethane	<0.55	<0.53	<0.54	<0.54
M&P-Xylene	43.8	29.1	44.9	39.3
O-Xylene	19.5	11.5	15.9	15.6
Vinyl Chloride	<0.55	<0.53	<0.54	<0.54
Total	<246	<220	<255	<241

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

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*
Acetone	66.8	68.4	80.3	71.8
Benzene	11.2	10.1	9.71	10.3
Bromodichloromethane	<1.66	2.45	2.51	<2.21
Bromoform	<0.47	<0.45	<0.47	<0.46
Bromomethane	<4.23	<4.09	<4.19	<4.17
1,3-Butadiene	<0.94	<0.91	<0.93	<0.93
2-Butanone	31.7	23.4	38.8	31.3
Carbon Tetrachloride	<4.27	5.50	5.71	<5.16
Chloroform	3.69	3.47	3.86	3.67
Cumene (Isopropylbenzene)	2.61	2.92	2.81	2.78
Dibromochloromethane	<0.47	<0.45	<0.47	<0.46
Dichlorodifluoromethane	<1.08	<1.21	<1.23	<1.17
1,2-Dichloroethane	2.72	3.07	2.28	2.69
trans,1,2-Dichloroethene	<0.89	<0.58	0.76	<0.74
1,1-Dichloroethene	<0.47	<0.45	<0.47	<0.46
1,2-Dichloropropane	<0.47	<0.45	<0.47	<0.46
Ethylbenzene	18.7	16.4	16.8	17.3
Ethylene Dibromide	<0.94	<0.91	<0.93	<0.93
Mesitylene (1,3,5-Trimethylbenzene)	25.0	29.5	23.6	26.0
Methylene Chloride	63.1	74.1	60.0	65.7
Styrene	12.2	13.3	10.7	12.0
Tetrachloroethene	<0.47	<0.45	0.57	<0.50
Toluene	54.4	41.5	60.6	52.2
1,1,1-Trichloroethane	<0.47	<0.45	<0.47	<0.46
Trichloroethene/1,1,2-Trichloroethene	<0.47	<0.45	<0.47	<0.46
Trichlorotrifluoroethane	2.58	1.74	2.76	2.36
Trichlorofluoromethane	<0.94	<0.91	<0.93	<0.93
M&P-Xylene	75.2	49.9	77.0	67.4
O-Xylene	33.5	19.7	27.3	26.8
Vinyl Chloride	<0.94	<0.91	<0.93	<0.93
Total	<422	<378	<438	<413

* 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	51.5	52.7	61.8	55.3
Benzene	8.64	7.79	7.48	7.97
Bromodichloromethane	<1.28	1.89	1.94	<1.70
Bromoform	<0.36	<0.35	<0.36	<0.36
Bromomethane	<3.26	<3.15	<3.23	<3.21
1,3-Butadiene	<0.72	<0.70	<0.72	<0.71
2-Butanone	24.4	18.0	29.9	24.1
Carbon Tetrachloride	<3.29	4.24	4.40	<3.97
Chloroform	2.85	2.67	2.97	2.83
Cumene (Isopropylbenzene)	2.01	2.25	2.16	2.14
Dibromochloromethane	<0.36	<0.35	<0.36	<0.36
Dichlorodifluoromethane	<0.83	<0.93	<0.94	<0.90
1,2-Dichloroethane	2.10	2.37	1.76	2.07
trans,1,2-Dichloroethene	<0.69	<0.44	0.59	<0.57
1,1-Dichloroethene	<0.36	<0.35	<0.36	<0.36
1,2-Dichloropropane	<0.36	<0.35	<0.36	<0.36
Ethylbenzene	14.4	12.6	12.9	13.3
Ethylene Dibromide	<0.72	<0.70	<0.72	<0.71
Mesitylene (1,3,5-Trimethylbenzene)	19.3	22.7	18.2	20.1
Methylene Chloride	48.6	57.1	46.2	50.6
Styrene	9.37	10.2	8.26	9.28
Tetrachloroethene	<0.36	<0.35	0.44	<0.38
Toluene	41.9	32.0	46.7	40.2
1,1,1-Trichloroethane	<0.36	<0.35	<0.36	<0.36
Trichloroethene/1,1,2-Trichloroethene	<0.36	<0.35	<0.36	<0.36
Trichlorotrifluoroethane	1.99	1.34	2.13	1.82
Trichlorofluoromethane	<0.72	<0.70	<0.72	<0.71
M&P-Xylene	57.9	38.5	59.3	51.9
O-Xylene	25.8	15.1	21.0	20.7
Vinyl Chloride	<0.72	<0.70	<0.72	<0.71
Total	<325	<291	<337	<318

* 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 µg/Rm³*	Test No. 2 µg/Rm³*	Test No. 3 µg/Rm³*	Average µg/Rm³*
Acetone	55.1	56.4	66.2	59.3
Benzene	9.25	8.35	8.01	8.54
Bromodichloromethane	<1.37	2.02	2.07	<1.82
Bromoform	<0.39	<0.37	<0.38	<0.38
Bromomethane	<3.49	<3.37	<3.45	<3.44
1,3-Butadiene	<0.78	<0.75	<0.77	<0.76
2-Butanone	26.1	19.3	32.0	25.8
Carbon Tetrachloride	<3.53	4.54	4.71	<4.26
Chloroform	3.05	2.86	3.19	3.03
Cumene (Isopropylbenzene)	2.16	2.41	2.32	2.30
Dibromochloromethane	<0.39	<0.37	<0.38	<0.38
Dichlorodifluoromethane	<0.89	<1.00	<1.01	<0.97
1,2-Dichloroethane	2.25	2.54	1.88	2.22
trans,1,2-Dichloroethene	<0.74	<0.47	0.63	<0.61
1,1-Dichloroethene	<0.39	<0.37	<0.38	<0.38
1,2-Dichloropropane	<0.39	<0.37	<0.38	<0.38
Ethylbenzene	15.4	13.5	13.8	14.3
Ethylene Dibromide	<0.78	<0.75	<0.77	<0.76
Mesitylene (1,3,5-Trimethylbenzene)	20.6	24.3	19.5	21.5
Methylene Chloride	52.0	61.1	49.5	54.2
Styrene	10.0	10.9	8.84	9.94
Tetrachloroethene	<0.39	<0.37	0.47	<0.41
Toluene	44.9	34.3	50.0	43.0
1,1,1-Trichloroethane	<0.39	<0.37	<0.38	<0.38
Trichloroethene/1,1,2-Trichloroethene	<0.39	<0.37	<0.38	<0.38
Trichlorotrifluoroethane	2.13	1.44	2.28	1.95
Trichlorofluoromethane	<0.78	<0.75	<0.77	<0.76
M&P-Xylene	62.0	41.2	63.6	55.6
O-Xylene	27.6	16.2	22.5	22.1
Vinyl Chloride	<0.78	<0.75	<0.77	<0.76
Total	<349	<312	<361	<341

* 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	1.01	1.03	1.21	1.08
Benzene	0.17	0.15	0.15	0.16
Bromodichloromethane	<0.025	0.037	0.038	<0.033
Bromoform	<0.0071	<0.0069	<0.0070	<0.0070
Bromomethane	<0.064	<0.062	<0.063	<0.063
1,3-Butadiene	<0.014	<0.014	<0.014	<0.014
2-Butanone	0.48	0.35	0.59	0.47
Carbon Tetrachloride	<0.065	0.083	0.086	<0.078
Chloroform	0.056	0.052	0.058	0.055
Cumene (Isopropylbenzene)	0.039	0.044	0.042	0.042
Dibromochloromethane	<0.0071	<0.0069	<0.0070	<0.0070
Dichlorodifluoromethane	<0.016	<0.018	<0.018	<0.018
1,2-Dichloroethane	0.041	0.046	0.034	0.041
trans,1,2-Dichloroethene	<0.013	<0.0087	0.011	<0.011
1,1-Dichloroethene	<0.0071	<0.0069	<0.0070	<0.0070
1,2-Dichloropropane	<0.0071	<0.0069	<0.0070	<0.0070
Ethylbenzene	0.28	0.25	0.25	0.26
Ethylene Dibromide	<0.014	<0.014	<0.014	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	0.38	0.44	0.36	0.39
Methylene Chloride	0.95	1.12	0.91	0.99
Styrene	0.18	0.20	0.16	0.18
Tetrachloroethene	<0.0071	<0.0069	0.0087	<0.0075
Toluene	0.82	0.63	0.91	0.79
1,1,1-Trichloroethane	<0.0071	<0.0069	<0.0070	<0.0070
Trichloroethene/1,1,2-Trichloroethene	<0.0071	<0.0069	<0.0070	<0.0070
Trichlorotrifluoroethane	0.039	0.026	0.042	0.036
Trichlorofluoromethane	<0.014	<0.014	<0.014	<0.014
M&P-Xylene	1.14	0.75	1.16	1.02
O-Xylene	0.51	0.30	0.41	0.41
Vinyl Chloride	<0.014	<0.014	<0.014	<0.014
Total	<6.38	<5.71	<6.61	<6.23

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

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	41.9	71.8	55.3	59.3	1.08
Benzene	6.03	10.3	7.97	8.54	0.16
Bromodichloromethane	<1.29	<2.21	<1.70	<1.82	<0.033
Bromoform	<0.27	<0.46	<0.36	<0.38	<0.0070
Bromomethane	<2.43	<4.17	<3.21	<3.44	<0.063
1,3-Butadiene	<0.54	<0.93	<0.71	<0.76	<0.014
2-Butanone	18.3	31.3	24.1	25.8	0.47
Carbon Tetrachloride	<3.01	<5.16	<3.97	<4.26	<0.078
Chloroform	2.14	3.67	2.83	3.03	0.055
Cumene (Isopropylbenzene)	1.62	2.78	2.14	2.30	0.042
Dibromochloromethane	<0.27	<0.46	<0.36	<0.38	<0.0070
Dichlorodifluoromethane	<0.68	<1.17	<0.90	<0.97	<0.018
1,2-Dichloroethane	1.57	2.69	2.07	2.22	0.041
trans,1,2-Dichloroethene	<0.43	<0.74	<0.57	<0.61	<0.011
1,1-Dichloroethene	<0.27	<0.46	<0.36	<0.38	<0.0070
1,2-Dichloropropane	<0.27	<0.46	<0.36	<0.38	<0.0070
Ethylbenzene	10.1	17.3	13.3	14.3	0.26
Ethylene Dibromide	<0.54	<0.93	<0.71	<0.76	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	15.2	26.0	20.1	21.5	0.39
Methylene Chloride	38.3	65.7	50.6	54.2	0.99
Styrene	7.02	12.0	9.28	9.94	0.18
Tetrachloroethene	<0.29	<0.50	<0.38	<0.41	<0.0075
Toluene	30.4	52.2	40.2	43.0	0.79
1,1,1-Trichloroethane	<0.27	<0.46	<0.36	<0.38	<0.0070
Trichloroethene/1,1,2-Trichloroethene	<0.27	<0.46	<0.36	<0.38	<0.0070
Trichlorotrifluoroethane	1.38	2.36	1.82	1.95	0.036
Trichlorofluoromethane	<0.54	<0.93	<0.71	<0.76	<0.014
M&P-Xylene	39.3	67.4	51.9	55.6	1.02
O-Xylene	15.6	26.8	20.7	22.1	0.41
Vinyl Chloride	<0.54	<0.93	<0.71	<0.76	<0.014
Total	<241	<413	<318	<341	<6.23

* 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 13A/13B µg	Field Blank 2 Tube 26A/26B µg	Trip Blank Tube 28A/28B µg	Method Blank µg
Acetone	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.02	<0.02	<0.02	<0.02
2-Butanone	<0.01	<0.01	<0.01	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	0.11	<0.1	<0.1	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01
Toluene	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.02	<0.02	<0.02	<0.02
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02
Total	<0.76	<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.

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APPENDIX 2

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

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

Particulate and Metals Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 9, 2019	13:02	16:16	180
2	September 10, 2019	8:08	11:24	180
3	September 10, 2019	12:48	16:01	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 9, 2019	11:25	13:29	120
2	September 9, 2019	15:20	17:24	120
3	September 11, 2019	9:35	11:40	120

Acid Gases Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 9, 2019	8:58	11:30	120
2	September 10, 2019	8:05	9:05	60
3	September 10, 2019	9:50	10:50	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time* min
1	September 11, 2019	8:34	13:14	240
2	September 11, 2019	13:28	17:36	240
3	September 12, 2019	11:05	15:19	240

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

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

Acrolein and Aldehydes Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	September 11, 2019	9:22	10:22	60
2	September 11, 2019	10:35	11:35	60
3	September 12, 2019	10:12	11:12	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	September 11, 2019	13:03	13:23	20
	2	September 11, 2019	13:30	13:50	20
	3	September 11, 2019	13:55	14:15	20
	4	September 11, 2019	14:20	14:40	20
2	1	September 11, 2019	14:45	15:05	20
	2	September 11, 2019	15:09	15:29	20
	3	September 11, 2019	15:33	15:53	20
	4	September 11, 2019	15:57	16:17	20
3	1	September 11, 2019	16:21	16:41	20
	2	September 11, 2019	16:46	17:06	20
	3	September 11, 2019	17:11	17:31	20
	4	September 11, 2019	17:35	17:55	20

Total Hydrocarbons Trains

Sampling Location	Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
BH Outlet	1	September 9, 2019	14:16	15:16	60
BH Outlet	2	September 9, 2019	15:27	16:27	60
BH Outlet	3	September 9, 2019	16:35	17:35	60
Quench Inlet	1	September 9, 2019	8:33	9:33	60
Quench Inlet	2	September 9, 2019	9:43	10:43	60
Quench Inlet	3	September 9, 2019	10:50	11:50	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	0.850	1.017	6.43	3.677	99.9
2	0.850	0.997	6.43	3.531	98.2
3	0.850	1.017	6.43	3.375	96.9

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.848	0.997	4.51	1.201	102.2
2	0.848	0.997	4.51	1.209	103.6
3	0.848	0.997	4.51	1.186	103.5

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.851	1.017	6.48	2.319	99.9
2	0.849	1.017	6.37	1.143	98.1
3	0.849	1.017	6.37	1.116	96.9

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.851	1.017	6.48	4.701	98.0
2	0.849	0.997	6.37	4.514	99.7
3	0.850	0.997	6.43	4.667	98.8

* Dry at 25°C and 1 atmosphere

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

Particulate and Metals Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	16.9	17.9	-2.29	99.3	11.2	8.23
2	139	16.0	17.3	-2.27	99.2	11.0	8.32
3	139	15.2	16.6	-2.27	98.9	10.9	8.27
Average	139	16.0	17.3	-2.27	99.1	11.1	8.27

Particle Size Distribution Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	17.5	17.3	-2.29	99.4	10.9	8.45
2	140	17.3	17.2	-2.27	99.4	11.1	8.20
3	140	17.5	17.1	-2.52	98.4	11.0	8.22
Average	140	17.4	17.2	-2.36	99.0	11.0	8.29

Acid Gases Trains **

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	138	16.7	16.4	-2.29	99.4	11.2	8.26
2	142	15.8	17.2	-2.27	99.2	11.1	8.31
3	141	15.1	16.8	-2.27	99.2	11.0	8.27
Average	140	15.9	16.8	-2.27	99.3	11.1	8.28

Semi-Volatile Organics Trains

Test No.	Gas Temp. °C	Moisture by Volume %	Gas Velocity m/s	Static Pressure kPa	Absolute Pressure kPa	Carbon Dioxide by Volume % *	Oxygen by Volume % *
1	140	16.3	17.2	-2.52	98.4	11.1	8.09
2	140	17.2	17.1	-2.52	98.3	11.0	8.10
3	139	16.3	17.1	-2.44	99.0	11.0	8.31
Average	140	16.6	17.1	-2.49	98.5	11.0	8.17

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically on a single traverse in the duct.

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

Particulate and Metals Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.4	15.5	19.9	18.7
2	25.5	15.2	19.3	18.0
3	24.6	14.7	18.7	17.3
Average	25.5	15.1	19.3	18.0

Particle Size Distribution Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.6	14.9	18.7	18.1
2	25.4	14.9	19.1	18.0
3	25.3	14.6	18.7	17.7
Average	25.4	14.8	18.9	17.9

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	24.3	14.4	18.4	17.3
2	25.4	15.0	19.1	17.9
3	24.8	14.9	18.9	17.5
Average	24.8	14.8	18.8	17.6

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.4	14.9	19.3	17.8
2	25.2	14.6	18.9	17.6
3	25.3	14.9	19.0	17.9
Average	25.3	14.8	19.0	17.8

* At 25°C and 1 atmosphere

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

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

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

Test No.	Particulate Collected			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	3.2	1.0	4.2	3.677	0.67	1.14	0.89	0.95	17.7
2	1.5	<0.1	<1.6	3.531	<0.27	<0.45	<0.36	<0.38	<6.87
3	1.5	<0.1	<1.6	3.375	<0.28	<0.47	<0.37	<0.40	<6.96
Average					<0.41	<0.69	<0.54	<0.58	<10.5
Blank	<0.1	0.6							

* 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 Rm³*	$PM_{2.5}$ Concentration Actual mg/m³	Dry Reference mg/Rm³*	Dry Adjusted mg/Rm³**	Wet Reference mg/Rm³*	Emission Rate mg/s
1	<0.2	1.201	<0.097	<0.17	<0.13	<0.14	<2.48
2	<0.2	1.209	<0.097	<0.17	<0.13	<0.14	<2.46
3	<0.2	1.186	<0.097	<0.17	<0.13	<0.14	<2.46
Average			<0.097	<0.17	<0.13	<0.14	<2.47
Blank	<0.2						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm³*	PM_{10} Concentration Actual mg/m³	Dry Reference mg/Rm³*	Dry Adjusted mg/Rm³**	Wet Reference mg/Rm³*	Emission Rate mg/s
1	<0.3	1.201	<0.15	<0.25	<0.20	<0.21	<3.72
2	<0.3	1.209	<0.15	<0.25	<0.19	<0.21	<3.70
3	<0.3	1.186	<0.15	<0.25	<0.20	<0.21	<3.69
Average			<0.15	<0.25	<0.20	<0.21	<3.70
Blank	<0.3						

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

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

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 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	1.9	1.201	0.92	1.58	1.26	1.30	23.6
2	2.2	1.209	1.07	1.82	1.42	1.51	27.1
3	2.9	1.186	1.41	2.45	1.91	2.02	35.7
Average			1.13	1.95	1.53	1.61	28.8
Blank	<0.1						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	0.9	1.201	0.44	0.75	0.60	0.62	11.2
2	3.0	1.209	1.46	2.48	1.94	2.05	37.0
3	0.9	1.186	0.44	0.76	0.59	0.63	11.1
Average			0.78	1.33	1.04	1.10	19.7
Blank	1.0						

* 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	7.59	2.319	1.92	3.27	2.55	2.71	50.7
2	3.32	1.143	1.73	2.90	2.29	2.45	44.2
3	2.91	1.116	1.55	2.61	2.05	2.20	39.6
Average			1.74	2.93	2.30	2.46	44.8
Blank	<0.987						

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	<0.221	2.319	<0.056	<0.095	<0.074	<0.079	<1.48
2	<0.161	1.143	<0.084	<0.14	<0.11	<0.12	<2.14
3	<0.165	1.116	<0.088	<0.15	<0.12	<0.12	<2.25
Average			<0.076	<0.13	<0.10	<0.11	<1.96
Blank	<0.168						

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	2.00	2.319	0.51	0.86	0.67	0.71	13.4
2	0.876	1.143	0.46	0.77	0.60	0.65	11.6
3	0.802	1.116	0.43	0.72	0.57	0.61	10.9
Average			0.46	0.78	0.61	0.66	12.0
Blank	<0.434						

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 9 to September 12, 2019

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.80	8.28	10.12
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	6	12	30
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	7.3	12.1	19.5
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	0.02	2
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	0.01	0.1
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	94	110	121
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	109	110	111
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	4	5	7
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	4.6	5.1	5.5
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0.08	2
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	10

Data measured by the ORTECH CEMS on September 9, 2019

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

* 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 µg	Impingers & Rinses µg	Total Collected µg
Antimony	0.35	<0.1	0.35
Arsenic	<1	<0.2	<0.20
Barium	6.09	2.65	8.74
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.61	0.079	0.69
Chromium	2.51	0.91	3.42
Cobalt	<0.2	0.20	0.20
Copper	1.65	1.47	3.12
Lead	2.46	0.85	3.31
Mercury *	<0.015	0.59	0.59
Molybdenum	9.29	<0.1	9.29
Nickel	2.96	1.19	4.15
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	19.2	11.8	31.0
Total			<66.8

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	5.82	1.48	7.30
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.24	<0.05	0.24
Chromium	2.23	0.50	2.73
Cobalt	<0.2	<0.1	<0.20
Copper	1.27	0.83	2.10
Lead	1.18	1.15	2.33
Mercury *	<0.015	<0.39	<0.39
Molybdenum	9.32	<0.1	9.32
Nickel	2.68	0.80	3.48
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	13.6	8.08	21.7
Total			<51.9

* Includes the permanganate impingers

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

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

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	5.36	0.86	6.22
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.17	<0.05	0.17
Chromium	8.28	0.63	8.91
Cobalt	<0.2	<0.1	<0.20
Copper	1.29	0.88	2.17
Lead	1.37	0.77	2.14
Mercury *	<0.015	<0.34	<0.34
Molybdenum	8.49	<0.1	8.49
Nickel	3.09	1.24	4.33
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	18.1	11.9	30.0
Total			<65.1

* Includes the permanganate impingers

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

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

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	0.35	0.056	0.096	0.075	0.080	0.0015
Arsenic	<0.20	<0.032	<0.054	<0.042	<0.045	<0.00084
Barium	8.74	1.40	2.38	1.85	1.97	0.037
Beryllium	<0.20	<0.032	<0.054	<0.042	<0.045	<0.00084
Cadmium	0.69	0.11	0.19	0.15	0.16	0.0029
Chromium	3.42	0.55	0.93	0.72	0.77	0.014
Cobalt	0.20	0.031	0.053	0.042	0.044	0.00083
Copper	3.12	0.50	0.85	0.66	0.70	0.013
Lead	3.31	0.53	0.90	0.70	0.75	0.014
Mercury	0.59	0.094	0.16	0.12	0.13	0.0025
Molybdenum	9.29	1.48	2.53	1.97	2.09	0.039
Nickel	4.15	0.66	1.13	0.88	0.94	0.017
Selenium	<1.00	<0.16	<0.27	<0.21	<0.23	<0.0042
Silver	<0.20	<0.032	<0.054	<0.042	<0.045	<0.00084
Thallium	<0.20	<0.032	<0.054	<0.042	<0.045	<0.00084
Vanadium	<0.10	<0.016	<0.027	<0.021	<0.023	<0.00042
Zinc	31.0	4.95	8.43	6.57	6.99	0.13
Total	<66.8	<10.7	<18.2	<14.1	<15.0	<0.28

Dry Gas Volume Sampled (Rm³*) :	3.677
Actual Flowrate (m³/s) :	26.4
Dry Reference Flowrate (Rm³/s*) :	15.5
Dry Adjusted Flowrate (Rm³/s**) :	19.9
Wet Reference Flowrate (Rm³/s*) :	18.7

* At 25°C and 1 atmosphere

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

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

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Arsenic	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Barium	7.30	1.23	2.07	1.63	1.75	0.031
Beryllium	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Cadmium	0.24	0.041	0.068	0.054	0.058	0.0010
Chromium	2.73	0.46	0.77	0.61	0.65	0.012
Cobalt	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Copper	2.10	0.35	0.60	0.47	0.50	0.0090
Lead	2.33	0.39	0.66	0.52	0.56	0.010
Mercury	<0.39	<0.066	<0.11	<0.087	<0.093	<0.0017
Molybdenum	9.32	1.57	2.64	2.08	2.23	0.040
Nickel	3.48	0.59	0.99	0.78	0.83	0.015
Selenium	<1.00	<0.17	<0.28	<0.22	<0.24	<0.0043
Silver	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Thallium	<0.20	<0.034	<0.057	<0.045	<0.048	<0.00086
Vanadium	<0.10	<0.017	<0.028	<0.022	<0.024	<0.00043
Zinc	21.7	3.66	6.14	4.84	5.18	0.093
Total	<51.9	<8.76	<14.7	<11.6	<12.4	<0.22

Dry Gas Volume Sampled (Rm³*) :	3.531
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	15.2
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	18.0

* At 25°C and 1 atmosphere

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

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

Metal	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Arsenic	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Barium	6.22	1.10	1.84	1.45	1.57	0.027
Beryllium	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Cadmium	0.17	0.030	0.050	0.040	0.043	0.00074
Chromium	8.91	1.58	2.64	2.08	2.24	0.039
Cobalt	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Copper	2.17	0.38	0.64	0.51	0.55	0.0095
Lead	2.14	0.38	0.63	0.50	0.54	0.0093
Mercury	<0.34	<0.060	<0.10	<0.079	<0.086	<0.0015
Molybdenum	8.49	1.50	2.52	1.98	2.14	0.037
Nickel	4.33	0.77	1.28	1.01	1.09	0.019
Selenium	<1.00	<0.18	<0.30	<0.23	<0.25	<0.0044
Silver	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Thallium	<0.20	<0.035	<0.059	<0.047	<0.050	<0.00087
Vanadium	<0.10	<0.018	<0.030	<0.023	<0.025	<0.00044
Zinc	30.0	5.31	8.89	6.99	7.55	0.13
Total	<65.1	<11.5	<19.3	<15.2	<16.4	<0.28

Dry Gas Volume Sampled (Rm^3*) :	3.375
Actual Flowrate (m^3/s) :	24.6
Dry Reference Flowrate (Rm^3/s*) :	14.7
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	17.3

* 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	0.056	<0.034	<0.035	<0.042	30.1
Arsenic	<0.032	<0.034	<0.035	<0.034	5.2
Barium	1.40	1.23	1.10	1.24	11.9
Beryllium	<0.032	<0.034	<0.035	<0.034	5.2
Cadmium	0.11	0.041	0.030	0.060	72.4
Chromium	0.55	0.46	1.58	0.86	72.2
Cobalt	0.031	<0.034	<0.035	<0.033	6.2
Copper	0.50	0.35	0.38	0.41	18.4
Lead	0.53	0.39	0.38	0.43	19.1
Mercury	0.094	<0.066	<0.060	<0.073	24.8
Molybdenum	1.48	1.57	1.50	1.52	3.1
Nickel	0.66	0.59	0.77	0.67	13.4
Selenium	<0.16	<0.17	<0.18	<0.17	5.2
Silver	<0.032	<0.034	<0.035	<0.034	5.2
Thallium	<0.032	<0.034	<0.035	<0.034	5.2
Vanadium	<0.016	<0.017	<0.018	<0.017	5.2
Zinc	4.95	3.66	5.31	4.64	18.7
Total	<10.7	<8.76	<11.5	<10.3	13.7

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

Metal	Dry Reference Concentration				Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	%
Antimony	0.096	<0.057	<0.059	<0.071	31.2
Arsenic	<0.054	<0.057	<0.059	<0.057	4.3
Barium	2.38	2.07	1.84	2.10	12.8
Beryllium	<0.054	<0.057	<0.059	<0.057	4.3
Cadmium	0.19	0.068	0.050	0.10	73.4
Chromium	0.93	0.77	2.64	1.45	71.5
Cobalt	0.053	<0.057	<0.059	<0.056	5.3
Copper	0.85	0.60	0.64	0.70	19.3
Lead	0.90	0.66	0.63	0.73	20.1
Mercury	0.16	<0.11	<0.10	<0.12	25.9
Molybdenum	2.53	2.64	2.52	2.56	2.7
Nickel	1.13	0.99	1.28	1.13	13.1
Selenium	<0.27	<0.28	<0.30	<0.28	4.3
Silver	<0.054	<0.057	<0.059	<0.057	4.3
Thallium	<0.054	<0.057	<0.059	<0.057	4.3
Vanadium	<0.027	<0.028	<0.030	<0.028	4.3
Zinc	8.43	6.14	8.89	7.82	18.8
Total	<18.2	<14.7	<19.3	<17.4	13.8

* At 25°C and 1 atmosphere

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

Metal	Dry Adjusted Concentration				Coefficient
	Test No. 1 µg/Rm³**	Test No. 2 µg/Rm³**	Test No. 3 µg/Rm³**	Average µg/Rm³**	of Variation %
Antimony	0.075	<0.045	<0.047	<0.055	30.5
Arsenic	<0.042	<0.045	<0.047	<0.045	4.7
Barium	1.85	1.63	1.45	1.64	12.3
Beryllium	<0.042	<0.045	<0.047	<0.045	4.7
Cadmium	0.15	0.054	0.040	0.080	72.8
Chromium	0.72	0.61	2.08	1.14	71.8
Cobalt	0.042	<0.045	<0.047	<0.044	5.8
Copper	0.66	0.47	0.51	0.55	18.7
Lead	0.70	0.52	0.50	0.57	19.5
Mercury	0.12	<0.087	<0.079	<0.097	25.2
Molybdenum	1.97	2.08	1.98	2.01	3.1
Nickel	0.88	0.78	1.01	0.89	13.1
Selenium	<0.21	<0.22	<0.23	<0.22	4.7
Silver	<0.042	<0.045	<0.047	<0.045	4.7
Thallium	<0.042	<0.045	<0.047	<0.045	4.7
Vanadium	<0.021	<0.022	<0.023	<0.022	4.7
Zinc	6.57	4.84	6.99	6.13	18.6
Total	<14.1	<11.6	<15.2	<13.6	13.6

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

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

Metal	Wet Reference Concentration				Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.080	<0.048	<0.050	<0.059	29.8
Arsenic	<0.045	<0.048	<0.050	<0.048	5.5
Barium	1.97	1.75	1.57	1.76	11.5
Beryllium	<0.045	<0.048	<0.050	<0.048	5.5
Cadmium	0.16	0.058	0.043	0.086	72.1
Chromium	0.77	0.65	2.24	1.22	72.5
Cobalt	0.044	<0.048	<0.050	<0.047	6.5
Copper	0.70	0.50	0.55	0.58	18.1
Lead	0.75	0.56	0.54	0.61	18.8
Mercury	0.13	<0.093	<0.086	<0.10	24.5
Molybdenum	2.09	2.23	2.14	2.15	3.2
Nickel	0.94	0.83	1.09	0.95	13.6
Selenium	<0.23	<0.24	<0.25	<0.24	5.5
Silver	<0.045	<0.048	<0.050	<0.048	5.5
Thallium	<0.045	<0.048	<0.050	<0.048	5.5
Vanadium	<0.023	<0.024	<0.025	<0.024	5.5
Zinc	6.99	5.18	7.55	6.58	18.8
Total	<15.0	<12.4	<16.4	<14.6	13.8

* 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	0.0015	<0.00086	<0.00087	<0.0011	33.5
Arsenic	<0.00084	<0.00086	<0.00087	<0.00086	1.7
Barium	0.037	0.031	0.027	0.032	15.4
Beryllium	<0.00084	<0.00086	<0.00087	<0.00086	1.7
Cadmium	0.0029	0.0010	0.00074	0.0016	75.5
Chromium	0.014	0.012	0.039	0.022	68.9
Cobalt	0.00083	<0.00086	<0.00087	<0.00085	2.8
Copper	0.013	0.0090	0.0095	0.011	21.4
Lead	0.014	0.010	0.0093	0.011	22.5
Mercury	0.0025	<0.0017	<0.0015	<0.0019	28.3
Molybdenum	0.039	0.040	0.037	0.039	4.2
Nickel	0.017	0.015	0.019	0.017	11.5
Selenium	<0.0042	<0.0043	<0.0044	<0.0043	1.7
Silver	<0.00084	<0.00086	<0.00087	<0.00086	1.7
Thallium	<0.00084	<0.00086	<0.00087	<0.00086	1.7
Vanadium	<0.00042	<0.00043	<0.00044	<0.00043	1.7
Zinc	0.13	0.093	0.13	0.12	18.2
Total	<0.28	<0.22	<0.28	<0.26	13.0

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

Metal	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Antimony	<0.042	<0.071	<0.055	<0.059	<0.0011
Arsenic	<0.034	<0.057	<0.045	<0.048	<0.00086
Barium	1.24	2.10	1.64	1.76	0.032
Beryllium	<0.034	<0.057	<0.045	<0.048	<0.00086
Cadmium	0.060	0.10	0.080	0.086	0.0016
Chromium	0.86	1.45	1.14	1.22	0.022
Cobalt	<0.033	<0.056	<0.044	<0.047	<0.00085
Copper	0.41	0.70	0.55	0.58	0.011
Lead	0.43	0.73	0.57	0.61	0.011
Mercury	<0.073	<0.12	<0.097	<0.10	<0.0019
Molybdenum	1.52	2.56	2.01	2.15	0.039
Nickel	0.67	1.13	0.89	0.95	0.017
Selenium	<0.17	<0.28	<0.22	<0.24	<0.0043
Silver	<0.034	<0.057	<0.045	<0.048	<0.00086
Thallium	<0.034	<0.057	<0.045	<0.048	<0.00086
Vanadium	<0.017	<0.028	<0.022	<0.024	<0.00043
Zinc	4.64	7.82	6.13	6.58	0.12
Total	<10.3	<17.4	<13.6	<14.6	<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	<5	1.03	1.03
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	1.34	0.35	1.69
Cobalt	<0.2	<0.1	<0.20
Copper	<1	0.58	0.58
Lead	0.64	1.69	2.33
Mercury *	<0.015	<0.16	<0.16
Molybdenum	8.85	<0.1	8.85
Nickel	1.73	0.48	2.21
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			<25.2

* Includes the permanganate impingers.

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

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

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	97.9	0.012	0.021	0.016	0.017	0.31
Pentachlorodibenzo-p-dioxins	195	0.024	0.041	0.032	0.035	0.62
Hexachlorodibenzo-p-dioxins	377	0.047	0.080	0.062	0.067	1.19
Heptachlorodibenzo-p-dioxins	791	0.099	0.17	0.13	0.14	2.51
Octachlorodibenzo-p-dioxin	881	0.11	0.19	0.14	0.16	2.79
Total	2342	0.29	0.50	0.38	0.42	7.42

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	103	0.013	0.022	0.017	0.018	0.33
Pentachlorodibenzofurans	87.2	0.011	0.019	0.014	0.016	0.28
Hexachlorodibenzofurans	92.6	0.012	0.020	0.015	0.016	0.29
Heptachlorodibenzofurans	123	0.015	0.026	0.020	0.022	0.39
Octachlorodibenzofuran	218	0.027	0.046	0.036	0.039	0.69
Total	624	0.078	0.13	0.10	0.11	1.98

Dry Gas Volume Sampled (Rm³*) :	4.701
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	17.8

* 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 pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	85.6	0.011	0.019	0.015	0.016	0.28
Pentachlorodibenzo-p-dioxins	130	0.017	0.029	0.022	0.024	0.42
Hexachlorodibenzo-p-dioxins	423	0.054	0.094	0.072	0.078	1.37
Heptachlorodibenzo-p-dioxins	824	0.11	0.18	0.14	0.15	2.67
Octachlorodibenzo-p-dioxin	885	0.11	0.20	0.15	0.16	2.86
Total	2348	0.30	0.52	0.40	0.43	7.59

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate ng/s
Tetrachlorodibenzofurans	34.6	0.0044	0.0077	0.0059	0.0064	0.11
Pentachlorodibenzofurans	65.5	0.0084	0.015	0.011	0.012	0.21
Hexachlorodibenzofurans	78.4	0.010	0.017	0.013	0.014	0.25
Heptachlorodibenzofurans	119	0.015	0.026	0.020	0.022	0.38
Octachlorodibenzofuran	216	0.028	0.048	0.037	0.040	0.70
Total	514	0.066	0.11	0.088	0.094	1.66

Dry Gas Volume Sampled (Rm^3*) :	4.514
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	71.9	0.0091	0.015	0.012	0.013	0.23
Pentachlorodibenzo-p-dioxins	131	0.017	0.028	0.022	0.023	0.42
Hexachlorodibenzo-p-dioxins	207	0.026	0.044	0.035	0.037	0.66
Heptachlorodibenzo-p-dioxins	409	0.052	0.088	0.069	0.073	1.31
Octachlorodibenzo-p-dioxin	516	0.065	0.11	0.087	0.092	1.65
Total	1335	0.17	0.29	0.22	0.24	4.26

Furans

Congener Group	Total Collected pg	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	23.7	0.0030	0.0051	0.0040	0.0042	0.076
Pentachlorodibenzofurans	25.9	0.0033	0.0055	0.0044	0.0046	0.083
Hexachlorodibenzofurans	48.8	0.0062	0.010	0.0082	0.0087	0.16
Heptachlorodibenzofurans	65.0	0.0082	0.014	0.011	0.012	0.21
Octachlorodibenzofuran	104	0.013	0.022	0.017	0.019	0.33
Total	267	0.034	0.057	0.045	0.048	0.85

Dry Gas Volume Sampled (Rm³*) :	4.667
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.012	0.011	0.0091	0.011	14.7
Pentachlorodibenzo-p-dioxins	0.024	0.017	0.017	0.019	23.3
Hexachlorodibenzo-p-dioxins	0.047	0.054	0.026	0.042	34.4
Heptachlorodibenzo-p-dioxins	0.099	0.11	0.052	0.085	34.5
Octachlorodibenzo-p-dioxin	0.11	0.11	0.065	0.096	28.1
Total	0.29	0.30	0.17	0.25	29.2

Furans

Congener Group	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.013	0.0044	0.0030	0.0068	78.8
Pentachlorodibenzofurans	0.011	0.0084	0.0033	0.0075	51.6
Hexachlorodibenzofurans	0.012	0.010	0.0062	0.0093	30.1
Heptachlorodibenzofurans	0.015	0.015	0.0082	0.013	31.7
Octachlorodibenzofuran	0.027	0.028	0.013	0.023	36.5
Total	0.078	0.066	0.034	0.059	38.6

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

Dioxins

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.021	0.019	0.015	0.018	15.0
Pentachlorodibenzo-p-dioxins	0.041	0.029	0.028	0.033	23.0
Hexachlorodibenzo-p-dioxins	0.080	0.094	0.044	0.073	35.1
Heptachlorodibenzo-p-dioxins	0.17	0.18	0.088	0.15	35.0
Octachlorodibenzo-p-dioxin	0.19	0.20	0.11	0.16	28.6
Total	0.50	0.52	0.29	0.43	29.7

Furans

Congener Group	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.022	0.0077	0.0051	0.012	78.5
Pentachlorodibenzofurans	0.019	0.015	0.0055	0.013	51.7
Hexachlorodibenzofurans	0.020	0.017	0.010	0.016	30.3
Heptachlorodibenzofurans	0.026	0.026	0.014	0.022	32.2
Octachlorodibenzofuran	0.046	0.048	0.022	0.039	37.0
Total	0.13	0.11	0.057	0.10	38.7

* 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	0.016	0.015	0.012	0.014	14.2
Pentachlorodibenzo-p-dioxins	0.032	0.022	0.022	0.025	22.5
Hexachlorodibenzo-p-dioxins	0.062	0.072	0.035	0.056	34.4
Heptachlorodibenzo-p-dioxins	0.13	0.14	0.069	0.11	34.4
Octachlorodibenzo-p-dioxin	0.14	0.15	0.087	0.13	27.9
Total	0.38	0.40	0.22	0.34	29.1

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	0.017	0.0059	0.0040	0.0089	78.0
Pentachlorodibenzofurans	0.014	0.011	0.0044	0.010	51.2
Hexachlorodibenzofurans	0.015	0.013	0.0082	0.012	29.7
Heptachlorodibenzofurans	0.020	0.020	0.011	0.017	31.5
Octachlorodibenzofuran	0.036	0.037	0.017	0.030	36.3
Total	0.10	0.088	0.045	0.078	38.1

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

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

Dioxins

Congener Group	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.017	0.016	0.013	0.015	15.2
Pentachlorodibenzo-p-dioxins	0.035	0.024	0.023	0.027	23.5
Hexachlorodibenzo-p-dioxins	0.067	0.078	0.037	0.061	34.9
Heptachlorodibenzo-p-dioxins	0.14	0.15	0.073	0.12	35.0
Octachlorodibenzo-p-dioxin	0.16	0.16	0.092	0.14	28.6
Total	0.42	0.43	0.24	0.36	29.7

Furans

Congener Group	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.018	0.0064	0.0042	0.0096	78.9
Pentachlorodibenzofurans	0.016	0.012	0.0046	0.011	51.9
Hexachlorodibenzofurans	0.016	0.014	0.0087	0.013	30.5
Heptachlorodibenzofurans	0.022	0.022	0.012	0.018	32.2
Octachlorodibenzofuran	0.039	0.040	0.019	0.032	37.0
Total	0.11	0.094	0.048	0.084	38.9

* 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	0.31	0.28	0.23	0.27	14.9
Pentachlorodibenzo-p-dioxins	0.62	0.42	0.42	0.49	23.6
Hexachlorodibenzo-p-dioxins	1.19	1.37	0.66	1.07	34.3
Heptachlorodibenzo-p-dioxins	2.51	2.67	1.31	2.16	34.4
Octachlorodibenzo-p-dioxin	2.79	2.86	1.65	2.43	28.0
Total	7.42	7.59	4.26	6.43	29.2

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	0.33	0.11	0.076	0.17	79.1
Pentachlorodibenzofurans	0.28	0.21	0.083	0.19	51.8
Hexachlorodibenzofurans	0.29	0.25	0.16	0.23	30.2
Heptachlorodibenzofurans	0.39	0.38	0.21	0.33	31.7
Octachlorodibenzofuran	0.69	0.70	0.33	0.57	36.5
Total	1.98	1.66	0.85	1.50	38.7

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

Dioxins

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	0.011	0.018	0.014	0.015	0.27
Pentachlorodibenzo-p-dioxins	0.019	0.033	0.025	0.027	0.49
Hexachlorodibenzo-p-dioxins	0.042	0.073	0.056	0.061	1.07
Heptachlorodibenzo-p-dioxins	0.085	0.15	0.11	0.12	2.16
Octachlorodibenzo-p-dioxin	0.096	0.16	0.13	0.14	2.43
Total	0.25	0.43	0.34	0.36	6.43

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	0.0068	0.012	0.0089	0.0096	0.17
Pentachlorodibenzofurans	0.0075	0.013	0.010	0.011	0.19
Hexachlorodibenzofurans	0.0093	0.016	0.012	0.013	0.23
Heptachlorodibenzofurans	0.013	0.022	0.017	0.018	0.33
Octachlorodibenzofuran	0.023	0.039	0.030	0.032	0.57
Total	0.059	0.10	0.078	0.084	1.50

* At 25°C and 1 atmosphere

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

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

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<3.7	<1.2
Pentachlorodibenzo-p-dioxins	<1.7	<0.81
Hexachlorodibenzo-p-dioxins	<2.1	<1.6
Heptachlorodibenzo-p-dioxins	6.83	2.84
Octachlorodibenzo-p-dioxin	21.8	<4.2
Total	<36.1	<10.7

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<2.8	<0.81
Pentachlorodibenzofurans	<1.7	<0.66
Hexachlorodibenzofurans	2.37	<1.2
Heptachlorodibenzofurans	3.11	<0.76
Octachlorodibenzofuran	4.32	<1.8
Total	<14.3	<5.23

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

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

Specific Isomer	Total Collected pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.5	<0.19	<0.32	<0.25	<0.27	<0.0048
12378-pentachlorodibenzo-p-dioxin	4.82	0.60	1.03	0.79	0.86	0.015
123478-hexachlorodibenzo-p-dioxin	6.35	0.79	1.35	1.04	1.13	0.020
123678-hexachlorodibenzo-p-dioxin	21.5	2.68	4.57	3.53	3.83	0.068
123789-hexachlorodibenzo-p-dioxin	10.9	1.36	2.32	1.79	1.94	0.035
1234678-heptachlorodibenzo-p-dioxin	372	46.4	79.1	61.1	66.2	1.18
Octachlorodibenzo-p-dioxin	881	110	187	145	157	2.79
2378-tetrachlorodibenzofuran	4.40	0.55	0.94	0.72	0.78	0.014
12378-pentachlorodibenzofuran	<5.3	<0.66	<1.13	<0.87	<0.94	<0.017
23478-pentachlorodibenzofuran	11.2	1.40	2.38	1.84	1.99	0.035
123478-hexachlorodibenzofuran	8.68	1.08	1.85	1.43	1.55	0.028
123678-hexachlorodibenzofuran	<11	<1.37	<2.34	<1.81	<1.96	<0.035
234678-hexachlorodibenzofuran	16.0	2.00	3.40	2.63	2.85	0.051
123789-hexachlorodibenzofuran	4.86	0.61	1.03	0.80	0.87	0.015
1234678-heptachlorodibenzofuran	78.1	9.75	16.6	12.8	13.9	0.25
1234789-heptachlorodibenzofuran	12.6	1.57	2.68	2.07	2.24	0.040
Octachlorodibenzofuran	218	27.2	46.4	35.8	38.8	0.69
PCB 81	<19	<2.37	<4.04	<3.12	<3.38	<0.060
PCB 77	144	18.0	30.6	23.6	25.6	0.46
PCB 123	48.0	5.99	10.2	7.88	8.55	0.15
PCB 118	4530	565	964	744	807	14.4
PCB 114	104	13.0	22.1	17.1	18.5	0.33
PCB 105	1310	163	279	215	233	4.15
PCB 126	<21	<2.62	<4.47	<3.45	<3.74	<0.067
PCB 167	54.7	6.83	11.6	8.98	9.74	0.17
PCB 156/157	146	18.2	31.1	24.0	26.0	0.46
PCB 169	<11	<1.37	<2.34	<1.81	<1.96	<0.035
PCB 189	<9.7	<1.21	<2.06	<1.59	<1.73	<0.031
Total Dioxins & Furans Only	<1668	<208	<355	<274	<297	<5.29
Total PCBs Only	<6397	<798	<1361	<1051	<1139	<20.3
Total Dioxins & Furans and PCBs	<8066	<1006	<1716	<1325	<1436	<25.6

Dry Gas Volume Sampled (Rm³*) :	4.701
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	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 35
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected pg	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.5	<0.19	<0.33	<0.26	<0.28	<0.0049
12378-pentachlorodibenzo-p-dioxin	4.49	0.58	0.99	0.77	0.83	0.015
123478-hexachlorodibenzo-p-dioxin	8.37	1.07	1.85	1.43	1.54	0.027
123678-hexachlorodibenzo-p-dioxin	25.1	3.22	5.56	4.30	4.61	0.081
123789-hexachlorodibenzo-p-dioxin	13.2	1.69	2.92	2.26	2.43	0.043
1234678-heptachlorodibenzo-p-dioxin	379	48.6	84.0	64.9	69.6	1.23
Octachlorodibenzo-p-dioxin	885	114	196	151	163	2.86
2378-tetrachlorodibenzofuran	1.56	0.20	0.35	0.27	0.29	0.0050
12378-pentachlorodibenzofuran	4.69	0.60	1.04	0.80	0.86	0.015
23478-pentachlorodibenzofuran	7.16	0.92	1.59	1.23	1.32	0.023
123478-hexachlorodibenzofuran	5.67	0.73	1.26	0.97	1.04	0.018
123678-hexachlorodibenzofuran	<7.8	<1.00	<1.73	<1.33	<1.43	<0.025
234678-hexachlorodibenzofuran	15.2	1.95	3.37	2.60	2.79	0.049
123789-hexachlorodibenzofuran	7.78	1.00	1.72	1.33	1.43	0.025
1234678-heptachlorodibenzofuran	79.6	10.2	17.6	13.6	14.6	0.26
1234789-heptachlorodibenzofuran	14.2	1.82	3.15	2.43	2.61	0.046
Octachlorodibenzofuran	216	27.7	47.9	37.0	39.7	0.70
PCB 81	<15	<1.93	<3.32	<2.57	<2.76	<0.049
PCB 77	52.5	6.74	11.6	8.98	9.65	0.17
PCB 123	<36	<4.62	<7.98	<6.16	<6.62	<0.12
PCB 118	1590	204	352	272	292	5.14
PCB 114	<31	<3.98	<6.87	<5.31	<5.70	<0.10
PCB 105	456	58.5	101	78.0	83.8	1.47
PCB 126	<17	<2.18	<3.77	<2.91	<3.12	<0.055
PCB 167	16.4	2.10	3.63	2.81	3.01	0.053
PCB 156/157	<47	<6.03	<10.4	<8.04	<8.64	<0.15
PCB 169	<11	<1.41	<2.44	<1.88	<2.02	<0.036
PCB 189	<11	<1.41	<2.44	<1.88	<2.02	<0.036
Total Dioxins & Furans Only	<1676	<215	<371	<287	<308	<5.42
Total PCBs Only	<2283	<293	<506	<391	<420	<7.38
Total Dioxins & Furans and PCBs	<3959	<508	<877	<678	<728	<12.8

Dry Gas Volume Sampled (Rm³*) :	4.514
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Total Collected pg	Actual Concentration pg/m^3	Dry Reference Concentration pg/Rm^3*	Dry Adjusted Concentration pg/Rm^3**	Wet Reference Concentration pg/Rm^3*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.3	<0.16	<0.28	<0.22	<0.23	<0.0042
12378-pentachlorodibenzo-p-dioxin	<1.3	<0.16	<0.28	<0.22	<0.23	<0.0042
123478-hexachlorodibenzo-p-dioxin	4.13	0.52	0.88	0.69	0.74	0.013
123678-hexachlorodibenzo-p-dioxin	14.7	1.86	3.15	2.47	2.62	0.047
123789-hexachlorodibenzo-p-dioxin	6.53	0.82	1.40	1.10	1.16	0.021
1234678-heptachlorodibenzo-p-dioxin	194	24.5	41.6	32.6	34.6	0.62
Octachlorodibenzo-p-dioxin	516	65.1	111	86.7	92.0	1.65
2378-tetrachlorodibenzofuran	1.33	0.17	0.28	0.22	0.24	0.0042
12378-pentachlorodibenzofuran	3.71	0.47	0.79	0.62	0.66	0.012
23478-pentachlorodibenzofuran	4.26	0.54	0.91	0.72	0.76	0.014
123478-hexachlorodibenzofuran	4.17	0.53	0.89	0.70	0.74	0.013
123678-hexachlorodibenzofuran	<5.1	<0.64	<1.09	<0.86	<0.91	<0.016
234678-hexachlorodibenzofuran	8.17	1.03	1.75	1.37	1.46	0.026
123789-hexachlorodibenzofuran	5.21	0.66	1.12	0.88	0.93	0.017
1234678-heptachlorodibenzofuran	43.3	5.46	9.28	7.28	7.72	0.14
1234789-heptachlorodibenzofuran	7.53	0.95	1.61	1.27	1.34	0.024
Octachlorodibenzofuran	104	13.1	22.3	17.5	18.5	0.33
PCB 81	<33	<4.16	<7.07	<5.55	<5.89	<0.11
PCB 77	<36	<4.54	<7.71	<6.05	<6.42	<0.11
PCB 123	<28	<3.53	<6.00	<4.70	<4.99	<0.089
PCB 118	1210	153	259	203	216	3.86
PCB 114	<40	<5.05	<8.57	<6.72	<7.13	<0.13
PCB 105	<270	<34.1	<57.9	<45.4	<48.2	<0.86
PCB 126	<30	<3.79	<6.43	<5.04	<5.35	<0.096
PCB 167	<14	<1.77	<3.00	<2.35	<2.50	<0.045
PCB 156/157	<19	<2.40	<4.07	<3.19	<3.39	<0.061
PCB 169	<16	<2.02	<3.43	<2.69	<2.85	<0.051
PCB 189	<15	<1.89	<3.21	<2.52	<2.68	<0.048
Total Dioxins & Furans Only	<925	<117	<198	<155	<165	<2.95
Total PCBs Only	<1711	<216	<367	<288	<305	<5.46
Total Dioxins & Furans and PCBs	<2636	<333	<565	<443	<470	<8.41

Dry Gas Volume Sampled (Rm^3*) :	4.667
Actual Flowrate (m^3/s) :	25.3
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	19.0
Wet Reference Flowrate (Rm^3/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration Test No. 1 pg/m³	Test No. 2 pg/m³	Test No. 3 pg/m³	Average pg/m³	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.19	<0.19	<0.16	<0.18	8.4
12378-pentachlorodibenzo-p-dioxin	0.60	0.58	<0.16	<0.45	54.9
123478-hexachlorodibenzo-p-dioxin	0.79	1.07	0.52	0.80	34.7
123678-hexachlorodibenzo-p-dioxin	2.68	3.22	1.86	2.59	26.6
123789-hexachlorodibenzo-p-dioxin	1.36	1.69	0.82	1.29	34.0
1234678-heptachlorodibenzo-p-dioxin	46.4	48.6	24.5	39.8	33.5
Octachlorodibenzo-p-dioxin	110	114	65.1	96.2	28.1
2378-tetrachlorodibenzofuran	0.55	0.20	0.17	0.31	69.1
12378-pentachlorodibenzofuran	<0.66	0.60	0.47	<0.58	17.1
23478-pentachlorodibenzofuran	1.40	0.92	0.54	0.95	45.3
123478-hexachlorodibenzofuran	1.08	0.73	0.53	0.78	36.2
123678-hexachlorodibenzofuran	<1.37	<1.00	<0.64	<1.01	36.2
234678-hexachlorodibenzofuran	2.00	1.95	1.03	1.66	32.8
123789-hexachlorodibenzofuran	0.61	1.00	0.66	0.75	28.3
1234678-heptachlorodibenzofuran	9.75	10.2	5.46	8.48	30.9
1234789-heptachlorodibenzofuran	1.57	1.82	0.95	1.45	31.0
Octachlorodibenzofuran	27.2	27.7	13.1	22.7	36.5
PCB 81	<2.37	<1.93	<4.16	<2.82	42.0
PCB 77	18.0	6.74	<4.54	<9.75	73.9
PCB 123	5.99	<4.62	<3.53	<4.71	26.1
PCB 118	565	204	153	307	73.2
PCB 114	13.0	<3.98	<5.05	<7.33	67.0
PCB 105	163	58.5	<34.1	<85.4	80.5
PCB 126	<2.62	<2.18	<3.79	<2.86	29.0
PCB 167	6.83	2.10	<1.77	<3.57	79.3
PCB 156/157	18.2	<6.03	<2.40	<8.88	93.3
PCB 169	<1.37	<1.41	<2.02	<1.60	22.6
PCB 189	<1.21	<1.41	<1.89	<1.51	23.3
Total Dioxins & Furans Only	<208	<215	<117	<180	30.5
Total PCBs Only	<798	<293	<216	<436	72.6
Total Dioxins & Furans and PCBs	<1006	<508	<333	<616	56.8

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	<0.32	<0.33	<0.28	<0.31	9.0
12378-pentachlorodibenzo-p-dioxin	1.03	0.99	<0.28	<0.77	55.2
123478-hexachlorodibenzo-p-dioxin	1.35	1.85	0.88	1.36	35.6
123678-hexachlorodibenzo-p-dioxin	4.57	5.56	3.15	4.43	27.4
123789-hexachlorodibenzo-p-dioxin	2.32	2.92	1.40	2.21	34.7
1234678-heptachlorodibenzo-p-dioxin	79.1	84.0	41.6	68.2	34.0
Octachlorodibenzo-p-dioxin	187	196	111	165	28.6
2378-tetrachlorodibenzofuran	0.94	0.35	0.28	0.52	68.9
12378-pentachlorodibenzofuran	<1.13	1.04	0.79	<0.99	17.4
23478-pentachlorodibenzofuran	2.38	1.59	0.91	1.63	45.2
123478-hexachlorodibenzofuran	1.85	1.26	0.89	1.33	36.1
123678-hexachlorodibenzofuran	<2.34	<1.73	<1.09	<1.72	36.3
234678-hexachlorodibenzofuran	3.40	3.37	1.75	2.84	33.2
123789-hexachlorodibenzofuran	1.03	1.72	1.12	1.29	29.2
1234678-heptachlorodibenzofuran	16.6	17.6	9.28	14.5	31.4
1234789-heptachlorodibenzofuran	2.68	3.15	1.61	2.48	31.7
Octachlorodibenzofuran	46.4	47.9	22.3	38.8	37.0
PCB 81	<4.04	<3.32	<7.07	<4.81	41.3
PCB 77	30.6	11.6	<7.71	<16.7	73.6
PCB 123	10.2	<7.98	<6.00	<8.06	26.1
PCB 118	964	352	259	525	72.9
PCB 114	22.1	<6.87	<8.57	<12.5	66.8
PCB 105	279	101	<57.9	<146	80.2
PCB 126	<4.47	<3.77	<6.43	<4.89	28.2
PCB 167	11.6	3.63	<3.00	<6.09	79.0
PCB 156/157	31.1	<10.4	<4.07	<15.2	93.0
PCB 169	<2.34	<2.44	<3.43	<2.74	22.0
PCB 189	<2.06	<2.44	<3.21	<2.57	22.8
Total Dioxins & Furans Only	<355	<371	<198	<308	31.0
Total PCBs Only	<1361	<506	<367	<744	72.3
Total Dioxins & Furans and PCBs	<1716	<877	<565	<1053	56.5

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

Specific Isomer	Dry Adjusted Concentration Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.25	<0.26	<0.22	<0.24	8.2
12378-pentachlorodibenzo-p-dioxin	0.79	0.77	<0.22	<0.59	54.7
123478-hexachlorodibenzo-p-dioxin	1.04	1.43	0.69	1.06	35.0
123678-hexachlorodibenzo-p-dioxin	3.53	4.30	2.47	3.43	26.7
123789-hexachlorodibenzo-p-dioxin	1.79	2.26	1.10	1.72	34.1
1234678-heptachlorodibenzo-p-dioxin	61.1	64.9	32.6	52.8	33.4
Octachlorodibenzo-p-dioxin	145	151	86.7	128	27.9
2378-tetrachlorodibenzofuran	0.72	0.27	0.22	0.40	68.4
12378-pentachlorodibenzofuran	<0.87	0.80	0.62	<0.77	16.7
23478-pentachlorodibenzofuran	1.84	1.23	0.72	1.26	44.6
123478-hexachlorodibenzofuran	1.43	0.97	0.70	1.03	35.5
123678-hexachlorodibenzofuran	<1.81	<1.33	<0.86	<1.33	35.6
234678-hexachlorodibenzofuran	2.63	2.60	1.37	2.20	32.6
123789-hexachlorodibenzofuran	0.80	1.33	0.88	1.00	28.8
1234678-heptachlorodibenzofuran	12.8	13.6	7.28	11.2	30.8
1234789-heptachlorodibenzofuran	2.07	2.43	1.27	1.92	31.0
Octachlorodibenzofuran	35.8	37.0	17.5	30.1	36.3
PCB 81	<3.12	<2.57	<5.55	<3.74	42.3
PCB 77	23.6	8.98	<6.05	<12.9	73.1
PCB 123	7.88	<6.16	<4.70	<6.25	25.5
PCB 118	744	272	203	406	72.4
PCB 114	17.1	<5.31	<6.72	<9.70	66.3
PCB 105	215	78.0	<45.4	<113	79.8
PCB 126	<3.45	<2.91	<5.04	<3.80	29.2
PCB 167	8.98	2.81	<2.35	<4.71	78.6
PCB 156/157	24.0	<8.04	<3.19	<11.7	92.6
PCB 169	<1.81	<1.88	<2.69	<2.13	23.0
PCB 189	<1.59	<1.88	<2.52	<2.00	23.7
Total Dioxins & Furans Only	<274	<287	<155	<239	30.4
Total PCBs Only	<1051	<391	<288	<576	71.8
Total Dioxins & Furans and PCBs	<1325	<678	<443	<815	56.0

* 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. 2 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration Test No. 1 pg/Rm³*	Test No. 2 pg/Rm³*	Test No. 3 pg/Rm³*	Average pg/Rm³*	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.27	<0.28	<0.23	<0.26	9.0
12378-pentachlorodibenzo-p-dioxin	0.86	0.83	<0.23	<0.64	55.2
123478-hexachlorodibenzo-p-dioxin	1.13	1.54	0.74	1.14	35.3
123678-hexachlorodibenzo-p-dioxin	3.83	4.61	2.62	3.69	27.2
123789-hexachlorodibenzo-p-dioxin	1.94	2.43	1.16	1.84	34.5
1234678-heptachlorodibenzo-p-dioxin	66.2	69.6	34.6	56.8	34.0
Octachlorodibenzo-p-dioxin	157	163	92.0	137	28.6
2378-tetrachlorodibenzofuran	0.78	0.29	0.24	0.44	69.3
12378-pentachlorodibenzofuran	<0.94	0.86	0.66	<0.82	17.6
23478-pentachlorodibenzofuran	1.99	1.32	0.76	1.36	45.6
123478-hexachlorodibenzofuran	1.55	1.04	0.74	1.11	36.5
123678-hexachlorodibenzofuran	<1.96	<1.43	<0.91	<1.43	36.6
234678-hexachlorodibenzofuran	2.85	2.79	1.46	2.37	33.3
123789-hexachlorodibenzofuran	0.87	1.43	0.93	1.07	28.8
1234678-heptachlorodibenzofuran	13.9	14.6	7.72	12.1	31.4
1234789-heptachlorodibenzofuran	2.24	2.61	1.34	2.07	31.6
Octachlorodibenzofuran	38.8	39.7	18.5	32.4	37.0
PCB 81	<3.38	<2.76	<5.89	<4.01	41.3
PCB 77	25.6	9.65	<6.42	<13.9	74.0
PCB 123	8.55	<6.62	<4.99	<6.72	26.5
PCB 118	807	292	216	438	73.3
PCB 114	18.5	<5.70	<7.13	<10.4	67.2
PCB 105	233	83.8	<48.2	<122	80.7
PCB 126	<3.74	<3.12	<5.35	<4.07	28.2
PCB 167	9.74	3.01	<2.50	<5.08	79.5
PCB 156/157	26.0	<8.64	<3.39	<12.7	93.4
PCB 169	<1.96	<2.02	<2.85	<2.28	21.9
PCB 189	<1.73	<2.02	<2.68	<2.14	22.7
Total Dioxins & Furans Only	<297	<308	<165	<257	31.0
Total PCBs Only	<1139	<420	<305	<621	72.8
Total Dioxins & Furans and PCBs	<1436	<728	<470	<878	57.0

* At 25°C and 1 atmosphere

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

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

Specific Isomer	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
2378-tetrachlorodibenzo-p-dioxin	<0.0048	<0.0049	<0.0042	<0.0046	8.3
12378-pentachlorodibenzo-p-dioxin	0.015	0.015	<0.0042	<0.011	54.9
123478-hexachlorodibenzo-p-dioxin	0.020	0.027	0.013	0.020	34.5
123678-hexachlorodibenzo-p-dioxin	0.068	0.081	0.047	0.065	26.4
123789-hexachlorodibenzo-p-dioxin	0.035	0.043	0.021	0.033	33.8
1234678-heptachlorodibenzo-p-dioxin	1.18	1.23	0.62	1.01	33.5
Octachlorodibenzo-p-dioxin	2.79	2.86	1.65	2.43	28.0
2378-tetrachlorodibenzofuran	0.014	0.0050	0.0042	0.0077	69.5
12378-pentachlorodibenzofuran	<0.017	0.015	0.012	<0.015	17.3
23478-pentachlorodibenzofuran	0.035	0.023	0.014	0.024	45.6
123478-hexachlorodibenzofuran	0.028	0.018	0.013	0.020	36.5
123678-hexachlorodibenzofuran	<0.035	<0.025	<0.016	<0.025	36.5
234678-hexachlorodibenzofuran	0.051	0.049	0.026	0.042	32.9
123789-hexachlorodibenzofuran	0.015	0.025	0.017	0.019	27.9
1234678-heptachlorodibenzofuran	0.25	0.26	0.14	0.21	30.9
1234789-heptachlorodibenzofuran	0.040	0.046	0.024	0.037	30.9
Octachlorodibenzofuran	0.69	0.70	0.33	0.57	36.5
PCB 81	<0.060	<0.049	<0.11	<0.071	42.1
PCB 77	0.46	0.17	<0.11	<0.25	74.2
PCB 123	0.15	<0.12	<0.089	<0.12	26.4
PCB 118	14.4	5.14	3.86	7.79	73.5
PCB 114	0.33	<0.10	<0.13	<0.19	67.4
PCB 105	4.15	1.47	<0.86	<2.16	80.9
PCB 126	<0.067	<0.055	<0.096	<0.072	29.0
PCB 167	0.17	0.053	<0.045	<0.090	79.7
PCB 156/157	0.46	<0.15	<0.061	<0.23	93.6
PCB 169	<0.035	<0.036	<0.051	<0.041	22.6
PCB 189	<0.031	<0.036	<0.048	<0.038	23.2
Total Dioxins & Furans Only	<5.29	<5.42	<2.95	<4.55	30.5
Total PCBs Only	<20.3	<7.38	<5.46	<11.0	73.0
Total Dioxins & Furans and PCBs	<25.6	<12.8	<8.41	<15.6	57.1

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

TABLE 42

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration pg/m^3	Dry Reference Concentration pg/Rm^3*	Dry Adjusted Concentration pg/Rm^3**	Wet Reference Concentration pg/Rm^3*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.18	<0.31	<0.24	<0.26	<0.0046
12378-pentachlorodibenzo-p-dioxin	<0.45	<0.77	<0.59	<0.64	<0.011
123478-hexachlorodibenzo-p-dioxin	0.80	1.36	1.06	1.14	0.020
123678-hexachlorodibenzo-p-dioxin	2.59	4.43	3.43	3.69	0.065
123789-hexachlorodibenzo-p-dioxin	1.29	2.21	1.72	1.84	0.033
1234678-heptachlorodibenzo-p-dioxin	39.8	68.2	52.8	56.8	1.01
Octachlorodibenzo-p-dioxin	96.2	165	128	137	2.43
2378-tetrachlorodibenzofuran	0.31	0.52	0.40	0.44	0.0077
12378-pentachlorodibenzofuran	<0.58	<0.99	<0.77	<0.82	<0.015
23478-pentachlorodibenzofuran	0.95	1.63	1.26	1.36	0.024
123478-hexachlorodibenzofuran	0.78	1.33	1.03	1.11	0.020
123678-hexachlorodibenzofuran	<1.01	<1.72	<1.33	<1.43	<0.025
234678-hexachlorodibenzofuran	1.66	2.84	2.20	2.37	0.042
123789-hexachlorodibenzofuran	0.75	1.29	1.00	1.07	0.019
1234678-heptachlorodibenzofuran	8.48	14.5	11.2	12.1	0.21
1234789-heptachlorodibenzofuran	1.45	2.48	1.92	2.07	0.037
Octachlorodibenzofuran	22.7	38.8	30.1	32.4	0.57
PCB 81	<2.82	<4.81	<3.74	<4.01	<0.071
PCB 77	<9.75	<16.7	<12.9	<13.9	<0.25
PCB 123	<4.71	<8.06	<6.25	<6.72	<0.12
PCB 118	307	525	406	438	7.79
PCB 114	<7.33	<12.5	<9.7	<10.4	<0.19
PCB 105	<85.4	<146	<113	<122	<2.16
PCB 126	<2.86	<4.89	<3.80	<4.07	<0.072
PCB 167	<3.57	<6.09	<4.71	<5.08	<0.090
PCB 156/157	<8.88	<15.2	<11.7	<12.7	<0.23
PCB 169	<1.60	<2.74	<2.13	<2.28	<0.041
PCB 189	<1.51	<2.57	<2.00	<2.14	<0.038
Total Dioxins & Furans Only	<180	<308	<239	<257	<4.55
Total PCBs Only	<436	<744	<576	<621	<11.0
Total Dioxins & Furans and PCBs	<616	<1053	<815	<878	<15.6

* 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 pg	Laboratory Blank pg
2378-tetrachlorodibenzo-p-dioxin	<3.7	<1.2
12378-pentachlorodibenzo-p-dioxin	<1.7	<0.81
123478-hexachlorodibenzo-p-dioxin	<2.1	<1.6
123678-hexachlorodibenzo-p-dioxin	<1.9	<1.4
123789-hexachlorodibenzo-p-dioxin	<2.0	<1.5
1234678-heptachlorodibenzo-p-dioxin	2.99	2.84
Octachlorodibenzo-p-dioxin	21.8	<4.2
2378-tetrachlorodibenzofuran	<2.8	<0.81
12378-pentachlorodibenzofuran	<1.7	<2.1
23478-pentachlorodibenzofuran	<1.6	<0.60
123478-hexachlorodibenzofuran	<1.1	<1.1
123678-hexachlorodibenzofuran	<1.0	<1.0
234678-hexachlorodibenzofuran	<1.1	<1.1
123789-hexachlorodibenzofuran	2.37	<3.0
1234678-heptachlorodibenzofuran	3.11	<1.5
1234789-heptachlorodibenzofuran	<0.92	<0.76
Octachlorodibenzofuran	4.32	<1.8
PCB 81	<13	<9.7
PCB 77	<13	<10
PCB 123	<14	<16
PCB 118	<13	<22
PCB 114	<14	<17
PCB 105	<13	<16
PCB 126	<15	<17
PCB 167	<6.2	<6.5
PCB 156/157	<8.3	<8.6
PCB 169	<7.4	<7.4
PCB 189	<6.2	<8.0
Total Dioxins & Furans Only	<56.2	<27.3
Total PCBs Only	<123	<138
Total Dioxins & Furans and PCBs	<179	<166

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

TABLE 44
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.19	<0.19	<0.16	<0.18
12378-pentachlorodibenzo-p-dioxin	1.00000	0.60	0.58	<0.16	<0.45
123478-hexachlorodibenzo-p-dioxin	0.10000	0.079	0.11	0.052	0.080
123678-hexachlorodibenzo-p-dioxin	0.10000	0.27	0.32	0.19	0.26
123789-hexachlorodibenzo-p-dioxin	0.10000	0.14	0.17	0.082	0.13
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.46	0.49	0.24	0.40
Octachlorodibenzo-p-dioxin	0.00030	0.033	0.034	0.020	0.029
2378-tetrachlorodibenzofuran	0.10000	0.055	0.020	0.017	0.031
12378-pentachlorodibenzofuran	0.03000	<0.020	0.018	0.014	<0.017
23478-pentachlorodibenzofuran	0.30000	0.42	0.28	0.16	0.29
123478-hexachlorodibenzofuran	0.10000	0.11	0.073	0.053	0.078
123678-hexachlorodibenzofuran	0.10000	<0.14	<0.10	<0.064	<0.10
234678-hexachlorodibenzofuran	0.10000	0.20	0.20	0.10	0.17
123789-hexachlorodibenzofuran	0.10000	0.061	0.10	0.066	0.075
1234678-heptachlorodibenzofuran	0.01000	0.097	0.10	0.055	0.085
1234789-heptachlorodibenzofuran	0.01000	0.016	0.018	0.0095	0.014
Octachlorodibenzofuran	0.00030	0.0082	0.0083	0.0039	0.0068
PCB 81	0.00030	<0.00071	<0.00058	<0.0012	<0.00085
PCB 77	0.00010	0.0018	0.00067	<0.00045	<0.00098
PCB 123	0.00003	0.00018	<0.00014	<0.00011	<0.00014
PCB 118	0.00003	0.017	0.0061	0.0046	0.0092
PCB 114	0.00003	0.00039	<0.00012	<0.00015	<0.00022
PCB 105	0.00003	0.0049	0.0018	<0.0010	<0.0026
PCB 126	0.10000	<0.26	<0.22	<0.38	<0.29
PCB 167	0.00003	0.00020	0.000063	<0.000053	<0.00011
PCB 156/157	0.00003	0.00055	<0.00018	<0.000072	<0.00027
PCB 169	0.03000	<0.041	<0.042	<0.061	<0.048
PCB 189	0.00003	<0.000036	<0.000042	<0.000057	<0.000045
Total Dioxins & Furans Only		<2.89	<2.80	<1.46	<2.38
Total PCBs Only		<0.33	<0.27	<0.45	<0.35
Total Dioxins & Furans and PCBs		<3.22	<3.07	<1.91	<2.73

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.32	<0.33	<0.28	<0.31
12378-pentachlorodibenzo-p-dioxin	1.00000	1.03	0.99	<0.28	<0.77
123478-hexachlorodibenzo-p-dioxin	0.10000	0.14	0.19	0.088	0.14
123678-hexachlorodibenzo-p-dioxin	0.10000	0.46	0.56	0.31	0.44
123789-hexachlorodibenzo-p-dioxin	0.10000	0.23	0.29	0.14	0.22
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.79	0.84	0.42	0.68
Octachlorodibenzo-p-dioxin	0.00030	0.056	0.059	0.033	0.049
2378-tetrachlorodibenzofuran	0.10000	0.094	0.035	0.028	0.052
12378-pentachlorodibenzofuran	0.03000	<0.034	0.031	0.024	<0.030
23478-pentachlorodibenzofuran	0.30000	0.71	0.48	0.27	0.49
123478-hexachlorodibenzofuran	0.10000	0.18	0.13	0.089	0.133
123678-hexachlorodibenzofuran	0.10000	<0.23	<0.17	<0.11	<0.17
234678-hexachlorodibenzofuran	0.10000	0.34	0.34	0.18	0.28
123789-hexachlorodibenzofuran	0.10000	0.10	0.17	0.11	0.13
1234678-heptachlorodibenzofuran	0.01000	0.17	0.18	0.093	0.15
1234789-heptachlorodibenzofuran	0.01000	0.027	0.031	0.016	0.025
Octachlorodibenzofuran	0.00030	0.014	0.014	0.0067	0.012
PCB 81	0.00030	<0.0012	<0.0010	<0.0021	<0.0014
PCB 77	0.00010	0.0031	0.0012	<0.00077	<0.0017
PCB 123	0.00003	0.00031	<0.00024	<0.00018	<0.00024
PCB 118	0.00003	0.029	0.011	0.0078	0.016
PCB 114	0.00003	0.00066	<0.00021	<0.00026	<0.00038
PCB 105	0.00003	0.0084	0.0030	<0.0017	<0.0044
PCB 126	0.10000	<0.45	<0.38	<0.64	<0.49
PCB 167	0.00003	0.00035	0.00011	<0.000090	<0.00018
PCB 156/157	0.00003	0.00093	<0.00031	<0.00012	<0.00046
PCB 169	0.03000	<0.070	<0.073	<0.10	<0.082
PCB 189	0.00003	<0.000062	<0.000073	<0.000096	<0.000077
Total Dioxins & Furans Only		<4.93	<4.83	<2.48	<4.08
Total PCBs Only		<0.56	<0.47	<0.76	<0.60
Total Dioxins & Furans and PCBs		<5.49	<5.30	<3.24	<4.67

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.25	<0.26	<0.22	<0.24
12378-pentachlorodibenzo-p-dioxin	1.00000	0.79	0.77	<0.22	<0.59
123478-hexachlorodibenzo-p-dioxin	0.10000	0.10	0.14	0.069	0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	0.35	0.43	0.25	0.34
123789-hexachlorodibenzo-p-dioxin	0.10000	0.18	0.23	0.11	0.17
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.61	0.65	0.33	0.53
Octachlorodibenzo-p-dioxin	0.00030	0.043	0.045	0.026	0.038
2378-tetrachlorodibenzofuran	0.10000	0.072	0.027	0.022	0.040
12378-pentachlorodibenzofuran	0.03000	<0.026	0.024	0.019	<0.023
23478-pentachlorodibenzofuran	0.30000	0.55	0.37	0.21	0.38
123478-hexachlorodibenzofuran	0.10000	0.14	0.097	0.070	0.10
123678-hexachlorodibenzofuran	0.10000	<0.18	<0.13	<0.086	<0.13
234678-hexachlorodibenzofuran	0.10000	0.26	0.26	0.14	0.22
123789-hexachlorodibenzofuran	0.10000	0.080	0.13	0.088	0.10
1234678-heptachlorodibenzofuran	0.01000	0.13	0.14	0.073	0.11
1234789-heptachlorodibenzofuran	0.01000	0.021	0.024	0.013	0.019
Octachlorodibenzofuran	0.00030	0.011	0.011	0.0052	0.0090
PCB 81	0.00030	<0.00094	<0.00077	<0.0017	<0.0011
PCB 77	0.00010	0.0024	0.00090	<0.00060	<0.0013
PCB 123	0.00003	0.00024	<0.00018	<0.00014	<0.00019
PCB 118	0.00003	0.022	0.0082	0.0061	0.012
PCB 114	0.00003	0.00051	<0.00016	<0.00020	<0.00029
PCB 105	0.00003	0.0065	0.0023	<0.0014	<0.0034
PCB 126	0.10000	<0.34	<0.29	<0.50	<0.38
PCB 167	0.00003	0.00027	0.000084	<0.000071	<0.00014
PCB 156/157	0.00003	0.00072	<0.00024	<0.000096	<0.00035
PCB 169	0.03000	<0.054	<0.056	<0.081	<0.064
PCB 189	0.00003	<0.000048	<0.000056	<0.000076	<0.000060
Total Dioxins & Furans Only		<3.80	<3.73	<1.94	<3.16
Total PCBs Only		<0.43	<0.36	<0.60	<0.46
Total Dioxins & Furans and PCBs		<4.24	<4.09	<2.54	<3.62

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

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	0.12	0.13	0.11	0.12
12378-pentachlorodibenzo-p-dioxin	1.00000	0.79	0.77	0.11	0.56
123478-hexachlorodibenzo-p-dioxin	0.10000	0.10	0.14	0.069	0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	0.35	0.43	0.25	0.34
123789-hexachlorodibenzo-p-dioxin	0.10000	0.18	0.23	0.11	0.17
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.61	0.65	0.33	0.53
Octachlorodibenzo-p-dioxin	0.00030	0.043	0.045	0.026	0.038
2378-tetrachlorodibenzofuran	0.10000	0.072	0.027	0.0223	0.040
12378-pentachlorodibenzofuran	0.03000	0.013	0.024	0.019	0.019
23478-pentachlorodibenzofuran	0.30000	0.55	0.37	0.21	0.38
123478-hexachlorodibenzofuran	0.10000	0.14	0.097	0.070	0.10
123678-hexachlorodibenzofuran	0.10000	0.090	0.067	0.043	0.067
234678-hexachlorodibenzofuran	0.10000	0.26	0.26	0.14	0.22
123789-hexachlorodibenzofuran	0.10000	0.080	0.13	0.088	0.10
1234678-heptachlorodibenzofuran	0.01000	0.13	0.14	0.073	0.11
1234789-heptachlorodibenzofuran	0.01000	0.021	0.024	0.013	0.019
Octachlorodibenzofuran	0.00030	0.011	0.011	0.0052	0.0090
PCB 81	0.00030	0.00047	0.00039	0.00083	0.00056
PCB 77	0.00010	0.0024	0.00090	0.00030	0.0012
PCB 123	0.00003	0.00024	0.000092	0.000071	0.00013
PCB 118	0.00003	0.022	0.0082	0.0061	0.012
PCB 114	0.00003	0.00051	0.000080	0.00010	0.00023
PCB 105	0.00003	0.0065	0.0023	0.00068	0.0032
PCB 126	0.10000	0.17	0.15	0.25	0.19
PCB 167	0.00003	0.00027	0.000084	0.000035	0.00013
PCB 156/157	0.00003	0.00072	0.00012	0.000048	0.00030
PCB 169	0.03000	0.027	0.028	0.040	0.032
PCB 189	0.00003	0.000024	0.000028	0.000038	0.000030
Total Dioxins & Furans Only		3.58	3.54	1.68	2.93
Total PCBs Only		0.23	0.19	0.30	0.24
Total Dioxins & Furans and PCBs		3.81	3.72	1.98	3.17

* 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	<0.25	<0.26	<0.22	<0.24
12378-pentachlorodibenzo-p-dioxin	0.500	0.40	0.38	<0.11	<0.30
123478-hexachlorodibenzo-p-dioxin	0.100	0.10	0.14	0.069	0.11
123678-hexachlorodibenzo-p-dioxin	0.100	0.35	0.43	0.25	0.34
123789-hexachlorodibenzo-p-dioxin	0.100	0.18	0.23	0.11	0.17
1234678-heptachlorodibenzo-p-dioxin	0.010	0.61	0.65	0.33	0.53
Octachlorodibenzo-p-dioxin	0.001	0.14	0.15	0.087	0.13
2378-tetrachlorodibenzofuran	0.100	0.072	0.027	0.022	0.040
12378-pentachlorodibenzofuran	0.050	<0.044	0.040	0.031	<0.038
23478-pentachlorodibenzofuran	0.500	0.92	0.61	0.36	0.63
123478-hexachlorodibenzofuran	0.100	0.14	0.097	0.070	0.10
123678-hexachlorodibenzofuran	0.100	<0.18	<0.13	<0.086	<0.13
234678-hexachlorodibenzofuran	0.100	0.26	0.26	0.14	0.22
123789-hexachlorodibenzofuran	0.100	0.080	0.13	0.088	0.10
1234678-heptachlorodibenzofuran	0.010	0.13	0.14	0.073	0.11
1234789-heptachlorodibenzofuran	0.010	0.021	0.024	0.013	0.019
Octachlorodibenzofuran	0.001	0.036	0.037	0.017	0.030
Total Dioxins & Furans		<3.92	<3.74	<2.06	<3.24
In-Stack Emission Limit					60

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

NATO/CCMS (1989) Toxicity Equivalency Factors

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

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

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.27	<0.28	<0.23	<0.26
12378-pentachlorodibenzo-p-dioxin	1.00000	0.86	0.83	<0.23	<0.64
123478-hexachlorodibenzo-p-dioxin	0.10000	0.11	0.15	0.074	0.11
123678-hexachlorodibenzo-p-dioxin	0.10000	0.38	0.46	0.26	0.37
123789-hexachlorodibenzo-p-dioxin	0.10000	0.19	0.24	0.12	0.18
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.66	0.70	0.35	0.57
Octachlorodibenzo-p-dioxin	0.00030	0.047	0.049	0.028	0.041
2378-tetrachlorodibenzofuran	0.10000	0.078	0.029	0.024	0.044
12378-pentachlorodibenzofuran	0.03000	<0.028	0.026	0.020	<0.025
23478-pentachlorodibenzofuran	0.30000	0.60	0.39	0.23	0.41
123478-hexachlorodibenzofuran	0.10000	0.15	0.10	0.074	0.11
123678-hexachlorodibenzofuran	0.10000	<0.20	<0.14	<0.091	<0.14
234678-hexachlorodibenzofuran	0.10000	0.28	0.28	0.15	0.24
123789-hexachlorodibenzofuran	0.10000	0.087	0.14	0.093	0.11
1234678-heptachlorodibenzofuran	0.01000	0.14	0.15	0.077	0.12
1234789-heptachlorodibenzofuran	0.01000	0.022	0.026	0.013	0.021
Octachlorodibenzofuran	0.00030	0.012	0.012	0.0056	0.0097
PCB 81	0.00030	<0.0010	<0.00083	<0.0018	<0.0012
PCB 77	0.00010	0.0026	0.00096	<0.00064	<0.0014
PCB 123	0.00003	0.00026	<0.00020	<0.00015	<0.00020
PCB 118	0.00003	0.024	0.0088	0.0065	0.013
PCB 114	0.00003	0.00056	<0.00017	<0.00021	<0.00031
PCB 105	0.00003	0.0070	0.0025	<0.0014	<0.0037
PCB 126	0.10000	<0.37	<0.31	<0.54	<0.41
PCB 167	0.00003	0.00029	0.000090	<0.000075	<0.00015
PCB 156/157	0.00003	0.00078	<0.00026	<0.00010	<0.00038
PCB 169	0.03000	<0.059	<0.061	<0.086	<0.068
PCB 189	0.00003	<0.000052	<0.000061	<0.000080	<0.000064
Total Dioxins & Furans Only		<4.12	<4.01	<2.06	<3.40
Total PCBs Only		<0.47	<0.39	<0.63	<0.50
Total Dioxins & Furans and PCBs		<4.59	<4.39	<2.69	<3.89

* At 25°C and 1 atmosphere

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

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

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

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.00000	<0.0048	<0.0049	<0.0042	<0.0046
12378-pentachlorodibenzo-p-dioxin	1.00000	0.015	0.015	<0.0042	<0.011
123478-hexachlorodibenzo-p-dioxin	0.10000	0.0020	0.0027	0.0013	0.0020
123678-hexachlorodibenzo-p-dioxin	0.10000	0.0068	0.0081	0.0047	0.0065
123789-hexachlorodibenzo-p-dioxin	0.10000	0.0035	0.0043	0.0021	0.0033
1234678-heptachlorodibenzo-p-dioxin	0.01000	0.012	0.012	0.0062	0.010
Octachlorodibenzo-p-dioxin	0.00030	0.00084	0.00086	0.00049	0.00073
2378-tetrachlorodibenzofuran	0.10000	0.0014	0.00050	0.00042	0.00077
12378-pentachlorodibenzofuran	0.03000	<0.00050	0.00046	0.00036	<0.00044
23478-pentachlorodibenzofuran	0.30000	0.011	0.0069	0.0041	0.0072
123478-hexachlorodibenzofuran	0.10000	0.0028	0.0018	0.0013	0.0020
123678-hexachlorodibenzofuran	0.10000	<0.0035	<0.0025	<0.0016	<0.0025
234678-hexachlorodibenzofuran	0.10000	0.0051	0.0049	0.0026	0.0042
123789-hexachlorodibenzofuran	0.10000	0.0015	0.0025	0.0017	0.0019
1234678-heptachlorodibenzofuran	0.01000	0.0025	0.0026	0.0014	0.0021
1234789-heptachlorodibenzofuran	0.01000	0.00040	0.00046	0.00024	0.00037
Octachlorodibenzofuran	0.00030	0.00021	0.00021	0.00010	0.00017
PCB 81	0.00030	<0.000018	<0.000015	<0.000032	<0.000021
PCB 77	0.00010	0.000046	0.000017	<0.000011	<0.000025
PCB 123	0.00003	0.0000046	<0.0000035	<0.0000027	<0.0000036
PCB 118	0.00003	0.00043	0.00015	0.00012	0.00023
PCB 114	0.00003	0.0000099	<0.0000030	<0.0000038	<0.0000056
PCB 105	0.00003	0.00012	0.000044	<0.000026	<0.000065
PCB 126	0.10000	<0.0067	<0.0055	<0.0096	<0.0072
PCB 167	0.00003	0.0000052	0.0000016	<0.0000013	<0.0000027
PCB 156/157	0.00003	0.000014	<0.0000046	<0.0000018	<0.0000068
PCB 169	0.03000	<0.0010	<0.0011	<0.0015	<0.0012
PCB 189	0.00003	<0.00000092	<0.0000011	<0.0000014	<0.0000011
Total Dioxins & Furans Only		<0.073	<0.071	<0.037	<0.060
Total PCBs Only		<0.0084	<0.0068	<0.011	<0.0088
Total Dioxins & Furans and PCBs		<0.082	<0.077	<0.048	<0.069

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	<0.18	<0.31	<0.24	<0.26	<0.0046
12378-pentachlorodibenzo-p-dioxin	<0.45	<0.77	<0.59	<0.64	<0.011
123478-hexachlorodibenzo-p-dioxin	0.080	0.14	0.11	0.11	0.0020
123678-hexachlorodibenzo-p-dioxin	0.26	0.44	0.34	0.37	0.0065
123789-hexachlorodibenzo-p-dioxin	0.13	0.22	0.17	0.18	0.0033
1234678-heptachlorodibenzo-p-dioxin	0.40	0.68	0.53	0.57	0.010
Octachlorodibenzo-p-dioxin	0.029	0.049	0.038	0.041	0.00073
2378-tetrachlorodibenzofuran	0.031	0.052	0.040	0.044	0.00077
12378-pentachlorodibenzofuran	<0.017	<0.030	<0.023	<0.025	<0.00044
23478-pentachlorodibenzofuran	0.29	0.49	0.38	0.41	0.0072
123478-hexachlorodibenzofuran	0.078	0.13	0.10	0.11	0.0020
123678-hexachlorodibenzofuran	<0.10	<0.17	<0.13	<0.14	<0.0025
234678-hexachlorodibenzofuran	0.17	0.28	0.22	0.24	0.0042
123789-hexachlorodibenzofuran	0.075	0.13	0.10	0.11	0.0019
1234678-heptachlorodibenzofuran	0.085	0.15	0.11	0.12	0.0021
1234789-heptachlorodibenzofuran	0.014	0.025	0.019	0.021	0.00037
Octachlorodibenzofuran	0.0068	0.012	0.0090	0.0097	0.00017
PCB 81	<0.00085	<0.0014	<0.0011	<0.0012	<0.000021
PCB 77	<0.00098	<0.0017	<0.0013	<0.0014	<0.000025
PCB 123	<0.00014	<0.00024	<0.00019	<0.00020	<0.0000036
PCB 118	0.0092	0.016	0.012	0.013	0.00023
PCB 114	<0.00022	<0.00038	<0.00029	<0.00031	<0.0000056
PCB 105	<0.0026	<0.0044	<0.0034	<0.0037	<0.000065
PCB 126	<0.29	<0.49	<0.38	<0.41	<0.0072
PCB 167	<0.00011	<0.00018	<0.00014	<0.00015	<0.0000027
PCB 156/157	<0.00027	<0.00046	<0.00035	<0.00038	<0.0000068
PCB 169	<0.048	<0.082	<0.064	<0.068	<0.0012
PCB 189	<0.000045	<0.000077	<0.000060	<0.000064	<0.0000011
Total Dioxins & Furans Only	<2.38	<4.08	<3.16	<3.40	<0.060
Total PCBs Only	<0.35	<0.60	<0.46	<0.50	<0.0088
Total Dioxins & Furans and PCBs	<2.73	<4.67	<3.62	<3.89	<0.069

* At 25°C and 1 atmosphere

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

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

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

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

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.091	0.15	0.12	0.13	0.0023
12378-pentachlorodibenzo-p-dioxin	0.42	0.72	0.56	0.60	0.011
123478-hexachlorodibenzo-p-dioxin	0.080	0.14	0.11	0.11	0.0020
123678-hexachlorodibenzo-p-dioxin	0.26	0.44	0.34	0.37	0.0065
123789-hexachlorodibenzo-p-dioxin	0.13	0.22	0.17	0.18	0.0033
1234678-heptachlorodibenzo-p-dioxin	0.40	0.68	0.53	0.57	0.010
Octachlorodibenzo-p-dioxin	0.029	0.049	0.038	0.041	0.00073
2378-tetrachlorodibenzofuran	0.031	0.052	0.040	0.044	0.00077
12378-pentachlorodibenzofuran	0.014	0.024	0.019	0.020	0.00035
23478-pentachlorodibenzofuran	0.29	0.49	0.38	0.41	0.0072
123478-hexachlorodibenzofuran	0.078	0.13	0.10	0.11	0.0020
123678-hexachlorodibenzofuran	0.050	0.086	0.067	0.072	0.0013
234678-hexachlorodibenzofuran	0.17	0.28	0.22	0.24	0.0042
123789-hexachlorodibenzofuran	0.075	0.13	0.10	0.11	0.0019
1234678-heptachlorodibenzofuran	0.085	0.15	0.11	0.12	0.0021
1234789-heptachlorodibenzofuran	0.014	0.025	0.019	0.021	0.00037
Octachlorodibenzofuran	0.0068	0.012	0.0090	0.0097	0.00017
PCB 81	0.00042	0.00072	0.00056	0.00060	0.000011
PCB 77	0.00090	0.0015	0.0012	0.0013	0.000023
PCB 123	0.00010	0.00017	0.00013	0.00014	0.0000026
PCB 118	0.0092	0.016	0.012	0.013	0.00023
PCB 114	0.00017	0.00030	0.00023	0.00025	0.0000044
PCB 105	0.0024	0.0041	0.0032	0.0034	0.000061
PCB 126	0.14	0.24	0.19	0.20	0.0036
PCB 167	0.000098	0.00017	0.00013	0.00014	0.0000025
PCB 156/157	0.00022	0.00038	0.00030	0.00032	0.0000057
PCB 169	0.024	0.041	0.032	0.034	0.00061
PCB 189	0.000023	0.000039	0.000030	0.000032	0.00000057
Total Dioxins & Furans Only	2.21	3.79	2.93	3.15	0.056
Total PCBs Only	0.18	0.31	0.24	0.26	0.0046
Total Dioxins & Furans and PCBs	2.39	4.09	3.17	3.41	0.061

* 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	4630	578	985	760	824	14.7
1,3-Dichlorobenzene	232	29.0	49.4	38.1	41.3	0.74
1,4-Dichlorobenzene	209	26.1	44.5	34.3	37.2	0.66
1,2-Dichlorobenzene	210	26.2	44.7	34.5	37.4	0.67
Total Dichlorobenzene	651	81.2	138	107	116	2.06
1,3,5-trichlorobenzene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
1,2,4-trichlorobenzene	121	15.1	25.7	19.9	21.5	0.38
1,2,3-trichlorobenzene	12.4	1.55	2.64	2.04	2.21	0.039
Total Trichlorobenzene	<145	<18.1	<30.9	<23.9	<25.9	<0.46
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	24.9	3.11	5.30	4.09	4.43	0.079
1,2,3,4-tetrachlorobenzene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Total Tetrachlorobenzene	<36.9	<4.60	<7.85	<6.06	<6.57	<0.12
Pentachlorobenzene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Hexachlorobenzene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Total Chlorobenzenes	<5487	<685	<1167	<901	<977	<17.4

Dry Gas Volume Sampled (Rm^3*) :	4.701
Actual Flowrate (m^3/s) :	25.4
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	19.3
Wet Reference Flowrate (Rm^3/s*) :	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 52
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	3450	443	764	590	634	11.2
1,3-Dichlorobenzene	248	31.8	54.9	42.4	45.6	0.80
1,4-Dichlorobenzene	216	27.7	47.9	37.0	39.7	0.70
1,2-Dichlorobenzene	197	25.3	43.6	33.7	36.2	0.64
Total Dichlorobenzene	661	84.8	146	113	121	2.14
1,3,5-trichlorobenzene	14.5	1.86	3.21	2.48	2.66	0.047
1,2,4-trichlorobenzene	174	22.3	38.5	29.8	32.0	0.56
1,2,3-trichlorobenzene	13.6	1.75	3.01	2.33	2.50	0.044
Total Trichlorobenzene	202	25.9	44.8	34.6	37.1	0.65
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	38.1	4.89	8.44	6.52	7.00	0.12
1,2,3,4-tetrachlorobenzene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Total Tetrachlorobenzene	<50.1	<6.43	<11.1	<8.57	<9.21	<0.16
Pentachlorobenzene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Hexachlorobenzene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Total Chlorobenzenes	<4387	<563	<972	<751	<806	<14.2

Dry Gas Volume Sampled (Rm³*) :	4.514
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

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

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	3270	413	701	549	583	10.4
1,3-Dichlorobenzene	186	23.5	39.9	31.3	33.2	0.59
1,4-Dichlorobenzene	177	22.3	37.9	29.7	31.6	0.57
1,2-Dichlorobenzene	165	20.8	35.4	27.7	29.4	0.53
Total Dichlorobenzene	528	66.6	113	88.7	94.2	1.69
1,3,5-trichlorobenzene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
1,2,4-trichlorobenzene	144	18.2	30.9	24.2	25.7	0.46
1,2,3-trichlorobenzene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Total Trichlorobenzene	<168	<21.2	<36.0	<28.2	<30.0	<0.54
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	28.4	3.58	6.09	4.77	5.07	0.091
1,2,3,4-tetrachlorobenzene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Total Tetrachlorobenzene	<40.4	<5.10	<8.66	<6.79	<7.21	<0.13
Pentachlorobenzene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Hexachlorobenzene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Total Chlorobenzenes	<4030	<509	<864	<677	<719	<12.9

Dry Gas Volume Sampled (Rm³*) :	4.667
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

TABLE 54
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m^3	ng/m^3	ng/m^3	ng/m^3	%
Monochlorobenzene	578	443	413	478	18.4
1,3-Dichlorobenzene	29.0	31.8	23.5	28.1	15.1
1,4-Dichlorobenzene	26.1	27.7	22.3	25.4	10.9
1,2-Dichlorobenzene	26.2	25.3	20.8	24.1	11.9
Total Dichlorobenzene	81.2	84.8	66.6	77.6	12.4
1,3,5-trichlorobenzene	<1.50	1.86	<1.51	<1.62	12.6
1,2,4-trichlorobenzene	15.1	22.3	18.2	18.5	19.6
1,2,3-trichlorobenzene	1.55	1.75	<1.51	<1.60	7.8
Total Trichlorobenzene	<18.1	25.9	<21.2	<21.8	18.1
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.11	4.89	3.58	3.86	23.9
1,2,3,4-tetrachlorobenzene	<1.50	<1.54	<1.51	<1.52	1.4
Total Tetrachlorobenzene	<4.60	<6.43	<5.10	<5.38	17.6
Pentachlorobenzene	<1.50	<1.54	<1.51	<1.52	1.4
Hexachlorobenzene	<1.50	<1.54	<1.51	<1.52	1.4
Total Chlorobenzenes	<685	<563	<509	<585	15.4

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

Specific Isomer	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	985	764	701	817	18.3
1,3-Dichlorobenzene	49.4	54.9	39.9	48.0	15.9
1,4-Dichlorobenzene	44.5	47.9	37.9	43.4	11.6
1,2-Dichlorobenzene	44.7	43.6	35.4	41.2	12.4
Total Dichlorobenzene	138	146	113	133	13.1
1,3,5-trichlorobenzene	<2.55	3.21	<2.57	<2.78	13.5
1,2,4-trichlorobenzene	25.7	38.5	30.9	31.7	20.3
1,2,3-trichlorobenzene	2.64	3.01	<2.57	<2.74	8.7
Total Trichlorobenzene	<30.9	44.8	<36.0	<37.2	18.8
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	5.30	8.44	6.09	6.61	24.8
1,2,3,4-tetrachlorobenzene	<2.55	<2.66	<2.57	<2.59	2.2
Total Tetrachlorobenzene	<7.85	<11.1	<8.66	<9.20	18.4
Pentachlorobenzene	<2.55	<2.66	<2.57	<2.59	2.2
Hexachlorobenzene	<2.55	<2.66	<2.57	<2.59	2.2
Total Chlorobenzenes	<1167	<972	<864	<1001	15.4

* At 25°C and 1 atmosphere

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

Specific Isomer	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Monochlorobenzene	760	590	549	633	17.7
1,3-Dichlorobenzene	38.1	42.4	31.3	37.3	15.1
1,4-Dichlorobenzene	34.3	37.0	29.7	33.7	10.9
1,2-Dichlorobenzene	34.5	33.7	27.7	32.0	11.6
Total Dichlorobenzene	107	113	88.7	103	12.3
1,3,5-trichlorobenzene	<1.97	2.48	<2.02	<2.16	13.1
1,2,4-trichlorobenzene	19.9	29.8	24.2	24.6	20.2
1,2,3-trichlorobenzene	2.04	2.33	<2.02	<2.13	8.2
Total Trichlorobenzene	<23.9	34.6	<28.2	<28.9	18.6
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	4.09	6.52	4.77	5.13	24.5
1,2,3,4-tetrachlorobenzene	<1.97	<2.05	<2.02	<2.01	2.1
Total Tetrachlorobenzene	<6.06	<8.57	<6.79	<7.14	18.1
Pentachlorobenzene	<1.97	<2.05	<2.02	<2.01	2.1
Hexachlorobenzene	<1.97	<2.05	<2.02	<2.01	2.1
Total Chlorobenzenes	<901	<751	<677	<776	14.7

* 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 Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	824	634	583	681	18.7
1,3-Dichlorobenzene	41.3	45.6	33.2	40.0	15.7
1,4-Dichlorobenzene	37.2	39.7	31.6	36.2	11.5
1,2-Dichlorobenzene	37.4	36.2	29.4	34.3	12.5
Total Dichlorobenzene	116	121	94.2	111	13.1
1,3,5-trichlorobenzene	<2.14	2.66	<2.14	<2.31	13.1
1,2,4-trichlorobenzene	21.5	32.0	25.7	26.4	19.9
1,2,3-trichlorobenzene	2.21	2.50	<2.14	<2.28	8.4
Total Trichlorobenzene	<25.9	37.1	<30.0	<31.0	18.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	4.43	7.00	5.07	5.50	24.3
1,2,3,4-tetrachlorobenzene	<2.14	<2.21	<2.14	<2.16	1.8
Total Tetrachlorobenzene	<6.57	<9.21	<7.21	<7.66	18.0
Pentachlorobenzene	<2.14	<2.21	<2.14	<2.16	1.8
Hexachlorobenzene	<2.14	<2.21	<2.14	<2.16	1.8
Total Chlorobenzenes	<977	<806	<719	<834	15.7

* At 25°C and 1 atmosphere

TABLE 58
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Rates for Chlorobenzenes

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	14.7	11.2	10.4	12.1	18.7
1,3-Dichlorobenzene	0.74	0.80	0.59	0.71	15.0
1,4-Dichlorobenzene	0.66	0.70	0.57	0.64	10.8
1,2-Dichlorobenzene	0.67	0.64	0.53	0.61	12.0
Total Dichlorobenzene	2.06	2.14	1.69	1.96	12.4
1,3,5-trichlorobenzene	<0.038	0.047	<0.038	<0.041	12.3
1,2,4-trichlorobenzene	0.38	0.56	0.46	0.47	19.2
1,2,3-trichlorobenzene	0.039	0.044	<0.038	<0.041	7.5
Total Trichlorobenzene	<0.46	0.65	<0.54	<0.55	17.7
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	0.079	0.12	0.091	0.098	23.5
1,2,3,4-tetrachlorobenzene	<0.038	<0.039	<0.038	<0.038	1.0
Total Tetrachlorobenzene	<0.12	<0.16	<0.13	<0.14	17.2
Pentachlorobenzene	<0.038	<0.039	<0.038	<0.038	1.0
Hexachlorobenzene	<0.038	<0.039	<0.038	<0.038	1.0
Total Chlorobenzenes	<17.4	<14.2	<12.9	<14.8	15.7

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

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	478	817	633	681	12.1
1,3-Dichlorobenzene	28.1	48.0	37.3	40.0	0.71
1,4-Dichlorobenzene	25.4	43.4	33.7	36.2	0.64
1,2-Dichlorobenzene	24.1	41.2	32.0	34.3	0.61
Total Dichlorobenzene	77.6	133	103	111	1.96
1,3,5-trichlorobenzene	<1.62	<2.78	<2.16	<2.31	<0.041
1,2,4-trichlorobenzene	18.5	31.7	24.6	26.4	0.47
1,2,3-trichlorobenzene	<1.60	<2.74	<2.13	<2.28	<0.041
Total Trichlorobenzene	<21.8	<37.2	<28.9	<31.0	<0.55
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	3.86	6.61	5.13	5.50	0.098
1,2,3,4-tetrachlorobenzene	<1.52	<2.59	<2.01	<2.16	<0.038
Total Tetrachlorobenzene	<5.38	<9.20	<7.14	<7.66	<0.14
Pentachlorobenzene	<1.52	<2.59	<2.01	<2.16	<0.038
Hexachlorobenzene	<1.52	<2.59	<2.01	<2.16	<0.038
Total Chlorobenzenes	<585	<1001	<776	<834	<14.8

* 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	<12	<12
1,3-Dichlorobenzene	<12	<12
1,4-Dichlorobenzene	<12	<12
1,2-Dichlorobenzene	<12	<12
Total Dichlorobenzene	<36.0	<36.0
1,3,5-trichlorobenzene	<12	<12
1,2,4-trichlorobenzene	<12	<12
1,2,3-trichlorobenzene	<12	<12
Total Trichlorobenzene	<36.0	<36.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<12	<12
1,2,3,4-tetrachlorobenzene	<12	<12
Total Tetrachlorobenzene	<24.0	<24.0
Pentachlorobenzene	<12	<12
Hexachlorobenzene	<12	<12
Total Chlorobenzenes	<132	<132

"<" 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	<60	<7.49	<12.8	<9.85	<10.7	<0.19
3-monochlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
4-monochlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Total Monochlorophenols	<180	<22.5	<38.3	<29.6	<32.1	<0.57
2,6-dichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,4 & 2,5-dichlorophenol	400	49.9	85.1	65.7	71.2	1.27
3,5-dichlorophenol	460	57.4	97.9	75.5	81.9	1.46
2,3-dichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
3,4-dichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Total Dichlorophenols	<1040	<130	<221	<171	<185	<3.30
2,4,6-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,3,6-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,3,5-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,4,5-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,3,4-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
3,4,5-trichlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Total Trichlorophenols	<360	<44.9	<76.6	<59.1	<64.1	<1.14
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Total Tetrachlorophenols	<120	<15.0	<25.5	<19.7	<21.4	<0.38
Pentachlorophenol	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Total Chlorophenols	<1760	<220	<374	<289	<313	<5.58

Dry Gas Volume Sampled (Rm³*) :	4.701
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	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 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	<60	<7.70	<13.3	<10.3	<11.0	<0.19
3-monochlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
4-monochlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Total Monochlorophenols	<180	<23.1	<39.9	<30.8	<33.1	<0.58
2,6-dichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,4 & 2,5-dichlorophenol	89.0	11.4	19.7	15.2	16.4	0.29
3,5-dichlorophenol	1100	141	244	188	202	3.56
2,3-dichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
3,4-dichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Total Dichlorophenols	<1369	<176	<303	<234	<252	<4.43
2,4,6-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,3,6-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,3,5-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,4,5-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,3,4-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
3,4,5-trichlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Total Trichlorophenols	<360	<46.2	<79.8	<61.6	<66.2	<1.16
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Total Tetrachlorophenols	<120	<15.4	<26.6	<20.5	<22.1	<0.39
Pentachlorophenol	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Total Chlorophenols	<2089	<268	<463	<357	<384	<6.76

Dry Gas Volume Sampled (Rm³*) :	4.514
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 63
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
3-monochlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
4-monochlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Total Monochlorophenols	<180	<22.7	<38.6	<30.2	<32.1	<0.57
2,6-dichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,4 & 2,5-dichlorophenol	62.6	7.90	13.4	10.5	11.2	0.20
3,5-dichlorophenol	709	89.5	152	119	126	2.26
2,3-dichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
3,4-dichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Total Dichlorophenols	<952	<120	<204	<160	<170	<3.04
2,4,6-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,3,6-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,3,5-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,4,5-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,3,4-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
3,4,5-trichlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Total Trichlorophenols	<360	<45.4	<77.1	<60.5	<64.2	<1.15
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
2,3,4,5-tetrachlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Total Tetrachlorophenols	<120	<15.1	<25.7	<20.2	<21.4	<0.38
Pentachlorophenol	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Total Chlorophenols	<1672	<211	<358	<281	<298	<5.34

Dry Gas Volume Sampled (Rm³*) :	4.667
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration Test No. 1 ng/m³	Test No. 2 ng/m³	Test No. 3 ng/m³	Average ng/m³	Coefficient of Variation %
2-monochlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
3-monochlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
4-monochlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
Total Monochlorophenols	<22.5	<23.1	<22.7	<22.8	1.4
2,6-dichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,4 & 2,5-dichlorophenol	49.9	11.4	7.90	23.1	101
3,5-dichlorophenol	57.4	141	89.5	96.0	44.0
2,3-dichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
3,4-dichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
Total Dichlorophenols	<130	<176	<120	<142	20.9
2,4,6-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,3,6-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,3,5-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,4,5-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,3,4-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
3,4,5-trichlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
Total Trichlorophenols	<44.9	<46.2	<45.4	<45.5	1.4
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
2,3,4,5-tetrachlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
Total Tetrachlorophenols	<15.0	<15.4	<15.1	<15.2	1.4
Pentachlorophenol	<7.49	<7.70	<7.57	<7.59	1.4
Total Chlorophenols	<220	<268	<211	<233	13.2

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

Specific Isomer	Dry Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
3-monochlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
4-monochlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
Total Monochlorophenols	<38.3	<39.9	<38.6	<38.9	2.2
2,6-dichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,4 & 2,5-dichlorophenol	85.1	19.7	13.4	39.4	101
3,5-dichlorophenol	97.9	244	152	164	44.8
2,3-dichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
3,4-dichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
Total Dichlorophenols	<221	<303	<204	<243	21.9
2,4,6-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,3,6-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,3,5-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,4,5-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,3,4-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
3,4,5-trichlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
Total Trichlorophenols	<76.6	<79.8	<77.1	<77.8	2.2
2,3,5,6/2,3,4,6-tetrachlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
2,3,4,5-tetrachlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
Total Tetrachlorophenols	<25.5	<26.6	<25.7	<25.9	2.2
Pentachlorophenol	<12.8	<13.3	<12.9	<13.0	2.2
Total Chlorophenols	<374	<463	<358	<398	14.1

* At 25°C and 1 atmosphere

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

Specific Isomer	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
3-monochlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
4-monochlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
Total Monochlorophenols	<29.6	<30.8	<30.2	<30.2	2.1
2,6-dichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,4 & 2,5-dichlorophenol	65.7	15.2	10.5	30.5	100
3,5-dichlorophenol	75.5	188	119	128	44.5
2,3-dichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
3,4-dichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
Total Dichlorophenols	<171	<234	<160	<188	21.3
2,4,6-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,3,6-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,3,5-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,4,5-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,3,4-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
3,4,5-trichlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
Total Trichlorophenols	<59.1	<61.6	<60.5	<60.4	2.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
2,3,4,5-tetrachlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
Total Tetrachlorophenols	<19.7	<20.5	<20.2	<20.1	2.1
Pentachlorophenol	<9.85	<10.3	<10.1	<10.1	2.1
Total Chlorophenols	<289	<357	<281	<309	13.6

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

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

Specific Isomer	Wet Reference Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
2-monochlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
3-monochlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
4-monochlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
Total Monochlorophenols	<32.1	<33.1	<32.1	<32.4	1.8
2,6-dichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,4 & 2,5-dichlorophenol	71.2	16.4	11.2	32.9	101
3,5-dichlorophenol	81.9	202	126	137	44.4
2,3-dichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
3,4-dichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
Total Dichlorophenols	<185	<252	<170	<202	21.5
2,4,6-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,3,6-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,3,5-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,4,5-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,3,4-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
3,4,5-trichlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
Total Trichlorophenols	<64.1	<66.2	<64.2	<64.8	1.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
2,3,4,5-tetrachlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
Total Tetrachlorophenols	<21.4	<22.1	<21.4	<21.6	1.8
Pentachlorophenol	<10.7	<11.0	<10.7	<10.8	1.8
Total Chlorophenols	<313	<384	<298	<332	13.8

* At 25°C and 1 atmosphere

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

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
2-monochlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
3-monochlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
4-monochlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
Total Monochlorophenols	<0.57	<0.58	<0.57	<0.58	1.0
2,6-dichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,4 & 2,5-dichlorophenol	1.27	0.29	0.20	0.59	101
3,5-dichlorophenol	1.46	3.56	2.26	2.43	43.7
2,3-dichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
3,4-dichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
Total Dichlorophenols	<3.30	<4.43	<3.04	<3.59	20.6
2,4,6-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,3,6-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,3,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,3,4-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
3,4,5-trichlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
Total Trichlorophenols	<1.14	<1.16	<1.15	<1.15	1.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
2,3,4,5-tetrachlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
Total Tetrachlorophenols	<0.38	<0.39	<0.38	<0.38	1.0
Pentachlorophenol	<0.19	<0.19	<0.19	<0.19	1.0
Total Chlorophenols	<5.58	<6.76	<5.34	<5.89	12.9

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	<7.59	<13.0	<10.1	<10.8	<0.19
3-monochlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
4-monochlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
Total Monochlorophenols	<22.8	<38.9	<30.2	<32.4	<0.58
2,6-dichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,4 & 2,5-dichlorophenol	23.1	39.4	30.5	32.9	0.59
3,5-dichlorophenol	96.0	164	128	137	2.43
2,3-dichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
3,4-dichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
Total Dichlorophenols	<142	<243	<188	<202	<3.59
2,4,6-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,3,6-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,3,5-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,4,5-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,3,4-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
3,4,5-trichlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
Total Trichlorophenols	<45.5	<77.8	<60.4	<64.8	<1.15
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
2,3,4,5-tetrachlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
Total Tetrachlorophenols	<15.2	<25.9	<20.1	<21.6	<0.38
Pentachlorophenol	<7.59	<13.0	<10.1	<10.8	<0.19
Total Chlorophenols	<233	<398	<309	<332	<5.89

* 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	<60	<60
3-monochlorophenol	<60	<60
4-monochlorophenol	<60	<60
Total Monochlorophenols	<180	<180
2,6-dichlorophenol	<60	<60
2,4 & 2,5-dichlorophenol	<60	<60
3,5-dichlorophenol	<60	<60
2,3-dichlorophenol	<60	<60
3,4-dichlorophenol	<60	<60
Total Dichlorophenols	<300	<300
2,4,6-trichlorophenol	<60	<60
2,3,6-trichlorophenol	<60	<60
2,3,5-trichlorophenol	<60	<60
2,4,5-trichlorophenol	<60	<60
2,3,4-trichlorophenol	<60	<60
3,4,5-trichlorophenol	<60	<60
Total Trichlorophenols	<360	<360
2,3,5,6/2,3,4,6-tetrachlorophenol	<60	<60
2,3,4,5-tetrachlorophenol	<60	<60
Total Tetrachlorophenols	<120	<120
Pentachlorophenol	<60	<60
Total Chlorophenols	<1020	<1020

"<" 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	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Acenaphthylene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Anthracene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(a)Anthracene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(b)Fluoranthene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(k)Fluoranthene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(a)fluorene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(b)fluorene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(g,h,i)Perylene	25.5	3.18	5.42	4.19	4.54	0.081
Benzo(a)Pyrene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Benzo(e)Pyrene	21.6	2.70	4.59	3.55	3.85	0.068
Biphenyl	36.0	4.49	7.66	5.91	6.41	0.11
2-Chloronaphthalene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Chrysene/Triphenylene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Coronene	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Dibenzo(a,e)pyrene	<60	<7.49	<12.8	<9.85	<10.7	<0.19
9,10-dimethylanthracene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
7,12-Dimethylbenzo(a)anthracene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Fluoranthene	50.4	6.29	10.7	8.28	8.97	0.16
Fluorene	38.1	4.75	8.10	6.26	6.78	0.12
Indeno(1,2,3-cd)Pyrene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
2-methylanthracene	16.3	2.03	3.47	2.68	2.90	0.05
3-Methylcholanthrene	<60	<7.49	<12.8	<9.85	<10.7	<0.19
1-Methylnaphthalene	39.4	4.92	8.38	6.47	7.02	0.12
2-Methylnaphthalene	75.7	9.45	16.1	12.4	13.5	0.24
1-Methylphenanthrene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
9-Methylphenanthrene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Naphthalene	310	38.7	65.9	50.9	55.2	0.98
Perylene	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Phenanthrene	162	20.2	34.5	26.6	28.8	0.51
Picene	<60	<7.49	<12.8	<9.85	<10.7	<0.19
Pyrene	75.8	9.46	16.1	12.4	13.5	0.24
Tetralin	115	14.4	24.5	18.9	20.5	0.36
m-terphenyl	<12	<1.50	<2.55	<1.97	<2.14	<0.038
o-Terphenyl	<12	<1.50	<2.55	<1.97	<2.14	<0.038
p-terphenyl	<12	<1.50	<2.55	<1.97	<2.14	<0.038
Total	<1458	<182	<310	<239	<260	<4.62

Dry Gas Volume Sampled (Rm³*) :	4.701
Actual Flowrate (m³/s) :	25.4
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.3
Wet Reference Flowrate (Rm³/s*) :	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 72
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Acenaphthylene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Anthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(a)Anthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(b)Fluoranthene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(k)Fluoranthene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(a)fluorene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(b)fluorene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(g,h,i)Perylene	95.3	12.2	21.1	16.3	17.5	0.31
Benzo(a)Pyrene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Benzo(e)Pyrene	22.0	2.82	4.87	3.76	4.04	0.071
Biphenyl	31.9	4.09	7.07	5.46	5.86	0.10
2-Chloronaphthalene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Chrysene/Triphenylene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Coronene	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Dibenzo(a,e)pyrene	<60	<7.70	<13.3	<10.3	<11.0	<0.19
9,10-dimethylanthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
7,12-Dimethylbenzo(a)anthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Fluoranthene	19.4	2.49	4.30	3.32	3.57	0.063
Fluorene	19.9	2.55	4.41	3.41	3.66	0.064
Indeno(1,2,3-cd)Pyrene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
2-methylanthracene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
3-Methylcholanthrene	<60	<7.70	<13.3	<10.3	<11.0	<0.19
1-Methylnaphthalene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
2-Methylnaphthalene	22.3	2.86	4.94	3.82	4.10	0.072
1-Methylphenanthrene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
9-Methylphenanthrene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Naphthalene	147	18.9	32.6	25.2	27.0	0.48
Perylene	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Phenanthrene	92.3	11.8	20.4	15.8	17.0	0.30
Picene	<60	<7.70	<13.3	<10.3	<11.0	<0.19
Pyrene	25.5	3.27	5.65	4.36	4.69	0.082
Tetralin	90.1	11.6	20.0	15.4	16.6	0.29
m-terphenyl	<12	<1.54	<2.66	<2.05	<2.21	<0.039
o-Terphenyl	<12	<1.54	<2.66	<2.05	<2.21	<0.039
p-terphenyl	<12	<1.54	<2.66	<2.05	<2.21	<0.039
Total	<1082	<139	<240	<185	<199	<3.50

Dry Gas Volume Sampled (Rm³*) :	4.514
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere
** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 73
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected ng	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Acenaphthylene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Anthracene	17.4	2.20	3.73	2.92	3.10	0.056
Benzo(a)Anthracene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(b)Fluoranthene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(k)Fluoranthene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(a)fluorene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(b)fluorene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(g,h,i)Perylene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(a)Pyrene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Benzo(e)Pyrene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Biphenyl	41.8	5.27	8.96	7.02	7.46	0.13
2-Chloronaphthalene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Chrysene/Triphenylene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Coronene	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Dibenzo(a,c/a,h)Anthracene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Dibenzo(a,e)pyrene	<60	<7.57	<12.9	<10.1	<10.7	<0.19
9,10-dimethylanthracene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
7,12-Dimethylbenzo(a)anthracene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Fluoranthene	20.4	2.57	4.37	3.43	3.64	0.065
Fluorene	60.8	7.67	13.0	10.2	10.8	0.19
Indeno(1,2,3-cd)Pyrene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
2-methylanthracene	37.0	4.67	7.93	6.22	6.60	0.12
3-Methylcholanthrene	<60	<7.57	<12.9	<10.1	<10.7	<0.19
1-Methylnaphthalene	25.2	3.18	5.40	4.23	4.49	0.080
2-Methylnaphthalene	46.7	5.89	10.0	7.85	8.33	0.15
1-Methylphenanthrene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
9-Methylphenanthrene	17.5	2.21	3.75	2.94	3.12	0.056
Naphthalene	174	22.0	37.3	29.2	31.0	0.56
Perylene	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Phenanthrene	313	39.5	67.1	52.6	55.8	1.00
Picene	<60	<7.57	<12.9	<10.1	<10.7	<0.19
Pyrene	18.4	2.32	3.94	3.09	3.28	0.059
Tetralin	84.1	10.6	18.0	14.1	15.0	0.27
m-terphenyl	<12	<1.51	<2.57	<2.02	<2.14	<0.038
o-Terphenyl	<12	<1.51	<2.57	<2.02	<2.14	<0.038
p-terphenyl	<12	<1.51	<2.57	<2.02	<2.14	<0.038
Total	<1348	<170	<289	<227	<240	<4.30

Dry Gas Volume Sampled (Rm³*) :	4.667
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.0
Wet Reference Flowrate (Rm³/s*) :	17.9

* At 25°C and 1 atmosphere

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

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

TABLE 74
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration Test No. 1	Test No. 2	Test No. 3	Average	Coefficient of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	<1.50	<1.54	<1.51	<1.52	1.4
Acenaphthylene	<1.50	<1.54	<1.51	<1.52	1.4
Anthracene	<1.50	<1.54	2.20	<1.74	22.4
Benzo(a)Anthracene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(b)Fluoranthene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(k)Fluoranthene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(a)fluorene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(b)fluorene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(g,h,i)Perylene	3.18	12.2	<1.51	<5.64	102
Benzo(a)Pyrene	<1.50	<1.54	<1.51	<1.52	1.4
Benzo(e)Pyrene	2.70	2.82	<1.51	<2.34	30.8
Biphenyl	4.49	4.09	5.27	4.62	13.0
2-Chloronaphthalene	<1.50	<1.54	<1.51	<1.52	1.4
Chrysene/Triphenylene	<1.50	<1.54	<1.51	<1.52	1.4
Coronene	<7.49	<7.70	<7.57	<7.59	1.4
Dibenzo(a,c/a,h)Anthracene	<1.50	<1.54	<1.51	<1.52	1.4
Dibenzo(a,e)pyrene	<7.49	<7.70	<7.57	<7.59	1.4
9,10-dimethylanthracene	<1.50	<1.54	<1.51	<1.52	1.4
7,12-Dimethylbenzo(a)anthracene	<1.50	<1.54	<1.51	<1.52	1.4
Fluoranthene	6.29	2.49	2.57	3.78	57.3
Fluorene	4.75	2.55	7.67	4.99	51.4
Indeno(1,2,3-cd)Pyrene	<1.50	<1.54	<1.51	<1.52	1.4
2-methylanthracene	2.03	<1.54	4.67	<2.75	61.2
3-Methylcholanthrene	<7.49	<7.70	<7.57	<7.59	1.4
1-Methylnaphthalene	4.92	<1.54	3.18	<3.21	52.6
2-Methylnaphthalene	9.45	2.86	5.89	6.07	54.3
1-Methylphenanthrene	<1.50	<1.54	<1.51	<1.52	1.4
9-Methylphenanthrene	<1.50	<1.54	2.21	<1.75	22.8
Naphthalene	38.7	18.9	22.0	26.5	40.2
Perylene	<1.50	<1.54	<1.51	<1.52	1.4
Phenanthrene	20.2	11.8	39.5	23.9	59.4
Picene	<7.49	<7.70	<7.57	<7.59	1.4
Pyrene	9.46	3.27	2.32	5.02	77.2
Tetralin	14.4	11.6	10.6	12.2	16.0
m-terphenyl	<1.50	<1.54	<1.51	<1.52	1.4
o-Terphenyl	<1.50	<1.54	<1.51	<1.52	1.4
p-terphenyl	<1.50	<1.54	<1.51	<1.52	1.4
Total	<182	<139	<170	<164	13.6

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	<2.55	<2.66	<2.57	<2.59	2.2
Acenaphthylene	<2.55	<2.66	<2.57	<2.59	2.2
Anthracene	<2.55	<2.66	3.73	<2.98	21.8
Benzo(a)Anthracene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(b)Fluoranthene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(k)Fluoranthene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(a)fluorene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(b)fluorene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(g,h,i)Perylene	5.42	21.1	<2.57	<9.70	103
Benzo(a)Pyrene	<2.55	<2.66	<2.57	<2.59	2.2
Benzo(e)Pyrene	4.59	4.87	<2.57	<4.01	31.3
Biphenyl	7.66	7.07	8.96	7.89	12.2
2-Chloronaphthalene	<2.55	<2.66	<2.57	<2.59	2.2
Chrysene/Triphenylene	<2.55	<2.66	<2.57	<2.59	2.2
Coronene	<12.8	<13.3	<12.9	<13.0	2.2
Dibenzo(a,c/a,h)Anthracene	<2.55	<2.66	<2.57	<2.59	2.2
Dibenzo(a,e)pyrene	<12.8	<13.3	<12.9	<13.0	2.2
9,10-dimethylanthracene	<2.55	<2.66	<2.57	<2.59	2.2
7,12-Dimethylbenzo(a)anthracene	<2.55	<2.66	<2.57	<2.59	2.2
Fluoranthene	10.7	4.30	4.37	6.46	57.1
Fluorene	8.10	4.41	13.0	8.51	50.8
Indeno(1,2,3-cd)Pyrene	<2.55	<2.66	<2.57	<2.59	2.2
2-methylanthracene	3.47	<2.66	7.93	<4.68	60.6
3-Methylcholanthrene	<12.8	<13.3	<12.9	<13.0	2.2
1-Methylnaphthalene	8.38	<2.66	5.40	<5.48	52.2
2-Methylnaphthalene	16.1	4.94	10.0	<10.3	54.0
1-Methylphenanthrene	<2.55	<2.66	<2.57	<2.59	2.2
9-Methylphenanthrene	<2.55	<2.66	3.75	<2.99	22.2
Naphthalene	65.9	32.6	37.3	45.3	39.9
Perylene	<2.55	<2.66	<2.57	<2.59	2.2
Phenanthrene	34.5	20.4	67.1	40.7	58.8
Picene	<12.8	<13.3	<12.9	<13.0	2.2
Pyrene	16.1	5.65	3.94	8.57	76.9
Tetralin	24.5	20.0	18.0	20.8	15.9
m-terphenyl	<2.55	<2.66	<2.57	<2.59	2.2
o-Terphenyl	<2.55	<2.66	<2.57	<2.59	2.2
p-terphenyl	<2.55	<2.66	<2.57	<2.59	2.2
Total	<310	<240	<289	<280	12.9

* 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<1.97	<2.05	<2.02	<2.01	2.1
Acenaphthylene	<1.97	<2.05	<2.02	<2.01	2.1
Anthracene	<1.97	<2.05	2.92	<2.32	22.8
Benzo(a)Anthracene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(b)Fluoranthene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(k)Fluoranthene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(a)fluorene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(b)fluorene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(g,h,i)Perylene	4.19	16.3	<2.02	<7.50	103
Benzo(a)Pyrene	<1.97	<2.05	<2.02	<2.01	2.1
Benzo(e)Pyrene	3.55	3.76	<2.02	<3.11	30.6
Biphenyl	5.91	5.46	7.02	6.13	13.1
2-Chloronaphthalene	<1.97	<2.05	<2.02	<2.01	2.1
Chrysene/Triphenylene	<1.97	<2.05	<2.02	<2.01	2.1
Coronene	<9.85	<10.3	<10.1	<10.1	2.1
Dibenzo(a,c/a,h)Anthracene	<1.97	<2.05	<2.02	<2.01	2.1
Dibenzo(a,e)pyrene	<9.85	<10.3	<10.1	<10.1	2.1
9,10-dimethylanthracene	<1.97	<2.05	<2.02	<2.01	2.1
7,12-Dimethylbenzo(a)anthracene	<1.97	<2.05	<2.02	<2.01	2.1
Fluoranthene	8.28	3.32	3.43	5.01	56.5
Fluorene	6.26	3.41	10.2	6.63	51.6
Indeno(1,2,3-cd)Pyrene	<1.97	<2.05	<2.02	<2.01	2.1
2-methylanthracene	2.68	<2.05	6.22	<3.65	61.5
3-Methylcholanthrene	<9.85	<10.3	<10.1	<10.1	2.1
1-Methylnaphthalene	6.47	<2.05	4.23	<4.25	51.9
2-Methylnaphthalene	12.4	3.82	7.85	8.03	53.7
1-Methylphenanthrene	<1.97	<2.05	<2.02	<2.01	2.1
9-Methylphenanthrene	<1.97	<2.05	2.94	<2.32	23.2
Naphthalene	50.9	25.2	29.2	35.1	39.4
Perylene	<1.97	<2.05	<2.02	<2.01	2.1
Phenanthrene	26.6	15.8	52.6	31.7	59.7
Picene	<9.85	<10.3	<10.1	<10.1	2.1
Pyrene	12.4	4.36	3.09	6.63	76.5
Tetralin	18.9	15.4	14.1	16.1	15.2
m-terphenyl	<1.97	<2.05	<2.02	<2.01	2.1
o-Terphenyl	<1.97	<2.05	<2.02	<2.01	2.1
p-terphenyl	<1.97	<2.05	<2.02	<2.01	2.1
Total	<239	<185	<227	<217	13.1

* 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<2.14	<2.21	<2.14	<2.16	1.8
Acenaphthylene	<2.14	<2.21	<2.14	<2.16	1.8
Anthracene	<2.14	<2.21	3.10	<2.48	21.7
Benzo(a)Anthracene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(b)Fluoranthene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(k)Fluoranthene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(a)fluorene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(b)fluorene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(g,h,i)Perylene	4.54	17.5	<2.14	<8.06	103
Benzo(a)Pyrene	<2.14	<2.21	<2.14	<2.16	1.8
Benzo(e)Pyrene	3.85	4.04	<2.14	<3.34	31.3
Biphenyl	6.41	5.86	7.46	6.58	12.3
2-Chloronaphthalene	<2.14	<2.21	<2.14	<2.16	1.8
Chrysene/Triphenylene	<2.14	<2.21	<2.14	<2.16	1.8
Coronene	<10.7	<11.0	<10.7	<10.8	1.8
Dibenzo(a,c/a,h)Anthracene	<2.14	<2.21	<2.14	<2.16	1.8
Dibenzo(a,e)pyrene	<10.7	<11.0	<10.7	<10.8	1.8
9,10-dimethylanthracene	<2.14	<2.21	<2.14	<2.16	1.8
7,12-Dimethylbenzo(a)anthracene	<2.14	<2.21	<2.14	<2.16	1.8
Fluoranthene	8.97	3.57	3.64	5.39	57.5
Fluorene	6.78	3.66	10.8	7.10	50.8
Indeno(1,2,3-cd)Pyrene	<2.14	<2.21	<2.14	<2.16	1.8
2-methylanthracene	2.90	<2.21	6.60	<3.90	60.5
3-Methylcholanthrene	<10.7	<11.0	<10.7	<10.8	1.8
1-Methylnaphthalene	7.02	<2.21	4.49	<4.57	52.6
2-Methylnaphthalene	13.5	4.10	8.33	8.64	54.4
1-Methylphenanthrene	<2.14	<2.21	<2.14	<2.16	1.8
9-Methylphenanthrene	<2.14	<2.21	3.12	<2.49	22.1
Naphthalene	55.2	27.0	31.0	37.7	40.4
Perylene	<2.14	<2.21	<2.14	<2.16	1.8
Phenanthrene	28.8	17.0	55.8	33.9	58.8
Picene	<10.7	<11.0	<10.7	<10.8	1.8
Pyrene	13.5	4.69	3.28	7.16	77.4
Tetralin	20.5	16.6	15.0	17.3	16.3
m-terphenyl	<2.14	<2.21	<2.14	<2.16	1.8
o-Terphenyl	<2.14	<2.21	<2.14	<2.16	1.8
p-terphenyl	<2.14	<2.21	<2.14	<2.16	1.8
Total	<260	<199	<240	<233	13.3

* At 25°C and 1 atmosphere

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

Compound	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Acenaphthene	<0.038	<0.039	<0.038	<0.038	1.0
Acenaphthylene	<0.038	<0.039	<0.038	<0.038	1.0
Anthracene	<0.038	<0.039	0.056	<0.044	22.4
Benzo(a)Anthracene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(b)Fluoranthene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(k)Fluoranthene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(a)fluorene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(b)fluorene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(g,h,i)Perylene	0.081	0.31	<0.038	<0.14	102
Benzo(a)Pyrene	<0.038	<0.039	<0.038	<0.038	1.0
Benzo(e)Pyrene	0.068	0.071	<0.038	<0.059	30.7
Biphenyl	0.11	0.10	0.13	0.12	13.1
2-Chloronaphthalene	<0.038	<0.039	<0.038	<0.038	1.0
Chrysene/Triphenylene	<0.038	<0.039	<0.038	<0.038	1.0
Coronene	<0.19	<0.19	<0.19	<0.19	1.0
Dibenzo(a,c/a,h)Anthracene	<0.038	<0.039	<0.038	<0.038	1.0
Dibenzo(a,e)pyrene	<0.19	<0.19	<0.19	<0.19	1.0
9,10-dimethylanthracene	<0.038	<0.039	<0.038	<0.038	1.0
7,12-Dimethylbenzo(a)anthracene	<0.038	<0.039	<0.038	<0.038	1.0
Fluoranthene	0.16	0.063	0.065	0.096	57.7
Fluorene	0.12	0.064	0.19	0.13	51.5
Indeno(1,2,3-cd)Pyrene	<0.038	<0.039	<0.038	<0.038	1.0
2-methylanthracene	0.05	<0.039	0.12	<0.070	61.2
3-Methylcholanthrene	<0.19	<0.19	<0.19	<0.19	1.0
1-Methylnaphthalene	0.12	<0.039	0.080	<0.081	52.9
2-Methylnaphthalene	0.24	0.072	0.15	0.15	54.6
1-Methylphenanthrene	<0.038	<0.039	<0.038	<0.038	1.0
9-Methylphenanthrene	<0.038	<0.039	0.056	<0.044	22.8
Naphthalene	0.98	0.48	0.56	0.67	40.6
Perylene	<0.038	<0.039	<0.038	<0.038	1.0
Phenanthrene	0.51	0.30	1.00	0.60	59.5
Picene	<0.19	<0.19	<0.19	<0.19	1.0
Pyrene	0.24	0.082	0.059	0.13	77.6
Tetralin	0.36	0.29	0.27	0.31	16.3
m-terphenyl	<0.038	<0.039	<0.038	<0.038	1.0
o-Terphenyl	<0.038	<0.039	<0.038	<0.038	1.0
p-terphenyl	<0.038	<0.039	<0.038	<0.038	1.0
Total	<4.62	<3.50	<4.30	<4.14	14.0

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

Compound	Actual Concentration ng/m^3	Dry Reference Concentration ng/Rm^3*	Dry Adjusted Concentration ng/Rm^3**	Wet Reference Concentration ng/Rm^3*	Emission Rate µg/s
Acenaphthene	<1.52	<2.59	<2.01	<2.16	<0.038
Acenaphthylene	<1.52	<2.59	<2.01	<2.16	<0.038
Anthracene	<1.74	<2.98	<2.32	<2.48	<0.044
Benzo(a)Anthracene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(b)Fluoranthene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(k)Fluoranthene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(a)fluorene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(b)fluorene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(g,h,i)Perylene	<5.64	<9.70	<7.50	<8.06	<0.14
Benzo(a)Pyrene	<1.52	<2.59	<2.01	<2.16	<0.038
Benzo(e)Pyrene	<2.34	<4.01	<3.11	<3.34	<0.059
Biphenyl	4.62	7.89	6.13	6.58	0.12
2-Chloronaphthalene	<1.52	<2.59	<2.01	<2.16	<0.038
Chrysene/Triphenylene	<1.52	<2.59	<2.01	<2.16	<0.038
Coronene	<7.59	<13.0	<10.1	<10.8	<0.19
Dibenzo(a,c/a,h)Anthracene	<1.52	<2.59	<2.01	<2.16	<0.038
Dibenzo(a,e)pyrene	<7.59	<13.0	<10.1	<10.8	<0.19
9,10-dimethylanthracene	<1.52	<2.59	<2.01	<2.16	<0.038
7,12-Dimethylbenzo(a)anthracene	<1.52	<2.59	<2.01	<2.16	<0.038
Fluoranthene	3.78	6.46	5.01	5.39	0.096
Fluorene	4.99	8.51	6.63	7.10	0.13
Indeno(1,2,3-cd)Pyrene	<1.52	<2.59	<2.01	<2.16	<0.038
2-methylanthracene	<2.75	<4.68	<3.65	<3.90	<0.070
3-Methylcholanthrene	<7.59	<13.0	<10.1	<10.8	<0.19
1-Methylnaphthalene	<3.21	<5.48	<4.25	<4.57	<0.081
2-Methylnaphthalene	6.07	10.3	8.03	8.64	0.15
1-Methylphenanthrene	<1.52	<2.59	<2.01	<2.16	<0.038
9-Methylphenanthrene	<1.75	<2.99	<2.32	<2.49	<0.044
Naphthalene	26.5	45.3	35.1	37.7	0.67
Perylene	<1.52	<2.59	<2.01	<2.16	<0.038
Phenanthrene	23.9	40.7	31.7	33.9	0.60
Picene	<7.59	<13.0	<10.1	<10.8	<0.19
Pyrene	5.02	8.57	6.63	7.16	0.13
Tetralin	12.2	20.8	16.1	17.3	0.31
m-terphenyl	<1.52	<2.59	<2.01	<2.16	<0.038
o-Terphenyl	<1.52	<2.59	<2.01	<2.16	<0.038
p-terphenyl	<1.52	<2.59	<2.01	<2.16	<0.038
Total	<164	<280	<217	<233	<4.14

* 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	<12	<12
Acenaphthylene	<12	<12
Anthracene	<12	<12
Benzo(a)Anthracene	<12	<12
Benzo(b)Fluoranthene	<12	<12
Benzo(k)Fluoranthene	<12	<12
Benzo(a)fluorene	<12	<12
Benzo(b)fluorene	<12	<12
Benzo(g,h,i)Perylene	<12	<12
Benzo(a)Pyrene	<12	<12
Benzo(e)Pyrene	<12	<12
Biphenyl	<12	<12
2-Chloronaphthalene	<12	<12
Chrysene/Triphenylene	<12	<12
Coronene	<60	<60
Dibenzo(a,c/a,h)Anthracene	<12	<12
Dibenzo(a,e)pyrene	<60	<60
9,10-dimethylanthracene	<12	<12
7,12-Dimethylbenzo(a)anthracene	<12	<12
Fluoranthene	<12	<12
Fluorene	<12	<12
Indeno(1,2,3-cd)Pyrene	<12	<12
2-methylanthracene	<12	<12
3-Methylcholanthrene	<60	<60
1-Methylnaphthalene	<12	<12
2-Methylnaphthalene	<12	<12
1-Methylphenanthrene	<12	<12
9-Methylphenanthrene	<12	<12
Naphthalene	117	104
Perylene	<12	<12
Phenanthrene	<12	<12
Picene	<60	<60
Pyrene	<12	<12
Tetralin	95.5	94.7
m-terphenyl	<12	<12
o-Terphenyl	<12	<12
p-terphenyl	<12	<12
Total	<825	<811

"<" 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 Rm³*	Actual µg/m³	Acetaldehyde Concentration Dry Reference µg/Rm³*	Dry Adjusted µg/Rm³**	Wet Reference µg/Rm³*	Acetaldehyde Emission Rate mg/s
1	3.8	0.0305	73.1	125	96.3	104	1.86
2	3.6	0.0311	67.9	116	89.3	96.9	1.72
3	4.1	0.0336	71.9	122	95.7	102	1.82
Average			71.0	121	93.8	101	1.80
Blank	5.8						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm³*	Actual µg/m³	Formaldehyde Concentration Dry Reference µg/Rm³*	Dry Adjusted µg/Rm³**	Wet Reference µg/Rm³*	Formaldehyde Emission Rate mg/s
1	<2.0	0.0305	<38.5	<65.6	<50.7	<54.9	<0.98
2	<1.8	0.0311	<33.9	<57.9	<44.7	<48.4	<0.86
3	<2.0	0.0336	<35.1	<59.5	<46.7	<49.6	<0.89
Average			<35.8	<61.0	<47.3	<51.0	<0.91
Blank	<2.6						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm³*	Actual µg/m³	Acrolein Concentration Dry Reference µg/Rm³*	Dry Adjusted µg/Rm³**	Wet Reference µg/Rm³*	Acrolein Emission Rate mg/s
1	<20	0.0305	<385	<656	<507	<549	<9.78
2	<18	0.0311	<339	<579	<447	<484	<8.62
3	<20	0.0336	<351	<595	<467	<496	<8.87
Average			<358	<610	<473	<510	<9.09
Blank	<26						

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				Coefficient	Total
	Run No. 1 Tube 4A/4B	Run No. 3 Tube 2A/2B	Run No. 4 Tube 3A/3B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.92	0.51	1.74	1.06	59.1	3.17
Benzene	0.22	0.12	0.14	0.16	31.8	0.48
Bromodichloromethane	0.045	0.021	0.031	0.032	37.3	0.097
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	0.66	0.27	0.78	0.57	46.7	1.71
Carbon Tetrachloride	0.15	0.036	0.047	0.078	81.7	0.24
Chloroform	0.089	0.069	0.088	0.082	13.7	0.25
Cumene (Isopropylbenzene)	0.049	0.045	0.063	0.052	18.1	0.16
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	0.072	0.037	0.024	0.044	56.0	0.13
1,2-Dichloroethane	0.053	0.044	0.050	0.049	9.4	0.15
trans,1,2-Dichloroethene	0.051	0.028	0.041	0.040	28.8	0.12
1,1-Dichloroethene	0.014	<0.01	<0.01	<0.011	20.4	<0.034
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	0.34	0.23	0.37	0.31	23.7	0.94
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.41	0.56	0.56	0.51	16.9	1.53
Methylene Chloride	1.74	2.23	2.09	2.02	12.4	6.06
Styrene	0.22	0.25	0.29	0.25	12.9	0.76
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	2.07	0.43	0.84	1.11	76.5	3.34
1,1,1-Trichloroethane	0.016	<0.01	<0.01	<0.012	28.9	<0.036
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	0.088	0.067	0.085	0.080	14.2	0.24
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	1.23	1.65	1.64	1.51	15.9	4.52
O-Xylene	0.51	0.26	0.69	0.49	43.5	1.46
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<9.17	<7.11	<9.79	<8.69	16.2	<26.1

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0203
Run No. 3	0.0198
Run No. 4	0.0202

* 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 of Variation	Total Collected
	Run No. 1 Tube 5A/5B	Run No. 3 Tube 7A/7B	Run No. 4 Tube 8A/8B	Average		
	µg	µg	µg	µg	%	µg
Acetone	0.57	0.53	1.28	0.79	53.4	2.38
Benzene	0.070	0.13	0.16	0.12	39.2	0.37
Bromodichloromethane	0.020	0.026	<0.01	<0.019	43.3	<0.056
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	0.27	0.31	0.19	0.26	23.5	0.78
Carbon Tetrachloride	0.050	0.054	<0.01	<0.038	64.0	<0.11
Chloroform	0.069	0.043	0.044	0.052	28.3	0.16
Cumene (Isopropylbenzene)	0.049	0.065	0.039	0.051	25.7	0.15
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	0.038	0.043	0.035	0.039	10.5	0.12
trans,1,2-Dichloroethene	0.028	0.017	0.016	0.020	32.7	0.061
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	0.34	0.46	0.27	0.36	27.1	1.07
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.52	0.59	0.49	0.53	9.7	1.60
Methylene Chloride	1.17	1.06	0.66	0.96	28.0	2.88
Styrene	0.26	0.29	0.21	0.25	15.0	0.76
Tetrachloroethene	<0.01	<0.01	0.010	<0.010	-	<0.030
Toluene	0.47	0.88	1.06	0.80	37.4	2.41
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	0.05	0.039	0.037	0.043	20.3	0.13
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	0.70	1.69	1.30	1.23	40.8	3.69
O-Xylene	0.25	0.70	0.55	0.50	46.2	1.49
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<5.17	<7.18	<6.62	<6.33	16.4	<19.0

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0203
Run No. 3	0.0207
Run No. 4	0.0204

* At 25°C and 1 atmosphere.

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

TABLE 84
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 3

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 9A/9B	Run No. 3 Tube 11A/11B	Run No. 4 Tube 12A/12B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	1.01	1.82	1.09	1.31	34.2	3.92
Benzene	0.21	0.19	0.17	0.19	10.3	0.58
Bromodichloromethane	0.038	<0.01	0.022	<0.023	60.2	<0.070
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	0.50	1.32	0.23	0.69	83.2	2.06
Carbon Tetrachloride	0.098	0.21	0.043	0.12	71.4	0.35
Chloroform	0.048	0.036	0.042	0.042	14.3	0.13
Cumene (Isopropylbenzene)	0.053	0.11	0.055	0.071	42.1	0.21
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	0.031	0.076	0.076	0.061	42.6	0.18
1,2-Dichloroethane	0.040	0.053	0.036	0.043	20.7	0.13
trans,1,2-Dichloroethene	0.017	1.00	0.022	0.35	163	1.04
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	0.54	0.65	0.32	0.50	32.9	1.51
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	0.45	0.75	0.50	0.57	28.3	1.70
Methylene Chloride	1.19	1.72	1.52	1.48	18.4	4.43
Styrene	0.25	0.40	0.24	0.30	30.5	0.90
Tetrachloroethene	0.015	<0.01	0.016	<0.014	23.5	<0.041
Toluene	1.76	1.52	1.23	1.50	17.6	4.51
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	0.051	0.11	0.056	0.072	45.2	0.22
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	2.55	2.42	2.46	2.48	2.6	7.43
O-Xylene	0.61	1.01	1.08	0.90	28.0	2.71
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<9.69	<13.7	<9.45	<10.9	21.6	<32.8

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0202
Run No. 3	0.0204
Run No. 4	0.0204

* At 25°C and 1 atmosphere.

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

TABLE 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/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	3.17	30.5	52.6	40.7	43.7	0.77
Benzene	0.48	4.59	7.92	6.12	6.57	0.12
Bromodichloromethane	0.097	0.93	1.61	1.24	1.34	0.024
Bromoform	<0.030	<0.29	<0.50	<0.38	<0.41	<0.0073
Bromomethane	<0.27	<2.60	<4.48	<3.46	<3.72	<0.065
1,3-Butadiene	<0.060	<0.58	<1.00	<0.77	<0.83	<0.015
2-Butanone	1.71	16.5	28.4	22.0	23.6	0.42
Carbon Tetrachloride	0.24	2.26	3.90	3.01	3.24	0.057
Chloroform	0.25	2.37	4.09	3.16	3.39	0.060
Cumene (Isopropylbenzene)	0.16	1.51	2.61	2.01	2.16	0.038
Dibromochloromethane	<0.030	<0.29	<0.50	<0.38	<0.41	<0.0073
Dichlorodifluoromethane	0.13	1.28	2.21	1.71	1.83	0.032
1,2-Dichloroethane	0.15	1.41	2.44	1.89	2.03	0.036
trans,1,2-Dichloroethene	0.12	1.15	1.99	1.54	1.65	0.029
1,1-Dichloroethene	<0.034	<0.33	<0.56	<0.44	<0.47	<0.0082
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.38	<0.41	<0.0073
Ethylbenzene	0.94	9.02	15.6	12.0	12.9	0.23
Ethylene Dibromide	<0.060	<0.58	<1.00	<0.77	<0.83	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	1.53	14.7	25.4	19.6	21.0	0.37
Methylene Chloride	6.06	58.3	101	77.8	83.5	1.47
Styrene	0.76	7.30	12.6	9.74	10.5	0.18
Tetrachloroethene	<0.030	<0.29	<0.50	<0.38	<0.41	<0.0073
Toluene	3.34	32.1	55.4	42.8	46.0	0.81
1,1,1-Trichloroethane	<0.036	<0.35	<0.60	<0.46	<0.50	<0.0087
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.38	<0.41	<0.0073
Trichlorotrifluoroethane	0.24	2.31	3.99	3.08	3.31	0.058
Trichlorofluoromethane	<0.060	<0.58	<1.00	<0.77	<0.83	<0.015
M&P-Xylene	4.52	43.5	75.0	58.0	62.3	1.10
O-Xylene	1.46	14.0	24.2	18.7	20.1	0.35
Vinyl Chloride	<0.060	<0.58	<1.00	<0.77	<0.83	<0.015
Total	<26.1	<251	<433	<334	<359	<6.32

Dry Gas Volume Sampled (Rm³*) :	0.0602
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

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

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

Compound	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	2.38	22.5	38.8	29.9	32.2	0.57
Benzene	0.37	3.45	5.96	4.60	4.94	0.087
Bromodichloromethane	<0.056	<0.53	<0.91	<0.70	<0.76	<0.013
Bromoform	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Bromomethane	<0.27	<2.55	<4.40	<3.40	<3.65	<0.064
1,3-Butadiene	<0.060	<0.57	<0.98	<0.75	<0.81	<0.014
2-Butanone	0.78	7.31	12.6	9.75	10.5	0.18
Carbon Tetrachloride	<0.11	<1.08	<1.86	<1.43	<1.54	<0.027
Chloroform	0.16	1.47	2.54	1.96	2.11	0.037
Cumene (Isopropylbenzene)	0.15	1.44	2.49	1.92	2.07	0.036
Dibromochloromethane	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Dichlorodifluoromethane	<0.060	<0.57	<0.98	<0.75	<0.81	<0.014
1,2-Dichloroethane	0.12	1.09	1.89	1.46	1.57	0.028
trans,1,2-Dichloroethene	0.061	0.58	0.99	0.77	0.82	0.015
1,1-Dichloroethene	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
1,2-Dichloropropane	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Ethylbenzene	1.07	10.1	17.4	13.4	14.4	0.25
Ethylene Dibromide	<0.060	<0.57	<0.98	<0.75	<0.81	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	1.60	15.1	26.0	20.1	21.5	0.38
Methylene Chloride	2.88	27.2	46.9	36.2	38.9	0.68
Styrene	0.76	7.17	12.4	9.56	10.3	0.18
Tetrachloroethene	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Toluene	2.41	22.7	39.3	30.3	32.6	0.57
1,1,1-Trichloroethane	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.28	<0.49	<0.38	<0.41	<0.0071
Trichlorotrifluoroethane	0.13	1.22	2.10	1.62	1.74	0.031
Trichlorofluoromethane	<0.060	<0.57	<0.98	<0.75	<0.81	<0.014
M&P-Xylene	3.69	34.8	60.1	46.4	49.9	0.88
O-Xylene	1.49	14.1	24.3	18.8	20.2	0.35
Vinyl Chloride	<0.060	<0.57	<0.98	<0.75	<0.81	<0.014
Total	<19.0	<179	<309	<239	<256	<4.51

Dry Gas Volume Sampled (Rm³*) :	0.0614
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

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

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

Compound	Total Collected µg	Actual Concentration µg/m³	Dry Reference Concentration µg/Rm³*	Dry Adjusted Concentration µg/Rm³**	Wet Reference Concentration µg/Rm³*	Emission Rate mg/s
Acetone	3.92	37.2	64.3	49.6	53.3	0.94
Benzene	0.58	5.51	9.51	7.35	7.89	0.14
Bromodichloromethane	<0.070	<0.67	<1.15	<0.89	<0.95	<0.017
Bromoform	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
Bromomethane	<0.27	<2.57	<4.43	<3.42	<3.67	<0.065
1,3-Butadiene	<0.060	<0.57	<0.98	<0.76	<0.82	<0.014
2-Butanone	2.06	19.5	33.7	26.0	28.0	0.49
Carbon Tetrachloride	0.35	3.29	5.67	4.38	4.71	0.083
Chloroform	0.13	1.20	2.07	1.60	1.71	0.030
Cumene (Isopropylbenzene)	0.21	2.03	3.51	2.71	2.91	0.051
Dibromochloromethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
Dichlorodifluoromethane	0.18	1.74	3.00	2.32	2.49	0.044
1,2-Dichloroethane	0.13	1.23	2.12	1.63	1.76	0.031
trans,1,2-Dichloroethene	1.04	9.89	17.1	13.2	14.2	0.25
1,1-Dichloroethene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
1,2-Dichloropropane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
Ethylbenzene	1.51	14.4	24.8	19.2	20.6	0.36
Ethylene Dibromide	<0.060	<0.57	<0.98	<0.76	<0.82	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	1.70	16.2	27.9	21.6	23.2	0.41
Methylene Chloride	4.43	42.1	72.7	56.1	60.3	1.06
Styrene	0.90	8.50	14.7	11.3	12.2	0.21
Tetrachloroethene	<0.041	<0.39	<0.67	<0.52	<0.56	<0.0098
Toluene	4.51	42.8	73.9	57.1	61.3	1.08
1,1,1-Trichloroethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0072
Trichlorotrifluoroethane	0.22	2.06	3.56	2.75	2.95	0.052
Trichlorofluoromethane	<0.060	<0.57	<0.98	<0.76	<0.82	<0.014
M&P-Xylene	7.43	70.6	122	94.2	101	1.78
O-Xylene	2.71	25.7	44.4	34.3	36.9	0.65
Vinyl Chloride	<0.060	<0.57	<0.98	<0.76	<0.82	<0.014
Total	<32.8	<312	<538	<416	<446	<7.86

Dry Gas Volume Sampled (Rm³*) :	0.0610
Actual Flowrate (m³/s) :	25.2
Dry Reference Flowrate (Rm³/s*) :	14.6
Dry Adjusted Flowrate (Rm³/s**) :	18.9
Wet Reference Flowrate (Rm³/s*) :	17.6

* At 25°C and 1 atmosphere

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

TABLE 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	30.5	22.5	37.2	30.1
Benzene	4.59	3.45	5.51	4.52
Bromodichloromethane	0.93	<0.53	<0.67	<0.71
Bromoform	<0.29	<0.28	<0.29	<0.29
Bromomethane	<2.60	<2.55	<2.57	<2.57
1,3-Butadiene	<0.58	<0.57	<0.57	<0.57
2-Butanone	16.5	7.31	19.5	14.4
Carbon Tetrachloride	2.26	<1.08	3.29	<2.21
Chloroform	2.37	1.47	1.20	1.68
Cumene (Isopropylbenzene)	1.51	1.44	2.03	1.66
Dibromochloromethane	<0.29	<0.28	<0.29	<0.29
Dichlorodifluoromethane	1.28	<0.57	1.74	<1.19
1,2-Dichloroethane	1.41	1.09	1.23	1.24
trans,1,2-Dichloroethene	1.15	0.58	9.89	3.87
1,1-Dichloroethene	<0.33	<0.28	<0.29	<0.30
1,2-Dichloropropane	<0.29	<0.28	<0.29	<0.29
Ethylbenzene	9.02	10.1	14.4	11.2
Ethylene Dibromide	<0.58	<0.57	<0.57	<0.57
Mesitylene (1,3,5-Trimethylbenzene)	14.7	15.1	16.2	15.3
Methylene Chloride	58.3	27.2	42.1	42.5
Styrene	7.30	7.17	8.50	7.66
Tetrachloroethene	<0.29	<0.28	<0.39	<0.32
Toluene	32.1	22.7	42.8	32.6
1,1,1-Trichloroethane	<0.35	<0.28	<0.29	<0.30
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.28	<0.29	<0.29
Trichlorotrifluoroethane	2.31	1.22	2.06	1.86
Trichlorofluoromethane	<0.58	<0.57	<0.57	<0.57
M&P-Xylene	43.5	34.8	70.6	49.6
O-Xylene	14.0	14.1	25.7	17.9
Vinyl Chloride	<0.58	<0.57	<0.57	<0.57
Total	<251	<179	<312	<247

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	52.6	38.8	64.3	51.9
Benzene	7.92	5.96	9.51	7.80
Bromodichloromethane	1.61	<0.91	<1.15	<1.22
Bromoform	<0.50	<0.49	<0.49	<0.49
Bromomethane	<4.48	<4.40	<4.43	<4.44
1,3-Butadiene	<1.00	<0.98	<0.98	<0.99
2-Butanone	28.4	12.6	33.7	24.9
Carbon Tetrachloride	3.90	<1.86	5.67	<3.81
Chloroform	4.09	2.54	2.07	2.90
Cumene (Isopropylbenzene)	2.61	2.49	3.51	2.87
Dibromochloromethane	<0.50	<0.49	<0.49	<0.49
Dichlorodifluoromethane	2.21	<0.98	3.00	<2.06
1,2-Dichloroethane	2.44	1.89	2.12	2.15
trans,1,2-Dichloroethene	1.99	0.99	17.1	6.69
1,1-Dichloroethene	<0.56	<0.49	<0.49	<0.52
1,2-Dichloropropane	<0.50	<0.49	<0.49	<0.49
Ethylbenzene	15.6	17.4	24.8	19.2
Ethylene Dibromide	<1.00	<0.98	<0.98	<0.99
Mesitylene (1,3,5-Trimethylbenzene)	25.4	26.0	27.9	26.4
Methylene Chloride	101	46.9	72.7	73.4
Styrene	12.6	12.4	14.7	13.2
Tetrachloroethene	<0.50	<0.49	<0.67	<0.55
Toluene	55.4	39.3	73.9	56.2
1,1,1-Trichloroethane	<0.60	<0.49	<0.49	<0.53
Trichloroethene/1,1,2-Trichloroethene	<0.50	<0.49	<0.49	<0.49
Trichlorotrifluoroethane	3.99	2.10	3.56	3.22
Trichlorofluoromethane	<1.00	<0.98	<0.98	<0.99
M&P-Xylene	75.0	60.1	122	85.7
O-Xylene	24.2	24.3	44.4	31.0
Vinyl Chloride	<1.00	<0.98	<0.98	<0.99
Total	<433	<309	<538	<427

* 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	40.7	29.9	49.6	40.1
Benzene	6.12	4.60	7.35	6.02
Bromodichloromethane	1.24	<0.70	<0.89	<0.95
Bromoform	<0.38	<0.38	<0.38	<0.38
Bromomethane	<3.46	<3.40	<3.42	<3.43
1,3-Butadiene	<0.77	<0.75	<0.76	<0.76
2-Butanone	22.0	9.75	26.0	19.3
Carbon Tetrachloride	3.01	<1.43	4.38	<2.94
Chloroform	3.16	1.96	1.60	2.24
Cumene (Isopropylbenzene)	2.01	1.92	2.71	2.22
Dibromochloromethane	<0.38	<0.38	<0.38	<0.38
Dichlorodifluoromethane	1.71	<0.75	2.32	<1.59
1,2-Dichloroethane	1.89	1.46	1.63	1.66
trans,1,2-Dichloroethene	1.54	0.77	13.2	5.17
1,1-Dichloroethene	<0.44	<0.38	<0.38	<0.40
1,2-Dichloropropane	<0.38	<0.38	<0.38	<0.38
Ethylbenzene	12.0	13.4	19.2	14.9
Ethylene Dibromide	<0.77	<0.75	<0.76	<0.76
Mesitylene (1,3,5-Trimethylbenzene)	19.6	20.1	21.6	20.4
Methylene Chloride	77.8	36.2	56.1	56.7
Styrene	9.74	9.56	11.3	10.2
Tetrachloroethene	<0.38	<0.38	<0.52	<0.43
Toluene	42.8	30.3	57.1	43.4
1,1,1-Trichloroethane	<0.46	<0.38	<0.38	<0.41
Trichloroethene/1,1,2-Trichloroethene	<0.38	<0.38	<0.38	<0.38
Trichlorotrifluoroethane	3.08	1.62	2.75	2.48
Trichlorofluoromethane	<0.77	<0.75	<0.76	<0.76
M&P-Xylene	58.0	46.4	94.2	66.2
O-Xylene	18.7	18.8	34.3	23.9
Vinyl Chloride	<0.77	<0.75	<0.76	<0.76
Total	<334	<239	<416	<330

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

TABLE 91
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Wet Reference Concentrations

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*
Acetone	43.7	32.2	53.3	43.0
Benzene	6.57	4.94	7.89	6.47
Bromodichloromethane	1.34	<0.76	<0.95	<1.02
Bromoform	<0.41	<0.41	<0.41	<0.41
Bromomethane	<3.72	<3.65	<3.67	<3.68
1,3-Butadiene	<0.83	<0.81	<0.82	<0.82
2-Butanone	23.6	10.5	28.0	20.7
Carbon Tetrachloride	3.24	<1.54	4.71	<3.16
Chloroform	3.39	2.11	1.71	2.40
Cumene (Isopropylbenzene)	2.16	2.07	2.91	2.38
Dibromochloromethane	<0.41	<0.41	<0.41	<0.41
Dichlorodifluoromethane	1.83	<0.81	2.49	<1.71
1,2-Dichloroethane	2.03	1.57	1.76	1.78
trans,1,2-Dichloroethene	1.65	0.82	14.2	5.55
1,1-Dichloroethene	<0.47	<0.41	<0.41	<0.43
1,2-Dichloropropane	<0.41	<0.41	<0.41	<0.41
Ethylbenzene	12.9	14.4	20.6	16.0
Ethylene Dibromide	<0.83	<0.81	<0.82	<0.82
Mesitylene (1,3,5-Trimethylbenzene)	21.0	21.5	23.2	21.9
Methylene Chloride	83.5	38.9	60.3	60.9
Styrene	10.5	10.3	12.2	11.0
Tetrachloroethene	<0.41	<0.41	<0.56	<0.46
Toluene	46.0	32.6	61.3	46.6
1,1,1-Trichloroethane	<0.50	<0.41	<0.41	<0.44
Trichloroethene/1,1,2-Trichloroethene	<0.41	<0.41	<0.41	<0.41
Trichlorotrifluoroethane	3.31	1.74	2.95	2.67
Trichlorofluoromethane	<0.83	<0.81	<0.82	<0.82
M&P-Xylene	62.3	49.9	101	71.1
O-Xylene	20.1	20.2	36.9	25.7
Vinyl Chloride	<0.83	<0.81	<0.82	<0.82
Total	<359	<256	<446	<354

* 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	0.77	0.57	0.94	0.76
Benzene	0.12	0.087	0.14	0.11
Bromodichloromethane	0.024	<0.013	<0.017	<0.018
Bromoform	<0.0073	<0.0071	<0.0072	<0.0072
Bromomethane	<0.065	<0.064	<0.065	<0.065
1,3-Butadiene	<0.015	<0.014	<0.014	<0.014
2-Butanone	0.42	0.18	0.49	0.36
Carbon Tetrachloride	0.057	<0.027	0.083	<0.056
Chloroform	0.060	0.037	0.030	0.042
Cumene (Isopropylbenzene)	0.038	0.036	0.051	0.042
Dibromochloromethane	<0.0073	<0.0071	<0.0072	<0.0072
Dichlorodifluoromethane	0.032	<0.014	0.044	<0.030
1,2-Dichloroethane	0.036	0.028	0.031	0.031
trans,1,2-Dichloroethene	0.029	0.015	0.25	0.098
1,1-Dichloroethene	<0.0082	<0.0071	<0.0072	<0.0075
1,2-Dichloropropane	<0.0073	<0.0071	<0.0072	<0.0072
Ethylbenzene	0.23	0.25	0.36	0.28
Ethylene Dibromide	<0.015	<0.014	<0.014	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	0.37	0.38	0.41	0.39
Methylene Chloride	1.47	0.68	1.06	1.07
Styrene	0.18	0.18	0.21	0.19
Tetrachloroethene	<0.0073	<0.0071	<0.0098	<0.0081
Toluene	0.81	0.57	1.08	0.82
1,1,1-Trichloroethane	<0.0087	<0.0071	<0.0072	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.0073	<0.0071	<0.0072	<0.0072
Trichlorotrifluoroethane	0.058	0.031	0.052	0.047
Trichlorofluoromethane	<0.015	<0.014	<0.014	<0.014
M&P-Xylene	1.10	0.88	1.78	1.25
O-Xylene	0.35	0.35	0.65	0.45
Vinyl Chloride	<0.015	<0.014	<0.014	<0.014
Total	<6.32	<4.51	<7.86	<6.23

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

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	30.1	51.9	40.1	43.0	0.76
Benzene	4.52	7.80	6.02	6.47	0.11
Bromodichloromethane	<0.71	<1.22	<0.95	<1.02	<0.018
Bromoform	<0.29	<0.49	<0.38	<0.41	<0.0072
Bromomethane	<2.57	<4.44	<3.43	<3.68	<0.065
1,3-Butadiene	<0.57	<0.99	<0.76	<0.82	<0.014
2-Butanone	14.4	24.9	19.3	20.7	0.36
Carbon Tetrachloride	<2.21	<3.81	<2.94	<3.16	<0.056
Chloroform	1.68	2.90	2.24	2.40	0.042
Cumene (Isopropylbenzene)	1.66	2.87	2.22	2.38	0.042
Dibromochloromethane	<0.29	<0.49	<0.38	<0.41	<0.0072
Dichlorodifluoromethane	<1.19	<2.06	<1.59	<1.71	<0.030
1,2-Dichloroethane	1.24	2.15	1.66	1.78	0.031
trans,1,2-Dichloroethene	3.87	6.69	5.17	5.55	0.098
1,1-Dichloroethene	<0.30	<0.52	<0.40	<0.43	<0.0075
1,2-Dichloropropane	<0.29	<0.49	<0.38	<0.41	<0.0072
Ethylbenzene	11.2	19.2	14.9	16.0	0.28
Ethylene Dibromide	<0.57	<0.99	<0.76	<0.82	<0.014
Mesitylene (1,3,5-Trimethylbenzene)	15.3	26.4	20.4	21.9	0.39
Methylene Chloride	42.5	73.4	56.7	60.9	1.07
Styrene	7.66	13.2	10.2	11.0	0.19
Tetrachloroethene	<0.32	<0.55	<0.43	<0.46	<0.0081
Toluene	32.6	56.2	43.4	46.6	0.82
1,1,1-Trichloroethane	<0.30	<0.53	<0.41	<0.44	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.49	<0.38	<0.41	<0.0072
Trichlorotrifluoroethane	1.86	3.22	2.48	2.67	0.047
Trichlorofluoromethane	<0.57	<0.99	<0.76	<0.82	<0.014
M&P-Xylene	49.6	85.7	66.2	71.1	1.25
O-Xylene	17.9	31.0	23.9	25.7	0.45
Vinyl Chloride	<0.57	<0.99	<0.76	<0.82	<0.014
Total	<247	<427	<330	<354	<6.23

* 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 13A/13B µg	Field Blank 2 Tube 26A/26B µg	Trip Blank Tube 28A/28B µg	Method Blank µg
Acetone	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.02	<0.02	<0.02	<0.02
2-Butanone	<0.01	<0.01	<0.01	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	0.11	<0.1	<0.1	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01
Toluene	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.02	<0.02	<0.02	<0.02
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02
Total	<0.76	<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
(89 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:109802:19

2019/08/14

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 2019/07/25, prepared and submitted on behalf of Covanta Durham York Renewable Energy L.P. (DYEC), and referring to source testing (ORTECH Project 21950) to be conducted at DYEC's energy from waste facility, located at 72 Osbourne Rd., Clarington (Ontario).

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 2019 Compliance Source Testing Program.

The testing is an annual requirement 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 2019 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: *As Covanta has indicated its intention at using the DYEC CEM system to determine compliance of some of the target contaminants listed in the ECA's Schedule "D", a relative accuracy certification (RATA) of the parameters of interest need to be conducted to validate that the DYEC CEM's parameters of interest meet the minimum specification listed in the ECA's Schedule "F", if the last RATA conducted at the DYEC CEM system is older than 1 year. The RATA report is to be appended to the source testing report.*

***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 (^{o}C)
- 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 and 2018 compliance source testing programs, 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 2019 source testing program, as the proposed reference methodologies and process monitoring strategies are still appropriate for this program. The sampling strategies are considered acceptable; but in the case of those contaminants that will be monitored by the DYEC CEM system, a relative accuracy certification (not older than 1 year) is required to assure the quality of the data generated meet the MECP expectations.

We noted the sampling schedule for the week of September 9, 2019, with testing starting on September 09 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 416-994-5449, or by email at guillermo.azocar@ontario.ca.

Sincerely yours,

Guillermo Azocar
Source Assessment Specialist
Technology Standards Section

Doc.Mgmt.5AC080097)

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)
M. Januszkiewicz – Durham Region (via email: mirka.januszkiewicz@durham.ca)
L. McDowell – York Region (via email: laura.mcdowell@york.ca)
G. Anello – Durham Region (via email: gioseph.anello@durham.ca)
S. Dittman – York Region (via email: seth.dittman@york.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)
B. Fullerton -MECP TASDB TSS (via email: bill.fullerton@ontario.ca)

File AQ-02 (Durham-York Energy Centre – Clarington - 2019)

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. <u>SITE OPERATIONS</u>

(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. **<u>EQUIPMENT and SITE INSPECTIONS and MAINTENANCE</u>**

Operation and Maintenance

(1) Prior to the receipt of the Waste at the Site, the Owner shall prepare and update as necessary, an Operation and Maintenance Manual for all the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility. The Manual shall be prepared in accordance with the written manufacturer's and/or supplier's specifications and good engineering practice.

As a minimum, the Operation and Maintenance Manual shall specify:

(a) operation procedures of the Equipment, the APC Equipment, the CEM Systems, the Works, and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility, in accordance with manufacturers' recommendations and good engineering practices to achieve compliance with this Certificate, the *EPA,* the *OWRA* and their Regulations;
(b) calibration procedures for the CEM Systems as required by this Certificate;
(c) procedures for start-up and shutdown, including Controlled Shutdown and Emergency Shutdown;
(d) quality assurance procedures for the operation and calibration of the CEM Systems in accordance with *40 CFR 60,* Appendix F or *Report EPS 1/PG/7,* as appropriate;
(e) Waste receiving and screening procedures;
(f) Waste, Rejected Waste and Residual Waste handling procedures;
(g) testing and monitoring procedures as required by this Certificate;
(h) maintenance and preventative maintenance procedures as required by this Certificate;
(i) Facility inspection, including frequency of inspections, procedures;
(j) procedure for handling complaints as required by this Certificate.
(k) contingency measures to resolve upset conditions and/or minimize the environmental impacts from the Facility;
(l) emergency response procedures, including procedures for dealing with power failure, fire, explosion, spills and any other potential emergencies;
(m) procedures for record keeping activities as required by this Certificate;
(n) description of the responsibilities of the Site personnel and the personnel training protocols; and
(o) a list of personnel positions responsible for operation and maintenance, including supervisory personnel and personnel responsible for handling of the emergency situations, recording and reporting pursuant to the requirements of this Certificate, along with the training and experience required for the positions and a description of the responsibilities.

(2) A copy of this Operations and Maintenance Manual shall be kept at the Site, be accessible to the Site personnel at all times and be updated, as required. The Operations and Maintenance Manual shall be available for inspection by a Provincial Officer upon request.

(3) The Owner shall implement the operation, maintenance, preventative maintenance and calibration procedures set out in the Operations and Maintenance Manual required by this Certificate.

Critical Spare Parts

(4) (a) The Owner shall prepare a list of critical spare parts, update this list annually or more frequently, if necessary, to ensure that this list is maintained up-to-date and shall be available for inspection by a Provincial Officer upon request.

(b) The Owner shall ensure that the critical spare parts are available at the Site at all times or are immediately available from an off-Site supplier.

Inspections

(5) Prior to receipt of the Waste at the Site, the Owner shall prepare a comprehensive written inspection program which includes inspections of all aspects of the Site's operations including, but not limited to the following:

(a) buildings and the indoor waste storage facilities and presence of dust and odour and leaks in or near any openings, such as doorways, window, vent, louver or any other opening;
(b) outdoor Residual Waste transport equipment, and the presence of dust and leaks at or near transfer points or the equipment seams;
(c) the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility;
(d) spill containment areas, loading areas and the conditions around the Wastewater Settling Basin;
(e) security fencing, gates, barriers and signs;
(f) off-site nuisance impacts such as odour, dust, litter, etc.
(g) presence of stormwater pooling at the Site; and
(h) condition of the on-Site roads for presence of leaks and drips from the waste delivery trucks or excessive dust emissions.

(6) The inspections, except for the inspection of the Works, are to be undertaken daily by the Trained Personnel in accordance with the inspection program to ensure that the Facility is maintained in good working order at all times and that no off-Site impacts are occurring. Any deficiencies detected during these regular inspections must be promptly corrected.

Inspections and Maintenance of the Works

(7) The Owner shall inspect the Works at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

6. PERFORMANCE REQUIREMENTS

(1) The Owner shall, ensure that the Facility/Equipment is designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) the maximum 10-minute average concentration of odour at the most impacted Sensitive Receptor, resulting from the operation of the Facility/Equipment, calculated in accordance with the procedures outlined in the attached Schedule "B", shall not exceed 1 odour unit;

(b) the noise emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-205;*

(c) the vibration emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-207.*

(2) The Owner shall ensure that the Boilers and the associated APC Equipment and the CEM Systems are designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) (i) The temperature in the combustion zone of each Boiler shall reach a minimum of 1000 degrees Celsius (°C) for one second, prior to introduction of the Waste into the combustion chamber of the Boiler during the start-up, and thereafter maintained during the entire thermal treatment cycle and subsequent shutdown until all Waste combustion is completed.

(ii) Compliance with the minimum temperature requirement shall be demonstrated by direct measurement at the location where the combustion gases have achieved the residence time of one second at a minimum temperature of 1000°C (the Target Location) or by correlation of the required temperature of 1000°C for one second to the temperature measured downstream of the Target Location as proven by a method acceptable to the Director.

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

(c) (i) The operational target for the concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler is 40 milligrams per dry cubic metre, as a 4-hour rolling average, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, as measured and recorded by the CEM System, for the period from and including initial commissioning of the facility to twelve months following the completion of the first Source Testing program.

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

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

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

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

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

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

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

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

Residual Waste Compliance Criteria

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

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

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

7. TESTING, MONITORING and AUDITING

Source Testing

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

Continuous Monitoring

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

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

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

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

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

Long-Term Sampling for Dioxins and Furans

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

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

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

Ambient Air Monitoring

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

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

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

Noise Monitoring - Acoustic Audit

(5) The Owner:

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

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

(6) The Director:

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

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

Residual Waste Testing

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Testing:

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

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

Disposal of Residual Waste

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

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

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

Groundwater and Surface Water Monitoring

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

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

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

8. **NUISANCE IMPACT CONTROL and HOUSEKEEPING**

Odour Management

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Vehicles and Traffic

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

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

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

(d) Any necessary truck washing shall occur only in the designated wash down area of the Tipping Building or the Residue Building.

(11) The Owner shall ensure that there is no queuing or parking of vehicles that are waiting to enter the Site on any roadway that is not a distinct part of the Site.

Litter

(12) The Owner shall:

(a) take all practical steps to prevent the escape of litter from the Site;
(b) pick up litter around the Site on a daily basis, or more frequently if necessary; and
(c) if necessary, erect litter fences around the areas causing a litter problem.

Dust

(13) The Owner shall ensure that all on-site roads and operations/yard areas are regularly swept/washed to prevent dust impacts off-Site.

Vermin and Vectors

(14) The Owner shall:

(a) implement necessary housekeeping procedures to eliminate sources and potential sources of attraction for vermin and vectors; and

(b) hire a qualified, licensed pest control professional to design and implement a pest control plan for the Site. The pest control plan shall remain in place, and be updated from time to time as necessary, until the Site has been closed and this Certificate has been revoked.

Visual Screening

(15) The Owner shall provide visual screening for the Site in accordance with the documentation included in the attached Schedule "A".

9. STAFF TRAINING

(1) (a) The Owner shall ensure that all operators of the Site are trained with respect to the following, as per the specific job requirements of each individual operator:

(i) terms and conditions of this Certificate and the requirements of the EA Approval;
(ii) operation and management of the Site, or area(s) within the Site, as per the specific job requirements of each individual operator, and which may include procedures for receiving, screening and identifying Waste, refusal, handling, processing and temporarily storing wastes, operation of the Equipment, the APC Equipment, the CEM System and the Works;
(iii) testing, monitoring and operating requirements;
(iv) maintenance and inspection procedures;
(v) recording procedures;
(vi) nuisance impact control and housekeeping procedures;
(vii) procedures for recording and responding to public complaints;
(viii) an outline of the responsibilities of Site personnel including roles and responsibilities during emergency situations;
(ix) the Contingency and Emergency Response Plan including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
(x) environmental, and occupational health and safety concerns pertaining to the wastes to be handled;
(xi) emergency first-aid information; and
(xii) relevant waste management legislation and regulations, including the *EPA*, the *OWRA*, the *O. Reg. 347*, the *O. Reg. 419/05* and the Ministry guidelines affecting thermal treatment facilities.

(2) The Owner shall ensure that all personnel are trained in the requirements of this Certificate relevant to the employee's position:

(a) upon commencing employment at the Site in a particular position;
(b) whenever items listed in Condition 9.(1) are changed or updated; and
(c) during the planned refresher training.

10. **COMPLAINTS / ODOUR-CONTAMINANT EMISSIONS RESPONSE PROCEDURE**

(1) The Owner or a designated representative of the Owner shall be available to receive public complaints caused by the operations at the Site twenty-four (24) hours per day, seven (7) days per week.

(2) If at any time, the Owner or the Ministry receives a complaint or the Owner or the Provincial Officer detects an emission of odour or any contaminant, (Emission Event), from the Site, in addition to the requirements set out in the EA approval, the Owner shall record all relevant information in the computerized tracking system and shall respond to the complaint/Emission Event according to the following procedure:

Step 1: Record of Complaint/Emission Event

(a) (i) The Owner shall record each complaint/Emission Event and each record shall include the following:

(A) name, address and the telephone number of the complainant, if known;
(B) time and date of the complaint/Emission Event;
(C) details of the complaint; and

(ii) After the complaint/Emission Event has been recorded in the tracking system, the Owner shall immediately report to the District Manager by phone or e-mail during office hours and to the Ministry's Spills Actions Centre at 1-800-268-6060 after office hours on the receipt of the complaint or occurrence of the Emission Event.

Step 2: Investigation and Handling of Complaint/Emission Event

(b) The Owner shall immediately initiate investigation of the complaint/Emission Event. As a minimum, the investigation shall include the following:

(i) determination of the activities being undertaken at the Site at the time of the complaint/Emission Event;
(ii) meteorological conditions including, but not limited to the ambient temperature, approximate wind speed and its direction.
(iii) determination if the complaint is attributed to activities being undertaken at the Site and if so, the possible cause(s) of the complaint/Emission Event; and

(iv) determination of the remedial action(s) to address the cause(s) of the Complaint/Emission Event, and the schedule for the implementation of the necessary remedial action(s).

(c) The Owner shall respond to the complainant, if known, and the response shall include the results of the investigation of the Complaint, the action(s) taken or planned to be taken to address the cause(s) of the Complaint, and if any follow-up response(s) will be provided.

(d) Upon completed investigation of the Complaint/Emission event, the Owner shall, within three (3) business days, submit a report to the District Manager on the Complaint, on the action(s) taken or planned to be taken to address the cause(s) of the Complaint and on all proposed action(s) to prevent recurrence of the Complaint/Emission Event in the future.

(3) If, in the opinion of the District Manager, failure of the APC Equipment and/or any other process or equipment upset or malfunction results in off-site Complaint/Emission Event, confirmed by the Owner or a Provincial Officer of the Ministry, the Owner shall, immediately upon notification from the District Manager, implement any necessary additional control measures, including, but not necessarily limited to, those in the Contingency and Emergency Response Plan required by this Certificate.

(4) If the District Manager deems the additional control measures taken as per condition 10.(3) to be unsuitable, insufficient or ineffective, the District Manager may direct the Owner, in writing, to take further measures to address the noted failure, upset or malfunction including pursuant to section 39 of the *EPA* requiring a reduction in the receipt of Waste, cessation of the receipt of Waste, removal and off-site disposal of Waste from the Tipping Building as well as making repairs or modifications to equipment or processes.

11. **CONTINGENCY and EMERGENCY RESPONSE PLAN**

(1) (a) The Owner shall develop and implement a Contingency and Emergency Response Plan in accordance with the requirements set out in the EA Approval.

(b) Notwithstanding the requirements set out in the EA Approval, the Contingency and Emergency Response Plan shall be prepared in consultation with the District Manager or designate, the local Municipality and the Fire Department.

(2) In addition to the requirements set out in the EA Approval, the Contingency and Emergency Response Plan, as a minimum, shall include the following:

(a) the Site plan clearly showing the equipment layout and all storage areas for wastes and reagents;

(b) a list of Site personnel responsible for the implementation of the contingency measures and various emergency response tasks and their training requirements;

(c) a list of equipment and materials required for the implementation of the contingency measures and the emergency situation response;

(d) maintenance and testing program for equipment required for the implementation of the contingency measures and the emergency situation response;

(e) procedures to be undertaken as part of the implementation of the contingency measures and the emergency situation response;

(f) names and telephone numbers of waste management companies available for emergency response;

(g) notification protocol, with names and telephone numbers of persons to be contacted, including the Owner, the Site personnel, the Ministry of the Environment Spills Action Centre and the York Durham District, the local Fire and Police Departments, the local Municipality, the local Medical Officer of Health, and the Ministry of Labour;

(h) procedures and actions to be taken should the incoming Waste not meet the applicable quality criteria specified in this Certificate;

(i) procedures and actions to be taken should the outgoing Residual Waste fail to meet the criteria specified in this Certificate;

(j) procedures and actions to be taken should the current disposal options for the outgoing Residual Waste become unavailable;

(k) design of the contingency measure, procedures and actions should the emissions from the Site, including the fugitive odour/dust emissions, cause occurrences of public Complaints;

(l) procedures and actions to be taken should the Owner be unable to maintain the negative pressure in the Tipping Building;

(m) procedures and actions to be taken should the occurrence of Complaints require the Owner to suspend the waste processing activities at the Site; and

(n) identification and risk assessment of all reasonably foreseeable incidents that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate, including but not limited to:

    (i) a breakdown of the Facility/Equipment or part of the Facility/Equipment, including the APC Equipment and the CEM Systems associated with the Boilers;

    (ii) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements;

    (iii) any change in process parameters which may result in non compliance with the Performance Requirements;

    (iv) power failure resulting in the use of the Emergency Diesel Generator or Total Power Failure; and

    (v) description of the preventative and control measures to minimize the occurrence or impacts of the above incidents; and

    (vi) procedures for corrective measures and timelines to take to address the above incidents in a timely manner to effectively prevent or minimize the discharge of any contaminant into the natural environment and continue to maintain compliance with the *EPA* , the Regulations and this Certificate, including procedures for Waste Processing Rate reduction, waste feed cut-off, Controlled Shutdown or Emergency Shutdown of the Boilers as applicable.

(3) The Owner shall submit the finalized Contingency and Emergency Response Plan to the Director a minimum of one hundred and twenty (120) days prior to the Commencement Date of Operation, for approval.

(4) An up-to-date version of the Contingency and Emergency Response Plan shall be kept at the Site at all times, in a central location available to all staff, and it shall be available for inspection by a Provincial Officer upon request.

(5) The Owner shall ensure that the names and telephone numbers of the persons to be contacted in the event of an emergency situation are kept up-to-date, and that these numbers are prominently displayed at the Site and at all times available to all staff and emergency response personnel.

(6) The Contingency and Emergency Response Plan shall be reviewed on a regular basis and updated, as necessary. The revised version of the Contingency and Emergency Response Plan shall be submitted to the local Municipality and the Fire Department for comments and to the District Manager for comments and concurrence.

(7) The Owner shall implement the recommendations of the updated Contingency and Emergency Response Plan, immediately upon receipt of the written concurrence from the District Manager.

12. **EMERGENCY SITUATION RESPONSE and REPORTING**

(1) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site and manage any emergency situation in accordance with the Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the equipment and materials listed in the Contingency and Emergency Response Plan are immediately available at the Site, are in a good state of repair, and fully operational at all times.

(3) The Owner shall ensure that all Site personnel responsible for the emergency situation response are fully trained in the use of the equipment and related materials, and in the procedures to be employed in the event of an emergency.

(4) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

13. SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER

(1) The Owner shall notify the District Manager in writing, at least six (60) days prior to the scheduled date for the first receipt of Waste at the Site, as to whether or not the construction of the Facility has been carried out in accordance with this Certificate to a point of Substantial Completion.

(2) (a) The Owner shall forthwith notify the District Manager and the Spills Action Centre by telephone, when any of the following incidents occur that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate:

(i) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements triggering a Waste Processing Rate Reduction, Waste Feed cut-off, Controlled Shutdown or Emergency Shutdown as specified in the Emergency Response and Contingency Plan;
(ii) failure of the APC Equipment associated with the Boilers; and
(iii) power failure resulting in the use of the emergency diesel generator or Total Power Failure;

(b) In addition to fulfilling the notification requirements from the *EPA,* the Owner shall prepare and submit a written report to the District Manager with respect to any of the above said occurrences, within five (5) calendar days of the occurrence, in the following format:

(i) date of the occurrence;
(ii) general description of the occurrence;
(iii) duration of the occurrence;
(iv) effect of the occurrence on the emissions from the Facility;
(v) measures taken to alleviate the effect of the occurrence on the emissions from the Facility; and
(vi) measures taken to prevent the occurrence of the same or similar occurrence in the future.

(3) Should a Spill, as defined in the *EPA*, occur at the Site, in addition to fulfilling the requirements from the *EPA* and applicable regulations, the Owner shall submit to the District Manager a written report within three (3) calendar days outlining the nature of the Spill, remedial measure taken and the measures taken to prevent future occurrences at the Site.

(4) (a) Within ninety (90) days from the date of this Certificate, the Regions shall prepare and submit to the District Manager for concurrence, a Soil Testing Plan to monitor the impact of the Site operations at the locations where the ambient air monitoring is proposed by the Owner in accordance with the requirements set out in the EA Approval.

(b) (i) This Plan shall ensure that representative samples of the soil to be tested are collected in sufficient numbers and that the samples are properly preserved and tested so that reliable data on the soil characteristics is collected.

(ii) As a minimum, the Plan shall include testing for cadmium, lead, chromium, nickel, cobalt, copper, molybdenum, selenium, zinc and mercury, Dioxins and Furans.

(iii) This Plan shall comply with the Ministry's regulatory requirements for sampling and testing of soil and it shall include the rationale for the proposed methods.

(iv) This Plan be kept at the Site at all times and be available for inspection by a Provincial Officer upon request.

14. **RECORDS KEEPING**

(1) Any information requested by the Ministry concerning the Facility and its operation under this Certificate, including, but not limited to, any records required to be kept by this Certificate, shall be provided to the Ministry, upon request, in a timely manner.

(2) The Owner shall retain, for a minimum of seven (7) years from the date of their creation, except as noted below, all reports, records and information described in this Certificate.

Daily Activities

(3) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) date of record and the name and signature of the person completing the report;
(b) quantity and source of the incoming Waste received at the Site;
(c) records of the estimated quantity of Waste thermally treated in the Boilers;
(d) quantity of the Unacceptable Waste received at the Site by the end of the approved Waste receipt period and the type(s) of the Unacceptable Waste received;
(e) quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;
(f) destination and/or receiving site(s) for the Residual Waste shipped from the Site;
(g) quantity and type of any Rejected Waste accepted at the Site;
(h) destination and/or receiving site(s) for the Rejected Waste shipped from the Site;
(i) housekeeping activities, including litter collection and washing/cleaning activities, etc.
(j) amount of electricity produced;

(k) amount of excess electricity exported to the electrical grid.

Monitoring and Testing Records

(4) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) day and time of the activity;
(b) all original records produced by the recording devices associated with the CEM Systems;
(c) a summary of daily records of readings of the CEM Systems, including:
  (i) the daily minimum and maximum 4-hour average readings for carbon monoxide;
  (ii) the daily minimum and maximum one hour average readings for oxygen;
  (iii) the daily minimum and maximum 10-minute average readings for organic matter;
  (iv) the daily minimum and maximum 24-hour average readings for sulphur dioxide;
  (v) the daily minimum and maximum 24-hour average readings for nitrogen oxides;
  (vi) the daily minimum and maximum 24-hour average readings for hydrogen chloride;
  (vii) the daily minimum and maximum 6-minute average and 2-hour average opacity readings; and
  (viii) the daily minimum and maximum one-hour average readings for temperature measurements.
(d) records of all excursions from the applicable Performance Requirements as measured by the CEM Systems, duration of the excursions, reasons for the excursions and corrective measures taken to eliminate the excursions;
(e) all records produced during any Acoustic Audit;
(f) all records produced during any Source Testing;
(g) all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;
(h) all records produced during the Residual Waste compliance testing;
(i) all records produced during the Soil Testing;
(j) all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;
(k) all records produced during the Ambient Air Monitoring required by this Certificate;
(l) all records associated with radiation monitoring of the incoming Waste, including but not limited to:
  (i) transaction number;
  (ii) hauler;
  (iii) vehicle ID;
  (iv) alarm level;
  (v) maximum CPS;
  (vi) uSv/hr;

(vii) comment;
(viii) background CPS;
(ix) driver time in and out; and
(x) name of the Trainer Personnel that carried out the monitoring.

(m) results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;
(n) results the negative pressure in the Tipping Building carried out, as required.

Inspections/Maintenance/Repairs

(5) The Owner shall maintain an on-Site written or digital record of inspections and maintenance as required by this Certificate. As a minimum, the record shall include the following:

(a) the name and signature of the Trained Personnel that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered, including the need for a maintenance or repair activity;
(d) the recommendations for remedial action;
(e) the date, time and description of actions (repair or maintenance) undertaken;
(f) the name and signature of the Trained Personnel who undertook the remedial action; and
(g) an estimate of the quantity of any materials removed during cleaning of the Works.

Emergency Situations

(6) The Owner shall maintain an on-Site written or digital record of the emergency situations. As a minimum, the record shall include the following:

(a) the type of an emergency situation;
(b) description of how the emergency situation was handled;
(c) the type and amount of material spilled, if applicable;
(d) a description of how the material was cleaned up and stored, if generated; and
(e) the location and time of final disposal, if applicable; and
(f) description of the preventative and control measures undertaken to minimize the potential for re-occurrence of the emergency situation in the future.

Complaints Response Records

(7) The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.

Training

(8) The Owner shall maintain an on-Site written or digital record of training as required by this Certificate. As a minimum, the record shall include the following:

(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

Reports

(9) The Owner shall keep at the Site the following reports required by this Certificate:

(a) the ESDM Report
(b) the Acoustic Assessment Report;
(c) the Annual Report; and
(d) the Third Party Audit.

15. REPORTING

Annual Report

(1) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

(a) a summary of the quality and the quantity of the Wastes accepted at the Site, including the maximum amount of the Waste received annually and daily and the sources of the Waste;

(b) a summary of the quality and the quantity of the Residual Waste shipped from the Site, including the analytical data required to characterize the Residual Waste, the off-Site destinations for the Residual Waste and its subsequent use, if known;

(c) estimated material balance for each month documenting the maximum amount of wastes stored at the Site;

(d) annual water usage;

(e) annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;

(f) summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;

(g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;

(h) a summary of dates, duration and reasons for any environmental and operational problems, Boilers downtime, APC Equipment and CEM System malfunctions that may have negatively impacted the quality of the environment or any incidents triggered by the Emergency Response and

Contingency Plan and corrective measures taken to eliminate the environmental impacts of the incidents;

(i) a summary of the dates, duration and reasons for all excursions from the applicable Performance Requirements as measured by the CEM Systems or as reported by the annual Source Testing, reasons for the excursions and corrective measures taken to eliminate the excursions;

(j) results of the evaluation of the performance of the long-term sampling system in determining the Dioxins and Furans emission trends and/or fluctuations for the year reported on as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers;

(k) dates of all environmental complaints relating to the Site together with cause of the Complaints and actions taken to prevent future Complaints and/or events that could lead to future Complaints;

(l) any environmental and operational problems that could have negatively impacted the environment, discovered as a result of daily inspections or otherwise and any mitigative actions taken;

(m) a summary of any emergency situations that have occurred at the Site and how they were handled;

(n) the results and an interpretive analysis of the results of the groundwater and surface water, including an assessment of the need to amend the monitoring programs;

(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;

(p) any recommendations to improve the environmental and process performance of the Site in the future;

(q) statement of compliance with this Certificate, including compliance with the *O. Reg. 419/05* and all air emission limits based on the results of source testing, continuous monitoring and engineering calculations, as may be appropriate; and

(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.

Third Party Audit

(2) (a) The Regions shall ensure that an independent technical review of the operations at the Site is undertaken in accordance with the requirements of the EA Approval.

(b) In addition to the Third Party Audit requirements set out in the EA approval, the Third Party Audit shall include the following:

(i) a review of the data from the monitoring and testing required by this Certificate;
(ii) a review of all complaints received about the operation of the Facility;
(iii) any recommendations for improving the operation of the Facility received from the Advisory Committee; and
(iv) a recommendation of any improvements that could be made to ensure that the operation of the Facility is optimized and is protective of the health and safety of people and the environment.

(3) The Regions shall submit a Written Audit Report on the results of the independent technical review to the Regional Director in accordance with the Audit Plan and retain a copy at the Site.

Soil Testing Report

(4) Within one (1) month of completion of each Soil Testing event, the Regions shall submit to the District Manager a Soil Testing Report, which includes the details on the sampling/testing procedures, the results of the testing and a comparison with the results obtained during the previous Soil Testing.

16. PUBLIC ACCESS TO DOCUMENTATION

(1) The Owner shall, at all times, maintain documentation that describes the current operations of the Facility. The Owner shall post the documentation at the website for the undertaking and during regular business hours, the Owner shall make the following documents available for inspection at the Site by any interested member of the public, upon submission to the Ministry for review:

(a) a current ESDM Report that demonstrates compliance with the Performance Limits for the Facility regarding all Compounds of Concern;

(b) a current Acoustic Assessment Report that demonstrates compliance with the Performance Limits for the Facility regarding noise emissions;

(c) the most recent Annual Report;

(d) the most current Third Party Audit Report;

(e) Odour Management and Mitigation Plan, prepared in accordance with the requirements of the EA Approval;

(f) Noise Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval; and

(g) Groundwater and Surface Water Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval.

(2) The Owner shall ensure that necessary hardware and software are provided at a location available to the public, to provide on-line real-time reporting of the operating parameter data for the Facility, including acceptable operating limits, stack emissions, and all other parameters for which continuous monitoring is required and that continuous records of the same be kept and made available to the public.

17. ADVISORY COMMITTEE

(1) The Regions shall establish an Advisory Committee in accordance with the requirements set out in the EA Approval.

18. CLOSURE of the SITE

(1) A minimum of nine (9) months prior to closure of the Site, the Owner shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Owner shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

SCHEDULE "A"

Supporting Documentation

(1) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Emission Summary and Dispersion Modelling Report, dated March 2011, prepared by Golder Associates;

(b) Acoustic Assessment Report prepared by Golder Associates Ltd., dated March 2011 and signed by Paul Niejadlik.

(2) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Attachment #1 containing the "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.;

(b) Attachment #3 containing the "Public Consultation Report", dated March 2011, prepared by Golder Associates Ltd.;

(c) Attachment #4 containing the Host Community Agreement

(d) Attachment #5 containing the proof of legal name for Covanta Durham York Renewable Energy Limited Partnership; and

(e) A letter May 24, 2011 from Anthony Ciccone, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, providing additional technical information on the proposal and attaching a report entitled "Amendment #1 Durham York Energy Centre Design and Operations Report", dated May 2011;

(3) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of Durham and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) "Surface Water and Groundwater Technical Study Report" dated July 2009, prepared by Jacques Whitford, Markham, Ontario (CD Report).

(b) "Stormwater Design Model Output" prepared by Sigma Energy, dated March 2001 (CD Report).

(c) Clearance letter from Central Lake Ontario Conservation date February 22, 2011.

(d) A letter dated March 23, 2011, from Brian Bahor, Covanta Energy Corporation, to Stefanos Habtom, Ontario Ministry of the Environment, providing additional technical design information on the proposed stormwater management ponds.

SCHEDULE "B"

Procedure to calculate and record the 10-minute average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor

(a) Calculate and record one-hour average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor, employing CALPUFF atmospheric dispersion model or the dispersion model acceptable to the Director that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour average odour concentrations.

(b) Convert and record each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations using the One-hour Average to 10-Minute Average Conversion described below; and

(c) Record and present the 10-Minute Average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the most impacted Sensitive Receptor in a histogram. The histogram shall identify all predicted 10-minute average odour concentration occurrences in terms of frequency, identifying the number of occurrences over the entire range of predicted odour concentration in increments of not more than 1/10 of one odour unit. The maximum 10-minute average concentration of odour at the Sensitive Receptor will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

One-hour Average To 10-minute Average Conversion

1. Use the following formula to convert and record one-hour average concentrations predicted by the CALPUFF atmospheric dispersion model or by the dispersion model acceptable to the Director to 10-minute average concentrations:

X10min = X60min*1.65

where X10min = 10-minute average concentration
X60min = one-hour average concentration

SCHEDULE "C"

PERFORMANCE REQUIREMENTS

In-Stack Emission Limits

Parameter	In-Stack Emission Limit	Verification of Compliance
Total Suspended Particulate Matter (filterable particulate measured in accordance with the Ontario Source Testing Code)	9 mg/Rm3	Results from compliance Source Testing
cadmium	7 µg/Rm3	Results from compliance Source Testing
lead	50 µg/Rm3	Results from compliance Source Testing
mercury	15 µg/Rm3	Results from compliance Source Testing
dioxins and furans	60 pg/Rm3	Results from compliance Source Testing; results expressed as I-TEQ
hydrochloric acid (HCl)	9 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
sulphur dioxide (SO2)	35 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
nitrogen oxides (NOx)	121 mg/ Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
organic matter (undiluted, expressed as equivalent methane)	50 ppmdv (33 mg/ Rm3)	Results from compliance source testing
carbon monoxide	35 ppmdv (40 mg/Rm3)	Calculated as the rolling arithmetic average of four (4) hours of data measured by a CEM System that provides data at least once every fifteen minutes, in accordance with condition 6 (2) (c)
opacity	10 percent	Calculated as the rolling arithmetic average of six (6) minutes of data measured by a CEM System that provides data at least once every minute
	5 percent	Calculated as the rolling arithmetic average of two (2) hours of data measured by a CEM System that provides data at least once every

		fifteen minutes

mg/Rm3- milligrams per reference cubic metre;

pg/Rm3 - picograms per reference cubic metre

ppmdv parts per million by dry volume,

µg/Rm3 - micrograms per reference cubic metre

R- reference conditions - 25 degrees Celsius, 101.3 kilopascals, dry basis, 11% oxygen

SCHEDULE "D"

TEST CONTAMINANTS

Hydrogen Chloride
Hydrogen Fluoride
Oxides of Nitrogen expressed as Nitrogen Dioxide
Sulphur Dioxide
Total Hydrocarbons, expressed as methane on wet basis
Carbon Dioxide
Total Suspended Particulate Matter (< 44 microns)
Total PM-10 including condensables
Total PM-2.5 including condensables

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Schedule "D" - Cont'd

Chlorobenzenes	Chlorophenols
	2-monochlorophenol (2-MCP)
Monochlorobenzene (MCB)	3-monochlorophenol (3-MCP)
1,2-Dichlorobenzene (1,2-DCB)	4-monochlorophenol (4-MCP)
1,3-Dichlorobenzene (1,3-DCB)	2,3-dichlorophenol (2,3-DCP)
1,4-Dichlorobenzene (1,4-DCB)	2,4-dichlorophenol (2,4-DCP)
1,2,3-Trichlorobenzene (1,2,3-TCB)	2,5-dichlorophenol (2,5-DCP)
1,2,4-Trichlorobenzene (1,2,4-TCB)	2,6-dichlorophenol (2,6-DCP)
1,3,5-Trichlorobenzene (1,3,5-TCB)	3,4-dichlorophenol (3,4-DCP)
1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB)	3,5-dichlorophenol (3,5-DCP)
1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB)	2,3,4-trichlorophenol (2,3,4-T3CP)
1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB)	2,3,5-trichlorophenol (2,3,5-T3CP)
Pentachlorobenzene (PeCB)	2,3,6-trichlorophenol (2,3,6-T3CP)
Hexachlorobenzene (HxCB)	2,4,5-trichlorophenol (2,4,5-T3CP)
	2,4,6-trichlorophenol (2,4,6-T3CP)
	3,4,5-trichlorophenol (3,4,5-T3CP)
	2,3,4,5-tetrachlorophenol (2,3,4,5-T4CP)
	2,3,4,6-tetrachlorophenol (2,3,4,6-T4CP)
	2,3,5,6-tetrachlorophenol (2,3,5,6-T4CP)
	Pentachlorophenol (PeCP)

Schedule "D" - Cont'd

Co-Planar PCBs (Dioxin-like PCBs)	Volatile Organic Matter
PCB-077 (3,3',4,4'-TCB)	Acetaldehyde
PCB-081 (3,4,4',5-TCB)	Acetone
PCB-105 (2,3,3',4,4'-PeCB)	Acrolein
PCB-114 (2,3,4,4',5-PeCB)	Benzene
PCB-118 (2,3',4,4',5-PeCB)	Bromodichloromethane
PCB-123 (2',3,4,4',5-PeCB)	Bromoform
PCB-126 (3,3',4,4',5-PeCB)	Bromomethane
PCB-156 (2,3,3',4,4',5-HxCB)	Butadiene, 1,3 -
PCB-157 (2,3,3',4,4',5'-HxCB)	Butanone, 2 -
PCB-167 (2,3',4,4',5,5'-HxCB)	Carbon Tetrachloride
PCB-169 (3,3',4,4',5,5'-HxCB)	Chloroform
PCB-189 (2,3,3',4,4',5,5'-HpCB)	Cumene
	Dibromochloromethane
	Dichlorodifluoromethane
	Dichloroethane, 1,2 -
	Dichloroethene, Trans - 1,2
	Dichloroethene, 1,1 -
	Dichloropropane, 1,2 -
	Ethylbenzene
	Ethylene Dibromide
	Formaldehyde
	Mesitylene
	Methylene Chloride
	Styrene
	Tetrachloroethene
	Toluene
	Trichloroethane, 1,1,1 -
	Trichloroethene
	Trichloroethylene, 1,1,2 -
	Trichlorotrifluoroethane
	Trichlorofluoromethane
	Xylenes, M-, P- and O-
	Vinyl Chloride

Schedule "D" - Cont'd

Polycyclic Organic Matter	Dioxin/Furan Isomers
Acenaphthylene	
Acenaphthene	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Anthracene	1,2,3,7,8-Pentachlorodibenzo-p-dioxin
Benzo(a)anthracene	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
Benzo(b)fluoranthene	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
Benzo(k)fluoranthene	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
Benzo(a)fluorene	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
Benzo(b)fluorene	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin
Benzo(ghi)perylene	
Benzo(a)pyrene	2,3,7,8-Tetrachlorodibenzofuran
Benzo(e)pyrene	2,3,4,7,8-Pentachlorodibenzofuran
Biphenyl	1,2,3,7,8-Pentachlorodibenzofuran
2-Chloronaphthalene	1,2,3,4,7,8-Hexachlorodibenzofuran
Chrysene	1,2,3,6,7,8-Hexachlorodibenzofuran
Coronene	1,2,3,7,8,9-Hexachlorodibenzofuran
Dibenzo(a,c)anthracene	2,3,4,6,7,8-Hexachlorodibenzofuran
Dibenzo(a,h)anthracene	1,2,3,4,6,7,8-Heptachlorodibenzofuran
Dibenzo(a,e)pyrene	1,2,3,4,7,8,9-Heptachlorodibenzofuran
9,10-Dimethylanthracene	1,2,3,4,6,7,8,9-Octachlorodibenzofuran
7,12-Dimethylbenzo(a)anthracene	
Fluoranthene	
Fluorene	
Indeno(1,2,3-cd)pyrene	
2-Methylanthracene	
3-Methylcholanthrene	
1-Methylnaphthalene	
2-Methylnaphthalene	
1-Methylphenanthrene	
9-Methylphenanthrene	
Naphthalene	
Perylene	
Phenanthrene	
Picene	
Pyrene	
Tetralin	
M-terphenyl	
O-terphenyl	
P-terphenyl	
Triphenylene	

SCHEDULE "E"

SOURCE TESTING PROCEDURES

1. The Owner shall submit, to the Manager a test protocol including the Pre-Test Information required by the Source Testing Code, at least two (2) months prior to the scheduled Source Testing date.

2. (1) For the purpose of the Source Testing program, the Owner is temporarily permitted to operate the Boilers at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b) during the period of the Source Testing. The Owner shall ensure that the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone of the Boilers, as measured and recorded by the CEM System, shall not be less than 5 percent by volume on a dry basis, during this Source Testing program.

   (2) If the Source Testing results demonstrate that compliance with the Performance Requirements can be maintained at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b), the Owner may apply to the Director for approval to alter the required residual oxygen concentration.

3. The Owner shall finalize the test protocol in consultation with the Manager.

4. The Owner shall not commence the Source Testing until the Manager has accepted the test protocol.

5. The Owner shall complete the first Source Testing not later than six (6) months after Commencement of Operation of the Facility/Equipment.

6. The Owner shall conduct subsequent Source Testing at least once (1) every calendar year thereafter.

7. The Owner shall notify the District Manager and the Manager in writing of the location, date and time of any impending Source Testing required by this Certificate, at least fifteen (15) days prior to the Source Testing.

8. The Owner shall submit a report on the Source Testing programs to the District Manager and the Manager not later than three (3) months after completing each Source Testing program. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

   (1) an executive summary;
   (2) records of operating conditions; including process description, records of waste composition and feed rate during the Source Testing;
   (3) all records produced by the CEM Equipment;
   (4) procedures followed during the Source Testing and any deviation from the proposed test protocol and the reasons therefore;
   (5) the results of the analyses of the stack emissions;

(6) a summary table that compares the Source Testing results, the monitoring data and the records of operating conditions during the Source Testing to the requirements imposed by the *EPA*, the Regulation and/or the Performance Requirements;

(7) the results of dispersion calculations in accordance with the *O. Reg. 419/05*, indicating the maximum concentration of the Test Contaminants, at the Point of Impingement.

(8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the Test Contaminants.

9. The Owner shall ensure that the Source Testing Report is made available and easily accessible for review by the public at the Facility, immediately after the document is submitted to the Ministry.

10. The Director may not accept the results of the Source Testing if:

(1) the Source Testing Code or the requirements of the Manager were not followed; or

(2) the Owner did not notify the District Manager and the Manager of the Source Testing; or

(3) the Owner failed to provide a complete report on the Source Testing.

11. If the Director does not accept the results of the Source Testing, the Director may require re-testing.

SCHEDULE "F"

PARAMETER:
Temperature

LOCATION:
The sample point for the Continuous Temperature Monitor shall be located at a point where the temperature in the combustion zone of the Boilers has reached at least 1000°C for a period of not less than one second. Compliance shall be proven by direct measurement or/and a correlation between the measured temperature and the intended target proven by a method acceptable to the Director.

PERFORMANCE:
The Continuous Temperature Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	SPECIFICATION
1)	Type:	"K", "J" or other type or alternative measurement device with equivalent measurement accuracy and suitable to the temperature range being measured
2)	Accuracy:	± 1.5 percent of the minimum gas temperature

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor without a significant loss of accuracy and with a time resolution of 1 minutes or better. Temperature readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.

PARAMETER:
Carbon Monoxide

INSTALLATION:
The Continuous Carbon Monoxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Carbon Monoxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2.5 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤5 percent of span value
8) Response Time (90 percent response to a step change):	≤180 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Oxygen

INSTALLATION:
The Continuous Oxygen Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (percentage):	0 - 20 or 0 - 25
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Oxygen Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (percentage):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data
3) Calibration Error:	0.25 percent O_2
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 0.5 percent O_2
7) Span Calibration Drift (24-hour):	≤ 0.5 percent O_2
8) Response Time (90 percent response to a step change):	≤ 90 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Oxygen concentration readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Hydrogen Chloride

INSTALLATION:
The Continuous Hydrogen Chloride Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of hydrogen chloride in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Hydrogen Chloride Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 20 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated daily at the sample point, to ensure that it meets the drift limits specified above, during the periods of the operation of the . The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 5 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Nitrogen Oxides

INSTALLATION:
The Continuous Nitrogen Oxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of nitrogen oxides in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Analyzer Operating Range (parts per million, ppm):	0 to ≥200 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Nitrogen Oxides Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Sulphur Dioxide

INSTALLATION:
The Continuous Sulphur Dioxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of sulphur dioxide in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1. Range (parts per million, ppm):	0 to ≥100 ppm
2. Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Sulphur Dioxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1. Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2. Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3. Calibration Error:	≤ 2 percent of actual concentration
4. System Bias:	≤ 4 percent of the mean value of the reference method test data
5. Procedure for Zero and Span Calibration Check:	all system components checked
6. Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7. Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8. Response Time (90 percent response to a step change):	≤ 200 seconds
9. Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Total Hydrocarbons

INSTALLATION:
The Total Hydrocarbons Monitor shall be installed at an accessible location where the measurements are representative of the concentrations of Organic Matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and shall meet the following installation specifications.

	PARAMETERS	**SPECIFICATION**
1.	Detector Type:	Flame Ionization
2.	Oven Temperature:	160°C minimum
3.	Flame Temperature:	1800 °C minimum at the corona of the hydrogen flame
4.	Range (parts per million, ppm):	0 to ≥200 ppm
5.	Calibration Gas:	propane in air or nitrogen
6.	Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Total Hydrocarbons Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	**SPECIFICATION**
1.	Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2.	Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3.	System Bias:	≤ 4 percent of the mean value of the reference method test data
4.	Noise:	≤ 1 percent of span value on most sensitive range
5.	Repeatability:	≤ 1 percent of span value
6.	Linearity (response with propane in air):	≤ 3 percent of span value over all ranges
7.	Calibration Error:	≤ 2 percent of actual concentration
8.	Procedure for Zero and Span Calibration Check:	all system components checked on all ranges
9.	Zero Calibration Drift (24-hours):	≤ 2.5 percent of span value on all ranges
10.	Span Calibration Drift (24-hours):	≤ 2.5 percent of span value
11.	Response Time (90 percent response to a step change):	≤ 60 seconds
12.	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Measurements of concentrations of organic matter (as methane) shall be kept as 10 minute average values for record keeping and reporting purposes.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER: Opacity

INSTALLATION: The Continuous Opacity Monitor shall be installed at an accessible location where the measurements are representative of the actual opacity of the Undiluted Gases leaving the APC Equipment associated with each Boiler and shall meet the following design and installation specifications.

PARAMETERS		SPECIFICATION
1)	Wavelength at Peak Spectral Response (nanometres, nm):	500 - 600
2)	Wavelength at Mean Spectral Response (nm):	500 - 600
3)	Detector Angle of View:	≤ 5 degrees
4)	Angle of Projection:	≤ 5 degrees
5)	Range (percent of opacity):	0 -100

PERFORMANCE:
The Continuous Opacity Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS		SPECIFICATION
1)	Span Value (percent opacity):	2 times the average normal opacity of the source
2)	Calibration Error:	≤3 percent opacity
3)	Attenuator Calibration:	≤2 percent opacity
4)	Response Time (95 percent response to a step change):	≤ 10 seconds
5)	Schedule for Zero and Calibration Checks:	daily minimum
6)	Procedure for Zero and Calibration Checks:	all system components checked
7)	Zero Calibration Drift (24-hours):	≤ 2 percent opacity
8)	Span Calibration Drift (24-hours):	≤ 2 percent opacity
9)	Conditioning Test Period:	≥ 168 hours without corrective maintenance
10)	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated, to ensure that it meets the drift limits specified above, during the periods of the operation of the Equipment. The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 30 seconds or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Moisture, Hydrogen Fluoride and Ammonia

Selection and Installation

The Owner shall select and install a CEM System, to measure moisture content of the stack gases, the concentration of hydrogen fluoride and ammonia in the Undiluted Gases leaving the APC Equipment associated with each Boiler, as follows:

a) Design and Performance Specifications shall be in accordance with 40 CFR 60, Appendix B, Specification 4.

b) The Owner shall select the probe locations in compliance with 40 CFR 60, Appendix B, Specification 2.

Test Procedures

The Owner shall verify compliance with the Design and Performance Specifications in accordance with 40 CFR 60, Appendix B, Specification 4, with the reference method for the relative accuracy test being Method 4. of the Source Testing Code.

In furtherance of, but without limiting the generality of the foregoing, the mean difference between the calibration gas value and the analyzer response value at each of the four test concentrations shall be less than 5 percent of the measurement range.

SCHEDULE "G"

A stormwater management facility to service a 10.0 ha drainage area of the Durham York Energy Centre located on the west side of Osbourne Road and north of the CN Rail, Lot 27, Concession Broken Front, Part, Municipality of Clarington, Regional Municipality of Durham, designed to provide quality and quantity control of stormwater run-off by attenuating runoff from storm events up to 1:100 years return frequency to or below the pre-development levels, consisting of:

East Stormwater Management Pond (East SWM Pond)

A stormwater management facility to service a 5.7 ha drainage area comprising of the eastern part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 128 m long drainage ditch collecting stormwater runoff from the north eastern part of the site, having an average horizontal slope of 1.56%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- one (1) approximately 199 m long drainage ditch collecting stormwater runoff from the eastern part of the site, having an average horizontal slope of 2.77%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately fourteen (14) catch basins/maintenance holes and a total of 466.8 m long 450 mm diameter and 34.6 m of 600 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the north and north eastern part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 11.0 m wide and 34.8 m long and depth of 1.0 m, equipped with 600 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south east part of the site, with approximate bottom dimensions of 21.0 m wide and 71.4 m long and a maximum depth of 2.7 m at 96.70 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent pool storage capacity of 1,008 m^3 at elevation 95.0 m masl, an active storage capacity of 3,099 m^3 at 96.70 m masl elevation, and total storage capacity of 4,107 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 97.0 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

West Stormwater Management Pond (West SWM Pond)

A stormwater management facility to service a 4.3 ha drainage area comprising of the western part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 296 m long drainage ditch collecting stormwater runoff from the north western part of the site, having an average horizontal slope of 1.0%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately five (5) catch basins/maintenance holes and a total of 272.2 m long 450 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the western part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 13.0 m wide and 26.0 m long and depth of 1.0 m, equipped with 450 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south western part of the site, with approximate bottom dimensions of 13.0 m wide and 58.0 m long and a maximum depth of 2.5 m at 96.5 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent storage capacity of 623 m^3 at elevation 95.0 m masl, an active storage capacity of 2,054 m^3 at 96.50 m masl elevation, and total storage capacity of 2,677 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 96.80 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

including all associated controls and appurtenances.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

Conditions 1.(1), (2), (5), (6), (7), (8), (9), (10), (11), (12), (13), (17), (18) and (19) are included to clarify the legal rights and responsibilities of the Owner.

Conditions Nos.1.(3) and (4) are included to ensure that the Site is operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

Condition No. 1.(14) is included to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

Condition No.1.(15) is included to restrict potential transfer or encumbrance of the Site without the notification to the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate.

Condition No. 1.(16) is included to ensure that the appropriate Ministry staff has ready access to the operations of the Site which are approved under this Certificate. The Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *EPA*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.

SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE

Condition No. 2. is included to specify the approved waste receipt rates, the approved waste types and the service area from which waste may be accepted at the Site based on the Owner's application and supporting documentation. Condition No. 2. is also included to specify the maximum amount of waste that is approved to be stored at the Site.

SIGNS and SITE SECURITY

Condition No. 3. is included to ensure that the Site's users, operators and the public are fully aware of important information and restrictions related to the operation of the Site. Condition No. 3. is also included to ensure that the Site is sufficiently secured, supervised and operated by properly trained personnel and to ensure controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site personnel is on duty.

SITE OPERATIONS

Condition No. 4. is included to outline the operational requirements for the Facility to ensure that the said operation does not result in an adverse effect or a hazard to the natural environment or any person.

EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

Condition No. 5. is included to require the Site to be maintained and inspected thoroughly on a regular basis to ensure that the operations at the Site are undertaken in a manner which does not result in an adverse effect or a hazard to the health and safety of the environment or any person.

PERFORMANCE REQUIREMENTS

Condition No. 6 is included to set out the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.

TESTING, MONITORING and AUDITING

Condition No. 7. is to require the Owner to gather accurate information on the operation of the Facility so that the environmental impact and subsequent compliance with the *EPA*, the *OWRA*, their Regulations and this Certificate can be verified.

NUISANCE IMPACT CONTROL and HOUSEKEEPING

Condition No. 8. is included to ensure that the Site is operated and maintained in an environmentally acceptable manner which does not result in a negative impact on the natural environment or any person. Condition No. 8 is also included to specify odour control measures to minimize a potential for odour emissions from the Site.

STAFF TRAINING

Condition No. 9. is included to ensure that staff are properly trained in the operation of the equipment and instrumentation used at the Site, in the emergency response procedures and on the requirements and restrictions related to the Site operations under this Certificate.

COMPLAINTS RECORDING PROCEDURE

Condition No.10. is included to require the Owner to respond to any environmental complaints resulting from the Facility appropriately and in a timely manner and that appropriate actions are taken to prevent any further incidents that may cause complaints in the future.

CONTINGENCY and EMERGENCY RESPONSE PLAN and EMERGENCY SITUATIONS RESPONSE AND REPORTING

Conditions Nos.11. and 12. are included to ensure that the Owner is prepared and properly equipped to take immediate action in the event of an emergency situation.

SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER

Condition No. 13. is included to set out the requirements for the submissions to the District Manager and the Regional Director regarding the operation of the Facility and the activities required by this Certificate.

RECORDS KEEPING

Condition No.14. is included to ensure that detailed records of Site activities, inspections, monitoring and upsets are recorded and maintained for inspection and information purposes.

REPORTING

Condition No.15. is to ensure that regular review of site, operations and monitoring is carried out and findings documented by a third party for determining whether or not the Site is being operated in compliance with this Certificate of Approval, the EPA and its regulations and whether or not any changes should be considered.

PUBLIC ACCESS to DOCUMENTATION

Condition No.16. is included to ensure that the public has access to information on the operation of the Site in order to participate in the activities of the Advisory Committee in a meaningful and effective way.

ADVISORY COMMITTEE

Condition No.17. is included to require the Owner to establish a forum for the exchange of information and public dialogue on activities carried out at the Site and to ensure that the local residents are properly informed of the activities at the Site and that their concerns can be heard and acted upon , as necessary. Open communication with the public and local authorities is important in helping to maintain high standards for the operation of the Site and protection of the natural environment. Condition 16. is also included to ensure that the requirements of the EA Approval are fulfilled.

CLOSURE of the SITE

Condition No.18. is included to ensure that the final closure of the Site is completed in accordance with Ministry's standards.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, and in accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written Notice served upon me, the Environmental Review Tribunal, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act and Section 101 of the

Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 9 and 39, *Environmental Protection Act*
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted site is approved under Section 9 and Section 27 of the Environmental Protection Act and Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 28th day of June, 2011

Signature
Ian Parrott, P .Eng.
Director
Section 9, *EPA*
Section 39, *EPA*
Section 53, *OWRA*

MW,QN,SH/

c: District Manager, MOE York-Durham
Regional Director, MOE Central Region

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 1
Issue Date: August 12, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
United States of America
07960

Site Location: Durham York Energy Centre
72 Osbourne Rd Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 forWaste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment,, as follows:

1. The following definition has been added:

"Contingency and Emergency Response Plan" also means the document entitled "Spill Contingency and Emergency Response Plan";

2. The following Conditions are amended to read as follows:

2.(5)(b)(iii) The Owner may use equipment used to handle the hazardous wastes to handle other wastes provided that prior to such use the equipment has been thoroughly cleaned first.

4.(5)(e) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is as follows:

(i) The storage duration is limited to a maximum of seven (7) days.

(ii) Should longer storage duration be required to accommodate the duration of the required compliance testing, a minimum of forty eight (48) hours before the storage extension is commenced, the Owner shall notify the District Manager of the required extension. The notification shall include the duration of the extension and the reasons.

3. The following Conditions are added:

7.(7) (e) The Owner shall carry out the required bottom and fly ash compliance testing in accordance with the document entitled "Ash Sampling and Testing Protocol", listed in the attached Schedule.

11.8 Containment evaluations performed under the Spill Contingency and Emergency Response Plan shall be conducted by the Owner in accordance to procedures agreed by the District Manager pursuant to Conditions 8.(7)(i),(ii) and (iii).

4. The following documents have been added to Schedule "A":

4. October 31, 2013 letter from Mirka Januszkiewicz, the Regional Municipality of Durham to Ian Parrott, Ministry of the Environment and Climate Change, requesting approval of the Ash Sampling and Testing Protocol and the document entitled "Durham York Energy Centre, Ash Sampling and Testing Protocol", prepared by by Golder Associates and dated June 2014.

5. Document entitled "Durham York Energy Centre, Spill Contingency & Emergency Response Plan" prepared by Covanta Durham York Renewable Energy Limited Partnership and dated January 13, 2014, excluding section entitled "Containment Evaluation".

6. Document entitled "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations", prepared by Covanta Durham York Renewable Energy Limited Partnership and dated June 2014.

7. Document entitled "Durham York Energy Centre, Noise Monitoring and Reporting Plan", prepared by Golder Associates and dated September 2011.

The reasons for this amendment to the Approval are as follows:

to approve the "Ash Sampling and Testing Protocol" as required Condition 7.(7)(a), the "Durham York Energy Centre, Spill Contingency & Emergency Response Plan", as required Condition 11.(3), "Durham York Energy Centre, Noise Monitoring and Reporting Plan" as required Condition 7.(5)(a) and "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations" as proposed by the applicant.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;

8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment 2 St. Clair Avenue West, Floor 12A Toronto, Ontario M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of August, 2014

Ian Parrott, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MW/
c: District Manager, MOE York-Durham
n/a, The Regional Municipality of Durham

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 2
Issue Date: October 24, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and
The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership
445 South St
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, as follows:

1. The address of the Site has been changed to read as follows:

Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

2. The following definitions have been added:

"**Operator**" means any person other than the Regions' employees, authorized by the Regions as having the charge, management or control of any aspect of the Site and includes TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change, and includes its successors and assignees, their successors and assignees;

"**Regions**" means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and it includes The Regional Municipality of Durham and The Regional Municipality of York, their successors and assignees;

2. The following definition has been amended to read as follows:

"**Site**" means the property referred to as Durham York Energy Centre where the Owner has located and operates the Facility and the Works and located at 1835 Energy Drive in the Municipality of Clarington, Regional Municipality of Durham;

"**Owner**" within the context of this Approval, means the Regions and the Operator;

3. The following Conditions have been amended to read as follows:

"General: Change of Ownership" Conditions 1.(14) and 1.(15):

(14) The Regions shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any changes:

(a) the ownership of the Site;
(b) the operator of the Site;
(c) the address of the Regions;
(d) the partners, where the Regions are or at any time become a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B.17, as amended, shall be included in the notification;
(e) the name of the corporation where the Regions are or at any time become a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

(15) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Regions shall notify the successor of and provide the successor with a copy of this Approval, and the Regions shall provide a copy of the notification to the District Manager and the Director.

"Service Area, Approved Waste Types, Rates And Storage: Storage Restrictions" Condition 2.(5)(e):

2.(5)(e) (i) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation.

(ii) The storage duration of bottom ash in the bunkers is limited to a maximum of seven (7) days.

(iii) Should additional storage location(s) and a longer storage duration be required during testing, a minimum of forty eight (48) hours before the storage parameters are changed from those approved in Condition 2.(5)(e)(i) and (ii), the Owner shall notify the District Manager, in writing, of the proposed changes and provide the reasons for the changes.

"Site Operations: Residual Waste Handling and Disposal" Condition 4.(5)(b)(iii):

4.(5)(b)(iii) The Owner may use the equipment that comes in contact with the hazardous wastes to handle other wastes provided that prior to such use, the equipment has been cleaned, as confirmed by visual inspections, to ensure the removal of any hazardous waste residues and to prevent cross contamination.

"Closure of the Site" Conditions 18.(1) and 18.(2):

(1) A minimum of nine (9) months prior to closure of the Site, the Regions shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Regions shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

4. "Covanta Durham York Renewable Energy Limited Partnership" is replaced with "TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under

the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change and includes its successors and assignees", in the Environmental Compliance Approval dated June 28, 2011 and in the Notice of Amendment dated August 12, 2014.

5. The following documents are added to Schedule "A":

8. Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Matthew R. Mulcahy, Covanta Durham York Renewable Energy Limited Partnership, Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Cliff Curtis, The Regional Municipality of Durham and Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Laura McDowell, The Regional Municipality of York, including the following attached supporting documentation:

(a) revised Section 8.0 "Ash Handling and Associated System" and revised Section 10.0 "Potable Process and Wastewater" dated May 2014, of the document entitled "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.

(b) Drawing No. M-2530, entitled "Piping & Instrumentation Diagram Bottom Ash Lime Slurry System"

(c) Drawing No. 70258-1-ME-GA-SK-001, entitled "Covanta Durham York Hydrated Lime System for Boiler Bottom Ash"

9. E-mail dated September 10, 2014 (2:26 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Margaret Wojcik, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the proposal, including an attachment entitled "M-1500^0360 Highlighted for MOE.pdf".

10. E-mail dated October 13, 2014 (3:23 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Ricki Allum, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the legal name of the applicant, including an attachment entitled "Partnership Legal Clarification.pdf".

The reasons for this amendment to the Approval are as follows:

to approve the proposed Bottom Ash Lime Conditioning System, to correct the typographical errors in the Notice of Amendment dated August 12, 2014, to clarify the intent of the Residual Waste equipment cleaning condition and to allow different bottom ash storage conditions during testing.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;

7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment 2 St. Clair Avenue West, Floor 12A Toronto, Ontario M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of October, 2014

Tesfaye Gebrezghi, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MW/
c: District Manager, MOE York-Durham
Leon Brasowski, Covanta Energy Corporation

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 3
Issue Date: December 23, 2015

The Regional Municipality of Durham
605 Rossland Road Level 5
Whitby, Ontario
L1N 6A3

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment , as follows:

The following Conditions are revoked:

7. TESTING, MONITORING and AUDITING

Noise Monitoring - Acoustic Audit

(5) The Owner:

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

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

(6) The Director:

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

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

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and

M5G 1E5	Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 23rd day of December, 2015

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 4
Issue Date: February 24, 2016

The Regional Municipality of Durham
605 Rossland Road East, Level 5
Whitby, Ontario
L1N 6A3

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

TransRiver Canada Incorporated operating as Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for a Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, , as follows:

The following Conditions are revoked:

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

Noise Monitoring - Acoustic Audit

(5) The Owner:

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

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

(6) The Director:

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

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

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of February, 2016

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

APPENDIX 4

Particulate and Metals Field Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particulate/Metals
Test Date	September 9 2019
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21960	
Page	1 of 5	
Probe No.:	7-Series	
Meter Box No.:	Team 4	
Impinger Box No.:	7	

Pitot Factor	.851	
DGMCF	1.006	
Barometric Pressure	30.03	"Hg
Static Pressure	-8.8	"H2O
Nozzle Size	.2563	inches
Stack Diameter	4.5	feet
Length	–	feet
Width	–	feet
Port length:	11	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	576.2	g
WCBDA	23.7	g

Combustion Gas Concentration

Oxygen	8.27	%
Carbon Dioxide	11.15	%
Carbon Monoxide	9.6	ppm

Measuring Device	MII Numbers
Probe / Pitot 5P6	
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Canada
Calipers	

Reading Interval	2.5	
Number of Ports	2	
Number of Points/Port	12	

Nozzle Measurements	
1	.2560
2	.2560
3	.2570
4	.2560
Average:	.2563

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. 9 2019	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
	*	*	*		*			*		*	*	*	*
		73.13											
1	0	~~72.77~~	.81	.76	284	254	246	60	64	61	64	1.95	5
	2.5	75.06	.78	.75	283	255	245	57	224	66	65	1.9	5
	5	76.92	.78	.75	284	257	249	56	239	72	64	1.95	5.5
2	7.5	78.77	.74	.74	284	256	245	54	242	78	64	1.9	5
	10	80.62	.75	.75	284	255	249	55	243	78	65	1.95	5.5
	12.5	82.47	.78	.77	283	255	246	54	245	82	66	2.1	5.5
3	15	84.37	.81	.78	284	257	263	57	245	84	65	2.15	6
	17.5	86.34	.81	.78	285	255	244	55	246	85	67	2.15	6
	20	88.31	.81	.78	285	254	248	56	247	87	67	2.15	6
4	22.5	90.29	.77	.77	285	254	245	56	245	93	67	2.1	6
	25	92.25	.76	.76	285	254	265	55	245	88	69	2.05	5.5
	27.5	94.19	.77	.77	285	254	247	56	245	89	68	2.1	6
5	30	96.16	.74	.75	285	256	245	56	251	91	68	2.0	5.5
	32.5	98.08	.73	.75	286	255	249	55	245	91	68	1.95	5.5
	35	99.98	.73	.75	286	254	244	56	244	90	68	1.95	5.5
6	37.5	101.87	.68	.72	286	253	248	55	244	91	69	1.8	5.5
	40	103.69	.65	.71	286	254	247	55	243	91	69	1.75	5.5
	42.5	105.50	.64	.70	286	253	245	54	243	91	70	1.7	5.5
7	45	107.29	.67	.72	286	253	247	54	242	92	70	1.8	5.5
	47.5	109.13	.67	.72	286	254	246	54	241	92	71	1.8	5.5
	50	110.91	.65	.71	286	253	245	53	240	92	71	1.7	5.5

Traverse:	1				
Start Time:	11:12	Initial Leak Check:	0.002	cfm@ 17	"Hg
Finish Time:	–	Final Leak Check:	–	cfm@ –	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019 | Plant: Covanta DYEC | Test No.: 1 | Particulate/Metals |

Plant Location: Courtice, Ontario | Test Location: APC Outlet No. 1

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	112.69	.71	.74	285	253	248	52	241	92	71	1.85	5.5
	55	114.55	.69	.73	284	253	245	52	240	93	72	1.8	5.5
	57.5	116.36	.68	.72	285	253	246	52	240	92	71	1.8	5.5
9	60	118.18	.70	.74	285	253	248	52	239	93	71	1.85	5.5
	62.5	120.03	.70	.74	284	253	245	52	241	93	72	1.9	5.5
	65	121.89	.71	.74	284	252	248	52	240	92	74	1.9	5.5
10	67.5	123.76	.71	.74	284	252	246	51	240	92	72	1.9	5.5
	70	125.67	.68	.75	237	253	246	51	239	92	71	1.9	5.5
	72.5	127.55	.67	.75	234	252	247	51	240	92	72	1.9	5.5
11	75	129.43	.81	.82	239	254	246	51	238	92	72	2.2	6
	77.5	131.49	.81	.82	239	252	248	50	239	93	72	2.3	6
	80	133.57	.80	.81	240	252	248	50	239	93	72	2.3	6
12	82.5	135.68	.79	.81	240	251	248	50	238	93	72	2.2	6
	85	137.76	.79	.81	240	251	245	50	237	93	72	2.2	6
	87.5	139.83	.77	.80	240	251	249	51	238	93	72	2.15	6
	90	141.94											

Traverse: 1

Start Time: – | Initial Leak Check: – cfm@ – "Hg

Finish Time: | Final Leak Check: .002 cfm@ 14 "Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019	Plant: Covanta DYEC	Test No.: 1	Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	142.72	.74	.74	286	253	246	50	175	72	72	1.9	6
	2.5	144.60	.74	.74	281	255	232	47	234	75	72	1.9	6
	5	146.49	.74	.75	281	256	243	45	244	81	70	1.95	6
2	7.5	148.37	.75	.76	281	254	244	44	250	86	69	2.0	6
	10	150.29	.77	.77	281	253	247	43	252	88	70	2.05	6
	12.5	152.24	.76	.76	281	254	246	43	254	89	70	2.05	6
3	15	154.18	.72	.75	280	254	247	43	254	90	71	1.95	6
	17.5	156.10	.74	.76	280	253	243	43	254	90	71	2.0	6
	20	158.02	.72	.75	280	254	247	45	256	91	71	1.95	6
4	22.5	159.93	.68	.73	281	254	227	44	257	92	72	1.85	6
	25	161.79	.70	.74	281	254	249	44	254	92	71	1.9	6
	27.5	163.66	.71	.74	281	254	233	44	256	92	71	1.9	6
5	30	165.52	.67	.72	281	254	246	45	261	93	72	1.8	5.5
	32.5	167.34	.66	.72	281	254	248	43	264	93	72	1.75	5.5
	35	169.14	.66	.72	280	254	245	44	265	93	72	1.8	5.5
6	37.5	170.96	.60	.68	280	254	237	41	267	93	72	1.6	5.5
	40	172.69	.55	.65	280	254	246	44	268	93	72	1.5	5.5
	42.5	174.38	.62	.70	280	254	247	44	269	94	73	1.65	5.5
7	45	176.14	.68	.73	280	254	270	43	275	95	72	1.8	5.5
	47.5	177.99	.68	.73	280	254	270	43	275	95	72	1.8	5.5
	50	179.85	.69	.73	280	254	270	44	271	95	74	1.8	5.5

Traverse: 2					
Start Time: 12:57	Initial Leak Check:	.004	cfm@	24	"Hg
Finish Time: –	Final Leak Check:	–	cfm@	–	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019	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 ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
*	*	*	*		*			*		*	*	*	*
8	52.5	181.67	.71	.75	281	255	263	44	265	95	74	1.95	6
	55	183.57	.71	.75	281	255	258	44	259	96	74	1.95	6
	57.5	185.47	.71	.75	282	255	250	44	252	96	74	1.9	6
9	60	187.34	.74	.76	281	254	241	44	242	96	75	2	6
	62.5	189.27	.75	.77	282	254	243	44	241	96	74	2	6
	65	191.22	.75	.77	282	253	247	45	244	97	74	2	6
10	67.5	193.13	.75	.77	283	254	244	44	244	97	74	2	6
	70	195.13	.75	.77	283	254	244	44	244	97	74	2	6
	72.5	197.05	.75	.77	283	253	245	45	245	97	74	2	6
11	75	198.98	.72	.75	283	254	248	45	246	97	75	2	6
	77.5	200.89	~~.78~~ .77	.78	283	253	245	45	245	97	74	2	6
	80	202.83	.76	.77	284	252	243	45	244	97	75	2.1	6
12	82.5	204.80	.75	.77	284	253	245	45	245	97	75	2	6
	85	206.77	.74	.76	284	253	245	46	247	97	75	2	6
	87.5	208.68	.73	.76	284	253	247	45	249	97	75	2	6
	90	210.68											

90.84

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: ~~2~~ 1428	Final Leak Check: 0.002	cfm@ 18	"Hg

Project No.: 21960

Operator :

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: 2	Particulate/Metals	
Test Date	Sept 9 2019	
Test Location	APC Outlet No. 1	
Operator Signature		

Project No.:	21960	
Page	1 of 5	
Probe No.:	7 Series	
Meter Box No.:	Team 4	
Impinger Box No.:		

Pitot Factor	.851	
DGMCF	1.006	
Barometric Pressure	30.00	"Hg
Static Pressure	-8.8	"H2O
Nozzle Size	.2563	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		mg
Probe		mg

Moisture Gain

CWTR	616.2	g
WCBDA	23.9	g

Combustion Gas Concentration

Oxygen	8.08	%
Carbon Dioxide	11.21	%
Carbon Monoxide	12.2	ppm

Measuring Device	MII Numbers
Probe / Pitot SP6	
Trendicator	COE 20090
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Canada
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. 9 2019	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 ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	11.31	.76	.75	284	250	248	63	220	74	70	1.95	5
	2.5	13.28	.81	.78	282	258	245	63	221	75	71	2.1	5
	5	15.25	.8	.78	283	257	252	61	218	80	70	2.1	5
2	7.5	17.22	.82	.79	283	255	243	57	219	86	70	2.15	5
	10	19.2	.82	.79	282	254	245	54	221	88	72	2.15	5.5
	12.5	21.24	.83	.80	282	254	251	53	228	90	72	2.2	5.5
3	15	23.28	.80	.79	283	255	248	54	231	91	72	2.15	5.5
	17.5	25.30	.78	.78	283	255	244	53	230	92	72	2.1	5.5
	20	27.27	.81	.79	282	255	252	52	234	94	72	2.1	5.5
4	22.5	29.25	.73	.75	283	255	252	51	237	95	72	1.95	5
	25	31.17	.70	.74	283	255	245	51	235	95	73	1.85	5
	27.5	33.04	.72	.75	283	254	249	51	234	95	73	1.9	5
5	30	34.93	.64	.71	283	255	246	50	235	96	81	1.7	5
	32.5	36.74	.66	.72	283	254	250	50	234	96	74	1.75	5
	35	38.58	.65	.71	283	255	250	50	236	97	74	1.7	5
6	37.5	40.35	.64	.71	283	255	245	49	235	97	75	1.7	5
	40	42.15	.65	.71	282	255	251	49	236	97	75	1.75	5
	42.5	43.95	.65	.72	282	255	248	49	236	98	75	1.75	5
7	45	45.78	.64	.71	282	254	252	48	234	98	75	1.7	5
	47.5	47.57	.66	.72	282	254	252	48	234	98	76	1.75	5
	50	49.38	.67	.73	282	254	247	48	234	98	76	1.8	5

Traverse: 1				
Start Time: 15:17	Initial Leak Check:	.006	cfm@ 15	"Hg
Finish Time: –	Final Leak Check:	–	cfm@ –	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019	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	51.23	.66	.72	282	254	251	48	234	98	75	1.75	5
	55	53.05	.65	.72	282	253	251	48	232	98	76	1.7	5
	57.5	54.84	.68	.73	282	254	245	47	232	98	76	1.8	5
9	60	56.71	.67	.73	282	281	253	47	232	98	76	1.8	5
	62.5	58.54	.67	.73	281	253	247	47	231	98	76	1.8	5
	65	60.36	.66	.72	281	253	249	46	234	98	76	1.8	5
10	67.5	62.19	.64	.71	281	254	250	46	232	98	76	1.7	5
	70	63.97	.63	.71	280	254	248	46	233	98	76	1.7	5
	72.5	65.75	.64	.71	280	254	248	46	235	98	76	1.7	5
11	75	67.53	.72	.76	280	254	249	55	233	99	76	1.95	5.5
	77.5	69.46	.72	.76	280	254	247	46	235	99	76	1.95	5.5
	80	71.35	.64	.71	280	254	250	46	235	99	76	1.7	5
12	82.5	73.15	.64	.71	280	254	247	46	232	99	77	1.7	5
	85	74.95	.62	.70	280	253	250	46	232	99	77	1.65	5
	87.5	76.73	.62	.70	280	253	248	46	233	99	77	1.65	5
	90	78.53											

Traverse:	1				
Start Time:	–	Initial Leak Check:	– cfm@	–	"Hg
Finish Time:	16:47	Final Leak Check:	.004 cfm@	14	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019 | Plant: Covanta DYEC | Test No.: 2 | Particulate/Metals |

Plant Location: Courtice, Ontario | Test Location: APC Outlet No. 1

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	79.26	.77	.77	281	254	249	60	130	79	78	2.0	5.5
	2.5	81.24	.75	.76	280	258	250	47	230	86	75	1.95	5.5
	5	83.18	.81	.80	279	257	251	45	230	93	76	2.15	6
2	7.5	85.20	.76	.77	279	256	244	44	230	96	75	1.95	5.5
	10	87.17	.76	.77	279	255	251	43	225	98	76	1.95	5.5
	12.5	89.06	.79	.79	279	255	251	45	227	98	75	2.1	5.5
3	15	91.06	.73	.76	279	255	246	43	225	99	76	1.95	5.5
	17.5	92.97	.78	.79	279	256	253	43	228	99	76	2.1	5.5
	20	94.95	.82	.81	279	256	249	44	239	99	76	2.2	6
4	22.5	96.99	.70	.75	280	256	251	44	245	100	76	1.9	5.5
	25	98.89	.71	.75	280	256	251	44	244	100	77	1.9	5.5
	27.5	100.77	.71	.75	280	256	246	44	251	100	76	1.9	5.5
5	30	102.64	.73	.76	280	256	253	44	249	100	78	2.0	6
	32.5	104.56	.69	.74	280	256	257	44	251	100	77	1.85	5.5
	35	106.43	.72	.76	281	256	246	45	247	100	77	1.95	5.5
6	37.5	108.34	.64	.71	281	256	250	44	239	100	77	1.7	5.5
	40	110.15	.64	.71	281	256	247	44	238	100	77	1.7	5.5
	42.5	111.94	.66	.72	281	255	250	45	240	100	77	1.8	5.5
7	45	113.75	.69	.74	282	255	246	44	241	100	77	1.85	5.5
	47.5	115.62	.69	.74	282	256	249	44	242	100	77	1.85	5.5
	50	117.49	.72		282	256	246	44	243	101	78	1.95	6

Traverse: 2

Start Time: 16:58 | Initial Leak Check: .004 cfm@ 15 "Hg

Finish Time: | Final Leak Check: cfm@ "Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 9 2019	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 ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	119.39	.73	.76	282	255	253	44	240	101	77	2	6
	55	121.33	.72	.76	282	255	248	44	245	100	78	2	6
	57.5	123.26	.71	.75	282	255	250	44	241	101	77	1.9	6
9	60	125.18	.73	.76	282	255	251	45	238	100	77	2	6
	62.5	127.10	.75	.77	283	255	246	45	235	100	77	1.9	6
	65	129.03	.77	.78	284	255	251	45	240	100	77	2	6
10	67.5	130.98	.80	.80	285	255	245	45	236	100	78	2.1	6
	70	132.98	.80	.80	285	255	251	45	237	100	77	2.15	6
	72.5	135.00	.80	.80	285	255	249	45	238	100	78	2.15	6
11	75	137.04	.76	.78	284	255	249	45	236	100	77	2.1	6
	77.5	139.03	.77	.82	~~214~~ 284	255	251	45	237	100	77	2.15	6
	80	141.05	.77	.82	~~214~~ 284	255	246	45	236	100	77	2.2	6
12	82.5	143.13	.69	.77	~~218~~ 284	255	253	45	237	100	78	2.1	6
	85	145.13	.68	.73	284	255	249	45	237	100	78	1.8	6
	87.5	147.00	.70	.75	284	255	249	45	234	100	78	1.8	6
	90	148.88											

Traverse: 2			
Start Time: –	Initial Leak Check: –	cfm@ –	"Hg
Finish Time: 1828	Final Leak Check: 0.004	cfm@ 19	"Hg

Project No.: 21960

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date	September 10, 2015
Test Location	APC Outlet No. #1
Operator Signature	[signature]

Project No.:	21960
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Team 4
Impinger Box No.:	

Pitot Factor	0.851	
DGMCF	1.006	
Barometric Pressure	29.93	"Hg
Static Pressure	-8.8	"H2O
Nozzle Size	.2563	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		mg
Probe		mg

Moisture Gain

CWTR	578.7	g
WCBDA	20.1	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	11.09	%
Carbon Monoxide	11.3	ppm

Measuring Device	MII Numbers
Probe / Pitot SP6	COE 20098
Trendicator	COE 20090
Control Box T#4	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	ENVCAN
Calipers	

Nozzle Measurements

1	.2560
2	.2560
3	.2570
4	.2560
Average:	.2563

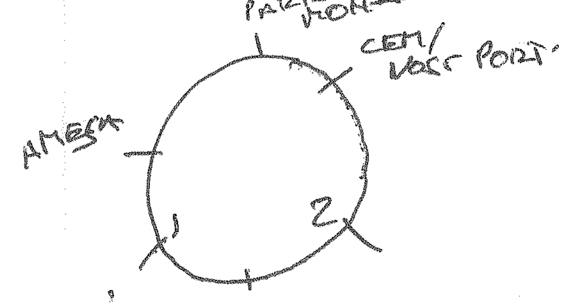
Probe Liner Glass / Metal /Teflon / Other

Nozzle Glass / Metal / Other

Union None /Metal / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram



Notes:

Field Data Sheet

Date: SEPT 10, 2019	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot 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	49.5	.75	.74	270	230	248	59	200	70	65	1.9	5
	2.5	51.13	.77	.76	271	260	241	50	200	67	69	2.1	5.
	5	53.06	.76	.75	272	258	246	49	200	66	73	2.1	5
2	7.5	55.02	.72	.74	272	257	254	48	200	66	77	2.0	5
	10	56.92	.72	.74	274	256	250	49	200	68	81	1.9	5
	12.5	58.79	.72	.74	272	256	243	50	200.	68	83	1.9	5
3	15	60.65	.72	.74	272	256	243	50	192	68	83	1.9	5.
	17.5	62.48	.72	.74	282	256	243	51	195.	69	84	1.9	5.
	20	64.38	.72	.74	282	255	254	51	199	69	89	1.9	5.
4	22.5	66.24	.68	.72	282	256	246	51.	201	70	91	1.8	5.
	25	68.10	.70	.74	282	256	244	51	205	71	92	1.9	5.
	27.5	70.0	.70	.74	282	256.	248	51	208	72	93	1.9	5.
5	30	71.80	.72	.75	282	255	256	52	209	72	94	2.0	5.
	32.5	73.69	.71	.74	282	256	245	52	210	74	94	2.0	5.
	35	75.60	.69	.73	281	257	246	52	213	72	96	1.9	5
6	37.5	77.48	.70	.74	281	266	255	52	214	73.	96	1.9	5.
	40	79.35	.66	.72	281	257	244	51	216	73	97.	1.8	5.
	42.5	81.18	.67	.73	281	266	248	51	216	73	97	1.8	5
7	45	83.05	.62	.70	282	268	254	52	216	74	97	1.7	5.0
	47.5	84.80	.62	.70	282	256.	246	51	216	74	97	1.7	5.0
	50	86.58	.62	.70	282	256	250	52	217	74	98.	1.7	5.0

Traverse:			
Start Time: ~~0929~~ 0935	Initial Leak Check:	.005 cfm@	19 "Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept 10, 2016	Plant: Covanta DYEC	Test No.: 3	Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	88.34	.75	.77	282	256	253	51	217	74	98	2.1	6.0
	55	90.32	.75	.77	282	257	249	52	219	74	99	2.1	6.0
	57.5	92.32	.75	.77	282	257	249	52	220	75	99	2.0	6.0
9	60	94.25	.83	.81	283	256	256	52	220	75	99	2.3	6.0
	62.5	96.34	.83	.81	283	258	248	52	222	75	100	2.3	6.0
	65	98.44	.84	.82	283	257	246	52	222	76	100	2.3	6.0
10	67.5	100.55	.87	.82	283	257	251	52	222	76	100	2.4	6.0
	70	102.68	.87	.83	283	257	261	53	223	76	101	2.4	6.0
	72.5	104.80	.86	.83	283	257	255	53	223	76	101	2.4	6.0
11	75	106.92	.91	.85	283	257	255	53	224	77	101	2.5	6.0
	77.5	109.08	.90	.85	283	258	251	53	224	77	101	2.5	6.0
	80	111.24	.92	.85	283	257	255	54	224	77	101	2.5	6.0
12	82.5	113.40	~~.95~~ .87	.87	283	257	247	54	225	77	101	2.6	6.0
	85	115.60	.91	.85	284	253	257	53	226	77	103	2.6	6.0
	87.5	117.77	.91	.85	283	259	256	53	225	77	101	2.6	6.0
	90	119.94											

Traverse: 1	
Start Time: /	Initial Leak Check: / cfm@ / "Hg
Finish Time: 11 05	Final Leak Check: .005 cfm@ 14 "Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept 19 2019	Plant: Covanta DYEC	Test No.: 3	Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	120.47	.87	.82	282	259	249	54	206	77	88	2.4	6.0
	2.5	122.60	.87	.82	282	263	246	53	212	77	91	2.4	6.0
	5	124.74	.86	.82	283	260	251	50	218	77	96	2.4	6.0
2	7.5	126.85	.87	.83	283	259	255	49	220	77	97	2.3	6.0
	10	128.92	.87	.83	284	259	246	48	220	77	99	2.35	6.0
	12.5	131.03	.87	.83	283	258	253	48	221	77	99	2.35	6.0
3	15	133.14	.86	.82	283	258	252	47	221	77	100	2.35	6.0
	17.5	135.25	.86	.82	284	259	248	47	221	79	100	2.35	6.0
	20	137.35	.85	.82	283	259	247	46	221	78	100	2.3	6.0
4	22.5	139.43	.82	.81	282	258	252	46	220	78	100	2.3	6.0
	25	141.50	.84	.82	283	258	252	46	221	78	100	2.3	6.0
	27.5	143.58	.82	.81	282	259	254	46	221	78	101	2.3	6.0
5	30	145.65	.77	.78	282	258	252	46	220	78	101	2.3	6.0
	32.5	147.73	.77	.78	282	257	247	45	221	78	101	2.3	6.0
	35	149.80	.77	.78	282	257	255	45	220	78	101	2.1	6.0
6	37.5	151.80	.75	.77	282	258	247	45	220	78	101	2.0	6.0
	40	153.74	.74	.77	282	257	249	45	220	78	101	2.0	6.0
	42.5	155.69	.73	.76	282	257	254	45	220	78	101	2.0	6.0
7	45	157.60	.72	.76	282	257	254	46	219	78	101	2.0	6.0
	47.5	159.58	.72	.76	281	257	249	45	218	78	101	2.0	6.0
	50	161.53	.72	.76	281	257	257	45	219	78	101	2.0	6.0

Traverse: 2				
Start Time: 1110	Initial Leak Check:	.005	cfm@ 14	"Hg
Finish Time: –	Final Leak Check:	–	cfm@ –	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept 10, 2019	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	163.45	.74	.77	279	259	245	46	218	~~101~~ 78	~~78~~ 101	2.1	6.0
	55	165.44	.74	.77	281	257	254	45	219	79	100	2.1	6.0
	57.5	167.37	.75	.77	281	257	254	46	219	78	101	2.1	6.0
9	60	169.32	.79	.79	282	257	247	46	219	78	101	2.2	6.0
	62.5	171.35	.78	.79	281	257	255	46	220	78	101	2.2	6.0
	65	173.37	.75	.77	281	257	252	46	220	79	101	2.1	6.0
10	67.5	175.39	.75	.77	278	257	248	46	220	79	101	2.1	6.0
	70	177.37	.75	.77	277	257	256	46	219	79	~~105~~ 101	2.1	6.0
	72.5	179.30	.74	.77	277	257	247	46	219	79	101	2.1	6.0
11	75	181.26	.75	.77	277	257	251	46	218	79	101	2.1	6.0
	77.5	183.20	.75	.77	279	256	255	46	219	79	101	2.1	6.0
	80	185.16	.75	.77	279	258	249	46	218	79	101	2.1	6.0
12	82.5	~~186~~ 187.11	.75	.77	279	257	251	46	219	79	101	2.1	6.0
	85	189.06	.74	.77	279	257	254	46	218	78	101	2.1	6.0
	87.5	191.0	.74	.77	278	257	247	47	218	78	101	2.1	6.0
	90	192.95											

Traverse: 2		
Start Time: /	Initial Leak Check: / cfm@ / "Hg	
Finish Time: 1240	Final Leak Check: .005 cfm@ 14 "Hg	

Project No.: 21960

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particulate/Metals
Test Date	Sept 9/19
Test Location	APC Outlet No. 2
Operator Signature	OH

Project No.:	21960
Page	1 of 5
Probe No.:	6
Meter Box No.:	T3
Impinger Box No.:	13

Pitot Factor	S7A 0.850	
DGMCF	1.017	
Barometric Pressure	~~29.8~~ 30.01	"Hg
Static Pressure	-9.20	"H2O
Nozzle Size	.2530	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner Glass / Metal / Teflon / Other__________

Nozzle Glass / Metal / Other__________

Union None / Metal / Teflon / Other__________

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	~~651.5~~ 525.1	g
WCBDA	~~21.8~~ 25.8	g

Combustion Gas Concentration

Oxygen	8.23	%
Carbon Dioxide	11.19	%
Carbon Monoxide	17.3	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	8037
Trendicator	COE 20093
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements

1 .2545
2 .2530
3 .2525
4 .2520
Average: .2530

Notes:

Field Data Sheet

Date: Sept 9, 2019	Plant: Covanta DYEC	Test No.: 1	Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
*	*	*	*		*			*		*	*	*	*
1	0	504.16	.67	.69	~~235~~ 275	240	239	60	74	68	68	1.9	3
	2.5	506.38	.67	.69	~~236~~ 275	243	240	56	198	68	69	1.7	3
	5	507.93	.66	.69	~~235~~ 275	247	40	55	203	68	69	1.8	3
2	7.5	9.62	.69	.70	~~220 238~~	241	241	54	207	68	69	1.8	3
	10	11.32	.70	.69	274	247	241	54	213	69	70	1.7	3
	12.5	13.02	.69	.69	274	248	241	53	213	69	70	1.7	3
3	15	14.70	.71	.70	283	246	241	54	215	69	71	1.8	3
	17.5	16.42	.72	.70	285	247	241	55	217	69	71	1.8	3
	20	18.14	.73	.70	284	248	241	55	219	69	72	1.8	3
4	22.5	19.85	.71	.69	284	247	241	55	221	69	72	1.8	3
	25	21.56	.72	.70	284	245	241	56	222	69	72	1.8	3
	27.5	23.37	.71	.69	284	244	242	56	223	69	73	1.8	3
5	30	25.08	.68	.68	284	244	241	56	224	70	73	1.7	3
	32.5	26.67	.69	.68	285	243	241	56	224	70	74	1.8	3
	35	28.37	.67	.67	284	246	241	56	225	70	74	1.8	3
6	37.5	30.08	.66	.67	286	248	241	56	225	70	74	1.7	3
	40	31.76	.67	.68	284	244	241	55	225	71	75	1.7	3
	42.5	33.44	.68	.68	284	246	241	55	225	71	75	1.7	3
7	45	35.11	.63	.65	284	247	241	55	225	71	75	1.6	3
	47.5	36.75	.65	.66	284	243	241	55	226	71	75	1.6	3
	50	38.37	.64	.66	284	245	241	55	226	71	76	1.6	3

Traverse: 1				
Start Time: 13:02	Initial Leak Check:	.007	cfm@ 13	"Hg
Finish Time:	Final Leak Check:		cfm@	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 9, 2019	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 ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	540.00	.72	.70	284	249	241	55	225	71	76	1.8	3
	55	541.71	.72	.70	284	247	241	55	226	72	76	1.8	3
	57.5	43.43	.73	.71	284	243	241	54	226	72	76	1.8	3
9	60	45.16	.79	.73	285	247	241	54 ~~55~~	225	72	76	1.95	3
	62.5	46.94	.78	.73	285	246	241	54	226	72	77	1.9	3
	65	48.73	.77	.73	285	249	241	54	226	72	77	1.9	3
10	67.5	50.53	.81	.74	285	248	241	55	226	73	77	2.0	3
	70	52.36	.81	.74	286	250	240	55	226	73	77	2	3
	72.5	54.20	.81	.74	286	244	241	55	226	73	77	2	3
11	75	56.04	.81	.74	286	246	241	55	226	73	77	2	3
	77.5	57.98	.81	.74	286	250	241	54	227	73	77	2	3
	80	59.72	.80	.74	286	250	241	54	227	74	77	2	3
12	82.5	61.56	.65	.67	285	250	241	54	227	74	77	1.7	3
	85	63.28	.62	.65	285	251	241	54	227	74	77	1.6	3
	87.5	64.88	.72	.66	85	45	41	54	26	74	77	1.8	3
	90	66.315											

Traverse: 1				
Start Time: 13:02	Initial Leak Check:	cfm@		"Hg
Finish Time: 14:36	Final Leak Check: 0.004	cfm@	11	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 9, 2019	Plant: Covanta DYEC	Test No.: 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	566.95	.86	.76	279	246	241	~~63~~ 54	134	74	75	2	3
	2.5	68.68	.85	.77	288	249	241	53	226	74	76	2	3
	5	70.52	.87	.77	288	245	241	53	228	74	76	2	3
2	7.5	72.35	.86	.77	288	250	241	52	229	74	76	2	3
	10	74.18	.88	.77	289	248	241	51	230	74	76	2.1	3
	12.5	76.04	.89	.78	290	250	241	51	231	74	77	2.1	3
3	15	77.91	.87	.77	290	251	241	51	231	74	77	2.1	3
	17.5	79.88	.85	.76	291	252	241	52	231	75	77	2.1	3
	20	81.64	.84	.76	290	251	241	53	231	74	77	2.1	3
4	22.5	83.51	.79	.73	290	250	241	53	230	75	77	1.9	3
	25	85.32	.80	.74	290	245	241	53	230	75	78	2	3
	27.5	87.15	.80	.74	289	248	241	53	230	75	78	2	3
5	30	89.09	.76	.72	290	251	241	53	230	75	78	1.9	3
	32.5	90.80	.74	.71	291	249	241	54	230	75	78	1.8	3
	35	92.57	.74	.71	290	251	241	54	229	75	78	1.8	3
6	37.5	94.33	.72	.70	291	251	241	54	229	75	78	1.8	3
	40	96.09	.72	.70	291	248	242	54	230	75	79	1.8	3
	42.5	97.85	.71	.70	290	247	241	55	230	75	79	1.8	3
7	45	99.61	.72	.70	290	250	241	55	230	76	79	1.8	3
	47.5	601.37	.68	.68	290	247	241	55	230	76	79	1.7	3
	50	603.11	.65	.67	289	247	241	55	230	76	79	1.7	3

Traverse: 2			
Start Time: 14:45	Initial Leak Check: 0.004	cfm@ 12	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 9, 2019	Plant: Covanta DYEC	Test No.: 1	Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	604.85	.68	.68	289	245	241	55	230	76	79	1.7	3
	55	606.57	.67	.68	289	245	241	55	230	76	79	1.7	3
	57.5	608.29	.67	.68	288	246	241	56	230	76	80	1.7	3
9	60	610.01	.70	.69	288	248	241	56	229	76	80	1.7	4
	62.5	611.74	.69	.69	288	248	241	56	229	76	80	1.8	4
	65	613.48	.69	.69	288	249	241	57	230	77	80	1.8	4
10	67.5	615.23	.66	.68	282	248	241	57	229	77	80	1.7	4
	70	616.93	.67	.68	282	248	241	57	230	77	80	1.7	4
	72.5	618.63	.69	.69	283	250	244	58	229	77	80	1.7	4
11	75	620.32	.69	.70	271	249	241	58	228	77	80	1.7	4
	77.5	622.04	.69	.70	272	247	240	58	228	77	80	1.8	4
	80	623.79	.68	.69	273	244	240	58	228	77	80	1.8	4
12	82.5	625.55	.66	.68	266	250	241	59	228	77	80	1.7	4
	85	627.29	.64	.67	266	248	240	59	228	77	80	1.7	4
	87.5	629.02	.65	.68	265	249	240	60	227	77	80	1.7	4
	90	630.80											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 1616	Final Leak Check: 0.001	cfm@ 16	"Hg

~~672.75~~

Project No.: 21960

Operator : D.H.

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particulate/Metals
Test Date	Sept. 10/2019
Test Location	APC Outlet No. 2
Operator Signature	K.C.

57A

Project No.:	21960	
Page	1 of 5	
Probe No.:	6B	
Meter Box No.:	Team 2	
Impinger Box No.:	13	

Pitot Factor	.850	
DGMCF	0.997	
Barometric Pressure	29.95	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2530	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		mg
Probe		mg

Moisture Gain

CWTR	~~469.0~~ 474.5	g
WCBDA	~~18.2~~ 19.8	g

Combustion Gas Concentration

Oxygen	~~8.23~~ 8.32	%
Carbon Dioxide	11.04	%
Carbon Monoxide	9.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2545
2	.2530
3	.2525
4	~~.2530~~ .2520
Average:	.2530

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: 09/10/19	Plant: Covanta DYEC	Test No.: Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time *	Dry Gas Meter ft³ * 841.90	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F * 68	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	~~842.00~~	0.7	.68	288	250	245	59	59	64	65	1.5	3
	2.5	843.91	.73	.69	288	256	244	47	62	65	65	1.6	3
	5	845.63	.73	.69	288	255	246	46	64	64	65	1.6	3
2	7.5	847.36	.73	.69	288	257	245	46	64	64	65	1.6	3
	10	849.11	.72	.69	288	256	244	46	68	65	66	1.6	3
	12.5	850.85	.73	.69	287	257	245	46	65	65	66	1.6	3
3	15	852.58	.71	.68	288	252	245	46	66	65	66	1.5	3
	17.5	854.29	.69	.68	282	253	245	46	66	65	67	1.5	3
	20	855.98	.70	.68	281	256	245	47	67	65	68	1.~~45~~	3
4	22.5	857.65	.70	.68	281	255	245	47	67	65	69	1.5	3
	25	859.36	.70	.68	284	258	245	47	67	66	69	1.6	3
	27.5	861.06	.70	.68	284	255	245	47	68	66	70	1.6	3
5	30	862.78	.70	.68	283	258	245	47	69	66	70	1.6	3
	32.5	864.50	.68	.67	283	257	246	47	70	66	71	1.5	3
	35	866.19	.68	.68	283	259	246	48	255	67	72	1.5	3
6	37.5	867.89	.65	.66	283	255	246	48	228	67	72	1.45	3
	40	869.53	.65	.66	283	258	246	48	229	67	73	1.5	3
	42.5	871.21	.66	.67	283	256	246	48	229	67	72	1.5	3
7	45	872.88	.61	.64	282	257	246	48	229	68	74	1.4	3
	47.5	874.5	.61	.64	282	255	245	49	229	68	73	1.4	3
	50	876.10	.61	.64	282	254	246	49	228	68	74	1.4	3

Traverse: 1				
Start Time: 808	Initial Leak Check: .006	cfm@ 15	"Hg	
Finish Time:	Final Leak Check:	cfm@	"Hg	

Project No.: 21960

Operator : K. C

Field Data Sheet

Date: Sept. 10/19	Plant: Covanta DYEC	Test No.: Particulate/Metals	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
8	52.5	877.72	.65	.66	282	258	246	49	~~226~~ 227	69	74	1.5	3
	55	879.38	.65	.66	282	259	246	49	227	69	75	1.5	3
	57.5	881.05	.65	.66	282	257	246	49	228	69	75	1.5	3
9	60	882.75	.71	.69	282	255	246	49	228	70	75	1.6	3
	62.5	884.47	.70	.69	281	256	246	49	228	70	76	1.6	3
	65	886.19	.69	.69	281	255	246	50	229	70	76	1.6	3
10	67.5	887.92	.72	.70	281	260	246	50	228	70	76	1.65	3
	70	889.68	.73	.71	281	256	246	50	228	70	76	1.7	3
	72.5	891.48	.74	.71	281	257	246	50	228	71	76	1.7	3
11	75	893.25	.75	.72	281	255	246	50	229	71	77	1.7	3
	77.5	895.03	.75	.72	281	258	246	50	229	71	77	1.7	3
	80	896.85	.75	.72	281	260	246	50	230	71	78	1.7	3
12	82.5	898.65	.71	.70	281	260	246	50	230	72	78	1.65	3
	85	900.42	.71	.70	281	260	246	50	230	72	78	1.65	3
	87.5	902.18	.73	.71	281	256	246	50	230	72	78	1.65	3
	90	904.04											

903.14

Traverse: 1			
Start Time: 8:08	Initial Leak Check:	cfm@	"Hg
Finish Time: 939	Final Leak Check: .006	cfm@ 17	"Hg

Project No.: 21960

Operator : K.C.

Field Data Sheet

Date: Sept.10/19	Plant: Covanta DYEC	Test No.: Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	904.85	.59	.63	281	256	247	61	139	73	75	1.3	3
	2.5	906.6	.60	.64	~~259~~ 280	256	248	51	222	73	75	1.3	3
	5	908.13	.61	.65	281	257	248	50	229	73	75	1.4	3
2	7.5	909.74	.61	.65	280	255	248	50	231	73	75	1.4	3
	10	911.38	.60	.64	280	255	248	50	232	73	76	1.3	3
	12.5	912.97	.63	.66	280	258	248	50	232	73	75	1.3	3
3	15	914.56	.66	.67	279	259	248	50	233	73	76	1.5	3
	17.5	916.26	.65	.67	279	260	248	50	233	73	76	1.5	3
	20	917.96	.65	.68	280	257	248	50	233	73	77	1.5	3
4	22.5	919.64	.66	.67	280	256	248	50	233	73	77	1.5	3
	25	921.35	.65	.67	282	258	248	50	233	73	77	1.5	3
	27.5	923.02	.65	.67	282	256	248	50	232	73	77	1.5	3
5	30	924.69	.63	.66	282	261	248	51	232	74	78	1.4	3
	32.5	926.35	.63	.66	282	258	248	51	232	74	78	1.4	3
	35	927.99	.62	.65	283	260	248	51	232	74	78	1.4	3
6	37.5	929.62	.59	.64	283	259	248	51	232	74	78	1.3	3
	40	931.21	.58	.63	283	255	248	51	232	74	79	1.3	3
	42.5	932.79	.60	.64	283	256	248	51	231	74	79	1.3	3
7	45	934.79	.54	.61	283	255	248	51	231	74	79	1.2	3
	47.5	935.92	.54	.61	283	260	248	52	230	74	78	1.25	3
	50	937.48	.54		283	260	248	52	229	74	79	1.2	3

Traverse: 2		
Start Time: 954	Initial Leak Check: .004	cfm@ 17 "Hg
Finish Time:	Final Leak Check:	cfm@ "Hg

Project No.: 21960

Operator : K. L.

Field Data Sheet

Date: Sept. 10/19	Plant: Covanta DYEC	Test No.: Particulate/Metals	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
8	52.5	939.02	.62	.65	283	260	248	52	229	75	79	1.4	3
	55	940.66	.63	.66	283	260	248	52	229	75	79	1.4	3
	57.5	942.33	.65	.67	283	257	248	52	229	75	80	1.4	3
9	60	944.0	.68	.69	283	258	248	53	229	75	80	1.6	3
	62.5	945.73	.69	.69	283	258	248	53	229	75	80	1.6	3
	65	947.46	.69	.69	283	256	248	53	229	75	81	1.6	3
10	67.5	949.17	.77	.73	283	258	248	53	230	76	81	1.8	4
	70	951.01	.77	.73	283	261	248	53	231	76	81	1.8	4
	72.5	952.88	.78	.74	283	262	248	53	231	76	81	1.8	4
11	75	954.73	.81	.75	284	259	248	53	231	76	81	1.9	4
	77.5	956.63	.81	.75	284	257	248	54	231	76	81	1.9	4
	80	958.52	.81	.75	284	261	248	54	231	76	81	1.9	4
12	82.5	960.43	.80	.74	284	259	248	54	231	76	82	1.9	4
	85	962.30	.80	.74	284	262	248	54	231	76	82	1.9	4
	87.5	964.19	.81	.75	284	257	248	54	231	77	82	1.9	4
	90	~~966.19~~ ~~21~~											
		966.21											

966.90

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 1124	Final Leak Check: .006	cfm@ 15	"Hg

Project No.: 21960

Operator : K.C.

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date	Sept. 10/19
Test Location	APC Outlet No. 2
Operator Signature	K.C.

Project No.:	21960
Page	1 of 5
Probe No.:	6B
Meter Box No.:	Team 3
Impinger Box No.:	~~8~~ 10

Pitot Factor	.850	
DGMCF	1.017	
Barometric Pressure	29.87	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size		inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner Glass / Metal /Teflon / Other__________

Nozzle Glass / Metal / Other__________

Union None /Metal / Teflon / Other__________

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	~~650.7~~ 424.1	g
WCBDA	~~13.7~~ 21.7	g

Combustion Gas Concentration

Oxygen	8.27	%
Carbon Dioxide	10.93	%
Carbon Monoxide	18.1	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2545
2	.2530
3	.2525
4	.2520
Average:	.2530

Notes:

Field Data Sheet

Date: Sept 10, 2019	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 ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	710.23	.58	.61	280	247	242	68	69	71	71	1.3	3
	2.5	712.11	.61	.64	257	247	241	59	69	71	72	1.4	3
	5	713.71	.60	.63	259	251	243	56	70	72	72	1.5	3
2	7.5	715.33	.59	.63	261	251	243	54	69	72	73	1.5	3
	10	716.92	.57	.62	261	251	244	53	71	72	73	1.4	3
	12.5	718.48	.57	.62	262	247	243	51	70	72	74	1.4	3
3	15	720.03	.59	.63	262	248	243	51	70	72	74	1.5	3
	17.5	721.59	.60	.63	278	249	244	50	69	73	75	1.5	3
	20	723.15	.58	.62	279	249	244	50	71	73	76	1.4	3
4	22.5	724.70	.58	.62	279	251	243	50	71	73	76	1.4	3
	25	726.24	.57	.61	282	252	243	50	71	73	77	1.4	3
	27.5	727.79	.57	.61	282	252	243	50	71	74	77	1.4	3
5	30	729.34	.55	.60	282	250	243	50	71	74	78	1.4	3
	32.5	730.89	.55	.60	283	252	243	50	71	74	78	1.4	3
	35	732.43	.56	.61	282	246	244	50	70	74	79	1.4	3
6	37.5	~~[illegible]~~ 733.97	.57	.61	282	250	243	50	72	75	79	1.4	3
	40	735.50	.55	.60	282	250	243	50	73	75	79	1.4	3
	42.5	737.03	.56	.61	282	251	243	50	72	75	79	1.4	3
7	45	738.59	.56	.61	282	251	244	50	71	75	80	1.4	3
	47.5	740.10	.54	.60	283	247	243	50	72	76	80	1.3	3
	50	741.60	.54	.60	82	50	43	50	72	76	80	1.3	3

Traverse: 1			
Start Time: 12:48	Initial Leak Check: 0.004	cfm@ 15	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept 10, 2019	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 ft³ *	Pitot Δ P "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure Δ H "H_2O *	Pump Vacuum "Hg Gauge *
8	52.5	743.10	.61	.64	~~284~~ 283	249	244	50	74	76	80	1.5	3
	55	744.67	.61	.64	283	251	243	50	72	76	80	1.5	3
	57.5	746.24	.61	.64	283	249	244	50	73	76	81	1.5	3
9	60	747.82	.66	.66	284	251	244	50	74	77	81	1.6	3
	62.5	749.45	.69	.68	284	250	243	50	72	77	81	1.7	3
	65	751.12	.66	.66	284	248	244	50	72	77	81	1.6	3
10	67.5	752.78	.68	.67	284	253	244	50	73	77	81	1.6	3
	70	754.42	.76	.68	284	253	243	51	72	77	81	1.7	3
	72.5	756.10	.68	.67	284	250	244	51	73	77	81	1.7	3
11	75	757.79	.71	.69	285	248	243	51	73	77	82	1.7	3
	77.5	759.47	.74	.7	285	249	243	51	74	78	82	1.8	3
	80	761.21	.71	.69	285	249	243	51	73	78	82	1.7	3
12	82.5	762.92	.72	.69	286	250	243	51	73	78	82	1.7	3
	85	764.63	.72	.69	286	250	244	51	73	78	82	1.7	3
	87.5	766.34	.73	.70	286	253	243	51	74	78	82	1.8	3
	90	768.14											

Traverse: 1				
Start Time: 12:48	Initial Leak Check:	cfm@		"Hg
Finish Time: 14:19	Final Leak Check: 0.004	cfm@	13	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 10, 2019	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 ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	768.95	.78	.72	286	248	244	63	75	78	78	1.8	3
	2.5	770.82	.77	.71	286	248	241	52	76	78	79	1.8	3
	5	772.59	.78	.72	288	252	243	51	75	78	79	1.8	3
2	7.5	774.33	.75	.70	288	253	244	51	74	78	79	1.8	3
	10	776.07	.73	.70	288	248	243	51	74	78	80	1.8	3
	12.5	777.82	.73	.70	288	254	244	51	75	78	80	1.8	3
3	15	779.57	.75	.70	288	248	243	52	74	78	80	1.8	3
	17.5	781.32	.73	.70	289	252	242	52	75	78	81	1.8	3
	20	783.07	.76	.71	288	248	243	52	74	78	81	1.8	3
4	22.5	784.82	.72	.69	288	248	243	52	75	78	81	1.8	3
	25	786.57	.74	.70	288	254	243	53	74	78	81	1.8	3
	27.5	788.32	.74	.70	288	248	243	53	76	78	81	1.8	3
5	30	790.07	.67	.67	288	254	243	53	75	78	81	1.6	3
	32.5	791.75	.66	.66	289	250	243	54	~~74~~ 75	78	82	1.6	3
	35	793.41	.65	.66	288	251	243	54	74	78	82	1.6	3
6	37.5	795.08	.54	.60	288	251	242	54	74	78	82	1.3	3
	40	796.61	.54	.60	288	253	243	55	78	78	82	1.3	3
	42.5	798.14	.52	.59	288	254	243	55	75	78	82	1.3	3
7	45	799.66	.56	.61	288	253	243	55	76	78	82	1.4	3
	47.5	801.21	.58	.62	287	253	242	55	74	78	82	1.4	3
	50	802.76	.57	.62	287	253	242	55	74	78	82	1.4	3

Traverse: 2			
Start Time: 14:31	Initial Leak Check: 0.002	cfm@ 13	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 10, 2019	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 ΔP "H_2O	Desired cfm	* Stack Temp °F	Probe Temp °F	Oven Temp °F	* Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	* Meter Temp Outlet °F	* Meter Temp Inlet °F	* Meter Pressure ΔH "H_2O	* Pump Vacuum "Hg Gauge
8	52.5	804.32	.60	.63	287	254	242	56	76	79	83	1.5	3
	55	805.90	.61	.64	287	254	242	56	75	79	83	1.5	3
	57.5	807.50	.60	.63	287	248	243	56	74	79	83	1.5	3
9	60	809.09	.62	.64	287	249	242	56	74	79	83	1.5	3
	62.5	810.69	.62	.64	287	250	242	56	74	79	83	1.5	3
	65	812.28	.61	.64	288	251	242	57	74	~~8~~ 79	83	1.5	3
10	67.5	813.96	.60	.63	288	252	242	57	75	79	83	1.5	3
	70	815.47	.59	.63	287	249	243	56	75	79	83	1.5	3
	72.5	817.06	.59	.63	285	251	242	56	74	79	83	1.5	3
11	75	818.65	.58	.62	285	247	242	57	74	79	83	1.5	3
	77.5	820.23	.6	.63	275	248	242	57	74	80	83	1.5	3
	80	821.84	.58	.63	275	253	242	56	74	90	83	1.5	3
12	82.5	823.43	.6	.64	275	251	242	56	74	80	83	1.5	3
	85	825.02	.59	.63	274	254	242	57	75	80	83	1.5	3
	87.5	826.61	.58	.63	274	253	242	57	75	80	83	1.5	3
	90	828.19											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 16:01	Final Leak Check: 0.004	cfm@ 12	"Hg

Project No.: 21960

Operator : DH

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	SEPT 10/19	
Test Location	APC Outlet No. 1	
Operator Signature	DW	

Project No.:	21960	
Page	1 of	
Probe No.:	4	
Meter Box No.:	T1	
Impinger Box No.:	16	

Pitot Factor	0.848	
DGMCF	1.018	
Barometric Pressure	29.96	"Hg
Static Pressure	-6.6	"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	158.9	g
WCBDA	10.8	g

Combustion Gas Concentration

Oxygen	8.28	%
Carbon Dioxide	11.09	%
Carbon Monoxide	8.8	ppm

Measuring Device	MII Numbers
Probe / Pitot	M10/25
Trendicator	COE2004
Control Box	COE2004
Incline Manometer	COE2004
Comb.Gas.Analyzer	-
Micromanometer	-
Barometer	ENV.CAN
Calipers	B03906

Nozzle Measurements	
1	0.1780
2	0.1775
3	0.1770
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

Notes:

Field Data Sheet

Date: SEPT 10/13	Plant:	Covanta DYEC	Test No.: 1	Particle Size	Page 2 of 2
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1 ~~21880~~	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	74.16	.70	0.35	281	252	263	67	66	65	64	0.38	3
2	10.2	77.51	.70		281	252	263	56	68	66	65	0.38	3
3	20.9	81.00	.63		282	252	263	56	65	66	65	0.38	3
4	31.4	84.68	.61		282	257	263	56	60	68	66	0.38	3
5	41.3	88.14	.56		281	256	263	55	59	70	67	0.38	3
6	50.6	91.34	.52		282	252	263	55	61	70	67	0.38	3
	59.7	94.44											
1	0	94.44	.74		282	252	264	56	61	71	65	0.38	3
2	10.8	98.16	.75		284	253	263	53	57	71	66	0.38	3
3	21.4	101.78	.75		284	253	263	53	54	73	70	0.38	3
4	31.3	105.22	.66		285	254	264	53	55	73	70	0.38	3
5	41.6	108.80	.59		284	252	263	53	55	73	70	0.38	3
6	50.9	112.09	.53		283	253	263	53	54	74	72	0.38	3
	60.3	115.34											

Traverse: 1				
Start Time: 810	Initial Leak Check:	.004	cfm@ 16	"Hg
Finish Time: 910	Final Leak Check:		cfm@	"Hg

Traverse: 2				
Start Time: 912	Initial Leak Check:		cfm @	"Hg
Finish Time: 1012	Final Leak Check:		cfm @	"Hg

Project No.: 21960

Operator : Dr

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.:	2 Particle Size	
Test Date	SEPT 10 /19	
Test Location	APC Outlet No. 1	
Operator Signature	DU	

Project No.:	21960	
Page	1 of	
Probe No.:		
Meter Box No.:		
Impinger Box No.:		

Pitot Factor	0.848	
DGMCF	1.018	
Barometric Pressure	29.91	"Hg
Static Pressure	-8.8	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

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

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	159.9	g
WCBDA	9.4	g

Combustion Gas Concentration

Oxygen	8.02	%
Carbon Dioxide	11.27	%
Carbon Monoxide	13.0	ppm

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other

Union None /Metal / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: SEPT10/A	Plant:	Covanta DYEC	Test No.: 2	Particle Size	Page 2 of 2
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1 ~~21880~~	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	15.45	.78	.35	283	251	255	69	69	74	73	.38	3
2	10.4	19.10	.78		283	253	260	63	68	74	73	.38	3
3	20.9	22.75	.77		283	253	260	63	65	75	73	.38	3
4	30.9	26.05	.67		282	253	262	63	65	76	74	.38	3
5	40.5	29.42	.56		281	253	262	60	65	76	74	.38	3
6	49.9	32.68	.50		281	254	262	59	64	77	74	.38	3
	58.9	36.15											
1	0	36.15	.66		278	260	243	63	66	76	74	.38	3
2	10.7	39.74	.66		279	254	262	58	62	77	75	.38	3
3	21.5	43.35	.63		278	255	261	57	60	77	75	.38	3
4	32.3	46.99	.56		278	253	263	56	60	78	76	.38	3
5	42.5	50.59	.51		278	254	263	55	60	78	76	.38	3
6	52.1	53.94	.49		278	255	262	55	60	78	76	.38	3
	61.1	57.20											

Traverse: 1			
Start Time: 1141	Initial Leak Check:	.006 cfm@	17 "Hg
Finish Time: 1240	Final Leak Check:	cfm@	"Hg

Traverse: 2			
Start Time: 1247	Initial Leak Check:	cfm @	"Hg
Finish Time: 1348	Final Leak Check:	cfm @	"Hg

Project No.: 21960

Operator : RM

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	SEPTEMBER 10 2019
Test Location	APC Outlet No. 1
Operator Signature	[signature]

Project No.:	21960	
Page	1 of	
Probe No.:	4	
Meter Box No.:	T1	
Impinger Box No.:	16	

Pitot Factor	0.848	
DGMCF	1.0156	
Barometric Pressure	29.85	"Hg
Static Pressure	-8.9	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	11	inches

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

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other________

Union None / Metal / Teflon / Other________

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	168.5	g
WCBDA	10.9	g

Combustion Gas Concentration

Oxygen	8.14	%
Carbon Dioxide	11.10	%
Carbon Monoxide	14.9	ppm

Site Diagram

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

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Notes:

Field Data Sheet

Date: SEPT 10/19	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1 ~~21880~~	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	57.39	.71	.35	282	251	264	74	74	75	74	.38	4
2	11.2	61.26	.74		284	253	263	68	69	75	74	.38	4
3	22.3	65.16	.71		285	253	263	68	70	76	75	.38	4
4	33.4	68.84	.63		284	252	264	67	67	76	75	.38	4
5	43.7	72.41	.58		283	253	263	68	68	77	75	.38	4
6	53.2	75.70	.51		283	253	264	68	66	77	75	.38	4
	62.1	78.90											
1	0	78.90	.74		282	252	264	68	67	77	75	.38	4
2	10.3	82.45	.74		283	252	260	68	62	77	75	.38	4
3	20.5	86.04	.68		283	252	260	62	61	77	76	.38	4
4	30.6	89.64	.65		283	252	264	62	61	77	75	.38	4
5	40.0	92.94	.60		283	254	265	62	61	77	76	.38	4
6	49.0	96.09	.53		287	256	262	66	64	79	77	.38	4
	57.9	99.28											

Traverse: 1			
Start Time: 1441	Initial Leak Check: .003	cfm@ 15.5	"Hg
Finish Time: 1543	Final Leak Check:	cfm@	"Hg

Traverse: 2			
Start Time: 1546	Initial Leak Check:	cfm @	"Hg
Finish Time: 1644	Final Leak Check:	cfm @	"Hg

Project No.: 21960

Operator : Del

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particle Size
Test Date	SEPTEMBER 9, 2019
Test Location	APC Outlet No. 2
Operator Signature	[signature]

Project No.:	21960	
Page	1 of	
Probe No.:	PM10/2.5	
Meter Box No.:	T2	
Impinger Box No.:	16	

Pitot Factor	0.848	
DGMCF	0.997	
Barometric Pressure	30.03	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	11	inches

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

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other

Union None / Metal / Teflon / Other

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	177.1	g
WCBDA	10.5	g

Combustion Gas Concentration

Oxygen	8.45	%
Carbon Dioxide	10.87	%
Carbon Monoxide	10.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	PM 10/25
Trendicator	EOEZ0092
Control Box	EOEZ0092
Incline Manometer	EOEZ0092
Comb.Gas.Analyzer	PLANT
Micromanometer	-
Barometer	ENV CAN
Calipers	B05906

Nozzle Measurements	
1	0.1775
2	0.1775
3	0.1780
4	0.1770
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: SE01	Plant: Covanta DYEC	Test No.: 1	Particle Size	Page of
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2 ~~21880~~	

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	57.14	.74	.35	283	254	246	65	70	63 ~~79~~	63	0.38	5
2	10.7	60.85	.78		285	254	246	58	64	64	64	0.38	5
3	21.3	64.60	.78		286	258	246	56	56	65	65	0.38	5
4	31.8	68.10	.73		286	259	247	56	56	66	67	0.38	5
5	41.9	71.63	.67		285	257	247	57	56	66	67	0.38	5
6	51.6	75.03	.59		285	257	247	57	56	67	70	0.38	5
	60.9	78.29											
1	0	78.29	.77		285	260	235	58	59	69	69	0.38	5
2	10.5	81.95	.73		284	260	236	57	58	69	70	0.38	5
3	20.6	85.40	.68		283	260	242	57	58	69	71	0.38	5
4	30.7	88.85	.64		283	263	244	57	59	70	72	0.38	5
5	40.5	92.25	.56		282	263	243	57	60	70	73	0.38	5
6	49.9	95.53	.47		282	263	243	57	60	71	73	0.38	5
	59.1	98.74											

Traverse: 1125 1				
Start Time: ~~1124~~	Initial Leak Check:	.006	cfm@ 15	"Hg
Finish Time: 1226	Final Leak Check:		cfm@	"Hg

Traverse: 2				
Start Time: 1230	Initial Leak Check:	/	cfm @	"Hg
Finish Time: 1329	Final Leak Check:		cfm @	"Hg

Project No.: 21960

Operator : D O [illegible]

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: 2	Particle Size	
Test Date	SEPTEMBER 9, 2019	
Test Location	APC Outlet No. 2	
Operator Signature	[signature]	

Project No.:	21960	
Page	1 of	
Probe No.:	PM10/2.5	
Meter Box No.:	T2	
Impinger Box No.:	9	

Pitot Factor	0.848	
DGMCF	0.997	
Barometric Pressure	30.01	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	11	inches

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

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other

Union None /Metal / Teflon / Other

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	176.0	g
WCBDA	10.0	g

Combustion Gas Concentration

Oxygen	8.30	%
Carbon Dioxide	11.11	%
Carbon Monoxide	16.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEG
Trendicator	T657
Control Box	
Incline Manometer	/
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements

1 ______
2 ______
3 ______
4 ______
Average:

Site Diagram

Notes:

Field Data Sheet

Date: Sept 9/15	Plant:	Covanta DYEC	Test No.: 2	Particle Size	Page 2 of 2
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 2 21880	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	99.19	.83	.35	286	263	252	69	60	73	73	0.38	3.5
2	10.5	102.85	.78	↓	286	263	253	55	61	72	73	0.38	3.5
3	21.2	106.64	.73		286	266	254	55	60	72	73	0.38	3.5
4	31.9	110.40	.70		286	265	253	55	57	73	74	0.38	3.5
5	42.3	114.04	.66		285	264	252	55	57	73	74	0.38	3.5
6	52.3	117.52	.56		285	260	255	55	57	74	76	0.38	3.5
	61.6	120.77											
1	0	120.77	.74		283	267	253	58	62	74	76	.38	3.5
2	10.7	124.50	.75		283	265	254	56	60	75	77	.38	3.5
3	21.1	128.25	.71		283	267	254	55	60	75	77	.38	3.5
4	31.1	131.85	.63		283	267	254	55	61	76	79	.38	3.5
5	40.8	135.26	.54		283	265	254	55	60	76	78	.38	3.5
6	50.1	138.7	.44	↓	281	264	255	55	61	76	78	.38	3.5
	58.4	141.65											

Traverse: 1				
Start Time: 1520	Initial Leak Check:	.005	cfm@ 16	"Hg
Finish Time: 1622	Final Leak Check:		cfm@	"Hg

Traverse: 2				
Start Time: 1626	Initial Leak Check:		cfm @	"Hg
Finish Time: ~~1524~~ 1724	Final Leak Check:		cfm @	"Hg

Project No.: 21960

Operator : Dln

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	SEPT 11, 2019
Test Location	APC Outlet No. 2
Operator Signature	RW

Project No.:	21960
Page	1 of 2
Probe No.:	4
Meter Box No.:	72
Impinger Box No.:	9

Pitot Factor	0.848	
DGMCF	0.997	
Barometric Pressure	29.79	"Hg
Static Pressure	-10.1	"H2O
Nozzle Size	0.1775	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	11	inches

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

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other__________

Union None /Metal / Teflon / Other__________

Pitot Leak Checked? Yes No

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	172.9	g
WCBDA	12.3	g

Combustion Gas Concentration

Oxygen	8.22	%
Carbon Dioxide	10.96	%
Carbon Monoxide	19.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	TEST
Control Box	1
Incline Manometer	
Comb.Gas.Analyzer	UNIT
Micromanometer	
Barometer	2
Calipers	

Nozzle Measurements	
1	
2	
3	
4	
Average:	

Site Diagram

Notes:

Field Data Sheet

Date: SEPT 11/13	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2 21880	

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	67.18	.71	.35	282	258	254	70	71	75	75	.38	4
2	11.1	71.11	.72		282	261	248	61	63	75	75	.38	4
3	22.0	74.89	.72		283	261	245	59	60	76	77	.38	4
4	32.4	78.55	.71		284	259	246	59	62	76	77	.38	4
5	42.6	82.13	.64		285	261	246	59	62	77	78	.38	4
6	52.6	85.68	.53		284	258	246	62	62	77	78	.38	4
	61.7	88.89											
1	0	88.89	.73		283	252	245	64	66	78	78	.38	4
2	10.5	92.55	.71		283	246	245	56	63	78	78	.38	4
3	21.1	96.25	.70		283	261	246	56	63	78	78	.38	4
4	31.4	99.85	.65		283	260	246	57	64	78	79	.38	4
5	41.1	103.31	.56		283	260	246	57	65	79	80	.38	4
6	50.1	106.46	.52		283	259	247	58	66	79	80	.38	4
	58.3	109.34											

Traverse: 1	9:35		
Start Time: 935	Initial Leak Check: .012	cfm@ 13	"Hg
Finish Time: 1037	Final Leak Check:	cfm@	"Hg

Traverse: 2			
Start Time: 1042	Initial Leak Check:	cfm @	"Hg
Finish Time: 1140	Final Leak Check:	cfm @	"Hg

Project No.: 21960

Operator : DW

AS

AS - DH Sunr COB

DOMTAR - DW

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	September 12 2019
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21960
Page	1 of 5
Probe No.:	7 series
Meter Box No.:	Box Team 4
Impinger Box No.:	

Pitot Factor	.849	
DGMCF	1.006	
Barometric Pressure	29.94	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	.2506	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	668.6	g
WCBDA	17.1	g

Combustion Gas Concentration

Oxygen	3.16	%
Carbon Dioxide	11.19	%
Carbon Monoxide	12.3	ppm

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

Nozzle Measurements	
1	.2495
2	.2520
3	.2515
4	.2495
Average:	.2506

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 2019	Plant:	Covanta DYEC	Test No.:	1 SVOC
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1

	*	*	*		*			*		*	*	*	*
Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	93.84	.72	.68	281	254	246	63	42	65	66	1.6	6
	5	97.30	.75	.70	281	251	243	51	41	72	66	1.7	6
2	10	100.81	.75	.70	281	252	248	49	44	80	66	1.7	6
	15	104.35	.77	.71	282	253	248	48	43	86	68	1.8	6.5
3	20	107.98	.78	.72	283	253	248	48	46	88	69	1.8	6.5
	25	111.65	.76	.71	283	253	243	48	43	89	68	1.7	6.5
4	30	115.24	.67	.67	284	254	249	52	47	90	69	1.5	6
	35	118.61	.70	.69	284	255	251	52	41	92	70	1.6	6.5
5	40	122.08	.65	.66	284	253	244	57	41	93	70	1.45	6
	45	125.39	.64	.66	284	253	244	56	41	93	71	1.45	6
6	50	128.70	.55	.61	285	256	250	55	44	94	71	1.3	6
	55	131.79	.56	.61 ~~.62~~	284	254	253	54	40	94	71	1.3	6
7	60	134.88	.58	.63	284	255	245	51	39	94	72	1.3	6
	65	138.04	.57	.62	283	254	248	50	40	94	73	1.3	6
8	70	141.20	.59	.63	283	255	252	50	40	95	73	1.4	6
	75	144.38	.61	.64	283	254	247	48	40	95	73	1.4	6
9	80	147.60	.62	.65	283	254	245	47	40	96	73	1.4	6
	85	150.83	.60	.64	283	254	251	47	40	95	73	1.4	6
10	90	154.02	.60	.64	283	254	251	47	40	95	73	1.4	6
	95	157.32	.61	.64	282	254	245	48	40	96	74	1.4	6
11	100	160.56	.56	.62	282	256	250	48	40	96	73	1.3	6

Traverse:	1			
Start Time: 8:14	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.: 21960

Operator :

Field Data Sheet

Date: Sept 12/19	Plant: Covanta DYEC	Test No.: 1 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
	105	163.66	.57	.62	282	254	251	49	39	95	74	1.3	6
12	110	166.75	.57	.62	282	254	245	49	40	95	74	1.3	6
	115	169.85	.57	.62	282	255	246	49	40	95	75	1.3	6
	120	172.93											

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

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

Project No.: 21960

Operator : AS

Field Data Sheet

Date: Sept 12/19	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 ft³	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	173.31	.77	.71	282	255	247	58	41	77	72	1.8	6.5
	5	176.91	.82	.74	285	258	249	51	42	89	73	1.9	6.5
2	10	180.62	.83	.75	285	255	250	49	43	94	74	2.0	7
	15	184.37	.79	.73	284	254	252	49	43 ~~50~~	96	74	1.9	7
3	20	188.16	.76	.72	284	257	246	50	44	96	75	1.8	7
	25	191.78	.73	.71	283	254	251	50	44	96	74	1.8	7
4	30	195.37	.64	.66	283	254	251	50	46	97	75	1.5	6
	35	198.78	.65	.67	283	254	245	51	47	97	75	1.5	6
5	40	202.16	.65	.67	282	254	247	51	48	97	75	1.5	6
	45	205.54	.64	.67	282	254	250	51	50	97	75	1.5	6
6	50	208.89	.58	.63	282	255	250	51	52	97	75	1.4	6
	55	212.12	.63	.66	282	254	245	52	54	97	75	1.5	6
7	60	215.37	.66	.67	283	256	248	52	56	97	76	1.5	6
	65	218.66	.67	.68	283	254	251	52	59	97	75	1.6	6.5
8	70	222.07	.69	.69	284	254	249	53	60	97	76	1.6	6.5
	75	225.49	.68	.68	284	255	246	52	63	98	77	1.6	6.5
9	80	228.92	.70	.69	285	255	251	53	55	98	77	1.7	7
	85	232.40	.72	.70	284	254	252	53	50	98	76	1.7	7
10	90	235.92	.71	.70	285	254	246	53	50	98	76	1.7	7
	95	239.41	.69	.69	284	255	249	53	50	98	76	1.7	7
11	100	242.89	.70 ~~.69~~	.69	284	255	251	53	52	98	76	1.7	7

Traverse: 2		
Start Time: 10:23	Initial Leak Check: .002 cfm@ 14 "Hg	
Finish Time:	Final Leak Check: cfm@ "Hg	

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

Project No.: 21960

Operator : AS

Field Data Sheet

Date: sept 12/19	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point *	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
	105	246.35	.70	.70	282	254	250	54	53	99	78	1.7	7
12	110	249.80	.71	.70	282	253	247	54	55	99	77	1.7	7
	115	253.32	.65	.70	282	254	247	54	57	99	77	1.5	7
	120	256.74											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 12:23	Final Leak Check: .002	cfm@ 15	"Hg

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

Project No.: 21960

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	September 12 2019
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21960
Page	1 of 5
Probe No.:	7-Series
Meter Box No.:	Team 4
Impinger Box No.:	

Pitot Factor	.849	
DGMCF	1.006	
Barometric Pressure	29.96	"Hg
Static Pressure	-8.5	"H2O
Nozzle Size	.2506	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	723.4	g
WCBDA	19.1	g

Combustion Gas Concentration

Oxygen	8.07	%
Carbon Dioxide	11.21	%
Carbon Monoxide	11.4	ppm

Site Diagram

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

Nozzle Measurements

1 __________

2 __________

3 __________

4 __________

Average:

Notes:

Field Data Sheet

Date: Sept, 12 2019	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	57.12	.68	.67	281	254	261	61	70	73	74	1.5	7
	5	60.54	.81	.73	283	253	258	68	70	82	74	1.8	8
2	10	64.21	.81	.73	282	252	249	56	71	91	74	1.8	8
	15	67.86	.78	.73	282	254	253	53	43	93	74	1.8	8
3	20	71.48	.76	.72	282	253	246	50	45	95	74	1.75	7
	25	75.10	.80	.74	282	254	252	48	46	96	76	1.85	7.5
4	30	78.82	.73	.71	282	254	247	46	47	98	76	1.75	7.5
	35	82.45	.68	.69	281	254	253	45	45	98	77	1.55	7
5	40	85.88	.70	.70	281	254	246	45	44	98	77	1.65	7
	45	89.38	.66	.67	282	254	254	45	46	98	77	1.55	7
6	50	92.83	.60	.64	281	255	248	45	45	97	77	1.4	6.5
	55	96.08	.63	.66	281	254	254	46	44	96	77	1.45	7
7	60	99.38	.65	.67	282	255	248	46	44	97	76	1.5	7
	65	102.75	.66	.67	282	254	252	46	44	96	76	1.5	7
8	70	106.11	.71	.70	282	254	249	46	44	96	76	1.65	7
	75	109.61	.73	.71	283	254	252	46	45	97	76	1.7	7.5
9	80	113.19	.73	.71	283	254	252	46	46	97	76	1.7	7.5
	85	116.78	.75	.72	284	253	250	46	45	97	76	1.75	8
10	90	120.43	.73	.71	283	254	252	50	46	98	77	1.7	7.5
	95	124.02	.75	.72	284	253	247	46	46	98	77	1.75	7.5
11	100	127.65	.75	.72	281	254	253	47	46	98	77	1.75	7.5

Traverse: 2			
Start Time: 13:07	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.: 21960

Operator :

Field Data Sheet

Date: Sept. 12 2019	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	* Clock Time	* Dry Gas Meter ft³	* Pitot Δ P "H_2O	Desired cfm	* Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp * Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp * Outlet °F	Meter Temp * Inlet °F	* Meter Pressure Δ H "H_2O	* Pump Vacuum "Hg Gauge
	105	131.28	.71	.70	281	253	246	47	47	98	77	1.65	7.5
12	110	134.83	.69	.69	281	253	253	47	48	98	77	1.6	7.5
	115	138.30	.69	.69	280	253	246	48	49	97	77	1.6	7.5
	120	141.75											

Traverse: 2			
Start Time: –	Initial Leak Check: –	cfm@ –	"Hg
Finish Time: 15:07	Final Leak Check: .002	cfm@ 14	"Hg

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

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 12 2019	Plant: Covanta DYEC	Test No.: 2 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft³	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	142.22	.61	.64	281	255	253	60	48	80	76	1.35	7
	5	145.56	.59	.63	280	252	247	46	45	89	75	1.3	7
2	10	148.76	.61	.64	280	253	251	44	44	94	75	1.35	7
	15	151.97	.63	.66	281	252	247	44	44	95	75	1.45	7
3	20	155.26	.62	.65	277	252	250	44	44	95	76	1.45	7
	25	158.55	.59	.64	279	253	251	45	44	96	76	1.35	7
4	30	161.76	.63	.66	279	253	251	45	44	96	76	1.45	7
	35	165.07	.61	.65	279	252	249	45	44	96	76	1.4	7
5	40	168.35	.63	.66	280	253	253	46	45	98	77	1.45	7
	45	171.03	.65	.67	281	252	246	46	46	97	77	1.5	7.5
6	50	174.98	.61	.62	281	252	252	46	47	98	77	1.4	7.5
	55	178.22	.63	.66	281	253	245	47	47	97	77	1.4	7.5
7	60	181.52	.55	.62	281	251	245	47	47	97	77	1.3	7.5
	65	184.60	.64	.66	282	253	240	53	46	~~86~~ 74	77	1.5	7.5
8	70	187.82	.62	.64	285	253	264	48	49	73	81	1.4	7.5
	75	191.01	.65	.66	285	253	~~24~~ 273	48	50	91	84	1.5	7.5
9	80	194.28	.67	.68	285	253	252	48	51	95	75	1.6	7.5
	85	197.64	.73	.70	286	254	263	50	50	97	75	1.75	8
10	90	201.17	.81	.75	285	254	263	50	49	99	76	1.95	9
	95	204.92	.84	.76	285	254	237	51	51	99	77	2	9
11	100	208.76	.87	.77	283	254	266	52	54	100	78	2	9

Traverse: 1		
Start Time: 15:17	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

Test paused at 16:22
Resumed at 16:49

Project No.: 21960

Operator :

Field Data Sheet

Date: Sept. 12 2019	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft³	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	212.61	.87	.78	284	253	253	50	51	101	79	2.1	9
12	110	216.47	.87	.78	284	254	257	53	52	101	78	2.1	9
	115	220.39	.85	.77	283	254	239	50	49	101	79	2.1	9
	120	224.29											

Traverse: 1			
Start Time: \	Initial Leak Check: \	cfm@ \	"Hg
Finish Time: 17:46	Final Leak Check: 0.002	cfm@ 14	"Hg

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

Project No.: 21960

Operator : OH

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.:	Semi-Volatile Organic Compounds	
Test Date	Sept. 13/19	
Test Location	APC Outlet No. 1	
Operator Signature	K.G.	

Project No.:	21960	
Page	1 of 5	
Probe No.:	6C	
Meter Box No.:	LOE 20090	
Impinger Box No.:	8	

Pitot Factor	.851	
DGMCF	1.006	
Barometric Pressure	30.00	"Hg
Static Pressure	-8.45	"H2O
Nozzle Size	.2553	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	724.4	g
WCBDA	22.2	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	11.12	%
Carbon Monoxide	12.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP-2
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2555
2	.2560
3	.2550
4	.2545
Average:	.2553

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. 13/19	Plant: Covanta DYEC	Test No.: 3	SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft³ *	Pitot Δ P "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure Δ H "H_2O *	Pump Vacuum "Hg Gauge *
1	0	525.23	.84	.76	280	249	254	67	61	65	66	2.0	7
	5	528.94	.83	.76	281	250	250	55	46	74	67	2	8
2	10	532.75	.79	.75	281	251	244	51	48	82	68	2	8
	15	536.57	.78	.75	280	251	250	48	52	86	69	2	8
3	20	540.36	.75	.74	280	251	250	47	57	90	70	1.9	8
	25	544.13	.75	.74	280	251	250	47	61	92	71	1.9	8
4	30	547.88	.71	.72	280	252	245	46	64	94	72	1.8	7.5
	35	551.56	.72	.73	280	252	247	46	67	95	72	1.8	7.5
5	40	555.22	.67	.71	280	252	251	47	71	96	73	1.7	7.5
	45	558.81	.69	.72	280	252	252	47	74	96	74	1.7	7.5
6	50	562.39	.64	.69	280	252	246	47	76	97	74	1.6	7
	55	565.90	.59	.66	280	252	249	48	68	97	74	1.5	7
7	60	569.31	.69	.72	281	251	252	48	47	97	75	1.8	7.5
	65	572.97	.69	.72	281	255	245	48	44	97	74	1.8	7.5
8	70	576.61	.75	.75	282	252	251	48	45	98	75	1.9	8
	75	580.38	.75	.75	282	253	252	48	46	98	75	1.9	8
9	80	584.17	.75	.75	283	252	246	48	47	98	75	1.9	8
	85	587.94	.75	.75	283	251	251	48	49	98	76	1.9	8
10	90	591.70	.74	.74	283	252	252	48	50	98	75	1.9	8
	95	595.44	.75	.75	282	252	246	48	50	98	75	1.9	8
11	100	599.18	.74	.74	282	251	251	49	49	98	76	1.9	8

Traverse: 1			
Start Time: 825	Initial Leak Check: 0.01	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.: 21960

Operator: KC

Field Data Sheet

Date: Sept. 13/19	Plant: Covanta DYEC	Test No.: 3 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
	105	602.97	.74	.75	270	251	251	49	48	97	76	1.9	8
12	110	606.75	.60	.68	270	250	246	49	49	96	76	1.5	7.5
	115	610.23	.60	.67	270	250	251	50	47	95	76	1.5	7
	120	613.60											

Traverse: 1			
Start Time:	Initial Leak Check: ~~.0~~	cfm@	"Hg
Finish Time: 1025	Final Leak Check: .004	cfm@ 14	"Hg

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

Project No.: 21960

Operator : KC

Field Data Sheet

Date: Sept. 13/19	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	~~614.~~ 613.99	.81	.76	280	251	245	62	48	76	74	2.0	7
	5	617.87	.80	.76	281	251	247	48	48	82	72	2	7
2	10	621.76	.81	.77	281	251	246	47	53	89	73	2	7
	15	625.61	.80	.77	281	251	249	46	49	93	73	2	7
3	20	629.44	.80	.77	281	254	249	47	54	93	73	2	7.5
	25	633.29	.84	.79	281	251	245	49	55	94	73	2.1	9
4	30	637.24	.77	.76	281	252	251	49	51	95	74	2	8.5
	35	641.11	.73	.74	281	251	250	49	54	95	74	1.9	8
5	40	644.90	.70	.72	281	251	245	50	51	96	76	1.8	8
	45	648.59	.69	.72	280	254	251	49	53	95	74	1.8	8
6	50	652.23	.61	.67	280	251	250	48	50	95	74	1.5	8
	55	655.62	.64	.69	280	255	246	48	49	95	74	1.5	8
7	60	658.98	.66	.70	281	252	251	48	50	96	76	1.7	8
	65	662.52	.67	.71	281	251	248	47	50	96	74	1.7	8
8	70	666.07	.68	.71	281	251	247	47	52	97	75	1.7	8
	75	669.67	.67	.69	281	251	251	47	53	97	76	1.7	8
9	80	673.20	.68	.71	282	250	250	47	55	97	75	1.7	8
	85	676.79	.70	.72	281	251	247	47	54	97	75	1.8	8.5
10	90	680.44	.67	.71	281	251	250	47	49	97	75	1.7	8
	95	684.03	.68	.71	279	250	250	47	48	98	75	1.7	8
11	100	687.61	.71	.73	280	250	248	47	46	98	75	1.8	8.5

Traverse: 2		
Start Time: 1038	Initial Leak Check: 0.004 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.: 21960

Operator : KC

Field Data Sheet

Date: Sept.13/19	Plant: Covanta DYEC	Test No.: 3	SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time *	Dry Gas Meter ft^3 *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
	105	691.29	.67	.71	279	250	246	47	44	98	75	1.75	8
12	110	694.86	.67	.71	279	250	251	48	43	98	75	1.75	8
	115	698.41	.68	.71	275	250	253	48	42	98	76	1.75	8
	120	702.08											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 12:40	Final Leak Check: <0.002	cfm@ 12	"Hg

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

Project No.: 21960

Operator : K.C.

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T1	Semi-Volatile Organic Compounds
Test Date	sept 11 2019
Test Location 1	APC Outlet No. 2
Operator Signature	~~[illegible]~~ DH

Project No.:	21960	
Page	1 of 5	
Probe No.:	6C	
Meter Box No.:	Team 3	
Impinger Box No.:	6	

Pitot Factor	.851	
DGMCF	1.017	
Barometric Pressure	29.79	"Hg
Static Pressure	~~-9.7~~ -10.1	"H2O
Nozzle Size	.2553	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	651.5	g
WCBDA	21.8	g

Combustion Gas Concentration

Oxygen	8.09	%
Carbon Dioxide	11.09	%
Carbon Monoxide	20.9	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.2555
2	.2560
3	2550
4	2545
Average:	2553

Notes:

Field Data Sheet

Date: Sept. 11/19	Plant:	Covanta DYEC	Test No.: 1	SVOC	Page 2 of 5
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
*	*	*	*		*			*		*	*	*	*
1	0	830.06	~~.66~~ .73	~~.69~~ .71	286	243	245	~~35~~ 61	~~74~~ 66	75	76	1.7	5
	5	833.48	.75	~~.70~~ .72	286	245	244	61	52	76	76	1.8	6
2	10	836.95	.72	.70	286	245	242	57	53	76	77	1.8	6
	15	840.43	.74	.71	295	245	241	55	53	76	78	1.8	6
3	20	843.93	.67	.68	284	245	242	53	53	76	78	1.75	6
	25	847.41	.67	.68	284	245	242	52	52	77	79	1.75	6
4	30	850.86	.64	.66	283	245	241	52	52	77	80	1.6	6
	35	854.23	.66	.68	283	245	241	53	52	78	81	1.7	6
5	40	857.61	.57	.63	284	246	241	53	52	78	81	1.5	6
	45	860.87	.61	.65	283	245	241	54	52	78	82	1.6	6
6	50	864.15	~~.54~~ .55	.62	284	245	242	54	54	79	82	1.4	6
	55	867.35	.56	.62	284	245	241	55	53	79	83	1.4	6
7	60	870.51	.61	.65	284	245	241	55	53	79	83	1.55	6
	65	873.76	.62	.66	284	245	241	56	52	80	83	1.6	6
8	70	877.06	.66	.68	285	245	241	56	52	80	84	1.7	6
	75	880.43	.67	.68	285	245	241	56	52	86	84	1.7	6
9	80	883.86	.67	.68	285	245	241	56	53	81	84	1.7	6
	85	887.29	.70	.70	286	245	241	56	54	81	84	1.8	6
10	90	890.77	.69	.69	286	245	241	56	55	81	84	1.8	6
	95	894.30	.65	.67	286	245	241	56	56	82	85	1.7	6
11	100	897.66	.66	.68	286	245	241	56	56	82	85	1.7	7

Traverse: 1			
Start Time: 8:34	Initial Leak Check: .012	cfm@ 15	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse: 1			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11/18	Plant: Covanta DYEC	Test No.: 1 SVOC
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	901.08	.68	.69	294	245	241	57	57	82	85	1.8	7
12	110	904.59	.65	.68	284	245	241	56	59	82	85	1.7	7
	115	908.06	.65	.68	284	245	241	56	59	82	85	1.7	7
	120	911.46											

Traverse: 1		
Start Time:	Initial Leak Check: cfm@	"Hg
Finish Time: 10:34	Final Leak Check: .02 cfm@ 13	"Hg

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

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11/19	Plant: Covanta DYEC	Test No.: 1	SVOC
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	912.22	.68	.7	275	245	247	66	46	81	81	1.7	7
	5	915.68	.65	.68	274	247	244	59	50	81	80	1.7	7
2	10	919.13	.66	.68	282	246	243	55	50	81	81	1.7	7
	15	922.57	.67	.68	283	246	244	54	51	80	81	1.7	7
3	20	926.19	.68	.69	284	246	244	54	51	80	82	1.7	7
	25	929.40	.67	.68	284	246	244	53	51	80	82	1.75	7
4	30	932.87	.64	.67	285	246	243	54	53	80	83	1.65	7
	35	936.25	.65	.67	285	246	243	54	53	81	83	1.65	7
5	40	939.62	.62	.66	286	246	243	55	54	81	83	1.6	7
	45	~~94~~ 942.94	.63	.66	286	246	243	55	55	81	84	1.6	7
6	50	946.25	~~.62~~ .65	.67	286	246	243	56	56	81	84	1.7	7
	55	949.61	.65	.67	285	246	244	56	~~56~~ 57	82	84	1.7	7
7	60	952.97	.58	.64	285	246	243	56	59	82	85	1.5	7
	65	956.27	.62	.66	285	246	244	57	61	82	85	1.6	7
8	70	959.60	.65	.67	286	246	243	57	63	82	85	1.7	7
	75	963.00	.67	.69	286	246	243	57	63	82	85	1.7	7
9	80	966.46	.74	.72	285	246	243	58	54	83	85	1.9	8
	85	970.04	.69	.70	285	247	243	58	54	83	85	1.8	7.5
10	90	973.56	.73	.72	285	247	243	58	53	83	85	1.9	8
	95	977.34	.75	.73	284	247	243	58	54	83	85	1.9	8
11	100	980.97	.73	.71	284	247	243	59	55	83	85	1.8	7.5

Traverse: 2		
Start Time: 11:12	Initial Leak Check: 0.009	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.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11/19	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 ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	984.57	.72	.71	284	247	243	59	56	83	85	1.8	7.5
12	110	988.13	.73	.72	284	247	243	59	59	83	85	1.8	7.5
	115	991.73	.73	.72	284	247	243	59	57	83	85	1.8	7.5
	120	995.33											

Traverse: 2		
Start Time:	Initial Leak Check: cfm@ "Hg	
Finish Time: ~~11:08~~ 1314	Final Leak Check: .008 cfm@ 15 "Hg	

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

Project No.: 21960

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	Sept 11, 2019
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21960
Page	1 of 5
Probe No.:	6D
Meter Box No.:	T2
Impinger Box No.:	12

Pitot Factor	.849	
DGMCF	0.997	
Barometric Pressure	29.76	"Hg
Static Pressure	-10.1	"H2O
Nozzle Size	.2506	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	669.0	g
WCBDA	18.2	g

Combustion Gas Concentration

Oxygen	8.10	%
Carbon Dioxide	11.03	%
Carbon Monoxide	14.9	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	SP. 4
Trendicator	COE 20092
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	-
Barometer	ENV.CAN
Calipers	

Nozzle Measurements	
1	.2495
2	.2520
3	.2515
4	.2495
Average:	.2506

Notes:

Field Data Sheet

Date: Sept 11, 2019	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 ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	9.45	.72	.70	279	258	249	68	67	78	79	1.65	7
	5	12.83	.78	.73	281	256	250	65	60	78	78	1.8	7
2	10	16.42	.74	.71	282	256	250	56	56	78	78	1.75	7
	15	20.02	.73	.71	282	256	250	53	53	78	79	1.7	7
3	20	23.63	.71	.70	283	256	250	51	53	78	79	1.6	7
	25	27.13	.72	.70	283	256	251	50	55	78	80	1.65	7
4	30	30.64	.65	.67	284	256	251	50	52	80	80	1.5	7
	35	33.91	.67	.68	284	256	251	50	54	80	81	1.5	7
5	40	37.38	.64	.66	284	256	252	51	54	79	81	1.5	7
	45	40.72	.64	.66	285	257	251	51	55	79	82	1.5	7
6	50	44.02	.57	.63	285	257	251	52	54	80	82	1.3	7
	55	47.14	.57	.63	285	257	251	52	53	80	83	1.3	7
7	60	50.26	.59	.64	285	257	251	52	54	80	83	1.3	7
	65	53.38	.60	.64	286	257	251	53	55	81	84	1.35	7
8	70	56.51	.59	.64	286	257	251	53	52	81	84	1.35	7
	75	59.64	.60	.64	286	257	251	54	50	81	84	1.35	7
9	80	62.80	.61	.65	286	257	251	54	47	81	84	1.4	7
	85	66.03	.61	.65	286	257	252	53	46	82	84	1.4	7
10	90	69.27	.58	.63	285	257	251	49	47	82	85	1.3	7
	95	72.48	.59	.64	285	252	252	47	46	82	65	1.3	~~7~~ 6.5
11	100	75.65	.56	.62	282	257	251	47	47	82	85	1.3	6.5

Traverse: 1			
Start Time: 13:28	Initial Leak Check: 0.003	cfm@ 11	"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.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11, 2019	Plant:	Covanta DYEC	Test No.:	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	78.82	.55	.62	282	257	251	47	47	82	85	1.25	6.5
12	110	81.98	.53	.61	281	257	251	47	45	82	85	1.2	6.5
	115	85.05	.51	.60	278	257	251	47	46	82	85	1.2	6.5
	120	88.13											

Traverse: 1				
Start Time:	Initial Leak Check:	~~0.0~~	cfm@	"Hg
Finish Time: 15:28	Final Leak Check:	0.002	cfm@ 15	"Hg

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

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11, 2019	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 ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	88.40	.72	.71	284	256	251	57	39	83	84	1.7	7
	5	91.88	.7	.7	285	256	252	50	56	83	85	1.7	7
2	10	95.43	.76	.73	285	257	252	50	52	83	84	1.7	7
	15	99.005	.76	.73	285	257	252	50	53	83	85	1.8	7
3	20	102.67	.74	.73	285	257	252	51	53	83	84	1.7	7
	25	106.29	.75	.72	285	257	252	51	51	83	84	1.7	7
4	30	109.91	.72	.71	286	257	252	51	52	83	85	1.7	7
	35	113.52	.70	.70	286	257	252	52	53	83	85	1.6	7
5	40	117.10	.66	.68	285	257	252	52	52	83	85	1.5	7
	45	120.53	.66	.68	285	257	252	52	52	83	85	1.5	7
6	50	123.99	.59	.64	285	257	252	52	52	83	85	1.35	7
	55	127.26	.59	.64	286	258	252	53	50	83	85	1.35	7
7	60	130.52	.64	.67	287	258	253	54	52	83	86	1.5	7
	65	133.87	.66	.68	287	258	253	54	52	84	86	1.5	7
8	70	137.23	.68	.69	287	259	253	54	53	84	86	1.6	7
	75	140.64	.68	.69	287	258	252	54	53	84	87	1.6	7
9	80	144.04	.68	.69	288	258	252	54	56	84	87	1.6	7
	85	147.45	.68	.69	287	258	252	54	55	84	87	1.6	7
10	90	150.86	.70	.70	287	258	252	54	54	84	87	1.65	7.5
	95	154.32	.70	.70	287	258	252	54	51	84	87	1.65	7.5
11	100	157.82	.63	.66	286	258	252	55	49	85	87	1.5	7.5

Traverse: 2				
Start Time: 15:36	Initial Leak Check:	0.002 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.: 21960

Operator : DH

Field Data Sheet

Date: Sept 11, 2019	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 ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	161.26	.66	.68	284	258	252	55	49	85	87	1.55	7
12	110	164.70	.65	.67	285	258	252	55	52	85	87	1.5	7.5
	115	168.13	.64	.67	283	258	252	56	51	85	87	1.5	7.5
	120	171.535											

Traverse: 2
Start Time:
Finish Time: 17:36
Initial Leak Check: cfm@ "Hg
Final Leak Check: 0.002 cfm@ 20 "Hg

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

Project No.: 21960
Operator : DH

ORTECH Environmental

Plant		Covanta DYEC	
Plant Location		Courtice, Ontario	
Test No.:	3	Semi-Volatile Organic Compounds	
Test Date	Sept 12 2019		
Test Location		APC Outlet No. 2	
Operator Signature		DH	

Project No.:	21960	
Page	1 of 5	
Probe No.:	6B	
Meter Box No.:	T2	
Impinger Box No.:	15	

Pitot Factor	.850	
DGMCF	.997	
Barometric Pressure	~~28.82~~ 29.95	"Hg
Static Pressure	-9.8	"H2O
Nozzle Size	.2530	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	656.7	g
WCBDA	13.7	g

Combustion Gas Concentration

Oxygen	8.31	%
Carbon Dioxide	10.95	%
Carbon Monoxide	13.3	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot	6B / 57A
Trendicator	COE20092
Control Box	COE20092
Incline Manometer	COE20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements

1 .2545
2 .2530
3 .2525
4 .2520
Average: .2530

Notes:

Field Data Sheet

Date: Sept 12 2019	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 *
1	0	253.78	.74	.71	278	257	272	66	41	69	71	1.7	4.5
	5	257.26	.73	.71	283	254	247	52	41	69	70	1.7	5
2	10	260.74	.75	.72	283	259	247	50	41	69	70	1.7	5
	15	264.20	.74	.71	283	254	246	49	41	69	71	1.75	5
3	20	267.77	.73	.71	283	255	245	48	41	69	71	1.7	5
	25	271.34	.72	.70	283	260	252	48	42	70	72	1.7	5
4	30	274.88	.67	.68	283	257	247	48	42	70	73	1.6	5
	35	278.34	.69	.69	283	258	248	49	42	70	73	1.6	5
5	40	281.77	.65	.67	283	260	249	49	42	70	73	1.6	5.5
	45	285.14	.66	.67	283	261	249	49	42	71	74	1.5	5
6	50	288.51	.59	.64	283	259	250	49	42	71	74	1.35	5
	55	291.71	.60	.64	283	259	250	50	~~42~~ 41	71	74	1.4	5
7	60	294.92	.58	.63	284	260	249	50	42	71	74	1.3	5
	65	298.09	.59	.64	284	256	250	51	42	72	75	1.4	5
8	70	301.25	.66	.68	284	256	249	51	43	72	75	1.5	5
	75	304.55	.67	.68	285	260	250	52	44	72	76	1.55	5
9	80	307.91	.69	.69	285	256	252	52	45	72	76	1.6	5
	85	311.33	.62	.67	286	256	249	52	46	73	76	1.4	5.5
10	90	314.60	.71	.70	286	257	251	52	46	73	76	1.7	5.5
	95	318.04	.70	.70	283	258	251	53	48	73	76	1.7	6
11	100	321.54	.7	.70	277	258	249	54	48	73	76	1.7	6

Traverse:			
Start Time: ~~10:5~~ 11:05	Initial Leak Check: .005	cfm@ 15.5	"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.: 21960

Operator : DH

Field Data Sheet

Date: Sept 12, 2019	Plant:	Covanta DYEC	Test No.: 3	SVOC	
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	325.04	.73	.72	276	256	249	54	47	73	76	1.7	6
12	110	328.54	.68	.69	277	255	250	55	46	73	76	1.6	6
	115	332.01	.75	.72	276	256	250	55	45	73	76	1.8	6
	120	335.65											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 1:05	Final Leak Check: 0.003	cfm@ 16	"Hg

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

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept.12/19	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	336.15	.71	.70	282	258	252	66	43	74	~~9~~75	1.7	6
	5	339.66	.70	.70	282	259	252	52	43	74	75	1.7	6
2	10	343.23	.70	.70	282	257	250	49	44	74	74	1.6	6
	15	346.76	~~.75~~ .77	.72	282	260	253	48	45	74	75	1.8	6.5
3	20	350.38	.74	.72	282	256	251	48	45	74	76	1.7	6.5
	25	354.02	.77	.73	283	259	251	49	44	74	76	1.8	6.5
4	30	357.67	.71	.70	283	260	250	49	45	74	76	1.7	6.5
	35	361.27	.71	.70	283	258	260	50	45	74	76	1.7	6.5
5	40	364.86	.66	.68	283	262	251	51	45	74	76	1.5	6
	45	368.36	.64	.67	283	257	249	52	45	74	76	1.5	6
6	50	371.76	.56	.62	283	262	252	52	45	74	76	1.3	5.5
	55	374.95	.56	.62	283	260	245	53	44	74	76	1.3	5.5
7	60	378.11	.57	.63	283	261	252	54	43	74	76	1.3	5.5
	65	381.28	.57	.63	282	260	251	53	44	74	76	1.3	5.5
8	70	384.45	.62	.66	282	261	253	54	44	74	77	1.4	6
	75	387.73	.65	.67	282	259	249	54	47	74	77	1.5	6
9	80	391.09	.65	.67	283	261	254	54	46	75	78	1.5	6
	85	394.54	.66	.68	283	256	246	54	47	75	77	1.5	6
10	90	397.97	.65	.67	283	261	248	55	47	75	77	1.5	6
	95	401.39	~~.65~~ .64	.67	283	260	253	55	47	75	77	1.5	6
11	100	404.79	.65	.67	283	261	254	56	48	75	77	1.5	6

Traverse: 2		
Start Time: 1319	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.: 21960

Operator : K C.

Field Data Sheet

Date: Sept. 12/19	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 ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
	105	408.22	.65	.67	281	260	249	56	49	75	77	1.5	6
12	110	411.63	.55	.62	281	260	251	55	49	75	77	1.3	6
	115	414.77	.52	.60	280	256	255	55	48	75	77	1.2	5.5
	120	417.80											

Traverse: 2			
Start Time: ~~1519~~	Initial Leak Check:	cfm@	"Hg
Finish Time: 1519	Final Leak Check: 0.004	cfm@ 14	"Hg

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

Project No.: 21960

Operator : K. C.

APPENDIX 7

Acid Gas Field Data Sheets
(14 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T1
Test Date	Sep 9/19
Test Location	APC Outlet No. 1
Operator Signature	AS

Project No.:	21960	
Page	1 of 3	
Probe No.:		
Meter Box No.:	Team 1	
Impinger Box No.:	14	

Pitot Factor	SP4 .0849	
DGMCF	1.016	
Barometric Pressure	30.04	"Hg
Static Pressure	-8.7	"H2O
Nozzle Size	.2506	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	300.2	g
WCBDA	21.0	g

Combustion Gas Concentration

Oxygen	8.13	%
Carbon Dioxide	11.22	%
Carbon Monoxide	9.9	ppm

Measuring Device	MII Numbers
Probe / Pitot SP4	B04011
Trendicator Team 1	COE 20094
Control Box	COE 20094
Incline Manometer	COE 20094
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Nozzle Measurements	
1	.2495
2	.2520
3	.2515
4	.2495
Average:	.2506

Site Diagram

Notes:

Field Data Sheet

Date: Sept 9/19	Plant: Covanta DYEC	Test No.: 1 M26A	Page 2 of 3
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/~~Trap~~ °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	18.04	.77	.67	282	258	252	59	85	60	59	1.7	3
2	5	21.52	.77	.67	284	255	258	46	253	61	59	1.6	3
3	10	24.84	.73	.65	284	255	257	45	254	61	59	1.5	3
4	15	28.06	.65	.62	284	245	257	46	255	64	59	1.4	2.5
5	20	31.18	.59	.59	284	246	257	48	258	65	59	1.3	2.5
6	25	34.23	.53	.56	283	246	258	49	258	68	60	1.1	2
7	30	37.20	.59	.59	283	247	257	47	258	69	60	1.2	2
8	35	40.11	.60	.60	283	247	259	45	259	70	61	1.3	2
9	40	43.12	.60	.60	283	247	258	44	259	71	61	1.3	2
10	45	46.13	.59	.59	281	247	258	43	260	72	62	1.3	2
11	50	49.19	.52	.56	281	247	258	44	260	74	63	1.1	2
12	55	52.01	.51	.55	281	247	259	47	257	73	63	1.1	2
	60	54.83											

Traverse: L			
Start Time: 8:11	Initial Leak Check: .004 cfm@ 15 "Hg
Finish Time: 9:11	Final Leak Check: .003 cfm@ 14 "Hg

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

Project No.: 21960
Operator : AS

Field Data Sheet

Date: Sept 9/9	Plant: Covanta DYEC	Test No.: 1	M26A	Page 3 of 3
	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	55.31	.73	.66	282	248	259	50	171	69	64	1.6	3
2	5	58.73	.77	.68	284	247	260	42	261	71	66	1.6	3
3	10	62.16	.77	.68	286	247	259	41	261	73	65	1.6	3
4	15	65.60	.68	.64	286	248	259	41	260	75	66	1.5	3
5	20	68.83	.59	.60	285	248	259	40	260	75	66	1.3	2.5
6	25	71.84	.56	.58	284	248	260	40	259	76	66	1.2	2.5
7	30	74.75	.59	.60	283	248	259	41	259	76	66	1.3	2.5
8	35	77.69	.61	.61	284	248	260	41	258	76	67	1.3	2.5
9	40	80.74	.69	.65	284	248	260	42	257	72	68	1.6	3
10	45	84.05	.64	.62	284	248	261	42	262	71	68	1.4	3
11	50	87.19	.65	.63	284	247	262	44	262	69	70	1.4	3
12	55	90.33	.65	.63	284	248	261	44	262	70	69	1.4	3
	60	93.51											

Traverse:					
Start Time:	9:19	Initial Leak Check:	.002	cfm@ 15	"Hg
Finish Time:	10:28	Final Leak Check:	.002	cfm@ 16	"Hg

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

paused @ ~~10:00~~ 9:55
restarted @ 10:04

Project No.: 21960
Operator: AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A T2
Test Date	Sept 9/19
Test Location	APC Outlet No. 1
Operator Signature	AB

Project No.:	21960
Page	1 of 2
Probe No.:	
Meter Box No.:	Team 1
Impinger Box No.:	14

Pitot Factor	.849	
DGMCF	1.018	
Barometric Pressure	30.04	"Hg
Static Pressure	-8.7	"H2O
Nozzle Size	.2506	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	183.5	g
WCBDA	12.7	g

Combustion Gas Concentration

Oxygen	8.30	%
Carbon Dioxide	11.01	%
Carbon Monoxide	7.0	ppm

see T1

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

see T1

Nozzle Measurements
1 ____
2 ____
3 ____
4 ____
Average:

Site Diagram

Notes:

Field Data Sheet

Date: Sep 9/19	Plant: Covanta DYEC	Test No.: M26A T2	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

NW

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	94.07	.63	.62	280	236	247	61	67	69	68	1.4	2
2	5	97.29	.65	.62	286	251	253	52	262	68	66	1.4	2
3	10	100.36	.70	.65	283	249	256	52	252	68	67	1.6	2.5
4	15	103.63	.70	.65	286	248	256	53	255	69	67	1.6	2.5
5	20	106.91	.68	.64	287	249	256	56	258	70	67	1.5	2.5
6	25	110.14	.74	.67	287	248	256	57	260	70	66	1.6	3
7	30	113.53	.74	.67	288	248	258	62	262	72	67	1.6	3
8	35	116.92	.70	.65	288	248	255	55	262	72	67	1.6	3
9	40	120.30	.70	.65	288	248	256	52	265	72	67	1.6	3
10	45	123.65	.76	.68	287	247	253	50	266	72	67	1.7	3
11	50	127.10	.81	.70	287	248	258	48	267	73	68	1.8	3
12	55	130.70	.82	.70	286	247	257	48	270	73	68	1.8	3
	60	134.52											

Traverse:	2			
Start Time:	11:19	Initial Leak Check:	.003 cfm@	16 "Hg
Finish Time:	12:19	Final Leak Check:	.003 cfm@	15 "Hg

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

Project No.: 21960

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.: T3	M26A	
Test Date	Sep 9/19	
Test Location	APC Outlet No. 1	
Operator Signature	AS	

Project No.:	21960	
Page	1 of 2	
Probe No.:		
Meter Box No.:		
Impinger Box No.:		

Pitot Factor	0.849	
DGMCF	1.018	
Barometric Pressure	30.02	"Hg
Static Pressure	-8.7	"H2O
Nozzle Size	0.2506	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	159.7	g
WCBDA	12.7	g

Combustion Gas Concentration

Oxygen	8.18	%
Carbon Dioxide	11.28	%
Carbon Monoxide	9.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements

1 ____________
2 ____________
3 ____________
4 ____________
Average:

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: Sep 9/19	Plant: Covanta DYEC	Test No.: 13 M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time *	Dry Gas Meter ft³ *	Pitot Δ P "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure Δ H "H_2O *	Pump Vacuum "Hg Gauge *
1	0	35.47	.59	.60	280	249	258 ~~249~~	68 ~~258~~	142	71	69	1.3	2
2	5	38.56	.59	.60	280	247	259	51	268	70	69	1.3	2
3	10	41.55	.61	.61	275	247	259	51	269	70	69	1.3	2.5
4	15	44.61	.63	.62	280	247	259	53	269	71	69	1.4	2.5
5	20	47.79	.63	.62	282	248	260	55	271	72	69	1.4	2.5
6	25	50.95	.61	.61	282	247	259	59	270	73	69	1.3	2
7	30	54.06	.57	.59	282	248	260	62	272	74	69	1.3	2
8	35	57.06	.60	.61	282	246	259	66	272	74	69	1.3	2
9	40	60.07	.61	.61	283	248	260	64	264	75	69	1.4	2
10	45	63.17	.68	.64	283	248	262	60	252	75	69	1.6	2.5
11	50	66.39	.79	.69	284	247	262	63	245	76	71	1.8	3
12	55	69.90	.82	.71	283	248	264	64	247	76	71	1.9	3
	60	73.72											

Traverse: 1			
Start Time: 13:02 59	Initial Leak Check: .002 cfm@ 16 "Hg	Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time: 14:07	Final Leak Check: .002 cfm@ 16 "Hg	Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21960

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC	
Plant Location	Courtice, Ontario	
Test No.:	M26A 1	
Test Date	Sept 9/19	
Test Location	APC Outlet No. 2	
Operator Signature	[signature]	

Project No.:	21960	
Page	1 of 3	
Probe No.:	6	
Meter Box No.:	T3	
Impinger Box No.:	3	

Pitot Factor	0.851	
DGMCF	1.017	
Barometric Pressure	~~29.9~~ 30.04	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	.2553	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	320.0	g
WCBDA	21.0	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	11.17	%
Carbon Monoxide	15.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP2
Trendicator	
Control Box	COE 20073
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	.255
2	.256
3	.255
4	.245
Average:	.2553

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 9/19	Plant:	Covanta DYEC	Test No.: 1	M26A	Page 2 of 3
	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 *
		~~[illegible]~~ 424.16											
1	0	~~[illegible]~~	.69	.69	273	241	239	59	60	59	59	1.7	2
2	5	428.06	.74	.71	286	244	244	49	65	62	63	1.8	2
3	10	431.48	.71	.69	287	243	244	48	65	62	63	1.8	2
4	15	434.91	.69	.68	287	243	243	45	64	62	64	1.7	2
5	20	438.29	.65	.66	288	243	243	45	65	62	64	1.6	3
6	25	441.59	.59	.63	288	244	243	45	65	63	66	1.5	3
7	30	444.79	.64	.66	288	243	243	45	215	63	66	1.6	3
8	35	448.09	.63	.66	288	244	243	46	217	64	67	1.6	3
9	40	451.31	.62	.65	288	244	243	45	216	64	68	1.6	3
10	45	454.55	.63	.66	288	244	243	46	216	65	69	1.6	3
11	50	457.79	~~.61~~ .62	.65	286	244	243	46	216	65	69	1.6	3
12	55	461.04	.35	.49	219	243	244	47	216	66	70	0.84	2
	60	463.53											

Traverse: 1			
Start Time: 858	Initial Leak Check: ~~0.001~~ 0.002	cfm@ 19	"Hg
Finish Time: 958	Final Leak Check: 0.012	cfm@ 18	"Hg

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

Project No.: 21960

Operator : DH

Field Data Sheet

Date: Sept 9/19	Plant:	Covanta DYEC	Test No.:	1	M26A	Page 3 of 3
	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	464.675	.72	0.71	273	243	247	60	130	67	67	1.8	3
2	5	468.44	.71	0.70	284	243	244	48	219	67	68	1.8	3
3	10	471.86	.69	.69	284	243	244	48	220	67	68	1.75	3
4	15	475.29	.64	.67	284	243	244	50	220	67	~~8~~ 70	1.65	3
5	20	478.61	~~6~~ .57	.63	284	243	242	51	219	68	70	1.5	3
6	25	481.89	.45	.56	284	243	243	53	218	68	71	1.15	3 ~~2~~
7	30	484.64	.55	.62	285	243	243	55	218	68	72	1.4	3
8	35	487.65	.58	.64	285	243	243	57	218	68	72	1.5	3
9	40	490.80	.6	.65	285	243	242	60	219	69	73	1.5	3
10	45	493.96	.63	.66	284	243	242	60	219	69	73	1.6	3
11	50	497.21	.59	.65	266	243	242	59	220	69	74	1.55	3
12	55	500.55	.59		254	242	241	59	220	70	74	1.6	3
	60	503.655											

Traverse: 2			
Start Time: 10:30	Initial Leak Check: 0.016	cfm@ 13	"Hg
Finish Time: 11:30	Final Leak Check: 0.02	cfm@ 12	"Hg

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

Project No.: 21960

Operator : DH

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T42	M26A
Test Date	Sept 10/19
Test Location	APC Outlet No. 2
Operator Signature	AS

Project No.:	21960	
Page	1 of 2	
Probe No.:		
Meter Box No.:	Team 3	
Impinger Box No.:	14	

Pitot Factor	.849	
DGMCF	1.017	
Barometric Pressure	29.97	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2506	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	148.1	g
WCBDA	10.2	g

Combustion Gas Concentration

Oxygen	8.31	%
Carbon Dioxide	11.11	%
Carbon Monoxide	9.9	ppm

Site Diagram

Measuring Device	MII Numbers
Probe / Pitot SP4	B04011
Trendicator	
Control Box Team3	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	EnvCan
Calipers	

Nozzle Measurements	
1	.2495
2	.2520
3	.2515
4	.2495
Average:	.2506

Notes:

Field Data Sheet

Date: Sept 10/19	Plant:	Covanta DYEC	Test No.: TD	M26A	Page 2 of 2
	Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	M26A Clock Time *	Dry Gas Meter ft^3 *	Pitot Δ P "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure Δ H "H_2O *	Pump Vacuum "Hg Gauge *
1	0	31.35	.82	.70	286	245	239	63	61	64	64	1.7	3
2	5	35.28	.86	.71	288	242	240	47	206	65	65	1.8	3
3	10	38.85	.80	.69	289	244	241	47	201	65	65	1.7	3
4	15	42.16	.74	.66	289	243	242	47	216	65	67	1.6	3
5	20	45.42	.66	.63	289	243	242	48	218	66	68	1.5	3
6	25	48.62	.61	.61	288	243	241	49	219	67	70	1.34	2.5
7	30	51.68	.60	.60	288	244	241	49	218	67	71	1.4	2.5
8	35	54.73	.62	.61	287	244	241	50	218	68	72	1.4	2.5
9	40	57.86	.62	.61	287	244	247	51	219	68	73	1.4	2.5
10	45	61.01	.62	.62	286	244	241	53	219	69	75	1.4	3
11	50	64.15	.57	.59	286	246	241	55	220	69	74	1.3	2.5
12	55	67.19	.58	.60	286	245	240	58	219	70	74	1.3	2.5
	60	70.18											

Traverse: 2			
Start Time: 8:05	Initial Leak Check: .004	cfm@ 14	"Hg
Finish Time: 9:05	Final Leak Check: .004	cfm@ 14	"Hg

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

26A 13 U1 => 158.8 U2 26A 320.0
12.7 T1 21.0

Project No.: 21960
Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: T3	M26A
Test Date	Sept 10 2019
Test Location	APC Outlet No. 2
Operator Signature	AS

Project No.:	21960	
Page	1 of 2	
Probe No.:		
Meter Box No.:	~~#~~ Team 3	
Impinger Box No.:	14	

Pitot Factor	.849	
DGMCF	1.017	
Barometric Pressure	29.95	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2506	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

see T2

Moisture Gain

CWTR	135.7	g
WCBDA	10.6	g

Combustion Gas Concentration

Oxygen	8.27	%
Carbon Dioxide	11.04	%
Carbon Monoxide	9.3	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements
1
2
3
4
Average:

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 10/19	Plant: Covanta DYEC	Test No.: 3	M26A	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	M26A Clock Time *	Dry Gas Meter ft³ *	Pitot Δ P "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure Δ H "H_2O *	Pump Vacuum "Hg Gauge *
1	0	70.92	.66	.63	283	248	245	68	77	71	71	1.5	2.5
2	5	74.14	.65	.63	284	245	245	66	118	71	72	1.5	2.5
3	10	77.28	.74	.67	285	246	245	60	227	71	73	1.7	3
4	15	80.65	.70	.66	285	246	245	59	228	72	74	1.6	3
5	20	84.01	.67	.64	286	246	244	58	228	72	75	1.6	3
6	25	87.26	~~.6~~.59	.60	287	246	244	58	228	73	77	1.4	2.5
7	30	90.28	.64	.63	287	246	244	58	227	73	77	1.5	2.5
8	35	93.50	.63	.62	287	247	244	59	227	73	78	1.5	2.5
9	40	96.65	.64	.63	287	247	244	62	227	74	78	1.5	2.5
10	45	99.85	.63	.63	287	246	244	60	227	74	79	1.5	2.5
11	50	103.04	.60	.61	286	246	243	59	226	74	79	1.4	2.5
12	55	106.17	.60	.61	286	246	243	59	225	75	79	1.4	2.5
	60	109.27											

Traverse: ~~9:50~~ 1			
Start Time: 9:50	Initial Leak Check: .003	cfm@ 15	"Hg
Finish Time: 10:50	Final Leak Check: .003	cfm@ 15	"Hg

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

Project No.: 21960

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	0.989	92.25	114.80	22.55	29.95	0.80	41.8	21.18	0.0212
1-2	0.989	15.30	36.40	21.10	29.95	0.80	42.0	19.80	0.0198
1-3	0.989	36.80	59.60	22.80	29.95	0.80	42.6	21.36	0.0214
1-4	0.989	60.10	84.60	24.50	29.95	0.80	43.2	22.90	0.0229
2-1	0.989	84.90	108.50	23.60	29.95	0.80	43.0	22.08	0.0221
2-2	0.989	9.60	33.60	24.00	29.95	0.80	43.2	22.44	0.0224
2-3	0.989	34.10	57.20	23.10	29.95	0.80	44.4	21.51	0.0215
2-4	0.989	57.70	79.00	21.30	29.95	0.80	43.8	19.88	0.0199
3-1	0.989	79.20	100.60	21.40	29.96	0.80	43.6	19.99	0.0200
3-2	0.989	100.90	124.20	23.30	29.96	0.80	43.8	21.75	0.0217
3-3	0.989	124.40	148.80	24.40	29.96	0.80	44.2	22.75	0.0227
3-4	0.989	149.90	173.90	24.00	29.96	0.80	45.0	22.32	0.0223

* 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	0.995	274.00	295.00	21.00	29.78	2.00	34.0	20.29	0.0203
1-2	0.995	296.10	316.80	20.70	29.78	2.00	34.0	20.00	0.0200
1-3	0.995	317.10	337.60	20.50	29.78	2.00	34.4	19.78	0.0198
1-4	0.995	337.90	358.80	20.90	29.78	2.00	34.6	20.15	0.0202
2-1	0.995	359.20	380.30	21.10	29.76	2.00	35.2	20.29	0.0203
2-2	0.995	380.70	401.90	21.20	29.76	2.00	35.6	20.36	0.0204
2-3	0.995	402.40	424.00	21.60	29.76	2.00	36.0	20.72	0.0207
2-4	0.995	424.20	445.50	21.30	29.76	2.00	36.6	20.39	0.0204
3-1	0.995	446.90	468.00	21.10	29.75	2.00	36.6	20.19	0.0202
3-2	0.995	468.40	489.60	21.20	29.75	2.00	36.8	20.28	0.0203
3-3	0.995	490.75	512.10	21.35	29.75	2.00	36.8	20.42	0.0204
3-4	0.995	513.70	535.00	21.30	29.75	2.00	37.0	20.36	0.0204

* Dry at 25°C and 1 atmosphere

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE		Vost #4
Plant Location: Courtice, ON	Test No: 1		Control Box ID: A11542
Test location: APC Outlet No. 1	DGMCF: 0.989		Operator: JG
Date: SEPTEMBER 12, 2019	Barometric Pressure: 29.95 "Hg		Project No: 21960
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 26A 26B	L2326507-91

Tube Pair 1 Start Time: 1206		Initial Leak Check NDL @ 14 "Hg				Sample ID: 14A 14B	
Tube Pair 1 End Time: 1226		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-79	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	4892.25	123	141	15	40	0.8	5
5	4898.65	126	142	13	41	0.8	5
10	4904.40	126	141	10	42	0.8	5
15	4909.70	127	142	8	43	0.8	5
20	4914.8	126	141	8	43	0.8	5

Tube Pair 2 Start Time: 1230		Initial Leak Check NDL @ 14 "Hg				Sample ID: 15A, 15B	
Tube Pair 2 End Time: 1250		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-80	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	4916.3	125	141	10	39	.8	5
5	4921.0	126	141	10	42	.8	5
10	4926.2	126	141	9	43	.8	5
15	4931.3	126	141	9	43	.8	5
20	4936.4	126	141	9	43	.8	5

Tube Pair 3 Start Time: 1254		Initial Leak Check NDL @ 13.5 "Hg				Sample ID: 16A 16B	
Tube Pair 3 End Time: 1314		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-81	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	4936.8	124	139	10	40	.8	6.5
5	4941.9	126	140	9	42	.8	6.5
10	4948.25	126	140	8	44	.8	6.5
15	4954.20	127	140	9	43	.8	6.5
20	4959.60	126	141	8	45	.8	6.5

Tube Pair 4 Start Time: 1319		Initial Leak Check NDL @ 14 "Hg				Sample ID: 17A 17B	
Tube Pair 4 End Time: 1339		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-82	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	4960.1	125	139	9	40	.8	4.5
5	4966.5	126	139	7	43	.8	4.5
10	4972.7	127	140	9	43	.8	4.5
15	4978.7	126	140	8	45	.8	4.5
20	4984.6	126	140	8	45	.8	4.5

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE	Vost #4
Plant Location Courtice, ON	Test No: 2	Control Box ID: A11542
Test location: APC Outlet No. 1	DGMCF: 0.989	Operator: JG
Date: SEPTEMBER 12 2019	Barometric Pressure: "Hg	Project No: 21960
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak 29.95	Field Blank Pair ID: 26A 26B L2326507-91

Tube Pair 1 Start Time: 1343	Initial Leak Check NDL @ 14 "Hg	Sample ID: 18A 18B
Tube Pair 1 End Time: 1403	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-83

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	4984.9	125	138	8	41	0.8	4.5
5	4991.2	125	138	8	41	0.8	4.5
10	4997.1	126	139	8	45	0.8	4.5
15	5002.7	127	139	8	44	0.8	4.5
20	5008.5	125	139	9	44	0.8	4.5

Tube Pair 2 Start Time: 1410	Initial Leak Check NDL @ 14 "Hg	Sample ID: 19A 19B
Tube Pair 2 End Time: 1430	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-84

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	500.96	125	138	10	40	.8	5
5	5016.9	126	140	9	43	.8	5
10	5022.2	127	140	10	44	.8	5
15	5028.5	127	140	10	44	.8	5
20	5033.6	126	140	9	45	.8	5

Tube Pair 3 Start Time: 1434	Initial Leak Check NDL @ 13.5 "Hg	Sample ID: 20A 20B
Tube Pair 3 End Time: 1454	Final Leak Check @ 14 "Hg	Lab ID: L2326507-85

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5034.1	124	140	11	44	.8	4.5
5	5040.3	125	140	10	44	.8	4.5
10	5046.0	126	141	10	44	.8	4.5
15	5051.7	126	141	10	45	.8	4.5
20	5057.2	126	141	10	45	.8	4.5

Tube Pair 4 Start Time: 1459	Initial Leak Check NDL @ 14 "Hg	Sample ID: 21A 21B
Tube Pair 4 End Time: 1519	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-86

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5057.7	126	140	12	42	.8	4.5
5	5063.1	126	140	11	43	.8	5.0
10	5068.1	126	140	12	44	.8	5.5
15	5073.4	126	140	11	45	.8	5.5
20	5079.0	127	140	11	45	.8	5.5

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE	Vost #4
Plant Location Courtice, ON	Test No: 3	Control Box ID: A11542
Test location: APC Outlet No. 1	DGMCF: 0.989	Operator: KG
Date: SEPTEMBER 12, 2019	Barometric Pressure: 29.96 "Hg	Project No: 21960
~ 1 LPM for 20 minutes / NDL - No Dectectable Leak		Field Blank Pair ID: 26A 26B L2326507-91

Tube Pair 1 Start Time: 1522	Initial Leak Check NDL @ 14 "Hg	Sample ID: 22A 22B
Tube Pair 1 End Time: 1542	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-87

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5079.2	124	138	11	41	.8	5.0
5	5085.1	127	139	11	43	.8	5.0
10	5090.3	126	139	11	45	.8	5.0
15	5095.4	126	139	12	44	.8	5.0
20	5100.6	126	139	11	45	.8	5.0

Tube Pair 2 Start Time: 1546	Initial Leak Check NDL @ 14 "Hg	Sample ID: 23A 23B
Tube Pair 2 End Time: 1606	Final Leak Check @ 15 "Hg	Lab ID: L2326507-88

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5100.9	125	138	11	41	.8	4.5
5	5107.2	126	138	12	44	.8	4.5
10	5112.7	126	139	12	44	.8	4.5
15	5117.8	125	139	11	45	.8	4.5
20	5124.2	127	139	10	45	.8	4.5

Tube Pair 3 Start Time: 1610	Initial Leak Check NDL @ 15 "Hg	Sample ID: 24A 24B
Tube Pair 3 End Time: 1630	Final Leak Check NDL @ 15 "Hg	Lab ID: L2326507-88

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5124.4	125	138	12	41	0.8	4.5
5	5131.1	126	139	11	44	0.8	4.5
10	5137.3	127	139	11	45	0.8	4.5
15	5143.5	126	139	11	45	0.8	4.5
20	5148.8	126	140	11	46	0.8	4.5

Tube Pair 4 Start Time: 1634	Initial Leak Check NDL @ 18 "Hg	Sample ID: 25A 25B
Tube Pair 4 End Time: 1654	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-89

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	5149.9	125	139	12	42	.8	5
5	5156.3	126	141	12	45	.8	5
10	5162.65	126	140	11	45	.8	5
15	5168.60	127	142	11	45	.8	5
20	5173.90	129	144	11	48	.8	5

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE	
Plant Location Courtice, ON	Test No: 1	Control Box ID: M05498
Test location: APC Outlet No. 2	DGMCF: 0.998	Operator: JG
Date: SEPTEMBER 11, 2019	Barometric Pressure: 29.78 "Hg	Project No: 21960
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 13A 13B

Tube Pair 1 Start Time: 1303	Initial Leak Check NDL @ 15 "Hg	Sample ID: 4A 4B
Tube Pair 1 End Time: 1323	Final Leak Check NDL @ 23 "Hg	Lab ID: L2326507-69

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	274	138	138	16	33	2	4.5
5	279.15	137	138	14	33	2	4.5
10	284.50	140	139	14	36	2	4.5
15	290.0	138	138	13	34	2	5.0
20	295.0	139	138	10	34	2	5.0

Tube Pair 2 Start Time: 1330	Initial Leak Check NDL @ 23 "Hg	Sample ID: 1A 1B
Tube Pair 2 End Time: 1350	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-66

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	296.1	139	138	13	33	2.0	6
5	301.6	139	139	16	33	2.0	7
10	306.8	139	139	11	34	2.0	7
15	311.8	141	140	10	35	2.0	7
20	316.8	141	140	10	35	2.0	7

Tube Pair 3 Start Time: 1355	Initial Leak Check NDL @ 14 "Hg	Sample ID: 2A, 2B
Tube Pair 3 End Time: 1415	Final Leak Check NDL @ 14 "Hg	Lab ID: L2326507-67

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	317.10	138	139	13	34	2.0	5.0
5	322.20	138	139	11	34	2.0	5.5
10	327.50	138	140	11	34	2.0	6.0
15	332.50	141	142	13	35	2.0	6.0
20	337.60	141	142	13	35	2.0	6.0

Tube Pair 4 Start Time: 1420	Initial Leak Check NDL @ 14 "Hg	Sample ID: 3A, 3B
Tube Pair 4 End Time: 1440	Final Leak Check NDL @ 16 "Hg	Lab ID: L2326507-68

Clock Time	Dry Gas Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	~~338~~ 337.9	139	140	15	34	2.0	5.0
5	343.4	138	140	13	34	2.0	5.0
10	348.6	138	140	11	35	2.0	5.0
15	353.6	138	141	11	35	2.0	5.0
20	358.8	138	141	11	35	2.0	5.0

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE		
Plant Location Courtice, ON	Test No: 2	Control Box ID: Mo5498	
Test location: APC Outlet No. 2	DGMCF: 0.995	Operator: JG	
Date: SEPTEMBER 11, 2019	Barometric Pressure: 29.76 "Hg	Project No: 21960	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 13A 13B	

Tube Pair 1 Start Time: 1445		Initial Leak Check NDL @ 16 "Hg				Sample ID: 5A 5B	
Tube Pair 1 End Time: 1505		Final Leak Check NDL @ 13 "Hg				Lab ID: L2326507-70	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	359.20	138	140	13	35	2.0	5.0
5	364.50	139	140	12	35	2.0	5.0
10	369.50	139	140	12	35	2.0	6.0
15	374.80	140	143	13	35	2.0	6.0
20	380.30	139	140	12	36	2.0	6.0

Tube Pair 2 Start Time: 1509		Initial Leak Check NDL @ 13 "Hg				Sample ID: 6A 6B	
Tube Pair 2 End Time: 1529		Final Leak Check NDL @ 22 "Hg				Lab ID: L2326507-71	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	380.7	139	140	13	35	2.0	6.0
5	385.9	138	140	11	35	2.0	6.0
10	391.1	138	140	12	36	2.0	6.0
15	396.5	140	140	11	36	2.0	6.0
20	401.9	141	143	10	36	2.0	6.0

Tube Pair 3 Start Time: 1533		Initial Leak Check NDL @ 13 "Hg				Sample ID: 7A, 7B	
Tube Pair 3 End Time: 1553		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-72	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	402.4	140	140	10	36	2.0	5.0
5	407.7	138	141	10	36	2.0	5.0
10	413.0	138	140	10	36	2.0	5.0
15	418.7	137	141	12	36	2.0	5.0
20	424.0	138	140	12	36	2.0	5.0

Tube Pair 4 Start Time: 1557		Initial Leak Check NDL @ 14 "Hg				Sample ID: 8A 8B	
Tube Pair 4 End Time: 1617		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-73	
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	424.2	138	141	12	36	2.0	5.0
5	429.6	139	140	11	36	2.0	5.0
10	434.6	138	142	12	37	2.0	5.0
15	440.1	138	140	12	37	2.0	5.0
20	445.5	138	140	12	37	2.0	5.0

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC		Test Condition: COMPLIANCE			
Plant Location Courtice, ON		Test No: 3		Control Box ID: M05 498	
Test location: APC Outlet No. 2		DGMCF: 0.995		Operator: JG.	
Date: SEPTEMBER 11, 2019		Barometric Pressure: 29.75 "Hg		Project No: 21960	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak		Field Blank Pair ID: 13A, 13B		

Tube Pair 1 Start Time: 1621		Initial Leak Check NDL @ 14 "Hg				Sample ID: ~~8A~~ 9 ~~8B~~ 9	
Tube Pair 1 End Time: 1641		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-74	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	446.9	139	140	11	36	2.0	5
5	451.20	139	140	12	36	2.0	5
10	456.30	139	140	12	37	2.0	5
15	462.30	139	141	12	37	2.0	5
20	468.00	139	141	12	37	2.0	5

Tube Pair 2 Start Time: 1646		Initial Leak Check NDL @ 14 "Hg				Sample ID: ~~9A~~ 10 ~~9B~~ 10	
Tube Pair 2 End Time: 1706.		Final Leak Check NDL @ 14 "Hg				Lab ID: L2326507-75	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	468.4	139	141	11	36	2.0	7
5	473.9	139	141	11	37	2.0	7
10	479.0	138	141	12	37	2.0	7
15	484.9	138	141	11	37	2.0	7
20	489.6	138	141	11	37	2.0	7

Tube Pair 3 Start Time: 1711		Initial Leak Check NDL @ 14 "Hg				Sample ID: ~~10A~~ 11 ~~10B~~ 11	
Tube Pair 3 End Time: 1731		Final Leak Check NDL @ 23 "Hg				Lab ID: L2326507-76	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	~~489.75~~ 490.75	138	141	11	37	2.0	~~7.5~~
5	495.30	138	141	11	36	2.0	~~7.5~~
10	500.9	137	141	11	37	2.0	5
15	506.5	139	142	13	37	2.0	5
20	512.1	139	142	13	37	2.0	5

Tube Pair 4 Start Time: 1735		Initial Leak Check NDL @ 20 "Hg				Sample ID: 12A 12B	
Tube Pair 4 End Time: 1755		Final Leak Check NDL @ 18 "Hg				Lab ID: L2326507-77	
Clock Time	Dry Gas Meter L	Temperatures Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	513.7	139	142	11	37	~~8.0~~	5
5	519.1	139	141	11	37	~~50~~ 2.0	5
10	524.30	141	142	11	37	2.0	5
15	529.40	138	141	11	37	2.0	5
20	535.0	138	141	11	37	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	1.005	74.70	107.50	32.80	29.93	0.40	30.2	32.45	0.0324
2	1.005	25.35	58.40	33.05	29.93	0.40	41.3	31.53	0.0315
3	1.005	59.90	90.90	31.00	29.94	0.40	43.5	29.39	0.0294

* 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	0.985	164.73	196.57	31.84	29.79	1.00	33.1	30.48	0.0305
2	0.985	202.01	234.56	32.55	29.79	1.00	33.5	31.11	0.0311
3	0.985	537.74	571.27	33.53	29.94	1.00	20.9	33.59	0.0336

* 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 12, 2019
Project No.:	21960

Measuring Device	MII Number
Control Module	VOST #4 A11442
Barometer	

Barometric Pressure: 29.93 "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	4774.7	124	139	131	17	21	.4	2.0
5	4778.2	127	140	137	14	23	.4	2.0
10	4781.0	130	141	138	13	26	.4	2.0
15	4783.8	130	141	140	11	28	.4	2.0
20	4786.6	127	141	140	10	28	.4	2.0
25	4789.25	131	141	140	10	30	.4	2.0
30	4791.80	130	141	141	10	31	.4	2.0
35	4794.2	131	141	140	10	33	.4	2.0
40	4797.0	129	142	141	10	33	.4	2.0
45	4799.8	129	142	141	10	33	.4	2.0
50	4802.1	130	141	137	10	33	.4	2.0
55	4804.8	131	140	139	10	36	.4	2.0
60	4807.5	129	140	139	10	37	.4	2.0

Start Time:	~~0813~~ 0813
Finish Time:	0913
Initial Leak Check:	<.01 Lpm @ 15 " Hg
Final Leak Check:	<.01 Lpm @ 14 " Hg

DGMCF:	1.005
Sample Volume:	32.8
Average DGM Temp:	30
Average DGM Δ H:	.4

Comments:

: sample @ ~0.5 lpm for 60 minutes.

Operator: [signature]

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2 ~~1/2~~ September 12, 2019
Test location:	APC Outlet No. 1
Date:	
Project No.:	21960

Measuring Device	MII Number
Control Module	Vost 4 A11542
Barometer	

Barometric Pressure: 29.93 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
0	4826.35	125	139.	141	15	39	.4	2
5	4829.45	125	139	140	16	39	.4	2
10	4832.0	128	139	141	14	39	.4	2
15	4834.55	128	139	141	13	40	.4	2
20	4837.1	130	139	141	12	41	.4	2
25	4839.65	135	140	141	11	41	.4	2
30	~~4839.65~~ 4842.2	139	140	138	10	41	.4	2.0
35	4845.2	126	140	138	10	42	.4	2.0
40	4847.6	128	140	140	10	42	.4	2.0
45	4850.5	128	141	139	10	42	.4	2.0
50	4853.1	129	143	142	10	43	.4	2.0
55	4855.8	133	140	141	10	44	.4	2.0
60	4858.4	133	140	141	10	44	.4	2.0

Start Time:	0948		
Finish Time:	1048		
Initial Leak Check:	<.01	Lpm @ 14	" Hg
Final Leak Check:	<.01	Lpm @ 14	" Hg

DGMCF:	~~0.989~~ 1.005
Sample Volume:	33.05
Average DGM Temp:	41(3)
Average DGM ΔH:	0.4

Comments: TRAIN #3

: sample @ ~0.5 lpm for 60 minutes.

Operator: [signature]

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 1
Date:	SEPTEMBER 12, 2019
Project No.:	21960

Measuring Device	MII Number
Control Module	Vost 4 A11542
Barometer	

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	4859.9	128	139	141	18	42	.4	2.0
5	4863.0	128	139	141	18	42	.4	2.0
10	4865.6	127	139	144	15	42	.4	2.0
15	4868.3	127	129	141	10	43	.4	2.0
20	4870.9	139	142	141	10	44	.4	2.0
25	4873.5	132	139	141	10	44	.4	2.0
30	4876.2	129	139	144	10	44	.4	2.0
35	4878.4	126	140	141	10	44	.4	2.0
40	4880.1	132	139	143	10	44	.4	2.0
45	4883.0	131	144	144	10	44	.4	2.0
50	4885.7	131	144	144	10	44	.4	2.0
55	4888.50	132	139	144	10	44	.4	2.0
60	4890.90	132	139	144	10	44	.4	2.0

Start Time:	1051
Finish Time:	1151
Initial Leak Check:	<.01 Lpm @ 14 " Hg
Final Leak Check:	<.01 Lpm @ 14 " Hg

DGMCF:	1.005
Sample Volume:	31.0
Average DGM Temp:	43.46
Average DGM Δ H:	0.4

Comments: TRAIN #1

: sample @ ~0.5 lpm for 60 minutes.

Operator: [signature]

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.: 2	~~5406~~
Test location:	APC Outlet No. 2
Date: 11/09/19	
Project No.:	21960

Measuring Device	MII Number
Control Module	M05498
Barometer	

Barometric Pressure: 29.79 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
0	164.73	125	139	113	13	31	1	3
5	167.97	130	139	115	13	32	1	3
10	170.75	130	139	115	13	32	1	3
15	173.2	130	139	115	13	32	1	3
20	175.93	131	139	115	13	33	1	3
25	178.34	130	139	113	13	33	1	3
30	181.06	130	140	113	13	33	1	3
35	183.55	130	140	113	13	34	1	3
40	186.27	130	140	113	13	34	1	3.5
45	188.82	130	140	113	13	34	1	3.5
50	191.43	130	141	114	13	34	1	3.5
55	194.02	130	141	114	13	34	1	3.5
60	196.57	130	140	115	13	34	1	3.5

Start Time: 922		
Finish Time: 1022		
Initial Leak Check:	<0.01	Lpm @ 14 " Hg
Final Leak Check:	<0.01	Lpm @ ~~13~~ 21 " Hg

DGMCF:	0.985
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

: sample @ ~0.5 lpm for 60 minutes.

Operator:

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	~~S~~ 2 SVOC
Test location:	APC Outlet No. 2
Date:	11/09/2019
Project No.:	21960

Measuring Device	MII Number
Control Module	M05498
Barometer	

Barometric Pressure: 29.79 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
0	202.01	126	140	112	13	33	1	3
5	205.23	130	140	114	13	33	1	3
10	207.9	130	140	114	13	33	1	3
15	210.26	130	140	115	13	33	1	3
20	213.20	131	140	115	13	33	1	3
25	215.80	131	140	114	13	33	1	3
30	218.60	131	140	115	13	34	1	3
35	221.19	131	140	115	13	34	1	3.5
40	223.95	131	140	115	13	34	1	3.5
45	226.50	131	140	115	13	34	1	3.5
50	229.25	131	140	115	13	34	1	3.5
55	231.80	131	140	113	13	34	1	3.5
60	234.56	131	140	115	13	34	1	3.5

Start Time: 1035		
Finish Time: 1135		
Initial Leak Check: <0.01	Lpm @ 13	" Hg
Final Leak Check: <0.01	Lpm @ 13	" Hg

DGMCF:	0.985 ✓
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

: 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. 2
Date:	Sept. 12/19
Project No.:	21960

Measuring Device	MII Number
Control Module	M05498
Barometer	

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	537.74	~~75~~ 130	133	125	10	18	1	3.5
5	539.30	128	140	125	10	19	1	3.5
10	542.39	130	140	124	10	19	1	3.5
15	545.25	130	140	121	10	20	1	3.5
20	548.05	131	140	121	10	21	1	3.5
25	551.04	131	140	120	10	21	1	3.5
30	553.69	131	141	118	10	21	1	3.5
35	556.65	131	141	118	10	22	1	3.5
40	559.42	131	140	117	10	22	1	3.5
45	562.37	131	140	117	10	22	1	3.5
50	565.58	131	140	116	10	22	1	3.5
55	568.52	132	140	116	10	22	1	3.5
60	571.27	131	140	116	10	23	1	3.5

Start Time: 1012		
Finish Time: 1112		
Initial Leak Check: <0.01	Lpm @ 20	" Hg
Final Leak Check: <0.01	Lpm @ 14	" Hg

DGMCF:	0.985
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

: sample @ ~0.5 lpm for 60 minutes.

Operator: K.C.

a Kontrol Energy Company

APPENDIX 10

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

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

L2344999

Client: Covanta
Project Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21960 - J2637

ORTECH Sample ID 19-21960-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
1	Sept 9, 19	#1 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
2				Probe Rinse Nitric	0.1N Nitric	Metals
3				Filter	Particulate	Particulate & Metals
4				Impinger 1-5 Solution	Nitric/Peroxide	Metals
5				Impinger 6-7 Solution	Acid. KMnO4	Mercury
6				Impinger 6-7 Rinse	8N HCl	Mercury
7	Sept 9, 19	#1 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
8				Probe Rinse Nitric	0.1N Nitric	Metals
9				Filter	Particulate	Particulate & Metals
10				Impinger 1-5 Solution	Nitric/Peroxide	Metals
11				Impinger 6-7 Solution	Acid. KMnO4	Mercury
12				Impinger 6-7 Rinse	8N HCl	Mercury
13	Sept 10, 19	#1 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
14				Probe Rinse Nitric	0.1N Nitric	Metals
15				Filter	Particulate	Particulate & Metals
16				Impinger 1-5 Solution	Nitric/Peroxide	Metals
17				Impinger 6-7 Solution	Acid. KMnO4	Mercury
18				Impinger 6-7 Rinse	8N HCl	Mercury
19	Sept 10, 19	Blank 1	Blank 1	Probe Rinse Acetone	Acetone	Particulate & Metals
20				Probe Rinse Nitric	0.1N Nitric	Metals
21				Filter	Particulate	Particulate & Metals
22				Impinger 1-5 Solution	Nitric/Peroxide	Metals
23				Impinger 6-7 Solution	Acid. KMnO4	Mercury
24				Impinger 6-7 Rinse	8N HCl	Mercury

1
3
4

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Project Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/PO: 21960 - J2637

ORTECH Sample ID 19-21960-PM-	Sample Date	Location	Test No.	Sample Description	Sample Media	Sample Analysis
25	Sept 9, 19	#2 APC Outlet	1	Probe Rinse Acetone	Acetone	Particulate & Metals
26				Probe Rinse Nitric	0.1N Nitric	Metals
27				Filter	Particulate	Particulate & Metals
28				Impinger 1-5 Solution	Nitric/Peroxide	Metals
29				Impinger 6-7 Solution	Acid. KMnO4	Mercury
30				Impinger 6-7 Rinse	8N HCl	Mercury
31	Sept 10, 19	#2 APC Outlet	2	Probe Rinse Acetone	Acetone	Particulate & Metals
32				Probe Rinse Nitric	0.1N Nitric	Metals
33				Filter	Particulate	Particulate & Metals
34				Impinger 1-5 Solution	Nitric/Peroxide	Metals
35				Impinger 6-7 Solution	Acid. KMnO4	Mercury
36				Impinger 6-7 Rinse	8N HCl	Mercury
37	Sept 10, 19	#2 APC Outlet	3	Probe Rinse Acetone	Acetone	Particulate & Metals
38				Probe Rinse Nitric	0.1N Nitric	Metals
39				Filter	Particulate	Particulate & Metals
40				Impinger 1-5 Solution	Nitric/Peroxide	Metals
41				Impinger 6-7 Solution	Acid. KMnO4	Mercury
42				Impinger 6-7 Rinse	8N HCl	Mercury
43	Sept 10, 19	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] Date: Sept 11, 19

Relinquished To: AARON BURTON Date: 11-Sept-2019 11:50

12.0°C

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

L2345016

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21960 - J2637

	ORTECH Sample ID 19-21960-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
	1	Sept 10, 19	1	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
	2				PM 2.5 cyclone Rinse	Acetone	Particulate
	3				PM 2.5 exit & connectors	Acetone	Particulate
	4				Back up filter	filter	Particulate
	5				Impinger Soln & rinse	Water	Particulate
5	6				Secondary Filter	Filter	Particulate*
	7				Impinger Rinse	Acetone & Hexane	Particulate
6	8	Sept 10, 19	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 10, 19	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 9, 19	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 9, 19	2	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
22	30				PM 2.5 cyclone Rinse	Acetone	Particulate
23	31				PM 2.5 exit & connectors	Acetone	Particulate
24	32				Back up filter	Filter	Particulate
	33				Impinger Soln & rinse	Water	Particulate
25	34				Secondary Filter	Filter	Particulate*
	35				Impinger Rinse	Acetone & Hexane	Particulate

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21960 - J2637

	ORTECH Sample ID 19-21960-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
26	43	Sept 10, 19	Blank 1	# 1 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
27	44				PM 2.5 cyclone Rinse	Acetone	Particulate
28	45				PM 2.5 exit & connectors	Acetone	Particulate
29	46				Back up filter	filter	Particulate
30	47				Impinger Soln & rinse	Water	Particulate
	48				Secondary Filter	Filter	Particulate*
	49				Impinger Rinse	Acetone & Hexane	Particulate
31	50	Sept 10, 19	Blank 2	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
32	51				PM 2.5 cyclone Rinse	Acetone	Particulate
33	52				PM 2.5 exit & connectors	Acetone	Particulate
34	53				Back up filter	Filter	Particulate
35	54				Impinger Soln & rinse	Water	Particulate
	55				Secondary Filter	Filter	Particulate*
	56				Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

11:50
12.0°C

Relinquished To: Aaron Breton Date: 11-Sept-2019

Relinquished By: [signature] Date: Sept 11, 19

Test 3 Unit 2 will follow later

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: 21960 - J2637

ORTECH Sample ID 19-21960-M201A-	Date	Test No.	Location	Sample Description	Sample Media	Sample Analysis
36	Sept 11, 19	3	# 2 APC Outlet	Nozzle & PM10 cyclone rinse	Acetone	Particulate
37				PM 2.5 cyclone Rinse	Acetone	Particulate
38				PM 2.5 exit & connectors	Acetone	Particulate
39				Back up filter	Filter	Particulate
40				Impinger Soln & rinse	Water	Particulate
41				Secondary Filter	Filter	Particulate*
42				Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

Relinquished To: Aaron Burton Date: 16-Sept-2019 16:30

Relinquished By: [signature] Date: Sept 16/19

ORTECH Environmental Sample Log

Acid Gases

Covanta

L2344909

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO #: 21960-J2637

ORTECH Sample ID 19-21960-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Final Volume(ml)	Sample Analysis
1	Sept 9, 19	APC Outlet # 1	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	611	HCl, HF & Ammonia
2	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	483	HCl, HF & Ammonia
3		APC Outlet # 1	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	466	HCl, HF & Ammonia
4		APC Outlet # 2	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	611	HCl, HF & Ammonia
5	Sept 10, 19	APC Outlet # 2	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	445	HCl, HF & Ammonia
6	↓	APC Outlet # 2	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	451	HCl, HF & Ammonia
Blank 1		APC # 1	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	494	HCl, HF & Ammonia
Blank 2		APC # 2	Impinger Soln & rinse	0.1N $H_2SO_4 + DH_2O$	200	464	HCl, HF & Ammonia

RUSH ANALYSIS FOR UNIT #2 HCl

Analyze for HCl, HF and Ammonia

Relinquished By: [signature] Date: Sept 11, 19

Relinquished To: AARON BURTON Date: 11-~~Sept~~-2019 11:50 9.8°C

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21960 - J2637

ORTECH Sample ID 19 - 21960 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1	Sept 12, 19	Test 1 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
2		Test 1 Filter		Particulate	SVOC
3		Test 1 XAD-II Trap		N.A.	SVOC
4		Test 1 Impinger Solution		Ethylene Glycol	SVOC
5		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
6	Sept 12, 19	Test 2 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
7		Test 2 Filter		Particulate	SVOC
8		Test 2 XAD-II Trap		N.A.	SVOC
9		Test 2 Impinger Solution		Ethylene Glycol	SVOC
10		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
11	Sept 13, 19	Test 3 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
12		Test 3 Filter		Particulate	SVOC
13		Test 3 XAD-II Trap		N.A.	SVOC
14		Test 3 Impinger Solution		Ethylene Glycol	SVOC
15		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
16	Sept 12, 19	Blank 1 Probe Rinse	Blank	Hexane/Acetone	SVOC
17		Blank 1 Filter		Particulate	SVOC
18		Blank 1 XAD-II Trap		N.A.	SVOC
19		Blank 1 Impinger Solution		Ethylene Glycol	SVOC
20		Blank 1 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated August 5, 2019 for lists of analytes.

Relinquished To: Aaron Burton Date: 16-Sept-2019 15:30

Relinquished By: [signature] Date: SEPT 16/19

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21960 - J2637

ORTECH Sample ID 19 - 21960 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
21	Sept 11, 19	Test 1 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
22		Test 1 Filter		Particulate	SVOC
23		Test 1 XAD-II Trap		N.A.	SVOC
24		Test 1 Impinger Solution		Ethylene Glycol	SVOC
25		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
26	Sept 11, 19	Test 2 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
27		Test 2 Filter		Particulate	SVOC
28		Test 2 XAD-II Trap		N.A.	SVOC
29		Test 2 Impinger Solution		Ethylene Glycol	SVOC
30		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
31	Sept 12, 19	Test 3 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
32		Test 3 Filter		Particulate	SVOC
33		Test 3 XAD-II Trap		N.A.	SVOC
34		Test 3 Impinger Solution		Ethylene Glycol	SVOC
35		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
36	Sept 12, 19	Blank 2 Probe Rinse	Blank	Hexane/Acetone	SVOC
37		Blank 2 Filter		Particulate	SVOC
38		Blank 2 XAD-II Trap		N.A.	SVOC
39		Blank 2 Impinger Solution		Ethylene Glycol	SVOC
40		Blank 2 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated August 5, 2019 for lists of analytes.

Relinquished To: Aaron Barton　　　　Date: 16-Sept-2019 15:30

Relinquished By: [signature]　　　　Date: Sept 16/19

ORTECH Sample Log

VOCs

Client: Covanta
Project Number: 21960
Received By:
Job Assigned To: ALS
Quote / PO : 21960 - J2637

Test Location	Test Number	Pair Number	ORTECH Sample ID 19-21960-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet	1	1	14 a&b	SEPT 12/19	Tenax and Tenax/Charcoal	VOCs
		2	15 a&b		Tenax and Tenax/Charcoal	VOCs
		3	16 a&b	"	Tenax and Tenax/Charcoal	archive
		4	17 a&b		Tenax and Tenax/Charcoal	VOCs
	2	1	18 a&b		Tenax and Tenax/Charcoal	VOCs
		2	19 a&b		Tenax and Tenax/Charcoal	VOCs
		3	20 a&b	"	Tenax and Tenax/Charcoal	VOCs
		4	21 a&b		Tenax and Tenax/Charcoal	archive
		Field Blank	26 a&b		Tenax and Tenax/Charcoal	VOCs
	3	1	22 a&b		Tenax and Tenax/Charcoal	VOCs
		2	23 a&b		Tenax and Tenax/Charcoal	VOCs
		3	24 a&b	"	Tenax and Tenax/Charcoal	VOCs
		4	25 a&b		Tenax and Tenax/Charcoal	archive
		Trip Blank			Tenax and Tenax/Charcoal	VOCs
# 2 APC Outlet	1	1	4 a&b	SEPT 11/19	Tenax and Tenax/Charcoal	VOCs
		2	1 a&b		Tenax and Tenax/Charcoal	archive
		3	2 a&b	"	Tenax and Tenax/Charcoal	VOCs
		4	3 a&b		Tenax and Tenax/Charcoal	VOCs
		Field Blank	13 a&b		Tenax and Tenax/Charcoal	VOCs
	2	1	5 a&b		Tenax and Tenax/Charcoal	VOCs
		2	6 a&b	"	Tenax and Tenax/Charcoal	archive
		3	7 a&b		Tenax and Tenax/Charcoal	VOCs
		4	8 a&b		Tenax and Tenax/Charcoal	VOCs
	3	1	9 a&b		Tenax and Tenax/Charcoal	VOCs
		2	10 a&b	"	Tenax and Tenax/Charcoal	archive
		3	11 a&b		Tenax and Tenax/Charcoal	VOCs
		4	12 a&b		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 13/19

Custody Received by: C Kocharakkal Date: 13-Sep-19 8:30 4.4

ORTECH Sample Log
Method 430 Samples
Covanta

Client: Covanta
Project Number: 21960
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/P.O.: 21960 - J2637

Test Location	Test Number	ORTECH Sample ID 19-21960-M430-	Sample Date	Sample Media
#1 APC Outlet	1	1	Sept 12, 19	DNPH & Toluene
	2	2	↓	DNPH & Toluene
	3	3	↓	DNPH & Toluene
	Blank 1	Blank 1	↓	DNPH & Toluene
#2 APC Outlet	1	4	Sept 11, 19	DNPH & Toluene
	2	5	↓	DNPH & Toluene
	3	6	Sept 12, 19	DNPH & Toluene
	Blank 2	Blank 2	↓	DNPH & Toluene
	Trip Spike			

Analyse for: **Formaldehyde**
Acetaldehyde
Acrolein

Relinquished To: C Kocharakkal Date: 13-Sep-19 8:30 4.4°C

Relinquished By: D. Dill Date: SEPT 13/19

APPENDIX 11

Particulate and Metals Train Recovery Data Sheets
(8 pages)

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: Sept 9, 19
Test No.: 1
Test Location: UN1 #1

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.6
After Act. Rinse:	342.9
Total TS1:	61.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.6
After 0.1N HNO_3 Rinse:	539.8
Total TS2:	258.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 226745

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:	459.2
	Final Wt:	663.8
1	Gain:	204.6
	Colour:	clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	651.6
	Initial Wt:	755.6
	Final Wt:	982.7
2	Gain:	227.1
	Colour:	clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	661.7
	Initial Wt:	767.4
	Final Wt:	888.2
3	Gain:	120.8
	Colour:	clear

	Impinger #4 Empty	
	Empty Wt:	~~670.9~~ 646.7
	Final Wt:	661.4
4	Gain:	14.7
	Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	432.9
w/ Imp. 1-4 Soln:	1208.1
Imp. 1 to 4 Volume:	775.2
After HNO_3 Rinse:	1342.1
Total TS4:	909.2

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	576.2
	Initial Wt:	704.0
	Final Wt:	712.6
5	Gain:	8.6
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	677.3
	Initial Wt:	793.3
	Final Wt:	793.7
6	Gain:	0.4
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	430.8
With Imp. 5&6 Soln:	678.4
Imp. 5&6 Volume:	247.6
After $KMnO_4$ Rinse:	791.9
After100g H_2O Rinse:	888.3
Total TS5-A:	457.5

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	284.4
With 150 mL DI H_2O:	433.3
After HCl Rinse:	486.8
After DI H_2O Rinse:	628.5
Total TS5-B:	344.1

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	727.0
	Final Wt:	950.7
7	Gain:	223.7

Impinger Box ID: 7

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	1
TS2 (Probe Rinse-0.1N HNO_3)	2
TS3 (Filter)	3
TS4 (Impinger 1-4 Sol'n-HNO_3)	4
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	5
TS5-B (Impinger 5,6 Rinse-HCl)	6

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Train Loaded By: DT
Train Recovered By: DT / AS
Recovery Witnessed By:
Date: Sept 9, 19

CWTR = 1 to 6: 576.2 ✓
WCBDA= 7: 223.7

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 9, 19
Test No.: 2
Test Location: UNIT 1

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.1
After Act. Rinse:	367.8
Total TS1:	85.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	282.2
After 0.1N HNO_3 Rinse:	439.3
Total TS2:	157.1

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 276746

CONTAINER TS3

Initial Wt:	.6207
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	614.0
	Final Wt:	788.5
1	Gain:	174.5
	Colour:	clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	671.6
	Initial Wt:	777.0
	Final Wt:	892.5
2	Gain:	115.5
	Colour:	clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	669.5
	Initial Wt:	774.3
	Final Wt:	921.8
3	Gain:	147.5
	Colour:	clear

	Impinger #4 Empty	
	Empty Wt:	664.2
	Final Wt:	834.8
4	Gain:	170.6
	Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	430.3
w/ Imp. 1-4 Soln:	1242.3
Imp. 1 to 4 Volume:	812.0
After HNO_3 Rinse:	1341.2
Total TS4:	910.9

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	662.0
	Initial Wt:	771.4
	Final Wt:	775.9
5	Gain:	4.5 ~~3.6~~
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	666.4
	Initial Wt:	781.9
	Final Wt:	785.5
6	Gain:	3.6
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	431.1
With Imp. 5&6 Soln:	658.3
Imp. 5&6 Volume:	227.2
After $KMnO_4$ Rinse:	769.8
After100g H_2O Rinse:	867.9
Total TS5-A:	436.8

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	280.8
With 150 mL DI H_2O:	427.6
After HCl Rinse:	494.7
After DI H_2O Rinse:	619.4
Total TS5-B:	338.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	892.4
	Final Wt:	916.3
7	Gain:	23.9

Impinger Box ID: 5

SAMPLE IDENTIFICATION	19-21960-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 / TT
Recovery Witnessed By:
Date: SEPT 9, 19

CWTR = 1 to 6: ~~653~~ 616.2 ✓

WCBDA= 7: 23.9

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 10, 19
Test No.: 3
Test Location: UNIT 1

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.4
After Act. Rinse:	368.4
Total TS1:	87.0

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.0
After 0.1N HNO_3 Rinse:	446.7
Total TS2:	165.7

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 226734

CONTAINER TS3

Initial Wt:	.6352
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	459.1
Final Wt:	697.2
1 Gain:	238.1
Colour:	clear

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	651.3
Initial Wt:	764.3
Final Wt:	953.6
2 Gain:	189.3
Colour:	clear

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	660.8
Initial Wt:	759.8
Final Wt:	892.1
3 Gain:	132.3
Colour:	clear

Impinger #4 Empty	
Empty Wt:	646.7
Final Wt:	656.9
4 Gain:	10.2
Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	434.5
w/ Imp. 1-4 Soln:	1211.8
Imp. 1 to 4 Volume:	777.3
After HNO_3 Rinse:	1326.8
Total TS4:	892.3

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	576.7
Initial Wt:	688.2
Final Wt:	693.8
5 Gain:	5.6
Colour:	Purple

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	679.0
Initial Wt:	794.4
Final Wt:	797.6
6 Gain:	3.2
Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	431.6
With Imp. 5&6 Soln:	664.5
Imp. 5&6 Volume:	232.9
After $KMnO_4$ Rinse:	776.1
After100g H_2O Rinse:	874.4
Total TS5-A:	442.8

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	280.5
With 150 mL DI H_2O:	430.8
After HCl Rinse:	474.3
After DI H_2O Rinse:	591.6
Total TS5-B:	311.1

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	950.4
Final Wt:	970.5
7 Gain:	20.1

Impinger Box ID: 7

SAMPLE IDENTIFICATION	19-21960-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

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/AS
Train Recovered By: ST/AS
Recovery Witnessed By:
Date:

CWTR = 1 to 6: 578.7 ✓

WCBDA= 7: 20.1

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Date:	SEPT 10/19
Test No.:	BLANK 1
Test Location:	

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	285.6
After Act. Rinse:	524.9
Total TS1:	239.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.4
After 0.1N HNO_3 Rinse:	478.6
Total TS2:	197.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 226737

CONTAINER TS3

Initial Wt:	.6236
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:	426.2
w/ Imp. 1-4 Soln:	638.6
Imp. 1 to 4 Volume:	212.4
After HNO_3 Rinse:	745.1
Total TS4:	318.9

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:	425.4
With Imp. 5&6 Soln:	653.5
Imp. 5&6 Volume:	228.1
After $KMnO_4$ Rinse:	769.1
After100g H_2O Rinse:	870.1
Total TS5-A:	444.7

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.6
With 150 mL DI H_2O:	431.1
After HCl Rinse:	481.4
After DI H_2O Rinse:	586.7
Total TS5-B:	305.1

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
7 Gain:	

Impinger Box ID:

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	19
TS2 (Probe Rinse-0.1N HNO_3)	20
TS3 (Filter)	21
TS4 (Impinger 1-4 Sol'n-HNO_3)	22
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	23
TS5-B (Impinger 5,6 Rinse-HCl)	24

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

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

CWTR = 1 to 6:

WCBDA= 7:

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: Sept 9, 19
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:	381.5
Total TS1:	98.9

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	283.2
After 0.1N HNO_3 Rinse:	428.0
Total TS2:	144.8

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: Q26747

CONTAINER TS3

Initial Wt:	.6134
Final Wt:	
Gain:	
Colour:	white

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	612.2
	Final Wt:	685.6
1	Gain:	73.4
	Colour:	clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	661.6
	Initial Wt:	767.6
	Final Wt:	937.6
2	Gain:	170.0
	Colour:	clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	672.4
	Initial Wt:	776.9
	Final Wt:	956.8
3	Gain:	179.9
	Colour:	clear

	Impinger #4 Empty	
	Empty Wt:	533.2
	Final Wt:	615.4
4	Gain:	82.2
	Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	424.0
w/ Imp. 1-4 Soln:	1134.3
Imp. 1 to 4 Volume:	710.3
After HNO_3 Rinse:	1259.7
Total TS4:	835.7

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	670.4
	Initial Wt:	783.6
	Final Wt:	792.8
5	Gain:	9.2
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	656.8
	Initial Wt:	771.3
	Final Wt:	781.7
6	Gain:	10.4
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	423.3
With Imp. 5&6 Soln:	666.3
Imp. 5&6 Volume:	243.0
After $KMnO_4$ Rinse:	777.3
After100g H_2O Rinse:	905.2
Total TS5-A:	481.9

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	285.9
With 150 mL DI H_2O:	435.0
After HCl Rinse:	479.4
After DI H_2O Rinse:	611.1
Total TS5-B:	325.2

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	875.1
	Final Wt:	900.9
7	Gain:	25.8

Impinger Box ID: 13

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	25
TS2 (Probe Rinse-0.1N HNO_3)	26
TS3 (Filter)	27
TS4 (Impinger 1-4 Sol'n-HNO_3)	28
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	29
TS5-B (Impinger 5,6 Rinse-HCl)	30

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Train Loaded By: DT
Train Recovered By: DT/AS
Recovery Witnessed By:
Date: Sept 9, 19

CWTR = 1 to 6:	525.1 ✓
WCBDA= 7:	25.8

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: Sept 10, 19
Test No.: 2
Test Location: UNIT 2

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.8
After Act. Rinse:	425.4
Total TS1:	143.6

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.7
After 0.1N HNO_3 Rinse:	487.8
Total TS2:	206.1

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 82 6735

CONTAINER TS3

Initial Wt:	.6260
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	612.2
	Final Wt:	757.3
1	Gain:	145.1
	Colour:	clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	661.6
	Initial Wt:	765.0
	Final Wt:	943.1
2	Gain:	178.1
	Colour:	clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	672.4
	Initial Wt:	772.3
	Final Wt:	892.0
3	Gain:	119.7
	Colour:	clear

	Impinger #4 Empty	
	Empty Wt:	533.2
	Final Wt:	548.0
4	Gain:	14.8
	Colour:	clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	433.5
w/ Imp. 1-4 Soln:	1089.1
Imp. 1 to 4 Volume:	655.6
After HNO_3 Rinse:	1219.5
Total TS4:	786.0

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	670.4
	Initial Wt:	785.3
	Final Wt:	794.0
5	Gain:	8.7
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	656.8
	Initial Wt:	773.6
	Final Wt:	781.7
6	Gain:	8.1
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	431.5
With Imp. 5&6 Soln:	673.4
Imp. 5&6 Volume:	241.9
After $KMnO_4$ Rinse:	786.3
After100g H_2O Rinse:	888.9
Total TS5-A:	457.4

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	287.5
With 150 mL DI H_2O:	437.1
After HCl Rinse:	436.5
After DI H_2O Rinse:	636.7
Total TS5-B:	349.2

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	900.9
	Final Wt:	920.7
7	Gain:	19.8

Impinger Box ID: 13

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	31
TS2 (Probe Rinse-0.1N HNO_3)	32
TS3 (Filter)	33
TS4 (Impinger 1-4 Sol'n-HNO_3)	34
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	35
TS5-B (Impinger 5,6 Rinse-HCl)	36

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Train Loaded By: DT/AS
Train Recovered By: DT
Recovery Witnessed By:
Date: Sept 10, 19

CWTR = 1 to 6: 474.5 ✓

WCBDA= 7: 19.8

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Date:	SEPT 10, 19
Test No.:	3
Test Location:	UNIT 2

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	280.4
After Act. Rinse:	452.4
Total TS1:	172.0

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	280.8
After 0.1N HNO_3 Rinse:	506.9
Total TS2:	226.1

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: QZ 6736

CONTAINER TS3

Initial Wt:	.6033
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	614.5
	Final Wt:	845.7
1	Gain:	231.2
	Colour:	Clear

	Impinger #2 HNO_3/H_2O_2	
	Empty Wt:	673.1
	Initial Wt:	779.3
	Final Wt:	892.4
2	Gain:	113.1
	Colour:	Clear

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	670.6
	Initial Wt:	774.7
	Final Wt:	829.7
3	Gain:	55.0
	Colour:	Clear

	Impinger #4 Empty	
	Empty Wt:	664.5
	Final Wt:	674.4
4	Gain:	9.9
	Colour:	Clear

CONTAINER TS4 WEIGHTS	
Empty Wt:	432.9
w/ Imp. 1-4 Soln:	1048.4
Imp. 1 to 4 Volume:	615.5
After HNO_3 Rinse:	1125.3
Total TS4:	692.4

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

	Impinger #5 $KMnO_4/H_2SO_4$	
	Empty Wt:	664.0
	Initial Wt:	775.0
	Final Wt:	780.9
5	Gain:	5.9
	Colour:	Purple

	Impinger # 6 $KMnO_4/H_2SO_4$	
	Empty Wt:	667.2
	Initial Wt:	782.0
	Final Wt:	791.0
6	Gain:	9.0
	Colour:	Purple

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	432.1
With Imp. 5&6 Soln:	668.9
Imp. 5&6 Volume:	236.8
After $KMnO_4$ Rinse:	785.7
After100g H_2O Rinse:	886.3
Total TS5-A:	454.2

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.5
With 150 mL DI H_2O:	434.5
After HCl Rinse:	[illegible]0.7
After DI H_2O Rinse:	592.5
Total TS5-B:	309.0

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

	Impinger #7 Silica Gel	
	Initial Wt:	915.7
	Final Wt:	937.4
7	Gain:	21.7

Impinger Box ID: 5

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	37
TS2 (Probe Rinse-0.1N HNO_3)	38
TS3 (Filter)	39
TS4 (Impinger 1-4 Sol'n-HNO_3)	40
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	41
TS5-B (Impinger 5,6 Rinse-HCl)	42

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

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

CWTR = 1 to 6:	424.1 ✓
WCBDA= 7:	21.7

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 10, 19
Test No.: BLANK 2
Test Location:

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

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.8
After Act. Rinse:	482.1
Total TS1:	200.3

MARK FLUID LEVEL

SEAL AND LABEL TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	286.3
After 0.1N HNO_3 Rinse:	402.4
Total TS2:	116.1

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: QZ 6738

CONTAINER TS3

Initial Wt:	.6150
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, and 4

CONTAINER TS4

1

Impinger #1 Empty	
Empty Wt:	
Final Wt:	
Gain:	
Colour:	

2

Impinger #2 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
Gain:	
Colour:	

3

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	
Initial Wt:	
Final Wt:	
Gain:	
Colour:	

4

Impinger #4 Empty	
Empty Wt:	
Final Wt:	
Gain:	
Colour:	

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.6
w/ Imp. 1-4 Soln:	637.3
Imp. 1 to 4 Volume:	210.7
After HNO_3 Rinse:	749.2
Total TS4:	322.6

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 5 & 6

5

Impinger #5 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
Gain:	
Colour:	

6

Impinger # 6 $KMnO_4/H_2SO_4$	
Empty Wt:	
Initial Wt:	
Final Wt:	
Gain:	
Colour:	

Impinger 5 & 6

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	433.8
With Imp. 5&6 Soln:	659.0
Imp. 5&6 Volume:	225.2
After $KMnO_4$ Rinse:	770.8
After100g H_2O Rinse:	867.8
Total TS5-A:	434.0

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	286.7
With 150 mL DI H_2O:	434.8
After HCl Rinse:	486.6
After DI H_2O Rinse:	589.3
Total TS5-B:	302.6

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 7

7

Impinger #7 Silica Gel	
Initial Wt:	
Final Wt:	
Gain:	

Impinger Box ID:

SAMPLE IDENTIFICATION	19-21960-PM-
TS1 (Probe Rinse-Acetone)	43
TS2 (Probe Rinse-0.1N HNO_3)	44
TS3 (Filter)	45
TS4 (Impinger 1-4 Sol'n-HNO_3)	46
TS5-A (Impinger 5,6 Sol'n-$KMnO_4$)	47
TS5-B (Impinger 5,6 Rinse-HCl)	48

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

CWTR = 1 to 6:
WCBDA= 7:

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

ORTECH Enivronmental

APPENDIX 12

Inorganics Analytical Reports
(28 pages)

ALS Environmental
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2344999		Mississauga, ON L5J 2Y4
Date of Report	3-Oct-19		(905)822-4120
Date of Sample Receipt	11-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	Covanta 21960

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (PE/TP/GN 30-Sep-19)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(7 THRU 12) #1 APC OUTLET TEST#2	19-21960-PM-(13 THRU 18) #1 APC OUTLET TEST#3	19-21960-PM-(19 THRU 24) BLANK1	19-21960-PM-(25 THRU 30) #2 APC OUTLET TEST#1
ALS Sample ID		L2344999-1	L2344999-2	L2344999-3	L2344999-4	L2344999-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		9-Sep-19	9-Sep-19	10-Sep-19	10-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis Method 5	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	1.0	0.5 J	<0.1	0.1 J	1.0
Acetone Particulate Matter	0.4	2.9	1.8	2.9	<0.1	3.2
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	59.9	85.0	85.8	238	96.5

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-PM-(31 THRU 36) #2 APC OUTLET TEST#2	19-21960-PM-(37 THRU 42) #2 APC OUTLET TEST#3	19-21960-PM-(43 THRU 48) BLANK2	MB
ALS Sample ID		L2344999-6	L2344999-7	L2344999-8	L2344999-MB
Matrix		Stack	Stack	Stack	n/a
Analysis type		Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	n/a
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	n/a
PM via Gravimetric Analysis	**LOR**				
Method 5	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	<0.1	<0.1	0.6 J	0.4 J
Acetone Particulate Matter	0.4	1.5	1.5	<0.1	0.1 J
	g	**g**	**g**	**g**	**g**
Acetone Mass	0.02	142	168	200	35.9

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 (905)822-4120
ALS WO#:	L2345016		
Date of Report	9-Oct-19		
Date of Sample Receipt	11-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 201A (PE/GN/TP 9-Oct-19)
Sample Particulate Analysis via Gravimetric USEPA Method 202 (SA/TP 7-Oct-19)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: L. Wrona
Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-M201A-1 #1 APC OUTLET TEST#1	19-21960-M201A-2 #1 APC OUTLET TEST#1	19-21960-M201A-3 #1 APC OUTLET TEST#1	19-21960-M201A-4 #1 APC OUTLET TEST#1	19-21960-M201A-(5-7) #1 APC OUTLET TEST#1
ALS Sample ID		L2345016-1	L2345016-2	L2345016-3	L2345016-4	L2345016-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
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	0.7	<0.1	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	62.5	43.8	9.4	-	-
PM via Gravimetric Analysis Method 202	LOR mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	1.1
Non-Extractale Condensable Particulates	0.4	-	-	-	-	0.6
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	175

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Sample Analysis Summary Report

Sample Name		**19-21960-M201A-8 #1 APC OUTLET TEST#2**	**19-21960-M201A-9 #1 APC OUTLET TEST#2**	**19-21960-M201A-10 #1 APC OUTLET TEST#2**	**19-21960-M201A-11 #1 APC OUTLET TEST#2**	**19-21960-M201A-(12-14) #1 APC OUTLET TEST#2**
ALS Sample ID		L2345016-6	L2345016-7	L2345016-8	L2345016-9	L2345016-10
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
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	0.3 J	0.2 J	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	36.5	44.0	47.9	-	-
PM via Gravimetric Analysis Method 202	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	1.5
Non-Extractale Condensable Particulates	0.4	-	-	-	-	3.0
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	221

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-M201A-15 #1 APC OUTLET TEST#3	19-21960-M201A-16 #1 APC OUTLET TEST#3	19-21960-M201A-17 #1 APC OUTLET TEST#3	19-21960-M201A-18 #1 APC OUTLET TEST#3	19-21960-M201A-(19-21) #1 APC OUTLET TEST#3
ALS Sample ID		L2345016-11	L2345016-12	L2345016-13	L2345016-14	L2345016-15
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis	LOR					
Method 201A	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	57.7	41.9	9.3	-	-
PM via Gravimetric Analysis	LOR					
Method 202	mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	0.5
Non-Extractale Condensable Particulates	0.4	-	-	-	-	1.7
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	232

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Sample Analysis Summary Report

Sample Name		19-21960-M201A-22 #2 APC OUTLET TEST#1	19-21960-M201A-23 #2 APC OUTLET TEST#1	19-21960-M201A-24 #2 APC OUTLET TEST#1	19-21960-M201A-25 #2 APC OUTLET TEST#1	19-21960-M201A-(26-28) #2 APC OUTLET TEST#1
ALS Sample ID		L2345016-16	L2345016-17	L2345016-18	L2345016-19	L2345016-20
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis	LOR					
Method 201A	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	<0.1	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	29.4	44.6	21.7	-	-
PM via Gravimetric Analysis	LOR					
Method 202	mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	0.9
Non-Extractale Condensable Particulates	0.4	-	-	-	-	1.9
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	221

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-M201A-29 #2 APC OUTLET TEST#2	19-21960-M201A-30 #2 APC OUTLET TEST#2	19-21960-M201A-31 #2 APC OUTLET TEST#2	19-21960-M201A-32 #2 APC OUTLET TEST#2	19-21960-M201A-(33-35) #2 APC OUTLET TEST#2
ALS Sample ID		L2345016-21	L2345016-22	L2345016-23	L2345016-24	L2345016-25
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis Method 201A	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.1 J	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	22.3	22.9	9.6	-	-
PM via Gravimetric Analysis Method 202	**LOR mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	3.0
Non-Extractale Condensable Particulates	0.4	-	-	-	-	2.2
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	263

ALS Environmental

Sample Analysis Summary Report

Sample Name		**19-21960-M201A-36 #2 APC OUTLET TEST#3**	**19-21960-M201A-37 #2 APC OUTLET TEST#3**	**19-21960-M201A-38 #2 APC OUTLET TEST#3**	**19-21960-M201A-39 #2 APC OUTLET TEST#3**	**19-21960-M201A-(40-42) #2 APC OUTLET TEST#3**
ALS Sample ID		L2345016-36	L2345016-37	L2345016-38	L2345016-39	L2345016-40
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Date of Receipt		16-Sep-19	16-Sep-19	16-Sep-19	16-Sep-19	16-Sep-19
PM via Gravimetric Analysis	**LOR**					
Method 201A	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	0.3 J	<0.1	<0.1	-	-
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	67.2	50.4	12.8	-	-
PM via Gravimetric Analysis	**LOR**					
Method 202	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	-	-	-	-	0.9
Non-Extractale Condensable Particulates	0.4	-	-	-	-	2.9
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	-	-	-	-	215

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-M201A-43 #1 APC OUTLET BLANK1	19-21960-M201A-44 #1 APC OUTLET BLANK1	19-21960-M201A-45 #1 APC OUTLET BLANK1	19-21960-M201A-46 #1 APC OUTLET BLANK1	19-21960-M201A-(47-49) #1 APC OUTLET BLANK1
ALS Sample ID		L2345016-26	L2345016-27	L2345016-28	L2345016-29	L2345016-30
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis Method 201A	LOR mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	0.1 J	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	63.2	71.8	52.9	-	-
PM via Gravimetric Analysis Method 202	LOR mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	<0.1
Non-Extractale Condensable Particulates	0.4	-	-	-	-	0.4
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	93.8

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Sample Analysis Summary Report

Sample Name		19-21960-M201A-50 #2 APC OUTLET BLANK2	19-21960-M201A-51 #2 APC OUTLET BLANK2	19-21960-M201A-52 #2 APC OUTLET BLANK2	19-21960-M201A-53 #2 APC OUTLET BLANK2	19-21960-M201A-(54-56) #2 APC OUTLET BLANK2
ALS Sample ID		L2345016-31	L2345016-32	L2345016-33	L2345016-34	L2345016-35
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
PM via Gravimetric Analysis Method 201A	LOR mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	<0.1	-
Acetone Particulate Matter	0.4	<0.1	0.1 J	<0.1	-	-
	g	g	g	g	g	g
Acetone Mass	0.02	73.9	79.0	72.9	-	-
PM via Gravimetric Analysis Method 202	LOR mg	mg	mg	mg	mg	mg
Extractable Condensable Particulates	0.4	-	-	-	-	1.0
Non-Extractale Condensable Particulates	0.4	-	-	-	-	<0.1
	g	g	g	g	g	g
Water Mass	0.02	-	-	-	-	102

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Sample Analysis Summary Report

Sample Name		**MB**	**MB**
ALS Sample ID		L2345016-MB1	L2345016-MB2
Matrix		n/a	n/a
Analysis type		Sample	Sample
Sampling Date/Time		n/a	n/a
Date of Receipt		n/a	n/a

PM via Gravimetric Analysis	**LOR**				
Method 201A	**mg**	**mg**		**mg**	
Filter Particulate Matter	0.8	<0.1		-	
Acetone Particulate Matter	0.4	0.2	J	0.1	J
	g	**g**		**g**	
Acetone Mass	0.02	35.9		34.5	
PM via Gravimetric Analysis	**LOR**				
Method 202	**mg**	**mg**		**mg**	
Extractable Condensable Particulates	0.4	<0.1		-	
Non-Extractale Condensable Particulates	0.4	<0.1		-	
	g	**g**		**g**	
Water Mass	0.02	237		-	

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1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	Ortech Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road Mississauga, ON L5J 2Y4 Canada
ALS WO#:	L2344909		
Date of Report	12-Sep-19		
Date of Sample Receipt	11-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS:

Cl as HCl Anion Analysed via Ion Chromatography USEPA Method 26A (GN 12-Sep-19)
F as HF Anion Analysed via Ion Chromatography USEPA Method 26A (GN 12-Sep-19)
Ammonia, Total (as NH3) via Ion Chromatography USEPA Method CTM-027 (GN 12-Sep-19)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: 90-110%)
MS = Matrix Spike Sample (limits: 90-110%, NH_3: 85-115%)
RPD = Relative Percent Difference (limits: <20% for sample duplicate, <10% for duplicate injection)
CVS = Calibration Verification Standard (limits: 90-110%)

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-M26A-1 APC OUTLET#1	19-21960-M26A-2 APC OUTLET#1	19-21960-M26A-3 APC OUTLET#1	19-21960-M26A-4 APC OUTLET#2	19-21960-M26A-5 APC OUTLET#2
ALS Sample ID	L2344909-1	L2344909-2	L2344909-3	L2344909-4	L2344909-5
Matrix	Stack	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample	Sample
Sampling Date/Time	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	10-Sep-19
Date of Receipt	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Ion Chromatography Analysis					
USEPA Method 26A	**mg**	**mg**	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.217	<0.175	<0.168	<0.221	<0.161
Analysis 1	<0.217	<0.175	<0.168	<0.221	<0.161
Analysis 2	<0.217	<0.175	<0.168	<0.221	<0.161
Total Cl^- as HCl (ave)	21.0	10.8	8.73	7.59	3.32
Analysis 1	20.8	11.0	8.63	7.60	3.33
Analysis 2	21.1	10.7	8.82	7.58	3.32
Ion Chromatography Analysis					
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.942	0.613	0.486	2.00	0.876

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Sample Analysis Summary Report

Sample Name	19-21960-M26A-6 APC OUTLET#2	19-21960-M26A-BLANK1 APC OUTLET#1	19-21960-M26A-BLANK2 APC OUTLET#2
ALS Sample ID	L2344909-6	L2344909-7	L2344909-8
Matrix	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample
Sampling Date/Time	10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt	11-Sep-19	11-Sep-19	11-Sep-19
Ion Chromatography Analysis			
USEPA Method 26A	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.165	<0.175	<0.168
Analysis 1	<0.165	<0.175	<0.168
Analysis 2	<0.165	<0.175	<0.168
Total Cl^- as HCl (ave)	2.91	<1.03	<0.987
Analysis 1	2.97	<1.03	<0.987
Analysis 2	2.84	<1.03	<0.987
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.802	<0.453	<0.434

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Sample QC Summary Report

Sample Name	LCB	LCS	LCS
ALS Sample ID	LCB	LCS	LCS
Matrix	Stack	Stack	Stack
Analysis type	Method Blank	Blank Spike	Blank Spike
Sampling Date/Time	n/a	n/a	n/a
Date of Receipt	n/a	n/a	n/a
Ion Chromatography Analysis			
USEPA Method 26A	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	0.00437	0.0578	101%
Analysis 1	0.00442	0.0577	
Analysis 2	0.00432	0.0578	
Total Cl^- as HCl (ave)	<0.0103	0.0770	98%
Analysis 1	<0.0103	0.0769	
Analysis 2	<0.0103	0.0771	
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.00472	0.0485	103%

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Sample QC Summary Report

Sample Name	19-21960-M26A-4 APC OUTLET#2	19-21960-M26A-4 APC OUTLET#2	19-21960-M26A-4 APC OUTLET#2	19-21960-M26A-4 APC OUTLET#2
ALS Sample ID	L2344909-4	L2344909-4DUP	L2344909-4MS	L2344909-4MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Spike	Matrix Spike
Sampling Date/Time	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19
Date of Receipt	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Ion Chromatography Analysis				
USEPA Method 26A	**mg**	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.221	<0.221	6.39	95%
Analysis 1	<0.221	<0.221	6.42	
Analysis 2	<0.221	<0.221	6.36	
Total Cl^- as HCl (ave)	7.59	7.27	17.4	101%
Analysis 1	7.60	7.27	17.5	
Analysis 2	7.58	7.28	17.3	
Ion Chromatography Analysis				
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	2.00	2.01	7.67	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#:	L2344999		Mississauga, ON L5J 2Y4
Date of Report	3-Oct-19		(905)822-4120
Date of Sample Receipt	11-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS:

Sample Preparation via USEPA Method 29 (AB 27-SEP-2019 & 01-OCT-2019)
Mercury Analysis via CVAA using Method USEPA 7470A (AB 30-SEP-2019 & 02-OCT-2019)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: L. Wrona

Lynne Wrona
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(7 THRU 12) #1 APC OUTLET TEST#2	19-21960-PM-(13 THRU 18) #1 APC OUTLET TEST#3	19-21960-PM-(19 THRU 24) BLANK1	19-21960-PM-(25 THRU 30) #2 APC OUTLET TEST#1
ALS Sample ID		L2344999-1	L2344999-2	L2344999-3	L2344999-4	L2344999-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		9-Sep-19	9-Sep-19	10-Sep-19	10-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Mercury via CVAA	**LOR**					
Method 29	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Analytical Fraction 2B	0.050	1.98	1.27	0.950	<0.15	0.590
Analytical Fraction 3B	0.025	<0.025	<0.025	<0.025	<0.025	<0.0275
Analytical Fraction 3C	0.25	0.208	<0.2	<0.15	<0.2	<0.2

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Sample Analysis Summary Report

Sample Name		19-21960-PM-(31 THRU 36) #2 APC OUTLET TEST#2	19-21960-PM-(37 THRU 42) #2 APC OUTLET TEST#3	19-21960-PM-(43 THRU 48) BLANK2
ALS Sample ID		L2344999-6	L2344999-7	L2344999-8
Matrix		Stack	Stack	Stack
Analysis type		Sample	Sample	Sample
Sampling Date/Time		10-Sep-19	10-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19
Mercury via CVAA	**LOR**			
Method 29	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<0.015	<0.015	<0.015
Analytical Fraction 2B	0.050	<0.39	<0.34	<0.155
Analytical Fraction 3B	0.025	<0.025	<0.025	<0.0225
Analytical Fraction 3C	0.25	<0.225	<0.15	<0.15

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Sample QC Summary Report

Sample Name		LCB	LCS	LCS	LCSD	LCSD
ALS Sample ID		LCB	LCS	LCS	LCSD	LCSD
Analysis type		Method Blank	Blank Spike	Blank Spike	Blank Spike Dup	Blank Spike Dup
Sampling Date/Time		N/A	N/A	N/A	N/A	N/A
Date of Receipt		N/A	N/A	N/A	N/A	N/A
Mercury via CVAA	**LOR**					
Method 29	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<0.015	0.281	94%	0.292	97%
Analytical Fraction 2B	0.050	<0.15	2.81	94%	2.83	95%
Analytical Fraction 3B	0.025	<0.025	0.454	91%	0.484	97%
Analytical Fraction 3C	0.25	<0.25	4.84	96%	4.81	95%

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Sample QC Summary Report

Sample Name		19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1
ALS Sample ID		L2344999-1	L2344999-1DUP	L2344999-1MS	L2344999-1MS	L2344999-1MSD	L2344999-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Mercury via CVAA	**LOR**						
Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<0.015	<0.015	0.303	99%	0.306	100%
Analytical Fraction 2B	0.050	1.98	2.01	10.4	93%	10.4	93%
Analytical Fraction 3B	0.025	<0.025	<0.025	0.441	89%	0.439	88%
Analytical Fraction 3C	0.250	0.208	0.204	3.86	91%	3.89	92%

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1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2344999		MIssissauga, ON L5J 2Y4
Date of Report	3-Oct-19		(905)822-4120
Date of Sample Receipt	11-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 2-Oct-19)

Sample Preparation via USEPA Method 29 (AB 1-Oct-19)

ANALYST COMMENTS:

Fraction 1A method blank (MB) shows significant background levels of Cr, Mo and Ni. Low levels of Cr have been observed in the reagent blank (RB) for this fraction as well. The difference between these two QC samples is the presence of a representative unsampled filter in the method blank. This background contribution is expected to originate in the filter matrix. Data for this fraction is likely to be biased high. **PE 3-Oct-19**

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		19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(7 THRU 12) #1 APC OUTLET TEST#2	19-21960-PM-(13 THRU 18) #1 APC OUTLET TEST#3	19-21960-PM-(19 THRU 24) BLANK1	19-21960-PM-(25 THRU 30) #2 APC OUTLET TEST#1	19-21960-PM-(31 THRU 36) #2 APC OUTLET TEST#2
ALS Sample ID		L2344999-1	L2344999-2	L2344999-3	L2344999-4	L2344999-5	L2344999-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		9-Sep-19	9-Sep-19	10-Sep-19	10-Sep-19	9-Sep-19	10-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A							
Antimony	0.2	0.237	0.215	<	<	0.353	<
Arsenic	1	<	<	<	<	<	<
Barium	5	6.39	5.52	7.65	5.46	6.09	5.82
Beryllium	0.2	<	<	<	<	<	<
Cadmium	0.1	2.01	0.290	0.299	<	0.614	0.241
Chromium	1	2.35	3.36	2.32	1.53	2.51	2.23
Cobalt	0.2	0.266	<	<	<	<	<
Copper	1	2.14	1.80	1.69	<	1.65	1.27
Lead	0.5	1.52	1.32	1.12	0.514	2.46	1.18
Molybdenum	0.2	9.22	9.46	9.74	9.48	9.29	9.32
Nickel	0.2	3.23	3.55	3.56	1.84	2.96	2.68
Selenium	2	<	<	<	<	<	<
Silver	0.2	<	<	<	<	<	<
Thallium	0.2	<	<	<	<	<	<
Vanadium	1	<	<	<	<	<	<
Zinc	6	15.3	26.9	18.8	<	19.2	13.6
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	0.101	<	<	<	<
Arsenic	0.2	<	<	<	<	<	<
Barium	0.5	2.65	1.52	1.32	0.771	2.65	1.48
Beryllium	0.1	<	<	<	<	<	<
Cadmium	0.05	0.0943	<	<	<	0.0792	<
Chromium	0.15	0.932	0.827	0.775	0.312	0.908	0.501
Cobalt	0.1	0.213	<	<	<	0.196	<
Copper	0.3	3.76	1.66	1.11	0.580	1.47	0.832
Lead	0.05	0.529	0.719	3.07	1.84	0.849	1.15
Molybdenum	0.1	0.102	<	<	<	<	<
Nickel	0.1	2.02	2.21	1.22	0.319	1.19	0.801
Selenium	1	<	<	<	<	<	<
Silver	0.1	<	<	<	<	<	<
Thallium	0.05	<	<	<	<	<	<
Vanadium	0.1	<	<	<	<	<	<
Zinc	3	13.0	12.6	9.09	<	11.8	8.08

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Sample Analysis Summary Report

Sample Name		**19-21960-PM-(37 THRU 42) #2 APC OUTLET TEST#3**	**19-21960-PM-(43 THRU 48) BLANK2**	**MB**
ALS Sample ID		L2344999-7	L2344999-8	L2344999-MB
Matrix		Stack	Stack	n/a
Analysis Type		Sample	Sample	Sample
Sampling Date		10-Sep-19	10-Sep-19	n/a
Date of Receipt		11-Sep-19	11-Sep-19	n/a
Multi-Metals via ICP-MS	**LOR**			
	ug	**ug**	**ug**	**ug**
Front Half HF Fraction 1A				
Antimony	0.2	<	<	<
Arsenic	1	<	<	<
Barium	5	5.36	<	<
Beryllium	0.2	<	<	<
Cadmium	0.1	0.170	<	<
Chromium	1	8.28	1.34	21.8
Cobalt	0.2	<	<	<
Copper	1	1.29	<	<
Lead	0.5	1.37	0.642	<
Molybdenum	0.2	8.49	8.85	20.7
Nickel	0.2	3.09	1.73	0.855
Selenium	2	<	<	<
Silver	0.2	<	<	<
Thallium	0.2	<	<	<
Vanadium	1	<	<	<
Zinc	6	18.1	<	<
Back Half (HNO3 / H2O2) Fraction 2A				
Antimony	0.1	<	<	
Arsenic	0.2	<	<	
Barium	0.5	0.857	1.03	-
Beryllium	0.1	<	<	-
Cadmium	0.05	<	<	-
Chromium	0.15	0.631	0.345	-
Cobalt	0.1	<	<	-
Copper	0.3	0.880	0.582	-
Lead	0.05	0.765	1.69	-
Molybdenum	0.1	<	<	-
Nickel	0.1	1.24	0.475	-
Selenium	1	<	<	-
Silver	0.1	<	<	-
Thallium	0.05	<	<	-
Vanadium	0.1	<	<	-
Zinc	3	11.9	<	-

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Sample QC Summary Report

Sample Name	LOR	RB	LCS	LCS	LCSD	LCSD
ALS Sample ID		RB	LCS	LCS	LCSD	LCSD
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis Type		Blank	LCS	LCS	LCS	LCS
Sampling Date		n/a	n/a	n/a	n/a	n/a
Date of Receipt		n/a	n/a	n/a	n/a	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A						
Antimony	0.2	<	11.9	99	11.8	98
Arsenic	1	<	55.7	93	55.9	93
Barium	5	<	58.7	98	58.5	97
Beryllium	0.2	<	52.3	87	52.2	87
Cadmium	0.1	<	29.2	97	29.7	99
Chromium	1	1.11	56.3	92	56.6	92
Cobalt	0.2	<	56.4	94	56.0	93
Copper	1	<	55.3	92	55.4	92
Lead	0.5	<	60.0	100	58.1	97
Molybdenum	0.2	<	29.2	97	28.8	96
Nickel	0.2	<	56.6	94	56.8	95
Selenium	2	<	58.2	97	57.8	96
Silver	0.2	<	21.4	71	29.8	99
Thallium	0.2	<	59.6	99	58.0	97
Vanadium	1	<	55.8	93	55.4	92
Zinc	6	<	111	91	113	92
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	<	6.30	105	6.22	104
Arsenic	0.2	<	29.2	97	29.6	99
Barium	0.5	<	30.7	102	30.2	101
Beryllium	0.1	<	27.3	91	27.6	92
Cadmium	0.05	<	15.0	100	15.2	101
Chromium	0.15	<	29.3	97	29.5	98
Cobalt	0.1	<	29.6	99	29.9	99
Copper	0.3	<	28.9	96	29.0	97
Lead	0.05	0.0721	31.0	103	30.6	102
Molybdenum	0.1	<	15.4	102	15.5	103
Nickel	0.1	<	29.7	99	29.9	100
Selenium	1	<	30.0	100	29.7	99
Silver	0.1	<	15.7	105	15.7	105
Thallium	0.05	<	31.5	105	29.8	99
Vanadium	0.1	<	29.4	98	29.7	99
Zinc	3	<	57.9	95	58.1	96

ALS Environmental

Sample QC Summary Report

Sample Name		19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1	19-21960-PM-(1 THRU 6) #1 APC OUTLET TEST#1
ALS Sample ID		L2344999-1	L2344999-1	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		9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19	9-Sep-19
Date of Receipt		11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	0.237	0.237	23.7	98	23.7	98
Arsenic	1	<	<	110	92	109	90
Barium	5	6.39	6.38	118	93	120	95
Beryllium	0.2	<	<	102	85	102	85
Cadmium	0.1	2.01	1.98	57.5	92	61.6	99
Chromium	1	2.35	2.34	112	92	111	90
Cobalt	0.2	0.266	0.264	111	93	111	92
Copper	1	2.14	2.14	111	91	110	89
Lead	0.5	1.52	1.55	117	96	116	95
Molybdenum	0.2	9.22	9.40	65.6	94	65.2	93
Nickel	0.2	3.23	3.33	116	94	114	93
Selenium	2	<	<	111	93	110	92
Silver	0.2	<	<	57.8	96	57.7	96
Thallium	0.2	<	<	115	96	114	95
Vanadium	1	<	<	111	92	109	91
Zinc	6	15.3	15.0	236	92	236	92
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	11.3	94	11.8	98
Arsenic	0.2	<	<	53.1	88	54.5	91
Barium	0.5	2.65	2.67	59.2	94	60.1	96
Beryllium	0.1	<	<	50.5	84	52.4	87
Cadmium	0.05	0.0943	0.107	27.7	92	27.7	92
Chromium	0.15	0.932	0.957	54.7	90	56.2	92
Cobalt	0.1	0.213	0.184	54.7	91	55.8	93
Copper	0.3	3.76	3.72	56.5	88	57.8	90
Lead	0.05	0.529	0.518	56.4	93	59.3	98
Molybdenum	0.1	0.102	0.119	28.1	93	29.3	97
Nickel	0.1	2.02	2.04	56.6	91	58.0	93
Selenium	1	<	<	54.6	90	54.6	90
Silver	0.1	<	<	28.4	95	29.7	99
Thallium	0.05	<	<	56.4	94	59.7	99
Vanadium	0.1	<	<	54.3	90	55.9	93
Zinc	3	13.0	12.9	118	87	120	89

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.: 21960
Date: SEPT 10, 19

Test No.: 1
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem
- CONTAINER TS1
- Container TS1 Weights
- Mark Fluid Level and
- Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem
- CONTAINER TS2
- Container TS2 Weights
- Mark Fluid Level and
- Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top
- CONTAINER TS3
- Container TS3 Weights
- Mark Fluid Level and
- Seal and label container TS3

Back-Up Filter

Filter ID: Q26715

CONTAINER TS4

Initial Wt:	.1512
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	490.7
Final Wt:	650.5
1 Gain:	159.8
Colour:	Clear

Impinger #2 Empty	
Empty Wt:	671.0
Final Wt:	671.7
2 Gain:	0.7
Colour:	clear

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	654.1
Initial Wt:	757.5
Final Wt:	755.9
3 Gain:	-1.6
Colour:	—

Impinger #4 Silica Gel	
Initial Wt:	972.7
Final Wt:	983.5
4 Gain:	10.8
% Spent:	15

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: 10:30
Purge Off: 11:30

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3: 158.9

WCBDA=4: 10.8

SAMPLE IDENTIFICATION	19-21960-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: DT/DU

16

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 10, 19

Test No.: 2
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: 0Z6718

CONTAINER TS4

Initial Wt:	.1524
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	531.0
Final Wt:	692.0
1 Gain:	161
Colour:	clear

Impinger #2 Empty	
Empty Wt:	539.6
Final Wt:	539.6
2 Gain:	0
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	644.8
Initial Wt:	741.8
Final Wt:	740.7
3 Gain:	-1.1
Colour:	clear

Impinger #4 Silica Gel	
Initial Wt:	943.5
Final Wt:	952.9
4 Gain:	9.4
% Spent:	25

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:	14:00
Purge Off:	15:00

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Mark Fluid Level and Seal and Label Container

CONTAINER TS6

Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3: 159.9

WCBDA=4: 9.4

SAMPLE IDENTIFICATION	19-21960-M201A-
TS1 (Part. > 10)	8
TS2 (Part. > 2.5)	9
TS3 (Part. < 2.5)	10
TS4 (Back Up Filter, <2.5)	11
TS5 (Imp 2 $H_2$0 and rinse)	12
TS6 (Secondary Filter)	13
TS7 (Acetone / Hexane rinse)	14

Train Loaded By: DT
Train Recovered By: DT/KU

#9

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 10, 19

Test No.: 3
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: Q26719

CONTAINER TS4

Initial Wt:	.1494
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	490.7
Final Wt:	661.4
1 Gain:	170.7
Colour:	clean

Impinger #2 Empty	
Empty Wt:	671.7
Final Wt:	671.3
2 Gain:	-0.4
Colour:	clean

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	654.1
Initial Wt:	755.9
Final Wt:	754.1
3 Gain:	-1.8
Colour:	clear

Impinger #4 Silica Gel	
Initial Wt:	983.5
Final Wt:	994.4
4 Gain:	10.9
% Spent:	

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)

** if there is no goin purge is not required.*

Purge On: 17:00
Purge Off: 18:00

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Mark Fluid Level and Seal and Label Container

CONTAINER TS6

Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3: 168.5

WCBDA=4: 10.9

SAMPLE IDENTIFICATION	19-21960-M201A-
TS1 (Part. > 10)	15
TS2 (Part. > 2.5)	16
TS3 (Part. < 2.5)	17
TS4 (Back Up Filter, <2.5)	18
TS5 (Imp 2 H_2O and rinse)	19
TS6 (Secondary Filter)	20
TS7 (Acetone / Hexane rinse)	21

Train Loaded By: DT
Train Recovered By: DT/DU

16

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 10/19

Test No.: BLANK 1
Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: 02 6716

CONTAINER TS4

Initial Wt:	.1490
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 Empty	
Empty Wt:	
Final Wt:	
2 Gain:	
Colour:	

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	
% Spent:	

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)
** if there is no goin purge is not required.*

Purge On:
Purge Off:

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and
Seal and Label Container

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and
Seal and Label Container

CWTR=1+2+3:

WCBDA=4:

SAMPLE IDENTIFICATION	19-21960-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_2O and rinse)	47
TS6 (Secondary Filter)	48
TS7 (Acetone / Hexane rinse)	49

Train Loaded By: DT
Train Recovered By: DT

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: SEPT 9, 19

Test No.: 1
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

- CONTAINER TS1
- Container TS1 Weights
- Mark Fluid Level and
- Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

- CONTAINER TS2
- Container TS2 Weights
- Mark Fluid Level and
- Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

- CONTAINER TS3
- Container TS3 Weights
- Mark Fluid Level and
- Seal and label container TS3

Back-Up Filter

Filter ID: QZ 6713

CONTAINER TS4

Initial Wt:	1466
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	490.7
Final Wt:	668.8
1 Gain:	178.1
Colour:	clear

Impinger #2 Empty	
Empty Wt:	671.0
Final Wt:	671.0
2 Gain:	0
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	654.1
Initial Wt:	753.6
Final Wt:	752.6
3 Gain:	-1.0
Colour:	—

Impinger #4 Silica Gel	
Initial Wt:	962.2
Final Wt:	972.7
4 Gain:	10.5
% Spent:	5

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)

** if there is no gain purge is not required.*

Purge On:	13:50
Purge Off:	14:50

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3: 177.1 ✓

WCBDA=4: 10.5

SAMPLE IDENTIFICATION	19-21960-M201A-
TS1 (Part. > 10)	22
TS2 (Part. > 2.5)	23
TS3 (Part. < 2.5)	24
TS4 (Back Up Filter, <2.5)	25
TS5 (Imp 2 H_2O and rinse)	26
TS6 (Secondary Filter)	27
TS7 (Acetone / Hexane rinse)	28

Train Loaded By: DU
Train Recovered By: AT / DU

16

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: Sept 9, 19

Test No.: 2
Test Location: Unit 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ6714

CONTAINER TS4

Initial Wt:	.1487
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	531.0
Final Wt:	708.3
1 Gain:	177.3
Colour:	clear

Impinger #2 Empty	
Empty Wt:	539.5
Final Wt:	539.5
2 Gain:	0
Colour:	—

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	644.8
Initial Wt:	743.1
Final Wt:	741.8
3 Gain:	-1.3
Colour:	clear

Impinger #4 Silica Gel	
Initial Wt:	~~943.~~ 933.5
Final Wt:	943.5
4 Gain:	10.0
% Spent:	—

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
Mark Fluid Level and
Seal and Label Container

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and
Seal and Label Container

CWTR=1+2+3: 176.0 ✓

WCBDA=4: 10.0

SAMPLE IDENTIFICATION	19-21960-M201A-
TS1 (Part. > 10)	29
TS2 (Part. > 2.5)	30
TS3 (Part. < 2.5)	31
TS4 (Back Up Filter, <2.5)	32
TS5 (Imp 2 H_2O and rinse)	33
TS6 (Secondary Filter)	34
TS7 (Acetone / Hexane rinse)	35

Train Loaded By: DU
Train Recovered By: DT/DU

#9

ORTECH Environmental

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21960
Date: Sept 11, 19

Test No.: 3
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem
- CONTAINER TS1
- Container TS1 Weights
- Mark Fluid Level and
- Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem
- CONTAINER TS2
- Container TS2 Weights
- Mark Fluid Level and
- Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top
- CONTAINER TS3
- Container TS3 Weights
- Mark Fluid Level and
- Seal and label container TS3

Back-Up Filter

Filter ID: 226720

CONTAINER TS4

Initial Wt:	.1490
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1	Knock Out
Empty Wt:	531.0
Final Wt:	706.5
1 Gain:	175.5
Colour:	clear

Impinger #2	Empty
Empty Wt:	539.6
Final Wt:	539.6
2 Gain:	0
Colour:	clear

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	644.8
Initial Wt:	740.7
Final Wt:	738.1
3 Gain:	-2.6
Colour:	clear

Impinger #4 Silica Gel	
Initial Wt:	952.9
Final Wt:	965.2
4 Gain:	12.3
% Spent:	—

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)
** if there is no gain purge is not required.*

Purge On: 11:55
Purge Off: 12:55

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5
Mark Fluid Level and Seal and Label Container

CONTAINER TS6
Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3: 172.9 ✓
WCBDA=4: 12.3

SAMPLE IDENTIFICATION	19-21960-M201A-
TS1 (Part. > 10)	36
TS2 (Part. > 2.5)	37
TS3 (Part. < 2.5)	38
TS4 (Back Up Filter, <2.5)	39
TS5 (Imp 2 H_2O and rinse)	40
TS6 (Secondary Filter)	41
TS7 (Acetone / Hexane rinse)	42

Train Loaded By: DT
Train Recovered By: DT

#9

ORTECH Environmental

PM_{10}, $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC

Project No.: 21960

Date: SEPT 10, 19

Test No.: BLANK 2

Test Location:

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem

CONTAINER TS1

Container TS1 Weights

Mark Fluid Level and

Seal and label container TS1

PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem

CONTAINER TS2

Container TS2 Weights

Mark Fluid Level and

Seal and label container TS2

Exit Stem, and Connecting Tubing to Filter, and Filter Top

CONTAINER TS3

Container TS3 Weights

Mark Fluid Level and

Seal and label container TS3

Back-Up Filter

Filter ID: QZ6717

CONTAINER TS4

Initial Wt:	.1499
Final Wt:	
Gain:	
Colour:	

Seal and label container TS4

Impingers 1, 2, 3, 4

Impinger #1 Knock Out	
Empty Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 Empty	
Empty Wt:	
Final Wt:	
2 Gain:	
Colour:	

Secondary Filter

Impinger #3 H_2O	
Empty Wt:	
Initial Wt:	
Final Wt:	
3 Gain:	
Colour:	

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	
% Spent:	

CONTAINER TS5 & TS6

Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)

** if there is no gain purge is not required.*

Purge On:	
Purge Off:	

Rinse all glassware from filter to 2nd u-tube with di H2O into TS3

CONTAINER TS5

Mark Fluid Level and Seal and Label Container

CONTAINER TS6

Secondary Filter

Seal and label container TS6

CONTAINER TS7

Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7

Acetone/Hexane Rinse

Mark Fluid Level and Seal and Label Container

CWTR=1+2+3:	
WCBDA=4:	

SAMPLE IDENTIFICATION	19-21960-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: BT

APPENDIX 14

SVOC Train Recovery Data Sheets
(8 pages)

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: 1
Test Date: SEPT 12, 19
Test Location: UNIT 1

Sample ID 1 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser — CONTAINER TS1

Empty Wt:	430.3
After Acetone/ Hexane Rinse:	640.1
Total TS1:	209.8

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 2 — Filter — CONTAINER TS2

Colour:	WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 3 — XAD-II Trap — CONTAINER TS3

Initial Wt:	357.3
Final Wt:	363.0
1 Gain:	5.7
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 4 — Impingers 1, 2 & 3 — CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	605.7
Final Wt:	1139.0
2 Gain:	533.3
Colour:	clear

Impinger #2 Ethylene Glycol	
Empty Wt:	550.3
Initial Wt:	651.4
Final Wt:	780.2
3 Gain:	128.8
Colour:	clear

Impinger #3 Empty	
Empty Wt:	533.1
Final Wt:	533.9
4 Gain:	0.8
Colour:	clear

Container TS4 Weights	
Empty Wt:	434.4
With Imp Soln:	1186.6
Imp Volume:	752.2
After ~100g H_2O Rinse:	1282.5
Total TS4:	848.1

CWTR = 1 + 2 + 3 + 4: 668.6

WCBDA=5: 17.1

Sample ID 5 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers — CONTAINER TS5

Empty Wt:	425.0
After Acetone Rinse:	—
After Hexane Rinse:	593.7
Total TS5:	168.7

Impinger Box ID: 2

Impinger 4 Silica Gel — CONTAINER TS6 (Impinger)

Initial Wt:	1001.2
Final Wt:	1018.3
5 Gain:	17.1
% Spent:	

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	5
Trap ID: 4	4
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: AS
Train Recovered By: DT

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.:	21960
Sample Batch No.:	19-21960-SVOC-

Test No.:	2
Test Date:	Sept 12, 19
Test Location:	UNIT 1

Sample ID 6 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	431.4
After Acetone/ Hexane Rinse:	747.1
Total TS1:	315.7

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 7 — Filter

CONTAINER TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 8 — XAD-II Trap

CONTAINER TS3

Initial Wt:	352.3
Final Wt:	358.3
1 Gain:	6.0
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 9 — Impingers 1, 2 & 3

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	557.4
Final Wt:	950.2
2 Gain:	392.8
Colour:	clear

Impinger #2 Ethylene Glycol	
Empty Wt:	586.2
Initial Wt:	686.3
Final Wt:	904.7
3 Gain:	218.4
Colour:	clear

Impinger #3 Empty	
Empty Wt:	530.7
Final Wt:	636.9
4 Gain:	106.2
Colour:	clear

Container TS4 Weights	
Empty Wt:	426.3
With Imp Soln:	1226.7
Imp Volume:	800.4
After ~100g H_2O Rinse:	1340.0
Total TS4:	913.7

CWTR = 1 + 2 + 3 + 4: 723.4

WCBDA=5: 19.1

Sample ID 10 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	424.6
After Acetone Rinse:	—
After Hexane Rinse:	603.2
Total TS5:	178.6

Impinger Box ID: 4

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

Initial Wt:	954.4
Final Wt:	973.5
5 Gain:	19.1
% Spent:	

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	E
Trap ID:	10
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: AS

Train Recovered By: DT

✓ 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.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: 3
Test Date: SEPT 13/19
Test Location: UNIT 1

Sample ID 11 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	280.1
After Acetone/ Hexane Rinse:	540.1
Total TS1:	260.0

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 12 — Filter

CONTAINER TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 13 — XAD-II Trap

CONTAINER TS3

Initial Wt:	405.3
Final Wt:	411.1
1 Gain:	5.8
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 14 — Impingers 1, 2 & 3

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	657.3
Final Wt:	1026.7
2 Gain:	369.4
Colour:	clear

Impinger #2 Ethylene Glycol	
Empty Wt:	652.1
Initial Wt:	752.8
Final Wt:	963.5
3 Gain:	210.7
Colour:	clear

Impinger #3 Empty	
Empty Wt:	659.7
Final Wt:	798.2
4 Gain:	138.5
Colour:	clear

Container TS4 Weights	
Empty Wt:	425.3
With Imp Soln:	1224.5
Imp Volume:	799.2
After ~100g H_2O Rinse:	1326.0
Total TS4:	900.7

CWTR = 1 + 2 + 3 + 4: 724.4

WCBDA=5: 22.2

Sample ID 15 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	280.9
After Acetone Rinse:	
After Hexane Rinse:	518.8
Total TS5:	237.9

Impinger Box ID: 8

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

Initial Wt:	857.0
Final Wt:	879.2
5 Gain:	22.2
% Spent:	

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	I
Trap ID: 8	8
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: AS
Train Recovered By: BT

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: BLANK 1
Test Date: SEPT 12, 19
Test Location:

Sample ID 16 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser — CONTAINER TS1

Empty Wt:	432.1
After Acetone/ Hexane Rinse:	717.1
Total TS1:	285.0

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 17 — Filter — CONTAINER TS2

Colour:	WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 18 — XAD-II Trap — CONTAINER TS3

1

Initial Wt:	355.5
Final Wt:	355.5
Gain:	—
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 19 — Impingers 1, 2 & 3 — CONTAINER TS4

2

Impinger #1 Empty	
Empty Wt:	606.6
Final Wt:	606.6
Gain:	—
Colour:	—

3

Impinger #2 Ethylene Glycol	
Empty Wt:	681.6
Initial Wt:	823.4
Final Wt:	823.4
Gain:	—
Colour:	—

4

Impinger #3 Empty	
Empty Wt:	543.3
Final Wt:	543.3
Gain:	—
Colour:	—

Container TS4 Weights	
Empty Wt:	430.4
With Imp Soln:	571.6
Imp Volume:	141.2
After ~100g H_2O Rinse:	676.3
Total TS4:	245.9

CWTR = 1 + 2 + 3 + 4:

WCBDA=5:

Sample ID 20 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers — CONTAINER TS5

Empty Wt:	434.0
After Acetone Rinse:	530.0
After Hexane Rinse:	613.8
Total TS5:	179.8

Impinger 4 Silica Gel — CONTAINER TS6 (Impinger)

5

Initial Wt:	
Final Wt:	
Gain:	
% Spent:	

Impinger Box ID:

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	H
Trap ID:	
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177177
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: DT
Train Recovered By: DT

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.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: 1
Test Date: SEPT 11, 19
Test Location: UNIT 2

Sample ID 21
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser
CONTAINER TS1

Empty Wt:	433.0
After Acetone/ Hexane Rinse:	674.3
Total TS1:	241.3

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 22
Filter
CONTAINER TS2

Colour: WHITE

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 23
XAD-II Trap
CONTAINER TS3

Initial Wt:	377.1
Final Wt:	379.6
1 Gain:	2.5
Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 24
Impingers 1, 2 & 3
CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	670.1
Final Wt:	986.3
2 Gain:	316.3
Colour:	clear

Impinger #2 Ethylene Glycol	
Empty Wt:	654.0
Initial Wt:	753.2
Final Wt:	946.8
3 Gain:	193.6
Colour:	clear

Impinger #3 Empty	
Empty Wt:	484.5
Final Wt:	623.6
4 Gain:	139.1
Colour:	clear

Container TS4 Weights	
Empty Wt:	429.1
With Imp Soln:	1162.9
Imp Volume:	733.8
After ~100g H_2O Rinse:	1252.7
Total TS4:	823.6

CWTR = 1 + 2 + 3 + 4: 651.5

WCBDA=5: 21.8

Sample ID 25
Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers
CONTAINER TS5

Empty Wt:	433.9
After Acetone Rinse:	576.9
After Hexane Rinse:	636.2
Total TS5:	202.3

Impinger Box ID: 6

Impinger 4 Silica Gel
CONTAINER TS6 (Impinger)

Initial Wt:	964.4
Final Wt:	986.2
5 Gain:	21.8
% Spent:	

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	C
Trap ID:	9
HPLC Batch No.:	A25
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: AS
Train Recovered By: DT

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.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: 2
Test Date: SEPT 11, 19
Test Location: UNIT 2

Sample ID 26 — Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser

CONTAINER TS1

Empty Wt:	425.8
After Acetone/ Hexane Rinse:	730.9
Total TS1:	305.1

MARK FLUID LEVEL

SEAL AND LABEL CONTAINER TS1

Sample ID 27 — Filter

CONTAINER TS2

Colour:

FOLD IN FOIL

SEAL AND LABEL CONTAINER TS2

Sample ID 28 — XAD-II Trap

CONTAINER TS3

	Initial Wt:	358.2
	Final Wt:	364.0
1	Gain:	5.8
	Colour:	WHITE

SEAL TRAP

WRAP IN FOIL

LABEL AS CONTAINER TS3

Sample ID 29 — Impingers 1, 2 & 3

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	602.3
	Final Wt:	1123.5
2	Gain:	521.2
	Colour:	clear

	Impinger #2 Ethylene Glycol	
	Empty Wt:	518.3
	Initial Wt:	618.1
	Final Wt:	758.9
3	Gain:	140.8
	Colour:	clear

	Impinger #3 Empty	
	Empty Wt:	559.7
	Final Wt:	560.9
4	Gain:	1.2
	Colour:	clear

Container TS4 Weights	
Empty Wt:	433.2
With Imp Soln:	1184.2
Imp Volume:	751.0
After ~100g H_2O Rinse:	1279.2
Total TS4:	846.0

CWTR = 1 + 2 + 3 + 4: 669.0

WCBDA=5: 18.2

Sample ID 30 — Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers

CONTAINER TS5

Empty Wt:	432.2
After Acetone Rinse:	519.2
After Hexane Rinse:	614.8
Total TS5:	182.6

Impinger Box ID: 12

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Impinger 4 Silica Gel

CONTAINER TS6 (Impinger)

	Initial Wt:	978.0
	Final Wt:	996.2
5	Gain:	18.2
	% Spent:	

Train & Proofing Identification		
Glassware Train Proofing Provided By:		ALS
Glassware Train ID:	8	F
Trap ID:	7	7
HPLC Batch No.:		ALS
Ethylene Gylcol Batch No.:		177179
Hexane Batch No.:		102371
Acetone Batch No.:		104561

Train Loaded By: AS
Train Recovered By: DT

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: 3
Test Date: SEPT 12/19
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)

TS1
- Empty Wt: 422.5
- After Acetone/ Hexane Rinse: 748.5
- Total TS1: 326
- MARK FLUID LEVEL
- SEAL AND LABEL CONTAINER TS1

TS2
- Colour: WHITE
- FOLD IN FOIL
- SEAL AND LABEL CONTAINER TS2

TS3
- Initial Wt: 383.8
- Final Wt: 395.4
- 1 Gain: 11.6
- Colour: WHITE
- SEAL TRAP
- WRAP IN FOIL
- LABEL AS CONTAINER TS3

TS4

Impinger #1 Empty	
Empty Wt:	677.5
Final Wt:	1037.9
2 Gain:	360.4
Colour:	clear

Impinger #2 Ethylene Glycol	
Empty Wt:	662.6
Initial Wt:	252.6
Final Wt:	348.1
3 Gain:	95.5
Colour:	clear

Impinger #3 Empty	
Empty Wt:	588.6
Final Wt:	777.8
4 Gain:	189.2
Colour:	clear

Container TS4 Weights	
Empty Wt:	424.6
With Imp Soln:	1144.9
Imp Volume:	720.3
After ~100g H_2O Rinse:	1273.1
Total TS4:	848.5

CWTR = 1 + 2 + 3 + 4: 656.7

WCBDA=5: 13.7

TS5
- Empty Wt: 425.1
- After Acetone Rinse: —
- After Hexane Rinse: 652.2
- Total TS5: 227.1

TS6
- Initial Wt: 955.2
- Final Wt: 968.9
- 5 Gain: 13.7
- % Spent:

Impinger Box ID: 15

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	D
Trap ID:	3
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: AS
Train Recovered By:

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21960
Sample Batch No.: 19-21960-SVOC-

Test No.: BLANK 2
Test Date: SEPT 12, 19
Test Location:

Sample ID 36
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser
CONTAINER TS1

Empty Wt:	435.1
After Acetone/ Hexane Rinse:	645.5
Total TS1:	210.4

MARK FLUID LEVEL
SEAL AND LABEL CONTAINER TS1

Sample ID 37
Filter
CONTAINER TS2
Colour: WHITE
FOLD IN FOIL
SEAL AND LABEL CONTAINER TS2

Sample ID 38
XAD-II Trap
CONTAINER TS3

Initial Wt:	393.4
Final Wt:	393.4
1 Gain:	—
Colour:	WHITE

SEAL TRAP
WRAP IN FOIL
LABEL AS CONTAINER TS3

Sample ID 39
Impingers 1, 2 & 3
CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	606.6
Final Wt:	606.6
2 Gain:	—
Colour:	—

Impinger #2 Ethylene Glycol	
Empty Wt:	681.6
Initial Wt:	791.8
Final Wt:	791.8
3 Gain:	—
Colour:	—

Impinger #3 Empty	
Empty Wt:	543.3
Final Wt:	543.3
4 Gain:	—
Colour:	—

Container TS4 Weights	
Empty Wt:	434.1
With Imp Soln:	542.6
Imp Volume:	108.5
After ~100g H_2O Rinse:	645.3
Total TS4:	211.2

CWTR = 1 + 2 + 3 + 4:
WCBDA=5:

Sample ID 40
Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers
CONTAINER TS5

Empty Wt:	432.5
After Acetone Rinse:	520.3
After Hexane Rinse:	626.4
Total TS5:	193.9

Impinger 4 Silica Gel
CONTAINER TS6 (Impinger)

Initial Wt:	
Final Wt:	
5 Gain:	
% Spent:	

Impinger Box ID:

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	H
Trap ID:	6
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	177179
Hexane Batch No.:	104371
Acetone Batch No.:	104561

Train Loaded By: DT
Train Recovered By: DT

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

APPENDIX 15

SVOC Analytical Report
(69 pages)

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#:	L2348009		MIssissauga, ON L5J 2Y4
Date of Report	9-Oct-19		(905)822-4120
Date of Sample Receipt	16-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **PCDD/F by EPA M23**

Certified by: RA McLeod

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

ALS Life Sciences

Sample Analysis summary Report

Sample Name	19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET	19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET	19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET	19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET	19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET	19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET
ALS Sample ID	L2348009-1	L2348009-2	L2348009-3	L2348009-5	L2348009-6	L2348009-7
Sample Size	1	1	1	1	1	1
Sample size units	Train	Train	Train	Train	Train	Train
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	12-Sep-19	12-Sep-19	13-Sep-19	11-Sep-19	11-Sep-19	12-Sep-19
Extraction Date	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	<1.2	<1.2	<3.4	<1.5	<1.5	<1.3
1,2,3,7,8-PeCDD	2.24	1.87	2.90	4.82	4.49	<1.3
1,2,3,4,7,8-HxCDD	<1.7	2.68	<2.8	6.35	8.37	4.13
1,2,3,6,7,8-HxCDD	6.92	5.71	<6.0	21.5	25.1	14.7
1,2,3,7,8,9-HxCDD	2.80	3.59	<2.7	10.9	13.2	6.53
1,2,3,4,6,7,8-HpCDD	50.1	48.2	50.2	372	379	194
OCDD	89.4	77.6	79.0	881	885	516
2,3,7,8-TCDF	<3.1	3.57	<3.5	4.40	1.56	1.33
1,2,3,7,8-PeCDF	5.17	<2.9	6.19	<5.3	4.69	3.71
2,3,4,7,8-PeCDF	5.00	4.09	<3.0	11.2	7.16	4.26
1,2,3,4,7,8-HxCDF	4.59	3.76	<3.1	8.68	5.67	4.17
1,2,3,6,7,8-HxCDF	<3.7	<3.0	4.66	<11	<7.8	<5.1
2,3,4,6,7,8-HxCDF	5.94	4.60	<3.9	16.0	15.2	8.17
1,2,3,7,8,9-HxCDF	3.25	<3.6	5.34	4.86	7.78	5.21
1,2,3,4,6,7,8-HpCDF	14.1	13.4	15.8	78.1	79.6	43.3
1,2,3,4,7,8,9-HpCDF	4.35	3.48	<3.5	12.6	14.2	7.53
OCDF	27.5	<10	12.0	218	216	104
Field Spike Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	87	86	87	90	87	87
13C12-1,2,3,4,7,8-HxCDD	78	75	81	75	78	76
13C12-2,3,4,7,8-PeCDF	104	101	104	105	102	105
13C12-1,2,3,4,7,8-HxCDF	80	86	81	85	80	86
13C12-1,2,3,4,7,8,9-HpCDF	89	87	92	87	86	90
Extraction Standards						
13C12-2,3,7,8-TCDD	78	82	74	84	55	82
13C12-1,2,3,7,8-PeCDD	90	97	99	95	66	96
13C12-1,2,3,6,7,8-HxCDD	82	93	79	89	59	86
13C12-1,2,3,4,6,7,8-HpCDD	77	87	88	84	57	81
13C12-OCDD	67	73	84	73	45	71
13C12-2,3,7,8-TCDF	86	90	76	90	60	87
13C12-1,2,3,7,8-PeCDF	90	98	95	93	66	93
13C12-1,2,3,6,7,8-HxCDF	86	92	82	89	61	85
13C12-1,2,3,4,6,7,8-HpCDF	85	94	92	89	59	85
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	90	95	91	95	80	88
Homologue Group Totals	pg	pg	pg	pg	pg	pg
Total-TCDD	31.0	25.7	23.8	97.9	85.6	71.9
Total-PeCDD	25.5	22.9	28.4	195	130	131
Total-HxCDD	91.7	86.1	92.5	377	423	207
Total-HpCDD	96.6	96.2	97.0	791	824	409
Total-TCDF	145	41.5	<3.5	103	34.6	23.7
Total-PeCDF	43.5	19.2	22.4	87.2	65.5	25.9
Total-HxCDF	21.9	20.3	27.2	92.6	78.4	48.8
Total-HpCDF	27.9	20.8	20.7	123	119	65.0
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	6.97	6.16	4.77	20.4	19.5	8.45
Mid Point PCDD/F TEQ (WHO 2005)	8.42	7.51	9.16	22.4	21.1	10.9
Upper Bound PCDD/F TEQ (WHO 2005)	9.02	8.11	11.3	23.2	21.8	11.6

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Sample Analysis summary Report

Sample Name	19-21960-SVOC-(16 THRU 20) BLANK1	19-21960-SVOC-(36 THRU 40) BLANK2
ALS Sample ID	L2348009-4	L2348009-8
Sample Size	1	1
Sample size units	Train	Train
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	12-Sep-19	12-Sep-19
Extraction Date	25-Sep-19	25-Sep-19
Target Analytes	pg	pg
2,3,7,8-TCDD	<0.85	<3.7
1,2,3,7,8-PeCDD	<0.49	<1.7
1,2,3,4,7,8-HxCDD	<0.89	<2.1
1,2,3,6,7,8-HxCDD	<0.81	<1.9
1,2,3,7,8,9-HxCDD	<0.87	<2.0
1,2,3,4,6,7,8-HpCDD	<3.1	2.99
OCDD	<14	21.8
2,3,7,8-TCDF	<0.64	<2.8
1,2,3,7,8-PeCDF	<1.5	<1.7
2,3,4,7,8-PeCDF	<0.50	<1.6
1,2,3,4,7,8-HxCDF	<0.51	<1.1
1,2,3,6,7,8-HxCDF	0.530	<1.0
2,3,4,6,7,8-HxCDF	<0.43	<1.1
1,2,3,7,8,9-HxCDF	2.73	2.37
1,2,3,4,6,7,8-HpCDF	<1.6	3.11
1,2,3,4,7,8,9-HpCDF	<0.69	<0.92
OCDF	2.93	4.32
Field Spike Standards	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	88	84
13C12-1,2,3,4,7,8-HxCDD	82	71
13C12-2,3,4,7,8-PeCDF	108	104
13C12-1,2,3,4,7,8-HxCDF	84	79
13C12-1,2,3,4,7,8,9-HpCDF	88	88
Extraction Standards		
13C12-2,3,7,8-TCDD	87	78
13C12-1,2,3,7,8-PeCDD	102	117
13C12-1,2,3,6,7,8-HxCDD	91	88
13C12-1,2,3,4,6,7,8-HpCDD	85	96
13C12-OCDD	72	92
13C12-2,3,7,8-TCDF	95	79
13C12-1,2,3,7,8-PeCDF	98	111
13C12-1,2,3,6,7,8-HxCDF	94	90
13C12-1,2,3,4,6,7,8-HpCDF	96	97
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	97	82
Homologue Group Totals	pg	pg
Total-TCDD	<0.85	<3.7
Total-PeCDD	<0.49	<1.7
Total-HxCDD	<0.89	<2.1
Total-HpCDD	<0.96	6.83
Total-TCDF	<0.64	<2.8
Total-PeCDF	<0.42	<1.7
Total-HxCDF	3.26	2.37
Total-HpCDF	<0.69	3.11
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.327	0.306
Mid Point PCDD/F TEQ (WHO 2005)	1.52	3.88
Upper Bound PCDD/F TEQ (WHO 2005)	2.33	7.45

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Quality Control Summary Report

Sample Name	Media/Method Blank	Laboratory Control Sample
ALS Sample ID	WG3165005-1	WG3165005-2
Sample Size	1	1
Sample size units	Train	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	25-Sep-19	25-Sep-19
Target Analytes	**pg**	**% Rec**
2,3,7,8-TCDD	<1.2	104
1,2,3,7,8-PeCDD	<0.81	109
1,2,3,4,7,8-HxCDD	<1.6	94
1,2,3,6,7,8-HxCDD	<1.4	107
1,2,3,7,8,9-HxCDD	<1.5	103
1,2,3,4,6,7,8-HpCDD	2.84	106
OCDD	<4.2	104
2,3,7,8-TCDF	<0.81	108
1,2,3,7,8-PeCDF	<2.1	109
2,3,4,7,8-PeCDF	<0.60	96
1,2,3,4,7,8-HxCDF	<1.1	104
1,2,3,6,7,8-HxCDF	<1.0	120
2,3,4,6,7,8-HxCDF	<1.1	114
1,2,3,7,8,9-HxCDF	<3.0	120
1,2,3,4,6,7,8-HpCDF	<1.5	110
1,2,3,4,7,8,9-HpCDF	<0.76	95
OCDF	<1.8	105
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	77	96
13C12-1,2,3,7,8-PeCDD	94	121
13C12-1,2,3,6,7,8-HxCDD	81	98
13C12-1,2,3,4,6,7,8-HpCDD	89	106
13C12-OCDD	74	94
13C12-2,3,7,8-TCDF	86	100
13C12-1,2,3,7,8-PeCDF	97	119
13C12-1,2,3,6,7,8-HxCDF	86	97
13C12-1,2,3,4,6,7,8-HpCDF	97	116
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	91	101
Homologue Group Totals	**pg**	
Total-TCDD	<1.2	
Total-PeCDD	<0.81	
Total-HxCDD	<1.6	
Total-HpCDD	2.84	
Total-TCDF	<0.81	
Total-PeCDF	<0.66	
Total-HxCDF	<1.2	
Total-HpCDF	<0.76	
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.0284	
Mid Point PCDD/F TEQ (WHO 2005)	1.93	
Upper Bound PCDD/F TEQ (WHO 2005)	3.46	

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-1	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A19
Run Date	03-Oct-19 09:23
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

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		10
1,2,3,7,8-PeCDD	1	32.00	2.24	0.74	M,J		50
1,2,3,4,7,8-HxCDD	0.1	34.05	<1.7	1.1	M,J,R	1.7	50
1,2,3,6,7,8-HxCDD	0.1	34.11	6.92	1.0	M,J		50
1,2,3,7,8,9-HxCDD	0.1	34.24	2.80	1.1	M,J		50
1,2,3,4,6,7,8-HpCDD	0.01	35.73	50.1	1.2			50
OCDD	0.0003	37.22	89.4	1.8	J		100
2,3,7,8-TCDF	0.1	26.89	<3.1	1.3	M,J,R	3.1	10
1,2,3,7,8-PeCDF	0.03	31.06	5.17	0.94	M,J		50
2,3,4,7,8-PeCDF	0.3	31.78	5.00	0.84	M,J		50
1,2,3,4,7,8-HxCDF	0.1	33.57	4.59	1.4	M,J		50
1,2,3,6,7,8-HxCDF	0.1	33.64	<3.7	1.3	M,J,R	3.7	50
2,3,4,6,7,8-HxCDF	0.1	33.97	5.94	1.4	M,J		50
1,2,3,7,8,9-HxCDF	0.1	34.39	3.25	1.6	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.17	14.1	0.67	J		50
1,2,3,4,7,8,9-HpCDF	0.01	35.98	4.35	0.79	J		50
OCDF	0.0003	37.30	27.5	2.1	J		100
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	1000	27.81	87	70-130			
13C12-1,2,3,4,7,8-HxCDD	10000	34.05	78	70-130			
13C12-2,3,4,7,8-PeCDF	10000	31.77	104	70-130			
13C12-1,2,3,4,7,8-HxCDF	10000	33.56	80	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.97	89	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	12000	27.78	78	40-130			
13C12-1,2,3,7,8-PeCDD	12000	31.99	90	40-130			
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	82	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.72	77	25-130			
13C12-OCDD	24000	37.21	67	25-130			
13C12-2,3,7,8-TCDF	12000	26.87	86	40-130			
13C12-1,2,3,7,8-PeCDF	12000	31.05	90	40-130			
13C12-1,2,3,6,7,8-HxCDF	12000	33.63	86	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.16	85	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	90	40-130			
Homologue Group Totals		**# peaks**	**Conc. pg**	**EDL pg**			
Total-TCDD		4	31.0	1.2			10
Total-PeCDD		3	25.5	0.74			50
Total-HxCDD		6	91.7	1.1			50
Total-HpCDD		2	96.6	1.2			50
Total-TCDF		14	145	1.3			10
Total-PeCDF		7	43.5	0.94			50
Total-HxCDF		4	21.9	1.6			50
Total-HpCDF		4	27.9	0.79			50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	6.97
Mid Point PCDD/F TEQ (WHO 2005)	8.42
Upper Bound PCDD/F TEQ (WHO 2005)	9.02

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-2	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A20
Run Date	03-Oct-19 10:05
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

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		10
1,2,3,7,8-PeCDD	1	31.99	1.87	0.62	M,J		50
1,2,3,4,7,8-HxCDD	0.1	34.06	2.68	1.1	J		50
1,2,3,6,7,8-HxCDD	0.1	34.10	5.71	0.98	J		50
1,2,3,7,8,9-HxCDD	0.1	34.23	3.59	1.0	J		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	48.2	1.1	J		50
OCDD	0.0003	37.21	77.6	1.6	J		100
2,3,7,8-TCDF	0.1	26.86	3.57	0.94	M,J		10
1,2,3,7,8-PeCDF	0.03	31.06	<2.9	0.61	M,J,R	2.9	50
2,3,4,7,8-PeCDF	0.3	31.78	4.09	0.55	M,J		50
1,2,3,4,7,8-HxCDF	0.1	33.57	3.76	0.95	M,J		50
1,2,3,6,7,8-HxCDF	0.1	33.63	<3.0	0.89	M,J,R	3.0	50
2,3,4,6,7,8-HxCDF	0.1	33.96	4.60	0.95	J		50
1,2,3,7,8,9-HxCDF	0.1	34.38	<3.6	1.1	M,J,R	3.6	50
1,2,3,4,6,7,8-HpCDF	0.01	35.17	13.4	0.57	J		50
1,2,3,4,7,8,9-HpCDF	0.01	35.97	3.48	0.67	J		50
OCDF	0.0003	37.30	<10	1.4	M,J,R	10	100

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.81	86	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.04	75	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.77	101	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.55	86	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.96	87	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.78	82	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.98	97	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	93	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.72	87	25-130
13C12-OCDD	24000	37.21	73	25-130
13C12-2,3,7,8-TCDF	12000	26.87	90	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.04	98	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	92	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.16	94	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	95	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	2	25.7	1.2	10
Total-PeCDD	2	22.9	0.62	50
Total-HxCDD	6	86.1	1.1	50
Total-HpCDD	2	96.2	1.1	50
Total-TCDF	9	41.5	0.94	10
Total-PeCDF	4	19.2	0.61	50
Total-HxCDF	5	20.3	1.1	50
Total-HpCDF	3	20.8	0.67	50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	6.16
Mid Point PCDD/F TEQ (WHO 2005)	7.51
Upper Bound PCDD/F TEQ (WHO 2005)	8.11

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET**	Sampling Date	13-Sep-19
ALS Sample ID	L2348009-3	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A21
Run Date	03-Oct-19 10:47
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.4	3.4	U		10
1,2,3,7,8-PeCDD	1	32.02	2.90	1.4	M,J		50
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<2.8	2.8	U		50
1,2,3,6,7,8-HxCDD	0.1	34.11	<6.0	2.6	M,J,R	6.0	50
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<2.7	2.7	U		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	50.2	2.7			50
OCDD	0.0003	37.22	79.0	2.0	J		100
2,3,7,8-TCDF	0.1	NotFnd	<3.5	3.5	U		10
1,2,3,7,8-PeCDF	0.03	31.07	6.19	2.0	M,J		50
2,3,4,7,8-PeCDF	0.3	31.79	<3.0	1.8	M,J,R	3.0	50
1,2,3,4,7,8-HxCDF	0.1	33.57	<3.1	1.9	M,J,R	3.1	50
1,2,3,6,7,8-HxCDF	0.1	33.63	4.66	1.7	M,J		50
2,3,4,6,7,8-HxCDF	0.1	33.97	<3.9	1.8	M,J,R	3.9	50
1,2,3,7,8,9-HxCDF	0.1	34.37	5.34	2.1	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.17	15.8	1.5	J		50
1,2,3,4,7,8,9-HpCDF	0.01	35.99	<3.5	1.8	M,J,R	3.5	50
OCDF	0.0003	37.30	12.0	2.3	M,J		100

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.84	87	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.05	81	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.78	104	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.56	81	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.97	92	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.83	74	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.99	99	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	79	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.72	88	25-130
13C12-OCDD	24000	37.21	84	25-130
13C12-2,3,7,8-TCDF	12000	26.92	76	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.06	95	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.63	82	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.16	92	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	91	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**Flags**	**LQL**
Total-TCDD	1	23.8	3.4		10
Total-PeCDD	3	28.4	1.4		50
Total-HxCDD	3	92.5	2.8		50
Total-HpCDD	2	97.0	2.7		50
Total-TCDF	0	<3.5	3.5	U	10
Total-PeCDF	4	22.4	2.0		50
Total-HxCDF	5	27.2	2.1		50
Total-HpCDF	2	20.7	1.8		50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4.77
Mid Point PCDD/F TEQ (WHO 2005)	9.16
Upper Bound PCDD/F TEQ (WHO 2005)	11.3

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor — TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(16 THRU 20) BLANK1**	Sampling Date	12-Sep-19	
ALS Sample ID	L2348009-4	Extraction Date	25-Sep-19	
Analysis Method	EPA M23	Sample Size	1	Train
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	2	

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A17
Run Date	03-Oct-19 07:59
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<0.85	0.85	U		10
1,2,3,7,8-PeCDD	1	31.98	<0.49	0.49	M,U	0.44	50
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<0.89	0.89	U		50
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<0.81	0.81	U		50
1,2,3,7,8,9-HxCDD	0.1	34.23	<0.87	0.84	M,J,R	0.87	50
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<3.1	0.96	M,J,R	3.1	50
OCDD	0.0003	37.20	<14	1.0	M,J,R	14	100
2,3,7,8-TCDF	0.1	NotFnd	<0.64	0.64	U		10
1,2,3,7,8-PeCDF	0.03	31.05	<1.5	0.42	J,R	1.5	50
2,3,4,7,8-PeCDF	0.3	31.77	<0.50	0.38	M,J,R	0.50	50
1,2,3,4,7,8-HxCDF	0.1	33.57	<0.51	0.43	M,J,R	0.51	50
1,2,3,6,7,8-HxCDF	0.1	33.62	0.530	0.40	M,J		50
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.43	0.43	M,U	0.40	50
1,2,3,7,8,9-HxCDF	0.1	34.37	2.73	0.49	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.16	<1.6	0.58	M,J,R	1.6	50
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.69	0.69	U		50
OCDF	0.0003	37.29	2.93	0.74	M,J		100

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.80	88	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.04	82	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.76	108	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.55	84	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.94	88	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.78	87	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.97	102	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.09	91	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.70	85	25-130
13C12-OCDD	24000	37.20	72	25-130
13C12-2,3,7,8-TCDF	12000	26.86	95	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.03	98	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.61	94	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	96	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.36	97	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<0.85	0.85	U	10
Total-PeCDD	0	<0.49	0.49	U	50
Total-HxCDD	0	<0.89	0.89	U	50
Total-HpCDD	0	<0.96	0.96	U	50
Total-TCDF	0	<0.64	0.64	U	10
Total-PeCDF	0	<0.42	0.42	U	50
Total-HxCDF	2	3.26	0.49		50
Total-HpCDF	0	<0.69	0.69	U	50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.327
Mid Point PCDD/F TEQ (WHO 2005)	1.52
Upper Bound PCDD/F TEQ (WHO 2005)	2.33

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET**	Sampling Date	11-Sep-19	
ALS Sample ID	L2348009-5	Extraction Date	25-Sep-19	
Analysis Method	EPA M23	Sample Size	1	Train
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	2	

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A22
Run Date	03-Oct-19 11:29
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

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		10
1,2,3,7,8-PeCDD	1	31.99	4.82	0.92	M,J		50
1,2,3,4,7,8-HxCDD	0.1	34.05	6.35	1.5	J		50
1,2,3,6,7,8-HxCDD	0.1	34.10	21.5	1.4	J		50
1,2,3,7,8,9-HxCDD	0.1	34.22	10.9	1.4	J		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	372	2.1			50
OCDD	0.0003	37.21	881	2.3			100
2,3,7,8-TCDF	0.1	26.87	4.40	1.2	J		10
1,2,3,7,8-PeCDF	0.03	31.05	<5.3	1.1	J,R	5.3	50
2,3,4,7,8-PeCDF	0.3	31.77	11.2	1.0	M,J		50
1,2,3,4,7,8-HxCDF	0.1	33.56	8.68	1.0	M,J		50
1,2,3,6,7,8-HxCDF	0.1	33.62	<11	0.94	M,J,1.	11	50
2,3,4,6,7,8-HxCDF	0.1	33.97	16.0	1.0	M,J		50
1,2,3,7,8,9-HxCDF	0.1	34.39	4.86	1.1	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.16	78.1	0.97			50
1,2,3,4,7,8,9-HpCDF	0.01	35.97	12.6	1.1	M,J		50
OCDF	0.0003	37.29	218	1.4			100

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1000	27.80	90	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.04	75	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.76	105	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.55	85	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.96	87	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.78	84	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.98	95	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	89	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.70	84	25-130
13C12-OCDD	24000	37.20	73	25-130
13C12-2,3,7,8-TCDF	12000	26.86	90	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.04	93	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	89	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	89	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	95	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	6	97.9	1.5	10
Total-PeCDD	7	195	0.92	50
Total-HxCDD	6	377	1.5	50
Total-HpCDD	2	791	2.1	50
Total-TCDF	12	103	1.2	10
Total-PeCDF	9	87.2	1.1	50
Total-HxCDF	9	92.6	1.1	50
Total-HpCDF	3	123	1.1	50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	20.4
Mid Point PCDD/F TEQ (WHO 2005)	22.4
Upper Bound PCDD/F TEQ (WHO 2005)	23.2

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor — TEQ: Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
1.	This result is an EMPC

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-6	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A23
Run Date	03-Oct-19 12:11
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

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		10
1,2,3,7,8-PeCDD	1	31.99	4.49	0.93	M,J		50
1,2,3,4,7,8-HxCDD	0.1	34.04	8.37	2.0	J		50
1,2,3,6,7,8-HxCDD	0.1	34.10	25.1	1.8	J		50
1,2,3,7,8,9-HxCDD	0.1	34.23	13.2	1.9	J		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	379	2.6			50
OCDD	0.0003	37.21	885	3.1			100
2,3,7,8-TCDF	0.1	26.86	1.56	1.3	M,J		10
1,2,3,7,8-PeCDF	0.03	31.05	4.69	1.1	M,J		50
2,3,4,7,8-PeCDF	0.3	31.77	7.16	0.98	M,J		50
1,2,3,4,7,8-HxCDF	0.1	33.56	5.67	1.7	M,J		50
1,2,3,6,7,8-HxCDF	0.1	33.62	<7.8	1.6	M,J,1.	7.8	50
2,3,4,6,7,8-HxCDF	0.1	33.95	15.2	1.7	M,J		50
1,2,3,7,8,9-HxCDF	0.1	34.39	7.78	2.0	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.16	79.6	1.1			50
1,2,3,4,7,8,9-HpCDF	0.01	35.96	14.2	1.3	M,J		50
OCDF	0.0003	37.29	216	2.1			100

Field Spike Standards	pg	Ret. Time	% Rec	Limits
37Cl4-2,3,7,8-TCDD	1000	27.80	87	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.04	78	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.76	102	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.55	80	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.96	86	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.77	55	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.98	66	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.09	59	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.70	57	25-130
13C12-OCDD	24000	37.20	45	25-130
13C12-2,3,7,8-TCDF	12000	26.86	60	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.04	66	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	61	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	59	25-130
Cleanup Standard	pg			
13C12-1,2,3,7,8,9-HxCDF	12000	34.36	80	40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	LQL
Total-TCDD	4	85.6	1.5	10
Total-PeCDD	6	130	0.93	50
Total-HxCDD	7	423	2.0	50
Total-HpCDD	2	824	2.6	50
Total-TCDF	9	34.6	1.3	10
Total-PeCDF	10	65.5	1.1	50
Total-HxCDF	8	78.4	2.0	50
Total-HpCDF	3	119	1.3	50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	19.5
Mid Point PCDD/F TEQ (WHO 2005)	21.1
Upper Bound PCDD/F TEQ (WHO 2005)	21.8

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
1.	This result is an EMPC

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-7	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A24
Run Date	03-Oct-19 12:54
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	NotFnd	<1.3	1.3	U		10
1,2,3,7,8-PeCDD	1	31.99	<1.3	0.62	M,J,R	1.3	50
1,2,3,4,7,8-HxCDD	0.1	34.04	4.13	1.7	M,J		50
1,2,3,6,7,8-HxCDD	0.1	34.10	14.7	1.5	J		50
1,2,3,7,8,9-HxCDD	0.1	34.23	6.53	1.6	M,J		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	194	2.1			50
OCDD	0.0003	37.20	516	1.4			100
2,3,7,8-TCDF	0.1	26.87	1.33	0.85	M,J		10
1,2,3,7,8-PeCDF	0.03	31.05	3.71	0.85	M,J		50
2,3,4,7,8-PeCDF	0.3	31.77	4.26	0.76	J		50
1,2,3,4,7,8-HxCDF	0.1	33.55	4.17	1.2	M,J		50
1,2,3,6,7,8-HxCDF	0.1	33.62	<5.1	1.1	M,J,1.	5.1	50
2,3,4,6,7,8-HxCDF	0.1	33.95	8.17	1.2	M,J		50
1,2,3,7,8,9-HxCDF	0.1	34.37	5.21	1.3	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.16	43.3	0.86	J		50
1,2,3,4,7,8,9-HpCDF	0.01	35.97	7.53	1.0	M,J		50
OCDF	0.0003	37.29	104	1.1			100

Field Spike Standards	pg	Ret. Time	% Rec	Limits
37Cl4-2,3,7,8-TCDD	1000	27.80	87	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.04	76	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.76	105	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.55	86	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.96	90	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.77	82	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.98	96	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	86	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.70	81	25-130
13C12-OCDD	24000	37.20	71	25-130
13C12-2,3,7,8-TCDF	12000	26.86	87	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.04	93	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	85	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	85	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	88	40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	LQL
Total-TCDD	6	71.9	1.3	10
Total-PeCDD	6	131	0.62	50
Total-HxCDD	7	207	1.7	50
Total-HpCDD	2	409	2.1	50
Total-TCDF	5	23.7	0.85	10
Total-PeCDF	6	25.9	0.85	50
Total-HxCDF	9	48.8	1.3	50
Total-HpCDF	3	65.0	1.0	50

Toxic Equivalency - (WHO 2005)	pg
Lower Bound PCDD/F TEQ (WHO 2005)	8.45
Mid Point PCDD/F TEQ (WHO 2005)	10.9
Upper Bound PCDD/F TEQ (WHO 2005)	11.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure
1.	This result is an EMPC

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(36 THRU 40) BLANK2**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-8	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 Train
Analysis Type	Sample	Percent Moisture	n/a
Sample Matrix	Stack	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A18
Run Date	03-Oct-19 08:41
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	NotFnd	<3.7	3.7	U		10
1,2,3,7,8-PeCDD	1	NotFnd	<1.7	1.7	U		50
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<2.1	2.1	U		50
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<1.9	1.9	U		50
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<2.0	2.0	U		50
1,2,3,4,6,7,8-HpCDD	0.01	35.73	2.99	1.9	M,J,B		50
OCDD	0.0003	37.21	21.8	2.0	J		100
2,3,7,8-TCDF	0.1	NotFnd	<2.8	2.8	U		10
1,2,3,7,8-PeCDF	0.03	NotFnd	<1.7	1.7	U		50
2,3,4,7,8-PeCDF	0.3	NotFnd	<1.6	1.6	U		50
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<1.1	1.1	U		50
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.0	1.0	U		50
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<1.1	1.1	U		50
1,2,3,7,8,9-HxCDF	0.1	34.39	2.37	1.3	M,J		50
1,2,3,4,6,7,8-HpCDF	0.01	35.17	3.11	0.78	M,J		50
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.92	0.92	U		50
OCDF	0.0003	37.30	4.32	1.9	M,J		100

Field Spike Standards	pg	Ret. Time	% Rec	Limits
37Cl4-2,3,7,8-TCDD	1000	27.84	84	70-130
13C12-1,2,3,4,7,8-HxCDD	10000	34.05	71	70-130
13C12-2,3,4,7,8-PeCDF	10000	31.78	104	70-130
13C12-1,2,3,4,7,8-HxCDF	10000	33.56	79	70-130
13C12-1,2,3,4,7,8,9-HpCDF	10000	35.97	88	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	12000	27.83	78	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.99	117	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	88	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.72	96	25-130
13C12-OCDD	24000	37.21	92	25-130
13C12-2,3,7,8-TCDF	12000	26.92	79	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.06	111	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	90	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.16	97	25-130
Cleanup Standard	pg			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	82	40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	Flags	LQL
Total-TCDD	0	<3.7	3.7	U	10
Total-PeCDD	0	<1.7	1.7	U	50
Total-HxCDD	0	<2.1	2.1	U	50
Total-HpCDD	2	6.83	1.9		50
Total-TCDF	0	<2.8	2.8	U	10
Total-PeCDF	0	<1.7	1.7	U	50
Total-HxCDF	1	2.37	1.3		50
Total-HpCDF	1	3.11	0.92		50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.306
Mid Point PCDD/F TEQ (WHO 2005)	3.88
Upper Bound PCDD/F TEQ (WHO 2005)	7.45

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.
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	**Media/Method Blank**	Sampling Date	n/a	
ALS Sample ID	WG3165005-1	Extraction Date	25-Sep-19	
Analysis Method	EPA M23	Sample Size	1 Train	
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	2	

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A15
Run Date	03-Oct-19 06:34
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUST470135H

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		10
1,2,3,7,8-PeCDD	1	NotFnd	<0.81	0.81	U		50
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.6	1.6	U		50
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<1.4	1.4	U		50
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<1.5	1.5	U		50
1,2,3,4,6,7,8-HpCDD	0.01	35.72	2.84	1.4	M,J		50
OCDD	0.0003	37.21	<4.2	1.8	M,J,R	4.2	100
2,3,7,8-TCDF	0.1	NotFnd	<0.81	0.81	U		10
1,2,3,7,8-PeCDF	0.03	31.05	<2.1	0.66	M,J,R	2.1	50
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.60	0.60	U		50
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<1.1	1.1	U		50
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.0	1.0	U		50
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<1.1	1.1	U		50
1,2,3,7,8,9-HxCDF	0.1	34.37	<3.0	1.2	M,J,R	3.0	50
1,2,3,4,6,7,8-HpCDF	0.01	35.16	<1.5	0.64	M,J,R	1.5	50
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.76	0.76	U		50
OCDF	0.0003	37.29	<1.8	1.8	M,U	1.5	100

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	12000	27.78	77	40-130
13C12-1,2,3,7,8-PeCDD	12000	31.98	94	40-130
13C12-1,2,3,6,7,8-HxCDD	12000	34.10	81	40-130
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.72	89	25-130
13C12-OCDD	24000	37.20	74	25-130
13C12-2,3,7,8-TCDF	12000	26.86	86	40-130
13C12-1,2,3,7,8-PeCDF	12000	31.04	97	40-130
13C12-1,2,3,6,7,8-HxCDF	12000	33.62	86	40-130
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	97	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	12000	34.37	91	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<1.2	1.2	U	10
Total-PeCDD	0	<0.81	0.81	U	50
Total-HxCDD	0	<1.6	1.6	U	50
Total-HpCDD	1	2.84	1.4		50
Total-TCDF	0	<0.81	0.81	U	10
Total-PeCDF	0	<0.66	0.66	U	50
Total-HxCDF	0	<1.2	1.2	U	50
Total-HpCDF	0	<0.76	0.76	U	50

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.0284
Mid Point PCDD/F TEQ (WHO 2005)	1.93
Upper Bound PCDD/F TEQ (WHO 2005)	3.46

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor; TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standard was not spiked to sample

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG3165005-2	Extraction Date	25-Sep-19
Analysis Method	EPA M23	Sample Size	1 n/a
Analysis Type	LCS	Percent Moisture	n/a
Sample Matrix	QC	Split Ratio	2

Approved:
T.Patterson
--e-signature--
04-Oct-2019

Run Information	**Run 1**
Filename	7-191003A12
Run Date	03-Oct-19 04:29
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	1200	27.80	104	70-130	
1,2,3,7,8-PeCDD	6000	31.99	109	70-130	
1,2,3,4,7,8-HxCDD	6000	34.04	94	70-130	
1,2,3,6,7,8-HxCDD	6000	34.10	107	70-130	
1,2,3,7,8,9-HxCDD	6000	34.23	103	70-130	
1,2,3,4,6,7,8-HpCDD	6000	35.70	106	70-130	
OCDD	12000	37.20	104	70-130	
2,3,7,8-TCDF	1200	26.89	108	70-130	
1,2,3,7,8-PeCDF	6000	31.05	109	70-130	
2,3,4,7,8-PeCDF	6000	31.77	96	70-130	
1,2,3,4,7,8-HxCDF	6000	33.55	104	70-130	
1,2,3,6,7,8-HxCDF	6000	33.62	120	70-130	
2,3,4,6,7,8-HxCDF	6000	33.95	114	70-130	
1,2,3,7,8,9-HxCDF	6000	34.37	120	70-130	
1,2,3,4,6,7,8-HpCDF	6000	35.15	110	70-130	
1,2,3,4,7,8,9-HpCDF	6000	35.96	95	70-130	
OCDF	12000	37.29	105	70-130	
Field Spike Standards			**% Rec**		
37Cl4-2,3,7,8-TCDD			NS		
13C12-1,2,3,4,7,8-HxCDD			NS		
13C12-2,3,4,7,8-PeCDF			NS		
13C12-1,2,3,4,7,8-HxCDF			NS		
13C12-1,2,3,4,7,8,9-HpCDF			NS		
Extraction Standards					
13C12-2,3,7,8-TCDD	12000	27.78	96	40-130	
13C12-1,2,3,7,8-PeCDD	12000	31.98	121	40-130	
13C12-1,2,3,6,7,8-HxCDD	12000	34.09	98	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	12000	35.70	106	25-130	
13C12-OCDD	24000	37.19	94	25-130	
13C12-2,3,7,8-TCDF	12000	26.86	100	40-130	
13C12-1,2,3,7,8-PeCDF	12000	31.04	119	40-130	
13C12-1,2,3,6,7,8-HxCDF	12000	33.61	97	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	12000	35.15	116	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	12000	34.36	101	40-130	

NS Indicates that this standard was not spiked to sample

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2348009		MIssissauga, ON L5J 2Y4
Date of Report	9-Oct-19		(905)822-4120
Date of Sample Receipt	16-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **PCB Congeners by EPA 1668C**

PCB Congener Group Totals and Total PCB are a sum of detected values, including EMPC values, consistent with USEPA CLP SOW CBC1.2

ES recoveries in the LCS are above the targeted control limits. However, the native recoveries are in control indicating that the injection standard amount spiked was below the design. Clearly there is no negative impact to the native target data in the samples and LCS despite this high bias to the LCS ES recoveries

Certified by: RA McLeod

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

ALS Life Sciences

Sample Analysis summary Report

Sample Name	19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET	19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET	19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET	19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET	19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET	19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET
ALS Sample ID	L2348009-1	L2348009-2	L2348009-3	L2348009-5	L2348009-6	L2348009-7
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	12-Sep-19	12-Sep-19	13-Sep-19	11-Sep-19	11-Sep-19	12-Sep-19
Extraction Date	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
PCB-081	<17	<13	<17	<19	<15	<33
PCB-077	294	110	490	144	52.5	<36
PCB-123	110	35.8	39.0	48.0	<36	<28
PCB-118	5070	2020	2440	4530	1590	1210
PCB-114	<110	52.8	62.1	104	<31	<40
PCB-105	1850	607	650	1310	456	<270
PCB-126	<22	<14	<13	<21	<17	<30
PCB-167	<65	<27	<20	54.7	16.4	<14
PCB-156/157	202	73.0	<68	146	<47	<19
PCB-169	<14	10.0	<5.8	<11	<11	<16
PCB-189	<9.4	<6.8	<6.8	<9.7	<11	<15
Extraction Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-081	90	74	69	79	73	44
13C12-PCB-077	92	77	73	84	79	45
13C12-PCB-123	94	83	71	84	80	52
13C12-PCB-118	94	81	72	82	78	52
13C12-PCB-114	95	83	73	84	82	52
13C12-PCB-105	97	84	76	90	83	55
13C12-PCB-126	95	82	73	85	81	50
13C12-PCB-167	94	80	72	79	77	48
13C12-PCB-156/157	89	77	67	77	72	44
13C12-PCB-169	100	88	80	88	82	52
13C12-PCB-189	97	85	77	86	85	56
Field Spike Standards						
13C12-PCB-031	108	111	111	109	110	126
13C12-PCB-095	86	94	81	85	78	83
13C12-PCB-153	90	93	91	93	96	95
Cleanup Standards						
13C12-PCB-028	82	65	68	79	92	49
13C12-PCB-111	97	75	72	81	100	49
13C12-PCB-178	93	69	67	74	95	45
Toxic Equivalency - (WHO 2005)						
Lower Bound PCB TEQ	0.246	0.395	0.145	0.200	0.0671	0.0363
Mid Point PCB TEQ	1.56	1.10	0.887	1.42	1.09	1.79
Upper Bound PCB TEQ	2.88	1.80	1.63	2.64	2.11	3.54

ALS Life Sciences

Sample Analysis summary Report

Sample Name	19-21960-SVOC-(16 THRU 20) BLANK1	19-21960-SVOC-(36 THRU 40) BLANK2
ALS Sample ID	L2348009-4	L2348009-8
Sample Size	1	1
Sample size units	Sample	Sample
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	12-Sep-19	12-Sep-19
Extraction Date	25-Sep-19	25-Sep-19
Target Analytes	**pg**	**pg**
PCB-081	<15	<13
PCB-077	<15	<13
PCB-123	<16	<14
PCB-118	<15	<13
PCB-114	<16	<14
PCB-105	<15	<13
PCB-126	<17	<15
PCB-167	<7.3	<6.2
PCB-156/157	<9.7	<8.3
PCB-169	<8.6	<7.4
PCB-189	<9.5	<6.2
Extraction Standards	**% Rec**	**% Rec**
13C12-PCB-081	54	97
13C12-PCB-077	56	101
13C12-PCB-123	58	112
13C12-PCB-118	58	116
13C12-PCB-114	58	114
13C12-PCB-105	59	119
13C12-PCB-126	58	111
13C12-PCB-167	56	109
13C12-PCB-156/157	52	101
13C12-PCB-169	60	112
13C12-PCB-189	59	118
Field Spike Standards		
13C12-PCB-031	116	115
13C12-PCB-095	93	86
13C12-PCB-153	94	99
Cleanup Standards		
13C12-PCB-028	52	82
13C12-PCB-111	53	97
13C12-PCB-178	48	91
Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ	0.00	0.00
Mid Point PCB TEQ	0.983	0.865
Upper Bound PCB TEQ	1.97	1.73

ALS Life Sciences

Quality Control Summary Report

Sample Name	**Media/Method Blank**
ALS Sample ID	WG3165005-1
Sample Size	1
Sample size units	Blank
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	25-Sep-19

Target Analytes	**pg**
PCB-081	<9.7
PCB-077	<10
PCB-123	<16
PCB-118	<22
PCB-114	<17
PCB-105	<16
PCB-126	<17
PCB-167	<6.5
PCB-156/157	<8.6
PCB-169	<7.4
PCB-189	<8.0
Extraction Standards	**% Rec**
13C12-PCB-081	90
13C12-PCB-077	96
13C12-PCB-123	102
13C12-PCB-118	102
13C12-PCB-114	101
13C12-PCB-105	106
13C12-PCB-126	103
13C12-PCB-167	101
13C12-PCB-156/157	96
13C12-PCB-169	108
13C12-PCB-189	110
Field Spike Standards	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS
Cleanup Standards	
13C12-PCB-028	77
13C12-PCB-111	89
13C12-PCB-178	87

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.965
Upper Bound PCB TEQ	1.93

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Sample Analysis summary Report

Sample Name	**Laboratory Control Sample**
ALS Sample ID	WG3165005-2
Sample Size	1
Sample size units	n/a
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	25-Sep-19
Target Analytes	**% Rec**
PCB-081	102
PCB-077	104
PCB-123	98
PCB-118	98
PCB-114	102
PCB-105	94
PCB-126	101
PCB-167	98
PCB-156/157	98
PCB-169	102
PCB-189	108
Extraction Standards	**% Rec**
13C12-PCB-081	157
13C12-PCB-077	171
13C12-PCB-123	173
13C12-PCB-118	170
13C12-PCB-114	167
13C12-PCB-105	181
13C12-PCB-126	178
13C12-PCB-167	162
13C12-PCB-156/157	156
13C12-PCB-169	185
13C12-PCB-189	187
Field Spike Standards	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS
Cleanup Standards	
13C12-PCB-028	114
13C12-PCB-111	132
13C12-PCB-178	115

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET**	Sampling Date	12-Sep-19		
ALS Sample ID	L2348009-1	Extraction Date	25-Sep-19		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	6		03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A06
Run Date	02-Oct-19 20:47
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.74	<17	17	M,U	15	150
PCB-077	0.0001	22.04	294	18			150
PCB-123	0.00003	23.05	110	22	J		150
PCB-118	0.00003	23.23	5070	20			150
PCB-114	0.00003	23.52	<110	21	J,R	110	150
PCB-105	0.00003	23.86	1850	20			150
PCB-126	0.1	25.47	<22	22	M,U		150
PCB-167	0.00003	26.40	<65	13	J,R	65	150
PCB-156/157	0.00003	27.00	202	16	J		300
PCB-169	0.03	NotFnd	<14	14	U		150
PCB-189	0.00003	NotFnd	<9.4	9.4	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**
13C12-PCB-081	12000	21.73	90	10-145
13C12-PCB-077	12000	22.03	92	10-145
13C12-PCB-123	12000	23.04	94	10-145
13C12-PCB-118	12000	23.22	94	10-145
13C12-PCB-114	12000	23.51	95	10-145
13C12-PCB-105	12000	23.85	97	10-145
13C12-PCB-126	12000	25.45	95	10-145
13C12-PCB-167	12000	26.39	94	10-145
13C12-PCB-156/157	24000	26.99	89	10-145
13C12-PCB-169	12000	28.66	100	10-145
13C12-PCB-189	12000	29.96	97	10-145
Field Spike Standards				
13C12-PCB-031	10000	15.72	108	70-130
13C12-PCB-095	10000	19.04	86	70-130
13C12-PCB-153	10000	24.18	90	70-130
Cleanup Standards				
13C12-PCB-028	12000	15.90	82	5-145
13C12-PCB-111	12000	22.00	97	10-145
13C12-PCB-178	12000	25.05	93	10-145

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.246
Mid Point PCB TEQ	1.56
Upper Bound PCB TEQ	2.88

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET**	Sampling Date	12-Sep-19	
ALS Sample ID	L2348009-2	Extraction Date	25-Sep-19	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	6	03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A07
Run Date	02-Oct-19 21:29
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-081	0.0003	NotFnd	<13	13	U		150
PCB-077	0.0001	22.04	110	14	J		150
PCB-123	0.00003	23.05	35.8	14	M,J		150
PCB-118	0.00003	23.22	2020	13			150
PCB-114	0.00003	23.52	52.8	14	J		150
PCB-105	0.00003	23.85	607	14			150
PCB-126	0.1	25.45	<14	14	M,U	7.5	150
PCB-167	0.00003	26.40	<27	8.8	J,R	27	150
PCB-156/157	0.00003	26.99	73.0	11	J		300
PCB-169	0.03	28.66	10.0	9.9	M,J		150
PCB-189	0.00003	NotFnd	<6.8	6.8	U		150

Extraction Standards	pg	Time	% Rec	Limits	
13C12-PCB-081	12000	21.72	74	10-145	
13C12-PCB-077	12000	22.02	77	10-145	
13C12-PCB-123	12000	23.04	83	10-145	
13C12-PCB-118	12000	23.21	81	10-145	
13C12-PCB-114	12000	23.51	83	10-145	
13C12-PCB-105	12000	23.84	84	10-145	
13C12-PCB-126	12000	25.45	82	10-145	
13C12-PCB-167	12000	26.38	80	10-145	
13C12-PCB-156/157	24000	26.99	77	10-145	
13C12-PCB-169	12000	28.66	88	10-145	R
13C12-PCB-189	12000	29.96	85	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.72	111	70-130	
13C12-PCB-095	10000	19.03	94	70-130	
13C12-PCB-153	10000	24.17	93	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.89	65	5-145	
13C12-PCB-111	12000	21.99	75	10-145	
13C12-PCB-178	12000	25.05	69	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.395
Mid Point PCB TEQ	1.10
Upper Bound PCB TEQ	1.80

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET**	Sampling Date	13-Sep-19		
ALS Sample ID	L2348009-3	Extraction Date	25-Sep-19		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	6		03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A08
Run Date	02-Oct-19 22:11
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.73	<17	17	M,U		150
PCB-077	0.0001	22.02	490	17			150
PCB-123	0.00003	23.03	39.0	12	M,J		150
PCB-118	0.00003	23.22	2440	12	M		150
PCB-114	0.00003	23.51	62.1	12	J		150
PCB-105	0.00003	23.85	650	11			150
PCB-126	0.1	25.47	<13	13	M,U	9.8	150
PCB-167	0.00003	26.39	<20	5.2	J,R	20	150
PCB-156/157	0.00003	26.98	<68	6.8	J,R	68	300
PCB-169	0.03	NotFnd	<5.8	5.8	U		150
PCB-189	0.00003	NotFnd	<6.8	6.8	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.71	69	10-145	
13C12-PCB-077	12000	22.01	73	10-145	
13C12-PCB-123	12000	23.03	71	10-145	
13C12-PCB-118	12000	23.21	72	10-145	
13C12-PCB-114	12000	23.50	73	10-145	
13C12-PCB-105	12000	23.84	76	10-145	
13C12-PCB-126	12000	25.43	73	10-145	
13C12-PCB-167	12000	26.36	72	10-145	
13C12-PCB-156/157	24000	26.98	67	10-145	
13C12-PCB-169	12000	28.65	80	10-145	R
13C12-PCB-189	12000	29.95	77	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.71	111	70-130	
13C12-PCB-095	10000	19.02	81	70-130	
13C12-PCB-153	10000	24.17	91	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.89	68	5-145	
13C12-PCB-111	12000	21.98	72	10-145	
13C12-PCB-178	12000	25.04	67	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.145
Mid Point PCB TEQ	0.887
Upper Bound PCB TEQ	1.63

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(16 THRU 20) BLANK1**	Sampling Date	12-Sep-19	
ALS Sample ID	L2348009-4	Extraction Date	25-Sep-19	Approved:
Analysis Method	EPA 1668C	Sample Size	1 Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	6	03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A09
Run Date	02-Oct-19 22:53
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-081	0.0003	NotFnd	<15	15	U		150
PCB-077	0.0001	NotFnd	<15	15	U		150
PCB-123	0.00003	NotFnd	<16	16	U		150
PCB-118	0.00003	NotFnd	<15	15	U		150
PCB-114	0.00003	NotFnd	<16	16	U		150
PCB-105	0.00003	NotFnd	<15	15	U		150
PCB-126	0.1	25.43	<17	17	M,U	14	150
PCB-167	0.00003	NotFnd	<7.3	7.3	U		150
PCB-156/157	0.00003	NotFnd	<9.7	9.7	U		300
PCB-169	0.03	NotFnd	<8.6	8.6	U		150
PCB-189	0.00003	NotFnd	<9.5	9.5	U		150

Extraction Standards	pg	Time	% Rec	Limits	Flags
13C12-PCB-081	12000	21.73	54	10-145	
13C12-PCB-077	12000	22.03	56	10-145	
13C12-PCB-123	12000	23.04	58	10-145	
13C12-PCB-118	12000	23.22	58	10-145	
13C12-PCB-114	12000	23.51	58	10-145	
13C12-PCB-105	12000	23.85	59	10-145	
13C12-PCB-126	12000	25.45	58	10-145	
13C12-PCB-167	12000	26.39	56	10-145	
13C12-PCB-156/157	24000	27.01	52	10-145	
13C12-PCB-169	12000	28.67	60	10-145	R
13C12-PCB-189	12000	29.96	59	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.72	116	70-130	
13C12-PCB-095	10000	19.04	93	70-130	
13C12-PCB-153	10000	24.18	94	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.90	52	5-145	
13C12-PCB-111	12000	22.00	53	10-145	
13C12-PCB-178	12000	25.06	48	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.983
Upper Bound PCB TEQ	1.97

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET**	Sampling Date	11-Sep-19	
ALS Sample ID	L2348009-5	Extraction Date	25-Sep-19	
Analysis Method	EPA 1668C	Sample Size	1	Sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	6	

Approved:
E. Sabljic
--e-signature--
03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A10
Run Date	02-Oct-19 23:35
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	21.73	<19	19	M,U	12	150
PCB-077	0.0001	22.03	144	20	J		150
PCB-123	0.00003	23.05	48.0	20	M,J		150
PCB-118	0.00003	23.22	4530	18			150
PCB-114	0.00003	23.51	104	19	J		150
PCB-105	0.00003	23.85	1310	17			150
PCB-126	0.1	NotFnd	<21	21	U		150
PCB-167	0.00003	26.39	54.7	10	J		150
PCB-156/157	0.00003	26.99	146	13	J		300
PCB-169	0.03	NotFnd	<11	11	U		150
PCB-189	0.00003	NotFnd	<9.7	9.7	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.72	79	10-145	
13C12-PCB-077	12000	22.02	84	10-145	
13C12-PCB-123	12000	23.04	84	10-145	
13C12-PCB-118	12000	23.21	82	10-145	
13C12-PCB-114	12000	23.50	84	10-145	
13C12-PCB-105	12000	23.84	90	10-145	
13C12-PCB-126	12000	25.45	85	10-145	
13C12-PCB-167	12000	26.38	79	10-145	
13C12-PCB-156/157	24000	26.99	77	10-145	
13C12-PCB-169	12000	28.66	88	10-145	R
13C12-PCB-189	12000	29.95	86	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.71	109	70-130	
13C12-PCB-095	10000	19.02	85	70-130	
13C12-PCB-153	10000	24.17	93	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.89	79	5-145	
13C12-PCB-111	12000	21.99	81	10-145	
13C12-PCB-178	12000	25.05	74	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.200
Mid Point PCB TEQ	1.42
Upper Bound PCB TEQ	2.64

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET**	Sampling Date	11-Sep-19	
ALS Sample ID	L2348009-6	Extraction Date	25-Sep-19	
Analysis Method	EPA 1668C	Sample Size	1	Sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	6	

Approved:
E. Sabljic
--e-signature--
03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A11
Run Date	03-Oct-19 00:17
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<15	15	U		150
PCB-077	0.0001	22.05	52.5	15	M,J		150
PCB-123	0.00003	23.05	<36	16	M,J,R	36	150
PCB-118	0.00003	23.23	1590	16			150
PCB-114	0.00003	23.52	<31	15	J,R	31	150
PCB-105	0.00003	23.86	456	15			150
PCB-126	0.1	NotFnd	<17	17	U		150
PCB-167	0.00003	26.40	16.4	9.3	J		150
PCB-156/157	0.00003	27.00	<47	12	J,R	47	300
PCB-169	0.03	NotFnd	<11	11	U		150
PCB-189	0.00003	NotFnd	<11	11	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.73	73	10-145	
13C12-PCB-077	12000	22.03	79	10-145	
13C12-PCB-123	12000	23.04	80	10-145	
13C12-PCB-118	12000	23.22	78	10-145	
13C12-PCB-114	12000	23.51	82	10-145	
13C12-PCB-105	12000	23.85	83	10-145	
13C12-PCB-126	12000	25.45	81	10-145	
13C12-PCB-167	12000	26.39	77	10-145	
13C12-PCB-156/157	24000	26.99	72	10-145	
13C12-PCB-169	12000	28.66	82	10-145	R
13C12-PCB-189	12000	29.96	85	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.72	110	70-130	
13C12-PCB-095	10000	19.04	78	70-130	
13C12-PCB-153	10000	24.18	96	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.90	92	5-145	
13C12-PCB-111	12000	22.00	100	10-145	
13C12-PCB-178	12000	25.06	95	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.0671
Mid Point PCB TEQ	1.09
Upper Bound PCB TEQ	2.11

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET**	Sampling Date	12-Sep-19		
ALS Sample ID	L2348009-7	Extraction Date	25-Sep-19		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Sample	*E. Sabljic*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	6		03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A12
Run Date	03-Oct-19 00:59
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<33	33	U		150
PCB-077	0.0001	22.06	<36	36	U	31	150
PCB-123	0.00003	23.07	<28	28	M,U	24	150
PCB-118	0.00003	23.23	1210	26			150
PCB-114	0.00003	23.54	<40	28	M,J,R	40	150
PCB-105	0.00003	23.88	<270	26	R	270	150
PCB-126	0.1	NotFnd	<30	30	U		150
PCB-167	0.00003	NotFnd	<14	14	U		150
PCB-156/157	0.00003	27.00	<19	19	M,U	16	300
PCB-169	0.03	NotFnd	<16	16	U		150
PCB-189	0.00003	NotFnd	<15	15	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.74	44	10-145	
13C12-PCB-077	12000	22.04	45	10-145	
13C12-PCB-123	12000	23.05	52	10-145	
13C12-PCB-118	12000	23.22	52	10-145	
13C12-PCB-114	12000	23.51	52	10-145	
13C12-PCB-105	12000	23.85	55	10-145	
13C12-PCB-126	12000	25.46	50	10-145	
13C12-PCB-167	12000	26.39	48	10-145	
13C12-PCB-156/157	24000	27.00	44	10-145	
13C12-PCB-169	12000	28.67	52	10-145	R
13C12-PCB-189	12000	29.96	56	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.73	126	70-130	
13C12-PCB-095	10000	19.04	83	70-130	
13C12-PCB-153	10000	24.18	95	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.91	49	5-145	
13C12-PCB-111	12000	22.00	49	10-145	
13C12-PCB-178	12000	25.06	45	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.0363
Mid Point PCB TEQ	1.79
Upper Bound PCB TEQ	3.54

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(36 THRU 40) BLANK2**	Sampling Date	12-Sep-19	
ALS Sample ID	L2348009-8	Extraction Date	25-Sep-19	
Analysis Method	EPA 1668C	Sample Size	1	Sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	6	

Approved:
E. Sabljic
--e-signature--
03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A13
Run Date	03-Oct-19 01:41
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
PCB-081	0.0003	NotFnd	<13	13	U		150
PCB-077	0.0001	22.02	<13	13	M,U	7.0	150
PCB-123	0.00003	NotFnd	<14	14	U		150
PCB-118	0.00003	NotFnd	<13	13	U		150
PCB-114	0.00003	NotFnd	<14	14	U		150
PCB-105	0.00003	NotFnd	<13	13	U		150
PCB-126	0.1	NotFnd	<15	15	U		150
PCB-167	0.00003	NotFnd	<6.2	6.2	U		150
PCB-156/157	0.00003	NotFnd	<8.3	8.3	U		300
PCB-169	0.03	NotFnd	<7.4	7.4	U		150
PCB-189	0.00003	NotFnd	<6.2	6.2	U		150

Extraction Standards	**pg**	**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.74	97	10-145	
13C12-PCB-077	12000	22.04	101	10-145	
13C12-PCB-123	12000	23.05	112	10-145	
13C12-PCB-118	12000	23.22	116	10-145	
13C12-PCB-114	12000	23.52	114	10-145	
13C12-PCB-105	12000	23.85	119	10-145	
13C12-PCB-126	12000	25.46	111	10-145	
13C12-PCB-167	12000	26.39	109	10-145	
13C12-PCB-156/157	24000	27.00	101	10-145	
13C12-PCB-169	12000	28.67	112	10-145	R
13C12-PCB-189	12000	29.98	118	10-145	
Field Spike Standards					
13C12-PCB-031	10000	15.73	115	70-130	
13C12-PCB-095	10000	19.04	86	70-130	
13C12-PCB-153	10000	24.18	99	70-130	
Cleanup Standards					
13C12-PCB-028	12000	15.90	82	5-145	
13C12-PCB-111	12000	22.00	97	10-145	
13C12-PCB-178	12000	25.06	91	10-145	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.865
Upper Bound PCB TEQ	1.73

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Media/Method Blank**	Sampling Date	n/a
ALS Sample ID	WG3165005-1	Extraction Date	25-Sep-19
Analysis Method	EPA 1668C	Sample Size	1 Blank
Analysis Type	Blank	Percent Moisture	n/a
Sample Matrix	QC	Split Ratio	6

Approved:
E. Sabljic
--e-signature--
03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A05
Run Date	02-Oct-19 20:05
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-081	0.0003	NotFnd	<9.7	9.7	U		150
PCB-077	0.0001	NotFnd	<10	10	U		150
PCB-123	0.00003	NotFnd	<16	16	U		150
PCB-118	0.00003	23.22	<22	15	M,J,R	22	150
PCB-114	0.00003	NotFnd	<17	17	U		150
PCB-105	0.00003	NotFnd	<16	16	U		150
PCB-126	0.1	NotFnd	<17	17	U		150
PCB-167	0.00003	NotFnd	<6.5	6.5	U		150
PCB-156/157	0.00003	NotFnd	<8.6	8.6	U		300
PCB-169	0.03	NotFnd	<7.4	7.4	U		150
PCB-189	0.00003	NotFnd	<8.0	8.0	U		150

Extraction Standards	pg	Time	% Rec	Limits	
13C12-PCB-081	12000	21.72	90	10-145	
13C12-PCB-077	12000	22.02	96	10-145	
13C12-PCB-123	12000	23.04	102	10-145	
13C12-PCB-118	12000	23.21	102	10-145	
13C12-PCB-114	12000	23.51	101	10-145	
13C12-PCB-105	12000	23.84	106	10-145	
13C12-PCB-126	12000	25.45	103	10-145	
13C12-PCB-167	12000	26.38	101	10-145	
13C12-PCB-156/157	24000	26.99	96	10-145	
13C12-PCB-169	12000	28.66	108	10-145	R
13C12-PCB-189	12000	29.95	110	10-145	
Field Spike Standards					
13C12-PCB-031			NS		
13C12-PCB-095			NS		
13C12-PCB-153			NS		
Cleanup Standards					
13C12-PCB-028	12000	15.89	77	5-145	
13C12-PCB-111	12000	21.99	89	10-145	
13C12-PCB-178	12000	25.05	87	10-145	

Toxic Equivalency - (WHO 2005)	
Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.965
Upper Bound PCB TEQ	1.93

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identifed. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a	
ALS Sample ID	WG3165005-2	Extraction Date	25-Sep-19	
Analysis Method	EPA 1668C	Sample Size	1	n/a
Analysis Type	LCS	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	6	

Approved:
E. Sabljic
--e-signature--
03-Oct-2019

Run Information	**Run 1**
Filename	5-191002A03
Run Date	02-Oct-19 18:40
Final Volume	25 ul
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS5 SPBOCTYL65972-02B

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-081	6000	21.73	102	60-135	
PCB-077	6000	22.03	104	60-135	
PCB-123	6000	23.05	98	60-135	
PCB-118	6000	23.22	98	60-135	
PCB-114	6000	23.52	102	60-135	
PCB-105	6000	23.85	94	60-135	
PCB-126	6000	25.46	101	60-135	
PCB-167	6000	26.39	98	60-135	
PCB-156/157	12000	27.00	98	60-135	
PCB-169	6000	28.67	102	60-135	
PCB-189	6000	29.98	108	60-135	
Extraction Standards		**Time**	**% Rec**	**Limits**	
13C12-PCB-081	12000	21.72	157	40-145	
13C12-PCB-077	12000	22.02	171	40-145	
13C12-PCB-123	12000	23.04	173	40-145	
13C12-PCB-118	12000	23.21	170	40-145	
13C12-PCB-114	12000	23.50	167	40-145	
13C12-PCB-105	12000	23.84	181	40-145	
13C12-PCB-126	12000	25.45	178	40-145	
13C12-PCB-167	12000	26.38	162	40-145	
13C12-PCB-156/157	24000	26.99	156	40-145	
13C12-PCB-169	12000	28.66	185	40-145	R
13C12-PCB-189	12000	29.95	187	40-145	
Field Spike Standards					
13C12-PCB-031			NS		
13C12-PCB-095			NS		
13C12-PCB-153			NS		
Cleanup Standards					
13C12-PCB-028	12000	15.89	114	15-145	
13C12-PCB-111	12000	21.99	132	40-145	
13C12-PCB-178	12000	25.05	115	40-145	

R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.

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#:	L2348009		Mississauga, ON L5J 2Y4
Date of Report	17-Oct-19		Canada
Date of Sample Receipt	16-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **CB by LRGC/MS - Isotope dilution**

The high level LCS at 300ng showed a low bias to recoveryy of the 1,3,5-Trichlorobenzene but a high bias on the 1,2,4-Trichlorobenzene. There is not clear explanation for this observation as there was no such bias obseved on the low level LCS spike at 15ng, a sample spike derived from the same native spiking solution.
Re-Analysis of the high level LCS gave the same results. The accuracy of the spking solution was confirmed.
It appears unlikely that this has an impact on the accuracy of the field sample target data which shows to be consistent from run to run.

Certified by:

Ron McLeod, Ph.D.
Technical Director

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Media/Method Blank		19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET		19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET		19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC		19-21960-SVOC-(16 THRU 20) BLANK1	
ALS Sample ID	WG3165005-1		L2348009-1		L2348009-2		L2348009-3		L2348009-4	
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		12-Sep-19		12-Sep-19		13-Sep-19		12-Sep-19	
Extraction Date	25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	<12	U	2100		3010		2460		<12	U
1,3-Dichlorobenzene	<12	U	163		196		224		<12	U
1,4-Dichlorobenzene	<12	U	164	M	151	M	222	M	15.7	
1,2-Dichlorobenzene	<12	U	175		170		193		<12	U
1,3,5-Trichlorobenzene	<12	U	<12	U	<12	U	<12	U	<12	U
1,2,4-Trichlorobenzene	<12	U	77.4		109		168		<12	U
1,2,3-Trichlorobenzene	<12	U	14.5		<12	U	<12	U	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<12	U	13.4		28.9		44		<12	U
1,2,3,4-Tetrachlorobenzene	<12	U	<12	U	<12	U	<12	U	<12	U
Pentachlorobenzene	<12	U	<12	U	<12	U	<12	U	<12	U
Hexachlorobenzene	<12	U	<12	U	<12	U	<12	U	<12	U
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	NS		90		88		90		94	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	6		4		4		5		2	
13C6-1,4-Dichlorobenzene	41		37		35		35		23	
13C6-1,2,3-Trichlorobenzene	43		39		41		35		44	
13C6-1,2,3,4-Tetrachlorobenzene	50		56		57		50		61	
13C6-Pentachlorobenzene	52		56		55		51		65	
13C6-Hexachlorobenzene	64		68		69		63		71	

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	**19-21960-SVOC- (21 THRU 25) TEST#1 #2 APC**	**19-21960-SVOC- (26 THRU 30) TEST#2 #2 APC**	**19-21960-SVOC- (31 THRU 35) TEST#3 #2 APC**	**19-21960-SVOC- (36 THRU 40) BLANK2**	**Laboratory Control Sample (300ng)**	**Laboratory Control Sample (15ng)**
ALS Sample ID	L2348009-5	L2348009-6	L2348009-7	L2348009-8	WG3165005-2	WG3165005-5
Sample Size	1	1	1	1	1	1
Sample units	sample	sample	sample	sample	n/a	n/a
Moisture Content	n/a	n/a	n/a	n/a	n/a	n/a
Matrix	Stack	Stack	Stack	Stack	QC	QC
Sampling Date	11-Sep-19	11-Sep-19	12-Sep-19	12-Sep-19	n/a	n/a
Extraction Date	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19	25-Sep-19
Target Analytes	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**	**% Recovery**	**% Recovery**
Chlorobenzene	4630	3450	3270 R	<12 U		
1,3-Dichlorobenzene	232	248	186	<12 U	86	76 M
1,4-Dichlorobenzene	209 M	216 M	177 M	<12 U	87 M	144 M
1,2-Dichlorobenzene	210	197 M	165	<12 U	106 M	92 R
1,3,5-Trichlorobenzene	<12 U	14.5 M	<12 U	<12 U	44	80 M
1,2,4-Trichlorobenzene	121	174	144	<12 U	234	110
1,2,3-Trichlorobenzene	12.4 M	13.6 M	<12 U	<12 U	112	120
1,2,3,5/1,2,4,5-Tetrachlorobenzene	24.9	38.1	28.4	<12 U	119	114
1,2,3,4-Tetrachlorobenzene	<12 U	<12 U	<12 U	<12 U	117	92
Pentachlorobenzene	<12 U	<12 U	<12 U	<12 U	113	98
Hexachlorobenzene	<12 U	<12 U	<12 U	<12 U	106	129 M,R
Field Sampling Standards	**%Rec**	**%Rec**	**%Rec**	**%Rec**	**%Rec**	**%Rec**
1-Bromo-2,3-Dichlorobenzene	86	82	83	91	NS	NS
Extraction Standards	**%Rec**	**%Rec**	**%Rec**	**%Rec**	**%Rec**	**%Rec**
13C6-Chlorobenzene	2	6	5	4	5	5
13C6-1,4-Dichlorobenzene	33	32	40	38	46	36
13C6-1,2,3-Trichlorobenzene	41	35	46	45	52	39
13C6-1,2,3,4-Tetrachlorobenzene	54	43	59	60	70	51
13C6-Pentachlorobenzene	50	41	56	63	74	50
13C6-Hexachlorobenzene	61	48	67	75	83	61

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	**Media/Method Blank**	Sampling Date	n/a
ALS Sample ID	WG3165005-1	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101626.D
Run Date	10/16/2019 14:48
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<12	U
1,3-Dichlorobenzene		NotFnd	<12	U
1,4-Dichlorobenzene		6.87	<12	U
1,2-Dichlorobenzene		NotFnd	<12	U
1,3,5-Trichlorobenzene		NotFnd	<12	U
1,2,4-Trichlorobenzene		NotFnd	<12	U
1,2,3-Trichlorobenzene		NotFnd	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		NotFnd	<12	U
1,2,3,4-Tetrachlorobenzene		NotFnd	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene			NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	6	
13C6-1,4-Dichlorobenzene	300	6.87	41	
13C6-1,2,3-Trichlorobenzene	300	9.29	43	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	50	
13C6-Pentachlorobenzene	300	12.37	52	
13C6-Hexachlorobenzene	300	14.01	64	

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	**19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-1	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101630.D
Run Date	10/16/2019 16:11
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	2100	
1,3-Dichlorobenzene		6.78	163	
1,4-Dichlorobenzene		6.87	164 M	
1,2-Dichlorobenzene		7.17	175	
1,3,5-Trichlorobenzene		8.36	<12	U
1,2,4-Trichlorobenzene		8.89	77.4	
1,2,3-Trichlorobenzene		9.30	14.5	
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.52	13.4	
1,2,3,4-Tetrachlorobenzene		NotFnd	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.32	90	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	4 M	
13C6-1,4-Dichlorobenzene	300	6.87	37	
13C6-1,2,3-Trichlorobenzene	300	9.30	39	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	56	
13C6-Pentachlorobenzene	300	12.37	56	
13C6-Hexachlorobenzene	300	14.01	68	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-2	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101631.D
Run Date	10/16/2019 16:32
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	3010	
1,3-Dichlorobenzene		6.79	196	
1,4-Dichlorobenzene		6.87	151 M	
1,2-Dichlorobenzene		7.17	170	
1,3,5-Trichlorobenzene		8.37	<12	U
1,2,4-Trichlorobenzene		8.90	109	
1,2,3-Trichlorobenzene		9.30	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.54	28.9	
1,2,3,4-Tetrachlorobenzene		10.97	<12	U
Pentachlorobenzene		12.36	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	88	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	4 M	
13C6-1,4-Dichlorobenzene	300	6.87	35	
13C6-1,2,3-Trichlorobenzene	300	9.29	41	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	57	
13C6-Pentachlorobenzene	300	12.36	55	
13C6-Hexachlorobenzene	300	14.01	69	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET**	Sampling Date	13-Sep-19
ALS Sample ID	L2348009-3	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101632.D
Run Date	10/16/2019 16:53
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	2460	
1,3-Dichlorobenzene		6.78	224	
1,4-Dichlorobenzene		6.87	222 M	
1,2-Dichlorobenzene		7.17	193	
1,3,5-Trichlorobenzene		8.36	<12	U
1,2,4-Trichlorobenzene		8.90	168	
1,2,3-Trichlorobenzene		9.30	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.52	44	
1,2,3,4-Tetrachlorobenzene		10.97	<12	U
Pentachlorobenzene		12.36	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	90	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	5	
13C6-1,4-Dichlorobenzene	300	6.87	35	
13C6-1,2,3-Trichlorobenzene	300	9.29	35	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	50	
13C6-Pentachlorobenzene	300	12.37	51	
13C6-Hexachlorobenzene	300	14.01	63	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(16 THRU 20) BLANK1**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-4	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101628.D
Run Date	10/16/2019 15:30
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<12	U
1,3-Dichlorobenzene		NotFnd	<12	U
1,4-Dichlorobenzene		6.87	15.7	
1,2-Dichlorobenzene		NotFnd	<12	U
1,3,5-Trichlorobenzene		NotFnd	<12	U
1,2,4-Trichlorobenzene		NotFnd	<12	U
1,2,3-Trichlorobenzene		NotFnd	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		NotFnd	<12	U
1,2,3,4-Tetrachlorobenzene		NotFnd	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	94	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	2	M
13C6-1,4-Dichlorobenzene	300	6.87	23	
13C6-1,2,3-Trichlorobenzene	300	9.29	44	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	61	
13C6-Pentachlorobenzene	300	12.36	65	
13C6-Hexachlorobenzene	300	14.01	71	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-5	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101633.D
Run Date	10/16/2019 17:14
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	4630	
1,3-Dichlorobenzene		6.78	232	
1,4-Dichlorobenzene		6.87	209	M
1,2-Dichlorobenzene		7.17	210	
1,3,5-Trichlorobenzene		8.36	<12	U
1,2,4-Trichlorobenzene		8.90	121	
1,2,3-Trichlorobenzene		9.30	12.4	M
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.53	24.9	
1,2,3,4-Tetrachlorobenzene		10.97	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	86	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	2	
13C6-1,4-Dichlorobenzene	300	6.87	33	
13C6-1,2,3-Trichlorobenzene	300	9.29	41	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	54	
13C6-Pentachlorobenzene	300	12.36	50	
13C6-Hexachlorobenzene	300	14.01	61	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-6	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101634.D
Run Date	10/16/2019 17:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	3450	
1,3-Dichlorobenzene		6.78	248	
1,4-Dichlorobenzene		6.87	216	M
1,2-Dichlorobenzene		7.17	197	M
1,3,5-Trichlorobenzene		8.37	14.5	M
1,2,4-Trichlorobenzene		8.90	174	
1,2,3-Trichlorobenzene		9.30	13.6	M
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.53	38.1	
1,2,3,4-Tetrachlorobenzene		10.97	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	82	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	6	M
13C6-1,4-Dichlorobenzene	300	6.87	32	
13C6-1,2,3-Trichlorobenzene	300	9.30	35	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	43	
13C6-Pentachlorobenzene	300	12.36	41	
13C6-Hexachlorobenzene	300	14.01	48	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-7	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101635.D
Run Date	10/16/2019 17:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		4.58	3270	R
1,3-Dichlorobenzene		6.79	186	
1,4-Dichlorobenzene		6.87	177 M	
1,2-Dichlorobenzene		7.17	165	
1,3,5-Trichlorobenzene		8.36	<12	U
1,2,4-Trichlorobenzene		8.90	144	
1,2,3-Trichlorobenzene		9.30	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		10.53	28.4	
1,2,3,4-Tetrachlorobenzene		10.97	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	83	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	5 M	
13C6-1,4-Dichlorobenzene	300	6.87	40	
13C6-1,2,3-Trichlorobenzene	300	9.29	46	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	59	
13C6-Pentachlorobenzene	300	12.36	56	
13C6-Hexachlorobenzene	300	14.01	67	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(36 THRU 40) BLANK2**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-8	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101629.D
Run Date	10/16/2019 15:51
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene		NotFnd	<12	U
1,3-Dichlorobenzene		NotFnd	<12	U
1,4-Dichlorobenzene		6.87	<12	U
1,2-Dichlorobenzene		NotFnd	<12	U
1,3,5-Trichlorobenzene		NotFnd	<12	U
1,2,4-Trichlorobenzene		NotFnd	<12	U
1,2,3-Trichlorobenzene		NotFnd	<12	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen		NotFnd	<12	U
1,2,3,4-Tetrachlorobenzene		NotFnd	<12	U
Pentachlorobenzene		NotFnd	<12	U
Hexachlorobenzene		NotFnd	<12	U
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	600	10.31	91	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	4	M
13C6-1,4-Dichlorobenzene	300	6.87	38	
13C6-1,2,3-Trichlorobenzene	300	9.30	45	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	60	
13C6-Pentachlorobenzene	300	12.36	63	
13C6-Hexachlorobenzene	300	14.00	75	

M Indicates that a peak has been manually integrated.
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	WG3165005-2		Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS			
Analysis Type	LCS			
Sample Matrix	QC			
Sample Size	1	n/a		
Percent Moisture	n/a			
Split Ratio	6			

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101624.D
Run Date	10/16/2019 14:07
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes	**ng spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	300	6.78	86	
1,4-Dichlorobenzene	300	6.86	87 M	
1,2-Dichlorobenzene	300	7.17	106 M	
1,3,5-Trichlorobenzene	300	8.36	44	
1,2,4-Trichlorobenzene	300	8.89	234	
1,2,3-Trichlorobenzene	300	9.29	112	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	600	10.52	119	
1,2,3,4-Tetrachlorobenzene	300	11.02	117	
Pentachlorobenzene	300	12.37	113	
Hexachlorobenzene	300	14.01	106	
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene			NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.57	5	R
13C6-1,4-Dichlorobenzene	300	6.86	46	
13C6-1,2,3-Trichlorobenzene	300	9.29	52	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.02	70	
13C6-Pentachlorobenzene	300	12.37	74	
13C6-Hexachlorobenzene	300	14.01	83	

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

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample (Low Level)**	Sampling Date	n/a
ALS Sample ID	WG3165005-5	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
17-Oct-2019

Run Information	**Run 1**
Filename	19101623.D
Run Date	10/16/2019 13:46
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP-5MS UST460651H

Target Analytes	**ng spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	15	6.78	76 M	
1,4-Dichlorobenzene	15	6.87	144 M	
1,2-Dichlorobenzene	15	7.17	92	R
1,3,5-Trichlorobenzene	15	8.36	80 M	
1,2,4-Trichlorobenzene	15	8.89	110	
1,2,3-Trichlorobenzene	15	9.30	120	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	30	10.52	114	
1,2,3,4-Tetrachlorobenzene	15	11.03	92	
Pentachlorobenzene	15	12.38	98	
Hexachlorobenzene	15	14.01	129 M	R
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene			NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	300	4.58	5	R
13C6-1,4-Dichlorobenzene	300	6.87	36	
13C6-1,2,3-Trichlorobenzene	300	9.29	39	
13C6-1,2,3,4-Tetrachlorobenzene	300	11.03	51	
13C6-Pentachlorobenzene	300	12.38	50	
13C6-Hexachlorobenzene	300	14.01	61	

M Indicates that a peak has been manually integrated.

NS Indicates that this compound was not spiked in.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental
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 (905)822-4120
ALS WO#:	L2348009	**Client Contact:**	Chris Belore
Date of Report	15-Oct-19	**Client Project ID:**	21960 Covanta
Date of Sample Receipt	16-Sep-19		

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS Isotope Dilution**

High LCS recovery for 2,3-Dichlorophenol appears to be due to an interference. None of this isomer is observed in any of the field samples; therefore there is no concern on analytical bias of this target.

Certified by:

Ron McLeod, PhD
Laboratory Manager and Technical Director

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method/Media Blank		19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET		19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET		19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET		19-21960-SVOC-(16 THRU 20) BLANK1	
ALS Sample ID	WG3165005-1		L2348009-1		L2348009-2		L2348009-3		L2348009-4	
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		12-Sep-19		12-Sep-19		13-Sep-19		12-Sep-19	
Extraction Date	25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
2-Chlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
3-Chlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
4-Chlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
2,6-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
2,4/2,5-Dichlorophenol	<60	U	446	M	<60	U	120	M	nq	
3,5-Dichlorophenol	<60	U	828	M	738	M	581	M	nq	
2,3-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
3,4-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	nq	
2,4,6-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,3,6-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,3,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,4,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,3,4-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
3,4,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
2,3,4,5-Tetrachlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
Pentachlorophenol	<60	U	<60	U	<60	U	<60	U	<60	U
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
13C6-4-Chlorophenol (ES)	58		55		59		60		2	R
13C6-2,4-Dichlorophenol (ES)	65		26		41		34		1	M
13C6-2,4,5-Trichlorophenol (ES)	72		46		61		27		30	
13C6-2,3,4,5-Tetrachlorophenol (ES)	84		74	R	93	R	31	R	45	R
13C6-Pentachlorophenol (ES)	65		58		73		37		40	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
nq	Not quantifiable due to an absence of significant recovery on the corresponding C-13 labelled extraction standard.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET		19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET		19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET		19-21960-SVOC-(36 THRU 40) BLANK2		Laboratory Control Sample	
ALS Sample ID	L2348009-5		L2348009-6		L2348009-7		L2348009-8		WG3165005-2	
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	11-Sep-19		11-Sep-19		12-Sep-19		12-Sep-19		n/a	
Extraction Date	25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
2-Chlorophenol	<60	U	<60	U	<60	U	<60	U	97	R
3-Chlorophenol	<60	U	<60	U	<60	U	<60	U	96	
4-Chlorophenol	<60	U	<60	U	<60	U	<60	U	92	
2,6-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	88	
2,4/2,5-Dichlorophenol	400	M	89	M	62.6	M	<60	U	71	
3,5-Dichlorophenol	460		1100	M	709	M	<60	U	125	
2,3-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	233	M,R
3,4-Dichlorophenol	<60	U	<60	U	<60	U	<60	U	109	
2,4,6-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	50	
2,3,6-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	55	
2,3,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	111	M,R
2,4,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	59	
2,3,4-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	47	
3,4,5-Trichlorophenol	<60	U	<60	U	<60	U	<60	U	53	
2,3,5,6/2,3,4,6-Tetrachlorophenol	<60	U	<60	U	<60	U	<60	U	60	M
2,3,4,5-Tetrachlorophenol	<60	U	<60	U	<60	U	<60	U	56	
Pentachlorophenol	<60	U	<60	U	<60	U	<60	U	54	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
13C6-4-Chlorophenol (ES)	61		44		58		21	R	33	
13C6-2,4-Dichlorophenol (ES)	39		24		31		11	M	36	
13C6-2,4,5-Trichlorophenol (ES)	60		19		48		53		66	
13C6-2,3,4,5-Tetrachlorophenol (ES)	88	R	53	R	77	R	65	R	81	R
13C6-Pentachlorophenol (ES)	60		49		30		24		63	

U Indicates that this compound was not detected above the LOR.
M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**		Sampling Date	n/a
ALS Sample ID	WG3165005-1		Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS			
Analysis Type	blank			
Sample Matrix	QC			
Sample Size	1	sample		
Percent Moisture	n/a			
Split Ratio	6			

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100412.D
Run Date	10/4/2019 11:48
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		NotFnd	<60	U
3,5-Dichlorophenol		NotFnd	<60	U
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		13.76	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	58	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	65	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	72	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	84	
13C6-Pentachlorophenol (ES)	1200	13.77	65	

U — Indicates that this compound was not detected above the LOR.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-1	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100416.D
Run Date	10/4/2019 13:23
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		9.71	446	M
3,5-Dichlorophenol		9.83	828	M
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	55	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	26	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	46	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	74	R
13C6-Pentachlorophenol (ES)	1200	13.76	58	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-2	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100417.D
Run Date	10/4/2019 13:47
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS UST460651

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		NotFnd	<60	U
3,5-Dichlorophenol		9.83	738	M
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		13.76	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	59	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	41	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	61	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	93	R
13C6-Pentachlorophenol (ES)	1200	13.76	73	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET**	Sampling Date	13-Sep-19
ALS Sample ID	L2348009-3	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100418.D
Run Date	10/4/2019 14:10
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USN127357H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		9.70	120 M	
3,5-Dichlorophenol		9.83	581 M	
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.55	60	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	34	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	27	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	31	R
13C6-Pentachlorophenol (ES)	1200	13.76	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	**19-21960-SVOC-(16 THRU 20) BLANK1**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-4	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100414.D
Run Date	10/4/2019 12:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USN127357H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		8.19	nq	
3-Chlorophenol		NotFnd	nq	
4-Chlorophenol		NotFnd	nq	
2,6-Dichlorophenol		NotFnd	nq	
2,4/2,5-Dichlorophenol		NotFnd	nq	
3,5-Dichlorophenol		NotFnd	nq	
2,3-Dichlorophenol		NotFnd	nq	
3,4-Dichlorophenol		NotFnd	nq	
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	2	R
13C6-2,4-Dichlorophenol (ES)	1200	9.71	1 M	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	30	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	45	R
13C6-Pentachlorophenol (ES)	1200	13.77	40	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
nq	Not quantifiable due to an absence of significant recovery on the corresponding C-13 labelled extraction standard.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-5	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100419.D
Run Date	10/4/2019 14:34
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes		**Ret. Time**	**Concentration n/a**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		9.72	400	M
3,5-Dichlorophenol		9.84	460	
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.56	61	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	39	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	60	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	88	R
13C6-Pentachlorophenol (ES)	1200	13.76	60	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-6	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100420.D
Run Date	10/4/2019 14:58
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		9.72	89	M
3,5-Dichlorophenol		9.84	1100	M
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.59	44	
13C6-2,4-Dichlorophenol (ES)	1200	9.73	24	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	19	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	53	R
13C6-Pentachlorophenol (ES)	1200	13.77	49	

M — Indicates that a peak has been manually integrated.
U — Indicates that this compound was not detected above the LOR.

R — Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-7	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100421.D
Run Date	10/4/2019 15:22
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		9.71	62.6	M
3,5-Dichlorophenol		9.83	709	M
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.56	58	
13C6-2,4-Dichlorophenol (ES)	1200	9.72	31	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	48	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	77	R
13C6-Pentachlorophenol (ES)	1200	13.76	30	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**19-21960-SVOC-(36 THRU 40) BLANK2**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-8	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100415.D
Run Date	10/4/2019 12:59
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol		NotFnd	<60	U
3-Chlorophenol		NotFnd	<60	U
4-Chlorophenol		NotFnd	<60	U
2,6-Dichlorophenol		NotFnd	<60	U
2,4/2,5-Dichlorophenol		NotFnd	<60	U
3,5-Dichlorophenol		9.83	<60	U
2,3-Dichlorophenol		NotFnd	<60	U
3,4-Dichlorophenol		NotFnd	<60	U
2,4,6-Trichlorophenol		NotFnd	<60	U
2,3,6-Trichlorophenol		NotFnd	<60	U
2,3,5-Trichlorophenol		NotFnd	<60	U
2,4,5-Trichlorophenol		NotFnd	<60	U
2,3,4-Trichlorophenol		NotFnd	<60	U
3,4,5-Trichlorophenol		NotFnd	<60	U
2,3,5,6/2,3,4,6-Tetrachlorophenol		NotFnd	<60	U
2,3,4,5-Tetrachlorophenol		NotFnd	<60	U
Pentachlorophenol		NotFnd	<60	U
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	21	R
13C6-2,4-Dichlorophenol (ES)	1200	9.70	11 M	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	53	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	65	R
13C6-Pentachlorophenol (ES)	1200	13.77	24	

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG3165005-2	Extraction Date	25-Sep-19
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	6		

Approved:
Andrew Reid
--e-signature--
09-Oct-2019

Run Information	**Run 1**
Filename	19100410.D
Run Date	10/4/2019 11:00
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
2-Chlorophenol	1200	8.19	97	R
3-Chlorophenol	1200	8.47	96	
4-Chlorophenol	1200	8.47	92	
2,6-Dichlorophenol	1200	9.50	88	
2,4/2,5-Dichlorophenol	2400	9.70	71	
3,5-Dichlorophenol	1200	9.83	125	
2,3-Dichlorophenol	1200	10.04	233 M	R
3,4-Dichlorophenol	1200	10.27	109	
2,4,6-Trichlorophenol	1200	10.64	50	
2,3,6-Trichlorophenol	1200	11.05	55	
2,3,5-Trichlorophenol	1200	11.12	111 M	R
2,4,5-Trichlorophenol	1200	11.18	59	
2,3,4-Trichlorophenol	1200	11.58	47	
3,4,5-Trichlorophenol	1200	11.70	53	
2,3,5,6/2,3,4,6-Tetrachlorophenol	2400	12.29	60 M	
2,3,4,5-Tetrachlorophenol	1200	12.79	56	
Pentachlorophenol	1200	13.77	54	
Extraction Standards			**% Rec**	
13C6-4-Chlorophenol (ES)	1200	8.54	33	
13C6-2,4-Dichlorophenol (ES)	1200	9.71	36	
13C6-2,4,5-Trichlorophenol (ES)	1200	11.18	66	
13C6-2,3,4,5-Tetrachlorophenol (E	1200	12.79	81	R
13C6-Pentachlorophenol (ES)	1200	13.77	63	

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2348009		Mississauga, ON L5J 2Y4
Date of Report	15-Oct-19		(905)822-4120
Date of Sample Receipt	16-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

Certified by: R.A. McLeod

Ron McLeod, Ph.D.
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Media/Method Blank		19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET		19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET		19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET		19-21960-SVOC-(16 THRU 20) BLANK1	
ALS Sample ID	WG3165005-1		L2348009-1		L2348009-2		L2348009-3		L2348009-4	
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		12-Sep-19		12-Sep-19		13-Sep-19		12-Sep-19	
Extraction Date	25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Naphthalene	104	M	229	M,B	164	M,B	313	M,B	89.1	M,B
2-Methylnaphthalene	<12	U	58.1		23.2	M	69.5	M	<12	U
1-Methylnaphthalene	<12	U	37.3		<12	U	34.0	M	<12	U
Acenaphthylene	<12	U	<12	U	<12	U	<12	U	<12	U
Acenaphthene	<12	U	<12	U	<12	U	<12	U	<12	U
Fluorene	<12	U	59.8	M	18.2	R	30.4	M,R	<12	U
Phenanthrene	<12	U	534	M	78.8		122		<12	U
Anthracene	<12	U	12.2	M	21.1		<12	U	<12	U
Fluoranthene	<12	U	124		23.5		18.4	M	<12	U
Pyrene	<12	U	105		33.7		20.9		<12	U
Benzo(a)Anthracene	<12	U	<12	U	<12	U	<12	U	<12	U
Chrysene/Triphenylene	<12	U	70.4		<12	U	<12	U	<12	U
Benzo(b)Fluoranthene	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(k)Fluoranthene	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(e)Pyrene	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(a)Pyrene	<12	U	<12	U	<12	U	<12	U	<12	U
Perylene	<12	U	<12	U	<12	U	<12	U	<12	U
Indeno(1,2,3-cd)Pyrene	<12	U	<12	U	<12	U	<12	U	<12	U
Dibenzo(a,h/a,c)Anthracene	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(g,h,i)Perylene	<12	U	<12	U	<12	U	<12	U	<12	U
Additional Analytes										
Tetralin	94.7	M	118	M,B	91.4	M,B	131	M,B	62.6	M,B
2-Chloronaphthalene	<12	U	<12	U	<12	U	<12	U	<12	U
Biphenyl	<12	U	50.0	M	35.1	M	221		<12	U
o-Terphenyl	<12	U	<12	U	<12	U	<12	U	<12	U
1-Methylphenanthrene	<12	U	<12	U	<12	U	<12	U	<12	U
9-Methylphenanthrene	<12	U	89.5		<12	U	<12	U	<12	U
2-methylanthracene	<12	U	157	M	<12	U	<12	U	<12	U
9,10-dimethylanthracene	<12	U	<12	U	<12	U	<12	U	<12	U
m-terphenyl	<12	U	<12	U	<12	U	<12	U	<12	U
p-terphenyl	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(a)fluorene	<12	U	<12	U	<12	U	<12	U	<12	U
Benzo(b)fluorene	<12	U	<12	U	<12	U	<12	U	<12	U
7,12-Dimethylbenzo(a)anthracene	<12	U	<12	U	<12	U	<12	U	<12	U
3-Methylcholanthrene	<60	U	<60	U	<60	U	<60	U	<60	U
Picene	<60	U	<60	U	<60	U	<60	U	<60	U
Dibenzo(a,e)pyrene	<60	U	<60	U	<60	U	<60	U	<60	U
Coronene	<60	U	<60	U	<60	U	<60	U	<60	U
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	NS		110.4		111.4		112.1		109.0	
Fluorene D10	NS		99.2		108.9		106.5		113.5	
Terphenyl D14(Surr.)	NS		118.7		126.6		126.6		113.1	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	66.4	M	69.0	M	64.8	M	67.9	M	78.8	M
2-Methylnaphthalene-D10	77.7		87.8		79.3		79.7		88.4	
Acenaphthylene D8	71.6		81.1		73.7		72.5	M	68.1	
Phenanthrene D10	69.7		75.0		71.5		69.0		78.3	
Anthracene-D10	70.1	M	63.4		62.0	M	58.3		62.6	M
Fluoranthene D10	79.6		97.4		85.3		87.6		92.2	
Benz(a)Anthracene-D12	63.9		69.1		61.8		61.1		59.8	
Chrysene D12	65.5	M	68.2		62.8		61.2		62.3	
Benzo(b)Fluoranthene-D12	81.7		91.7		69.6		72.5		92.7	
Benzo(k)Fluoranthene-D12	70.9	M	64.8		59.2	M	61.8	M	68.6	
Benzo(a)Pyrene D12	66.8	M	64.4	M	59.8	M,R	59.6	M	59.8	M
Perylene D12	63.0		51.1	M	36.0		38.0		43.9	M
Indeno(1,2,3,cd)Pyrene-D12	71.7		72.8		54.9		51.4	M	72.3	
Dibenz(a,h)Anthracene-D14	67.8	M	62.5	M	47.9	M	46.2	M	64.8	M
Benzo(g,h,i)Perylene D12	76.6	M	69.7		58.5	M	51.4		70.2	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this compound was not spiked in.

Sample Analysis Summary Report

Sample Name	19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET		19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET		19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET		19-21960-SVOC-(36 THRU 40) BLANK2		Laboratory Control Sample	
ALS Sample ID	L2348009-5		L2348009-6		L2348009-7		L2348009-8		WG3165005-2	
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	11-Sep-19		11-Sep-19		12-Sep-19		12-Sep-19		n/a	
Extraction Date	25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19		25-Sep-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**%**	
Naphthalene	310	M,B	147	M,B	174	M,B	117	M,B	98.3	M
2-Methylnaphthalene	75.7	M	22.3	M	46.7	M	<12	U	93.2	
1-Methylnaphthalene	39.4		<12	U	25.2	M	<12	U	101.0	
Acenaphthylene	<12	U	<12	U	<12	U	<12	U	91.0	
Acenaphthene	<12	U	<12	U	<12	U	<12	U	92.0	
Fluorene	38.1	M	19.9		60.8	M	<12	U	85.9	
Phenanthrene	162		92.3		313	M	<12	U	93.6	
Anthracene	<12	U	<12	U	17.4	M	<12	U	92.7	
Fluoranthene	50.4	M	19.4	M	20.4	M	<12	U	90.0	
Pyrene	75.8		25.5	M	18.4		<12	U	91.4	
Benzo(a)Anthracene	<12	U	<12	U	<12	U	<12	U	92.7	
Chrysene/Triphenylene	<12	U	<12	U	<12	U	<12	U	106.1	
Benzo(b)Fluoranthene	<12	U	<12	U	<12	U	<12	U	79.5	
Benzo(k)Fluoranthene	<12	U	<12	U	<12	U	<12	U	91.8	
Benzo(e)Pyrene	21.6	M	22.0	M	<12	U	<12	U	98.8	
Benzo(a)Pyrene	<12	U	<12	U	<12	U	<12	U	84.6	
Perylene	<12	U	<12	U	<12	U	<12	U	97.3	
Indeno(1,2,3-cd)Pyrene	<12	U	<12	U	<12	U	<12	U	89.6	
Dibenzo(a,h/a,c)Anthracene	<12	U	<12	U	<12	U	<12	U	96.8	
Benzo(g,h,i)Perylene	25.5	M	95.3	M	<12	U	<12	U	93.1	M
Additional Analytes										
Tetralin	115	M,B	90.1	M,B	84.1	M,B	95.5	M,B		
2-Chloronaphthalene	<12	U	<12	U	<12	U	<12	U		
Biphenyl	36.0	M	31.9	M,R	41.8	M,R	<12	U		
o-Terphenyl	<12	U	<12	U	<12	U	<12	U		
1-Methylphenanthrene	<12	U	<12	U	<12	U	<12	U		
9-Methylphenanthrene	<12	U	<12	U	17.5		<12	U		
2-methylanthracene	16.3	M	<12	U	37.0		<12	U		
9,10-dimethylanthracene	<12	U	<12	U	<12	U	<12	U		
m-terphenyl	<12	U	<12	U	<12	U	<12	U		
p-terphenyl	<12	U	<12	U	<12	U	<12	U		
Benzo(a)fluorene	<12	U	<12	U	<12	U	<12	U		
Benzo(b)fluorene	<12	U	<12	U	<12	U	<12	U		
7,12-Dimethylbenzo(a)anthracene	<12	U	<12	U	<12	U	<12	U		
3-Methylcholanthrene	<60	U	<60	U	<60	U	<60	U		
Picene	<60	U	<60	U	<60	U	<60	U		
Dibenzo(a,e)pyrene	<60	U	<60	U	<60	U	<60	U		
Coronene	<60	U	<60	U	<60	U	<60	U		
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	110.4		106.1		114.2		110.9		NS	
Fluorene D10	99.6		102.3		106.0		109.5		NS	
Terphenyl D14(Surr.)	127.8		120.8		127.7		118.0		NS	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	77.7	M	73.9	M	59.6	M	88.6	M	86.0	M
2-Methylnaphthalene-D10	92.3		79.2		67.6		100.4		97.8	
Acenaphthylene D8	93.1		74.1		64.9		89.4		91.5	
Phenanthrene D10	78.3		67.8		58.8		91.2		88.1	
Anthracene-D10	66.5		57.7		52.7	M	64.7		81.0	
Fluoranthene D10	103.5		80.4		70.7		105.5		99.3	
Benz(a)Anthracene-D12	86.7		57.4		50.3		78.3		88.4	
Chrysene D12	82.8		55.6		50.0		78.5		89.9	
Benzo(b)Fluoranthene-D12	85.6		72.1		65.7		110.8		106.9	
Benzo(k)Fluoranthene-D12	61.3		61.8	M	57.2	M	82.7		89.5	
Benzo(a)Pyrene D12	69.0	M	57.6	M	51.3	M	66.4		77.1	M
Perylene D12	51.9		43.7		36.9		52.3		78.3	
Indeno(1,2,3,cd)Pyrene-D12	62.3		46.9	M	48.9		88.1		90.0	
Dibenz(a,h)Anthracene-D14	47.1		39.1	M	36.2		70.0		80.3	
Benzo(g,h,i)Perylene D12	59.6		45.2		48.0		87.7		87.1	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this compound was not spiked in.

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Laboratory Method Blank Analysis Report

Sample Name	**Media/Method Blank**		Sampling Date	n/a
ALS Sample ID	WG3165005-1		Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429			
Analysis Type	blank			
Sample Matrix	QC			
Sample Size	1	Sample		
Percent Moisture	n/a			
Split Ratio	6		Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101107.D
Run Date	10/11/2019 15:20
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes		**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene		2.79	104 M		
2-Methylnaphthalene		3.38	<12	U	
1-Methylnaphthalene		3.49	<12	U	
Acenaphthylene		4.50	<12	U	
Acenaphthene		4.78	<12	U	
Fluorene		5.70	<12	U	
Phenanthrene		7.86	<12	U	
Anthracene		7.98	<12	U	
Fluoranthene		NotFnd	<12	U	
Pyrene		11.85	<12	U	
Benzo(a)Anthracene		15.74	<12	U	
Chrysene/Triphenylene		15.86	<12	U	
Benzo(b)Fluoranthene		19.07	<12	U	
Benzo(k)Fluoranthene		NotFnd	<12	U	
Benzo(e)Pyrene		19.81	<12	U	
Benzo(a)Pyrene		19.97	<12	U	
Perylene		20.15	<12	U	
Indeno(1,2,3-cd)Pyrene		23.39	<12	U	
Dibenzo(a,h/a,c)Anthracene		23.58	<12	U	
Benzo(g,h,i)Perylene		24.30	<12	U	
Additional Analytes					
Tetralin		2.67	94.7 M		
2-Chloronaphthalene		3.93	<12	U	
Biphenyl		3.91	<12	U	
o-Terphenyl		9.12	<12	U	
1-Methylphenanthrene		9.41	<12	U	
9-Methylphenanthrene		9.51	<12	U	
2-methylanthracene		9.58	<12	U	
9,10-dimethylanthracene		NotFnd	<12	U	
m-terphenyl		NotFnd	<12	U	
p-terphenyl		NotFnd	<12	U	
Benzo(a)fluorene		NotFnd	<12	U	
Benzo(b)fluorene		NotFnd	<12	U	
7,12-Dimethylbenzo(a)anthracene		NotFnd	<12	U	
3-Methylcholanthrene		NotFnd	<60	U	
Picene		NotFnd	<60	U	
Dibenzo(a,e)pyrene		NotFnd	<60	U	
Coronene		29.08	<60	U	
Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	600	2.77	66.4 M		50-150
2-Methylnaphthalene-D10	600	3.34	77.7		50-150
Acenaphthylene D8	600	4.47	71.6		50-150
Phenanthrene D10	600	7.80	69.7		50-150
Anthracene-D10	600	7.92	70.1 M		50-150
Fluoranthene D10	600	11.16	79.6		50-150
Benz(a)Anthracene-D12	600	15.68	63.9		50-150
Chrysene D12	600	15.79	65.5 M		50-150
Benzo(b)Fluoranthene-D12	600	19.01	81.7		50-150
Benzo(k)Fluoranthene-D12	600	19.09	70.9 M		50-150
Benzo(a)Pyrene D12	600	19.89	66.8 M		50-150
Perylene D12	600	20.11	63.0		50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.32	71.7		50-150
Dibenz(a,h)Anthracene-D14	600	23.48	67.8 M		50-150
Benzo(g,h,i)Perylene D12	600	24.20	76.6 M		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.

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(1 THRU 5) TEST#1 #1 APC OUTLET**	Sampling Date	12-Sep-19	
ALS Sample ID	L2348009-1	Extraction Date	25-Sep-19	
Analysis Method	PAH by CARB 429			
Analysis Type	sample			
Sample Matrix	Stack			Approved:
Sample Size	1 Sample			*Nishit Shah*
Percent Moisture	n/a			--e-signature--
Split Ratio	6	Workgroup	WG3165005	15-Oct-2019

Run Information	**Run 1**
Filename	19101111.D
Run Date	10/11/2019 17:43
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	2.79	229 M	B
2-Methylnaphthalene	3.38	58.1	
1-Methylnaphthalene	3.48	37.3	
Acenaphthylene	4.49	<12 U	
Acenaphthene	4.78	<12 U	
Fluorene	5.69	59.8 M	
Phenanthrene	7.85	534 M	
Anthracene	7.96	12.2 M	
Fluoranthene	11.22	124	
Pyrene	11.85	105	
Benzo(a)Anthracene	15.75	<12 U	
Chrysene/Triphenylene	15.85	70.4	
Benzo(b)Fluoranthene	18.97	<12 U	
Benzo(k)Fluoranthene	19.22	<12 U	
Benzo(e)Pyrene	19.81	<12 U	
Benzo(a)Pyrene	19.97	<12 U	
Perylene	20.08	<12 U	
Indeno(1,2,3-cd)Pyrene	23.43	<12 U	
Dibenzo(a,h/a,c)Anthracene	23.60	<12 U	
Benzo(g,h,i)Perylene	24.29	<12 U	
Additional Analytes			
Tetralin	2.67	118 M	B
2-Chloronaphthalene	3.92	<12 U	
Biphenyl	3.90	50.0 M	
o-Terphenyl	9.12	<12 U	
1-Methylphenanthrene	9.38	<12 U	
9-Methylphenanthrene	9.51	89.5	
2-methylanthracene	9.58	157 M	
9,10-dimethylanthracene	12.13	<12 U	
m-terphenyl	12.27	<12 U	
p-terphenyl	12.74	<12 U	
Benzo(a)fluorene	13.00	<12 U	
Benzo(b)fluorene	13.20	<12 U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<12 U	
3-Methylcholanthrene	21.10	<60 U	
Picene	24.07	<60 U	
Dibenzo(a,e)pyrene	28.20	<60 U	
Coronene	29.08	<60 U	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	500	3.45	110.4	
Fluorene D10	500	5.64	99.2	
Terphenyl D14(Surr.)	500	12.67	118.7	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	600	2.77	69.0 M	50-150
2-Methylnaphthalene-D10	600	3.34	87.8	50-150
Acenaphthylene D8	600	4.48	81.1	50-150
Phenanthrene D10	600	7.79	75.0	50-150
Anthracene-D10	600	7.93	63.4	50-150
Fluoranthene D10	600	11.16	97.4	50-150
Benz(a)Anthracene-D12	600	15.68	69.1	50-150
Chrysene D12	600	15.79	68.2	50-150
Benzo(b)Fluoranthene-D12	600	19.01	91.7	50-150
Benzo(k)Fluoranthene-D12	600	19.09	64.8	50-150
Benzo(a)Pyrene D12	600	19.89	64.4 M	50-150
Perylene D12	600	20.11	51.1 M	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.32	72.8	50-150
Dibenz(a,h)Anthracene-D14	600	23.48	62.5 M	50-150
Benzo(g,h,i)Perylene D12	600	24.19	69.7	50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

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Sample Analysis Report

Sample Name	**19-21960-SVOC-(6 THRU 10) TEST#2 #1 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-2	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101112.D
Run Date	10/11/2019 18:19
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	2.79	164 M		B
2-Methylnaphthalene	3.38	23.2 M		
1-Methylnaphthalene	3.48	<12	U	
Acenaphthylene	4.49	<12	U	
Acenaphthene	NotFnd	<12	U	
Fluorene	5.69	18.2	R	
Phenanthrene	7.85	78.8		
Anthracene	7.97	21.1		
Fluoranthene	11.22	23.5		
Pyrene	11.85	33.7		
Benzo(a)Anthracene	15.72	<12	U	
Chrysene/Triphenylene	15.89	<12	U	
Benzo(b)Fluoranthene	19.09	<12	U	
Benzo(k)Fluoranthene	NotFnd	<12	U	
Benzo(e)Pyrene	19.82	<12	U	
Benzo(a)Pyrene	NotFnd	<12	U	
Perylene	20.17	<12	U	
Indeno(1,2,3-cd)Pyrene	23.42	<12	U	
Dibenzo(a,h/a,c)Anthracene	23.51	<12	U	
Benzo(g,h,i)Perylene	24.30	<12	U	
Additional Analytes				
Tetralin	2.67	91.4 M		B
2-Chloronaphthalene	3.92	<12	U	
Biphenyl	3.90	35.1 M		
o-Terphenyl	9.11	<12	U	
1-Methylphenanthrene	NotFnd	<12	U	
9-Methylphenanthrene	9.52	<12	U	
2-methylanthracene	9.52	<12	U	
9,10-dimethylanthracene	12.20	<12	U	
m-terphenyl	12.28	<12	U	
p-terphenyl	12.74	<12	U	
Benzo(a)fluorene	12.96	<12	U	
Benzo(b)fluorene	13.21	<12	U	
7,12-Dimethylbenzo(a)anthracene	19.27	<12	U	
3-Methylcholanthrene	21.12	<60	U	
Picene	24.10	<60	U	
Dibenzo(a,e)pyrene	28.25	<60	U	
Coronene	29.05	<60	U	

Field Sampling Standards	**ng spiked**		**% Rec**		**Limits**
1-Methylnaphthalene-D10	500	3.45	111.4		
Fluorene D10	500	5.64	108.9		
Terphenyl D14(Surr.)	500	12.67	126.6		
Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	600	2.77	64.8 M		50-150
2-Methylnaphthalene-D10	600	3.34	79.3		50-150
Acenaphthylene D8	600	4.47	73.7		50-150
Phenanthrene D10	600	7.80	71.5		50-150
Anthracene-D10	600	7.92	62.0 M		50-150
Fluoranthene D10	600	11.16	85.3		50-150
Benz(a)Anthracene-D12	600	15.68	61.8		50-150
Chrysene D12	600	15.79	62.8		50-150
Benzo(b)Fluoranthene-D12	600	19.01	69.6		50-150
Benzo(k)Fluoranthene-D12	600	19.09	59.2 M		50-150
Benzo(a)Pyrene D12	600	19.89	59.8 M	R	50-150
Perylene D12	600	20.11	36.0		50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.33	54.9		50-150
Dibenz(a,h)Anthracene-D14	600	23.48	47.9 M		50-150
Benzo(g,h,i)Perylene D12	600	24.20	58.5 M		50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(11 THRU 15) TEST#3 #1 APC OUTLET**	Sampling Date	13-Sep-19
ALS Sample ID	L2348009-3	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101113.D
Run Date	10/11/2019 18:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	2.79	313 M	B
2-Methylnaphthalene	3.38	69.5 M	
1-Methylnaphthalene	3.48	34.0 M	
Acenaphthylene	4.49	<12 U	
Acenaphthene	4.78	<12 U	
Fluorene	5.69	30.4 M	R
Phenanthrene	7.85	122	
Anthracene	7.97	<12 U	
Fluoranthene	11.22	18.4 M	
Pyrene	11.85	20.9	
Benzo(a)Anthracene	15.75	<12 U	
Chrysene/Triphenylene	15.87	<12 U	
Benzo(b)Fluoranthene	19.09	<12 U	
Benzo(k)Fluoranthene	NotFnd	<12 U	
Benzo(e)Pyrene	19.81	<12 U	
Benzo(a)Pyrene	19.98	<12 U	
Perylene	20.22	<12 U	
Indeno(1,2,3-cd)Pyrene	23.37	<12 U	
Dibenzo(a,h/a,c)Anthracene	23.57	<12 U	
Benzo(g,h,i)Perylene	24.29	<12 U	
Additional Analytes			
Tetralin	2.67	131 M	B
2-Chloronaphthalene	3.92	<12 U	
Biphenyl	3.90	221	
o-Terphenyl	9.12	<12 U	
1-Methylphenanthrene	9.38	<12 U	
9-Methylphenanthrene	9.52	<12 U	
2-methylanthracene	9.59	<12 U	
9,10-dimethylanthracene	NotFnd	<12 U	
m-terphenyl	12.28	<12 U	
p-terphenyl	12.74	<12 U	
Benzo(a)fluorene	13.02	<12 U	
Benzo(b)fluorene	13.26	<12 U	
7,12-Dimethylbenzo(a)anthracene	19.21	<12 U	
3-Methylcholanthrene	NotFnd	<60 U	
Picene	24.16	<60 U	
Dibenzo(a,e)pyrene	28.22	<60 U	
Coronene	29.04	<60 U	

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	3.45	112.1
Fluorene D10	500	5.63	106.5
Terphenyl D14(Surr.)	500	12.66	126.6

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	600	2.78	67.9 M	50-150
2-Methylnaphthalene-D10	600	3.34	79.7	50-150
Acenaphthylene D8	600	4.47	72.5 M	50-150
Phenanthrene D10	600	7.79	69.0	50-150
Anthracene-D10	600	7.93	58.3	50-150
Fluoranthene D10	600	11.16	87.6	50-150
Benz(a)Anthracene-D12	600	15.68	61.1	50-150
Chrysene D12	600	15.79	61.2	50-150
Benzo(b)Fluoranthene-D12	600	19.01	72.5	50-150
Benzo(k)Fluoranthene-D12	600	19.09	61.8 M	50-150
Benzo(a)Pyrene D12	600	19.89	59.6 M	50-150
Perylene D12	600	20.11	38.0	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.33	51.4 M	50-150
Dibenz(a,h)Anthracene-D14	600	23.48	46.2 M	50-150
Benzo(g,h,i)Perylene D12	600	24.19	51.4	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.
B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(16 THRU 20) BLANK1**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-4	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101109.D
Run Date	10/11/2019 16:32
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**		**Flags**
Naphthalene	2.79	89.1	M	B
2-Methylnaphthalene	3.38	<12	U	
1-Methylnaphthalene	3.48	<12	U	
Acenaphthylene	4.49	<12	U	
Acenaphthene	4.73	<12	U	
Fluorene	5.69	<12	U	
Phenanthrene	7.85	<12	U	
Anthracene	7.98	<12	U	
Fluoranthene	11.22	<12	U	
Pyrene	11.85	<12	U	
Benzo(a)Anthracene	15.77	<12	U	
Chrysene/Triphenylene	15.88	<12	U	
Benzo(b)Fluoranthene	19.07	<12	U	
Benzo(k)Fluoranthene	19.18	<12	U	
Benzo(e)Pyrene	19.89	<12	U	
Benzo(a)Pyrene	19.98	<12	U	
Perylene	20.20	<12	U	
Indeno(1,2,3-cd)Pyrene	23.46	<12	U	
Dibenzo(a,h/a,c)Anthracene	23.57	<12	U	
Benzo(g,h,i)Perylene	24.30	<12	U	
Additional Analytes				
Tetralin	2.66	62.6	M	B
2-Chloronaphthalene	3.92	<12	U	
Biphenyl	3.90	<12	U	
o-Terphenyl	9.10	<12	U	
1-Methylphenanthrene	9.34	<12	U	
9-Methylphenanthrene	9.44	<12	U	
2-methylanthracene	9.55	<12	U	
9,10-dimethylanthracene	12.21	<12	U	
m-terphenyl	NotFnd	<12	U	
p-terphenyl	NotFnd	<12	U	
Benzo(a)fluorene	NotFnd	<12	U	
Benzo(b)fluorene	NotFnd	<12	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<12	U	
3-Methylcholanthrene	NotFnd	<60	U	
Picene	24.51	<60	U	
Dibenzo(a,e)pyrene	NotFnd	<60	U	
Coronene	NotFnd	<60	U	

Field Sampling Standards	**ng spiked**		**% Rec**		**Limits**
1-Methylnaphthalene-D10	500	3.45	109		
Fluorene D10	500	5.63	113.5		
Terphenyl D14(Surr.)	500	12.67	113.1		
Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	600	2.77	78.8	M	50-150
2-Methylnaphthalene-D10	600	3.34	88.4		50-150
Acenaphthylene D8	600	4.47	68.1		50-150
Phenanthrene D10	600	7.79	78.3		50-150
Anthracene-D10	600	7.93	62.6	M	50-150
Fluoranthene D10	600	11.16	92.2		50-150
Benz(a)Anthracene-D12	600	15.68	59.8		50-150
Chrysene D12	600	15.79	62.3		50-150
Benzo(b)Fluoranthene-D12	600	19.01	92.7		50-150
Benzo(k)Fluoranthene-D12	600	19.09	68.6		50-150
Benzo(a)Pyrene D12	600	19.89	59.8	M	50-150
Perylene D12	600	20.12	43.9	M	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.33	72.3		50-150
Dibenz(a,h)Anthracene-D14	600	23.49	64.8	M	50-150
Benzo(g,h,i)Perylene D12	600	24.20	70.2		50-150

M — Indicates that a peak has been manually integrated.
U — Indicates that this compound was not detected above the MDL.

B — Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(21 THRU 25) TEST#1 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-5	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101114.D
Run Date	10/11/2019 19:30
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**		**Flags**
Naphthalene	2.79	310 M		B
2-Methylnaphthalene	3.37	75.7 M		
1-Methylnaphthalene	3.48	39.4		
Acenaphthylene	4.49	<12	U	
Acenaphthene	4.78	<12	U	
Fluorene	5.69	38.1 M		
Phenanthrene	7.85	162		
Anthracene	7.97	<12	U	
Fluoranthene	11.22	50.4 M		
Pyrene	11.85	75.8		
Benzo(a)Anthracene	15.76	<12	U	
Chrysene/Triphenylene	15.87	<12	U	
Benzo(b)Fluoranthene	19.07	<12	U	
Benzo(k)Fluoranthene	19.17	<12	U	
Benzo(e)Pyrene	19.81	21.6 M		
Benzo(a)Pyrene	19.97	<12	U	
Perylene	20.21	<12	U	
Indeno(1,2,3-cd)Pyrene	23.42	<12	U	
Dibenzo(a,h/a,c)Anthracene	23.61	<12	U	
Benzo(g,h,i)Perylene	24.30	25.5 M		
Additional Analytes				
Tetralin	2.67	115 M		B
2-Chloronaphthalene	3.92	<12	U	
Biphenyl	3.90	36.0 M		
o-Terphenyl	9.12	<12	U	
1-Methylphenanthrene	9.43	<12	U	
9-Methylphenanthrene	9.52	<12	U	
2-methylanthracene	9.59	16.3 M		
9,10-dimethylanthracene	NotFnd	<12	U	
m-terphenyl	12.27	<12	U	
p-terphenyl	12.75	<12	U	
Benzo(a)fluorene	13.02	<12	U	
Benzo(b)fluorene	13.22	<12	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<12	U	
3-Methylcholanthrene	NotFnd	<60	U	
Picene	24.11	<60	U	
Dibenzo(a,e)pyrene	28.23	<60	U	
Coronene	NotFnd	<60	U	

Field Sampling Standards	**ng spiked**		**% Rec**	**Limits**
1-Methylnaphthalene-D10	500	3.45	110.4	
Fluorene D10	500	5.63	99.6	
Terphenyl D14(Surr.)	500	12.66	127.8	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	600	2.77	77.7 M	50-150
2-Methylnaphthalene-D10	600	3.34	92.3	50-150
Acenaphthylene D8	600	4.47	93.1	50-150
Phenanthrene D10	600	7.79	78.3	50-150
Anthracene-D10	600	7.92	66.5	50-150
Fluoranthene D10	600	11.16	103.5	50-150
Benz(a)Anthracene-D12	600	15.67	86.7	50-150
Chrysene D12	600	15.78	82.8	50-150
Benzo(b)Fluoranthene-D12	600	19.00	85.6	50-150
Benzo(k)Fluoranthene-D12	600	19.09	61.3	50-150
Benzo(a)Pyrene D12	600	19.88	69.0 M	50-150
Perylene D12	600	20.11	51.9	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.32	62.3	50-150
Dibenz(a,h)Anthracene-D14	600	23.48	47.1	50-150
Benzo(g,h,i)Perylene D12	600	24.19	59.6	50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(26 THRU 30) TEST#2 #2 APC OUTLET**	Sampling Date	11-Sep-19
ALS Sample ID	L2348009-6	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101115.D
Run Date	10/11/2019 20:06
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	2.79	147 M	B
2-Methylnaphthalene	3.38	22.3 M	
1-Methylnaphthalene	3.48	<12	U
Acenaphthylene	4.49	<12	U
Acenaphthene	4.78	<12	U
Fluorene	5.69	19.9	
Phenanthrene	7.85	92.3	
Anthracene	7.97	<12	U
Fluoranthene	11.22	19.4 M	
Pyrene	11.85	25.5 M	
Benzo(a)Anthracene	15.77	<12	U
Chrysene/Triphenylene	15.87	<12	U
Benzo(b)Fluoranthene	19.09	<12	U
Benzo(k)Fluoranthene	19.09	<12	U
Benzo(e)Pyrene	19.82	22.0 M	
Benzo(a)Pyrene	19.97	<12	U
Perylene	20.19	<12	U
Indeno(1,2,3-cd)Pyrene	23.39	<12	U
Dibenzo(a,h/a,c)Anthracene	23.54	<12	U
Benzo(g,h,i)Perylene	24.30	95.3 M	
Additional Analytes			
Tetralin	2.67	90.1 M	B
2-Chloronaphthalene	3.92	<12	U
Biphenyl	3.90	31.9 M	R
o-Terphenyl	9.11	<12	U
1-Methylphenanthrene	NotFnd	<12	U
9-Methylphenanthrene	9.52	<12	U
2-methylanthracene	9.58	<12	U
9,10-dimethylanthracene	NotFnd	<12	U
m-terphenyl	12.27	<12	U
p-terphenyl	12.73	<12	U
Benzo(a)fluorene	13.00	<12	U
Benzo(b)fluorene	13.22	<12	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<12	U
3-Methylcholanthrene	NotFnd	<60	U
Picene	24.08	<60	U
Dibenzo(a,e)pyrene	28.24	<60	U
Coronene	NotFnd	<60	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	3.45	106.1
Fluorene D10	500	5.63	102.3
Terphenyl D14(Surr.)	500	12.66	120.8

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	600	2.78	73.9 M	50-150
2-Methylnaphthalene-D10	600	3.34	79.2	50-150
Acenaphthylene D8	600	4.47	74.1	50-150
Phenanthrene D10	600	7.79	67.8	50-150
Anthracene-D10	600	7.92	57.7	50-150
Fluoranthene D10	600	11.16	80.4	50-150
Benz(a)Anthracene-D12	600	15.68	57.4	50-150
Chrysene D12	600	15.79	55.6	50-150
Benzo(b)Fluoranthene-D12	600	19.01	72.1	50-150
Benzo(k)Fluoranthene-D12	600	19.09	61.8 M	50-150
Benzo(a)Pyrene D12	600	19.89	57.6 M	50-150
Perylene D12	600	20.11	43.7	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.33	46.9 M	50-150
Dibenz(a,h)Anthracene-D14	600	23.49	39.1 M	50-150
Benzo(g,h,i)Perylene D12	600	24.20	45.2	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.
B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(31 THRU 35) TEST#3 #2 APC OUTLET**	Sampling Date	12-Sep-19
ALS Sample ID	L2348009-7	Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	6	Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**
Filename	19101116.D
Run Date	10/11/2019 20:42
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-1
Column	HP5-MS UST279461H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	2.79	174 M	B
2-Methylnaphthalene	3.37	46.7 M	
1-Methylnaphthalene	3.48	25.2 M	
Acenaphthylene	4.49	<12	U
Acenaphthene	4.78	<12	U
Fluorene	5.69	60.8 M	
Phenanthrene	7.85	313 M	
Anthracene	7.96	17.4 M	
Fluoranthene	11.22	20.4 M	
Pyrene	11.85	18.4	
Benzo(a)Anthracene	15.72	<12	U
Chrysene/Triphenylene	15.87	<12	U
Benzo(b)Fluoranthene	19.07	<12	U
Benzo(k)Fluoranthene	NotFnd	<12	U
Benzo(e)Pyrene	19.73	<12	U
Benzo(a)Pyrene	19.98	<12	U
Perylene	20.16	<12	U
Indeno(1,2,3-cd)Pyrene	23.41	<12	U
Dibenzo(a,h/a,c)Anthracene	23.62	<12	U
Benzo(g,h,i)Perylene	24.31	<12	U

Additional Analytes			
Tetralin	2.67	84.1 M	B
2-Chloronaphthalene	3.92	<12	U
Biphenyl	3.90	41.8 M	R
o-Terphenyl	9.12	<12	U
1-Methylphenanthrene	NotFnd	<12	U
9-Methylphenanthrene	9.52	17.5	
2-methylanthracene	9.59	37.0	
9,10-dimethylanthracene	NotFnd	<12	U
m-terphenyl	12.28	<12	U
p-terphenyl	NotFnd	<12	U
Benzo(a)fluorene	NotFnd	<12	U
Benzo(b)fluorene	NotFnd	<12	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<12	U
3-Methylcholanthrene	NotFnd	<60	U
Picene	24.09	<60	U
Dibenzo(a,e)pyrene	28.26	<60	U
Coronene	29.04	<60	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	3.45	114.2
Fluorene D10	500	5.63	106
Terphenyl D14(Surr.)	500	12.67	127.7

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	600	2.77	59.6 M	50-150
2-Methylnaphthalene-D10	600	3.34	67.6	50-150
Acenaphthylene D8	600	4.47	64.9	50-150
Phenanthrene D10	600	7.79	58.8	50-150
Anthracene-D10	600	7.93	52.7 M	50-150
Fluoranthene D10	600	11.16	70.7	50-150
Benz(a)Anthracene-D12	600	15.68	50.3	50-150
Chrysene D12	600	15.79	50.0	50-150
Benzo(b)Fluoranthene-D12	600	19.01	65.7	50-150
Benzo(k)Fluoranthene-D12	600	19.10	57.2 M	50-150
Benzo(a)Pyrene D12	600	19.89	51.3 M	50-150
Perylene D12	600	20.12	36.9	50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.33	48.9	50-150
Dibenz(a,h)Anthracene-D14	600	23.49	36.2	50-150
Benzo(g,h,i)Perylene D12	600	24.20	48.0	50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**19-21960-SVOC-(36 THRU 40) BLANK2**		Sampling Date	12-Sep-19
ALS Sample ID	L2348009-8		Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429			
Analysis Type	sample			
Sample Matrix	Stack			
Sample Size	1	Sample		
Percent Moisture	n/a			
Split Ratio	6		Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**	
Filename	19101110.D	
Run Date	10/11/2019 17:07	
Final Volume	1	mL
Dilution Factor	1	
Analysis Units	ng/sample	
Instrument	MSD-1	
Column	HP5-MS UST279461H	

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	2.79	117	M	B
2-Methylnaphthalene	3.38	<12	U	
1-Methylnaphthalene	3.48	<12	U	
Acenaphthylene	4.49	<12	U	
Acenaphthene	4.73	<12	U	
Fluorene	5.69	<12	U	
Phenanthrene	7.86	<12	U	
Anthracene	7.98	<12	U	
Fluoranthene	11.22	<12	U	
Pyrene	11.85	<12	U	
Benzo(a)Anthracene	15.78	<12	U	
Chrysene/Triphenylene	15.87	<12	U	
Benzo(b)Fluoranthene	19.07	<12	U	
Benzo(k)Fluoranthene	19.15	<12	U	
Benzo(e)Pyrene	19.81	<12	U	
Benzo(a)Pyrene	19.97	<12	U	
Perylene	20.16	<12	U	
Indeno(1,2,3-cd)Pyrene	23.40	<12	U	
Dibenzo(a,h/a,c)Anthracene	23.59	<12	U	
Benzo(g,h,i)Perylene	24.29	<12	U	
Additional Analytes				
Tetralin	2.67	95.5	M	B
2-Chloronaphthalene	3.92	<12	U	
Biphenyl	3.90	<12	U	
o-Terphenyl	9.12	<12	U	
1-Methylphenanthrene	9.39	<12	U	
9-Methylphenanthrene	9.48	<12	U	
2-methylanthracene	9.58	<12	U	
9,10-dimethylanthracene	12.09	<12	U	
m-terphenyl	12.23	<12	U	
p-terphenyl	12.75	<12	U	
Benzo(a)fluorene	13.02	<12	U	
Benzo(b)fluorene	13.21	<12	U	
7,12-Dimethylbenzo(a)anthracene	19.22	<12	U	
3-Methylcholanthrene	NotFnd	<60	U	
Picene	23.80	<60	U	
Dibenzo(a,e)pyrene	28.27	<60	U	
Coronene	29.04	<60	U	

Field Sampling Standards	**ng spiked**		**% Rec**		
1-Methylnaphthalene-D10	500	3.45	110.9		
Fluorene D10	500	5.63	109.5		
Terphenyl D14(Surr.)	500	12.67	118		
Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	600	2.77	88.6	M	50-150
2-Methylnaphthalene-D10	600	3.34	100.4		50-150
Acenaphthylene D8	600	4.47	89.4		50-150
Phenanthrene D10	600	7.79	91.2		50-150
Anthracene-D10	600	7.93	64.7		50-150
Fluoranthene D10	600	11.16	105.5		50-150
Benz(a)Anthracene-D12	600	15.68	78.3		50-150
Chrysene D12	600	15.78	78.5		50-150
Benzo(b)Fluoranthene-D12	600	19.00	110.8		50-150
Benzo(k)Fluoranthene-D12	600	19.09	82.7		50-150
Benzo(a)Pyrene D12	600	19.88	66.4		50-150
Perylene D12	600	20.11	52.3		50-150
Indeno(1,2,3,cd)Pyrene-D12	600	23.32	88.1		50-150
Dibenz(a,h)Anthracene-D14	600	23.48	70.0		50-150
Benzo(g,h,i)Perylene D12	600	24.19	87.7		50-150

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**		Sampling Date	n/a
ALS Sample ID	WG3165005-2		Extraction Date	25-Sep-19
Analysis Method	PAH by CARB 429			
Analysis Type	LCS			
Sample Matrix	QC			
Sample Size	1	Sample		
Percent Moisture	n/a			
Split Ratio	6		Workgroup	WG3165005

Approved:
Nishit Shah
--e-signature--
15-Oct-2019

Run Information	**Run 1**	**Run 2**
Filename	19101105.D	19100310.D
Run Date	10/11/2019 14:09	10/3/2019 15:43
Final Volume	1 mL	1 mL
Dilution Factor	1	10
Analysis Units	ng/sample	ng/sample
Instrument	MSD-1	MSD-1
Column	HP5-MS UST279461H	HP5-MS UST279461H

Target Analytes	**ug spiked**	**Ret. Time**	**% Rec**	**Flags**	**Limits**	**Ret. Time.**	**% Recovery**	**Flags**
Naphthalene	600	2.79	98.3	M	50-150			
2-Methylnaphthalene	600	3.38	93.2		50-150			
1-Methylnaphthalene	600	3.49	101		50-150			
Acenaphthylene	600	4.50	91		50-150			
Acenaphthene	600	4.79	92		50-150			
Fluorene	600	5.69	85.9		50-150			
Phenanthrene	600	7.85	93.6		50-150			
Anthracene	600	7.97	92.7		50-150			
Fluoranthene	600	11.22	90		50-150			
Pyrene	600	11.85	91.4		50-150			
Benzo(a)Anthracene	600	15.74	92.7		50-150			
Chrysene/Triphenylene	600	15.87	106.1		50-150			
Benzo(b)Fluoranthene	600	19.07	79.5		50-150			
Benzo(k)Fluoranthene	600	19.14	91.8		50-150			
Benzo(e)Pyrene	600	19.80	98.8		50-150			
Benzo(a)Pyrene	600	19.95	84.6		50-150			
Perylene	600	20.18	97.3		50-150			
Indeno(1,2,3-cd)Pyrene	600	23.39	89.6		50-150			
Dibenzo(a,h/a,c)Anthracene	600	23.58	96.8		50-150			
Benzo(g,h,i)Perylene	600	24.29	93.1	M	50-150			

Extraction Standards			**% Rec**		**Limits**	**% Rec**
Naphthalene D8	600	2.78	86.0	M	30-150	
2-Methylnaphthalene-D10	600	3.35	97.8		30-150	
Acenaphthylene D8	600	4.48	91.5		30-150	
Phenanthrene D10	600	7.80	88.1		50-150	
Anthracene-D10	600	7.93	81.0		50-150	
Fluoranthene D10	600	11.17	99.3		50-150	
Benz(a)Anthracene-D12	600	15.68	88.4		50-150	
Chrysene D12	600	15.79	89.9		50-150	
Benzo(b)Fluoranthene-D12	600	19.01	106.9		50-150	
Benzo(k)Fluoranthene-D12	600	19.08	89.5		50-150	
Benzo(a)Pyrene D12	600	19.88	77.1	M	30-150	
Perylene D12	600	20.11	78.3		50-150	
Indeno(1,2,3,cd)Pyrene-D12	600	23.31	90.0		50-150	
Dibenz(a,h)Anthracene-D14	600	23.47	80.3		50-150	
Benzo(g,h,i)Perylene D12	600	24.19	87.1		50-150	

M Indicates that a peak has been manually integrated.

APPENDIX 16

Acid Gas Recovery Data Sheets
(8 pages)

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 9, 19
Test No.:	1 M26A
Test Location:	UNIT 1

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	541.8
Initial Wt:	641.8
Final Wt:	826.2
1 Gain:	184.4
Colour:	clear

Impinger #2 0.1 N H_2SO4	
Empty Wt:	535.7
Initial Wt:	634.6
Final Wt:	746.1
2 Gain:	111.5
Colour:	clear

Impinger #3 EMPTY	
Empty Wt:	506.7
Final Wt:	513.0
3 Gain:	6.3
Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	423.3
With Imp. 1,2,3 Soln:	924.4
Imp. 1,2,3 Volume:	492.1
After Rinse:	1034.3
Total TS3:	611.0

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	940.5
Final Wt:	961.5
4 Gain:	21.0

Box ID: 14

CWTR = 1+2+3: 302.2 ✓

WCBDA= 4: 21.0

SAMPLE ID: 19-21960-M26A- 1

Train Loaded By: JH

Train Recovered By: DT

Revision: Jan 16, 2006

ORTECH Environmental

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 9, 19
Test No.:	2
Test Location:	UNIT 1

18-GFF-17

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	569.9
Initial Wt:	670.0
Final Wt:	825.8
Gain:	155.8
Colour:	clear

1

Impinger #2 0.1 N H_2SO4	
Empty Wt:	539.7
Initial Wt:	641.7
Final Wt:	666.6
Gain:	24.9
Colour:	clear

2

Impinger #3 EMPTY	
Empty Wt:	632.0
Final Wt:	634.8
Gain:	2.8
Colour:	clear

3

CONTAINER TS3 WEIGHTS	
Empty Wt:	423.9
With Imp. 1,2,3 Soln:	799.6
Imp. 1,2,3 Volume:	375.7
After Rinse:	907.0
Total TS3:	483.1

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	914.2
Final Wt:	926.9
Gain:	12.7

4

Box ID:

CWTR = 1+2+3:	183.5 ✓
WCBDA= 4:	12.7

SAMPLE ID: 19-21960-M26A- 2

Train Loaded By: DT

Train Recovered By: DT

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 9, 19
Test No.:	3
Test Location:	UNIT 1

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	586.0
	Initial Wt:	637.3
	Final Wt:	773.8
1	Gain:	~~135.6~~ 136.5
	Colour:	clear

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	540.7
	Initial Wt:	641.4
	Final Wt:	662.1
2	Gain:	20.7
	Colour:	clear

	Impinger #3 EMPTY	
	Empty Wt:	509.1
	Final Wt:	511.6
3	Gain:	2.5
	Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	284.9
With Imp. 1,2,3 Soln:	647.6
Imp. 1,2,3 Volume:	103.7
After Rinse:	751.3
Total TS3:	466.4

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	961.3
	Final Wt:	974.0
4	Gain:	12.7

Box ID: 14

CWTR = 1+2+3: ~~158.8~~ 159.7 ✓

WCBDA= 4: 12.7

SAMPLE ID: 19-21960-M26A- 3

Train Loaded By: DT

Train Recovered By: AS

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	Sept 10, 19
Test No.:	BLANK 1
Test Location:	

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	
	Initial Wt:	
	Final Wt:	
1	Gain:	
	Colour:	

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	
	Initial Wt:	
	Final Wt:	
2	Gain:	
	Colour:	

	Impinger #3 EMPTY	
	Empty Wt:	
	Final Wt:	
3	Gain:	
	Colour:	

CONTAINER TS3 WEIGHTS	
Empty Wt:	285.1
With Imp. 1,2,3 Soln:	488.7
Imp. 1,2,3 Volume:	203.6
After Rinse:	769.1
Total TS3:	484.0

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	
	Final Wt:	
4	Gain:	

Box ID:

CWTR = 1+2+3:

WCBDA= 4:

SAMPLE ID: 19-21960-M26A- BLANK 1

Train Loaded By: DT

Train Recovered By: DT

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 9, 19
Test No.:	1
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	664.4
	Initial Wt:	~~763~~ 764.0
	Final Wt:	982.1
1	Gain:	218.1
	Colour:	clear

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	572.9
	Initial Wt:	672.8
	Final Wt:	769.9
2	Gain:	97.1
	Colour:	clear

	Impinger #3 EMPTY	
	Empty Wt:	603.2
	Final Wt:	608.0
3	Gain:	4.8
	Colour:	clear

CONTAINER TS3 WEIGHTS	
Empty Wt:	428.6
With Imp. 1,2,3 Soln:	937.7
Imp. 1,2,3 Volume:	509.1
After Rinse:	1039.5
Total TS3:	610.9

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	956.5
	Final Wt:	977.5
4	Gain:	21.0

Box ID: 3

CWTR = 1+2+3:	320.0 ✓
WCBDA= 4:	21.0

SAMPLE ID: 19-21960-M26A- 4

Train Loaded By: K.C.

Train Recovered By: BT

#3

Revision: Jan 16, 2006

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Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 10, 19
Test No.:	2
Test Location:	UNIT 2

Filter is used but not recovered as sample

Impingers 1, 2, 3 | **Impinger 4**

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	667.5
	Initial Wt:	767.6
	Final Wt:	893.9
1	Gain:	126.3
	Colour:	Clear

	Impinger #4 Silica Gel	
	Initial Wt:	977.3
	Final Wt:	987.5
4	Gain:	10.2

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	575.3
	Initial Wt:	676.4
	Final Wt:	695.8
2	Gain:	19.4
	Colour:	clear

Box ID: 3

	Impinger #3 EMPTY	
	Empty Wt:	604.0
	Final Wt:	606.4
3	Gain:	2.4
	Colour:	clear

CWTR = 1+2+3:	148.1 ✓
WCBDA= 4:	10.2

SAMPLE ID: 19-21960-M26A- 5

CONTAINER TS3 WEIGHTS	
Empty Wt:	282.0
With Imp. 1,2,3 Soln:	629.2
Imp. 1,2,3 Volume:	~~727.2~~ 347.2
After Rinse:	727.2
Total TS3:	445.2

Train Loaded By:	DT
Train Recovered By:	DT

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 10, 19
Test No.:	3
Test Location:	Unit 2

Filter is used but not recovered as sample

Impingers 1, 2, 3

	Impinger #1 0.1 N H_2SO4	
	Empty Wt:	536.2
	Initial Wt:	641.3
	Final Wt:	760.0
1	Gain:	118.7
	Colour:	clear

	Impinger #2 0.1 N H_2SO4	
	Empty Wt:	541.6
	Initial Wt:	625.9
	Final Wt:	642.9
2	Gain:	17.0
	Colour:	clear

	Impinger #3 EMPTY	
	Empty Wt:	~~536.2~~ 513.0
	Final Wt:	513.0
3	Gain:	0
	Colour:	~~clear~~

CONTAINER TS3 WEIGHTS	
Empty Wt:	287.2
With Imp. 1,2,3 Soln:	617.0
Imp. 1,2,3 Volume:	329.8
After Rinse:	738.4
Total TS3:	451.2

Impinger 4

	Impinger #4 Silica Gel	
	Initial Wt:	974.0
	Final Wt:	984.6
4	Gain:	10.6

Box ID: 14

CWTR = 1+2+3:	135.7 ✓

WCBDA= 4:	10.6

SAMPLE ID: 19-21960-M26A-	6

Train Loaded By: AS

Train Recovered By: DT

Revision: Jan 16, 2006

ORTECH Environmental

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21960
Date:	SEPT 10, 19
Test No.:	BLANK 2
Test Location:	

Filter is used but not recovered as sample

Impingers 1, 2, 3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
1 Gain:	
Colour:	

Impinger #2 0.1 N H_2SO4	
Empty Wt:	
Initial Wt:	
Final Wt:	
2 Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	
Final Wt:	
3 Gain:	
Colour:	

CONTAINER TS3 WEIGHTS	
Empty Wt:	287.0
With Imp. 1,2,3 Soln:	493.7
Imp. 1,2,3 Volume:	206.7
After Rinse:	750.6
Total TS3:	463.6

Impinger 4

Impinger #4 Silica Gel	
Initial Wt:	
Final Wt:	
4 Gain:	

Box ID:

CWTR = 1+2+3:	
WCBDA= 4:	

SAMPLE ID: 19-21960-M26A- BLANK 2

Train Loaded By: DT

Train Recovered By: DT

Revision: Jan 16, 2006

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APPENDIX 17

VOST Analytical Report
(6 pages)

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	ORT100	**Client Name:**	ORTECH Environmental
ALS Project ID:	Lynne Wrona	**Client Address:**	804 Southdown Road
ALS WO#:	L2347690		MIssissauga, ON L5J 2Y4
Date of Report	27-Sep-19		(905)822-4120
Date of Sample Receipt	13-Sep-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only.
The values for Isopropylbenzene and 1,3,5-Trimethylbenzene are semi-quantitative and/or estimated due to being outside the normal volatility range for method 0030/0031.

The sampled traps each contained up to 5mL of water. For some samples there is some suppression of the Bromochloromethane internal standard. All recoveries are within the method control limit and native target data are not expected to be biased.

There is also evidence of hydrocarbons and siloxanes, which may be causing interference. Most notably affected is styrene where an interference is leading to peak that does not meet the ion abundance ratio criterion. These values should be considered estimated maximum possible concentrations.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-VOST-14A&B TEST#1 PAIR#1 (#1 APC OUTLET)		19-21960-VOST-15A&B TEST#1 PAIR#2 (#1 APC OUTLET)		19-21960-VOST-17A&B TEST#1 PAIR#4 (#1 APC OUTLET)		19-21960-VOST-18A&B TEST#2 PAIR#1 (#1 APC OUTLET)		19-21960-VOST-19A&B TEST#2 PAIR#2 (#1 APC OUTLET)		19-21960-VOST-20A&B TEST#2 PAIR#3 (#1 APC OUTLET)	
ALS Sample ID	L2347690-1		L2347690-2		L2347690-4		L2347690-5		L2347690-6		L2347690-7	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	12-Sep-19		12-Sep-19		12-Sep-19		12-Sep-19		12-Sep-19		12-Sep-19	
Extraction Date	24-Sep-19		24-Sep-19		24-Sep-19		24-Sep-19		24-Sep-19		24-Sep-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	0.03		<0.02	U	<0.02	U	<0.02	U	0.04		<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	0.08		0.03		0.06		0.02		0.06		0.03	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	1.46		0.80		2.01		0.79		1.89		1.84	
Methylene Chloride	1.31		1.48		1.24		1.27	M	1.86		1.76	
trans,1,2-Dichloroethene	0.03		<0.01	U	0.02		<0.01	U	0.02		<0.01	U
2-Butanone	1.36		0.07		0.59		0.42		0.80		0.33	
Chloroform	0.08	R	0.05		0.11		0.05		0.13		0.05	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	0.19		<0.01	U	0.07		0.19		0.07		0.11	
Benzene	0.35		0.14		0.23		0.24		0.27		0.16	
1,2-Dichloroethane	0.06		0.04		0.08		0.10		0.06		0.04	
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	0.06		<0.01	U	0.04	R	0.08		0.04		0.05	
Toluene	1.90		0.71		0.86		0.76		1.19		0.79	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	0.02	R	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	<0.01	U	<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	<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	0.49		0.22		0.48		0.33		0.61		0.15	
M&P-Xylene	1.63		1.65		1.52		1.52		1.15		0.63	
O-Xylene	0.73		0.78		0.64		0.63		0.42		0.25	
Styrene	0.27	R	0.20	R	0.31	R	0.31	R	0.35	R	0.23	R
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	0.07		0.03		0.06		0.07		0.09		0.04	
1,3,5-Trimethylbenzene	0.51		0.49		0.60		0.68		0.64		0.63	
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)	64.1		54.6		73.1		57.9		77.4		68.9	R
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	110.3		101		127.6		102.3	M	98.4		94.1	
d8-Toluene(SURR)	73.9		58.9		74.9		82.7		78.2		81.7	
4-Bromofluorobenzene(SURR)	106.7		100.9		122.3		119.1		89.4		133.9	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	65.8		113.8		62.7		116.2		55.1		142.2	
1,4-Difluorobenzene	80.5		94.1		62.0		59.2		80.0		107.9	
d5-Chlorobenzene	86.0		62.0		67.7		59.8		73.7		64.1	

U Indicates that this compound was not detected above the RL.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-VOST-26A&B FIELD BLANK (#1 APC OUTLET)		19-21960-VOST-22A&B TEST#3 PAIR#1 (#1 APC OUTLET)		19-21960-VOST-23A&B TEST#3 PAIR#2 (#1 APC OUTLET)		19-21960-VOST-24A&B TEST#3 PAIR#3 (#1 APC OUTLET)		19-21960-VOST-28A&B TEST#3 TRIP BLANK (#1 APC OUTLET)		19-21960-VOST-4A&B TEST#1 PAIR#1 (#2 APC OUTLET)	
ALS Sample ID	L2347690-9		L2347690-10		L2347690-11		L2347690-12		L2347690-14		L2347690-15	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	12-Sep-19		12-Sep-19		12-Sep-19		12-Sep-19		12-Sep-19		11-Sep-19	
Extraction Date	24-Sep-19		26-Sep-19		26-Sep-19		26-Sep-19		24-Sep-19		26-Sep-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	0.04		0.02		<0.02	U	0.07	
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	0.06		0.06		0.06		<0.02	U	0.09	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.01	
Acetone	<0.1	U	1.44		1.51	M	2.23	M	<0.1	U	0.92	
Methylene Chloride	<0.1	U	1.34		0.79		1.75		<0.1	U	1.74	
trans,1,2-Dichloroethene	<0.01	U	0.02		0.02		0.02		<0.01	U	0.05	
2-Butanone	<0.01	U	0.44		1.28		0.79		<0.01	U	0.66	
Chloroform	<0.01	U	0.07		0.11	R	0.08		<0.01	U	0.09	R
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.02	
Carbon Tetrachloride	<0.01	U	0.17		0.04		0.17		<0.01	U	0.15	
Benzene	<0.05	U	0.21		0.13		0.29		<0.05	U	0.22	
1,2-Dichloroethane	<0.01	U	0.07		0.02		0.05		<0.01	U	0.05	
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	0.07		0.02		0.08		<0.01	U	0.05	
Toluene	<0.05	U	1.43		0.90		1.58		<0.05	U	2.07	
1,1,2-Trichloroethane	<0.02	U	0.02	R	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	0.01		0.01		0.01		<0.01	U	<0.01	U
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	0.59		0.22		0.28		<0.01	U	0.34	
M&P-Xylene	<0.03	U	1.12		2.78		1.07		<0.03	U	1.23	
O-Xylene	<0.01	U	0.40		0.91		0.46		<0.01	U	0.51	
Styrene	<0.02	U	0.36	R	0.13	R	0.21	R	<0.02	U	0.22	R
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	0.09		0.04	R	0.06	R	<0.02	U	0.05	
1,3,5-Trimethylbenzene	<0.02	U	0.75		0.27		0.50		<0.02	U	0.41	
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)	72.1		68.2		91.3		67.5	R	73.4		77.0	R
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	88.4		104.0		72.0		109.3	R	94.7		132.0	
d8-Toluene(SURR)	89.1		71.1		90.8		73.7		94.9		82.3	
4-Bromofluorobenzene(SURR)	101.0		100.0		98.8		80.6		92.9		109.9	R
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	73.3		85.9		54.2		94.7		100.3		63.6	
1,4-Difluorobenzene	108.9		50.6		189.8		78.7		142.1		84.0	R
d5-Chlorobenzene	95.3		56.2		116.8		86.3		115.6		101.0	

U Indicates that this compound was not detected above the RL.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-VOST-2A&B TEST#1 PAIR#3 (#2 APC OUTLET)		19-21960-VOST-3A&B TEST#1 PAIR#4 (#2 APC OUTLET)		19-21960-VOST-13A&B FIELD BLANK (#2 APC OUTLET)		19-21960-VOST-5A&B TEST#2 PAIR#1 (#2 APC OUTLET)		19-21960-VOST-7A&B TEST#2 PAIR#3 (#2 APC OUTLET)		19-21960-VOST-8A&B TEST#2 PAIR#4 (#2 APC OUTLET)	
ALS Sample ID	L2347690-17		L2347690-18		L2347690-19		L2347690-20		L2347690-22		L2347690-23	
Sample units	sample		sample		sample		sample		sample		sample	
Matrix	VOST		VOST		VOST		VOST		VOST		VOST	
Sampling Date	11-Sep-19		11-Sep-19		11-Sep-19		11-Sep-19		11-Sep-19		11-Sep-19	
Extraction Date	26-Sep-19		26-Sep-19		24-Sep-19		26-Sep-19		26-Sep-19		26-Sep-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	0.04		0.02		<0.02	U	<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	0.07		0.09		<0.02	U	0.05		0.04		0.04	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	0.51		1.74		<0.1	U	0.57		0.53		1.28	
Methylene Chloride	2.23		2.09		0.11		1.17		1.06		0.66	
trans,1,2-Dichloroethene	0.03		0.04		<0.01	U	0.03		0.02		0.02	
2-Butanone	0.27		0.78		<0.01	U	0.27		0.31		0.19	
Chloroform	0.07		0.09		<0.01	U	0.07		0.04		0.04	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	0.04		0.05		<0.01	U	0.05		0.05		<0.01	U
Benzene	0.12		0.14		<0.05	U	0.07		0.13		0.16	
1,2-Dichloroethane	0.04		0.05		<0.01	U	0.04		0.04		0.04	
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	0.02		0.03		<0.01	U	0.02		0.03		<0.01	U
Toluene	0.43		0.84		<0.05	U	0.47		0.88		1.06	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U	0.02	R	<0.02	U
Tetrachloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.01	
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	0.23		0.37		<0.01	U	0.34		0.46		0.27	
M&P-Xylene	1.65		1.64		<0.03	U	0.70		1.69		1.30	
O-Xylene	0.26		0.69		<0.01	U	0.25		0.70		0.55	
Styrene	0.25	R	0.29	R	<0.02	U	0.26	R	0.29	R	0.21	R
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	0.05		0.06		<0.02	U	0.05		0.07		0.04	
1,3,5-Trimethylbenzene	0.56		0.56		<0.02	U	0.52		0.59		0.49	
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)	78.7	R	58.6		72.1		71.8		94.7		77.4	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	96.6	R	122.7		91.3		124.1		100.1		110.6	
d8-Toluene(SURR)	99.6		78.8		88.7		59.8		92.3		70.8	
4-Bromofluorobenzene(SURR)	70.7		93.1		100.4		83.1		124.8		123.6	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	84.9		59.8		65.7		71.1		122.5		128.6	
1,4-Difluorobenzene	94.4	R	75.7		105.6		96.1		95.3		98.5	
d5-Chlorobenzene	72.6		69.3		95.6		74.9		75.9		59.4	

U Indicates that this compound was not detected above the RL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	19-21960-VOST-9A&B TEST#3 PAIR#1 (#2 APC OUTLET)		19-21960-VOST-11A&B TEST#3 PAIR#3 (#2 APC OUTLET)		19-21960-VOST-12A&B TEST#3 PAIR#4 (#2 APC OUTLET)	
ALS Sample ID	L2347690-24		L2347690-26		L2347690-27	
Sample units	sample		sample		sample	
Matrix	VOST		VOST		VOST	
Sampling Date	11-Sep-19		11-Sep-19		11-Sep-19	
Extraction Date	26-Sep-19		26-Sep-19		26-Sep-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	0.03		0.08		0.08	
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	0.05		0.11		0.06	
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U
Acetone	1.01		1.82		1.09	
Methylene Chloride	1.19		1.72		1.52	
trans,1,2-Dichloroethene	0.02		1.00		0.02	
2-Butanone	0.50		1.32		0.23	
Chloroform	0.05	R	0.04	R	0.04	
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	0.10		0.21		0.04	
Benzene	0.21		0.19		0.17	
1,2-Dichloroethane	0.04		0.05		0.04	
Trichloroethene	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	0.04		<0.01	U	0.02	
Toluene	1.76		1.52		1.23	
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	0.02		<0.01	U	0.02	
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	0.54		0.65		0.32	
M&P-Xylene	2.55		2.42		2.46	
O-Xylene	0.61		1.01		1.08	
Styrene	0.25	R	0.40	R	0.24	R
Bromoform	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	0.05		0.11		0.06	
1,3,5-Trimethylbenzene	0.45		0.75		0.50	
1,3-Butadiene	<0.02	U	<0.02	U	<0.02	U
Trichlorotrifluoroethane	<0.02	U	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	91.6		60.2		75.1	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	80.7		95.6		85.8	
d8-Toluene(SURR)	83.1		65.8		75.3	
4-Bromofluorobenzene(SURR)	113.6		140		92.1	
Internal Standards	**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	126.9		83.7		138.2	
1,4-Difluorobenzene	114.8		74.5		108.7	
d5-Chlorobenzene	93.9		62.5		77.4	

U Indicates that this compound was not detected above the RL.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank		Laboratory Control Sample	Laboratory Control Sample
ALS Sample ID	WG3169507-1		WG3169507-1		WG3169507-2	WG3169507-2
Sample units	sample		sample		n/a	n/a
Matrix	QC		QC		QC	QC
Sampling Date	n/a		n/a		n/a	n/a
Extraction Date	24-Sep-19		26-Sep-19		24-Sep-19	26-Sep-19
Target Analytes	**ug/sample**		**ug/sample**		**% Rec**	**% Rec**
Dichlorodifluoromethane	<0.02	U	<0.02	U	92.7	86.0
Vinyl Chloride	<0.02	U	<0.02	U	100.5	113.0
Bromomethane	<0.09	U	<0.09	U	96.8	83.2
Trichlorofluoromethane	<0.02	U	<0.02	U	107.2	116.8
1,1-Dichloroethene	<0.01	U	<0.01	U	91.4	87.2
Acetone	<0.1	U	<0.1	U	120.0	118.9
Methylene Chloride	<0.1	U	<0.1	U	110.1	102.2
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	106.4	85.2
2-Butanone	<0.01	U	<0.01	U	100.9	86.1
Chloroform	<0.01	U	<0.01	U	101.3	93.4
1,1,1-Trichloroethane	<0.01	U	<0.01	U	100.5	102.1
Carbon Tetrachloride	<0.01	U	<0.01	U	111.5	79.7
Benzene	<0.05	U	<0.05	U	102.0	108.2
1,2-Dichloroethane	<0.01	U	<0.01	U	81.9	80.2
Trichloroethene	<0.01	U	<0.01	U	112.7	116.3
1,2-Dichloropropane	<0.01	U	<0.01	U	116.2	120.0
Bromodichloromethane	<0.01	U	<0.01	U	106.9	80.2
Toluene	<0.05	U	<0.05	U	105.0	104.6
1,1,2-Trichloroethane	<0.02	U	<0.02	U	110.2	96.3
Tetrachloroethene	<0.01	U	<0.01	U	112.8	89.0
Chlorodibromomethane	<0.01	U	<0.01	U	113.3	91.4
Ethylene Dibromide	<0.02	U	<0.02	U	115.0	104.4
Ethylbenzene	<0.01	U	<0.01	U	97.2	90.2
M&P-Xylene	<0.03	U	<0.03	U	91.5	99.3
O-Xylene	<0.01	U	<0.01	U	90.2	98.2
Styrene	<0.02	U	<0.02	U	93.9	98.9
Bromoform	<0.01	U	<0.01	U	107.1	111.6
Isopropylbenzene	<0.02	U	<0.02	U	87.6	91.5
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	98.3	113.3
1,3-Butadiene	<0.02	U	<0.02	U		
Trichlorotrifluoroethane	<0.02	U	<0.02	U		
Field Standard	**% Rec**		**% Rec**		**% Rec**	**% Rec**
d10-Ethylbenzene(SPK)	72.4		69.4		79.5	116.8
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**	**% Rec**
d4-1,2-Dichloroethane(SURR)	86.7		80.2		88.6	101.8
d8-Toluene(SURR)	83.9		96		96	86.2
4-Bromofluorobenzene(SURR)	103.8		89.6		87.6	111.9
Internal Standards	**% Rec**		**% Rec**		**% Rec**	**% Rec**
Bromochloromethane	96.5		94.2		127.6	93.4
1,4-Difluorobenzene	143.3		138.3		181.2	105.7
d5-Chlorobenzene	137		105.8		168.2	131.5

U Indicates that this compound was not detected above the RL.

APPENDIX 18

Aldehydes Recovery Data Sheets
(8 pages)

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	1
Test Location:	UNIT 1
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4	

Sample ID: 19-21960-M430-	1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.8
Initial Mass:	107.1
Final Mass:	109.9
Gain:	2.8

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.7
Mass with impingers:	177.3
With Toluene rinse:	186.8
Total sample:	70.1

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.9
Initial Mass:	107.3
Final Mass:	107.3
Gain:	0.0

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.6
Initial Mass:	107.1
Final Mass:	107.0
Gain:	-0.1

Impinger 4 (Silica Gel)	
Initial Mass:	124.1
Final Mass:	125.7
Gain:	1.6

Total Moisture Gain:	4.3

✓

Note: Load and recover train away from acetone

Train Loaded By: JG

Train Recovered By: DT

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	2
Test Location:	UNIT 1
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4

Sample ID: 19-21960-M430- 2

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	105.0
Initial Mass:	121.7
Final Mass:	124.7
Gain:	3.0

Imp. 1, 2 and 3 plus rinsings	
Colour:	Yellow
Bottle empty:	116.7
Mass with impingers:	173.1
With Toluene rinse:	180.7
Total sample:	64.0

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	97.3
Initial Mass:	116.1
Final Mass:	116.1
Gain:	0

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	99.0
Initial Mass:	117.8
Final Mass:	117.8
Gain:	0

3

Impinger 4 (Silica Gel)	
Initial Mass:	122.7
Final Mass:	124.2
Gain:	1.5

Total Moisture Gain:	4.5

✓

Note: Load and recover train away from acetone

Train Loaded By: ~~DT~~ JG

Train Recovered By: DT

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	3
Test Location:	UNIT 1
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4

Sample ID: 19-21960-M430- 3

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	82.8
Initial Mass:	103.2
Final Mass:	105.3
Gain:	2.1

Imp. 1, 2 and 3 plus rinsings	
Colour:	~~117.3~~ Yellow
Bottle empty:	~~178.8~~ 117.3
Mass with impingers:	178.8
With Toluene rinse:	188.5
Total sample:	71.2

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.9
Initial Mass:	109.5
Final Mass:	110.6
Gain:	1.1

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	104.8
Initial Mass:	125.1
Final Mass:	125.8
Gain:	0.7

2

Impinger 4 (Silica Gel)	
Initial Mass:	126.3
Final Mass:	126.5
Gain:	0.2

Total Moisture Gain: 4.1 ✓

Note: Load and recover train away from acetone

Train Loaded By: BT

Train Recovered By: BT

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	BLANK 1
Test Location:	
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4

Sample ID: 19-21960-M430- BLANK 1

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	117.4
Mass with impingers:	175.2
With Toluene rinse:	184.9
Total sample:	67.5

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:	

Total Moisture Gain:

Note: Load and recover train away from acetone

Train Loaded By: DT

Train Recovered By: DT

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	1
Test Location:	UNIT #2 APC OUTLET
Test Date:	SEPTEMBER 11, 2019.

Impingers 1, 2, 3 & 4	

Sample ID: 19-21960-M430-	4

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	82.0
Initial Mass:	101.7
Final Mass:	103.2
Gain:	1.50

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.6.
Mass with impingers:	176.0
With Toluene rinse:	183.4
Total sample:	66.80

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.3
Initial Mass:	108.1
Final Mass:	109.9
Gain:	1.80

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	104.2
Initial Mass:	124.0
Final Mass:	124.3
Gain:	0.3

2

Impinger 4 (Silica Gel)	
Initial Mass:	121.8
Final Mass:	125.7
Gain:	1.90

Total Moisture Gain:	5.50 ✓

Note: Load and recover train away from acetone

Train Loaded By: JG

Train Recovered By: JG.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	2
Test Location:	UNIT #2 APC OUTLET
Test Date:	SEPTEMBER 11, 2019

Impingers 1, 2, 3 & 4

Sample ID: 19-21960-M430- 5

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	88.0
Initial Mass:	106.2
Final Mass:	109.4
Gain:	3.20

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	115.9
Mass with impingers:	173.4
With Toluene rinse:	181.1
Total sample:	65.20

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.6
Initial Mass:	106.1
Final Mass:	106.3
Gain:	0.2

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.3
Initial Mass:	106.6
Final Mass:	106.1
Gain:	-0.5

Impinger 4 (Silica Gel)	
Initial Mass:	121.3
Final Mass:	124.3
Gain:	3.0

Total Moisture Gain:	5.9

Note: Load and recover train away from acetone

Train Loaded By: JG

Train Recovered By: JG.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	3
Test Location:	UNIT 2
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4

Sample ID: 19-21960-M430- 6

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.8
Initial Mass:	108.7
Final Mass:	103.1
Gain:	1.4

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.8
Mass with impingers:	178.7
With Toluene rinse:	185.8
Total sample:	

Impinger 2 (15 ml DNPH/4ml Toluene)	
Empty Mass:	87.9
Initial Mass:	109.1
Final Mass:	110.1
Gain:	1.6

Impinger 3 (15 ml DNPH/4ml Toluene)	
Empty Mass:	~~87.8~~ 104.8
Initial Mass:	125.4
Final Mass:	125.7
Gain:	0.3

Impinger 4 (Silica Gel)	
Initial Mass:	125.7
Final Mass:	128.3
Gain:	2.6

Total Moisture Gain:	5.3

Note: Load and recover train away from acetone

Train Loaded By: DT

Train Recovered By: DT

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21960
Test No.:	BLANK 2
Test Location:	
Test Date:	SEPT 12, 19

Impingers 1, 2, 3 & 4

Impinger 1 (15 ml DNPH/4ml Toluene)	
Empty Mass:	
Initial Mass:	
Final Mass:	
Gain:	

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:	

Sample ID: 19-21960-M430- BLANK 2

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	117.1
Mass with impingers:	174.9
With Toluene rinse:	184.5
Total sample:	67.4

Total Moisture Gain:

Note: Load and recover train away from acetone

Train Loaded By: DT

Train Recovered By: DT

ORTECH
a Kontrol Energy Company

APPENDIX 19

Aldehydes Analytical Report
(16 pages)

ALS Environmental

02-Oct-2019

Lynne Wrona
ALS
1435 Norjohn Court
Unit 1
Burlington, Ontario L7L0E6

Tel: (905) 331-3111
Fax:

Re: L2346706 Work Order: **1909761**

Dear Lynne,

ALS Environmental received 10 samples on 18-Sep-2019 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 16.

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: 02-Oct-19

Client: ALS
Project: L2346706
Work Order: 1909761

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1909761-01	19-21960-M430-1 #1 APC OUTLET TEST#1	Liquid		9/12/2019	9/18/2019	☐
1909761-02	19-21960-M430-2 #1 APC OUTLET TEST#2	Liquid		9/12/2019	9/18/2019	☐
1909761-03	19-21960-M430-3 #1 APC OUTLET TEST#3	Liquid		9/12/2019	9/18/2019	☐
1909761-04	19-21960-M430-BLANK1	Liquid		9/12/2019	9/18/2019	☐
1909761-05	19-21960-M430-4 #2 APC OUTLET TEST#1	Liquid		9/11/2019	9/18/2019	☐
1909761-06	19-21960-M430-5 #2 APC OUTLET TEST#2	Liquid		9/11/2019	9/18/2019	☐
1909761-07	19-21960-M430-6 #2 APC OUTLET TEST#3	Liquid		9/11/2019	9/18/2019	☐
1909761-08	19-21960-M430-BLANK2	Liquid		9/12/2019	9/18/2019	☐
1909761-09	Trip Spike Sample	Liquid			9/18/2019	☐
1909761-10	Trip Spike Reference	Liquid			9/18/2019	☐

ALS Environmental

Date: 02-Oct-19

Client: ALS
Project: L2346706
Work Order: 1909761

Case Narrative

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

ALS is an EPA recognized NLLAP laboratory for lead paint, soil, and dust wipe analyses under its AIHA-LAP accreditation.

Sample volumes (mL):
19-21960-M430-1 #1 APC OUTLET TEST#1: 24
19-21960-M430-2 #1 APC OUTLET TEST#2: 20
19-21960-M430-3 #1 APC OUTLET TEST#3: 24
19-21960-M430-BLANK1: 26
19-21960-M430-4 #2 APC OUTLET TEST#1: 20
19-21960-M430-5 #2 APC OUTLET TEST#2: 18
19-21960-M430-6 #2 APC OUTLET TEST#3: 20
19-21960-M430-BLANK2: 26
Trip Spike Sample: 2
Trip Spike Reference: 2

ALS Environmental

Date: *02-Oct-19*

Client:	ALS		
Project:	L2346706	**Work Order:**	1909761
Sample ID:	19-21960-M430-1 #1 APC OUTLET TEST#1	**Lab ID:**	1909761-01
Collection Date:	9/12/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**5.1**		**2.4**	**µg/sample**	1	9/23/2019 07:03 PM
Acrolein	ND		24	µg/sample	1	9/23/2019 07:03 PM
formaldehyde	ND		2.4	µg/sample	1	9/23/2019 07:03 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS

Project: L2346706 **Work Order:** 1909761

Sample ID: 19-21960-M430-2 #1 APC OUTLET TEST#2 **Lab ID:** 1909761-02

Collection Date: 9/12/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**4.9**		**2.0**	**µg/sample**	1	9/23/2019 07:15 PM
Acrolein	ND		20	µg/sample	1	9/23/2019 07:15 PM
formaldehyde	ND		2.0	µg/sample	1	9/23/2019 07:15 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS
Project: L2346706 **Work Order:** 1909761
Sample ID: 19-21960-M430-3 #1 APC OUTLET TEST#3 **Lab ID:** 1909761-03
Collection Date: 9/12/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**6.0**		**2.4**	µg/sample	1	9/23/2019 07:28 PM
Acrolein	ND		24	µg/sample	1	9/23/2019 07:28 PM
formaldehyde	ND		2.4	µg/sample	1	9/23/2019 07:28 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client:	ALS		
Project:	L2346706	**Work Order:**	1909761
Sample ID:	19-21960-M430-BLANK1	**Lab ID:**	1909761-04
Collection Date:	9/12/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**8.7**		**2.6**	**µg/sample**	1	9/23/2019 07:40 PM
Acrolein	ND		26	µg/sample	1	9/23/2019 07:40 PM
formaldehyde	ND		2.6	µg/sample	1	9/23/2019 07:40 PM

Note:

ALS Environmental Date: *02-Oct-19*

Client:	ALS		
Project:	L2346706	**Work Order:**	1909761
Sample ID:	19-21960-M430-4 #2 APC OUTLET TEST#1	**Lab ID:**	1909761-05
Collection Date:	9/11/2019	**Matrix:**	LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**3.8**		**2.0**	**µg/sample**	1	9/23/2019 07:52 PM
Acrolein	ND		20	µg/sample	1	9/23/2019 07:52 PM
formaldehyde	ND		2.0	µg/sample	1	9/23/2019 07:52 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS
Project: L2346706 **Work Order:** 1909761
Sample ID: 19-21960-M430-5 #2 APC OUTLET TEST#2 **Lab ID:** 1909761-06
Collection Date: 9/11/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**3.6**		**1.8**	µg/sample	1	9/23/2019 08:05 PM
Acrolein	ND		18	µg/sample	1	9/23/2019 08:05 PM
formaldehyde	ND		1.8	µg/sample	1	9/23/2019 08:05 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS
Project: L2346706
Sample ID: 19-21960-M430-6 #2 APC OUTLET TEST#3
Collection Date: 9/11/2019

Work Order: 1909761
Lab ID: 1909761-07
Matrix: LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**4.1**		**2.0**	**µg/sample**	1	9/23/2019 08:29 PM
Acrolein	ND		20	µg/sample	1	9/23/2019 08:29 PM
formaldehyde	ND		2.0	µg/sample	1	9/23/2019 08:29 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS
Project: L2346706 **Work Order:** 1909761
Sample ID: 19-21960-M430-BLANK2 **Lab ID:** 1909761-08
Collection Date: 9/12/2019 **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**5.8**		**2.6**	µg/sample	1	9/23/2019 08:42 PM
Acrolein	ND		26	µg/sample	1	9/23/2019 08:42 PM
formaldehyde	ND		2.6	µg/sample	1	9/23/2019 08:42 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS
Project: L2346706
Sample ID: Trip Spike Sample
Collection Date:

Work Order: 1909761
Lab ID: 1909761-09
Matrix: LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**1.9**		**0.20**	**µg/sample**	1	9/23/2019 08:54 PM
Acrolein	ND		2.0	µg/sample	1	9/23/2019 08:54 PM
formaldehyde	**2.0**		**0.20**	**µg/sample**	1	9/23/2019 08:54 PM

Note:

ALS Environmental

Date: *02-Oct-19*

Client: ALS

Project: L2346706 **Work Order:** 1909761

Sample ID: Trip Spike Reference **Lab ID:** 1909761-10

Collection Date: **Matrix:** LIQUID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **9/23/2019**	Analyst: **AT**
Acetaldehyde	**1.9**		**0.20**	**µg/sample**	1	9/23/2019 09:06 PM
Acrolein	ND		2.0	µg/sample	1	9/23/2019 09:06 PM
formaldehyde	**1.1**		**0.20**	**µg/sample**	1	9/23/2019 09:06 PM

Note:

ALS Environmental

Date: 02-Oct-19

Client: ALS
Work Order: 1909761
Project: L2346706

QC BATCH REPORT

Batch ID: **61983** Instrument ID **HPLC2** Method: **CARB430**

MBLK Sample ID **MBLK-61983-61983** Units: **µg/sample** Analysis Date: **9/23/2019 06:14 PM**
Client ID: Run ID: **HPLC2_190923A** SeqNo: **2101937** Prep Date: **9/23/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	ND	0.10								
Acrolein	ND	1.0								
formaldehyde	ND	0.10								

LCS Sample ID **LCS-61983-61983** Units: **µg/sample** Analysis Date: **9/23/2019 06:26 PM**
Client ID: Run ID: **HPLC2_190923A** SeqNo: **2101938** Prep Date: **9/23/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.128	0.10	2	0	106	70-130	0			
Acrolein	2.126	1.0	2	0	106	70-130	0			
formaldehyde	2.11	0.10	2	0	106	70-130	0			

LCSD Sample ID **LCSD-61983-61983** Units: **µg/sample** Analysis Date: **9/23/2019 06:39 PM**
Client ID: Run ID: **HPLC2_190923A** SeqNo: **2101939** Prep Date: **9/23/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.052	0.10	2	0	103	70-130	2.128	3.63	20	
Acrolein	2.023	1.0	2	0	101	70-130	2.126	4.96	20	
formaldehyde	1.919	0.10	2	0	95.9	70-130	2.11	9.51	20	

The following samples were analyzed in this batch:

1909761-01A	1909761-02A	1909761-03A
1909761-04A	1909761-05A	1909761-06A
1909761-07A	1909761-08A	1909761-09A
1909761-10A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental Date: 02-Oct-19

Client:	ALS
Project:	L2346706
WorkOrder:	**1909761**

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: 18-Sep-19 00:00

Work Order: 1909761

Received by: SNH

Checklist completed by Joe Ribar (eSignature) 18-Sep-19 (Date)

Reviewed by: Shawn Smythe (eSignature) 24-Sep-19 (Date)

Matrices: air

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):	3.6c		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

APPENDIX 20

SVOC and VOST Proof Data
(14 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#:	L2326507		Mississauga, ON L5J 2Y4
Date of Report	3-Sep-19		CANADA
Date of Sample Receipt	12-Aug-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **Chlorobenzenes by LRGC/MS - Isotope dilution**

Target analytes not detected.
Glassware is approved for the collection of samples for analysis of chlorobenzenes.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	**Method Blank**		**GLASSWARE PROOF 1/2**		**GLASSWARE PROOF 2/2 (IMPINGERS)**	
ALS Sample ID	WG3143238-1		L2326507-61		L2326507-101	
Sample Size	1		1		1	
Sample units	sample		sample		sample	
Moisture Content	n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a	
Extraction Date	26-Aug-19		26-Aug-19		26-Aug-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	<10	U	<10	U	<10	U
1,3-Dichlorobenzene	<10	U	<10	U	<10	U
1,4-Dichlorobenzene	<10	U	<10	U	<10	U
1,2-Dichlorobenzene	<10	U	<10	U	<10	U
1,3,5-Trichlorobenzene	<10	U	<10	U	<10	U
1,2,4-Trichlorobenzene	<10	U	<10	U	<10	U
1,2,3-Trichlorobenzene	<10	U	<10	U	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<10	U	<10	U	<10	U
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U
Pentachlorobenzene	<10	U	<10	U	<10	U
Hexachlorobenzene	<10	U	<10	U	<10	U
Extraction Standards	**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	62		47		46	
13C6-1,4-Dichlorobenzene	90		86		80	
13C6-1,2,3-Trichlorobenzene	97		90		86	
13C6-1,2,3,4-Tetrachlorobenzene	106		103		100	
13C6-Pentachlorobenzene	98		96		94	
13C6-Hexachlorobenzene	97		95		90	

U Indicates that this compound was not detected above the LOD.

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1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road Mississauga, ON L5J 2Y4 CANADA
ALS WO#:	L2326507	**Client Contact:**	Chris Belore
Date of Report	29-Aug-19	**Client Project ID:**	21960 Covanta
Date of Sample Receipt	12-Aug-19		

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Certified by:

Ron McLeod, PhD
Technical Director

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF 1/2		GLASSWARE PROOF 2/2 (IMPINGERS)	
ALS Sample ID	WG3143238-1		L2326507-61		L2326507-101	
Sample Size	1		1		1	
Sample units	sample		sample		sample	
Moisture Content	n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a	
Extraction Date	26-Aug-19		26-Aug-19		26-Aug-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**	
2-Chlorophenol	<50	U	<50	U	<50	U
3-Chlorophenol	<50	U	<50	U	<50	U
4-Chlorophenol	<50	U	<50	U	<50	U
2,6-Dichlorophenol	<50	U	<50	U	<50	U
2,4/2,5-Dichlorophenol	<50	U	<50	U	<50	U
3,5-Dichlorophenol	<50	U	<50	U	<50	U
2,3-Dichlorophenol	<50	U	<50	U	<50	U
3,4-Dichlorophenol	<50	U	<50	U	<50	U
2,4,6-Trichlorophenol	<50	U	<50	U	<50	U
2,3,6-Trichlorophenol	<50	U	<50	U	<50	U
2,3,5-Trichlorophenol	<50	U	<50	U	<50	U
2,4,5-Trichlorophenol	<50	U	<50	U	<50	U
2,3,4-Trichlorophenol	<50	U	<50	U	<50	U
3,4,5-Trichlorophenol	<50	U	<50	U	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<50	U	<50	U	<50	U
2,3,4,5-Tetrachlorophenol	<50	U	<50	U	<50	U
Pentachlorophenol	<50	U	<50	U	<50	U

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.

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1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2326507		Mississauga, ON
Date of Report	29-Aug-19		L5J 2Y4
Date of Sample Receipt	12-Aug-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **PCDD/F by EPA M23**

Certified by:

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

Results in this certificate relate only to the samples as submitted to the laboratory.

ALS Life Sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF 1/2	GLASSWARE PROOF 2/2 (IMPINGERS)
ALS Sample ID	L2326507-61	L2326507-101
Sample Size	1	1
Sample size units	Proof	Proof
Percent Moisture	n/a	n/a
Sample Matrix	Media Prep	Media Prep
Sampling Date	n/a	n/a
Extraction Date	26-Aug-19	26-Aug-19
Target Analytes	pg	pg
2,3,7,8-TCDD	<4.9	<3.1
1,2,3,7,8-PeCDD	<2.1	<1.5
1,2,3,4,7,8-HxCDD	<1.9	<1.9
1,2,3,6,7,8-HxCDD	<1.7	<1.7
1,2,3,7,8,9-HxCDD	<1.8	<1.8
1,2,3,4,6,7,8-HpCDD	<4.4	3.93
OCDD	48.8	<32
2,3,7,8-TCDF	<3.6	<2.4
1,2,3,7,8-PeCDF	<5.6	<3.5
2,3,4,7,8-PeCDF	<5.0	<3.1
1,2,3,4,7,8-HxCDF	<1.9	<1.2
1,2,3,6,7,8-HxCDF	<1.8	<1.1
2,3,4,6,7,8-HxCDF	<1.9	<1.2
1,2,3,7,8,9-HxCDF	<2.2	<1.4
1,2,3,4,6,7,8-HpCDF	3.52	<0.91
1,2,3,4,7,8,9-HpCDF	<1.7	<1.1
OCDF	8.83	5.15
Field Spike Standards	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	90	78
13C12-1,2,3,7,8-PeCDD	116	96
13C12-1,2,3,6,7,8-HxCDD	80	68
13C12-1,2,3,4,6,7,8-HpCDD	92	76
13C12-OCDD	83	67
13C12-2,3,7,8-TCDF	93	85
13C12-1,2,3,7,8-PeCDF	109	91
13C12-1,2,3,6,7,8-HxCDF	73	69
13C12-1,2,3,4,6,7,8-HpCDF	102	80
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	NS	NS
Homologue Group Totals	pg	pg
Total-TCDD	<4.9	<3.1
Total-PeCDD	<2.1	<1.5
Total-HxCDD	<1.9	<1.9
Total-HpCDD	6.15	3.93
Total-TCDF	<3.6	<2.4
Total-PeCDF	<5.6	<3.5
Total-HxCDF	<2.2	<1.4
Total-HpCDF	3.52	<1.1
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.0525	0.0408
Mid Point PCDD/F TEQ (WHO 2005)	5.29	3.51
Upper Bound PCDD/F TEQ (WHO 2005)	10.5	6.98

ALS Life Sciences

Quality Control Summary Report

Sample Name	**Method Blank**
ALS Sample ID	WG3143238-1
Sample Size	1
Sample size units	Proof
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	26-Aug-19
Target Analytes	**pg**
2,3,7,8-TCDD	<2.4
1,2,3,7,8-PeCDD	<1.2
1,2,3,4,7,8-HxCDD	<1.9
1,2,3,6,7,8-HxCDD	<1.8
1,2,3,7,8,9-HxCDD	<1.8
1,2,3,4,6,7,8-HpCDD	<3.2
OCDD	29.3
2,3,7,8-TCDF	<2.0
1,2,3,7,8-PeCDF	<1.3
2,3,4,7,8-PeCDF	<1.2
1,2,3,4,7,8-HxCDF	<1.0
1,2,3,6,7,8-HxCDF	1.04
2,3,4,6,7,8-HxCDF	<1.0
1,2,3,7,8,9-HxCDF	<1.2
1,2,3,4,6,7,8-HpCDF	<0.90
1,2,3,4,7,8,9-HpCDF	<1.1
OCDF	5.00
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	89
13C12-1,2,3,7,8-PeCDD	100
13C12-1,2,3,6,7,8-HxCDD	77
13C12-1,2,3,4,6,7,8-HpCDD	87
13C12-OCDD	79
13C12-2,3,7,8-TCDF	90
13C12-1,2,3,7,8-PeCDF	100
13C12-1,2,3,6,7,8-HxCDF	84
13C12-1,2,3,4,6,7,8-HpCDF	101
Cleanup Standard	
13C12-1,2,3,7,8,9-HxCDF	NS
Homologue Group Totals	**pg**
Total-TCDD	<2.4
Total-PeCDD	6.36
Total-HxCDD	<1.9
Total-HpCDD	2.44
Total-TCDF	<2.0
Total-PeCDF	<1.3
Total-HxCDF	1.95
Total-HpCDF	<1.1
Toxic Equivalency - (WHO 2005)	
Lower Bound PCDD/F TEQ (WHO 2005)	0.114
Mid Point PCDD/F TEQ (WHO 2005)	2.69
Upper Bound PCDD/F TEQ (WHO 2005)	5.24

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#:	L2326507		Mississauga, ON
Date of Report	28-Aug-19		L5J 2Y4
Date of Sample Receipt	12-Aug-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 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		GLASSWARE PROOF 1/2		GLASSWARE PROOF 2/2 (IMPINGERS)	
ALS Sample ID	WG3143238-1		L2326507-61		L2326507-101	
Sample Size	1		1		1	
Sample units	sample		sample		sample	
Moisture Content	n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a	
Extraction Date	26-Aug-19		26-Aug-19		26-Aug-19	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**	
Naphthalene	<10	U	<10	U	<10	U
2-Methylnaphthalene	<10	U	<10	U	<10	U
1-Methylnaphthalene	<10	U	<10	U	<10	U
Acenaphthylene	<10	U	<10	U	<10	U
Acenaphthene	<10	U	<10	U	<10	U
Fluorene	36.2	R	34.6	R,B	37.6	R,B
Phenanthrene	<10	U	<10	U	<10	U
Anthracene	<10	U	<10	U	<10	U
Fluoranthene	<10	U	<10	U	<10	U
Pyrene	<10	U	<10	U	<10	U
Benzo(a)Anthracene	<10	U	<10	U	<10	U
Chrysene/Triphenylene	<10	U	<10	U	<10	U
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U
Benzo(k)Fluoranthene	<10	U	<10	U	<10	U
Benzo(e)Pyrene	<10	U	<10	U	<10	U
Benzo(a)Pyrene	<10	U	<10	U	<10	U
Perylene	<10	U	<10	U	<10	U
Indeno(1,2,3-cd)Pyrene	<10	U	<10	U	<10	U
Dibenzo(a,h/a,c)Anthracene	<10	U	<10	U	<10	U
Benzo(g,h,i)Perylene	<10	U	<10	U	<10	U
Additional Analytes						
Tetralin	<10	U	<10	U	<10	U
2-Chloronaphthalene	<10	U	<10	U	<10	U
Biphenyl	<10	U	<10	U	<10	U
o-Terphenyl	<10	U	<10	U	<10	U
1-Methylphenanthrene	<10	U	<10	U	<10	U
9-Methylphenanthrene	<10	U	<10	U	<10	U
2-methylanthracene	<10	U	<10	U	<10	U
9,10-dimethylanthracene	<10	U	<10	U	<10	U
m-terphenyl	<10	U	<10	U	<10	U
p-terphenyl	<10	U	<10	U	<10	U
Benzo(a)fluorene	<10	U	<10	U	<10	U
Benzo(b)fluorene	<10	U	<10	U	<10	U
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U
3-Methylcholanthrene	<50	U	<50	U	<50	U
Picene	<50	U	<50	U	<50	U
Dibenzo(a,e)pyrene	<50	U	<50	U	<50	U
Coronene	<50	U	<50	U	<50	U
Extraction Standards	**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	90.0	M	87.4	M	68.4	M
2-Methylnaphthalene-D10	111.9		96.8		76.8	
Acenaphthylene D8	97.0		84.4		64.6	
Phenanthrene D10	96.0		84.6		66.8	
Anthracene-D10	94.4		80.3		64.0	
Fluoranthene D10	101.0		88.2		70.4	
Benz(a)Anthracene-D12	80.1		69.7		50.9	
Chrysene D12	91.7		73.4		54.3	
Benzo(b)Fluoranthene-D12	107.0		86.7		72.8	
Benzo(k)Fluoranthene-D12	83.7		68.2		54.0	
Benzo(a)Pyrene D12	79.1		78.0		77.2	
Perylene D12	74.9		73.1		47.4	
Indeno(1,2,3,cd)Pyrene-D12	88.6		72.2		60.8	
Dibenz(a,h)Anthracene-D14	80.2	M	66.6	M	54.9	M
Benzo(g,h,i)Perylene D12	82.3		69.4	M	60.0	M

U Indicates that this compound was not detected above the LOD.
M Indicates that a peak has been manually integrated.
B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Lynne Wrona	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2326507-61		Mississauga, ON
Date of Report	29-Aug-19		L5J 2Y4
Date of Sample Receipt	12-Aug-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **PCB Congeners by EPA 1668C**

PCB Congener Group Totals and Total PCB are a sum of detected values, including EMPC values, consistent with USEPA CLP SOW CBC1.2

Certified by:

Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

ALS Life Sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF 1/2	GLASSWARE PROOF 2/2 (IMPINGERS)
ALS Sample ID	L2326507-61	L2326507-101
Sample Size	1	1
Sample size units	Sample	Sample
Percent Moisture	n/a	n/a
Sample Matrix	Media Prep	Media Prep
Sampling Date	n/a	n/a
Extraction Date	26-Aug-19	26-Aug-19
Target Analytes	**pg**	**pg**
PCB-081	<5.1	<2.5
PCB-077	<5.5	<1.3
PCB-123	<5.1	<1.1
PCB-118	<6.5	<1.0
PCB-114	<5.0	<1.0
PCB-105	<7.7	<1.0
PCB-126	<5.1	<1.2
PCB-167	<2.8	<0.65
PCB-156/157	<10	<1.0
PCB-169	<3.5	<0.82
PCB-189	<3.4	<0.70
Extraction Standards	**% Rec**	**% Rec**
13C12-PCB-081	75	324
13C12-PCB-077	74	324
13C12-PCB-123	81	353
13C12-PCB-118	82	363
13C12-PCB-114	81	352
13C12-PCB-105	82	356
13C12-PCB-126	84	350
13C12-PCB-167	87	379
13C12-PCB-156/157	86	383
13C12-PCB-169	92	394
13C12-PCB-189	78	336
Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ	0.00	0.00
Mid Point PCB TEQ	0.310	0.0732
Upper Bound PCB TEQ	0.618	0.146

ALS Life Sciences

Quality Control Summary Report

Sample Name	**Method Blank**
ALS Sample ID	WG3143238-1
Sample Size	1
Sample size units	Blank
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	26-Aug-19

Target Analytes	**pg**
PCB-081	<6.8
PCB-077	<7.3
PCB-123	<7.7
PCB-118	<7.5
PCB-114	<8.0
PCB-105	<17
PCB-126	<17
PCB-167	<14
PCB-156/157	<17
PCB-169	<7.4
PCB-189	<4.4
Extraction Standards	**% Rec**
13C12-PCB-081	63
13C12-PCB-077	63
13C12-PCB-123	70
13C12-PCB-118	73
13C12-PCB-114	71
13C12-PCB-105	72
13C12-PCB-126	71
13C12-PCB-167	80
13C12-PCB-156/157	81
13C12-PCB-169	85
13C12-PCB-189	71

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	1.81
Upper Bound PCB TEQ	1.93

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	ORT100	**Client Name:**	ORTECH Environmental
ALS Project ID:	Lynne Wrona	**Client Address:**	804 Southdown Road
ALS WO#:	L2326507		Mississauga, ON L5J 2Y4
Date of Report	3-Sep-19		CANADA
Date of Sample Receipt	12-Aug-19	**Client Contact:**	Chris Belore
		Client Project ID:	21960 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260C**

Ketone data by VOST analyses are estimated values only

Target analytes were not detected in the proofs.
Media are approved for collection of samples for the analysis of VOCs via SW846 Method 5041A/8260C

Certified by: [signature]

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		VOST PROOF 1/3		VOST PROOF 2/3		VOST PROOF 3/3	
ALS Sample ID	WG3149909-1		L2326507-96		L2326507-97		L2326507-98	
Sample units	sample		sample		sample		sample	
Matrix	QC		Media Prep		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a		n/a	
Extraction Date	2-Sep-19		2-Sep-19		2-Sep-19		2-Sep-19	
Target Analytes	**ug/sample**		**ug/sample**		**ug/sample**		**ug/sample**	
Dichlorodifluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Vinyl Chloride	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromomethane	<0.09	U	<0.09	U	<0.09	U	<0.09	U
Trichlorofluoromethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,1-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Acetone	<0.1	U	<0.1	U	<0.1	U	<0.1	U
Methylene Chloride	<0.1	U	<0.1	U	<0.1	U	<0.1	U
trans,1,2-Dichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
2-Butanone	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chloroform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,1,1-Trichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Carbon Tetrachloride	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Benzene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,2-Dichloroethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Trichloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
1,2-Dichloropropane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Bromodichloromethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Toluene	<0.05	U	<0.05	U	<0.05	U	<0.05	U
1,1,2-Trichloroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Tetrachloroethene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Chlorodibromomethane	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Ethylene Dibromide	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Ethylbenzene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
M&P-Xylene	<0.03	U	<0.03	U	<0.03	U	<0.03	U
O-Xylene	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Styrene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Bromoform	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Isopropylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3,5-Trimethylbenzene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
1,3-Butadiene	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Trichlorotrifluoroethane	<0.02	U	<0.02	U	<0.02	U	<0.02	U
Field Standard	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d10-Ethylbenzene(SPK)	62.3		76.7		88.1		84.5	
Surrogate Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
d4-1,2-Dichloroethane(SURR)	96.6		91.5		87.9		89.8	
d8-Toluene(SURR)	76.5		91.7		94.7		93.8	
4-Bromofluorobenzene(SURR)	88.5		76.4		84		75.5	
Internal Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Bromochloromethane	110.5		103.7		93		103.5	
1,4-Difluorobenzene	148.4		140		127.8		139.6	
d5-Chlorobenzene	128.6		121.7		108.4		119.4	

U   Indicates that this compound was not detected above the RL.

APPENDIX 21

ORTECH Equipment Calibration Data
(31 pages)

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	Test 1	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.

Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.000 C		
High	90.9 A2	90.9 B2			
Mid	50.4 A4	51.6 B4		50.4 D4	2.4 E4
Low	30.51 A3	30.15 B3		30.5 D3	-1.2 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.2	-0.2
Mid	30.15	29.9	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	Test 2	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.000 C		
High	90.9 A2	90.9 B2			
Mid	50.4 A4	51.6 B4		50.4 D4	2.4 E4
Low	30.51 A3	30.15 B3		30.5 D3	-1.2 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.2	0.22	-0.02
Mid	29.93	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - Quench Inlet	Test 3	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0.2 B1	0.998 C		
High	90.9 A2	90.9 B2			
Mid	50.4 A4	51.6 B4		50.3 D4	2.6 E4
Low	30.51 A3	30.15 B3		30.4 D3	-1.0 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	0.22	0.2	0.02
Mid	30.1	29.0	1.1

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	Test 1	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.6 B4		50.6 D4	1.9 E4
Low	30.51 A3	30.2 B3		30.6 D3	-1.5 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	30.2	29.0	1.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	Test 2	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.6 B4		50.6 D4	1.9 E4
Low	30.51 A3	30.2 B3		30.6 D3	-1.5 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	0.19	-0.19
Mid	29	29.1	-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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - Quench Inlet	Test 3	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.6 B4		50.6 D4	1.9 E4
Low	31.51 A3	30.2 B3		31.6 D3	-4.6 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.19	0.22	-0.03
Mid	29.1	29.1	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC OUTLET	Test 1	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.007 C		
High	90.9 A2	91.5 B2			
Mid	50.4 A4	52 B4		50.7 D4	2.5 E4
Low	30.51 A3	30.7 B3		30.7 D3	0.0 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	30.7	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC OUTLET	Test 2	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.

Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.007 C		
High	90.9 A2	91.5 B2			
Mid	50.4 A4	52 B4		50.7 D4	2.5 E4
Low	30.51 A3	30.7 B3		30.7 D3	0.0 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	30.1	31.0	-0.9

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	10		15
Run 2	10		15
Run 3	10		15
Average	**10**		**15**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 1 - APC OUTLET	Test 3	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0.2 B1	1.004 C		
High	90.9 A2	91.5 B2			
Mid	50.4 A4	52 B4		50.6 D4	2.7 E4
Low	30.51 A3	30.7 B3		30.6 D3	0.2 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	31	31.0	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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC OUTLET	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.7 B4		50.6 D4	2.1 E4
Low	30.51 A3	30.5 B3		30.6 D3	-0.5 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	0.3	-0.3
Mid	30.5	29.0	1.5

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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC OUTLET	Test 2	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.7 B4		50.6 D4	2.1 E4
Low	30.51 A3	30.5 B3		30.6 D3	-0.5 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.3	0.4	-0.1
Mid	29.03	29.1	-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:	21960	Date:	September 9, 2019
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	VIG
Test Location:	Unit 2 - APC OUTLET	Test 3	

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.

Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	1.004 C		
High	90.9 A2	91.3 B2			
Mid	50.4 A4	51.7 B4		50.6 D4	2.1 E4
Low	30.51 A3	30.5 B3		30.6 D3	-0.5 E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.4	0.4	0
Mid	29.1	29.0	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**

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2019
Probe/Pitot ID	SP2
Mll Number	B04009
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.04	0.120	0.170	0.840	0.0110
(0.25")	9.21	0.205	0.280	0.855	0.0045
	11.14	0.300	0.410	0.855	0.0043
	13.18	0.420	0.580	0.851	0.0002
	15.62	0.590	0.810	0.853	0.0023
			Mean	0.851	0.0044

Without Nozzle	6.90	0.115	0.160	0.847	0.0043
	9.09	0.200	0.275	0.852	0.0007
	11.32	0.310	0.420	0.859	0.0070
	13.10	0.415	0.580	0.845	0.0062
	15.35	0.570	0.780	0.854	0.0028
			Mean	0.852	0.0042

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the MOE Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2019
Probe/Pitot ID	SP4
MII Number	B04011
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd \cdot \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.33	0.130	0.180	0.849	0.0008
(0.25")	9.09	0.200	0.280	0.845	0.0039
	11.32	0.310	0.430	0.849	0.0000
	13.79	0.460	0.640	0.847	0.0013
	15.62	0.590	0.810	0.853	0.0044
			Mean	0.849	0.0021

Without Nozzle	7.33	0.130	0.180	0.849	0.0009
	9.43	0.215	0.300	0.846	0.0023
	11.68	0.330	0.455	0.851	0.0027
	13.94	0.470	0.650	0.850	0.0014
	16.14	0.630	0.880	0.846	0.0028
			Mean	0.848	0.0020

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2019
Probe/Pitot ID	SP6
MII Number	COE20098
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.19	0.125	0.175	0.845	0.0061
(0.25")	8.86	0.190	0.260	0.854	0.0036
	11.14	0.300	0.415	0.850	0.0010
	13.49	0.440	0.610	0.849	0.0020
	15.49	0.580	0.790	0.856	0.0056
			Mean	0.851	0.0037

Without Nozzle	7.04	0.120	0.170	0.840	0.0052
	9.09	0.200	0.280	0.845	0.0002
	11.14	0.300	0.420	0.845	0.0002
	13.49	0.440	0.620	0.842	0.0029
	15.82	0.605	0.830	0.853	0.0084
			Mean	0.845	0.0034

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 20, 2019
Probe/Pitot ID	S7A
Mil Number	COE20112
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	0.0006
(0.25")	8.86	0.190	0.265	0.846	0.0037
	11.50	0.320	0.440	0.852	0.0023
	13.79	0.460	0.640	0.847	0.0027
	15.55	0.585	0.800	0.855	0.0047
			Mean	0.850	0.0028

Without Nozzle	7.04	0.120	0.165	0.852	0.0042
	8.98	0.195	0.270	0.849	0.0012
	10.95	0.290	0.410	0.841	0.0076
	13.49	0.440	0.600	0.856	0.0078
	14.94	0.540	0.760	0.842	0.0057
			Mean	0.848	0.0053

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	February 21, 2019
Probe/Pitot ID	PM 10 2.5
MII Number	COE 20132
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Nozzle Size inches	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
NA	7.04	0.120	0.170	0.840	0.0083
	9.09	0.200	0.275	0.852	0.0043
	10.95	0.290	0.400	0.851	0.0030
	13.49	0.440	0.620	0.842	0.0060
	15.75	0.600	0.820	0.855	0.0069
			Mean	0.848	0.0057

Note: Pitots must always be used in the orientation that they are calibrated in.

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 1
Date	August 12, 2019
Barometric Pressure	29.71
System Leak Check	< .001 cfm @ 25.5 "Hg

MII NUMBERS	
DGM	COE 20094
Gasometer	A01463
Barometer	COE 20028

Calibrated By	JB
Signature	
Reviewed and Accepted By	

$ft^3 =$ cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{V_{std}\ ft^3}{V_{dgm}\ ft^3} \quad \frac{T_{dgm}\ ^\circ F+460}{T_{std}\ ^\circ F+460} \quad \frac{P_{bar}\ (in.\ Hg)}{(P_{bar}\ in.\ Hg + DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration Factor	Time
Initial	Final	cm	ft^3	$^\circ C$	Initial	Final	ft^3	$^\circ F$	in. H_2O	$^\circ F$		min.
69.90	4.70	65.20	3.067	23.5	372.649	375.652	3.003	73	0.8	72	1.017	6
70.60	5.60	65.00	3.058	23.5	375.652	378.644	2.992	74	0.8	73	1.019	6
71.00	6.20	64.80	3.048	23.0	378.644	381.629	2.985	74.5	0.8	73	1.021	6
71.00	6.40	64.60	3.039	23.0	381.629	384.604	2.975	74.5	1.95	73	1.019	4
70.50	4.80	65.70	3.090	23.0	384.604	387.645	3.041	74.5	1.95	73	1.013	4
70.20	5.60	64.60	3.039	23.0	387.645	390.624	2.979	75	1.95	74	1.018	4
70.30	5.40	64.90	3.053	23.0	390.624	393.613	2.989	75	3.45	74	1.016	3
70.20	5.40	64.80	3.048	23.0	396.626	399.601	2.975	75.5	3.45	74	1.020	3
70.60	5.80	64.80	3.048	23.0	399.601	402.586	2.985	75.5	3.45	74	1.016	3

DGMCF AVERAGE 1.018

BEFORE 1.001

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

ORTECH Environmental
Manometer Calibration Data

Date	August 12, 2019	Calibrated By	JB
Manometer Number	Team 1	Signature	
Manometer MII Number	COE 20094	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 %
	0.210	NA	0.209	-0.5
0-1.0	0.430		0.432	0.5
	0.830		0.829	-0.1
	2.10		2.09	-0.5
1.0-10.0	5.10		5.06	-0.8
	9.30		9.26	-0.4

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer - Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales. (Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 1
MII	COE 20094
Date	August 12, 2019
Calibrated By	JB
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	69		1.4
100	99		1.0
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	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

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. O the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 2
Date	July 12, 2019
Barometric Pressure	29.38
System Leak Check	< .001 cfm @ 24 "Hg

MII NUMBERS	
DGM	COE 20092
Gasometer	A01463
Barometer	COE20028

Calibrated By	JB
Signature	
Reviewed and Accepted By	

ft^3 = cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^oF+460}{Tstd\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	^oC	Initial	Final	ft^3	^oF	in. H_2O	^oF	Factor	min.
68.80	5.60	63.20	2.973	23.5	727.266	730.246	2.980	74.5	0.75	74	0.996	6
69.20	6.10	63.10	2.968	23.5	730.246	733.214	2.968	74.5	0.75	74	0.999	6
68.40	5.40	63.00	2.963	23.5	736.194	739.164	2.970	75.5	0.75	75	0.998	6
69.00	6.20	62.80	2.954	23.5	739.164	742.136	2.972	75.5	1.8	75	0.992	4
69.20	6.10	63.10	2.968	23.5	742.136	745.115	2.979	75.5	1.8	75	0.994	4
68.90	5.80	63.10	2.968	23.5	745.115	748.070	2.955	75.5	1.8	75	1.002	4
69.00	6.30	62.70	2.949	23.5	748.070	751.019	2.949	75.5	3.2	75	0.994	3
69.00	5.90	63.10	2.968	23.5	751.019	753.987	2.968	75.5	3.2	75	0.994	3
69.00	5.80	63.20	2.973	23.5	753.987	756.939	2.952	75.5	3.2	75	1.001	3

DGMCF AVERAGE: 0.997

BEFORE: 0.99

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 3
Date	August 12, 2019
Barometric Pressure	29.71
System Leak Check	< 0.001 cfm @ 27 "Hg

MII NUMBERS	
DGM	COE 20093
Gasometer	A01463
Barometer	COE 20028

Calibrated By	JB
signature	
Reviewed and Accepted By	

$ft^3 =$ cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg + DGMPressure/13.6)}$$

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.
70.90	6.10	64.80	3.048	23.0	397.058	400.053	2.995	73	0.84	73	1.015	6
70.60	5.70	64.90	3.053	23.0	400.053	403.052	2.999	73.5	0.84	73	1.016	6
70.40	5.70	64.70	3.043	23.0	403.052	406.042	2.990	74.5	0.84	74	1.018	6
69.90	6.70	63.20	2.973	23.0	406.042	408.976	2.934	74.5	2	74	1.010	4
70.70	7.00	63.70	2.996	23.0	408.976	411.913	2.937	74.5	2	74	1.017	4
70.10	7.10	63.00	2.963	23.0	411.913	414.828	2.915	74.5	2	74	1.014	4
70.40	5.90	64.50	3.034	23.0	414.828	417.792	2.964	75.5	3.5	75	1.019	3
70.40	6.40	64.00	3.011	23.0	417.792	420.730	2.938	76	3.5	75	1.021	3
70.70	6.50	64.20	3.020	23.0	420.730	423.682	2.952	76.5	3.5	75	1.020	3

DGMCF AVERAGE 1.017

BEFORE 1.004

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 3
MII	COE 20093
Date	August 12, 2019
Calibrated By	JB
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	69		1.4
100	99		1.0
200	200		0.0
250	250		0.0
300	300		0.0
400	399		0.3
500	498		0.4
600	599		0.2
700	700		0.0
800	800		0.0
900	900		0.0
1000	1000		0.0
1100	1100		0.0
1200	1200		0.0
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:

'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	August 12, 2019	Calibrated By	JB
Manometer Number	Team 3	Signature	
Manometer MII Number	COE 20093	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

<u>Back Leg</u>

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.150	NA	0.152	1.3
0-1.0	0.560		0.564	0.7
	0.980		0.997	1.7
	1.80		1.74	-3.4
1.0-10.0	4.70		4.65	-1.1
	8.20		8.12	-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 4
Date	August 9, 2019
Barometric Pressure	29.47
System Leak Check	< 0.001 cfm @ 26 "Hg

MII NUMBERS	
DGM	COE 20090
Gasometer	A01463
Barometer	COE20028

Calibrated By	JB
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{V_{std}\ ft^3}{V_{dgm}\ ft^3} \quad \frac{T_{dgm}\ ^oF+460}{T_{std}\ ^oF+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg + DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration Factor	Time
Initial	Final	cm	ft^3	^oC	Initial	Final	ft^3	^oF	in. H_2O	^oF		min.
71.00	8.00	63.00	2.963	22.5	145.636	148.600	2.964	74	0.76	72	1.001	6
70.60	7.30	63.30	2.978	22.5	148.600	151.565	2.965	73	0.76	72	1.003	6
70.80	7.90	62.90	2.959	22.5	151.565	154.529	2.964	74.5	0.76	73	1.000	6
70.90	8.20	62.70	2.949	22.5	154.529	157.462	2.933	75	1.8	73	1.006	4
71.10	8.50	62.60	2.945	22.5	157.462	160.387	2.925	76	1.8	73	1.009	4
70.10	7.80	62.30	2.931	22.5	160.387	163.325	2.938	77	1.8	74	1.001	4
70.80	5.40	65.40	3.076	22.5	163.325	166.366	3.041	77.5	3.4	74	1.013	3
70.80	5.90	64.90	3.053	22.5	166.366	169.387	3.021	78	3.4	74	1.012	3
71.00	6.00	65.00	3.058	22.5	169.387	172.414	3.027	78	3.4	74	1.012	3

DGMCF AVERAGE: 1.006

BEFORE: 0.999

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Omega DP 116
MII	COE 20090
Date	August 9, 2019
Calibrated By	JB
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	70		0.0
100	99		1.0
200	200		0.0
250	250		0.0
300	300		0.0
400	399		0.3
500	498		0.4
600	599		0.2
700	700		0.0
800	800		0.0
900	900		0.0
1000	1000		0.0
1100	1100		0.0
1200	1200		0.0
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
'Trendicator display must read within ± 1.5%, and ± 3 degrees F of the micromite value at each output. Oth the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use.
(MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	August 9, 2019	Calibrated By	JB
Manometer Number	Team 4	Signature	JB
Manometer MII Number	COE 20090	Reviewed/Accepted By	AS
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

<u>Front Leg</u>

Manometer Scale	Manometer Reading "H_2O		Reference Manometer Reading	Percent Difference
"H_20	Before Adjustment	After Adjustment	"H_2O	%
	0.250	NA	0.258	3.1
0-1.0	0.410		0.401	-2.2
	0.800		0.787	-1.7
	1.60		1.640	2.4
1.0-10.0	5.80		5.840	0.7
	9.10		9.190	1.0

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer - Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	Vost 4
Date	August 28, 2019
Barometric Pressure	29.38
System Leak Check	< 0.005 Lpm @ 18 "Hg

MII NUMBERS	
DGM	A11542
Gasometer	A01463
Barometer	COE 20028

Calibrated By	DH
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
30.90	24.20	6.70	0.315	23.5	4.00	13.23	0.326	31.0	0.4	31.0	0.990	20	0.5
37.80	30.90	6.90	0.325	23.5	94.73	104.00	0.327	30.0	0.4	30.0	1.012	20	0.5
44.60	37.80	6.80	0.320	23.5	85.54	94.73	0.325	32.0	0.4	32.0	1.013	20	0.5
68.60	54.20	14.40	0.677	23.5	13.23	33.30	0.709	32.0	0.8	32.0	0.981	20	1.0
54.20	42.10	12.10	0.569	23.5	33.30	50.00	0.590	32.0	0.8	32.0	0.991	16	1.0
42.10	26.70	15.40	0.724	23.5	50.00	71.15	0.747	32.0	0.8	32.0	0.996	20	1.1

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE

0.5Lpm	1.005
1Lpm	0.989

Revision June 5, 2007

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
MII	A11542
Date	August 28, 2019
Calibrated By	DH
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	101		-1.0
125	126		-0.8
150	151		-0.7
200	200		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	600		0.0

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	M05498
Date	September 4, 2019
Barometric Pressure	29.53
System Leak Check	NDL @ 21' Hg

MII NUMBERS	
DGM	M05498
Gasometer	A01463
Barometer	COE 20028

Calibrated By	DH / KC
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ {}^oF+460}{Tstd\ {}^oF+460} \quad \frac{Pbar\ (\text{"}Hg)}{(Pbar\ \text{"}Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration Factor	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
65.80	54.40	11.40	0.536	23.0	9981.00	9996.15	0.535	26.0	1.9	26.0	1.008	15	1.0
54.40	43.00	11.40	0.536	23.0	9996.15	10011.70	0.549	26.0	1.9	26.0	0.982	15	1.0
43.00	31.50	11.50	0.541	23.0	11.70	27.15	0.546	26.0	1.9	26.0	0.997	15	1.0
22.40	15.10	7.30	0.343	23.0	86.92	96.80	0.349	26.0	1.0	26.0	0.992	20	0.5
36.90	29.80	7.10	0.334	23.0	67.35	77.12	0.345	26.0	1.0	26.0	0.975	20	0.5
35.40	28.00	7.40	0.348	23.0	116.45	126.50	0.355	26.0	1.0	26.0	0.988	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
0.5 Lpm	0.985

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
MII	M05498
Date	September 3, 2019
Calibrated By	DH / KC
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	101		-1.0
125	126		-0.8
150	151		-0.7
200	200		0.0
300	299		0.3
400	399		0.3
500	499		0.2
600	599		0.2

$$\% \text{ Difference} = \frac{(\text{micromite - after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

APPENDIX 22

Particulate and Metals Test Emission Calculations
(24 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	1 - Particulate & Metals
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.51 mm
DRY REF GAS VOLUME SAMPLED	3.905 m^3
AVGERGE ISOKINETICITY	103.2 %
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	136.7 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	17.80 m/s
BAROMETRIC PRESSURE (Station)	101.693 Kpa
STATIC PRESSURE	-2.191 Kpa
ABSOLUTE GAS PRESSURE	99.502 Kpa
OXYGEN CONCENTRATION	8.27 %
CARBON DIOXIDE CONCENTRATION	11.15 %
CARBON MONOXIDE CONCENTRATION	9.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.30 m^3/s
DRY REF GAS FLOWRATE	15.54 Rm^3/s
DRY ADJ GAS FLOWRATE	19.83 Rm^3/s
WET REF GAS FLOWRATE	18.80 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.9 mg
	-FILTER	1 mg
	-TOTAL	3.9 mg
DRY REF GAS VOLUME SAMPLED		3.905 m^3
PARTICULATE CONC. - ACTUAL		0.590 mg/m^3
PARTICULATE CONC. - DRY REF		0.999 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.783 mg/m^3
PARTICULATE CONC. - WET REF		0.826 mg/m^3
PARTICULATE EMISSION RATE		0.015522 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 9, 2019	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	30.03 "Hg	**CWTR (g)**	576.2
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	23.7
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.78 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%	8.27
CO2%	11.15
COppm	9.6

Measured H2O
17.3 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	73.13	0.81	284	60	61	64	1.95	5.0		18.90	
	2.5	75.06	0.78	283	57	66	65	1.9	5.0		18.54	**103.0**
	5	76.92	0.78	284	56	72	64	1.95	5.0		18.55	**100.5**
2	7.5	78.77	0.74	284	54	78	64	1.9	5.0		18.07	**99.6**
	10	80.62	0.75	284	55	78	65	1.95	5.5		18.19	**101.6**
	12.5	82.47	0.78	283	54	82	66	2.1	5.5		18.54	**100.9**
3	15	84.37	0.81	284	57	84	65	2.15	6.0		18.90	**101.1**
	17.5	86.34	0.81	285	55	85	67	2.15	6.0		18.92	**102.8**
	20	88.31	0.81	285	56	87	67	2.15	6.0		18.92	**102.6**
4	22.5	90.29	0.77	285	56	93	67	2.1	6.0		18.44	**102.9**
	25	92.25	0.76	285	55	88	69	2.05	5.5		18.32	**103.9**
	27.5	94.19	0.77	285	56	89	68	2.1	6.0		18.44	**103.8**
5	30	96.16	0.74	285	56	91	68	2	5.5		18.08	**104.7**
	32.5	98.08	0.73	286	55	91	68	1.95	5.5		17.97	**103.9**
	35	99.98	0.73	286	56	90	68	1.95	5.5		17.97	**103.6**
6	37.5	101.87	0.68	286	55	91	69	1.8	5.5		17.34	**103.1**
	40	103.69	0.65	286	55	91	69	1.75	5.5		16.96	**102.7**
	42.5	105.50	0.64	286	54	91	70	1.7	5.5		16.83	**104.4**
7	45	107.29	0.67	286	54	92	70	1.8	5.5		17.22	**104.0**
	47.5	109.13	0.67	286	54	92	71	1.8	5.5		17.22	**104.4**
	50	110.91	0.65	286	53	92	71	1.7	5.5		16.96	**100.9**
8	52.5	112.69	0.71	285	52	92	71	1.85	5.5		17.71	**102.4**
	55	114.55	0.69	284	52	93	72	1.8	5.5		17.45	**102.3**
	57.5	116.36	0.68	285	52	92	71	1.8	5.5		17.33	**100.8**
9	60	118.18	0.7	285	52	93	71	1.85	5.5		17.59	**102.3**
	62.5	120.03	0.7	284	52	93	72	1.9	5.5		17.57	**102.4**
	65	121.89	0.71	284	52	92	74	1.9	5.5		17.70	**102.8**
10	67.5	123.76	0.71	284	51	92	72	1.9	5.5		17.70	**102.6**
	70	125.67	0.68	237	51	92	71	1.9	5.5		16.77	**104.9**
	72.5	127.55	0.67	234	51	92	72	1.9	5.5		16.61	**102.3**
11	75	129.43	0.81	239	51	92	72	2.2	6.0		18.32	**102.7**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 9, 2019	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	30.03 "Hg	**CWTR (g)**	576.2
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	23.7
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.78 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%	8.27
CO2%	11.15
COppm	9.6

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 %
	77.5	131.49	0.81	239	50	93	72	2.3	6.0		18.32	**102.8**
	80	133.57	0.8	240	50	93	72	2.3	6.0		18.22	**103.7**
12	82.5	135.68	0.79	240	50	93	72	2.2	6.0		18.11	**105.9**
	85	137.76	0.79	240	50	93	72	2.2	6.0		18.11	**105.1**
	87.5	139.83	0.77	240	51	93	72	2.15	6.0		17.88	**104.6**
	90	141.94								0.78		**107.9**
1	0	142.72	0.74	286	50	72	72	1.9	6.0		18.09	
	2.5	144.60	0.74	281	47	75	72	1.9	6.0		18.03	**103.2**
	5	146.49	0.74	281	45	81	70	1.95	6.0		18.03	**103.1**
2	7.5	148.37	0.75	281	44	86	69	2	6.0		18.15	**102.2**
	10	150.29	0.77	281	43	88	70	2.05	6.0		18.39	**103.3**
	12.5	152.24	0.76	281	43	89	70	2.05	6.0		18.28	**103.3**
3	15	154.18	0.72	280	43	90	71	1.95	6.0		17.78	**103.3**
	17.5	156.10	0.74	280	43	90	71	2	6.0		18.02	**104.8**
	20	158.02	0.72	280	45	91	71	1.95	6.0		17.78	**103.4**
4	22.5	159.93	0.68	281	44	92	72	1.85	6.0		17.29	**104.1**
	25	161.79	0.7	281	44	92	71	1.9	6.0		17.54	**104.2**
	27.5	163.66	0.71	281	44	92	71	1.9	6.0		17.66	**103.4**
5	30	165.52	0.67	281	45	93	72	1.8	5.5		17.16	**102.1**
	32.5	167.34	0.66	281	43	93	72	1.75	5.5		17.03	**102.6**
	35	169.14	0.66	280	44	93	72	1.8	5.5		17.02	**102.2**
6	37.5	170.96	0.6	280	41	93	72	1.6	5.5		16.23	**103.3**
	40	172.69	0.55	280	44	93	72	1.5	5.5		15.54	**102.9**
	42.5	174.38	0.62	280	44	94	73	1.65	5.5		16.50	**105.0**
7	45	176.14	0.68	280	43	95	72	1.8	5.5		17.27	**102.9**
	47.5	177.99	0.68	280	43	95	72	1.8	5.5		17.27	**103.3**
	50	179.85	0.69	280	44	95	74	1.8	5.5		17.40	**103.8**
8	52.5	181.67	0.71	281	44	95	74	1.95	6.0		17.66	**100.7**
	55	183.57	0.71	281	44	96	74	1.95	6.0		17.66	**103.7**
	57.5	185.47	0.71	282	44	96	74	1.9	6.0		17.68	**103.6**
9	60	187.34	0.74	281	44	96	75	2	6.0		18.03	**102.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 9, 2019	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	30.03 "Hg	**CWTR (g)**	576.2
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	23.7
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.78 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%	8.27
CO2%	11.15
COppm	9.6

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 %
	62.5	189.27	0.75	282	44	96	74	2	6.0		18.17	**103.0**
	65	191.22	0.75	282	45	97	74	2	6.0		18.17	**103.6**
10	67.5	193.13	0.75	282	45	97	74	2	6.0		18.17	**101.3**
	70	195.13	0.75	282	45	97	74	2	6.0		18.17	**106.1**
	72.5	197.05	0.75	283	45	97	74	2	6.0		18.18	**101.9**
11	75	198.98	0.72	283	45	97	75	2	6.0		17.81	**102.5**
	77.5	200.89	0.77	283	45	97	74	2	6.0		18.42	**103.4**
	80	202.83	0.76	284	45	97	75	2.1	6.0		18.31	**101.7**
12	82.5	204.80	0.75	284	45	97	75	2	6.0		18.19	**103.9**
	85	206.77	0.74	284	46	97	75	2	6.0		18.07	**104.6**
	87.5	208.68	0.73	284	45	97	75	2	6.0		17.95	**102.1**
	90	210.68										**107.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	2 - Particulate & Metals
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.51 mm
DRY REF GAS VOLUME SAMPLED	3.864 m^3
AVGERGE ISOKINETICITY	104.2 %
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	138.7 °C
AVERAGE GAS MOISTURE BY VOLUME	18.4 %
AVERAGE GAS VELOCITY	17.78 m/s
BAROMETRIC PRESSURE (Station)	101.592 Kpa
STATIC PRESSURE	-2.191 Kpa
ABSOLUTE GAS PRESSURE	99.400 Kpa
OXYGEN CONCENTRATION	8.08 %
CARBON DIOXIDE CONCENTRATION	11.21 %
CARBON MONOXIDE CONCENTRATION	12.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.27 m^3/s
DRY REF GAS FLOWRATE	15.22 Rm^3/s
DRY ADJ GAS FLOWRATE	19.72 Rm^3/s
WET REF GAS FLOWRATE	18.66 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.8 mg
	-FILTER	0.5 mg
	-TOTAL	2.3 mg
DRY REF GAS VOLUME SAMPLED		3.864 m^3
PARTICULATE CONC. - ACTUAL		0.345 mg/m^3
PARTICULATE CONC. - DRY REF		0.595 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.460 mg/m^3
PARTICULATE CONC. - WET REF		0.486 mg/m^3
PARTICULATE EMISSION RATE		0.009063 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
Test No.: 2 - Particulate & Metals
Date: September 9, 2019

Plant Location: Courtice, Ontario
Test Location: APC Outlet No. 1
Operator: TT

Pitot Factor	0.851	
DGMCF	1.006	
Barometric Pressure	30	"Hg
Static Pressure	-8.800	"H_2O
Nozzle	0.2563	inches
Stack Diameter	4.500	ft
Length	0.000	ft
Width	0.000	ft

Filter (mg)	0.5	
Probe (mg)	1.8	
CWTR (g)	616.2	
WCBDA (g)	23.9	
Leak Check Volume	0.73	ft^3
Reading Interval	2.5	minutes
Number of Ports	2	
Number of points / Port	12	

Combustion Gases	
O2%	8.08
CO2%	11.21
COppm	12.2

Measured H2O
18.4 %

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	11.31	0.76	284	65	74	70	1.95	5.0		18.37	
	2.5	13.28	0.81	282	63	75	71	2.1	5.0		18.93	**107.7**
	5	15.25	0.8	283	61	80	70	2.1	5.0		18.83	**104.1**
2	7.5	17.22	0.82	283	57	86	70	2.15	5.0		19.06	**104.4**
	10	19.20	0.82	282	54	88	72	2.15	5.5		19.05	**103.1**
	12.5	21.24	0.83	282	53	90	72	2.2	5.5		19.17	**105.7**
3	15	23.28	0.8	283	54	91	72	2.15	5.5		18.83	**104.9**
	17.5	25.30	0.78	283	53	92	72	2.1	5.5		18.59	**105.8**
	20	27.27	0.81	282	52	94	72	2.1	5.5		18.93	**104.3**
4	22.5	29.25	0.73	283	51	95	72	1.95	5.0		17.99	**102.7**
	25	31.17	0.7	283	51	95	73	1.85	5.0		17.61	**104.8**
	27.5	33.04	0.72	283	51	95	73	1.9	5.0		17.86	**104.1**
5	30	34.93	0.64	283	50	96	81	1.7	5.0		16.84	**103.8**
	32.5	36.74	0.66	283	50	96	74	1.75	5.0		17.10	**104.5**
	35	38.58	0.65	283	50	97	74	1.7	5.0		16.97	**105.3**
6	37.5	40.35	0.64	283	49	97	75	1.7	5.0		16.84	**101.9**
	40	42.15	0.65	282	49	97	75	1.75	5.0		16.96	**104.4**
	42.5	43.95	0.65	282	49	98	75	1.75	5.0		16.96	**103.5**
7	45	45.78	0.64	282	48	98	75	1.7	5.0		16.83	**105.1**
	47.5	47.52	0.66	282	48	98	76	1.75	5.0		17.09	**100.7**
	50	49.38	0.67	282	48	98	76	1.8	5.0		17.22	**106.0**
8	52.5	51.23	0.66	282	48	98	75	1.75	5.0		17.09	**104.6**
	55	53.05	0.65	282	48	98	76	1.7	5.0		16.96	**103.8**
	57.5	54.84	0.68	282	47	98	76	1.8	5.0		17.35	**102.7**
9	60	56.71	0.67	282	47	98	76	1.8	5.0		17.22	**105.0**
	62.5	58.54	0.67	281	47	98	76	1.8	5.0		17.21	**103.5**
	65	60.36	0.66	281	46	98	76	1.8	5.0		17.08	**102.9**
10	67.5	62.19	0.64	281	46	98	76	1.7	5.0		16.82	**104.2**
	70	63.97	0.63	280	46	98	76	1.7	5.0		16.68	**102.9**
	72.5	65.75	0.64	280	55	99	76	1.7	5.0		16.81	**103.6**
11	75	67.53	0.72	280	46	99	76	1.95	5.0		17.83	**102.7**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 9, 2019	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.5
DGMCF	1.006	**Probe (mg)**	1.8
Barometric Pressure	30 "Hg	**CWTR (g)**	616.2
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	23.9
Nozzle	0.2563 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%	8.08
CO2%	11.21
COppm	12.2

Measured H2O
18.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	69.46	0.72	280	46	99	76	1.95	5.0		17.83	**105.1**
	80	71.35	0.64	280	46	99	76	1.7	5.0		16.81	**102.9**
12	82.5	73.15	0.64	280	46	99	77	1.7	5.0		16.81	**103.9**
	85	74.95	0.62	280	46	99	77	1.65	5.0		16.54	**103.8**
	87.5	76.73	0.62	280	46	99	77	1.65	5.0		16.54	**104.3**
	90	78.53								0.73		**105.4**
1	0	79.26	0.77	281	60	79	78	2	5.5		18.45	
	2.5	81.24	0.75	280	47	86	75	1.95	5.5		18.19	**106.1**
	5	83.18	0.81	279	45	93	76	2.15	6.0		18.90	**104.8**
2	7.5	85.20	0.76	279	44	96	75	1.95	5.5		18.30	**104.2**
	10	87.17	0.76	279	43	98	76	1.95	5.5		18.30	**104.7**
	12.5	89.06	0.79	279	45	98	75	2.1	5.5		18.66	**100.2**
3	15	91.06	0.73	279	43	99	76	1.95	5.5		17.94	**104.1**
	17.5	92.97	0.78	279	43	99	76	2.1	5.5		18.54	**103.2**
	20	94.95	0.82	279	44	99	76	2.2	6.0		19.01	**103.5**
4	22.5	96.99	0.7	280	44	100	76	1.9	5.5		17.58	**104.1**
	25	98.89	0.71	280	44	100	77	1.9	5.5		17.70	**104.8**
	27.5	100.77	0.71	280	44	100	76	1.9	5.5		17.70	**102.9**
5	30	102.64	0.73	280	44	100	78	2	6.0		17.95	**102.4**
	32.5	104.56	0.69	280	44	100	77	1.85	5.5		17.45	**103.5**
	35	106.43	0.72	281	45	100	77	1.95	5.5		17.84	**103.8**
6	37.5	108.34	0.64	281	44	100	77	1.7	5.5		16.82	**103.9**
	40	110.15	0.64	281	44	100	77	1.7	5.5		16.82	**104.3**
	42.5	111.94	0.66	281	45	100	77	1.8	5.5		17.08	**103.2**
7	45	113.75	0.69	282	44	100	77	1.85	5.5		17.48	**102.8**
	47.5	115.62	0.69	282	44	100	77	1.85	5.5		17.48	**103.9**
	50	117.49	0.72	282	44	101	78	1.95	6.0		17.85	**103.9**
8	52.5	119.39	0.73	282	44	101	77	2	6.0		17.97	**103.2**
	55	121.33	0.72	282	44	100	78	2	6.0		17.85	**104.8**
	57.5	123.26	0.71	282	44	101	77	1.9	6.0		17.73	**105.0**
9	60	125.18	0.73	282	45	100	77	2	6.0		17.97	**105.1**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 9, 2019	**Operator:**	TT

Pitot Factor	0.851	**Filter (mg)**	0.5
DGMCF	1.006	**Probe (mg)**	1.8
Barometric Pressure	30 "Hg	**CWTR (g)**	616.2
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	23.9
Nozzle	0.2563 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%	8.08
CO2%	11.21
COppm	12.2

Measured H2O
18.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	127.10	0.75	283	45	100	77	1.9	6.0		18.23	**103.8**
	65	129.03	0.77	284	45	100	77	2	6.0		18.49	**103.0**
10	67.5	130.98	0.8	285	45	100	78	2.1	6.0		18.85	**102.8**
	70	132.98	0.8	285	45	100	77	2.15	6.0		18.85	**103.4**
	72.5	135.00	0.8	285	45	100	78	2.15	6.0		18.85	**104.6**
11	75	137.04	0.76	284	45	100	77	2.1	6.0		18.37	**105.5**
	77.5	139.03	0.77	284	45	100	77	2.15	6.0		18.49	**105.6**
	80	141.05	0.77	284	45	100	77	2.2	6.0		18.49	**106.5**
12	82.5	143.13	0.69	284	45	100	78	2.1	6.0		17.50	**109.7**
	85	145.13	0.68	284	45	100	78	1.8	6.0		17.37	**111.3**
	87.5	147.00	0.7	284	45	100	78	1.8	6.0		17.63	**104.7**
	90	148.88										**103.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	3 - Particulate & Metals
Date:	September 10, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.51 mm
DRY REF GAS VOLUME SAMPLED	4.030 m^3
AVGERGE ISOKINETICITY	102.9 %
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	16.8 %
AVERAGE GAS VELOCITY	18.44 m/s
BAROMETRIC PRESSURE (Station)	101.355 Kpa
STATIC PRESSURE	-2.191 Kpa
ABSOLUTE GAS PRESSURE	99.163 Kpa
OXYGEN CONCENTRATION	8.26 %
CARBON DIOXIDE CONCENTRATION	11.09 %
CARBON MONOXIDE CONCENTRATION	11.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.24 m^3/s
DRY REF GAS FLOWRATE	16.08 Rm^3/s
DRY ADJ GAS FLOWRATE	20.52 Rm^3/s
WET REF GAS FLOWRATE	19.33 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.9 mg
	-FILTER	0.1 mg
	-TOTAL	3 mg
DRY REF GAS VOLUME SAMPLED		4.030 m^3
PARTICULATE CONC. - ACTUAL		0.439 mg/m^3
PARTICULATE CONC. - DRY REF		0.745 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.583 mg/m^3
PARTICULATE CONC. - WET REF		0.619 mg/m^3
PARTICULATE EMISSION RATE		0.011968 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 10, 2019	**Operator:**	JG

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	29.93 "Hg	**CWTR (g)**	578.7
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	20.1
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.53 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.26
CO2%	11.09
COppm	11.3

Measured H2O
16.8 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	49.50	0.75	270	59	70	65	1.9	5.0		18.03	
	2.5	51.13	0.77	270	50	67	69	2.1	5.0		18.27	88.1
	5	53.06	0.76	272	49	66	73	2.1	5.0		18.18	102.9
2	7.5	55.02	0.72	272	48	66	77	2	5.0		17.69	105.1
	10	56.92	0.72	274	49	68	81	1.9	5.0		17.72	104.2
	12.5	58.79	0.72	272	50	68	83	1.9	5.0		17.69	102.1
3	15	60.65	0.72	272	50	68	83	1.9	5.0		17.69	101.2
	17.5	62.48	0.72	282	51	69	89	1.9	5.0		17.81	99.6
	20	64.38	0.72	282	51	69	89	1.9	5.0		17.81	103.4
4	22.5	66.24	0.68	282	51	70	91	1.8	5.0		17.31	101.3
	25	68.10	0.7	282	51	71	92	1.9	5.0		17.57	103.9
	27.5	70.00	0.7	282	51	72	93	1.9	5.0		17.57	104.4
5	30	71.80	0.72	282	52	72	94	2	5.0		17.81	98.7
	32.5	73.69	0.71	282	52	74	94	2	5.0		17.69	102.2
	35	75.60	0.69	281	52	72	96	1.9	5.0		17.43	103.8
6	37.5	77.48	0.7	281	52	73	96	1.9	5.0		17.55	103.5
	40	79.35	0.66	281	51	73	97	1.8	5.0		17.04	102.1
	42.5	81.18	0.67	281	51	73	97	1.8	5.0		17.17	102.8
7	45	83.03	0.62	282	52	74	97	1.7	5.0		16.53	103.2
	47.5	84.80	0.62	282	51	74	97	1.7	5.0		16.53	102.6
	50	86.58	0.62	282	52	74	98	1.7	5.0		16.53	103.1
8	52.5	88.34	0.75	282	51	74	98	2.1	6.0		18.18	101.9
	55	90.32	0.75	282	52	74	99	2.1	6.0		18.18	104.3
	57.5	92.32	0.75	282	52	75	99	2	6.0		18.18	105.3
9	60	94.25	0.83	283	52	75	99	2.3	6.0		19.14	101.5
	62.5	96.34	0.83	283	52	75	100	2.3	6.0		19.14	104.6
	65	98.44	0.84	283	52	76	100	2.3	6.0		19.25	105.0
10	67.5	100.55	0.87	283	52	76	100	2.4	6.0		19.60	104.8
	70	102.68	0.87	283	53	74	101	2.4	6.0		19.60	104.0
	72.5	104.80	0.86	283	53	76	101	2.4	6.0		19.48	103.6
11	75	106.92	0.91	283	53	77	101	2.5	6.0		20.04	104.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 10, 2019	**Operator:**	JG

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	29.93 "Hg	**CWTR (g)**	578.7
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	20.1
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.53 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.26
CO2%	11.09
COppm	11.3

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	109.08	0.9	283	53	77	101	2.5	6.0		19.93	**102.9**
	80	111.24	0.92	283	54	77	101	2.5	6.0		20.15	**103.5**
12	82.5	113.40	0.95	283	54	77	101	2.6	6.0		20.48	**102.4**
	85	115.60	0.91	284	53	77	103	2.5	6.0		20.05	**102.6**
	87.5	117.77	0.91	283	53	77	101	2.5	6.0		20.04	**103.3**
	90	119.94								0.53		**103.4**
1	0	120.47	0.87	282	54	77	88	2.4	6.0		19.58	
	2.5	122.60	0.87	282	53	77	91	2.4	6.0		19.58	**104.9**
	5	124.74	0.86	283	50	77	95	2.4	6.0		19.48	**105.1**
2	7.5	126.85	0.87	283	49	77	97	2.3	6.0		19.60	**104.0**
	10	128.92	0.87	284	48	77	99	2.35	6.0		19.61	**101.2**
	12.5	131.03	0.87	283	48	77	99	2.35	6.0		19.60	**103.0**
3	15	133.14	0.86	283	47	77	100	2.35	6.0		19.48	**103.0**
	17.5	135.25	0.86	284	47	79	100	2.35	6.0		19.50	**103.5**
	20	137.35	0.85	283	46	78	100	2.3	6.0		19.37	**102.9**
4	22.5	139.43	0.82	283	46	78	100	2.3	6.0		19.02	**102.5**
	25	141.50	0.84	283	46	78	100	2.3	6.0		19.25	**103.8**
	27.5	143.58	0.82	282	46	78	100	2.3	6.0		19.01	**103.1**
5	30	145.65	0.77	282	46	78	101	2.3	6.0		18.42	**103.8**
	32.5	147.73	0.77	282	45	78	101	2.3	6.0		18.42	**107.5**
	35	149.80	0.77	282	45	78	101	2.1	6.0		18.42	**107.0**
6	37.5	151.80	0.75	282	45	78	101	2	6.0		18.18	**103.3**
	40	153.74	0.74	282	45	78	101	2	6.0		18.06	**101.5**
	42.5	155.69	0.73	282	45	78	101	2	6.0		17.94	**102.7**
7	45	157.60	0.72	282	46	78	101	2	6.0		17.81	**101.3**
	47.5	159.58	0.72	281	45	78	101	2	6.0		17.80	**105.8**
	50	161.53	0.72	281	45	78	101	2	6.0		17.80	**104.1**
8	52.5	163.45	0.74	279	46	78	101	2.1	6.0		18.02	**102.5**
	55	165.44	0.74	281	45	79	100	2.1	6.0		18.05	**104.7**
	57.5	167.37	0.75	281	46	78	101	2.1	6.0		18.17	**101.6**
9	60	169.32	0.79	282	46	78	101	2.2	6.0		18.66	**102.0**

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	September 10, 2019	**Operator:**	JG

Pitot Factor	0.851	**Filter (mg)**	0.1
DGMCF	1.006	**Probe (mg)**	2.9
Barometric Pressure	29.93 "Hg	**CWTR (g)**	578.7
Static Pressure	-8.800 "H_2O	**WCBDA (g)**	20.1
Nozzle	0.2563 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.53 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.26
CO2%	11.09
COppm	11.3

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	171.35	0.78	281	46	78	101	2.2	6.0		18.53	**103.6**
	65	173.37	0.75	281	46	79	101	2.1	6.0		18.17	**103.6**
10	67.5	175.39	0.75	278	46	79	101	2.1	6.0		18.13	**105.6**
	70	177.37	0.75	277	46	79	101	2.1	6.0		18.12	**103.3**
	72.5	179.30	0.74	277	46	79	101	2.1	6.0		18.00	**100.6**
11	75	181.26	0.75	277	46	79	101	2.1	6.0		18.12	**102.8**
	77.5	183.20	0.75	279	46	79	101	2.1	6.0		18.15	**101.1**
	80	185.16	0.75	279	46	79	101	2.1	6.0		18.15	**102.3**
12	82.5	187.11	0.75	279	46	79	101	2.1	6.0		18.15	**101.8**
	85	189.06	0.74	279	46	78	101	2.1	6.0		18.02	**101.8**
	87.5	191.00	0.74	278	47	78	101	2.1	6.0		18.01	**102.0**
	90	192.95										102.5

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 Particulate & Metals
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	3.677 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	140.0 °C
AVERAGE GAS MOISTURE BY VOLUME	16.9 %
AVERAGE GAS VELOCITY	17.89 m/s
BAROMETRIC PRESSURE (Station)	101.626 Kpa
STATIC PRESSURE	-2.291 Kpa
ABSOLUTE GAS PRESSURE	99.335 Kpa
OXYGEN CONCENTRATION	8.23 %
CARBON DIOXIDE CONCENTRATION	11.19 %
CARBON MONOXIDE CONCENTRATION	17.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.43 m^3/s
DRY REF GAS FLOWRATE	15.53 Rm^3/s
DRY ADJ GAS FLOWRATE	19.87 Rm^3/s
WET REF GAS FLOWRATE	18.70 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	3.2 mg
	-FILTER	1 mg
	-TOTAL	4.2 mg
DRY REF GAS VOLUME SAMPLED		3.677 m^3
PARTICULATE CONC. - ACTUAL		0.671 mg/m^3
PARTICULATE CONC. - DRY REF		1.142 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.893 mg/m^3
PARTICULATE CONC. - WET REF		0.949 mg/m^3
PARTICULATE EMISSION RATE		0.017738 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 9, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	1
DGMCF	1.017	**Probe (mg)**	3.2
Barometric Pressure	30.01 "Hg	**CWTR (g)**	525.1
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	25.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.535 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%	11.19
COppm	17.3

Measured H2O
16.9 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	504.16	0.67	275	60	68	68	1.9	3.0		17.07	
	2.5	506.38	0.67	275	56	68	69	1.7	3.0		17.07	132.6
	5	507.93	0.66	275	55	68	69	1.8	3.0		16.94	92.5
2	7.5	509.62	0.69	275	54	68	69	1.8	3.0		17.32	101.6
	10	511.32	0.7	274	54	69	70	1.7	3.0		17.44	100.0
	12.5	513.02	0.69	274	53	69	70	1.7	3.0		17.31	99.0
3	15	514.70	0.71	283	54	69	71	1.8	3.0		17.67	98.5
	17.5	516.42	0.72	285	55	69	71	1.8	3.0		17.81	100.0
	20	518.14	0.73	284	55	69	72	1.8	3.0		17.93	99.4
4	22.5	519.85	0.71	284	55	69	72	1.8	3.0		17.68	98.0
	25	521.56	0.72	284	56	69	72	1.8	3.0		17.80	99.4
	27.5	523.37	0.71	284	56	69	73	1.8	3.0		17.68	104.4
5	30	525.08	0.68	284	56	70	73	1.7	3.0		17.30	99.3
	32.5	526.67	0.69	285	56	70	74	1.8	3.0		17.44	94.2
	35	528.37	0.67	284	56	70	74	1.8	3.0		17.17	100.0
6	37.5	530.08	0.66	286	56	70	74	1.7	3.0		17.07	102.0
	40	531.76	0.67	284	55	71	75	1.7	3.0		17.17	101.1
	42.5	533.44	0.68	284	55	71	75	1.7	3.0		17.30	100.0
7	45	535.11	0.63	284	55	71	75	1.6	3.0		16.65	98.7
	47.5	536.75	0.65	284	55	71	75	1.6	3.0		16.92	100.6
	50	538.37	0.64	284	55	71	76	1.6	3.0		16.78	97.9
8	52.5	540.00	0.72	284	55	71	76	1.8	3.0		17.80	99.1
	55	541.71	0.72	284	55	72	76	1.8	3.0		17.80	98.1
	57.5	543.43	0.73	284	55	72	76	1.8	3.0		17.93	98.6
9	60	545.16	0.79	285	54	72	76	1.95	3.0		18.66	98.5
	62.5	546.94	0.78	285	54	72	77	1.9	3.0		18.54	97.5
	65	548.73	0.77	285	54	72	77	1.9	3.0		18.42	98.6
10	67.5	550.53	0.81	285	55	73	77	2	3.0		18.90	99.8
	70	552.36	0.81	286	55	73	77	2	3.0		18.91	98.8
	72.5	554.20	0.81	286	55	73	77	2	3.0		18.91	99.4
11	75	556.04	0.81	286	55	73	77	2	3.0		18.91	99.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 9, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	1
DGMCF	1.017	**Probe (mg)**	3.2
Barometric Pressure	30.01 "Hg	**CWTR (g)**	525.1
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	25.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.535 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%	11.19
COppm	17.3

Measured H2O
16.9 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	557.98	0.81	286	54	73	77	2	3.0		18.91	104.8
	80	559.72	0.8	286	54	74	77	2	3.0		18.79	94.0
12	82.5	561.56	0.65	286	54	74	77	1.7	3.0		16.94	100.0
	85	563.28	0.62	285	54	74	77	1.6	3.0		16.53	103.6
	87.5	564.88	0.72	285	54	74	77	1.8	3.0		17.81	98.6
	90	566.32								0.535		82.1
1	0	566.85	0.86	279	54	74	75	2	3.0		19.39	
	2.5	568.68	0.85	288	53	74	76	2	3.0		19.40	95.6
	5	570.52	0.87	288	53	74	76	2	3.0		19.62	97.2
2	7.5	572.35	0.86	288	52	74	76	2	3.0		19.51	95.6
	10	574.18	0.88	289	51	74	76	2.1	3.0		19.75	96.1
	12.5	576.04	0.89	290	51	74	77	2.1	3.0		19.87	96.7
3	15	577.91	0.87	290	51	74	77	2.1	3.0		19.65	96.6
	17.5	579.88	0.85	291	52	75	77	2.1	3.0		19.43	102.9
	20	581.64	0.84	290	53	74	77	2.1	3.0		19.31	93.0
4	22.5	583.51	0.79	290	53	75	77	1.9	3.0		18.72	99.4
	25	585.32	0.8	290	53	75	78	2	3.0		18.84	99.1
	27.5	587.15	0.8	289	53	75	78	2	3.0		18.83	99.5
5	30	589.09	0.76	289	53	75	78	1.9	3.0		18.35	105.4
	32.5	590.80	0.74	291	54	75	78	1.8	3.0		18.13	95.3
	35	592.57	0.74	290	54	75	78	1.8	3.0		18.12	100.1
6	37.5	594.33	0.72	291	54	75	78	1.8	3.0		17.89	99.4
	40	596.09	0.72	290	54	75	79	1.8	3.0		17.87	100.9
	42.5	597.85	0.71	290	55	75	79	1.8	3.0		17.75	100.7
7	45	599.61	0.72	290	55	76	79	1.8	3.0		17.87	101.4
	47.5	601.37	0.68	290	55	76	79	1.7	3.0		17.37	100.6
	50	603.11	0.65	289	55	76	79	1.7	3.0		16.97	102.3
8	52.5	604.85	0.68	289	55	76	79	1.7	3.0		17.36	104.6
	55	606.57	0.67	289	55	76	79	1.7	3.0		17.23	101.1
	57.5	608.29	0.67	288	56	76	80	1.7	3.0		17.22	101.9
9	60	610.01	0.7	288	56	76	80	1.7	4.0		17.60	101.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 9, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	1
DGMCF	1.017	**Probe (mg)**	3.2
Barometric Pressure	30.01 "Hg	**CWTR (g)**	525.1
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	25.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.535 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%	11.19
COppm	17.3

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	611.74	0.69	288	56	76	80	1.8	4.0		17.47	**100.1**
	65	613.48	0.69	288	57	77	80	1.8	4.0		17.47	**101.4**
10	67.5	615.23	0.66	282	57	77	80	1.7	4.0		17.02	**101.9**
	70	616.93	0.67	282	57	77	80	1.7	4.0		17.15	**100.8**
	72.5	618.63	0.69	283	58	77	80	1.7	4.0		17.42	**100.0**
11	75	620.32	0.69	271	58	77	80	1.7	4.0		17.27	**98.0**
	77.5	622.04	0.69	272	58	77	80	1.8	4.0		17.29	**99.0**
	80	623.79	0.68	273	58	77	80	1.8	4.0		17.17	**100.8**
12	82.5	625.55	0.66	266	59	77	80	1.7	4.0		16.84	**102.2**
	85	627.29	0.64	266	59	77	80	1.7	4.0		16.58	**102.0**
	87.5	629.02	0.65	265	60	77	80	1.7	4.0		16.70	**103.0**
	90	630.80										**105.1**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 Particulate & Metals
Date:	September 10, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.997
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	3.531 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	139.2 °C
AVERAGE GAS MOISTURE BY VOLUME	16.0 %
AVERAGE GAS VELOCITY	17.25 m/s
BAROMETRIC PRESSURE (Station)	101.422 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.156 Kpa
OXYGEN CONCENTRATION	8.32 %
CARBON DIOXIDE CONCENTRATION	11.04 %
CARBON MONOXIDE CONCENTRATION	9.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.49 m^3/s
DRY REF GAS FLOWRATE	15.15 Rm^3/s
DRY ADJ GAS FLOWRATE	19.25 Rm^3/s
WET REF GAS FLOWRATE	18.04 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		3.531 m^3
PARTICULATE CONC. - ACTUAL		0.269 mg/m^3
PARTICULATE CONC. - DRY REF		0.453 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.357 mg/m^3
PARTICULATE CONC. - WET REF		0.381 mg/m^3
PARTICULATE EMISSION RATE		0.006865 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 10, 2019	**Operator:**	KC

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	0.997	**Probe (mg)**	1.5
Barometric Pressure	29.95 "Hg	**CWTR (g)**	474.5
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.32
CO2%	11.04
COppm	9.6

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	841.90	0.7	288	59	64	65	1.5	3.0		17.59	
	2.5	843.91	0.73	288	47	65	65	1.6	3.0		17.96	115.6
	5	845.63	0.73	288	46	64	65	1.6	3.0		17.96	96.8
2	7.5	847.36	0.73	288	46	64	65	1.6	3.0		17.96	97.5
	10	849.11	0.72	288	46	65	66	1.6	3.0		17.84	98.6
	12.5	850.85	0.73	287	46	65	66	1.6	3.0		17.95	98.5
3	15	852.58	0.71	288	46	65	66	1.5	3.0		17.71	97.2
	17.5	854.29	0.69	282	46	65	67	1.5	3.0		17.39	97.5
	20	855.98	0.7	281	47	65	68	1.5	3.0		17.50	97.3
4	22.5	857.65	0.7	281	47	65	69	1.5	3.0		17.50	95.3
	25	859.36	0.7	284	47	66	69	1.6	3.0		17.54	97.4
	27.5	861.06	0.7	284	47	66	70	1.6	3.0		17.54	97.0
5	30	862.78	0.7	283	47	66	70	1.6	3.0		17.53	98.1
	32.5	864.50	0.68	283	47	66	71	1.5	3.0		17.28	98.0
	35	866.19	0.68	283	48	67	72	1.5	3.0		17.28	97.6
6	37.5	867.89	0.65	283	48	67	72	1.45	3.0		16.89	98.0
	40	869.53	0.65	283	48	67	73	1.5	3.0		16.89	96.6
	42.5	871.21	0.66	283	48	67	72	1.5	3.0		17.02	98.9
7	45	872.88	0.61	282	48	68	74	1.4	3.0		16.35	97.7
	47.5	874.50	0.61	282	49	68	73	1.4	3.0		16.35	98.2
	50	876.10	0.61	282	49	68	74	1.4	3.0		16.35	97.1
8	52.5	877.72	0.65	282	49	69	74	1.5	3.0		16.88	98.2
	55	879.38	0.65	282	49	69	74	1.5	3.0		16.88	97.4
	57.5	881.05	0.65	282	49	69	75	1.5	3.0		16.88	98.0
9	60	882.75	0.71	282	49	70	75	1.6	3.0		17.64	99.7
	62.5	884.47	0.7	281	49	70	76	1.6	3.0		17.50	96.4
	65	886.19	0.69	281	50	70	76	1.6	3.0		17.38	96.9
10	67.5	887.92	0.72	281	50	70	76	1.6	3.0		17.75	98.2
	70	889.68	0.73	281	50	70	76	1.7	3.0		17.88	97.8
	72.5	891.48	0.74	281	50	71	76	1.7	3.0		18.00	99.4
11	75	893.25	0.75	281	50	71	77	1.7	3.0		18.12	97.0

ORTECH Environmental

Plant: Covanta DYEC
Test No.: 2 Particulate & Metals
Date: September 10, 2019

Plant Location: Courtice, Ontario
Test Location: APC Outlet No. 2
Operator: KC

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	0.997	**Probe (mg)**	1.5
Barometric Pressure	29.95 "Hg	**CWTR (g)**	474.5
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.32
CO2%	11.04
COppm	9.6

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	895.03	0.75	281	50	71	77	1.7	3.0		18.12	96.8
	80	896.85	0.75	281	50	71	78	1.7	3.0		18.12	98.9
12	82.5	898.65	0.71	281	50	72	78	1.65	3.0		17.63	97.8
	85	900.42	0.71	281	50	72	78	1.65	3.0		17.63	98.7
	87.5	902.18	0.73	281	50	72	78	1.65	3.0		17.88	98.1
	90	904.04								0.81		102.3
1	0	904.85	0.59	281	61	73	75	1.3	3.0		16.07	
	2.5	906.60	0.6	280	51	73	75	1.3	3.0		16.19	107.1
	5	908.13	0.61	281	50	73	75	1.4	3.0		16.34	92.8
2	7.5	909.74	0.61	280	50	73	75	1.4	3.0		16.33	97.0
	10	911.38	0.6	280	50	73	76	1.3	3.0		16.19	98.7
	12.5	912.97	0.63	280	50	73	75	1.3	3.0		16.59	96.4
3	15	914.56	0.66	279	50	73	76	1.5	3.0		16.97	94.1
	17.5	916.26	0.65	279	50	73	76	1.5	3.0		16.84	98.2
	20	917.95	0.65	280	50	73	77	1.5	3.0		16.86	98.4
4	22.5	919.64	0.66	280	50	73	77	1.5	3.0		16.98	98.4
	25	921.35	0.65	282	50	73	76	1.5	3.0		16.88	98.8
	27.5	923.02	0.65	282	50	73	77	1.5	3.0		16.88	97.4
5	30	924.69	0.63	282	51	74	78	1.4	3.0		16.62	97.3
	32.5	926.35	0.63	282	51	74	78	1.4	3.0		16.62	98.1
	35	927.99	0.62	282	51	74	78	1.4	3.0		16.48	96.9
6	37.5	929.62	0.59	283	51	74	78	1.3	3.0		16.09	97.1
	40	931.21	0.58	283	51	74	79	1.3	3.0		15.95	97.1
	42.5	932.79	0.6	283	51	74	79	1.3	3.0		16.23	97.2
7	45	934.49	0.54	283	51	74	79	1.2	3.0		15.39	102.9
	47.5	935.92	0.54	283	52	74	78	1.25	3.0		15.39	91.2
	50	937.58	0.54	283	52	74	79	1.2	3.0		15.39	106.0
8	52.5	939.02	0.62	283	52	75	79	1.4	3.0		16.50	91.8
	55	940.66	0.63	283	52	75	79	1.4	3.0		16.63	97.6
	57.5	942.33	0.65	283	52	75	80	1.4	3.0		16.89	98.6
9	60	944.00	0.68	283	53	75	80	1.6	3.0		17.28	96.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 10, 2019	**Operator:**	KC

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	0.997	**Probe (mg)**	1.5
Barometric Pressure	29.95 "Hg	**CWTR (g)**	474.5
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.8
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 ft^3
Length	0.000 ft	**Reading Interval**	2.5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.32
CO2%	11.04
COppm	9.6

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	945.73	0.69	283	53	75	80	1.6	3.0		17.40	98.2
	65	947.46	0.69	283	53	75	81	1.6	3.0		17.40	97.5
10	67.5	949.17	0.77	283	53	76	81	1.8	4.0		18.38	96.3
	70	951.01	0.77	283	53	76	81	1.8	4.0		18.38	98.0
	72.5	952.88	0.78	283	53	76	81	1.8	4.0		18.50	99.6
11	75	954.73	0.81	284	53	76	81	1.9	4.0		18.87	97.9
	77.5	956.63	0.81	284	54	76	81	1.9	4.0		18.87	98.8
	80	958.52	0.81	284	54	76	81	1.9	4.0		18.87	98.3
12	82.5	960.43	0.8	284	54	76	82	1.9	4.0		18.75	99.3
	85	962.30	0.8	284	54	76	82	1.9	4.0		18.75	97.8
	87.5	964.19	0.81	284	54	77	82	1.9	4.0		18.87	98.8
	90	966.21										104.8

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 Particulate & Metals
Date:	September 10, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	3.375 m^3
AVGERGE ISOKINETICITY	96.9 %
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	139.1 °C
AVERAGE GAS MOISTURE BY VOLUME	15.2 %
AVERAGE GAS VELOCITY	16.62 m/s
BAROMETRIC PRESSURE (Station)	101.151 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	98.886 Kpa
OXYGEN CONCENTRATION	8.27 %
CARBON DIOXIDE CONCENTRATION	10.93 %
CARBON MONOXIDE CONCENTRATION	18.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.55 m^3/s
DRY REF GAS FLOWRATE	14.69 Rm^3/s
DRY ADJ GAS FLOWRATE	18.74 Rm^3/s
WET REF GAS FLOWRATE	17.33 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		3.375 m^3
PARTICULATE CONC. - ACTUAL		0.284 mg/m^3
PARTICULATE CONC. - DRY REF		0.474 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.372 mg/m^3
PARTICULATE CONC. - WET REF		0.402 mg/m^3
PARTICULATE EMISSION RATE		0.006964 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 10, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	1.017	**Probe (mg)**	1.5
Barometric Pressure	29.87 "Hg	**CWTR (g)**	424.1
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	21.7
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 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%	8.27
CO2%	10.93
COppm	18.1

Measured H2O
15.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	710.23	0.58	280	68	71	71	1.3	3.0		15.92	
	2.5	712.11	0.61	257	59	71	72	1.4	3.0		16.07	117.9
	5	713.71	0.6	259	56	72	72	1.5	3.0		15.96	96.3
2	7.5	715.33	0.59	261	54	72	73	1.5	3.0		15.85	98.4
	10	716.92	0.57	261	53	72	73	1.5	3.0		15.58	97.4
	12.5	718.48	0.57	262	51	72	74	1.4	3.0		15.59	97.2
3	15	720.03	0.59	262	51	72	74	1.5	3.0		15.86	96.6
	17.5	721.59	0.6	278	50	73	75	1.5	3.0		16.17	95.5
	20	723.15	0.58	279	50	73	76	1.4	3.0		15.91	95.6
4	22.5	724.70	0.59	279	50	73	76	1.4	3.0		16.05	96.6
	25	726.24	0.57	282	50	73	77	1.4	3.0		15.81	95.1
	27.5	727.79	0.57	282	50	73	77	1.4	3.0		15.81	97.5
5	30	729.34	0.55	282	50	74	78	1.4	3.0		15.53	97.5
	32.5	730.89	0.55	283	50	74	78	1.4	3.0		15.54	99.1
	35	732.43	0.56	282	50	74	79	1.4	3.0		15.67	98.5
6	37.5	733.97	0.57	282	50	75	79	1.4	3.0		15.81	97.5
	40	735.50	0.55	282	50	75	79	1.4	3.0		15.53	95.9
	42.5	737.03	0.56	282	50	75	79	1.4	3.0		15.67	97.6
7	45	738.59	0.56	282	50	75	80	1.4	3.0		15.67	98.6
	47.5	740.10	0.54	282	50	76	80	1.3	3.0		15.38	95.4
	50	741.60	0.54	282	50	76	80	1.3	3.0		15.38	96.4
8	52.5	743.10	0.61	283	50	76	80	1.5	3.0		16.36	96.4
	55	744.67	0.61	283	50	76	80	1.5	3.0		16.36	95.0
	57.5	746.24	0.61	283	50	76	81	1.5	3.0		16.36	95.0
9	60	747.82	0.66	284	50	77	81	1.6	3.0		17.03	95.5
	62.5	749.45	0.69	284	50	77	81	1.7	3.0		17.41	94.8
	65	751.12	0.66	284	50	77	81	1.6	3.0		17.03	95.0
10	67.5	752.78	0.68	284	50	77	81	1.6	3.0		17.29	96.5
	70	754.42	0.7	284	51	77	81	1.7	3.0		17.54	93.9
	72.5	756.10	0.68	284	51	77	81	1.7	3.0		17.29	94.9
11	75	757.79	0.71	285	51	77	82	1.7	3.0		17.68	96.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 10, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	1.017	**Probe (mg)**	1.5
Barometric Pressure	29.87 "Hg	**CWTR (g)**	424.1
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	21.7
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 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%	8.27
CO2%	10.93
COppm	18.1

Measured H2O
15.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	759.47	0.74	285	51	78	82	1.8	3.0		18.05	**94.2**
	80	761.21	0.71	285	51	78	82	1.7	3.0		17.68	**95.5**
12	82.5	762.92	0.72	286	51	78	82	1.7	3.0		17.81	**95.8**
	85	764.63	0.72	286	51	78	82	1.7	3.0		17.81	**95.2**
	87.5	766.34	0.73	286	51	78	82	1.8	3.0		17.94	**95.2**
	90	768.14								0.81		**99.5**
1	0	768.95	0.78	286	63	78	78	1.8	3.0		18.54	
	2.5	770.82	0.77	286	52	78	79	1.8	3.0		18.42	**100.4**
	5	772.59	0.78	288	51	78	79	1.8	3.0		18.56	**95.5**
2	7.5	774.33	0.75	288	51	78	79	1.8	3.0		18.20	**93.4**
	10	776.07	0.73	288	51	78	80	1.8	3.0		17.96	**95.3**
	12.5	777.82	0.73	288	51	78	80	1.8	3.0		17.96	**97.0**
3	15	779.57	0.75	288	52	78	80	1.8	3.0		18.20	**97.0**
	17.5	781.32	0.73	289	52	78	81	1.8	3.0		17.97	**95.7**
	20	783.07	0.76	288	52	78	81	1.8	3.0		18.32	**97.0**
4	22.5	784.82	0.72	288	52	78	81	1.8	3.0		17.84	**95.0**
	25	786.57	0.74	288	53	78	81	1.8	3.0		18.08	**97.6**
	27.5	788.32	0.74	288	53	78	81	1.8	3.0		18.08	**96.3**
5	30	790.07	0.67	288	53	78	81	1.6	3.0		17.21	**96.3**
	32.5	791.75	0.66	289	54	78	82	1.6	3.0		17.09	**97.1**
	35	793.41	0.65	288	54	78	82	1.6	3.0		16.95	**96.7**
6	37.5	795.08	0.54	288	54	78	82	1.3	3.0		15.45	**97.9**
	40	796.61	0.54	288	55	78	82	1.3	3.0		15.45	**98.3**
	42.5	798.14	0.52	288	55	78	82	1.3	3.0		15.16	**98.3**
7	45	799.66	0.56	288	55	78	82	1.4	3.0		15.73	**99.6**
	47.5	801.21	0.58	287	55	78	82	1.4	3.0		16.00	**97.9**
	50	802.76	0.57	287	55	78	82	1.4	3.0		15.86	**96.1**
8	52.5	804.32	0.6	287	56	79	83	1.5	3.0		16.27	**97.6**
	55	805.90	0.61	287	56	79	83	1.5	3.0		16.41	**96.2**
	57.5	807.50	0.6	287	56	79	83	1.5	3.0		16.27	**96.6**
9	60	809.09	0.62	287	56	79	83	1.5	3.0		16.54	**96.8**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	September 10, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	0.1
DGMCF	1.017	**Probe (mg)**	1.5
Barometric Pressure	29.87 "Hg	**CWTR (g)**	424.1
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	21.7
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.81 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%	8.27
CO2%	10.93
COppm	18.1

Measured H2O
15.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	810.69	0.62	287	56	79	83	1.5	3.0		16.54	95.8
	65	812.28	0.61	288	57	79	83	1.5	3.0		16.42	95.2
10	67.5	813.96	0.6	288	57	79	83	1.5	3.0		16.28	101.5
	70	815.47	0.59	287	56	79	83	1.5	3.0		16.13	92.0
	72.5	817.06	0.59	285	56	79	83	1.5	3.0		16.11	97.6
11	75	818.65	0.58	285	57	79	83	1.5	3.0		15.98	97.4
	77.5	820.23	0.6	275	57	80	83	1.5	3.0		16.14	97.7
	80	821.84	0.58	275	56	80	83	1.5	3.0		15.87	97.1
12	82.5	823.43	0.6	275	56	80	83	1.5	3.0		16.14	97.5
	85	825.02	0.59	274	57	80	83	1.5	3.0		15.99	95.9
	87.5	826.61	0.58	274	57	80	83	1.5	3.0		15.86	96.6
	90	828.20										97.2

APPENDIX 23

Particle Size Distribution Test Emission Calculations
(12 pages)

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 10, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 1

Project No.: 21960
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	1.018
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.96
Static Pressure ("H_2O)	-8.80
Oxygen Content (%)	8.28
Carbon Dioxide Content (%)	11.09
Carbon Monoxide Content (PPM)	8.8
Assumed Moisture (%)	
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}	42.7 Rft^3*	1.209 Rm^3*
Average Cyclone I Cut Diameter		9.96 µm
Average Cyclone IV Cut Diameter		2.22 µm
Average Isokineticity		103.9 %
Stack Gas Physical Parameters		
B_{ws}	16.0 % v/v	
Average m	212.9 (dimensionless)	
M_d	30.11 lbs/lbs mole	
M_w	28.17 lbs/lbs mole	
Average T_s	283 °F	139 °C
Average U_s	54.1 ft/s	16.5 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	51751 ACFM	24.4 m^3/s
Wet Reference Q_s	36662 SCFM*	17.3 Rm^3/s*
Dry Reference Q_s	30788 SCFM*	14.5 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.83 mg/Rm^3*	0.0120 g/s
Total Part. (b)	2.23 mg/Rm^3*	0.032 g/s
PM_{10} Part. (b)	1.65 mg/Rm^3*	0.024 g/s
$PM_{2.5}$ Part. (b)	1.57 mg/Rm^3*	0.023 g/s
Cond. Part.	1.41 mg/Rm^3*	0.020 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)	490.7	671.0	757.5	972.7	
final volume or weight (ml or mg)	650.5	671.7	755.9	983.5	
gain in volume or weight (ml or mg)	159.8	0.7	-1.6	10.8	0.0
				TOTAL	**169.7**

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.7	<0.1	<0.1	<0.1	1.7

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 10, 2019	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21960
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	0.0	10.18	74.16	0.70	0.35	281	65	64	0.38	3.0	57.4	10.32	2.38	97.4
	2	10.2	10.73	77.51	0.70	0.35	281	66	65	0.38	3.0	57.4	10.42	2.42	96.1
	3	20.9	10.53	81.00	0.63	0.35	282	66	65	0.38	3.0	54.5	9.90	2.22	109.0
	4	31.4	9.90	84.68	0.61	0.35	282	68	66	0.38	3.0	53.6	9.92	2.22	110.5
	5	41.3	9.30	88.14	0.56	0.35	281	70	67	0.38	3.0	51.3	10.05	2.27	113.1
	6	50.6	9.06	91.34	0.52	0.35				0.38		39.0	8.65	1.53	105.6
		59.7		94.44											
2	1	0.0	10.80	94.44	0.74	0.35	282	71	68	0.38	3.0	59.0	10.06	2.28	98.4
	2	10.8	10.60	98.16	0.75	0.35	284	71	68	0.38	3.0	59.5	10.12	2.31	97.0
	3	21.4	9.90	101.78	0.75	0.35	284	73	70	0.38	3.0	59.5	10.02	2.27	98.4
	4	31.3	10.25	105.22	0.66	0.35	285	73	70	0.38	3.0	55.9	9.99	2.26	105.4
	5	41.6	9.37	108.80	0.59	0.35	284	73	70	0.38	3.0	52.8	9.95	2.24	112.0
	6	50.9	9.37	112.09	0.53	0.35	283	74	72	0.38	3.0	50.0	10.06	2.28	116.3
		60.3		115.34											
Averages					**0.65**		**283**	**68**		**0.38**		**54.1**	**9.96**	**2.22**	**103.9**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 10, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 1

Project No.: 21960
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	1.018
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.91
Static Pressure ("H_2O)	-8.80
Oxygen Content (%)	8.02
Carbon Dioxide Content (%)	11.27
Carbon Monoxide Content (PPM)	13
Assumed Moisture (%)	
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}	42.7 Rft^3*	1.208 Rm^3*
Average Cyclone I Cut Diameter		10.06 µm
Average Cyclone IV Cut Diameter		2.29 µm
Average Isokineticity		106.2 %
Stack Gas Physical Parameters		
B_{ws}	16.0 % v/v	
Average m	218.9 (dimensionless)	
M_d	30.12 lbs/lbs mole	
M_w	28.18 lbs/lbs mole	
Average T_s	280 °F	138 °C
Average U_s	54.3 ft/s	16.5 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	51882 ACFM	24.5 m^3/s
Wet Reference Q_s	36815 SCFM*	17.4 Rm^3/s*
Dry Reference Q_s	30925 SCFM*	14.6 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.58 mg/Rm^3*	0.0085 g/s
Total Part. (b)	4.30 mg/Rm^3*	0.063 g/s
PM_{10} Part. (b)	4.06 mg/Rm^3*	0.059 g/s
$PM_{2.5}$ Part. (b)	3.89 mg/Rm^3*	0.057 g/s
Cond. Part.	3.72 mg/Rm^3*	0.054 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	531.0	539.6	741.8	943.5	
final volume or weight (ml or mg)	692.0	539.6	740.7	952.9	
gain in volume or weight (ml or mg)	161.0	0.0	-1.1	9.4	0.0
				TOTAL	169.3

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.3	0.2	<0.1	<0.1	4.5

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 10, 2019	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21960
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	0.0	10.44	15.45	0.78	0.35	283	74	73	0.38	3.0	60.7	10.00	2.26	96.5
	2	10.4	10.44	19.10	0.78	0.35	283	74	73	0.38	3.0	60.7	10.00	2.26	96.5
	3	20.9	9.90	22.75	0.77	0.35	283	75	73	0.38	3.0	60.3	10.36	2.40	92.5
	4	30.8	9.74	26.05	0.67	0.35	282	76	74	0.38	3.0	56.2	10.10	2.30	102.6
	5	40.5	9.34	29.42	0.56	0.35	281	76	74	0.38	3.0	51.3	10.03	2.27	113.3
	6	49.9	9.00	32.68	0.50	0.35	281	77	74	0.38	3.0	48.5	9.35	2.01	132.3
		58.9		36.15											
2	1	0.0	10.73	36.15	0.66	0.35	278	76	74	0.38	3.0	55.6	10.33	2.39	99.8
	2	10.7	10.80	39.74	0.66	0.35	279	77	75	0.38	3.0	55.7	10.36	2.40	99.5
	3	21.5	10.80	43.35	0.63	0.35	278	77	75	0.38	3.0	54.3	10.30	2.37	102.6
	4	32.3	10.14	46.99	0.56	0.35	278	78	76	0.38	3.0	51.2	9.93	2.23	114.6
	5	42.5	9.58	50.59	0.51	0.35	278	78	76	0.38	3.0	48.9	10.04	2.27	118.2
	6	52.1	9.08	53.94	0.49	0.35	278	78	76	0.38	3.0	47.9	9.86	2.20	123.8
		61.1		57.20											
Averages					**0.63**		**280**	**75**		**0.38**		**54.3**	**10.06**	**2.29**	**106.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 10, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 1

Project No.: 21960
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	1.018
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.85
Static Pressure ("H_2O)	-8.90
Oxygen Content (%)	8.14
Carbon Dioxide Content (%)	11.10
Carbon Monoxide Content (PPM)	14.9
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.1 l/min*
Cyclone Qs_{actual}	0.61 ft^3/min	17.2 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.7 Rft^3*	1.209 Rm^3*
Average Cyclone I Cut Diameter		9.97 µm
Average Cyclone IV Cut Diameter		2.26 µm
Average Isokineticity		105.2 %
Stack Gas Physical Parameters		
B_{ws}	16.8 % v/v	
Average m	219.2 (dimensionless)	
M_d	30.10 lbs/lbs mole	
M_w	28.07 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	55.5 ft/s	16.9 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53093 ACFM	25.1 m^3/s
Wet Reference Q_s	37418 SCFM*	17.7 Rm^3/s*
Dry Reference Q_s	31138 SCFM*	14.7 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.33 mg/Rm^3*	0.0049 g/s
Total Part. (b)	2.15 mg/Rm^3*	0.032 g/s
PM_{10} Part. (b)	2.07 mg/Rm^3*	0.030 g/s
$PM_{2.5}$ Part. (b)	1.98 mg/Rm^3*	0.029 g/s
Cond. Part.	1.82 mg/Rm^3*	0.027 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)	490.7	671.7	755.9	983.5	
final volume or weight (ml or mg)	661.4	671.3	754.1	994.4	
gain in volume or weight (ml or mg)	170.7	-0.4	-1.8	10.9	0.0
				TOTAL	179.4

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	<0.1	<0.1	<0.1	2.2

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 10, 2019	Plant: DYEC	Test No.: 3	Project No.: 21960
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	0.0	11.16	57.38	0.71	0.35	282	75	74	0.38	4.0	58.0	9.98	2.26	101.0
	2	11.2	11.16	61.26	0.74	0.35	284	75	74	0.38	4.0	59.3	9.95	2.24	99.6
	3	22.3	11.09	65.16	0.71	0.35	285	76	75	0.38	4.0	58.1	10.34	2.40	96.4
	4	33.4	10.34	68.84	0.63	0.35	284	76	75	0.38	4.0	54.7	10.05	2.28	106.4
	5	43.7	9.45	72.41	0.58	0.35	283	77	75	0.38	4.0	52.5	10.00	2.26	111.6
	6	53.2	8.93	75.70	0.51	0.35	283	77	75	0.38	4.0	49.2	9.80	2.18	122.5
		62.1		78.90											
2	1	0.0	10.26	78.90	0.74	0.35	282	77	75	0.38	4.0	59.2	10.04	2.28	98.1
	2	10.3	10.26	82.45	0.74	0.35	283	77	75	0.38	4.0	59.3	9.96	2.25	99.3
	3	20.5	10.03	86.04	0.68	0.35	283	77	76	0.38	4.0	56.8	9.79	2.18	106.2
	4	30.6	9.45	89.64	0.65	0.35	283	77	75	0.38	4.0	55.6	9.98	2.25	105.7
	5	40.0	9.02	92.94	0.60	0.35	283	77	76	0.38	4.0	53.4	9.98	2.26	110.0
	6	49.0	8.84	96.09	0.53	0.35	287	79	77	0.38	4.0	50.3	9.78	2.18	120.9
		57.9		99.28											
Averages					**0.65**		**284**	**76**		**0.38**		**55.5**	**9.97**	**2.26**	**105.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 9, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 2

Project No.: 21960
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	0.997
Pitot Factor	0.848
Barometric Pressure (" Hg)	30.03
Static Pressure ("H_2O)	-9.20
Oxygen Content (%)	8.45
Carbon Dioxide Content (%)	10.87
Carbon Monoxide Content (PPM)	10.5
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}	0.61 ft^3/min	17.1 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.4 Rft^3*	1.201 Rm^3*
Average Cyclone I Cut Diameter		9.99 µm
Average Cyclone IV Cut Diameter		2.26 µm
Average Isokineticity		102.2 %
Stack Gas Physical Parameters		
B_{ws}	17.5 % v/v	
Average m	219.1 (dimensionless)	
M_d	30.08 lbs/lbs mole	
M_w	27.96 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	56.7 ft/s	17.3 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	54188 ACFM	25.6 m^3/s
Wet Reference Q_s	38367 SCFM*	18.1 Rm^3/s*
Dry Reference Q_s	31646 SCFM*	14.9 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.33 mg/Rm^3*	0.0050 g/s
Total Part. (b)	2.66 mg/Rm^3*	0.040 g/s
PM_{10} Part. (b)	2.58 mg/Rm^3*	0.039 g/s
$PM_{2.5}$ Part. (b)	2.50 mg/Rm^3*	0.037 g/s
Cond. Part.	2.33 mg/Rm^3*	0.035 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)	490.7	671.0	753.6	962.2	
final volume or weight (ml or mg)	668.8	671.0	752.6	972.7	
gain in volume or weight (ml or mg)	178.1	0.0	-1.0	10.5	0.0
				TOTAL	187.6

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.1	<0.1	<0.1	<0.1	2.8

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 9, 2019	Plant: DYEC	Test No.: 1	Project No.: 21960
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	0.0	10.69	57.14	0.74	0.35	283	63	63	0.38	5.0	59.2	9.91	2.23	99.9
	2	10.7	10.62	60.85	0.78	0.35	285	64	64	0.38	5.0	60.9	9.80	2.19	99.0
	3	21.3	10.47	64.60	0.78	0.35	286	65	65	0.38	5.0	60.9	10.21	2.35	93.6
	4	31.8	10.10	68.10	0.73	0.35	286	66	67	0.38	5.0	59.0	9.92	2.23	100.8
	5	41.9	9.72	71.63	0.67	0.35	285	66	67	0.38	5.0	56.4	9.90	2.23	105.3
	6	51.6	9.32	75.03	0.59	0.35	285	67	70	0.38	5.0	53.0	9.93	2.24	111.8
		60.9		78.29											
2	1	0.0	10.47	78.29	0.77	0.35	285	69	69	0.38	5.0	60.5	9.95	2.24	97.7
	2	10.5	10.18	81.95	0.73	0.35	284	69	70	0.38	5.0	58.9	10.17	2.33	97.1
	3	20.6	10.10	85.40	0.68	0.35	283	69	71	0.38	5.0	56.8	10.12	2.31	101.2
	4	30.7	9.79	88.85	0.64	0.35	283	70	72	0.38	5.0	55.1	10.02	2.27	105.8
	5	40.5	9.40	92.25	0.58	0.35	282	70	73	0.38	5.0	52.4	9.98	2.25	111.6
	6	49.9	9.15	95.53	0.47	0.35	282	71	73	0.38	5.0	47.2	9.95	2.24	124.5
		59.1		98.74											
Averages					**0.68**		**284**	**68**		**0.38**		**56.7**	**9.99**	**2.26**	**102.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 9, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 2

Project No.: 21960
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	0.997
Pitot Factor	0.848
Barometric Pressure (" Hg)	30.01
Static Pressure ("H_2O)	-9.10
Oxygen Content (%)	8.20
Carbon Dioxide Content (%)	11.11
Carbon Monoxide Content (PPM)	16.6
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.1 l/min*
Cyclone Qs_{actual}	0.61 ft^3/min	17.2 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.7 Rft^3*	1.209 Rm^3*
Average Cyclone I Cut Diameter		9.95 μm
Average Cyclone IV Cut Diameter		2.24 μm
Average Isokineticity		103.6 %
Stack Gas Physical Parameters		
B_{ws}	17.3 % v/v	
Average m	219.2 (dimensionless)	
M_d	30.11 lbs/lbs mole	
M_w	28.01 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	56.3 ft/s	17.2 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53808 ACFM	25.4 m^3/s
Wet Reference Q_s	38069 SCFM*	18.0 Rm^3/s*
Dry Reference Q_s	31483 SCFM*	14.9 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.33 mg/Rm^3*	0.0049 g/s
Total Part. (b)	4.63 mg/Rm^3*	0.069 g/s
PM_{10} Part. (b)	4.55 mg/Rm^3*	0.068 g/s
$PM_{2.5}$ Part. (b)	4.47 mg/Rm^3*	0.066 g/s
Cond. Part.	4.30 mg/Rm^3*	0.064 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	531.0	539.5	743.1	933.5	
final volume or weight (ml or mg)	708.3	539.5	741.8	943.5	
gain in volume or weight (ml or mg)	177.3	0.0	-1.3	10.0	0.0
				TOTAL	186.0

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.1	<0.1	<0.1	<0.1	5.2

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 9, 2019	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21960
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	0.0	10.46	99.19	0.83	0.35	288	73	73	0.38	3.5	62.9	10.01	2.27	93.5
	2	10.5	10.74	102.85	0.78	0.35	286	72	73	0.38	3.5	60.9	9.94	2.24	97.2
	3	21.2	10.74	106.64	0.73	0.35	286	72	73	0.38	3.5	58.9	10.00	2.26	99.7
	4	31.9	10.39	110.40	0.70	0.35	286	73	74	0.38	3.5	57.7	10.01	2.27	101.7
	5	42.3	9.95	114.04	0.66	0.35	285	73	74	0.38	3.5	56.0	10.02	2.27	104.4
	6	52.3	9.34	117.52	0.56	0.35	285	74	76	0.38	3.5	51.6	10.07	2.29	112.5
		61.6		120.77											
2	1	0.0	10.67	120.77	0.74	0.35	283	74	76	0.38	3.5	59.2	10.04	2.28	98.2
	2	10.7	10.39	124.50	0.75	0.35	283	75	77	0.38	3.5	59.6	9.82	2.19	100.5
	3	21.1	10.02	128.25	0.71	0.35	283	75	77	0.38	3.5	58.0	9.86	2.21	102.8
	4	31.1	9.73	131.85	0.63	0.35	283	76	79	0.38	3.5	54.6	10.05	2.28	106.2
	5	40.8	9.26	135.26	0.54	0.35	283	76	78	0.38	3.5	50.6	9.60	2.11	122.4
	6	50.1	8.33	138.72	0.44	0.35	281	76	78	0.38	3.5	45.6	10.02	2.27	127.4
		58.4		141.65											
Averages					**0.67**		**284**	**75**		**0.38**		**56.3**	**9.95**	**2.24**	**103.6**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	September 11, 2019
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 2

Project No.: 21960
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	0.997
Pitot Factor	0.848
Barometric Pressure (" Hg)	29.79
Static Pressure ("H_2O)	-10.10
Oxygen Content (%)	8.22
Carbon Dioxide Content (%)	10.96
Carbon Monoxide Content (PPM)	19
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1775

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.9 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	17.1 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.9 Rft^3*	1.186 Rm^3*
Average Cyclone I Cut Diameter		10.02 µm
Average Cyclone IV Cut Diameter		2.28 µm
Average Isokineticity		103.5 %
Stack Gas Physical Parameters		
B_{ws}	17.5 % v/v	
Average m	218.7 (dimensionless)	
M_d	30.08 lbs/lbs mole	
M_w	27.97 lbs/lbs mole	
Average T_s	283 °F	140 °C
Average U_s	56.1 ft/s	17.1 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53596 ACFM	25.3 m^3/s
Wet Reference Q_s	37598 SCFM*	17.7 Rm^3/s*
Dry Reference Q_s	31013 SCFM*	14.6 Rm^3/s*
Summary of Particulate Emission Rates		
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.51 mg/Rm^3*	0.0074 g/s
Total Part. (b)	3.71 mg/Rm^3*	0.054 g/s
PM_{10} Part. (b)	3.46 mg/Rm^3*	0.051 g/s
$PM_{2.5}$ Part. (b)	3.37 mg/Rm^3*	0.049 g/s
Cond. Part.	3.20 mg/Rm^3*	0.047 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	531.0	539.6	740.7	952.9	
final volume or weight (ml or mg)	706.5	539.6	738.1	965.2	
gain in volume or weight (ml or mg)	175.5	0.0	-2.6	12.3	0.0
				TOTAL	185.2

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.3	<0.1	<0.1	<0.1	3.8

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: September 11, 2019	Plant: DYEC	Test No.: 3	Project No.: 21960
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	0.0	11.15	67.18	0.71	0.35	282	75	75	0.38	4.0	58.3	9.96	2.25	100.9
	2	11.1	10.81	71.11	0.72	0.35	282	75	75	0.38	4.0	58.7	10.01	2.27	99.5
	3	22.0	10.45	74.89	0.72	0.35	283	76	77	0.38	4.0	58.7	10.03	2.28	99.3
	4	32.4	10.24	78.55	0.71	0.35	284	76	77	0.38	4.0	58.4	10.04	2.29	100.0
	5	42.6	9.94	82.13	0.64	0.35	285	77	78	0.38	4.0	55.4	9.91	2.23	107.4
	6	52.6	9.16	85.68	0.53	0.35	284	77	78	0.38	4.0	50.4	10.04	2.28	115.8
		61.7		88.89											
2	1	0.0	10.53	88.89	0.73	0.35	283	78	78	0.38	4.0	59.1	10.10	2.31	97.7
	2	10.5	10.60	92.55	0.71	0.35	283	78	78	0.38	4.0	58.3	10.07	2.30	99.5
	3	21.1	10.31	96.25	0.70	0.35	283	78	78	0.38	4.0	57.9	10.07	2.30	100.2
	4	31.4	9.71	99.85	0.65	0.35	283	78	79	0.38	4.0	55.8	9.93	2.24	106.0
	5	41.1	8.99	103.31	0.56	0.35	283	79	80	0.38	4.0	51.8	10.06	2.29	112.1
	6	50.1	8.12	106.46	0.52	0.35	283	79	80	0.38	4.0	49.9	9.97	2.26	117.8
		58.3		109.34											
Averages					**0.66**		**283**	**77**		**0.38**		**56.1**	**10.02**	**2.28**	**103.5**

APPENDIX 24

Acid Gases Test Emission Calculations
(12 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No 1
Test No.:	1 - Method 26A
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.018
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	2.221 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	139.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.5 %
AVERAGE GAS VELOCITY	16.70 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.166 Kpa
ABSOLUTE GAS PRESSURE	99.561 Kpa
OXYGEN CONCENTRATION	8.13 %
CARBON DIOXIDE CONCENTRATION	11.22 %
CARBON MONOXIDE CONCENTRATION	9.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.68 m^3/s
DRY REF GAS FLOWRATE	14.62 Rm^3/s
DRY ADJ GAS FLOWRATE	18.86 Rm^3/s
WET REF GAS FLOWRATE	17.52 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		2.221 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Method 26A	**Test Location:**	APC Outlet No 1
Date:	September 9, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.018	**Probe (mg)**	0
Barometric Pressure	30.04 "Hg	**CWTR (g)**	302.2
Static Pressure	-8.700 "H_2O	**WCBDA (g)**	21
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.48 ft^3
Length	0.000 ft	**Reading Interval**	5 minutes
Width	0.000 ft	**Number of Ports**	2
		Number of points / Port	12

Combustion Gases	
O2%	8.13
CO2%	11.22
COppm	9.9

Measured H2O
16.5 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures: Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	18.04	0.77	282	68	60	59	1.7	3.0		18.33	
2	5	21.52	0.77	284	46	61	59	1.6	3.0		18.35	**100.7**
3	10	24.84	0.73	284	45	61	59	1.5	3.0		17.87	**96.1**
4	15	28.06	0.65	284	46	64	59	1.4	2.5		16.86	**95.7**
5	20	31.18	0.59	284	48	64	59	1.3	2.5		16.06	**97.9**
6	25	34.23	0.53	283	49	68	60	1.1	2.0		15.21	**100.5**
7	30	37.20	0.59	283	47	69	60	1.2	2.0		16.05	**102.6**
8	35	40.11	0.6	283	45	70	61	1.3	2.0		16.19	**95.2**
9	40	43.12	0.6	283	44	71	61	1.3	2.0		16.19	**97.5**
10	45	46.13	0.59	281	43	72	62	1.3	2.0		16.03	**97.4**
11	50	49.19	0.52	281	44	74	63	1.1	2.0		15.05	**99.5**
12	55	52.01	0.51	281	47	73	63	1.1	2.0		14.91	**97.4**
	60	54.83								0.48		**98.4**
1	0	55.31	0.73	282	50	69	64	1.6	3.0		17.84	
2	5	58.73	0.77	284	42	71	66	1.6	3.0		18.35	**100.2**
3	10	62.16	0.77	286	41	73	65	1.6	3.0		18.38	**97.7**
4	15	65.60	0.68	286	41	75	66	1.5	3.0		17.27	**98.0**
5	20	68.83	0.59	285	40	75	66	1.3	2.5		16.07	**97.6**
6	25	71.84	0.56	284	40	76	66	1.2	2.5		15.65	**97.5**
7	30	74.75	0.59	283	41	76	66	1.3	2.5		16.05	**96.6**
8	35	77.69	0.61	284	41	76	67	1.3	2.5		16.33	**95.0**
9	40	80.74	0.69	284	42	72	68	1.6	3.0		17.37	**96.9**
10	45	84.05	0.64	284	42	71	68	1.4	3.0		16.73	**99.3**
11	50	87.19	0.65	284	44	69	70	1.4	3.0		16.86	**97.8**
12	55	90.33	0.65	284	44	70	69	1.4	3.0		16.86	**97.1**
	60	93.51										**98.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No 1
Test No.:	2 - Method 26A
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.018
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	1.194 m^3
AVGERGE ISOKINETICITY	101.1 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.2 °C
AVERAGE GAS MOISTURE BY VOLUME	18.3 %
AVERAGE GAS VELOCITY	17.82 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.166 Kpa
ABSOLUTE GAS PRESSURE	99.561 Kpa
OXYGEN CONCENTRATION	8.3 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	7.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.33 m^3/s
DRY REF GAS FLOWRATE	15.22 Rm^3/s
DRY ADJ GAS FLOWRATE	19.37 Rm^3/s
WET REF GAS FLOWRATE	18.62 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.194 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 - Method 26A	**Test Location:**	APC Outlet No 1
Date:	September 9, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.018	**Probe (mg)**	0
Barometric Pressure	30.04 "Hg	**CWTR (g)**	183.5
Static Pressure	-8.700 "H_2O	**WCBDA (g)**	12.7
Nozzle	0.2506 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%	8.3
CO2%	11.01
COppm	7.0

Measured H2O
18.3 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	94.07	0.63	280	61	69	68	1.4	2.0		16.62	
2	5	97.29	0.65	286	52	68	66	1.4	2.0		16.95	**102.8**
3	10	100.36	0.7	283	52	68	67	1.6	2.5		17.56	**97.1**
4	15	103.63	0.7	286	53	69	67	1.6	2.5		17.59	**99.4**
5	20	106.91	0.68	287	56	70	67	1.5	2.5		17.35	**99.8**
6	25	110.14	0.74	287	57	70	66	1.6	3.0		18.10	**99.7**
7	30	113.53	0.74	288	62	72	67	1.6	3.0		18.11	**100.4**
8	35	116.92	0.7	288	55	72	67	1.6	3.0		17.62	**100.2**
9	40	120.30	0.7	288	52	72	67	1.6	3.0		17.62	**102.7**
10	45	123.65	0.76	287	50	72	67	1.7	3.0		18.35	**101.8**
11	50	127.10	0.81	287	48	73	68	1.7	3.0		18.94	**100.6**
12	55	130.70	0.82	286	48	73	68	1.8	3.0		19.04	**101.5**
	60	134.52										**107.0**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No 1
Test No.:	3 - Method 26A
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.018
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	1.123 m^3
AVGERGE ISOKINETICITY	99.3 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.5 ^oC
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	16.76 m/s
BAROMETRIC PRESSURE (Station)	101.659 Kpa
STATIC PRESSURE	-2.166 Kpa
ABSOLUTE GAS PRESSURE	99.493 Kpa
OXYGEN CONCENTRATION	8.18 %
CARBON DIOXIDE CONCENTRATION	11.28 %
CARBON MONOXIDE CONCENTRATION	9.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.76 m^3/s
DRY REF GAS FLOWRATE	14.57 Rm^3/s
DRY ADJ GAS FLOWRATE	18.71 Rm^3/s
WET REF GAS FLOWRATE	17.61 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.123 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 - Method 26A	**Test Location:**	APC Outlet No 1
Date:	September 9, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.018	**Probe (mg)**	0
Barometric Pressure	30.02 "Hg	**CWTR (g)**	159.7
Static Pressure	-8.700 "H_2O	**WCBDA (g)**	12.7
Nozzle	0.2506 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%	11.28
COppm	9.2

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	35.47	0.59	280	68	71	69	1.3	2.0		16.05	
2	5	38.56	0.59	280	51	70	69	1.3	2.0		16.05	**100.6**
3	10	41.55	0.61	275	51	70	69	1.3	2.5		16.26	**97.4**
4	15	44.61	0.63	280	53	71	69	1.4	2.5		16.58	**97.7**
5	20	47.79	0.63	282	55	72	69	1.4	2.5		16.61	**100.2**
6	25	50.95	0.61	282	59	73	69	1.3	2.0		16.34	**99.6**
7	30	54.06	0.57	282	62	74	69	1.3	2.0		15.80	**99.5**
8	35	57.06	0.6	282	66	74	69	1.3	2.0		16.21	**99.2**
9	40	60.07	0.61	283	64	75	69	1.4	2.0		16.35	**97.0**
10	45	63.17	0.68	283	60	75	69	1.6	2.5		17.27	**99.1**
11	50	66.39	0.79	284	63	76	71	1.8	3.0		18.62	**97.6**
12	55	69.90	0.82	283	64	76	71	1.9	3.0		18.96	**98.5**
	60	73.72										105.2

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 - M26A
Date:	September 9, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	2.319 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	137.8 ^oC
AVERAGE GAS MOISTURE BY VOLUME	16.7 %
AVERAGE GAS VELOCITY	16.44 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.291 Kpa
ABSOLUTE GAS PRESSURE	99.436 Kpa
OXYGEN CONCENTRATION	8.26 %
CARBON DIOXIDE CONCENTRATION	11.17 %
CARBON MONOXIDE CONCENTRATION	15.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.29 m^3/s
DRY REF GAS FLOWRATE	14.41 Rm^3/s
DRY ADJ GAS FLOWRATE	18.40 Rm^3/s
WET REF GAS FLOWRATE	17.30 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		2.319 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 2
Date:	September 9, 2019	**Operator:**	DH

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.017	**Probe (mg)**	0
Barometric Pressure	30.04 "Hg	**CWTR (g)**	320
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	21
Nozzle	0.2553 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	1.145 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%	11.17
COppm	15.5

Measured H2O
16.7 %

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	424.16	0.69	273	59	59	59	1.7	2.0		17.30	
2	5	428.06	0.74	286	49	62	63	1.8	2.0		18.07	114.1
3	10	431.48	0.71	287	48	62	63	1.8	2.0		17.72	**96.9**
4	15	434.91	0.69	287	45	62	64	1.7	2.0		17.47	**99.2**
5	20	438.29	0.65	288	45	62	64	1.6	3.0		16.96	**99.1**
6	25	441.59	0.59	288	45	63	66	1.5	3.0		16.16	**99.7**
7	30	444.79	0.64	288	45	63	66	1.6	3.0		16.83	**101.2**
8	35	448.09	0.63	288	46	64	67	1.6	3.0		16.70	**100.2**
9	40	451.31	0.62	288	45	64	68	1.6	3.0		16.57	**98.3**
10	45	454.55	0.63	288	46	65	69	1.6	3.0		16.70	**99.7**
11	50	457.79	0.62	286	46	65	69	1.6	3.0		16.54	**98.7**
12	55	461.04	0.35	219	47	66	70	0.84	2.0		11.86	**99.6**
	60	463.53								1.145		**96.6**
1	0	464.68	0.72	273	60	67	67	1.8	3.0		17.67	
2	5	468.44	0.71	284	48	67	68	1.8	3.0		17.68	**106.2**
3	10	471.86	0.69	284	48	67	68	1.75	3.0		17.43	**97.8**
4	15	475.29	0.64	284	50	67	70	1.65	3.0		16.79	**99.5**
5	20	478.61	0.57	284	51	68	70	1.5	3.0		15.84	**99.8**
6	25	481.89	0.45	284	53	68	71	1.15	3.0		14.08	**104.3**
7	30	484.64	0.55	285	55	68	72	1.4	3.0		15.57	**98.3**
8	35	487.65	0.58	285	57	68	72	1.5	3.0		15.99	**97.3**
9	40	490.80	0.6	285	60	69	73	1.5	3.0		16.26	**99.2**
10	45	493.96	0.63	285	60	69	73	1.6	3.0		16.67	**97.7**
11	50	497.21	0.59	266	59	69	74	1.55	3.0		15.92	**98.0**
12	55	500.55	0.59	254	59	70	74	1.6	3.0		15.79	**102.7**
	60	503.66										**94.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No 2
Test No.:	2 - Method 26A
Date:	September 10, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	1.143 m^3
AVGERGE ISOKINETICITY	98.1 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.9 °C
AVERAGE GAS MOISTURE BY VOLUME	15.8 %
AVERAGE GAS VELOCITY	17.19 m/s
BAROMETRIC PRESSURE (Station)	101.490 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.224 Kpa
OXYGEN CONCENTRATION	8.31 %
CARBON DIOXIDE CONCENTRATION	11.11 %
CARBON MONOXIDE CONCENTRATION	9.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.39 m^3/s
DRY REF GAS FLOWRATE	15.03 Rm^3/s
DRY ADJ GAS FLOWRATE	19.11 Rm^3/s
WET REF GAS FLOWRATE	17.87 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.143 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 - Method 26A	**Test Location:**	APC Outlet No 2
Date:	September 10, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.017	**Probe (mg)**	0
Barometric Pressure	29.97 "Hg	**CWTR (g)**	148.1
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	10.2
Nozzle	0.2506 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%	8.31
CO2%	11.11
COppm	9.9

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	31.35	0.82	286	68	64	64	1.7	3.0		18.97	
2	5	35.28	0.86	288	47	65	65	1.8	3.0		19.45	108.6
3	10	38.85	0.8	289	47	65	65	1.7	3.0		18.78	96.3
4	15	42.16	0.74	289	47	65	67	1.6	3.0		18.06	92.6
5	20	45.42	0.66	289	48	66	68	1.5	3.0		17.05	94.7
6	25	48.62	0.61	288	49	67	70	1.4	2.5		16.38	98.2
7	30	51.68	0.6	288	49	67	71	1.4	2.5		16.25	97.3
8	35	54.73	0.62	287	50	68	72	1.4	2.5		16.51	97.7
9	40	57.86	0.62	287	51	68	73	1.4	2.5		16.51	98.4
10	45	61.01	0.62	286	53	69	75	1.4	3.0		16.50	98.9
11	50	64.15	0.57	286	55	69	74	1.3	2.5		15.82	98.2
12	55	67.19	0.58	286	58	70	74	1.3	2.5		15.95	99.3
	60	70.18										96.7

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, On
Test Location:	APC Outlet No 2
Test No.:	3 - Method 26A
Date:	September 10, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	1.116 m^3
AVGERGE ISOKINETICITY	96.9 %
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	141.0 °C
AVERAGE GAS MOISTURE BY VOLUME	15.1 %
AVERAGE GAS VELOCITY	16.81 m/s
BAROMETRIC PRESSURE (Station)	101.422 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.156 Kpa
OXYGEN CONCENTRATION	8.27 %
CARBON DIOXIDE CONCENTRATION	11.04 %
CARBON MONOXIDE CONCENTRATION	9.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.84 m^3/s
DRY REF GAS FLOWRATE	14.85 Rm^3/s
DRY ADJ GAS FLOWRATE	18.94 Rm^3/s
WET REF GAS FLOWRATE	17.50 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.116 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 - Method 26A	**Test Location:**	APC Outlet No 2
Date:	September 10, 2019	**Operator:**	AS

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.017	**Probe (mg)**	0
Barometric Pressure	29.95 "Hg	**CWTR (g)**	135.7
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	10.6
Nozzle	0.2506 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%	8.27
CO2%	11.04
COppm	9.3

Measured H2O
15.1 %

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	70.92	0.66	283	68	71	71	1.5	2.5		16.97	
2	5	74.14	0.65	284	66	71	72	1.5	2.5		16.85	**96.9**
3	10	77.28	0.74	285	60	71	73	1.7	3.0		17.99	**95.2**
4	15	80.65	0.7	285	59	72	74	1.6	3.0		17.50	**95.8**
5	20	84.01	0.67	286	58	72	75	1.6	3.0		17.13	**98.0**
6	25	87.26	0.59	287	58	73	77	1.4	2.5		16.09	**96.9**
7	30	90.28	0.64	287	58	73	77	1.5	2.5		16.75	**95.7**
8	35	93.50	0.63	287	59	73	78	1.5	2.5		16.62	**98.0**
9	40	96.65	0.64	287	62	74	78	1.5	2.5		16.75	**96.5**
10	45	99.85	0.63	287	60	74	79	1.5	2.5		16.62	**97.2**
11	50	103.04	0.6	286	59	74	79	1.4	2.5		16.21	**97.5**
12	55	106.17	0.6	286	59	75	79	1.4	2.5		16.21	**98.0**
	60	109.27										**96.9**

APPENDIX 25

SVOC Test Emission Calculations
(18 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 SVOC
Date:	September 12, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	4.600 m^3
AVGERGE ISOKINETICITY	99.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.5 °C
AVERAGE GAS MOISTURE BY VOLUME	16.9 %
AVERAGE GAS VELOCITY	17.11 m/s
BAROMETRIC PRESSURE (Station)	101.388 Kpa
STATIC PRESSURE	-2.116 Kpa
ABSOLUTE GAS PRESSURE	99.272 Kpa
OXYGEN CONCENTRATION	8.16 %
CARBON DIOXIDE CONCENTRATION	11.19 %
CARBON MONOXIDE CONCENTRATION	12.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.28 m^3/s
DRY REF GAS FLOWRATE	14.88 Rm^3/s
DRY ADJ GAS FLOWRATE	19.15 Rm^3/s
WET REF GAS FLOWRATE	17.90 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.600 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 12, 2019	**Operator:**	TT

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	29.94 "Hg	**CWTR (g)**	668.6
Static Pressure	-8.500 "H_2O	**WCBDA (g)**	17.1
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.38 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%	8.16
CO2%	11.19
COppm	12.3

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	93.84	0.72	281	63	65	66	1.6	6.0		17.75	
	5	97.30	0.75	281	51	72	66	1.7	6.0		18.12	**101.2**
2	10	100.81	0.75	281	49	80	66	1.7	6.0		18.12	**99.9**
	15	104.35	0.77	282	48	86	68	1.8	6.5		18.37	**100.0**
3	20	107.98	0.78	283	48	88	69	1.8	6.5		18.50	**100.6**
	25	111.65	0.76	283	48	89	68	1.7	6.5		18.26	**100.8**
4	30	115.24	0.67	284	52	90	69	1.5	6.0		17.16	**99.9**
	35	118.61	0.7	284	52	92	70	1.6	6.5		17.54	**99.7**
5	40	122.08	0.65	284	57	93	70	1.45	6.0		16.90	**100.2**
	45	125.39	0.64	284	56	93	71	1.45	6.0		16.77	**99.0**
6	50	128.70	0.55	285	55	94	71	1.3	6.0		15.56	**99.7**
	55	131.79	0.56	284	54	94	71	1.3	6.0		15.69	**100.3**
7	60	134.88	0.58	284	51	94	72	1.3	6.0		15.96	**99.4**
	65	138.04	0.57	283	50	94	73	1.3	6.0		15.81	**99.8**
8	70	141.20	0.59	283	50	95	73	1.4	6.0		16.09	**100.5**
	75	144.38	0.61	283	48	95	73	1.4	6.0		16.36	**99.3**
9	80	147.60	0.62	283	47	96	73	1.4	6.0		16.49	**98.9**
	85	150.83	0.6	283	47	95	73	1.4	6.0		16.22	**98.3**
10	90	154.02	0.6	283	47	95	73	1.4	6.0		16.22	**98.8**
	95	157.32	0.61	282	48	96	74	1.4	6.0		16.35	**102.2**
11	100	160.56	0.56	282	48	96	73	1.3	6.0		15.66	**99.3**
	105	163.66	0.57	282	49	95	74	1.3	6.0		15.80	**99.2**
12	110	166.75	0.57	282	49	95	74	1.3	6.0		15.80	**98.0**
	115	169.85	0.57	282	49	95	75	1.3	6.0		15.80	**98.3**
	120	172.93								0.38		**97.6**
1	0	173.31	0.77	282	58	77	72	1.8	6.5		18.37	
	5	176.91	0.82	285	51	89	73	1.9	6.5		18.99	**100.2**
2	10	180.62	0.83	285	49	94	74	2	7.0		19.11	**99.1**
	15	184.37	0.79	284	49	96	74	1.7	7.0		18.63	**99.0**
3	20	188.16	0.76	284	50	96	75	1.8	7.0		18.27	**102.3**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 12, 2019	**Operator:**	TT

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	29.94 "Hg	**CWTR (g)**	668.6
Static Pressure	-8.500 "H_2O	**WCBDA (g)**	17.1
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.38 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%	8.16
CO2%	11.19
COppm	12.3

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	191.78	0.73	283	50	96	74	1.8	7.0		17.90	99.5
4	30	195.37	0.64	283	50	97	75	1.5	6.0		16.76	100.7
	35	198.78	0.65	283	51	97	75	1.5	6.0		16.89	101.9
5	40	202.16	0.65	282	51	97	75	1.5	6.0		16.88	100.2
	45	205.54	0.65	282	51	97	75	1.5	6.0		16.88	100.2
6	50	208.89	0.58	282	51	97	75	1.4	6.0		15.94	99.3
	55	212.12	0.63	282	52	97	75	1.5	6.0		16.61	101.3
7	60	215.37	0.66	283	52	97	76	1.5	6.0		17.02	97.8
	65	218.66	0.67	283	52	97	75	1.6	6.5		17.15	96.7
8	70	222.07	0.69	284	53	97	76	1.6	6.5		17.41	99.6
	75	225.49	0.68	284	52	97	77	1.6	6.5		17.28	98.4
9	80	228.92	0.7	285	53	98	77	1.7	7.0		17.55	99.4
	85	232.40	0.72	284	53	98	76	1.7	7.0		17.79	99.4
10	90	235.92	0.71	285	53	98	76	1.7	7.0		17.67	99.1
	95	239.41	0.69	284	53	98	76	1.7	7.0		17.41	99.0
11	100	242.89	0.7	284	53	98	76	1.7	7.0		17.54	100.1
	105	246.35	0.7	282	54	99	78	1.7	7.0		17.51	98.8
12	110	249.80	0.71	282	54	99	77	1.7	7.0		17.64	98.1
	115	253.32	0.65	282	54	99	77	1.5	7.0		16.88	99.5
	120	256.74										101.0

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 SVOC
Date:	September 12, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	4.708 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.9 ^oC
AVERAGE GAS MOISTURE BY VOLUME	17.7 %
AVERAGE GAS VELOCITY	17.50 m/s
BAROMETRIC PRESSURE (Station)	101.456 Kpa
STATIC PRESSURE	-2.116 Kpa
ABSOLUTE GAS PRESSURE	99.340 Kpa
OXYGEN CONCENTRATION	8.07 %
CARBON DIOXIDE CONCENTRATION	11.21 %
CARBON MONOXIDE CONCENTRATION	11.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.85 m^3/s
DRY REF GAS FLOWRATE	15.10 Rm^3/s
DRY ADJ GAS FLOWRATE	19.57 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		4.708 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 12, 2019	**Operator:**	TT

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	29.96 "Hg	**CWTR (g)**	723.4
Static Pressure	-8.500 "H_2O	**WCBDA (g)**	19.1
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.47 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%	8.07
CO2%	11.21
COppm	11.4

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	57.12	0.68	281	61	73	74	1.5	7.0		17.27	
	5	60.54	0.81	283	68	82	74	1.8	8.0		18.88	**102.2**
2	10	64.25	0.81	282	56	91	74	1.8	8.0		18.87	**100.9**
	15	67.86	0.78	282	53	93	74	1.8	8.0		18.51	**97.3**
3	20	71.48	0.76	282	50	95	74	1.75	7.0		18.27	**99.3**
	25	75.10	0.8	282	48	96	76	1.85	7.5		18.75	**100.4**
4	30	78.82	0.73	282	46	98	76	1.75	7.5		17.91	**100.3**
	35	82.45	0.68	281	45	98	77	1.55	7.0		17.27	**102.2**
5	40	85.88	0.7	281	45	98	77	1.65	7.0		17.53	**99.9**
	45	89.38	0.66	282	45	98	77	1.55	7.0		17.03	**100.5**
6	50	92.83	0.6	281	45	97	77	1.4	6.5		16.23	**102.0**
	55	96.08	0.63	281	46	96	77	1.45	7.0		16.63	**100.8**
7	60	99.38	0.65	282	46	97	76	1.5	7.0		16.90	**100.0**
	65	102.75	0.66	282	46	96	76	1.5	7.0		17.03	**100.6**
8	70	106.11	0.71	282	46	96	76	1.65	7.0		17.66	**99.6**
	75	109.61	0.73	283	46	97	76	1.7	7.5		17.92	**100.1**
9	80	113.19	0.73	283	46	97	76	1.7	7.5		17.92	**101.0**
	85	116.78	0.75	284	46	97	76	1.75	8.0		18.18	**101.3**
10	90	120.43	0.73	283	50	98	77	1.7	7.5		17.92	**101.6**
	95	124.02	0.75	284	46	98	77	1.75	7.5		18.18	**101.1**
11	100	127.65	0.75	281	47	98	77	1.75	7.5		18.14	**100.9**
	105	131.28	0.71	281	47	98	77	1.65	7.5		17.65	**100.7**
12	110	134.83	0.69	281	47	98	77	1.6	7.5		17.40	**101.2**
	115	138.30	0.69	280	48	97	77	1.6	7.5		17.39	**100.3**
	120	141.75								0.47		**99.8**
1	0	142.22	0.61	281	60	80	76	1.35	7.0		16.36	
	5	145.56	0.59	280	46	89	75	1.3	7.0		16.08	**104.5**
2	10	148.76	0.61	280	44	94	75	1.35	7.0		16.35	**100.9**
	15	151.97	0.63	281	44	95	75	1.45	7.0		16.63	**99.1**
3	20	155.26	0.62	277	44	95	76	1.45	7.0		16.45	**100.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 12, 2019	**Operator:**	TT

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	29.96 "Hg	**CWTR (g)**	723.4
Static Pressure	-8.500 "H_2O	**WCBDA (g)**	19.1
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.47 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%	8.07
CO2%	11.21
COppm	11.4

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	158.55	0.59	279	45	96	76	1.35	7.0		16.07	**100.4**
4	30	161.76	0.63	279	45	96	76	1.45	7.0		16.60	**100.4**
	35	165.07	0.61	279	45	96	76	1.4	7.0		16.34	**100.3**
5	40	168.35	0.63	280	46	98	77	1.45	7.0		16.62	**100.9**
	45	171.63	0.65	281	46	97	77	1.5	7.5		16.89	**99.1**
6	50	174.98	0.61	281	46	47	77	1.4	7.5		16.36	**99.9**
	55	178.22	0.63	281	47	97	77	1.4	7.5		16.63	**104.4**
7	60	181.52	0.55	281	47	97	77	1.3	7.5		15.54	**99.9**
	65	184.60	0.63	282	53	77	74	1.5	7.5		16.64	**99.8**
8	70	187.82	0.62	285	48	73	81	1.4	7.5		16.54	**99.7**
	75	191.01	0.65	285	48	91	74	1.5	7.5		16.93	**99.4**
9	80	194.28	0.67	285	48	95	75	1.6	7.5		17.19	**98.5**
	85	197.64	0.73	286	50	97	75	1.75	8.0		17.96	**99.3**
10	90	201.17	0.81	285	50	99	76	1.95	9.0		18.90	**99.9**
	95	204.92	0.84	285	51	99	77	2	9.0		19.25	**100.4**
11	100	208.75	0.87	286	52	100	78	2	9.0		19.60	**100.6**
	105	212.61	0.87	284	50	101	79	2.1	9.0		19.58	**99.5**
12	110	216.47	0.87	284	53	101	78	2.1	9.0		19.58	**99.3**
	115	220.39	0.85	283	50	101	79	2.1	9.0		19.34	**100.9**
	120	224.29										**101.4**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 SVOC
Date:	September 13, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	5.003 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	137.8 °C
AVERAGE GAS MOISTURE BY VOLUME	16.9 %
AVERAGE GAS VELOCITY	17.72 m/s
BAROMETRIC PRESSURE (Station)	101.592 Kpa
STATIC PRESSURE	-2.104 Kpa
ABSOLUTE GAS PRESSURE	99.488 Kpa
OXYGEN CONCENTRATION	8.26 %
CARBON DIOXIDE CONCENTRATION	11.12 %
CARBON MONOXIDE CONCENTRATION	12.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.18 m^3/s
DRY REF GAS FLOWRATE	15.50 Rm^3/s
DRY ADJ GAS FLOWRATE	19.79 Rm^3/s
WET REF GAS FLOWRATE	18.65 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		5.003 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2019	**Operator:**	KC

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	30 "Hg	**CWTR (g)**	724.4
Static Pressure	-8.450 "H_2O	**WCBDA (g)**	22.2
Nozzle	0.2553 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.39 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%	11.12
COppm	12.6

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	25.23	0.84	280	67	65	66	2	7.0		19.19	
	5	28.94	0.83	281	55	74	67	2	8.0		19.08	**96.7**
2	10	32.75	0.79	281	51	82	68	2	8.0		18.62	**99.0**
	15	36.57	0.78	280	48	86	69	2	8.0		18.49	**100.9**
3	20	40.36	0.75	280	47	90	70	1.9	8.0		18.13	**100.2**
	25	44.13	0.75	280	47	92	71	1.9	8.0		18.13	**101.1**
4	30	47.88	0.71	280	46	94	72	1.8	7.5		17.64	**100.3**
	35	51.56	0.72	280	46	95	72	1.8	7.5		17.76	**100.9**
5	40	55.22	0.67	280	47	96	73	1.7	7.5		17.13	**99.6**
	45	58.81	0.69	280	47	96	74	1.7	7.5		17.39	**101.0**
6	50	62.39	0.64	280	47	97	74	1.6	7.0		16.75	**99.2**
	55	65.90	0.59	280	48	97	74	1.5	7.0		16.08	**100.8**
7	60	69.31	0.69	281	48	97	75	1.8	7.5		17.40	**102.0**
	65	72.97	0.69	281	48	97	74	1.8	7.5		17.40	**101.3**
8	70	76.61	0.75	282	48	98	75	1.9	8.0		18.15	**100.8**
	75	80.38	0.75	282	48	98	75	1.9	8.0		18.15	**100.1**
9	80	84.17	0.75	283	48	98	75	1.9	8.0		18.17	**100.6**
	85	87.94	0.75	283	48	98	76	1.9	8.0		18.17	**100.1**
10	90	91.70	0.74	283	48	98	75	1.9	8.0		18.04	**99.8**
	95	95.44	0.75	282	48	98	75	1.9	8.0		18.15	**100.0**
11	100	99.18	0.74	282	49	98	76	1.9	8.0		18.03	**99.3**
	105	102.97	0.74	270	49	97	76	1.9	8.0		17.89	**101.2**
12	110	106.75	0.6	270	49	96	76	1.5	7.5		16.10	**100.2**
	115	110.23	0.6	270	50	95	76	1.5	7.0		16.10	**102.4**
	120	113.60								0.39		**99.3**
1	0	113.99	0.81	280	62	76	74	2	7.0		18.84	
	5	117.87	0.8	281	48	82	72	2	7.0		18.74	**101.1**
2	10	121.76	0.81	281	47	89	73	2	7.0		18.85	**101.7**
	15	125.61	0.8	281	46	93	73	2	7.0		18.74	**99.3**
3	20	129.44	0.8	281	47	93	73	2	7.5		18.74	**99.0**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 SVOC	**Test Location:**	APC Outlet No. 1
Date:	September 13, 2019	**Operator:**	KC

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.006	**Probe (mg)**	0
Barometric Pressure	30 "Hg	**CWTR (g)**	724.4
Static Pressure	-8.450 "H_2O	**WCBDA (g)**	22.2
Nozzle	0.2553 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.39 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%	11.12
COppm	12.6

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures: Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	133.29	0.84	281	49	94	73	2.1	9.0		19.20	99.6
4	30	137.24	0.77	281	49	95	74	2	8.5		18.38	99.6
	35	141.11	0.73	281	49	95	74	1.9	8.0		17.90	101.7
5	40	144.90	0.7	281	50	96	76	1.8	8.0		17.53	102.3
	45	148.59	0.69	280	49	95	74	1.8	8.0		17.39	101.4
6	50	152.23	0.61	280	48	95	74	1.5	8.0		16.35	101.0
	55	155.62	0.64	280	48	95	74	1.5	8.0		16.75	99.9
7	60	158.98	0.66	281	48	96	76	1.7	8.0		17.02	96.7
	65	162.52	0.67	281	47	96	74	1.7	8.0		17.15	100.2
8	70	166.07	0.68	281	47	97	75	1.7	8.0		17.27	99.9
	75	169.67	0.67	281	47	97	76	1.7	8.0		17.15	100.3
9	80	173.20	0.68	282	47	97	75	1.7	8.0		17.29	99.0
	85	176.79	0.7	281	47	97	75	1.8	8.5		17.53	100.1
10	90	180.44	0.67	281	47	97	75	1.7	8.0		17.15	100.3
	95	184.03	0.68	279	47	98	75	1.7	8.0		17.25	100.8
11	100	187.61	0.71	280	47	98	75	1.8	8.5		17.64	99.6
	105	191.29	0.67	279	47	98	75	1.75	8.0		17.12	100.2
12	110	194.86	0.67	279	48	98	75	1.75	8.0		17.12	100.0
	115	198.41	0.68	275	48	98	76	1.75	8.0		17.20	99.5
	120	202.08										101.7

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	1 SVOC
Date:	September 11, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.851
DGM CORRECTION FACTOR	1.017
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	4.701 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	140.0 °C
AVERAGE GAS MOISTURE BY VOLUME	16.3 %
AVERAGE GAS VELOCITY	17.20 m/s
BAROMETRIC PRESSURE (Station)	100.881 Kpa
STATIC PRESSURE	-2.515 Kpa
ABSOLUTE GAS PRESSURE	98.366 Kpa
OXYGEN CONCENTRATION	8.09 %
CARBON DIOXIDE CONCENTRATION	11.09 %
CARBON MONOXIDE CONCENTRATION	20.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.41 m^3/s
DRY REF GAS FLOWRATE	14.90 Rm^3/s
DRY ADJ GAS FLOWRATE	19.28 Rm^3/s
WET REF GAS FLOWRATE	17.80 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.701 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 11, 2019	**Operator:**	DH

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.017	**Probe (mg)**	0
Barometric Pressure	29.79 "Hg	**CWTR (g)**	651.5
Static Pressure	-10.100 "H_2O	**WCBDA (g)**	21.8
Nozzle	0.2553 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.76 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%	8.09
CO2%	11.09
COppm	20.9

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	830.06	0.73	280	68	75	76	1.7	5.0		17.97	
	5	833.48	0.75	286	61	76	76	1.8	6.0		18.29	**94.1**
2	10	836.95	0.72	286	57	76	77	1.8	6.0		17.92	**94.5**
	15	840.43	0.74	285	55	76	78	1.8	6.0		18.15	**96.6**
3	20	843.93	0.67	284	53	76	78	1.75	6.0		17.26	**95.7**
	25	847.41	0.67	284	52	77	79	1.75	6.0		17.26	**99.9**
4	30	850.86	0.64	283	52	77	80	1.6	6.0		16.86	**98.9**
	35	854.23	0.66	283	53	78	81	1.7	6.0		17.12	**98.7**
5	40	857.61	0.57	284	53	78	81	1.5	6.0		15.92	**97.3**
	45	860.87	0.61	283	54	78	82	1.6	6.0		16.46	**101.0**
6	50	864.15	0.55	284	54	79	82	1.4	6.0		15.64	**98.1**
	55	867.35	0.56	284	55	79	83	1.4	6.0		15.78	**100.7**
7	60	870.51	0.61	284	55	79	83	1.55	6.0		16.47	**98.5**
	65	873.76	0.62	284	56	80	83	1.6	6.0		16.60	**97.1**
8	70	877.06	0.66	284	56	80	84	1.7	6.0		17.13	**97.7**
	75	880.43	0.67	285	56	80	84	1.7	6.0		17.27	**96.6**
9	80	883.86	0.67	285	56	81	84	1.7	6.0		17.27	**97.7**
	85	887.29	0.7	286	56	81	84	1.8	6.0		17.67	**97.6**
10	90	890.77	0.69	286	56	81	84	1.8	6.0		17.54	**96.9**
	95	894.30	0.65	286	56	82	85	1.7	6.0		17.02	**99.0**
11	100	897.66	0.66	286	56	82	85	1.7	7.0		17.15	**96.9**
	105	901.08	0.68	284	57	82	85	1.8	7.0		17.39	**97.9**
12	110	904.59	0.65	284	56	82	85	1.7	7.0		17.00	**98.9**
	115	908.05	0.65	284	56	82	85	1.7	7.0		17.00	**99.7**
	120	911.46								0.76		**98.2**
1	0	912.22	0.68	275	66	82	85	1.7	7.0		17.28	
	5	915.65	0.65	274	59	81	80	1.7	7.0		16.89	**96.0**
2	10	919.13	0.66	282	55	81	81	1.7	7.0		17.11	**100.1**
	15	922.57	0.67	283	54	80	81	1.7	7.0		17.25	**98.7**
3	20	926.19	0.68	284	54	80	82	1.7	7.0		17.39	**103.2**

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	1 SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 11, 2019	**Operator:**	DH

Pitot Factor	0.851	**Filter (mg)**	0
DGMCF	1.017	**Probe (mg)**	0
Barometric Pressure	29.79 "Hg	**CWTR (g)**	651.5
Static Pressure	-10.100 "H_2O	**WCBDA (g)**	21.8
Nozzle	0.2553 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.76 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%	8.09
CO2%	11.09
COppm	20.9

Measured H2O
16.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures: Stack °F	Temperatures: Imp. Out °F	Temperatures: DGM Out °F	Temperatures: DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	929.40	0.67	284	53	80	82	1.75	7.0		17.26	90.8
4	30	932.87	0.64	285	54	80	83	1.65	7.0		16.88	98.9
	35	936.25	0.65	285	54	81	83	1.65	7.0		17.01	98.5
5	40	939.62	0.62	286	55	81	83	1.6	7.0		16.63	97.4
	45	942.94	0.63	286	55	81	84	1.6	7.0		16.76	98.3
6	50	946.25	0.65	286	56	81	84	1.7	7.0		17.02	97.1
	55	949.61	0.65	285	56	82	84	1.7	7.0		17.01	97.1
7	60	952.97	0.58	285	56	82	85	1.5	7.0		16.07	96.9
	65	956.27	0.62	285	57	82	85	1.6	7.0		16.61	100.7
8	70	959.60	0.65	286	57	82	85	1.7	7.0		17.02	98.3
	75	963.00	0.67	286	57	82	85	1.7	7.0		17.28	98.1
9	80	966.46	0.74	285	58	83	85	1.9	8.0		18.15	98.3
	85	970.08	0.69	285	58	83	85	1.8	7.5		17.53	97.8
10	90	973.56	0.73	285	58	83	85	1.9	8.0		18.03	97.3
	95	977.34	0.75	284	58	73	85	1.9	8.0		18.26	102.8
11	100	980.97	0.73	284	59	83	85	1.8	7.5		18.02	98.2
	105	984.57	0.72	284	59	83	85	1.8	7.5		17.89	97.8
12	110	988.13	0.73	284	59	83	85	1.8	7.5		18.02	97.4
	115	991.73	0.73	284	59	83	85	1.8	7.5		18.02	97.8
	120	995.33										97.8

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	2 SVOC
Date:	September 11, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.849
DGM CORRECTION FACTOR	0.997
NOZZLE DIAMETER	6.37 mm
DRY REF GAS VOLUME SAMPLED	4.514 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	140.3 ^{o}C
AVERAGE GAS MOISTURE BY VOLUME	17.2 %
AVERAGE GAS VELOCITY	17.05 m/s
BAROMETRIC PRESSURE (Station)	100.779 Kpa
STATIC PRESSURE	-2.515 Kpa
ABSOLUTE GAS PRESSURE	98.264 Kpa
OXYGEN CONCENTRATION	8.1 %
CARBON DIOXIDE CONCENTRATION	11.03 %
CARBON MONOXIDE CONCENTRATION	14.9 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.19 m^3/s
DRY REF GAS FLOWRATE	14.59 Rm^3/s
DRY ADJ GAS FLOWRATE	18.86 Rm^3/s
WET REF GAS FLOWRATE	17.62 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.514 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 11, 2019	**Operator:**	DH

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	0.997	**Probe (mg)**	0
Barometric Pressure	29.76 "Hg	**CWTR (g)**	669
Static Pressure	-10.100 "H_2O	**WCBDA (g)**	18.2
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.27 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%	8.1
CO2%	11.03
COppm	14.9

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures: Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	9.45	0.72	279	68	78	79	1.65	7.0		17.83	
	5	12.83	0.78	281	65	78	78	1.8	7.0		18.59	95.6
2	10	16.42	0.74	282	56	78	79	1.75	7.0		18.12	97.8
	15	20.02	0.73	282	53	78	79	1.7	7.0		17.99	100.7
3	20	23.63	0.71	283	51	78	79	1.6	7.0		17.76	101.7
	25	27.13	0.72	283	50	78	80	1.65	7.0		17.88	100.0
4	30	30.64	0.65	284	50	80	80	1.5	7.0		17.00	99.5
	35	33.91	0.67	284	50	80	81	1.5	7.0		17.26	97.4
5	40	37.38	0.64	284	51	79	81	1.5	7.0		16.87	101.7
	45	40.72	0.64	285	51	79	82	1.5	7.0		16.88	100.3
6	50	44.02	0.57	285	52	80	82	1.3	7.0		15.93	99.0
	55	47.14	0.57	285	52	80	83	1.3	7.0		15.93	99.1
7	60	50.26	0.59	285	52	80	83	1.3	7.0		16.21	99.0
	65	53.38	0.6	286	53	81	84	1.35	7.0		16.36	97.3
8	70	56.51	0.59	286	53	81	84	1.35	7.0		16.22	96.7
	75	59.64	0.6	286	54	81	84	1.35	7.0		16.36	97.5
9	80	62.80	0.61	286	54	81	84	1.4	7.0		16.49	97.6
	85	66.03	0.61	286	53	82	84	1.4	7.0		16.49	99.0
10	90	69.27	0.58	285	49	82	85	1.3	7.0		16.07	99.2
	95	72.48	0.59	285	47	82	85	1.3	6.5		16.21	100.6
11	100	75.65	0.56	282	47	82	85	1.3	6.5		15.76	98.5
	105	78.82	0.55	282	47	82	85	1.25	6.5		15.62	100.9
12	110	81.98	0.53	281	47	82	85	1.2	6.5		15.32	101.5
	115	85.05	0.51	278	47	82	85	1.2	6.5		15.00	100.3
	120	88.13								0.27		102.4
1	0	88.40	0.72	284	57	83	84	1.7	7.0		17.90	
	5	91.88	0.7	285	50	83	85	1.7	7.0		17.66	97.9
2	10	95.43	0.76	285	50	83	84	1.8	7.0		18.40	101.3
	15	99.01	0.76	285	50	83	85	1.8	7.0		18.40	98.0
3	20	102.67	0.74	285	51	83	84	1.7	7.0		18.15	100.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	2 SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 11, 2019	**Operator:**	DH

Pitot Factor	0.849	**Filter (mg)**	0
DGMCF	0.997	**Probe (mg)**	0
Barometric Pressure	29.76 "Hg	**CWTR (g)**	669
Static Pressure	-10.100 "H_2O	**WCBDA (g)**	18.2
Nozzle	0.2506 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.27 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%	8.1
CO2%	11.03
COppm	14.9

Measured H2O
17.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	106.29	0.75	285	51	83	84	1.7	7.0		18.28	**100.5**
4	30	109.91	0.72	285	51	83	85	1.7	7.0		17.91	**99.8**
	35	113.52	0.7	285	52	83	85	1.6	7.0		17.66	**101.5**
5	40	117.10	0.66	285	52	83	85	1.5	7.0		17.14	**102.1**
	45	120.53	0.66	285	52	83	85	1.5	7.0		17.14	**100.7**
6	50	123.99	0.59	286	52	83	85	1.35	7.0		16.22	**101.6**
	55	127.26	0.59	286	53	83	85	1.35	7.0		16.22	**101.6**
7	60	130.52	0.64	287	54	83	86	1.5	7.0		16.91	**101.3**
	65	133.87	0.66	287	54	84	86	1.5	7.0		17.17	**99.9**
8	70	137.23	0.68	287	54	84	86	1.6	7.0		17.43	**98.6**
	75	140.64	0.68	287	54	84	87	1.6	7.0		17.43	**98.6**
9	80	144.04	0.68	288	54	84	87	1.6	7.0		17.44	**98.2**
	85	147.45	0.68	287	54	84	87	1.6	7.0		17.43	**98.6**
10	90	150.86	0.7	287	54	84	87	1.65	7.5		17.68	**98.5**
	95	154.32	0.7	287	54	84	87	1.65	7.5		17.68	**98.5**
11	100	157.82	0.63	286	55	85	87	1.5	7.5		16.76	**99.7**
	105	161.26	0.66	284	55	85	87	1.55	7.0		17.13	**103.1**
12	110	164.70	0.65	285	55	85	87	1.5	7.5		17.01	**100.6**
	115	168.13	0.64	283	56	85	87	1.5	7.5		16.86	**101.1**
	120	171.54										**101.0**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 2
Test No.:	3 SVOC
Date:	September 12, 2019

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.85
DGM CORRECTION FACTOR	0.997
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	4.667 m^3
AVGERGE ISOKINETICITY	98.8 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.1 °C
AVERAGE GAS MOISTURE BY VOLUME	16.3 %
AVERAGE GAS VELOCITY	17.10 m/s
BAROMETRIC PRESSURE (Station)	101.422 Kpa
STATIC PRESSURE	-2.440 Kpa
ABSOLUTE GAS PRESSURE	98.982 Kpa
OXYGEN CONCENTRATION	8.31 %
CARBON DIOXIDE CONCENTRATION	10.95 %
CARBON MONOXIDE CONCENTRATION	13.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.26 m^3/s
DRY REF GAS FLOWRATE	14.93 Rm^3/s
DRY ADJ GAS FLOWRATE	18.99 Rm^3/s
WET REF GAS FLOWRATE	17.85 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.667 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 12, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	0
DGMCF	0.997	**Probe (mg)**	0
Barometric Pressure	29.95 "Hg	**CWTR (g)**	656.7
Static Pressure	-9.800 "H_2O	**WCBDA (g)**	13.7
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.5 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%	8.31
CO2%	10.95
COppm	13.3

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	253.78	0.74	278	66	69	71	1.7	4.5		17.99	
	5	257.26	0.73	283	52	69	70	1.7	5.0		17.93	96.1
2	10	260.74	0.75	283	50	69	70	1.7	5.0		18.18	97.2
	15	264.20	0.74	283	49	69	71	1.75	5.0		18.05	95.4
3	20	267.77	0.73	283	48	69	71	1.7	5.0		17.93	99.0
	25	271.34	0.72	283	48	70	72	1.7	5.0		17.81	99.6
4	30	274.88	0.67	283	48	70	73	1.6	5.0		17.18	99.3
	35	278.34	0.69	283	49	70	73	1.6	5.0		17.43	100.5
5	40	281.77	0.65	283	49	70	73	1.6	5.5		16.92	98.2
	45	285.14	0.66	283	49	71	74	1.5	5.0		17.05	99.4
6	50	288.51	0.59	283	49	71	74	1.35	5.0		16.12	98.4
	55	291.71	0.6	283	50	71	74	1.4	5.0		16.26	98.8
7	60	294.92	0.58	284	50	71	74	1.3	5.0		15.99	98.3
	65	298.09	0.59	284	51	72	75	1.4	5.0		16.13	98.8
8	70	301.25	0.66	284	51	72	75	1.5	5.0		17.06	97.4
	75	304.55	0.67	285	52	72	76	1.55	5.0		17.20	96.2
9	80	307.91	0.69	285	52	72	76	1.6	5.0		17.46	97.2
	85	311.33	0.62	286	52	82	86	1.4	5.5		16.56	97.5
10	90	314.60	0.71	286	52	73	76	1.7	5.5		17.72	96.6
	95	318.04	0.7	283	53	73	76	1.7	6.0		17.56	96.7
11	100	321.54	0.7	277	54	73	76	1.7	6.0		17.49	98.9
	105	325.04	0.73	276	54	73	76	1.7	6.0		17.85	98.5
12	110	328.54	0.68	277	55	73	76	1.6	6.0		17.24	96.4
	115	332.01	0.75	276	55	73	76	1.8	6.0		18.09	99.1
	120	335.65								0.5		98.9
1	0	336.15	0.71	283	66	74	75	1.7	6.0		17.69	
	5	339.66	0.7	282	52	74	75	1.7	6.0		17.55	98.5
2	10	343.23	0.7	282	49	75	74	1.6	6.0		17.55	100.8
	15	346.76	0.77	282	48	74	75	1.8	6.5		18.40	99.7
3	20	350.38	0.74	282	48	74	76	1.7	6.5		18.04	97.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 SVOC	**Test Location:**	APC Outlet No. 2
Date:	September 12, 2019	**Operator:**	DH

Pitot Factor	0.85	**Filter (mg)**	0
DGMCF	0.997	**Probe (mg)**	0
Barometric Pressure	29.95 "Hg	**CWTR (g)**	656.7
Static Pressure	-9.800 "H_2O	**WCBDA (g)**	13.7
Nozzle	0.253 inches		
Stack Diameter	4.500 ft	**Leak Check Volume**	0.5 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%	8.31
CO2%	10.95
COppm	13.3

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	354.02	0.77	282	49	74	76	1.8	6.5		18.40	99.9
4	30	357.67	0.71	283	49	74	76	1.7	6.5		17.69	98.2
	35	361.27	0.71	283	50	74	76	1.7	6.5		17.69	100.9
5	40	364.86	0.66	283	51	74	76	1.5	6.0		17.05	100.6
	45	368.36	0.64	283	52	74	76	1.5	6.0		16.79	101.7
6	50	371.76	0.56	283	52	74	76	1.3	5.5		15.71	100.3
	55	374.95	0.56	283	53	74	76	1.3	5.5		15.71	100.6
7	60	378.11	0.57	283	54	74	76	1.3	5.5		15.85	99.6
	65	381.28	0.57	283	53	74	76	1.3	5.5		15.85	99.1
8	70	384.45	0.62	282	54	74	77	1.4	6.0		16.52	99.1
	75	387.73	0.65	282	54	74	77	1.5	6.0		16.91	98.2
9	80	391.09	0.65	283	54	75	78	1.5	6.0		16.92	98.2
	85	394.54	0.66	283	54	75	77	1.5	6.0		17.05	100.7
10	90	397.97	0.65	283	55	75	77	1.5	6.0		16.92	99.5
	95	401.39	0.64	283	55	75	77	1.5	6.0		16.79	100.0
11	100	404.79	0.65	283	56	75	77	1.5	6.0		16.92	100.2
	105	408.22	0.65	281	56	75	77	1.5	6.0		16.90	100.3
12	110	411.63	0.55	281	55	75	77	1.3	6.0		15.54	99.5
	115	414.77	0.52	280	55	75	77	1.2	5.5		15.10	99.6
	120	417.80										98.7

APPENDIX 26

ORTECH Total Hydrocarbon CEM Data
(4 pages)

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 APC Outlet

	Test No. 1 September 9, 2019			Test No. 2 September 9, 2019			Test No. 3 September 9, 2019	
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
14:16	0.8		15:27	0.8		16:35	0.6	
14:17	1.2		15:28	0.8		16:36	0.5	
14:18	1.2		15:29	0.9		16:37	0.5	
14:19	1.3		15:30	0.9		16:38	0.4	
14:20	1.2		15:31	0.9		16:39	0.4	
14:21	1.0		15:32	0.9		16:40	0.4	
14:22	0.9		15:33	0.8		16:41	0.3	
14:23	0.8		15:34	0.8		16:42	0.3	
14:24	0.7		15:35	0.8		16:43	0.4	
14:25	0.6	1.0	15:36	1.1	0.9	16:44	0.6	0.4
14:26	0.7	1.0	15:37	1.0	0.9	16:45	0.2	0.4
14:27	0.6	0.9	15:38	1.0	0.9	16:46	0.2	0.4
14:28	0.5	0.8	15:39	1.0	0.9	16:47	0.2	0.3
14:29	0.9	0.8	15:40	1.0	0.9	16:48	0.1	0.3
14:30	1.3	0.8	15:41	1.0	0.9	16:49	0.2	0.3
14:31	0.7	0.8	15:42	1.0	1.0	16:50	0.2	0.3
14:32	0.5	0.7	15:43	1.0	1.0	16:51	0.2	0.3
14:33	0.5	0.7	15:44	1.0	1.0	16:52	0.2	0.2
14:34	0.6	0.7	15:45	0.9	1.0	16:53	0.2	0.2
14:35	0.4	0.7	15:46	0.9	1.0	16:54	0.2	0.2
14:36	0.3	0.6	15:47	0.9	1.0	16:55	0.2	0.2
14:37	0.1	0.6	15:48	0.9	0.9	16:56	0.2	0.2
14:38	0.1	0.5	15:49	0.9	0.9	16:57	0.2	0.2
14:39	0.0	0.4	15:50	0.9	0.9	16:58	0.2	0.2
14:40	0.0	0.3	15:51	0.9	0.9	16:59	0.2	0.2
14:41	0.0	0.2	15:52	0.9	0.9	17:00	0.0	0.2
14:42	0.0	0.2	15:53	0.9	0.9	17:01	0.0	0.1
14:43	0.0	0.1	15:54	0.9	0.9	17:02	0.1	0.1
14:44	0.0	0.1	15:55	0.9	0.9	17:03	0.1	0.1
14:45	0.0	0.1	15:56	0.9	0.9	17:04	0.1	0.1
14:46	0.0	0.0	15:57	0.9	0.9	17:05	0.1	0.1
14:47	0.0	0.0	15:58	0.9	0.9	17:06	0.1	0.1
14:48	0.3	0.0	15:59	0.9	0.9	17:07	0.1	0.1
14:49	0.1	0.0	16:00	0.9	0.9	17:08	0.1	0.1
14:50	0.0	0.0	16:01	0.9	0.9	17:09	0.1	0.1
14:51	0.0	0.0	16:02	0.9	0.9	17:10	0.1	0.1
14:52	0.1	0.1	16:03	0.9	0.9	17:11	0.2	0.1
14:53	0.2	0.1	16:04	0.9	0.9	17:12	0.3	0.1
14:54	0.1	0.1	16:05	0.9	0.9	17:13	0.3	0.1
14:55	0.0	0.1	16:06	0.9	0.9	17:14	0.3	0.2
14:56	0.0	0.1	16:07	0.9	0.9	17:15	0.3	0.2
14:57	0.0	0.1	16:08	0.9	0.9	17:16	0.3	0.2
14:58	0.0	0.0	16:09	0.8	0.9	17:17	0.4	0.2
14:59	0.0	0.0	16:10	0.8	0.9	17:18	0.3	0.3
15:00	0.0	0.0	16:11	0.8	0.9	17:19	0.4	0.3
15:01	0.1	0.0	16:12	0.9	0.9	17:20	0.4	0.3
15:02	0.0	0.0	16:13	0.9	0.9	17:21	0.3	0.3
15:03	0.0	0.0	16:14	0.9	0.9	17:22	0.3	0.3
15:04	0.0	0.0	16:15	0.9	0.9	17:23	0.4	0.3
15:05	0.0	0.0	16:16	0.9	0.9	17:24	0.4	0.3
15:06	0.0	0.0	16:17	0.9	0.9	17:25	0.4	0.3
15:07	0.0	0.0	16:18	0.9	0.9	17:26	0.4	0.4
15:08	0.0	0.0	16:19	0.9	0.9	17:27	0.3	0.3
15:09	0.0	0.0	16:20	0.8	0.9	17:28	0.2	0.3
15:10	0.0	0.0	16:21	0.8	0.9	17:29	0.1	0.3
15:11	0.1	0.0	16:22	0.8	0.9	17:30	0.2	0.3
15:12	0.0	0.0	16:23	0.8	0.9	17:31	0.2	0.3
15:13	0.0	0.0	16:24	0.8	0.9	17:32	0.2	0.3
15:14	0.1	0.0	16:25	0.8	0.8	17:33	0.2	0.2
15:15	0.0	0.0	16:26	0.9	0.8	17:34	0.2	0.2
15:16	0.0	0.0	16:27	0.9	0.8	17:35	0.2	0.2
Min	0.0	0.0	Min	0.8	0.8	Min	0.0	0.1
Max	1.3	1.0	Max	1.1	1.0	Max	0.6	0.4
Avg	0.3	0.3	Avg	0.9	0.9	Avg	0.2	0.2

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 1 Quench Inlet

	Test No. 1			Test No. 2			Test No. 3	
	September 9, 2019			September 9, 2019			September 9, 2019	
	THC - 1 min	THC - 10 min Avg		THC - 1 min	THC - 10 min Avg		THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	Time	ppm, dry	ppm, dry	Time	ppm, dry	ppm, dry
08:33	0.2		09:43	0.7		10:50	0.6	
08:34	0.9		09:44	0.6		10:51	0.8	
08:35	1.0		09:45	0.6		10:52	0.8	
08:36	1.0		09:46	0.6		10:53	0.7	
08:37	1.1		09:47	0.6		10:54	0.7	
08:38	1.0		09:48	0.6		10:55	0.8	
08:39	1.0		09:49	0.6		10:56	0.8	
08:40	1.0		09:50	0.6		10:57	0.8	
08:41	1.0		09:51	0.6		10:58	0.7	
08:42	1.0	0.9	09:52	0.6	0.6	10:59	0.8	0.8
08:43	1.0	1.0	09:53	0.5	0.6	11:00	0.8	0.8
08:44	1.1	1.0	09:54	0.5	0.6	11:01	0.8	0.8
08:45	1.0	1.0	09:55	0.6	0.6	11:02	0.7	0.8
08:46	1.0	1.0	09:56	0.6	0.6	11:03	0.7	0.8
08:47	1.0	1.0	09:57	0.6	0.6	11:04	0.8	0.8
08:48	1.1	1.0	09:58	0.6	0.6	11:05	0.8	0.8
08:49	1.1	1.0	09:59	0.6	0.6	11:06	0.8	0.8
08:50	1.2	1.0	10:00	0.6	0.6	11:07	0.8	0.8
08:51	1.2	1.1	10:01	0.6	0.6	11:08	0.8	0.8
08:52	1.1	1.1	10:02	0.6	0.6	11:09	0.8	0.8
08:53	1.1	1.1	10:03	0.5	0.6	11:10	0.7	0.8
08:54	1.1	1.1	10:04	0.5	0.6	11:11	0.7	0.8
08:55	1.0	1.1	10:05	0.5	0.6	11:12	0.7	0.8
08:56	1.0	1.1	10:06	0.5	0.6	11:13	0.7	0.8
08:57	0.9	1.1	10:07	0.5	0.6	11:14	0.7	0.8
08:58	0.9	1.1	10:08	0.5	0.6	11:15	0.7	0.8
08:59	0.9	1.0	10:09	0.5	0.5	11:16	0.7	0.7
09:00	0.9	1.0	10:10	0.6	0.5	11:17	0.8	0.7
09:01	0.9	1.0	10:11	0.6	0.5	11:18	0.9	0.7
09:02	0.9	1.0	10:12	0.6	0.5	11:19	0.9	0.8
09:03	0.9	0.9	10:13	0.6	0.5	11:20	0.8	0.8
09:04	0.9	0.9	10:14	0.6	0.6	11:21	0.8	0.8
09:05	0.9	0.9	10:15	0.6	0.6	11:22	0.8	0.8
09:06	0.9	0.9	10:16	0.6	0.6	11:23	0.8	0.8
09:07	0.9	0.9	10:17	0.6	0.6	11:24	0.8	0.8
09:08	0.9	0.9	10:18	0.7	0.6	11:25	0.8	0.8
09:09	0.9	0.9	10:19	0.8	0.6	11:26	0.8	0.8
09:10	0.9	0.9	10:20	0.7	0.6	11:27	0.8	0.8
09:11	0.9	0.9	10:21	0.6	0.6	11:28	0.8	0.8
09:12	0.8	0.9	10:22	0.7	0.6	11:29	0.8	0.8
09:13	0.8	0.9	10:23	0.7	0.7	11:30	0.8	0.8
09:14	0.8	0.9	10:24	0.6	0.7	11:31	0.8	0.8
09:15	0.8	0.9	10:25	0.6	0.7	11:32	0.8	0.8
09:16	0.8	0.9	10:26	0.6	0.7	11:33	0.9	0.8
09:17	0.8	0.9	10:27	0.6	0.7	11:34	0.9	0.8
09:18	0.8	0.8	10:28	0.6	0.7	11:35	0.9	0.8
09:19	0.8	0.8	10:29	0.7	0.7	11:36	0.9	0.8
09:20	0.8	0.8	10:30	0.7	0.7	11:37	0.8	0.8
09:21	0.8	0.8	10:31	0.7	0.7	11:38	0.9	0.9
09:22	0.9	0.8	10:32	0.7	0.7	11:39	0.8	0.9
09:23	0.9	0.8	10:33	0.7	0.7	11:40	0.8	0.9
09:24	1.0	0.9	10:34	0.7	0.7	11:41	0.8	0.9
09:25	0.9	0.9	10:35	0.7	0.7	11:42	0.8	0.9
09:26	0.8	0.9	10:36	0.7	0.7	11:43	0.8	0.8
09:27	0.9	0.9	10:37	0.7	0.7	11:44	0.6	0.8
09:28	0.8	0.9	10:38	0.7	0.7	11:45	0.6	0.8
09:29	0.9	0.9	10:39	0.7	0.7	11:46	0.6	0.8
09:30	0.8	0.9	10:40	0.7	0.7	11:47	0.6	0.7
09:31	0.8	0.9	10:41	0.7	0.7	11:48	0.6	0.7
09:32	0.8	0.9	10:42	0.7	0.7	11:49	0.6	0.7
09:33	0.7	0.8	10:43	0.7	0.7	11:50	0.7	0.7

Min	0.2	0.8	Min	0.5	0.5	Min	0.6	0.7
Max	1.2	1.1	Max	0.8	0.7	Max	0.9	0.9
Avg	0.9	0.9	Avg	0.6	0.6	Avg	0.8	0.8

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 APC Outlet

	Test No. 1 September 9, 2019			Test No. 2 September 9, 2019			Test No. 3 September 9, 2019	
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
14:16	0.6		15:27	0.8		16:35	0.8	
14:17	0.9		15:28	0.8		16:36	0.8	
14:18	1.1		15:29	0.9		16:37	0.9	
14:19	1.1		15:30	0.9		16:38	1.0	
14:20	1.0		15:31	0.9		16:39	0.9	
14:21	0.9		15:32	0.9		16:40	0.9	
14:22	1.4		15:33	0.8		16:41	1.1	
14:23	1.1		15:34	0.8		16:42	1.1	
14:24	1.0		15:35	0.8		16:43	1.0	
14:25	1.0	1.0	15:36	1.1	0.9	16:44	0.9	0.9
14:26	1.0	1.0	15:37	1.0	0.9	16:45	0.9	1.0
14:27	0.9	1.0	15:38	1.0	0.9	16:46	0.9	1.0
14:28	1.0	1.0	15:39	1.0	0.9	16:47	0.9	1.0
14:29	1.0	1.0	15:40	1.0	0.9	16:48	0.9	1.0
14:30	0.9	1.0	15:41	1.0	0.9	16:49	0.9	1.0
14:31	0.9	1.0	15:42	1.0	1.0	16:50	0.9	0.9
14:32	0.9	1.0	15:43	1.0	1.0	16:51	0.9	0.9
14:33	0.9	0.9	15:44	1.0	1.0	16:52	0.9	0.9
14:34	0.9	0.9	15:45	0.9	1.0	16:53	0.9	0.9
14:35	0.9	0.9	15:46	0.9	1.0	16:54	0.8	0.9
14:36	0.9	0.9	15:47	0.9	1.0	16:55	0.9	0.9
14:37	0.9	0.9	15:48	0.9	0.9	16:56	0.9	0.9
14:38	0.9	0.9	15:49	0.9	0.9	16:57	0.9	0.9
14:39	0.8	0.9	15:50	0.9	0.9	16:58	0.9	0.9
14:40	0.8	0.9	15:51	0.9	0.9	16:59	0.9	0.9
14:41	0.8	0.9	15:52	0.9	0.9	17:00	1.0	0.9
14:42	0.9	0.9	15:53	0.9	0.9	17:01	0.9	0.9
14:43	0.8	0.8	15:54	0.9	0.9	17:02	0.9	0.9
14:44	0.8	0.8	15:55	0.9	0.9	17:03	0.9	0.9
14:45	0.8	0.8	15:56	0.9	0.9	17:04	0.9	0.9
14:46	0.8	0.8	15:57	0.9	0.9	17:05	0.9	0.9
14:47	0.8	0.8	15:58	0.9	0.9	17:06	0.9	0.9
14:48	0.8	0.8	15:59	0.9	0.9	17:07	1.0	0.9
14:49	0.8	0.8	16:00	0.9	0.9	17:08	0.9	0.9
14:50	0.8	0.8	16:01	0.9	0.9	17:09	0.9	0.9
14:51	0.8	0.8	16:02	0.9	0.9	17:10	0.9	0.9
14:52	0.9	0.8	16:03	0.9	0.9	17:11	0.9	0.9
14:53	1.0	0.8	16:04	0.9	0.9	17:12	0.9	0.9
14:54	0.9	0.8	16:05	0.9	0.9	17:13	0.9	0.9
14:55	0.9	0.8	16:06	0.9	0.9	17:14	0.9	0.9
14:56	0.9	0.8	16:07	0.9	0.9	17:15	0.9	0.9
14:57	0.8	0.8	16:08	0.9	0.9	17:16	0.9	0.9
14:58	0.8	0.8	16:09	0.8	0.9	17:17	0.9	0.9
14:59	0.8	0.8	16:10	0.8	0.9	17:18	0.9	0.9
15:00	0.8	0.8	16:11	0.8	0.9	17:19	0.9	0.9
15:01	0.8	0.8	16:12	0.9	0.9	17:20	0.9	0.9
15:02	0.8	0.8	16:13	0.9	0.9	17:21	0.9	0.9
15:03	0.8	0.8	16:14	0.9	0.9	17:22	0.9	0.9
15:04	0.8	0.8	16:15	0.9	0.9	17:23	1.0	0.9
15:05	0.8	0.8	16:16	0.9	0.9	17:24	1.0	0.9
15:06	0.8	0.8	16:17	0.9	0.9	17:25	1.0	0.9
15:07	0.8	0.8	16:18	0.9	0.9	17:26	1.0	0.9
15:08	0.8	0.8	16:19	0.9	0.9	17:27	1.0	0.9
15:09	0.8	0.8	16:20	0.8	0.9	17:28	0.9	0.9
15:10	0.8	0.8	16:21	0.8	0.9	17:29	1.0	0.9
15:11	0.8	0.8	16:22	0.8	0.9	17:30	1.0	1.0
15:12	0.8	0.8	16:23	0.8	0.9	17:31	1.0	1.0
15:13	0.8	0.8	16:24	0.8	0.9	17:32	1.0	1.0
15:14	0.9	0.8	16:25	0.8	0.8	17:33	1.0	1.0
15:15	0.9	0.8	16:26	0.9	0.8	17:34	1.0	1.0
15:16	0.9	0.8	16:27	0.9	0.8	17:35	1.0	1.0

Min	0.6	0.8	Min	0.8	0.8	Min	0.8	0.9
Max	1.4	1.0	Max	1.1	1.0	Max	1.1	1.0
Avg	0.9	0.9	Avg	0.9	0.9	Avg	0.9	0.9

Covanta - Durham York Energy Centre
Total Hydrocarbon Sampling at the Boiler No. 2 Quench Inlet

	Test No. 1 September 9 , 2019			Test No. 2 September 9 , 2019			Test No. 3 September 9 , 2019	
	THC - 1 min	THC - 10 min Avg		THC - 1 min	THC - 10 min Avg		THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	Time	ppm, dry	ppm, dry	Time	ppm, dry	ppm, dry
08:33	0.5		09:43	0.7		10:50	1.0	
08:34	0.8		09:44	0.4		10:51	0.8	
08:35	0.6		09:45	0.4		10:52	0.7	
08:36	0.6		09:46	0.4		10:53	0.7	
08:37	0.6		09:47	0.4		10:54	0.7	
08:38	0.3		09:48	0.4		10:55	0.7	
08:39	0.3		09:49	0.3		10:56	0.6	
08:40	0.2		09:50	0.3		10:57	0.6	
08:41	0.2		09:51	0.3		10:58	0.6	
08:42	0.2	0.4	09:52	0.2	0.4	10:59	0.5	0.7
08:43	0.0	0.4	09:53	0.2	0.3	11:00	0.5	0.6
08:44	0.3	0.3	09:54	0.2	0.3	11:01	0.5	0.6
08:45	0.2	0.3	09:55	0.1	0.3	11:02	0.6	0.6
08:46	0.1	0.3	09:56	0.1	0.3	11:03	0.5	0.6
08:47	0.1	0.2	09:57	0.1	0.2	11:04	0.5	0.6
08:48	0.5	0.2	09:58	0.2	0.2	11:05	0.5	0.5
08:49	0.4	0.2	09:59	0.2	0.2	11:06	0.5	0.5
08:50	0.5	0.3	10:00	0.2	0.2	11:07	0.5	0.5
08:51	0.3	0.3	10:01	0.2	0.2	11:08	0.5	0.5
08:52	0.1	0.3	10:02	0.2	0.2	11:09	0.5	0.5
08:53	0.1	0.3	10:03	0.2	0.2	11:10	0.5	0.5
08:54	0.0	0.2	10:04	0.2	0.2	11:11	0.5	0.5
08:55	0.0	0.2	10:05	0.2	0.2	11:12	0.5	0.5
08:56	0.0	0.2	10:06	0.2	0.2	11:13	0.4	0.5
08:57	0.0	0.2	10:07	0.1	0.2	11:14	0.3	0.4
08:58	0.0	0.1	10:08	0.1	0.2	11:15	0.3	0.4
08:59	0.0	0.1	10:09	0.2	0.2	11:16	0.3	0.4
09:00	0.0	0.1	10:10	0.2	0.2	11:17	0.3	0.4
09:01	0.1	0.0	10:11	0.2	0.2	11:18	0.3	0.4
09:02	0.0	0.0	10:12	0.2	0.2	11:19	0.3	0.4
09:03	0.0	0.0	10:13	0.2	0.2	11:20	0.3	0.3
09:04	0.0	0.0	10:14	0.2	0.2	11:21	0.3	0.3
09:05	0.0	0.0	10:15	0.2	0.2	11:22	0.3	0.3
09:06	0.0	0.0	10:16	0.2	0.2	11:23	0.3	0.3
09:07	0.0	0.0	10:17	0.2	0.2	11:24	0.3	0.3
09:08	0.1	0.0	10:18	0.2	0.2	11:25	0.3	0.3
09:09	0.3	0.1	10:19	0.2	0.2	11:26	0.3	0.3
09:10	0.3	0.1	10:20	0.2	0.2	11:27	0.3	0.3
09:11	0.2	0.1	10:21	0.2	0.2	11:28	0.3	0.3
09:12	0.2	0.1	10:22	0.2	0.2	11:29	0.3	0.3
09:13	0.3	0.1	10:23	0.1	0.2	11:30	0.3	0.3
09:14	0.0	0.1	10:24	0.2	0.2	11:31	0.2	0.3
09:15	0.2	0.2	10:25	0.2	0.2	11:32	0.3	0.3
09:16	0.1	0.2	10:26	0.2	0.2	11:33	0.2	0.3
09:17	0.5	0.2	10:27	0.2	0.2	11:34	0.2	0.3
09:18	0.2	0.2	10:28	0.2	0.2	11:35	0.3	0.3
09:19	0.1	0.2	10:29	0.2	0.2	11:36	0.3	0.3
09:20	0.2	0.2	10:30	0.2	0.2	11:37	0.3	0.3
09:21	0.0	0.2	10:31	0.2	0.2	11:38	0.3	0.3
09:22	0.2	0.2	10:32	0.2	0.2	11:39	0.3	0.3
09:23	0.1	0.2	10:33	0.1	0.2	11:40	0.3	0.3
09:24	0.1	0.2	10:34	0.2	0.2	11:41	0.3	0.3
09:25	0.1	0.2	10:35	0.2	0.2	11:42	0.3	0.3
09:26	0.2	0.2	10:36	0.2	0.2	11:43	0.3	0.3
09:27	0.1	0.1	10:37	0.2	0.2	11:44	0.3	0.3
09:28	0.1	0.1	10:38	0.2	0.2	11:45	0.3	0.3
09:29	0.2	0.1	10:39	0.3	0.2	11:46	0.3	0.3
09:30	0.0	0.1	10:40	0.3	0.2	11:47	0.3	0.3
09:31	0.2	0.1	10:41	0.3	0.2	11:48	0.3	0.3
09:32	0.1	0.1	10:42	0.2	0.2	11:49	0.2	0.3
09:33	0.1	0.1	10:43	0.2	0.2	11:50	0.3	0.3

Min	0.0	0.0	Min	0.1	0.2	Min	0.2	0.3
Max	0.8	0.4	Max	0.7	0.4	Max	1.0	0.7
Avg	0.2	0.2	Avg	0.2	0.2	Avg	0.4	0.4

APPENDIX 27

**Dispersion Modelling Results
for the September 2019 Testing Program
(18 pages)**

GOLDER

TECHNICAL MEMORANDUM

DATE November 18, 2019 **Project No.** 19123663

TO Amanda Huxter
Covanta Durham York Renewable Energy LP

CC Anthony Ciccone

FROM Katherine Armstrong **EMAIL ksarmstrong@golder.com**

CALPUFF MODELLING FOR SEPTEMBER 2019 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 September 2019 compliance source testing program using the same CALPUFF model and other input data sets used in the ESDM Report and Environmental Assessment, however, the results are compared to O.Reg. 419/05 Schedule 3 limits last updated April 2018.

2.0 EMISSION RATES

Compliance source testing was completed by Ortech Environmental in September 2019 (Sampling dates were September 9-13) for each of the two combustion train units and results were provided to Golder on a mass per time basis. Three tests were completed for each unit and averaged. The average emission rates for each unit were then summed together to provide the total stack emission rate of each contaminant to be modelled. Where source testing results indicated that the measured concentration is below the detection limit, the full detection limit was used as the emission rate for conservatism.

Emission rates for which source testing data was available were converted to grams per second (g/s) and are provided in an updated Site-wide Emission Inventory included in Appendix A. This emission inventory includes emissions from silo filling and diesel generator testing taken from the ESDM report, in addition to source test emissions from the main stack.

In response to clarifications provided by the MECP of December 9, 2016, two different emission rates were calculated for Total Particulate Matter:

1. Filterable fraction emission rate only; and
2. Total Particulate Matter (Sum of condensable and filterable fractions).

As source testing for the condensable fraction of Total Particulate Matter is not required pursuant to Schedule "D": of the ECA, the condensable content of PM_{10} was used as the condensable portion in the Total Particulate Matter emission.

3.0 MODELLING

As part of the ECA application, the MECP approved the use of the CALPUFF modelling software and CALMET meteorological data to demonstrate compliance with Ontario Regulation 419/05 Schedule 3 standards at the DYEC. As a result, the same modelling approach has been taken for this update. The following models and pre- and post-processors were used in the assessment:

- CALMET diagnostic meteorological model (v. 5.8, level 070623);
- CALPUFF dispersion model (v. 6.263, level 080827);
- CALPOST post processor (v. 6.221, Level 080724);
- BPIP building downwash pre-processor (v. 04274);
- POSTUTIL post processor (v.1.64, Level 101025).

These model versions are consistent with those used in the original ESDM report. Dispersion Modelling inputs are described in the following subsections.

3.1 Model Domain

The CALPUFF Model domain used in this assessment is the same as the domain used in the previous Environmental Assessment (EA) and ESDM Report. It extends 40 km by 30 Km and is centred approximately 5 km north of the Site. This domain covers more than the air quality study area but will ensure that plumes are tracked beyond the furthest receptor locations to ensure the worst-case ground level concentrations are considered at all receptors.

3.2 Meteorology, Land Use and Terrain Data

The meteorology and terrain data used in this assessment is the same as the meteorology and terrain data used in the EA and ESDM Report.

3.3 Receptors

The receptors used in this assessment are the same as the receptors used in the ESDM Report. They include gridded ground level receptors to meet the requirements of O.Reg. 419/05 in addition to 400 discrete receptors to represent locations of interest. They include hospitals, nursing homes, schools, daycares, Senior citizen centres, the nearest residential receptors, specific watersheds and water bodies and parks.

3.4 Building Downwash

The buildings used in this assessment to represent building downwash are the same as the buildings used in the ESDM Report. Building wake effects were considered in this assessment using the U.S. EPA's Building Profile Input Program (BPIP-ISC). The inputs into this pre-processor include the coordinates and heights of the buildings and stacks. The output data from BPIP is used in the building wake effect calculations. No changes were made to the BPIP input or output file for this assessment.

3.5 Deposition

CALPUFF has the capability to account for wet and dry deposition of substances that would reduce ground level concentrations at POIs. However, the deposition algorithm has not been implemented for conservatism and to maintain consistency with the ESDM report and the previous EA for maximum POI predictions.

3.6 Thermal Internal Boundary Layer

CALPUFF contains an option to account for sub-grid coastal influences on plume dispersion such as the development of a thermal internal boundary layer (TIBL). Given the proximity of the proposed Facility to Lake Ontario (approximately 500m) and the grid size (250m), variations in coastline location within the grid cells near the proposed facility were accounted for in the dispersion modelling. To achieve this, a digitized sub-grid coastline, extending to the boundaries of the air quality study area was included as an additional input. This is consistent with the approach used in the ESDM report.

3.7 Averaging Times and Conversions

CALPUFF can predict 1-hour average values. Many of the relevant Schedule 3 standards are based on a 24-hour averaging time, which is also provided by CALPUFF. Several of the modelled contaminants have averaging periods less than 1 hour. For these contaminants, the 1 hour average concentration was converted using the conversion factors listed in Table 4-1 of Air Dispersion Modelling Guidance for Ontario (ADMGO). For example, the hourly concentrations can be converted to a 10-min average by multiplying the hour value by 1.65. This is consistent with the approach used in the ESDM report.

In 2016, a number of O.Reg 419/05 standards were updated or modified to include annual average Point of Impingement (POI) limits. CALPUFF can predict annual average values, therefore the CALPOST input file was modified to provide this output in addition to outputs for the 1 hour, 24 hour and 30 day averaging periods already provided.

3.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary Particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling of particulate matter. To model the chemical transformation of emitted NO, NO_2 and SO_2 into HNO_3, NO_3 and SO_4, CALPUFFs RIVAD/ARM3 mechanism was used. The flag MCHEM is set to 1 for model runs used to produce concentrations of particulate matter. This setting requires the input of monthly background ozone concentrations. The monthly background ozone data used in the modelling of secondary particulate matter is consistent with that used in the EA and is summarised below in Table 1.

Table 1: Background Ozone Concentrations used for Chemical Transformation Modelling(1)

Month	Ozone Concentrations (ppb)
January	13.70
February	18.50
March	24.22
April	11.09
May	32.29
June	33.63
July	16.32
August	21.33
September	12.63
October	15.39
November	17.10
December	20.91

Note: 1 – Ozone levels from Courtice Road Station (2007-2008)

Chemical transformations were only modelled to calculate additional concentrations of particulate matter that is created as part of secondary transformations. Reported concentrations of NO_2 and SO_2 do not include the effects of depletion due to chemical transformation. The flag MCHEM is set to 0 for model runs used to produce concentrations of all other contaminants. This is consistent with the approach used in the ESDM report

3.9 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are summarized in the Table 2. The model options used are consistent with those used in the ESDM report. In the ESDM report, Exhibit 9 indicated that Puff splitting was used, however this was a typographical error and this option was not actually used in the modelling. To maintain consistency with the ESDM report, puff splitting was not modelled for this assessment.

Table 2: CALPUFF Options and Flags

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MGAUSS	1	1	Vertical distribution used in the near field
MCTADJ	3	3	Terrain adjustment method (3 used for partial plume path adjustment)
MCTSG	0	0	Subgrid-Scale complex terrain flag
MSLUG	0	0	Near-field puffs modelled as elongated
MTRANS	1	1	Transitional Plume Rise modelled
MTIP	1	1	Stack-tip downwash
MBDW	2	2	Method used to simulate building downwash 1 = ISC method; 2 = PRIME method
MSHEAR	0	0	Vertical wind shear modelled above stack top
MSPLIT	0*	0	Puff splitting allowed 0 = No; 1 = Yes ** NB: Value of "1" reported in ESDM Report but value of "0" actually used in ESDM Report modelling*
MCHEM	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	Chemical Transformation Scheme 0 = chemical transformation not modeled 1 = transformation rates computed internally (MESOPUFF II scheme)
MAQCHEM	0	0	Aqueous phase transformation flag (only used if MCHEM =1 or 3)
MWET	0	0	Wet removal modelled 0 = NO; 1 = Yes
MDRY	0	0	Dry deposition modelled 0 = NO; 1 = Yes
MTILT	0	0	Gravitational settling (plume tilt) modelled
MDISP	2	2	Methods used to compute dispersion coefficients 2 = (dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.)

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MTURBVW	3	3	Sigma measurements used (Used only if MDISP = 1or 5)
MDISP2	3	3	Back-up method used to compute dispersion when measured turbulence data are missing (Used only if MDISP=1 or 5)
MTAULY	0	0	Method used for Lagrangian timescale for Sigma-y (used only if MDISP=1,2 or MSIDP2=1,2)
MTAUADV	0	0	Method used for Advective-Decay timescale for Turbulence (used only if MDISP=2 or MDISP2=2)
MCTURB	1	1	Method used to compute turbulence sigma-v & sigma-w using micrometeorological variables (Used only if MDISP = 2 or MDISP2 = 2)
MROUGH	0	0	PG sigma y,z adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion
MTINV	0	0	Strength of temp inversion provided in PROFILE.DAT extended records
MPDF	1	1	Probability Distribution Function used for dispersion under convective conditions 0 = NO; 1 = Yes
MSGTIBL	1	1	Sub-grid TIBL module used for shore line
MBCON	0	0	Boundary conditions (concentration) modeled
MFOG	0	0	Configure for FOG Model output
MREG	0	0	Test options specified to see if they conform to regulatory values

3.10 Source Parameters

Stack exhaust temperature and flow rate were updated to match the stack characteristics at the time of source testing. All other source parameters are consistent with those used in the ESDM Report. The source parameters modelled are provided in Table 3, below:

Table 3: Modelled Source Parameters

Source ID	Stack Height [m]	Stack Diameter [m]	Flow Rate [m³/s]	Exit Velocity [m/s]	Exhaust Temperature [K]
STCK1	87.6 (No Change)	1.7 (No Change)	51.07 (UPDATED)	22.50 (UPDATED)	412.3 (UPDATED)

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

4.0 MODELLING RESULTS

Modelling was completed for emissions from the main stack only, using a unit emission rate to generate dispersion factors in µg/m³ per g/s for 10-minute, ½ - hour, 1 hour, 24 hour, 30 day and annual averaging periods. In Ontario, MECP guidance allows for the removal of meteorological anomalies to account for extreme, rare and transient conditions that may be present in the datasets and considered outliers. As such, for air quality assessments that require 24-hour average concentrations, the highest predicted 24-hr concentration in each year of meteorological data may be removed. Similarly, for assessments that use shorter 1-hour average concentrations, the eight highest predicted concentrations in each year may be removed, as per the MECP guidance listed in ADMGO. No predicted results are removed for assessment against annual averaging periods. Elimination of these anomalies is optional but both methodologies are considered acceptable for the demonstration of compliance with Ontario Regulation 419/05 standards. Previously, maximums with anomalies were presented.

The resulting dispersion factors are presented in Table 4 for with and without meteorological anomalies removal:

Table 4: Modelling Dispersion Factors

Averaging Period	10-min	½- hr	1-hr	24-hr	30-day	Annual
Dispersion Factor without meteorological anomalies removal [µg/m³ per g/s]	32.46	23.61	19.67	1.03	0.12	0.03
Dispersion Factor with meteorological anomalies removal [µg/m³ per g/s]	9.70	7.05	5.88	0.98	0.12	0.03

The average emission rate for each contaminant presented in Appendix A was multiplied by the applicable dispersion factor above to calculate the maximum point of impingement concentration for emissions from the main stack. The modelled POI concentrations were compared to the current Schedule 3 standards listed in O.Reg. 419/05 and in the case of $PM_{2.5}$ and PM_{10}, the MECP AAQC.

The MECP has recently updated the list of standards and guidelines for facilities to assess their emissions against, namely the Air Contaminants Benchmark (ACB) List, dated April 2018, which includes standards and guidelines (Benchmark 1) and screening levels (Benchmark 2). The ACB List is required to be used to assess point of impingement (POI) concentrations of contaminants released into the air.

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are considered to be 'Contaminants with No MECP POI Limits'. Where applicable, predicted POI concentrations of Contaminants with No MECP POI Limits were screened against the Benchmark 2 screening levels in the ACB List or the de minimus limit.

The modelled concentrations of all compounds assessed were below their relevant MECP standards. The Emission Summary Table has been updated and is included in Appendix B. It has been modified to include reference to the new ACB List and to meet the requirements of the updated MECP guidance document "Procedure for preparing an Emission Summary and Dispersion Modelling Report" (PIBs 3614e04.1, March 2018). Results are presented both with and without meteorological anomaly removal but only the results with meteorological anomaly removal are presented as a percentage of the relevant limit.

The contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 6% of the relevant limit.

5.0 SUMMARY OF MODELLING UPDATES

The dispersion modelling for the DYEC was updated to reflect data obtained from Compliance September 2019 source testing. A summary of the changes made to the modelling are provided in Table 5, below.

Table 5: ECA Concordance Table

Modelling Inputs	Changes from ESDM Report
Emission Rates	Updated to use September 2019 Source Testing Data. List of contaminants assessed expanded to include all contaminants for which source testing data was performed.
Model and Model Version	No Change
Meteorology and Terrain data	No Change
Receptors	No Change
Building Downwash	No Change
Deposition	No Change
Chemical Transformations	No Change
Thermal Internal Boundary Layer	No Change
Averaging Times and Conversions	CALPOST input file was modified to generate annual averaging to account for new O.Reg. 419/05 standards introduced in 2016 that include annual averaging periods.
Dispersion Modelling Options	No Change
Background Air Quality Concentrations	Ozone background data used in secondary particulate modelling consistent with the EA.

Modelling Inputs	Changes from ESDM Report
Emission Summary Table	Updated to include new O.Reg. 419/05 standards introduced after the ECA was approved and contaminants that were not included in the ESDM report but for which source testing data was available.

6.0 CONCLUSIONS

This assessment was completed to document compliance with Condition 8(7) and 8(8) of Schedule E of the ECA for the DYEC. The results of this assessment demonstrate that the Facility is operating in compliance with the POI limits listed in s.20 of O. Reg. 419/05.

7.0 CLOSURE

We trust this memorandum meets your needs at this time. Should you have any questions please contact the undersigned.

K. Armstrong

Katherine Armstrong, M.Sc.
Air Quality Specialist

Anthony Ciccone, Ph.D., P.Eng.
Principal

KSA/ADC/ng

https://golderassociates.sharepoint.com/sites/109752/project files/6 deliverables/fall st/final/19123663-tm-rev0 18nov2019 covanta updated modelling memo.docx

APPENDIX A

Site-Wide Emission Inventory

Appendix A
Site-Wide Emission Inventory

		Source Parameters					Emission Data						
Source Identifier	Source Description	Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - Fall 2019 Source Testing Conditions	51.07	139	1.7	87.6	(680538, 4860346)	1 – methylnaphthalene	90-12-0	1.70E-07	1,24, annual	ST	Above-Average	100%
							1,1,2-Trichloroethane	79-00-5	1.42E-05	1,24, annual	ST	Above-Average	100%
							1,2,3,4-tetrachlorobenzene	634-66-2	7.66E-08	1,24, annual	ST	Above-Average	100%
							1,2,3-trichlorobenzene	87-61-6	8.14E-08	1,24, annual	ST	Above-Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	8.42E-07	1,24, annual	ST	Above-Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.88E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichlorobenzene	95-50-1	1.18E-06	1,24, annual	ST	Above-Average	100%
							1,2-Dichloroethane	107-06-2	7.20E-05	1,24, annual	ST	Above-Average	100%
							1,2-Dichloropropane	78-87-5	1.42E-05	1,24, annual	ST	Above-Average	100%
							1,3,5-trichlorobenzene	108-70-3	7.93E-08	1,24, annual	ST	Above-Average	100%
							1,3-Butadiene	106-99-0	2.84E-05	1,24, annual	ST	Above-Average	100%
							1,3-Dichlorobenzene	541-73-1	1.33E-06	1,24, annual	ST	Above-Average	100%
							1,4-Dichlorobenzene	106-46-7	1.21E-06	1,24, annual	ST	Above-Average	100%
							1-Methylphenanthrene	832-69-9	7.66E-08	1,24, annual	ST	Above-Average	100%
							2 – methylnaphthalene	91-57-6	3.13E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,5-tetrachlorophenol	4901-51-3	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3,4-trichlorophenol	15950-66-0	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3,5,6-tetrachlorophenol	935-95-5	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3,5-trichlorophenol	933-78-8	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3,6-trichlorophenol	933-75-5	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,3-dichlorophenol	576-24-9	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,4,5-trichlorophenol	95-95-4	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,4,6-Trichlorophenol	88-06-2	3.83E-07	1,24, annual	ST	Above-Average	100%
							2,4-Dichlorophenol	120-83-2	1.25E-06	1,24, annual	ST	Above-Average	100%
							2,6-dichlorophenol	87-65-0	3.83E-07	1,24, annual	ST	Above-Average	100%
							2-Butanone	78-93-3	8.37E-04	1,24, annual	ST	Above-Average	100%
							2-Chloronaphthalene	91-58-7	7.66E-08	1,24, annual	ST	Above-Average	100%
							2-Methylanthracene	613-12-7	2.64E-07	1,24, annual	ST	Above-Average	100%
							2-monochlorophenol	95-57-8	3.83E-07	1,24, annual	ST	Above-Average	100%
							3,4,5-trichlorophenol	609-19-8	3.83E-07	1,24, annual	ST	Above-Average	100%
							3,4-dichlorophenol	95-77-2	3.83E-07	1,24, annual	ST	Above-Average	100%
							3,5-dichlorophenol	591-35-5	4.71E-06	1,24, annual	ST	Above-Average	100%
							3-Methylcholanthrene	56-49-5	3.83E-07	1,24, annual	ST	Above-Average	100%
							3-monochlorophenol	108-43-0	3.83E-07	1,24, annual	ST	Above-Average	100%
							4-monochlorophenol	106-48-9	3.83E-07	1,24, annual	ST	Above-Average	100%
							7,12-Dimethylbenzo(a)anthracene	57-97-6	7.66E-08	1,24, annual	ST	Above-Average	100%
							9,10-Dimethylanthracene	781-43-1	7.66E-08	1,24, annual	ST	Above-Average	100%
							9-Methylphenanthrene	883-20-5	1.66E-07	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 [%]
							Acenaphthene	83-32-9	7.66E-08	1,24, annual	ST	Above-Average	5%
							Acenaphthylene	208-96-8	7.66E-08	1,24, annual	ST	Above-Average	2%
							Acetaldehyde	75-07-0	4.37E-03	1,24, annual	ST	Above-Average	100%
							Acetone	67-64-1	1.84E-03	1,24, annual	ST	Above-Average	100%
							Acrolein	107-02-8	2.00E-02	1,24, annual	ST	Above-Average	100%
							Ammonia	7664-41-7	1.91E-02	1,24, annual	ST	Above-Average	100%
							Anthracene	120-12-7	9.23E-08	1,24, annual	ST	Above-Average	19%
							Antimony	7440-36-0	2.07E-06	1,24, annual	ST	Above-Average	100%
							Arsenic	7440-38-2	1.65E-06	1,24, annual	ST	Above-Average	100%
							Barium	7440-39-3	6.49E-05	1,24, annual	ST	Above-Average	100%
							Benzene	71-43-2	2.70E-04	1,24, annual	ST	Above-Average	52%
							Benzo(a)anthracene	56-55-3	7.66E-08	1,24, annual	ST	Above-Average	27%
							Benzo(a)fluorene	238-84-6	7.66E-08	1,24, annual	ST	Above-Average	100%
							Benzo(a)pyrene	50-32-8	7.66E-08	1,24, annual	ST	Above-Average	48%
							Benzo(b)fluoranthene	205-99-2	7.66E-08	1,24, annual	ST	Above-Average	17%
							Benzo(b)fluorene	243-17-4	7.66E-08	1,24, annual	ST	Above-Average	100%
							Benzo(e)pyrene	192-97-2	9.75E-08	1,24, annual	ST	Above-Average	100%
							Benzo(g,h,i)perylene	191-24-2	1.81E-07	1,24, annual	ST	Above-Average	100%
							Benzo(k)fluoranthene	207-08-9	7.66E-08	1,24, annual	ST	Above-Average	52%
							Beryllium	7440-41-7	1.65E-06	1,24, annual	ST	Above-Average	100%
							Biphenyl	92-51-3	4.37E-07	1,24, annual	ST	Above-Average	100%
							Bromodichloromethane	75-27-4	5.12E-05	1,24, annual	ST	Above-Average	100%
							Bromoform	75-25-2	1.42E-05	1,24, annual	ST	Above-Average	100%
							Bromomethane	74-83-9	1.28E-04	1,24, annual	ST	Above-Average	100%
							Cadmium	7440-43-9	5.13E-06	1,24, annual	ST	Above-Average	100%
							Carbon Monoxide	630-08-0	4.43E-01	1,24, annual	ST	Above-Average	63%
							Carbon tetrachloride	56-23-5	1.34E-04	1,24, annual	ST	Above-Average	100%
							Chlorobenzene	108-90-7	9.78E-05	1,24, annual	ST	Above-Average	100%
							Chloroform	67-66-3	9.78E-05	1,24, annual	ST	Above-Average	100%
							Chromium (hexavalent)	18540-29-9	3.56E-05	1,24, annual	ST	Above-Average	100%
							Chrysene	218-01-9	1.40E-07	1,24, annual	ST	Above-Average	22%
							Cobalt	7440-48-4	2.02E-06	1,24, annual	ST	Above-Average	100%
							Copper	7440-50-8	2.66E-05	1,24, annual	ST	Above-Average	100%
							Coronene	191-07-1	3.83E-07	1,24, annual	ST	Above-Average	100%
							Cumene (Isopropylbenzene)	98-82-8	8.39E-05	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,c)anthracene	215-58-7	7.66E-08	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,e)pyrene	192-65-4	3.83E-07	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,h)anthracene	53-70-3	7.66E-08	1,24, annual	ST	Above-Average	40%
							Dibromochloromethane	124-48-1	1.42E-05	1,24, annual	ST	Above-Average	100%
							Dichlorodifluoromethane	75-71-8	4.78E-05	1,24, annual	ST	Above-Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.45E-05	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Dichloromethane	75-09-2	2.06E-03	1,24, annual	ST	Above-Average	100%
							Dioxins, Furans and Dioxin- like PCBs	N/A	1.06E-10	1,24, annual	ST	Above-Average	100%
							Ethylbenzene	100-41-4	5.42E-04	1,24, annual	ST	Above-Average	100%
							Ethylene Dibromide	106-93-4	2.84E-05	1,24, annual	ST	Above-Average	100%
							Fluoranthene	206-44-0	2.74E-07	1,24, annual	ST	Above-Average	17%
							Fluorides	7664-39-3	3.99E-03	1,24, annual	ST	Above-Average	100%
							Fluorine	86-73-7	2.42E-07	1,24, annual	ST	Above-Average	100%
							Formaldehyde	50-00-0	2.00E-03	1,24, annual	ST	Above-Average	99%
							Hexachlorobenzene	118-74-1	7.66E-08	1,24, annual	ST	Above-Average	100%
							Hydrogen Chloride	7647-01-0	1.81E-01	1,24, annual	ST	Above-Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	7.66E-08	1,24, annual	ST	Above-Average	36%
							Lead	7439-92-1	2.21E-05	1,24, annual	ST	Above-Average	100%
							M&P-Xylene	179601-23-1	2.27E-03	1,24, annual	ST	Above-Average	100%
							Mercury	7439-97-6	7.71E-06	1,24, annual	ST	Above-Average	100%
							Mesitylene (1,3,5-Trimethylbenzene)	108-67-8	7.79E-04	1,24, annual	ST	Above-Average	100%
							Molybdenum	7439-98-7	7.65E-05	1,24, annual	ST	Above-Average	100%
							m-Terphenyl	92-06-8	7.66E-08	1,24, annual	ST	Above-Average	100%
							Naphthalene	91-20-3	1.42E-06	1,24, annual	ST	Above-Average	3%
							Nickel	7440-02-0	3.80E-05	1,24, annual	ST	Above-Average	100%
							Nitrogen Oxides	10102-44-0	4.26E+00	1,24, annual	ST	Above-Average	44%
							Nitrogen Oxides	10102-44-0	4.26E+00	1,24, annual	ST	Above-Average	44%
							O-terphenyl	84-15-1	7.66E-08	1,24, annual	ST	Above-Average	100%
							O-Xylene	95-47-6	8.57E-04	1,24, annual	ST	Above-Average	100%
							Pentachlorobenzene	608-93-5	7.66E-08	1,24, annual	ST	Above-Average	100%
							Pentachlorophenol	87-86-5	3.83E-07	1,24, annual	ST	Above-Average	100%
							Perylene	198-55-0	7.66E-08	1,24, annual	ST	Above-Average	100%
							Phenanthrene	85-01-8	1.39E-06	1,24, annual	ST	Above-Average	9%
							Picene	213-46-7	3.83E-07	1,24, annual	ST	Above-Average	100%
							PM10 (Condensable and Filterable)	N/A	9.01E-02	1,24, annual	ST	Above-Average	100%
							PM10 (Filterable Only)	N/A	7.73E-03	1,24, annual	ST	Above-Average	100%
							PM2.5 (Condensable and Filterable)	N/A	8.73E-02	1,24, annual	ST	Above-Average	100%
							PM2.5 (Filterable Only)	N/A	4.89E-03	1,24, annual	ST	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	1.06E-10	1,24, annual	ST	Above-Average	100%
							p-Terphenyl	92-94-4	7.66E-08	1,24, annual	ST	Above-Average	100%
							Pyrene	129-00-0	2.98E-07	1,24, annual	ST	Above-Average	20%
							Selenium	7782-49-2	8.26E-06	1,24, annual	ST	Above-Average	100%
							Silver	7440-22-4	1.65E-06	1,24, annual	ST	Above-Average	100%
							Styrene	100-42-5	3.75E-04	1,24, annual	ST	Above-Average	100%
							Sulphur Dioxide	7446-09-5	3.80E-04	1,24, annual	ST	Above-Average	2%
							Tetrachloroethene	127-18-4	1.56E-05	1,24, annual	ST	Above-Average	100%
							Tetralin	119-64-2	6.69E-07	1,24, annual	ST	Above-Average	100%

		Source Parameters					Emission Data						
Source Identifier	Source Description	Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Thallium	7440-28-0	1.65E-06	1,24, annual	ST	Above-Average	100%
							Toluene	108-88-3	1.61E-03	1,24, annual	ST	Above-Average	95%
							Total Chromium (and compounds)	7440-47-3	3.56E-05	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Condensable and Filterable)	N/A	1.05E-01	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Filterable Only)	N/A	2.27E-02	1,24, annual	ST	Above-Average	100%
							trans,1,2-Dichloroethene	156-60-5	1.09E-04	1,24, annual	ST	Above-Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	1.47E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethene	86-42-0	1.42E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	1.56E-05	1,24, annual	ST	Above-Average	100%
							Trichlorofluoromethane	75-69-4	2.84E-05	1,24, annual	ST	Above-Average	100%
							Trichlorotrifluoroethane	76-13-1	8.26E-05	1,24, annual	ST	Above-Average	100%
							Triphenylene	217-59-4	1.40E-07	1,24, annual	ST	Above-Average	100%
							Vanadium	7440-62-2	8.26E-07	1,24, annual	ST	Above-Average	100%
							Vinyl chloride	75-01-4	2.84E-05	1,24, annual	ST	Above-Average	100%
							Xylenes, m-, p- and o-	1330-20-7	3.13E-03	1,24, annual	ST	Above-Average	98%
							Zinc	7440-66-6	2.45E-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%
							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	37%
							Nitrogen Oxides	10102-44-0	1.12E+00	½	EF	Marginal	12%
							Sulphur Dioxide	7446-09-5	1.88E-02	½	EF	Above-Average	98%
							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	48%
							Toluene	108-88-3	9.21E-05	½	EF	Marginal	5%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	½	EF	Marginal	2%
							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%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am^3/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	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	4.26E-05	½	EF	Marginal	97%
							Acenaphthylene	208-96-8	3.02E-06	½	EF	Marginal	98%
							Acenaphthene	83-32-9	1.53E-06	½	EF	Marginal	95%
							Fluorene	86-73-7	4.19E-06	½	EF	Marginal	100%
							Phenanthrene	85-01-8	1.34E-05	½	EF	Marginal	91%
							Anthracene	120-12-7	4.03E-07	½	EF	Marginal	81%
							Fluoranthene	206-44-0	1.32E-06	½	EF	Marginal	83%
							Pyrene	129-00-0	1.22E-06	½	EF	Marginal	80%
							Benzo(a)anthracene	56-55-3	2.04E-07	½	EF	Marginal	73%
							Chrysene	218-01-9	5.01E-07	½	EF	Marginal	78%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	½	EF	Marginal	83%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	½	EF	Marginal	48%
							Benzo(a)pyrene	50-32-8	8.42E-08	½	EF	Marginal	52%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	½	EF	Marginal	64%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	½	EF	Marginal	60%
							Benzo(ghi)perylene	191-24-2	1.82E-07	½	EF	Marginal	100%

APPENDIX B

Emission Summary Table

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration Before Meteorological Anomaly Removal [$\mu g/m^3$]	Maximum POI Concentration After Meteorological Anomaly Removal [$\mu g/m^3$]	Averaging Period	MECP POI Limit [$\mu g/m^3$]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MECP Limit [%]	Notes	Version of Date of ACB List
1 – methylnaphthalene	90-12-0	1.70E-07	Calpuff	1.74E-07	1.65E-07	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2,4 – Trichlorobenzene	120-82-1	8.42E-07	Calpuff	8.66E-07	8.22E-07	24-hour	400	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
1,2,4,5-Tetrachlorobenzene	95-94-3	1.88E-07	Calpuff	1.94E-07	1.84E-07	24-hour	1	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
1,2-Dichlorobenzene	95-50-1	1.18E-06	Calpuff	2.32E-05	6.93E-06	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
2 – methylnaphthalene	91-57-6	3.13E-07	Calpuff	3.22E-07	3.05E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
2,3,4,6-Tetrachlorophenol	58-90-2	3.83E-07	Calpuff	3.94E-07	3.73E-07	24-hour	0.75	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4,6-Trichlorophenol	88-06-2	3.83E-07	Calpuff	3.94E-07	3.73E-07	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
2,4-Dichlorophenol	120-83-2	1.25E-06	Calpuff	1.29E-06	1.22E-06	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
3-Methylcholanthrene	56-49-5	3.83E-07	Calpuff	3.94E-07	3.73E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
7,12-Dimethylbenzo(a)anthracene	57-97-6	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		Apr-18
Acenaphthene	83-32-9	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acenaphthylene	208-96-8	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Acetaldehyde	75-07-0	4.37E-03	Calpuff	4.49E-03	4.26E-03	24-hour	500	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Acetaldehyde	75-07-0	4.37E-03	Calpuff	4.49E-03	4.26E-03	24-hour	5000	—	Sch. 6	URT	—	<1%	—	
Acrolein	107-02-8	2.00E-02	Calpuff	2.06E-02	1.95E-02	24-hour	0.4	Health	Sch. 3	Standard	B1	5%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	2.00E-02	Calpuff	3.93E-01	1.17E-01	1-hour	4.5	Health	Sch. 3	Standard	B1	3%	Note 2URT - Note 4, Table 4	Apr-18
Acrolein	107-02-8	2.00E-02	Calpuff	2.06E-02	1.95E-02	24-hour	4	Health	Sch. 6	URT	—	<1%	—	Apr-18
Ammonia	7664-41-7	1.91E-02	Calpuff	1.96E-02	1.86E-02	24-hour	100	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Ammonia	7664-41-7	1.91E-02	Calpuff	1.96E-02	1.86E-02	24-hour	1000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Anthracene	120-12-7	9.23E-08	Calpuff	9.48E-08	9.00E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Antimony	7440-36-0	2.07E-06	Calpuff	2.13E-06	2.02E-06	24-hour	25	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Arsenic	7440-38-2	1.65E-06	Calpuff	1.70E-06	1.61E-06	24-hour	0.3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Barium	7440-39-3	6.49E-05	Calpuff	6.67E-05	6.33E-05	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Benzene	71-43-2	2.70E-04	Calpuff	8.74E-06	8.74E-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	2.70E-04	Calpuff	2.78E-04	2.63E-04	24-hour	100	Health	Sch. 6	URT/DAV	B1	<1%	—	
Benzene	71-43-2	2.70E-04	Calpuff	8.74E-06	8.74E-06	Annual	4.5	Health	—	AAV	—	<1%	—	Apr-18
Benzo(a)anthracene	56-55-3	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)fluorene	238-84-6	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(a)pyrene	50-32-8	7.66E-08	Calpuff	2.48E-09	2.48E-09	Annual	0.00001	Health	Sch. 3	Standard	B1	<1%	Note 7, 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Benzo(a)pyrene	50-32-8	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.005	Health	Sch. 6	URT	—	<1%	—	Apr-18
Benzo(a)pyrene	50-32-8	7.66E-08	Calpuff	2.48E-09	2.48E-09	Annual	0.0001	Health	—	AAV	—	<1%	—	Apr-18
Benzo(b)fluoranthene	205-99-2	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(b)fluorene	243-17-4	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(e)pyrene	192-97-2	9.75E-08	Calpuff	1.00E-07	9.51E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(g,h,i)perylene	191-24-2	1.81E-07	Calpuff	1.86E-07	1.76E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Benzo(k)fluoranthene	207-08-9	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Beryllium	7440-41-7	1.65E-06	Calpuff	1.70E-06	1.61E-06	24-hour	0.01	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Biphenyl	92-51-3	4.37E-07	Calpuff	4.49E-07	4.26E-07	24-hour	175	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromodichloromethane	75-27-4	5.12E-05	Calpuff	5.26E-05	5.00E-05	24-hour	350	Health	—	SL-JSL	B2	Below SL-JSL	—	Apr-18
Bromoform	75-25-2	1.42E-05	Calpuff	1.46E-05	1.38E-05	24-hour	55	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Bromomethane	74-83-9	1.28E-04	Calpuff	1.31E-04	1.25E-04	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Cadmium	7440-43-9	5.13E-06	Calpuff	5.27E-06	5.00E-06	24-hour	0.025	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Cadmium	7440-43-9	5.13E-06	Calpuff	5.27E-06	5.00E-06	24-hour	0.25	Health	Sch. 6	URT	—	<1%	—	Apr-18
Carbon Monoxide	630-08-0	4.43E-01	Calpuff	1.04E+01	3.12E+00	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	Note 9	Apr-18
Carbon tetrachloride	56-23-5	1.34E-04	Calpuff	1.37E-04	1.30E-04	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Carbon tetrachloride	56-23-5	1.34E-04	Calpuff	1.37E-04	1.30E-04	24-hour	24	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chlorobenzene	108-90-7	9.78E-05	Calpuff	1.92E-03	5.75E-04	1-hour	3500	Health	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chlorobenzene	108-90-7	9.78E-05	Calpuff	3.17E-03	9.48E-04	10-minute	4500	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	
Chloroform	67-66-3	9.78E-05	Calpuff	1.01E-04	9.54E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Chloroform	67-66-3	9.78E-05	Calpuff	1.01E-04	9.54E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Chromium (hexavalent)	18540-29-9	3.56E-05	Calpuff	1.15E-06	1.15E-06	Annual	0.00014	Health	Sch. 3	Standard	B1	<1%	Notes 11, 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Chromium (hexavalent)	18540-29-9	3.56E-05	Calpuff	3.66E-05	3.47E-05	24-hour	0.07	Health	Sch. 6	URT	—	<1%	—	
Chrysene	218-01-9	1.40E-07	Calpuff	1.44E-07	1.36E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Cobalt	7440-48-4	2.02E-06	Calpuff	2.07E-06	1.97E-06	24-hour	0.1	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Copper	7440-50-8	2.66E-05	Calpuff	2.74E-05	2.60E-05	24-hour	50	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Dibenzo(a,c)anthracene	215-58-7	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dibenzo(a,h)anthracene	53-70-3	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Dichlorodifluoromethane	75-71-8	4.78E-05	Calpuff	4.92E-05	4.66E-05	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.45E-05	Calpuff	1.49E-05	1.42E-05	24-hour	165	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloroethene, 1,1 -	75-34-3	1.45E-05	Calpuff	1.49E-05	1.42E-05	24-hour	1650	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dichloromethane	75-09-2	2.06E-03	Calpuff	2.12E-03	2.01E-03	24-hour	220	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Dichloromethane	75-09-2	2.06E-03	Calpuff	2.12E-03	2.01E-03	24-hour	22000	Health	Sch. 6	URT	—	<1%	—	Apr-18
Dioxins, Furans and Dioxin- like PCBs	N/A	1.06E-10	Calpuff	0.00011 pg TEQ/m^3	0.0001 pg TEQ/m^3	24-hour	0.1 pg TEQ/m^3	Health	Sch. 3	Guideline	B1	<1%	Note 8, 8a, Table 1URT - Note 4, Table 4	Apr-18
Ethylbenzene	100-41-4	5.42E-04	Calpuff	5.57E-04	5.29E-04	24-hour	1000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	5.42E-04	Calpuff	1.76E-02	5.26E-03	10-minute	1900	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Ethylbenzene	100-41-4	5.42E-04	Calpuff	5.57E-04	5.29E-04	24-hour	14000	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Ethylene Dibromide	106-93-4	2.84E-05	Calpuff	2.92E-05	2.77E-05	24-hour	3	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Fluoranthene	206-44-0	2.74E-07	Calpuff	2.82E-07	2.67E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Fluorides	7664-39-3	3.99E-03	Calpuff	4.10E-03	3.89E-03	24-hour	0.86	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.99E-03	Calpuff	4.65E-04	4.65E-04	30-day	0.34	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.99E-03	Calpuff	4.10E-03	3.89E-03	24-hour	1.74	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration Before Meteorological Anomaly Removal [µg/m³]	Maximum POI Concentration After Meteorological Anomaly Removal [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MECP Limit [%]	Notes	Version of Date of ACB List
Fluorides	7664-39-3	3.99E-03	Calpuff	4.65E-04	4.65E-04	30-day	0.69	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.99E-03	Calpuff	4.10E-03	3.89E-03	24-hour	3.44	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorides	7664-39-3	3.99E-03	Calpuff	4.65E-04	4.65E-04	30-day	1.38	Vegetation	Sch. 3	Standard	B1	<1%	Note 2, 20	Apr-18
Fluorine	86-73-7	2.42E-07	Calpuff	2.49E-07	2.36E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Formaldehyde	50-00-0	2.00E-03	Calpuff	2.06E-03	1.95E-03	24-hour	65	Odour & Irritation	Sch. 3	Standard	B1	<1%	—	Apr-18
Hexachlorobenzene	118-74-1	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Hydrogen Chloride	7647-01-0	1.81E-01	Calpuff	1.86E-01	1.76E-01	24-hour	20	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Hydrogen Chloride	7647-01-0	1.81E-01	Calpuff	1.86E-01	1.76E-01	24-hour	200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Indeno(1,2,3 – cd)pyrene	193-39-5	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Lead	7439-92-1	2.21E-05	Calpuff	2.27E-05	2.15E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	2.21E-05	Calpuff	2.57E-06	2.57E-06	30-day	0.2	Health	Sch. 3	Standard	B1	<1%	Note 2URT - Note 4, Table 4	Apr-18
Lead	7439-92-1	2.21E-05	Calpuff	2.27E-05	2.15E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	Note 2URT - Note 4, Table 4	Apr-18
Mercury	7439-97-6	7.71E-06	Calpuff	7.92E-06	7.52E-06	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Molybdenum	7439-98-7	7.65E-05	Calpuff	7.86E-05	7.46E-05	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Naphthalene	91-20-3	1.42E-06	Calpuff	1.46E-06	1.38E-06	24-hour	22.5	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Naphthalene	91-20-3	1.42E-06	Calpuff	4.60E-05	1.37E-05	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	Note 2, 3	Apr-18
Nickel	7440-02-0	3.80E-05	Calpuff	1.23E-06	1.23E-06	Annual	0.04	Health	Sch. 3	Standard	B1	<1%	Note 19, Table 2, 3URT - Note 4, Table 4	Apr-18
Nickel	7440-02-0	3.80E-05	Calpuff	3.90E-05	3.70E-05	24-hour	2	Health	Sch. 6	URT	—	<1%	—	Apr-18
Nickel	7440-02-0	3.80E-05	Calpuff	1.23E-06	1.23E-06	Annual	0.4	Health	—	AAV	—	<1%	—	Apr-18
Nitrogen Oxides	10102-44-0	4.26E+00	Calpuff	4.37E+00	4.15E+00	24-hour	200	Health	Sch. 3	Standard	B1	2%	Notes 2, 17	Apr-18
Nitrogen Oxides	10102-44-0	4.26E+00	Calpuff	8.37E+01	2.50E+01	1-hour	400	Health	Sch. 3	Standard	B1	6%	Notes 2, 17	Apr-18
O-terphenyl	84-15-1	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	
PM_{10} (Condensable and Filterable)	N/A	9.01E-02	Calpuff	3.40E-01	3.35E-01	24-hour	50	—	—	AAQC	—	<1%	—	
PM_{10} (Filterable Only)	N/A	7.73E-03	Calpuff	7.95E-03	2.55E-01	24-hour	50	—	—	AAQC	—	<1%	—	
$PM_{2.5}$ (Condensable and Filterable)	N/A	8.73E-02	Calpuff	8.98E-02	3.32E-01	24-hour	30	—	—	AAQC	—	1%	—	
$PM_{2.5}$ (Filterable Only)	N/A	4.89E-03	Calpuff	5.03E-03	2.52E-01	24-hour	30	—	—	AAQC	—	<1%	—	
Pentachlorobenzene	608-93-5	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	80	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Pentachlorophenol	87-86-5	3.83E-07	Calpuff	3.94E-07	3.73E-07	24-hour	20	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Perylene	198-55-0	7.66E-08	Calpuff	7.87E-08	7.47E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Phenanthrene	85-01-8	1.39E-06	Calpuff	1.43E-06	1.36E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Pyrene	129-00-0	2.98E-07	Calpuff	3.07E-07	2.91E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Selenium	7782-49-2	8.26E-06	Calpuff	8.49E-06	8.05E-06	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	Apr-18
Silver	7440-22-4	1.65E-06	Calpuff	1.70E-06	1.61E-06	24-hour	1	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Sulphur Dioxide	7446-09-5	3.80E-04	Calpuff	3.91E-04	3.71E-04	24-hour	275	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Sulphur Dioxide	7446-09-5	3.80E-04	Calpuff	7.47E-03	2.23E-03	1-hour	690	Health	Sch. 3	Standard	B1	<1%	Effective until July 1, 2023Note 2URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	1.56E-05	Calpuff	1.61E-05	1.52E-05	24-hour	360	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Tetrachloroethene	127-18-4	1.56E-05	Calpuff	1.61E-05	1.52E-05	24-hour	3600	Health	Sch. 6	URT	—	<1%	—	
Tetralin	119-64-2	6.69E-07	Calpuff	6.87E-07	6.52E-07	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Thallium	7440-28-0	1.65E-06	Calpuff	1.70E-06	1.61E-06	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	Apr-18
Toluene	108-88-3	1.61E-03	Calpuff	1.65E-03	1.57E-03	24-hour	2000	Not Applicable	Sch. 3	Guideline	B1	<1%	To be updated - Note 5	Apr-18
Total Chromium (and compounds)	7440-47-3	3.56E-05	Calpuff	3.66E-05	3.47E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	Note 11aURT - Note 4, Table 4	Apr-18
Total Chromium (and compounds)	7440-47-3	3.56E-05	Calpuff	3.66E-05	3.47E-05	24-hour	5	Health	Sch. 6	URT	—	<1%	—	Apr-18
Total Particulate Matter (Condensable and Filterable)	N/A	1.05E-01	Calpuff	3.55E-01	3.50E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Total Particulate Matter (Filterable only)	N/A	2.27E-02	Calpuff	2.71E-01	2.69E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	Apr-18
Trichloroethane, 1,1,1 -	71-55-6	1.47E-05	Calpuff	1.51E-05	1.43E-05	24-hour	115000	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Trichloroethene	86-42-0	1.42E-05	Calpuff	1.46E-05	1.38E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	1.56E-05	Calpuff	1.61E-05	1.52E-05	24-hour	12	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Trichloroethylene, 1,1,2 -	79-01-6	1.56E-05	Calpuff	1.61E-05	1.52E-05	24-hour	1200	Health	Sch. 6	URT	—	<1%	—	Apr-18
Trichlorofluoromethane	75-69-4	2.84E-05	Calpuff	2.92E-05	2.77E-05	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	Note 10	Apr-18
Vanadium	7440-62-2	8.26E-07	Calpuff	8.49E-07	8.05E-07	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	Apr-18
Vinyl chloride	75-01-4	2.84E-05	Calpuff	2.92E-05	2.77E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	URT - Note 4, Table 4	Apr-18
Vinyl chloride	75-01-4	2.84E-05	Calpuff	2.92E-05	2.77E-05	24-hour	100	Health	Sch. 6	URT	—	<1%	—	Apr-18
Xylenes, m-, p- and o-	1330-20-7	3.13E-03	Calpuff	3.21E-03	3.05E-03	24-hour	730	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	3.13E-03	Calpuff	1.01E-01	3.03E-02	10-minute	3000	Not Applicable	Sch. 3	Guideline	B1	<1%	Note 2, 3, 22	Apr-18
Xylenes, m-, p- and o-	1330-20-7	3.13E-03	Calpuff	3.21E-03	3.05E-03	24-hour	7300	Not Applicable	Sch. 6	URT	—	<1%	—	Apr-18
Zinc	7440-66-6	2.45E-04	Calpuff	2.51E-04	2.39E-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
9-Sep-19	0:00	7.92	7		0		116		3		0	8
9-Sep-19	1:00	8.18	8		0		107		4		0	8
9-Sep-19	2:00	7.94	7		0		107		3		0	8
9-Sep-19	3:00	7.71	6	7.0	0		118		3		0	7
9-Sep-19	4:00	8.11	8	7.3	0		121		3		0	8
9-Sep-19	5:00	8.07	15	9.0	0		106		3		0	8
9-Sep-19	6:00	7.63	13	10.5	0		121		4		0	7
9-Sep-19	7:00	8.15	10	11.5	0		107		4		0	8
9-Sep-19	8:00	7.85	11	12.3	0		105		4		0	8
9-Sep-19	9:00	8.30	8	10.5	0		111		4		0	8
9-Sep-19	10:00	7.99	10	9.8	0		116		4		0	8
9-Sep-19	11:00	8.36	7	9.0	0		107		4		0	8
9-Sep-19	12:00	8.27	8	8.3	0		117		4		0	8
9-Sep-19	13:00	8.18	9	8.5	0		112		4		0	8
9-Sep-19	14:00	8.10	12	9.0	0		104		4		0	8
9-Sep-19	15:00	8.47	12	10.3	0		111		4		0	8
9-Sep-19	16:00	7.85	15	12.0	0		111		3		0	8
9-Sep-19	17:00	7.60	8	11.8	0		107		4		0	7
9-Sep-19	18:00	8.48	9	11.0	0		111		4		0	8
9-Sep-19	19:00	8.31	8	10.0	0		110		4		0	8
9-Sep-19	20:00	8.13	10	8.8	0		110		3		0	8
9-Sep-19	21:00	8.64	11	9.5	0		112		4		0	8
9-Sep-19	22:00	7.60	10	9.8	0		112		3		0	7
9-Sep-19	23:00	8.16	7	9.5	0	0.0	107	111	2	3.6	0	8
10-Sep-19	0:00	8.12	11	9.8	0	0.0	114	111	3	3.6	0	8
10-Sep-19	1:00	7.72	15	10.8	0	0.0	111	111	3	3.5	0	7
10-Sep-19	2:00	8.32	8	10.3	0	0.0	106	111	3	3.5	0	8
10-Sep-19	3:00	8.05	9	10.8	0	0.0	111	111	3	3.5	0	8
10-Sep-19	4:00	8.14	12	11.0	0	0.0	121	111	3	3.5	0	8
10-Sep-19	5:00	7.97	10	9.8	0	0.0	104	111	3	3.5	0	8
10-Sep-19	6:00	8.11	9	10.0	0	0.0	121	111	3	3.5	0	8
10-Sep-19	7:00	8.33	7	9.5	0	0.0	112	111	4	3.5	0	8
10-Sep-19	8:00	8.50	6	8.0	0	0.0	113	111	3	3.5	0	8
10-Sep-19	9:00	8.10	9	7.8	0	0.0	107	111	3	3.4	0	8
10-Sep-19	10:00	8.33	9	7.8	0	0.0	107	111	3	3.4	0	8
10-Sep-19	11:00	8.25	13	9.3	0	0.0	108	111	2	3.3	0	8
10-Sep-19	12:00	8.08	10	10.3	0	0.0	111	111	2	3.2	0	8
10-Sep-19	13:00	7.92	13	11.3	0	0.0	112	111	2	3.1	0	8
10-Sep-19	14:00	8.32	12	12.0	0	0.0	112	111	2	3.0	0	8
10-Sep-19	15:00	8.11	15	12.5	0	0.0	114	111	2	3.0	0	8
10-Sep-19	16:00	8.12	12	13.0	0	0.0	106	111	3	3.0	0	8
10-Sep-19	17:00	8.03	18	14.3	0	0.0	113	111	2	2.9	0	8
10-Sep-19	18:00	8.53	15	15.0	0	0.0	109	111	2	2.8	0	8
10-Sep-19	19:00	8.31	14	14.8	0	0.0	114	111	3	2.8	0	8
10-Sep-19	20:00	8.32	10	14.3	0	0.0	111	111	3	2.8	0	8
10-Sep-19	21:00	8.14	12	12.8	0	0.0	115	111	3	2.7	0	8
10-Sep-19	22:00	8.38	9	11.3	0	0.0	108	111	3	2.7	0	8
10-Sep-19	23:00	8.22	10	10.3	0	0.0	107	111	3	2.8	0	8
11-Sep-19	0:00	8.37	15	11.5	0	0.0	115	111	3	2.8	0	8
11-Sep-19	1:00	9.45	11	11.3	0	0.0	110	111	4	2.8	0	8
11-Sep-19	2:00	10.08	10	11.5	0	0.0	101	111	3	2.8	0	8
11-Sep-19	3:00	8.57	9	11.3	0	0.0	114	111	3	2.8	0	8
11-Sep-19	4:00	8.07	11	10.3	0	0.0	114	111	2	2.8	0	8
11-Sep-19	5:00	7.99	14	11.0	0	0.0	114	111	2	2.7	0	8
11-Sep-19	6:00	8.21	12	11.5	0	0.0	119	111	3	2.7	0	8
11-Sep-19	7:00	8.21	15	13.0	0	0.0	108	111	3	2.7	0	8
11-Sep-19	8:00	8.19	9	12.5	0	0.0	113	111	3	2.7	0	8
11-Sep-19	9:00	8.47	12	12.0	0	0.0	109	111	3	2.7	0	8
11-Sep-19	10:00	8.28	10	11.5	0	0.0	108	111	3	2.7	0	8
11-Sep-19	11:00	8.15	9	10.0	0	0.0	113	111	2	2.7	0	8
11-Sep-19	12:00	8.24	10	10.3	0	0.0	114	111	2	2.7	0	8
11-Sep-19	13:00	8.01	11	10.0	0	0.0	108	111	3	2.7	0	8
11-Sep-19	14:00	8.27	11	10.3	0	0.0	103	111	2	2.7	0	8
11-Sep-19	15:00	8.03	17	12.3	0	0.0	111	111	2	2.7	0	8
11-Sep-19	16:00	8.03	15	13.5	0	0.0	112	111	3	2.7	0	8
11-Sep-19	17:00	8.08	14	14.3	0	0.0	107	111	3	2.8	0	8
11-Sep-19	18:00	8.28	14	15.0	0	0.0	108	111	3	2.8	0	8
11-Sep-19	19:00	8.39	17	15.0	0	0.0	111	111	3	2.8	0	8
11-Sep-19	20:00	8.34	19	16.0	0	0.0	114	111	3	2.8	0	8
11-Sep-19	21:00	8.12	10	15.0	0	0.0	112	111	3	2.8	0	8
11-Sep-19	22:00	8.32	13	14.8	0	0.0	114	111	3	2.8	0	8
11-Sep-19	23:00	8.44	11	13.3	0	0.0	110	111	3	2.8	0	8

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet										Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC	O_2
		%	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
Date	Time	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
12-Sep-19	0:00	8.40	9	10.8	0	0.0	111	111	3	2.8	0	8
12-Sep-19	1:00	8.32	9	10.5	0	0.0	107	111	3	2.8	0	8
12-Sep-19	2:00	8.18	10	9.8	0	0.0	108	111	3	2.8	0	8
12-Sep-19	3:00	8.47	13	10.3	0	0.0	108	111	3	2.8	0	8
12-Sep-19	4:00	8.26	10	10.5	0	0.0	119	111	3	2.8	0	8
12-Sep-19	5:00	8.17	14	11.8	0	0.0	96	110	3	2.8	0	8
12-Sep-19	6:00	7.64	8	11.3	0	0.0	119	110	3	2.8	0	7
12-Sep-19	7:00	8.07	11	10.8	0	0.0	111	110	3	2.8	0	8
12-Sep-19	8:00	8.13	8	10.3	0	0.0	109	110	3	2.8	0	8
12-Sep-19	9:00	7.93	14	10.3	0	0.0	111	110	3	2.8	0	8
12-Sep-19	10:00	8.19	11	11.0	0	0.0	112	110	3	2.8	0	8
12-Sep-19	11:00	8.17	8	10.3	0	0.0	106	110	3	2.9	0	8
12-Sep-19	12:00	8.43	11	11.0	0	0.0	110	110	3	2.9	0	8
12-Sep-19	13:00	7.84	10	10.0	0	0.0	113	110	3	2.9	0	8
12-Sep-19	14:00	8.08	11	10.0	0	0.0	109	110	3	3.0	0	8
12-Sep-19	15:00	7.96	11	10.8	0	0.0	115	111	3	3.0	0	8
12-Sep-19	16:00	8.13	9	10.3	0	0.0	106	110	3	3.0	0	8
12-Sep-19	17:00	8.37	9	10.0	0	0.0	116	111	3	3.0	0	8
12-Sep-19	18:00	10.13	11	10.0	0	0.0	109	111	3	3.0	0	8
12-Sep-19	19:00	9.27	9	9.5	0	0.0	112	111	2	3.0	0	8
12-Sep-19	20:00	8.17	10	9.8	0	0.0	106	110	2	2.9	0	8
12-Sep-19	21:00	8.25	6	9.0	0	0.0	115	111	3	2.9	0	8
12-Sep-19	22:00	8.35	9	8.5	0	0.0	110	110	3	2.9	0	8
12-Sep-19	23:00	8.45	10	8.8	0	0.0	109	110	4	3.0	0	8
13-Sep-19	0:00	8.45	7	8.0	0	0.0	111	110	4	3.0	0	8
13-Sep-19	1:00	8.30	7	8.3	0	0.0	114	111	3	3.0	0	8
13-Sep-19	2:00	8.45	12	9.0	0	0.0	108	111	3	3.0	0	8
13-Sep-19	3:00	8.67	17	10.8	0	0.0	107	111	3	3.0	0	8
13-Sep-19	4:00	9.15	23	14.8	0	0.0	109	110	3	3.0	0	9
13-Sep-19	5:00	9.22	24	19.0	0	0.0	120	111	3	3.0	0	9
13-Sep-19	6:00	8.11	13	19.3	0	0.0	127	111	3	3.0	0	8
13-Sep-19	7:00	8.50	8	17.0	0	0.0	103	111	3	3.0	0	8
13-Sep-19	8:00	8.25	10	13.8	0	0.0	112	111	3	3.0	0	8
13-Sep-19	9:00	8.36	8	9.8	0	0.0	110	111	3	3.0	0	8
13-Sep-19	10:00	8.50	14	10.0	0	0.0	114	111	3	3.0	0	8
13-Sep-19	11:00	8.28	12	11.0	0	0.0	109	111	3	3.0	0	8
13-Sep-19	12:00	8.13	13	11.8	0	0.0	108	111	3	3.0	0	8
13-Sep-19	13:00	8.82	16	13.8	0	0.0	111	111	3	3.0	0	9
13-Sep-19	14:00	8.64	15	14.0	0	0.0	113	111	4	3.0	0	9
13-Sep-19	15:00	8.82	16	15.0	0	0.0	107	111	4	3.1	0	9
13-Sep-19	16:00	8.68	13	15.0	0	0.0	116	112	3	3.1	0	8
13-Sep-19	17:00	8.47	12	14.0	0	0.0	109	111	3	3.1	0	9
13-Sep-19	18:00	8.64	11	13.0	0	0.0	112	111	3	3.1	0	9
13-Sep-19	19:00	8.40	10	11.5	0	0.0	110	111	3	3.1	0	8
13-Sep-19	20:00	8.23	6	9.8	0	0.0	111	111	3	3.2	0	8
13-Sep-19	21:00	8.56	7	8.5	0	0.0	113	111	4	3.2	0	8
13-Sep-19	22:00	8.48	10	8.3	0	0.0	110	111	5	3.3	0	8
13-Sep-19	23:00	8.34	10	8.3	0	0.0	106	111	7	3.4	0	8
	Min	7.60	6	7.0	0	0	96	110	2	2.7	0	7
	Max	10.13	24	19.3	0	0	127	112	7	3.6	0	9
	Avg	8.29	11	11.2	0	0	111	111	3	3.0	0	8
	Std Dev	0.39	3.2	2.3	-	-	4.51	0.4	0.7	0.3	-	0.3

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet										Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC	O_2
		%	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
Date	Time	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
9-Sep-19	0:00	7.80	9		0		107		6		0	7
9-Sep-19	1:00	8.44	10		0		113		7		0	8
9-Sep-19	2:00	8.24	9		0		99		6		0	8
9-Sep-19	3:00	8.18	7	8.8	0		97		6		0	8
9-Sep-19	4:00	7.83	7	8.3	0		117		4		0	8
9-Sep-19	5:00	7.96	10	8.3	0		100		7		1	8
9-Sep-19	6:00	8.10	12	9.0	0		110		5		2	8
9-Sep-19	7:00	8.67	14	10.8	0		111		6		0	8
9-Sep-19	8:00	8.19	11	11.8	0		116		5		0	8
9-Sep-19	9:00	8.35	12	12.3	0		109		6		0	8
9-Sep-19	10:00	8.11	18	13.8	0		108		6		0	8
9-Sep-19	11:00	8.41	7	12.0	0		113		6		0	8
9-Sep-19	12:00	9.00	8	11.3	2		111		4		0	8
9-Sep-19	13:00	8.32	15	12.0	0		115		4		0	8
9-Sep-19	14:00	8.20	19	12.3	0		104		5		0	8
9-Sep-19	15:00	8.18	13	13.8	0		114		6		0	8
9-Sep-19	16:00	8.03	15	15.5	0		109		6		0	8
9-Sep-19	17:00	8.34	16	15.8	0		115		5		0	8
9-Sep-19	18:00	8.29	7	12.8	0		109		5		0	8
9-Sep-19	19:00	8.08	10	12.0	0		116		5		0	8
9-Sep-19	20:00	8.17	12	11.3	0		109		5		0	8
9-Sep-19	21:00	8.11	10	9.8	0		117		4		0	8
9-Sep-19	22:00	7.93	10	10.5	0		110		5		0	8
9-Sep-19	23:00	8.17	10	10.5	0	0.1	102	110	5	5.4	0	8
10-Sep-19	0:00	8.16	9	9.8	0	0.1	111	110	6	5.4	0	8
10-Sep-19	1:00	8.00	9	9.5	0	0.1	113	110	6	5.3	0	8
10-Sep-19	2:00	8.15	8	9.0	0	0.1	110	110	6	5.3	0	8
10-Sep-19	3:00	8.42	7	8.3	0	0.1	109	111	6	5.3	0	8
10-Sep-19	4:00	8.25	15	9.8	0	0.1	117	111	5	5.4	0	8
10-Sep-19	5:00	7.95	14	11.0	0	0.1	94	111	6	5.3	1	8
10-Sep-19	6:00	7.98	15	12.8	0	0.1	117	111	5	5.3	1	8
10-Sep-19	7:00	8.54	8	13.0	0	0.1	113	111	5	5.3	0	8
10-Sep-19	8:00	8.33	9	11.5	0	0.1	109	111	5	5.3	0	8
10-Sep-19	9:00	8.30	8	10.0	0	0.1	110	111	5	5.3	0	8
10-Sep-19	10:00	8.31	8	8.3	0	0.1	111	111	5	5.2	0	8
10-Sep-19	11:00	8.35	12	9.3	0	0.1	105	110	4	5.1	0	8
10-Sep-19	12:00	8.14	17	11.3	0	0.0	111	110	4	5.1	0	8
10-Sep-19	13:00	8.02	14	12.8	0	0.0	109	110	5	5.2	0	8
10-Sep-19	14:00	8.55	16	14.8	0	0.0	114	111	4	5.1	0	8
10-Sep-19	15:00	8.27	17	16.0	0	0.0	112	111	4	5.0	0	8
10-Sep-19	16:00	8.16	12	14.8	0	0.0	113	111	5	5.0	0	8
10-Sep-19	17:00	8.08	18	15.8	0	0.0	110	110	4	5.0	0	8
10-Sep-19	18:00	8.29	18	16.3	0	0.0	108	110	4	4.9	0	8
10-Sep-19	19:00	8.39	14	15.5	0	0.0	111	110	4	4.9	0	8
10-Sep-19	20:00	8.35	10	15.0	0	0.0	109	110	4	4.8	0	8
10-Sep-19	21:00	8.17	9	12.8	0	0.0	111	110	5	4.9	0	8
10-Sep-19	22:00	8.22	11	11.0	0	0.0	115	110	5	4.9	0	8
10-Sep-19	23:00	8.29	13	10.8	0	0.0	111	111	4	4.8	0	8
11-Sep-19	0:00	8.12	9	10.5	0	0.0	111	111	5	4.8	0	8
11-Sep-19	1:00	8.95	11	11.0	0	0.0	114	111	5	4.8	0	8
11-Sep-19	2:00	8.22	14	11.8	0	0.0	105	110	5	4.7	0	8
11-Sep-19	3:00	8.54	17	12.8	0	0.0	100	110	5	4.7	0	8
11-Sep-19	4:00	8.45	21	15.8	0	0.0	114	110	4	4.6	0	8
11-Sep-19	5:00	8.04	11	15.8	0	0.0	95	110	6	4.6	0	8
11-Sep-19	6:00	8.10	14	15.8	0	0.0	118	110	5	4.6	1	8
11-Sep-19	7:00	8.54	20	16.5	0	0.0	103	110	5	4.6	1	8
11-Sep-19	8:00	8.40	15	15.0	0	0.0	112	110	4	4.6	0	8
11-Sep-19	9:00	8.03	14	15.8	0	0.0	114	110	5	4.6	0	8
11-Sep-19	10:00	8.12	20	17.3	0	0.0	108	110	5	4.6	0	8
11-Sep-19	11:00	8.30	21	17.5	0	0.0	103	110	5	4.6	0	8
11-Sep-19	12:00	8.06	21	19.0	0	0.0	112	110	5	4.7	0	8
11-Sep-19	13:00	7.99	16	19.5	0	0.0	109	110	6	4.7	0	8
11-Sep-19	14:00	8.03	13	17.8	0	0.0	107	109	5	4.8	0	8
11-Sep-19	15:00	8.07	16	16.5	0	0.0	111	109	6	4.8	0	8
11-Sep-19	16:00	8.25	12	14.3	0	0.0	112	109	6	4.9	0	8
11-Sep-19	17:00	8.26	8	12.3	0	0.0	113	109	6	5.0	0	8
11-Sep-19	18:00	8.90	10	11.5	0	0.0	113	110	6	5.0	0	9
11-Sep-19	19:00	8.64	10	10.0	0	0.0	109	110	5	5.1	0	9
11-Sep-19	20:00	8.42	13	10.3	0	0.0	105	109	4	5.1	0	8
11-Sep-19	21:00	8.25	17	12.5	0	0.0	113	109	5	5.1	0	8
11-Sep-19	22:00	8.31	11	12.8	0	0.0	114	109	5	5.1	0	8
11-Sep-19	23:00	8.23	12	13.3	0	0.0	107	109	5	5.1	0	8

Note: All times are Eastern Standard Time

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO		SO_2		NOx		HCl		THC		O_2
		%	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		%
Date	Time	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr		1-hr
12-Sep-19	0:00	8.37	9	12.3	0	0.0	110	109	6	5.2	0		8
12-Sep-19	1:00	8.33	9	10.3	0	0.0	110	109	6	5.2	0		8
12-Sep-19	2:00	8.56	9	9.8	0	0.0	112	109	5	5.2	0		8
12-Sep-19	3:00	8.08	7	8.5	0	0.0	106	110	6	5.3	0		8
12-Sep-19	4:00	8.11	7	8.0	0	0.0	121	110	6	5.3	0		8
12-Sep-19	5:00	7.83	9	8.0	0	0.0	96	110	7	5.4	0		8
12-Sep-19	6:00	8.38	6	7.3	0	0.0	120	110	6	5.4	1		8
12-Sep-19	7:00	8.39	9	7.8	0	0.0	108	110	6	5.5	0		8
12-Sep-19	8:00	8.42	7	7.8	0	0.0	110	110	5	5.5	0		8
12-Sep-19	9:00	8.19	7	7.3	0	0.0	115	110	5	5.5	0		8
12-Sep-19	10:00	8.33	14	9.3	0	0.0	107	110	5	5.5	0		8
12-Sep-19	11:00	8.39	8	9.0	0	0.0	119	111	5	5.5	0		8
12-Sep-19	12:00	8.33	12	10.3	0	0.0	110	111	5	5.5	0		8
12-Sep-19	13:00	8.31	13	11.8	0	0.0	110	111	5	5.5	0		8
12-Sep-19	14:00	8.19	15	12.0	0	0.0	106	111	4	5.4	0		8
12-Sep-19	15:00	8.10	9	12.3	0	0.0	116	111	5	5.4	0		8
12-Sep-19	16:00	8.00	10	11.8	0	0.0	108	111	6	5.4	0		8
12-Sep-19	17:00	8.53	11	11.3	0	0.0	111	111	4	5.3	0		8
12-Sep-19	18:00	8.17	10	10.0	0	0.0	111	111	5	5.3	0		8
12-Sep-19	19:00	7.97	12	10.8	0	0.0	111	111	6	5.3	0		8
12-Sep-19	20:00	8.45	9	10.5	0	0.0	109	111	5	5.3	0		9
12-Sep-19	21:00	10.12	30	15.3	0	0.0	111	111	5	5.3	0		10
12-Sep-19	22:00	8.83	14	16.3	0	0.0	110	111	4	5.3	0		9
12-Sep-19	23:00	8.82	8	15.3	0	0.0	115	111	5	5.3	0		9
	Min	7.80	6	7.3	0	0.0	94	109	4	4.6	0		7
	Max	10.12	30	19.5	2	0.1	121	111	7	5.5	2		10
	Avg	8.28	12	12.1	0.02	0.01	110	110	5	5.1	0.08		8
	Std Dev	0.30	4.2	2.9	0.2	0.03	5.17	0.5	0.8	0.3	0.3		0.3

Note: All times are Eastern Standard Time