

EMISSIONS TESTING REPORT #10488
Text and Appendices A through E

PERFORMED FOR:

COVANTA PROJECTS, INC.
Fairfield, New Jersey

at the

LAKE COUNTY
RESOURCE RECOVERY FACILITY
OKAHUMPKA, FLORIDA
Units 1 & 2 SDA Inlets and Stacks
January 2007

by

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**PE CERTIFICATION
TESTAR REPORT NUMBER 10488**

I hereby certify that I have personally examined and am familiar with the information submitted herein. Based upon my own knowledge and my inquiry of those individuals responsible for obtaining the information presented, the foregoing information is true, accurate and complete. I am aware that this information is being requested for the purpose of determining compliance with local, state, and federal laws and may be submitted to appropriate governmental regulatory agencies for those purposes. I am aware that there are significant penalties for submitting false information to such agencies, including the possibility of fine and imprisonment.

Signature



Date:

2/20/07

Gary L. Williams, P.E.

Director

Professional Engineer, State of Florida

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1.0 INTRODUCTION

1.1 General

Covanta of Lake, Inc. operates the Lake County Resource Recovery Facility in Okahumpka, Florida. Covanta contracted TESTAR, Inc. to conduct an air emissions testing program to quantify specific emissions from Units 1 and 2 for compliance purposes. The testing program was conducted between January 16 and 19, 2007 by TESTAR under the supervision of Mr. Joe Aldina of Covanta Projects, Inc.

1.2 Test Personnel

Table 1-1 presents the personnel that were involved in the testing program.

**Table 1-1
Test Personnel**

Affiliation	Personnel Responsibility
Covanta Projects, Inc.	Joe Aldina Test Coordinator
Florida Department of Environmental Protection	Garry Kuberski Test Observer
TESTAR, Inc.	Gary Williams, PE Project Director
	Jeff Coppedge Field Laboratory Manager
	Chris Wrenn CEM Test Engineer
	Jeff Aims Test Engineer
	Tom Winkeler Test Engineer
	Sean Daley Test Engineer
	Charles Nahrebecki Test Engineer

1.3 Test Parameters and Run Numbers

Tables 1-2 and 1-3 present the test dates, sampling locations, flue gas parameters, sampling methods, and run numbers for reference for Unit #1 and #2, respectively.

**Table 1-2
Unit #1 Test Sequence**

Test Location	Sampling Method	Flue Gas Parameter	Run Date	Run Time	Run Number
Unit #1 SDA Inlet	EPA MM26	Hydrogen Chloride	01/16/07	1338-1438	1-I-MM26-1
			01/16/07	1519-1628	1-I-MM26-2
			01/17/07	0937-1037	1-I-MM26-3
	EPA 29	Mercury	01/16/07	1221-1430	1-I-M29-1
			01/16/07	1458-1709	1-I-M29-2
			01/17/07	0936-1201	1-I-M29-3
Unit #1 Stack	EPA 23	Dioxins/Furans	01/17/07	1150-1559	1-S-M23-1
			01/18/07	0740-1145	1-S-M23-2
			01/18/07	1152-1556	1-S-M23-3
	EPA MM26	Hydrogen Chloride	01/16/07	1338-1438	1-S-MM26-1
			01/16/07	1519-1628	1-S-MM26-2
			01/17/07	0937-1037	1-S-MM26-3
	EPA 9	Opacity	01/16/07	1305-1405	1-S-M9-1
			01/16/07	1540-1640	1-S-M9-2
			01/17/07	0945-1045	1-S-M9-3
	EPA 29	Particulate and Metals	01/16/07	1221-1427	1-S-M29-1
			01/16/07	1458-1708	1-S-M29-2
			01/17/07	0936-1159	1-S-M29-3
Ash Handling System	EPA 22	Fugitive Emissions	01/17/07	0800-0910	M22-1
			01/17/07	1450-1600	M22-2
			01/18/07	0745-0855	M22-3
Carbon Silo	EPA 9	Opacity	01/16/07	0938-1008	CS-M9-1

**Table 1-3
Unit #2 Test Sequence**

Test Location	Sampling Method	Flue Gas Parameter	Run Date	Run Time	Run Number
Unit #2 SDA Inlet	EPA MM26	Hydrogen Chloride	01/17/07	1301-1401	2-I-MM26-2
			01/17/07	1546-1646	2-I-MM26-3
			01/18/07	0810-0910	2-I-MM26-4
	EPA 29	Mercury	01/17/07	1300-1514	2-I-M29-2
			01/17/07	1545-1801	2-I-M29-3
			01/18/07	0809-1024	2-I-M29-4
Unit #2 Stack	EPA MM26	Hydrogen Chloride	01/17/07	1301-1401	2-S-MM26-2
			01/17/07	1546-1646	2-S-MM26-3
			01/18/07	0810-0910	2-S-MM26-4
	EPA 9	Opacity	01/17/07	1340-1440	2-S-M9-1
			01/17/07	1650-1750	2-S-M9-2
			01/18/07	0910-1010	2-S-M9-3
	EPA 29	Particulate and Metals	01/17/07	1300-1509	2-S-M29-2
			01/17/07	1545-1801	2-S-M29-3
			01/18/07	0809-1020	2-S-M29-4

Table 1-4
Utilization of EPA Method 2 and 3 Data

Runs Requiring Additional Information	Runs Providing Air Flow Rate Data	Runs Providing Flue Gas Composition Data
1-I-MM26-1	NA	1-I-M29-1
1-I-MM26-2	NA	1-I-M29-2
1-I-MM26-3	NA	1-I-M29-3
1-S-MM26-1	NA	1-S-M29-1
1-S-MM26-2	NA	1-S-M29-2
1-S-MM26-3	NA	1-S-M29-3
2-I-MM26-2	NA	2-I-M29-2
2-I-MM26-3	NA	2-I-M29-3
2-I-MM26-4	NA	2-I-M29-4
2-S-MM26-2	NA	2-S-M29-2
2-S-MM26-3	NA	2-S-M29-3
2-S-MM26-4	NA	2-S-M29-4

2.0 SUMMARY OF RESULTS

2.1 Report Organization

The results of the testing project are summarized in Section 2. The process tested is discussed in Section 3. The sampling and analytical methods utilized are discussed in Section 4 while the Quality Assurance/Quality Control results are presented in Section 5. Appendix A contains detailed results of the testing program. Appendix B contains the field data that was collected and Appendix C contains the analytical results. Appendix D contains all pertinent testing equipment calibration data. Refer to the Table of Contents and the List of Tables and Figures for a complete reference with appropriate page numbers.

2.2 Presentation of Results

Table 2-1 presents the results of the emissions testing project for Unit #1 while Table 2-2 presents the results of the emissions testing project for Unit #2. A more detailed summary of the sampling gas parameters is presented in Appendix A.

2.3 Opacity Results

Opacity measurements were taken during each EPA Method 5 test run. No opacity results are presented in Appendix A because all values were zero. The field data sheets are located in Appendix B.

Opacity measurements were also taken on the Carbon Silo. No opacity results are presented in Appendix A because all values were zero. The field data sheets are located in Appendix B.

2.4 Fugitive Emissions Results

Fugitive emissions measurements were taken along the ash discharge system and at the ash loading area. The field data sheets are located in Appendix B.

2.5 Aborted Test Runs

Test runs 2-I-M29-1, 2-I-MM26-1, 2-S-M29-1, and 2-S-MM26-1 were aborted due to a malfunction in the fabric filter. The data sheets for these test runs are included in Appendix E. The malfunction was repaired and three test sets were performed.

2.6 SO₂, NO_x, and CO Compliance Data

The sulfur dioxide, nitrogen oxides, and carbon monoxide results were provided by the facility as 24 hour averages. The facility CEM data printouts sheets are located in Appendix B.

**Table 2-1
Unit #1 Summary of Emissions**

Parameter	Rep. 1	Rep. 2	Rep. 3	Average	Permit Limits
Carbon Silo					
Opacity, %	0	---	---	0	10
Fugitive Emissions					
Fugitive Emissions, %	0	0	0	0	5 ¹
Unit #1 SDA Inlet Concentrations					
Carbon Monoxide, ppm @ 7% O ₂	15	---	---	15	100 ²
Hydrogen Chloride, ppm @ 7% O ₂	809	694	704	735	NA
Mercury, ug/DSCM @ 7% O ₂	46.9	83.6	137	89.0	NA
Sulfur Dioxide, ppmvd @ 7% O ₂	34	---	---	34	NA ²
Unit #1 Stack Concentrations					
Dioxins/Furans, ng/DSCM @ 7% O ₂	11.2	11.7	10.8	11.2	30
Hydrogen Chloride, ppm @ 7% O ₂	17.0	17.4	16.5	17.0	29
Mercury, ug/DSCM @ 7% O ₂	10.5	9.28	8.49	9.42	70
Metals					
Cadmium, mg/DSCM @ 7% O ₂	0.0119	0.00683	0.00983	0.00951	0.04
Lead, mg/DSCM @ 7% O ₂	0.0769	0.0530	0.0690	0.0663	0.44
Nitrogen Oxides, ppm @ 7% O ₂	190	---	---	190	205 ²
Opacity, %	0	0	0	0	10
Particulate, mg/DSCM @ 7% O ₂	16.6	13.8	19.6	16.7	27
Sulfur Dioxide, ppm @ 7% O ₂	1	---	---	1	29 ²
Unit #1 Removal Efficiency %					
HCl RE%, ppm @ 7% O ₂	97.9	97.5	97.7	97.7	≥95%
Mercury RE%, ug/DSCM @ 7% O ₂	77.6	88.9	93.8	86.8	≥85%
Sulfur Dioxide RE%, ppm @ 7% O ₂	97.1	---	---	97.1	≥75% ²

¹ Permit limit is 5% (9 minutes during a 180 minute test). Results presented as 'Average' is cumulative for three 60 minute test runs.

² Data provided from facility CEM system.

**Table 2-2
Unit #2 Summary of Emissions**

Parameter	Rep. 1	Rep. 2	Rep. 3	Average	Permit Limits
Unit #2 SDA Inlet Concentrations					
Carbon Monoxide, ppm @ 7% O ₂	7	---	---	7	100 ¹
Hydrogen Chloride, ppm @ 7% O ₂	788	856	823	822	NA
Mercury, ug/DSCM @ 7% O ₂	122	59.6	115	98.7	NA
Sulfur Dioxide, ppmvd @ 7% O ₂	30	---	---	30	NA ¹
Unit #2 Stack Concentrations					
Hydrogen Chloride, ppm @ 7% O ₂	7.98	6.92	9.18	8.03	29
Mercury, ug/DSCM @ 7% O ₂	3.32	3.15	7.69	4.72	70
Metals					
Cadmium, mg/DSCM @ 7% O ₂	0.00160	0.00412	0.000918	0.00221	0.04
Lead, mg/DSCM @ 7% O ₂	0.0131	0.0156	0.00805	0.0123	0.44
Nitrogen Oxides, ppm @ 7% O ₂	181	---	---	181	205 ¹
Opacity, %	0	0	0	0	10
Particulate, mg/DSCM @ 7% O ₂	3.77	4.56	1.91	3.41	27
Sulfur Dioxide, ppm @ 7% O ₂	2	---	---	2	29 ¹
Unit #2 Removal Efficiency %					
HCl RE%, ppm @ 7% O ₂	99.0	99.2	98.9	99.0	≥95%
Mercury RE%, ug/DSCM @ 7% O ₂	97.3	94.7	93.3	95.1	≥85%
Sulfur Dioxide RE%, ppm @ 7% O ₂	93.3	---	---	93.3	≥75% ¹

¹ Data provided from facility CEM system.

3.0 PROCESS DESCRIPTION AND OPERATION

The Lake County Resource Recovery Facility processes up to 528 tons of solid waste each day, generating up to 14.5 megawatts of electricity. The facility was designed and built and is operated by Covanta of Lake, Inc. Each of the two (2) Martin GmbH waterwall furnaces processes up to 264 tons of waste per day. Waste is combusted at furnace temperatures exceeding 1,800 degrees Fahrenheit and reduced to an inert ash residue. Before leaving the facility, combustion air is directed through technologically advanced air pollution control equipment consisting of spray dryer absorbers (SDA) and fabric filter baghouses.

4.0 SAMPLING AND ANALYTICAL METHODS

This section briefly describes the sampling and analytical procedures that were used and any deviations from the methods. Figure 4-1 depicts cross-sections of the SDA Inlet test location and Figure 4-2 depicts cross-sections of the Stack test location.

4.1 EPA Methods 1-4

EPA Methods 1 through 4 were utilized in conjunction with each isokinetic test method. EPA Method 1 was used to determine the location of the sampling points. EPA Method 2 was used to measure the flue gas flow rate. EPA Method 3 was used to determine the flue gas molecular weight. EPA Method 4 was used to determine the flue gas moisture content. The information provided by these methods was used in determining isokinetics, parameter concentrations, and parameter emission rates.

4.2 EPA Method 9

Opacity (visible emissions) readings were taken every 15 seconds by a certified visual emissions reader for the specified length of time during each EPA Method 5 test run.

4.3 EPA Method 22

The accumulated emissions time of fugitive emissions was determined by observing the process area(s) during normal operations for a pre-determined observation period (one hour). This method does not require that the opacity of emissions be determined, but rather the length of time that any fugitive emissions are visible. Fugitive emissions include emissions that escape capture by exhaust hoods, that are emitted during material transfer, that are emitted from buildings housing material processing or handling equipment, or that are emitted directly from process equipment. If any fugitive emissions are observed during the observation period, the length of time that the emissions are visible is quantified using a stopwatch. This total accumulated time of fugitive emissions is then used to determine compliance with the subpart or permit.

4.4 EPA Method 23

The concentrations and emissions rates of polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans (PCDD/PCDF or dioxins/furans) were determined utilizing EPA 23. The EPA Method 23 sampling train consisted of a glass nozzle, a heated glass probe, a heated glassmat filter, a