



**Mercury and Air Toxics Standard Particulate Matter and
Hydrogen Chloride Emissions Test Report**

**Lansing Board of Water and Light
Erickson Station
Unit 1 Stack
Lansing, Michigan
October 4 and 5, 2016**

**Report Submittal Date
November 10, 2016**

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Mostardi Platt

Project No. M163105E



RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION

AIR QUALITY DIV.

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating (RO) Permit program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as described in General Condition No. 22 in the RO Permit and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name Lansing Board of Water & Light County Eaton
Source Address 3725 S. Canal Road City Lansing
AQD Source ID (SRN) B4001 RO Permit No. MI-ROP-B4001-2015 RO Permit Section No. _____

Please check the appropriate box(es):

Annual Compliance Certification (General Condition No. 28 and No. 29 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the RO Permit.

2. During the entire reporting period this source was in compliance with all terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the RO Permit, unless otherwise indicated and described on the enclosed deviation report(s).

Semi-Annual (or More Frequent) Report Certification (General Condition No. 23 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred.

2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

Other Report Certification

Reporting period (provide inclusive dates): From 10/04/2016 To 10/05/2016

Additional monitoring reports or other applicable documents required by the RO Permit are attached as described:
Erickson Mercury and Air Toxics Standard PM and HCl Emissions Test Report

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete, and that any observed, documented or known instances of noncompliance have been reported as deviations, including situations where a different or no monitoring method is specified by the RO Permit.

Mark Matus	Director Tech. Services	517-702-6153
Name of Responsible Official (print or type)	Title	Phone Number
Signature of Responsible Official		Date <u>11/28/2016</u>

* Photocopy this form as needed.

1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a Mercury and Air Toxics Standards (MATS) filterable particulate matter and hydrogen chloride emissions test program for the Lansing Board of Water and Light at the Erickson Station on the Unit 1 Stack in Lansing, Michigan on October 4 and 5, 2016. This report summarizes the results of the test program and test methods used.

The test location, test dates, and test parameters are summarized below.

TEST INFORMATION		
Test Location	Test Date	Test Parameters
Unit 1 Stack	October 4 and 5, 2016	Filterable Particulate Matter (FPM) and Hydrogen Chloride (HCl)

The purpose of the test program was to document FPM and HCl emissions to qualify for the LEE designation as required by 40 CFR Part 63, Subpart UUUUU. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

TEST RESULTS			
Test Location	Test Parameter	Emission Limits	Emission Rates
Unit 1 Stack	FPM	≤0.030 lb/mmBtu	0.0068 lb/mmBtu
	HCl	≤0.002 lb/mmBtu	0.0009 lb/mmBtu

Emissions on lb/mmBtu basis were determined using a standard F_d-Factor of 9,820 dscf/mmBtu for sub-bituminous coal. Plant operating data as provided by Lansing Board of Water and Light is included in Appendix A.

The Stationary Source Audit Sample Program audit sample was obtained from ERA and submitted for analysis to Maxxam Analytical. The results of the audit sample was compared to the assigned value by ERA and found to be acceptable. The audit sample result and evaluation are appended to this report.

The identifications of the individuals associated with the test program are summarized below.

TEST PERSONNEL INFORMATION		
Location	Address	Contact
Test Coordinator	Lansing Board of Water and Light 1232 Haco Drive P.O. Box 13007 Lansing, Michigan 48912	Ms. Trista Gregorski Environmental Engineer (517) 702-6865 (phone) tmg@lbwl.com
Test Facility	Lansing Board of Water and Light Erickson Station 3725 South Canal Road Lansing, Michigan 48917	
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Christopher Trezak Project Manager (630) 993-2100 (phone) ctrezak@mp-mail.com

The test crew consisted of Messrs. C. Eldridge, B. Marlow, and C. Trezak of Mostardi Platt.

2.0 TEST METHODOLOGY

Emissions testing was conducted following the methods specified in 40CFR60, Appendix A. A schematic of the test section diagram is found in Appendix B and schematics of the sampling trains used are included in Appendix C. Calculation nomenclature and sample calculations are included in Appendix D. Laboratory analysis data are found in Appendix E. Copies of analyzer print-outs for each test run are included in Appendix F and field data sheets are found in Appendix G.

The following methodologies were used during the test program:

Method 1 Traverse Point Determination

Test measurement points were selected in accordance with Method 1. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION				
Location	Upstream Diameters	Downstream Diameters	Test Parameter	Number of Sampling Points
Unit 1 Stack	7.9	11.3	FPM, HCl	12

Method 2 Volumetric Flowrate Determination

Gas velocity was measured following Method 2, for purposes of calculating stack gas volumetric flow rate. An S-type pitot tube, differential pressure gauge, thermocouple and temperature readout were used to determine gas velocity at each sample point. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 3A Oxygen (O₂)/Carbon Dioxide (CO₂) Determination

Stack gas molecular weight was determined in accordance with Method 3A. An ECOM analyzer was used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H and copies of the gas cylinder certifications are found in Appendix I.

Method 5 Filterable Particulate Matter (FPM) Determination

Stack gas FPM concentrations and emission rates were determined in accordance with USEPA Method 5, 40CFR60, Appendix A. An Environmental Supply Company, Inc. sampling train was used to sample stack gas at an isokinetic rate, as specified in the Method. Filter and probe temperatures were elevated to 320° Fahrenheit as described in 40CFR63, Subpart UUUUU. Particulate matter in the sample probe was recovered using an acetone rinse. The probe wash and filter catch were analyzed by Mostardi Platt in accordance with the Method in the Elmhurst, Illinois laboratory. Sample analysis data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 26A Hydrogen Chloride (HCl) Determination

Stack gas HCl concentrations and emission rates were determined in accordance with Method 26A, 40CFR60, Appendix A. An Environmental Supply Company sampling train was used to sample stack gas, in the manner specified in the Method. Analyses of the samples collected were conducted by Maxxam Analytics, Inc. of Mississauga, Ontario. Sample analysis data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

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3.0 TEST RESULT SUMMARIES

Client: Lansing Board of Water and Light
Facility: Erickson Station
Test Location: Unit 1 Stack
Test Method: 5 MATS

	Source Condition	High Load	High Load	High Load	
	Date	10/4/16	10/4/16	10/4/16	
	Start Time	9:10	11:50	14:25	
	End Time	11:25	14:05	16:40	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	320.6	322.8	322.5	322.0	
Flue Gas Moisture, percent by volume	9.7%	11.8%	11.5%	11.0%	
Average Flue Pressure, in. Hg	28.93	28.93	28.93	28.93	
Gas Sample Volume, dscf	72.074	73.287	72.293	72.551	
Average Gas Velocity, ft/sec	49.561	50.218	49.880	49.886	
Gas Volumetric Flow Rate, acfm	674,957	683,903	679,303	679,388	
Gas Volumetric Flow Rate, dscfm	398,359	393,569	391,991	394,640	
Gas Volumetric Flow Rate, scfm	441,391	446,003	443,145	443,513	
Average %CO ₂ by volume, dry basis	13.9	13.8	14.0	13.9	
Average %O ₂ by volume, dry basis	5.4	5.4	5.5	5.4	
Isokinetic Variance	101.3	104.2	103.2	102.9	
Standard Fuel Factor Fd, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0	
Filterable Particulate Matter (Method 5 MATS)					
grams collected	0.0176	0.0149	0.0184	0.0170	
grains/acf	0.0022	0.0018	0.0023	0.0021	
grains/dscf	0.0038	0.0031	0.0039	0.0036	
lb/hr	12.866	10.583	13.195	12.215	
lb/mmBtu (Standard Fd Factor)	0.0071	0.0059	0.0075	0.0068	

Client: Lansing Board of Water and Light
 Facility: Erickson Station
 Test Location: Unit 1 Stack
 Test Method: 26A

Source Condition	High Load	High Load	High Load	
Date	10/5/16	10/5/16	10/5/16	
Start Time	7:30	9:55	12:20	
End Time	9:45	12:10	14:35	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	320.6	322.0	323.6	322.1
Flue Gas Moisture, percent by volume	11.7%	11.8%	12.3%	11.9%
Average Flue Pressure, in. Hg	28.93	28.93	28.93	28.93
Gas Sample Volume, dscf	73.639	72.134	73.499	73.091
Average Gas Velocity, ft/sec	50.238	49.885	50.606	50.243
Gas Volumetric Flow Rate, acfm	684,180	679,379	689,192	684,250
Gas Volumetric Flow Rate, dscfm	395,110	390,966	393,742	393,273
Gas Volumetric Flow Rate, scfm	447,422	443,478	448,950	446,617
Average %CO ₂ by volume, dry basis	13.9	13.8	14.3	14.0
Average %O ₂ by volume, dry basis	5.4	5.5	5.2	5.4
Isokinetic Variance	104.3	103.3	104.5	104.0
Standard Fuel Factor Fd, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0
Hydrogen Chloride (HCl) Emissions				
ug of sample collected	1900	2100	2200	2067
ppm	0.60	0.68	0.70	0.66
mg/dscm	0.91	1.03	1.06	1.00
lb/hr	1.35	1.51	1.56	1.47
lb/mmBtu (Standard Fd Factor)	0.0008	0.0009	0.0009	0.0009

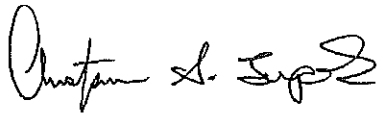
4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to Lansing Board of Water and Light. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

CERTIFICATION

As project manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results, and the test program was performed in accordance with the methods specified in this test report.

MOSTARDI PLATT



Christopher Trezak

Program Manager



Scott W. Banach

Quality Assurance