



**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
June 20 and 21, 2017**

**Report Submittal Date
July 24, 2017**

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Mostardi Platt

Project No. M172506A

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 June 20 and 21, 2017. 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 Dates	Test Parameters
Unit 1 Stack	June 20 and 21, 2017	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	0.0060 lb/mmBtu
		≤0.015 lb/mmBtu (LEE Status)*	
	HCl	≤0.002 lb/mmBtu	0.0012 lb/mmBtu
		≤0.001 lb/mmBtu (LEE Status)**	

*LEE designation for FPM is established if the FPM emissions measured during the initial compliance test and all subsequent quarterly testing completed over the initial 3-year period are less than 50% of the applicable emission limit, which equates to 0.015 lb/mmBtu.

** LEE designation for HCl is established if the HCl emissions measured during the initial compliance test and all subsequent quarterly testing completed over the initial 3-year period are less than 50% of the applicable emission limit, which equates to 0.001 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) trista.gregorski@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. B. Garcia, N. Leslie, 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.

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	High	High	
	Date	6/21/17	6/21/17	6/21/17	
	Start Time	6:55	9:28	12:00	
	End Time	9:07	11:42	14:13	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	326.8	330.7	332.4	330.0	
Flue Gas Moisture, percent by volume	12.1%	11.5%	11.6%	11.7%	
Average Flue Pressure, in. Hg	29.48	29.48	29.48	29.48	
Gas Sample Volume, dscf	78.587	75.902	77.359	77.283	
Average Gas Velocity, ft/sec	53.399	51.710	52.562	52.557	
Gas Volumetric Flow Rate, acfm	727,225	704,232	715,837	715,765	
Gas Volumetric Flow Rate, dscfm	422,521	409,983	415,376	415,960	
Gas Volumetric Flow Rate, scfm	480,764	463,307	469,901	471,324	
Average %CO ₂ by volume, dry basis	13.3	13.6	12.8	13.2	
Average %O ₂ by volume, dry basis	5.4	5.4	6.1	5.6	
Isokinetic Variance	101.6	101.2	101.8	101.5	
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	0.01647	0.01370	0.01690	0.01569	
mg/dscm	7.401	6.374	7.715	7.1634	
grains/acf	0.0019	0.0016	0.0020	0.0018	
grains/dscf	0.0032	0.0028	0.0034	0.0031	
lb/hr	11.711	9.787	12.002	11.167	
lb/mmBtu (Standard Fd Factor)	0.0061	0.0053	0.0067	0.0060	

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

	Source Condition	High	High	High	
	Date	6/20/17	6/20/17	6/20/17	
	Start Time	7:20	9:30	11:37	
	End Time	9:13	11:20	13:27	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	325.1	329.7	331.3	328.7	
Flue Gas Moisture, percent by volume	11.0%	11.2%	11.8%	11.3%	
Average Flue Pressure, in. Hg	29.37	29.37	29.37	29.37	
Gas Sample Volume, dscf	58.006	61.524	61.405	60.312	
Average Gas Velocity, ft/sec	48.703	52.159	52.256	51.039	
Gas Volumetric Flow Rate, acfm	663,272	710,346	711,663	695,094	
Gas Volumetric Flow Rate, dscfm	389,694	414,153	411,165	405,004	
Gas Volumetric Flow Rate, scfm	437,823	466,150	466,104	456,692	
Average %CO ₂ by volume, dry basis	12.5	13.5	12.9	13.0	
Average %O ₂ by volume, dry basis	5.9	5.5	6.3	5.9	
Isokinetic Variance	101.7	101.5	102.0	101.7	
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	2300.00	2500.00	2600.00	2466.67	
ppm	0.92	0.95	0.99	0.95	
mg/dscm	1.40	1.43	1.50	1.44	
lb/hr	2.044	2.226	2.303	2.191	
lb/mmBtu (Standard Fd Factor)	0.0012	0.0012	0.0013	0.0012	

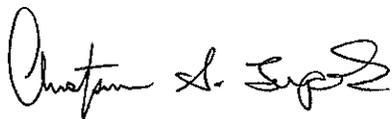
4.0 CERTIFICATION

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