



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

**Lansing Board of Water and Light
Erickson Station
Unit 1 Stack
Lansing, Michigan
March 15, 2022**

**Report Submittal Date
April 4, 2022**

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Project No. M221105

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1.0 EXECUTIVE SUMMARY

Mostardi Platt conducted a Mercury and Air Toxics Standards (MATS) 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 March 15, 2022. This report summarizes the results of the test program and test methods used.

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

TEST INFORMATION		
Test Location	Test Date	Test Parameters
Unit 1 Stack	March 15, 2022	Hydrogen Chloride (HCl)

The purpose of the test program was to document 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	LEE Emission Limits	Emission Rates
Unit 1 Stack	HCl	≤0.002 lb/mmBtu	≤0.001 lb/mmBtu	0.0014 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 analyzed by Mostardi Platt. The results of the audit sample were 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	Mr. Nathan Hude Environmental Regulatory Compliance (517) 702-6170 nathan.hude@lbwl.com
Test Facility	Lansing Board of Water and Light Erickson Station 1201 S. Washington Ave. Lansing, Michigan 48910	
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Scott McGough Project Supervisor (630) 993-2100 (phone) smcgough@mp-mail.com

The test crew consisted of Messrs. J. Kolodziejczyk, M. Friduss and S. McGough 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	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 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 at the Elmhurst, Illinois laboratory of Mostardi Platt. 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: 26A MATS

	Source Condition	Normal	Normal	Normal	
	Date	3/15/22	3/15/22	3/15/22	
	Start Time	8:45	11:17	13:35	
	End Time	10:42	13:08	15:23	
		Run 1	Run 2	Run 3	Average
Stack Conditions					
Average Gas Temperature, °F		329.1	334.7	331.2	331.7
Flue Gas Moisture, percent by volume		11.1%	11.5%	10.9%	11.2%
Average Flue Pressure, in. Hg		29.03	29.03	29.03	29.03
Gas Sample Volume, dscf		102.268	98.889	100.296	100.484
Average Gas Velocity, ft/sec		50.139	50.909	51.182	50.743
Gas Volumetric Flow Rate, acfm		682,838	693,319	697,033	691,063
Gas Volumetric Flow Rate, dscfm		394,012	395,309	401,927	397,083
Gas Volumetric Flow Rate, scfm		443,261	446,879	451,285	447,142
Average %CO ₂ by volume, dry basis		14.2	14.1	14.2	14.2
Average %O ₂ by volume, dry basis		4.8	4.7	4.7	4.7
Isokinetic Variance		104.6	100.9	100.6	102.0
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		4884	5274	5205	5121
ppm		1.11	1.24	1.21	1.19
mg/dscm		1.69	1.88	1.83	1.80
lb/hr		2.489	2.789	2.759	2.679
lb/mmBtu (Standard Fd Factor)		0.0013	0.0015	0.0014	0.0014

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.

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



Scott W. McGough

Program Manager



Scott W. Banach

Quality Assurance

APPENDICES

Appendix A - Plant Operating Data

Erickson Station Operating Load 2022 MATS Q1, Test 2

Run1	
Date/Time	UNIT01 MW Value
03/15/2022 07:45	164
03/15/2022 08:00	164
03/15/2022 08:15	164
03/15/2022 08:30	164
03/15/2022 08:45	164
03/15/2022 09:00	165
03/15/2022 09:15	165
03/15/2022 09:30	165
03/15/2022 09:45	165
Load Average:	164

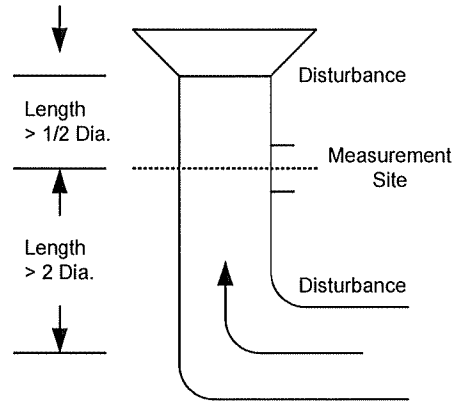
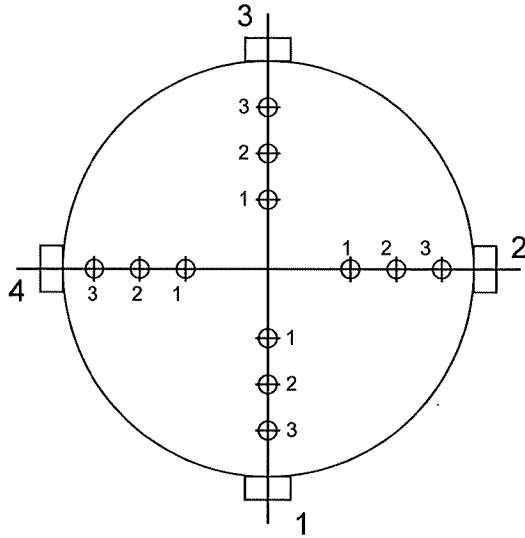
Run2	
Date/Time	UNIT01 MW Value
03/15/2022 10:00	164
03/15/2022 10:15	165
03/15/2022 10:30	164
03/15/2022 10:45	165
03/15/2022 11:00	164
03/15/2022 11:15	163
03/15/2022 11:30	162
03/15/2022 11:45	162
03/15/2022 12:00	162
03/15/2022 12:15	162
Load Average:	163

Run3	
Date/Time	UNIT01 MW Value
03/15/2022 12:30	163
03/15/2022 12:45	163
03/15/2022 13:00	163
03/15/2022 13:15	164
03/15/2022 13:30	164
03/15/2022 13:45	164
03/15/2022 14:00	164
03/15/2022 14:15	164
03/15/2022 14:30	164
Load Average:	164

Please note that the handwritten field data sheets will identify run times 1-hour later (local time) than the above data due to the fact that StackVision does not change for daylight savings time. Please contact LBWL with any questions.

Appendix B - Test Section Diagram

EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Lansing Board of Water and Light

Date: March 15, 2022

Test Location: Unit 1 Stack

Stack Diameter: 17.0 feet

Stack Area: 226.980 square feet

No. Points Across Diameter: 6

No. of Ports: 4

Port Length: 78 inches

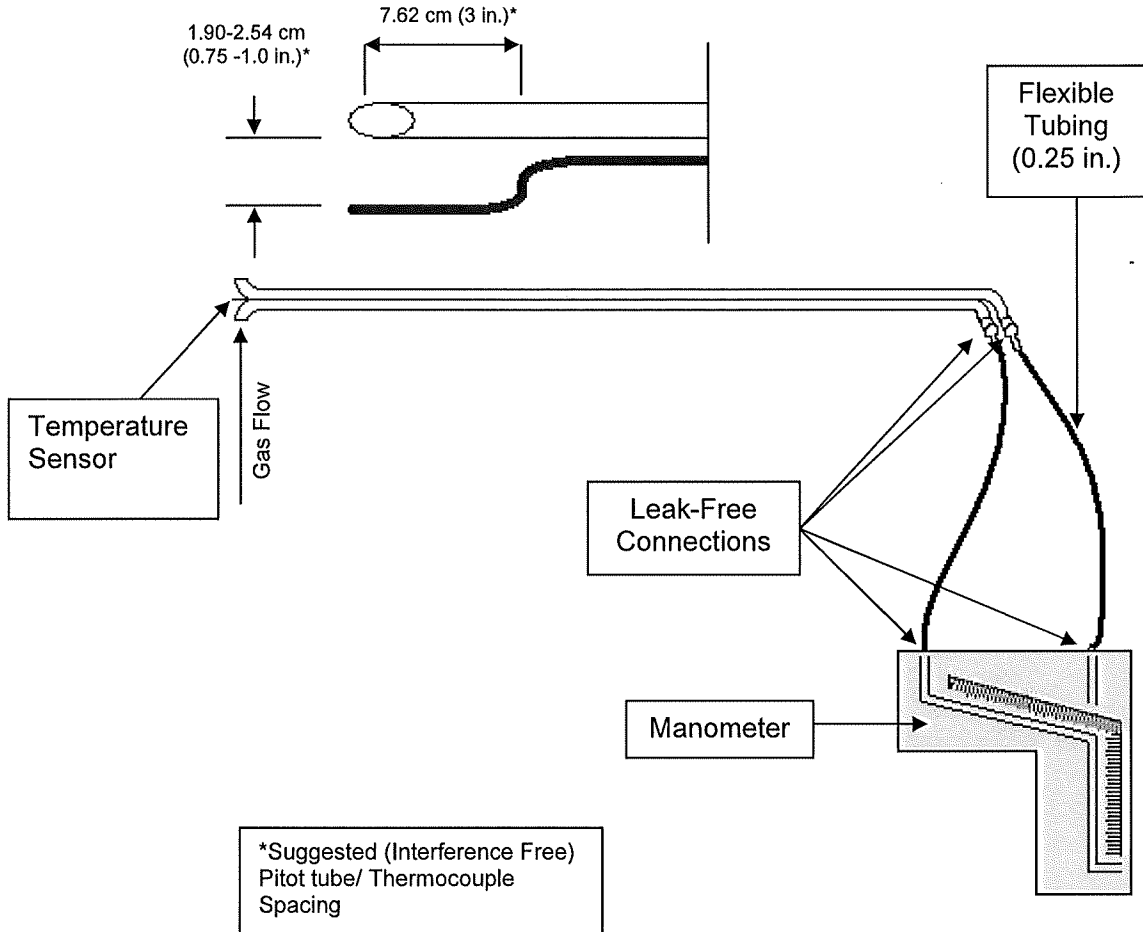
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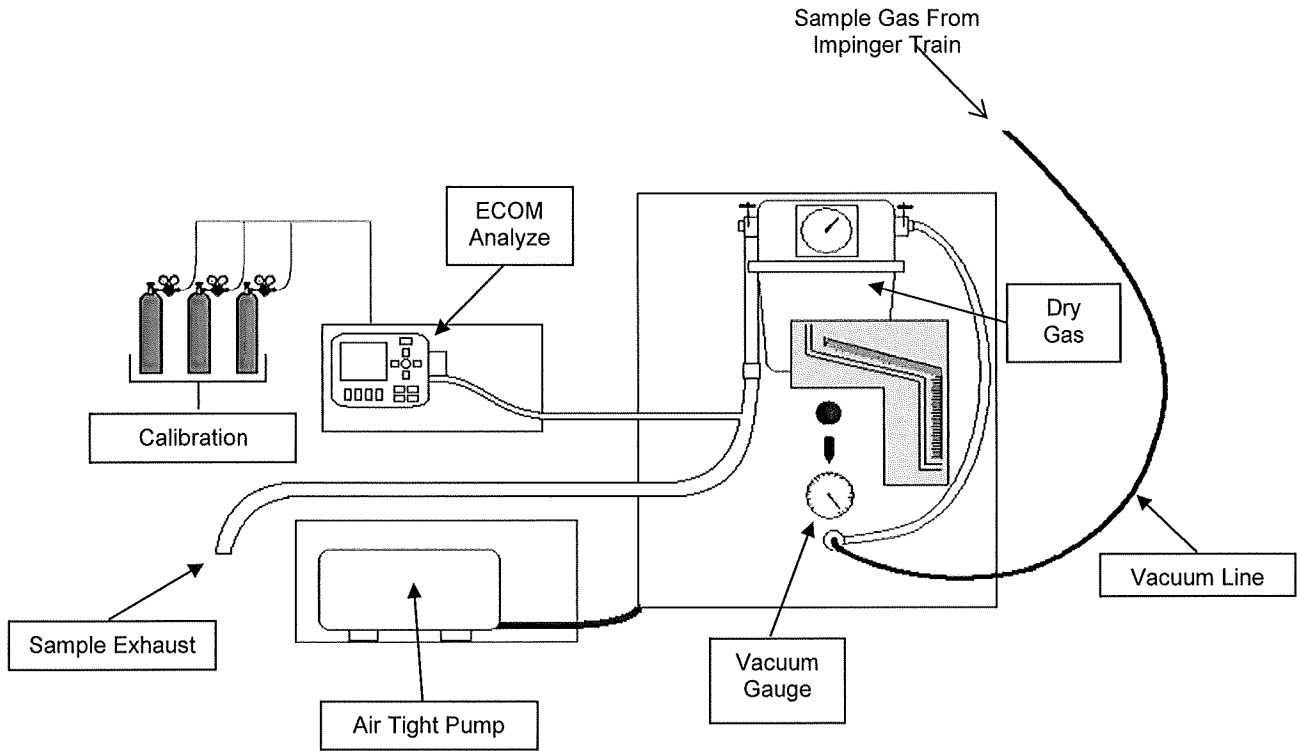
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Appendix C - Sample Train Diagrams

USEPA Method 2 – Type S Pitot Tube Manometer Assembly



USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing ECOM To Measure from Sample Exhaust



USEPA Method 26A – HCl Sample Train Diagram

