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Relative Accuracy Test Audit Test Report

Lansing Board of Water and Light
Erickson Station
Unit 1 Stack
Lansing, Michigan
Project No. M223207B
September 7 and 8, 2022

B4001_test_20220907

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Relative Accuracy Test Audit
Test Report

Lansing Board of Water and Light
Erickson Station
Unit 1 Stack
Lansing, Michigan
September 7 and 8, 2022

Report Submittal Date
October 11, 2022

Project No. M223207B

Corporate Headquarters
888 Industrial Drive
Elmhurst, Illinois 60126
630-993-2100

Crown Point, IN | Mendota Heights, MN | Denver, CO | Henderson, NV

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1.0 EXECUTIVE SUMMARY

Mostardi Platt conducted a Continuous Emissions Monitoring System (CEMS) Relative Accuracy Test Audit (RATA) test program for Lansing Board of Water and Light at the Erickson Station in Lansing, Michigan, on the Unit 1 Stack on September 7 and 8, 2022. This report summarizes the results of the test program and test methods used in accordance with the Mostardi Platt test protocol M213102 dated July 25, 2022. Mostardi Platt is a self-certified air emissions testing body (AETB). A copy of Mostardi Platt's self-certification can be found in Appendix A.

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

TEST INFORMATION		
Test Location	**Test Dates**	**Test Parameters**
Unit 1 Stack	September 7 and 8, 2022	Carbon Dioxide (CO_2), Sulfur Dioxide (SO_2), Nitrogen Oxides (NO_X), and Volumetric Flow

The purpose of the test program was to demonstrate the relative accuracies of the Unit 1 Stack CO_2, SO_2, NO_X, and volumetric flow analyzers during the specified operating conditions. The test results from this test program indicate that each CEMS component meets the United States Environmental Protection Agency (USEPA) annual performance specification for relative accuracy as published in 40 Code of Federal Regulations Part 75 (40CFR75).

RATA RESULTS						
Test Location	**Date**	**Parameter**	**Units**	**Relative Accuracy Acceptance Criteria**	**Relative Accuracy (RA)**	**Bias Adjustment Factor (BAF)**
Unit 1 Stack	9/8/2022	NO_X	lb/mmBtu	≤ 7.5% of the mean reference value	3.11%	1.000
		SO_2	ppmv	≤ 7.5% of the mean reference value	2.59%	1.000
		CO_2	% wet	≤ 7.5% of the mean reference value	3.20%	N/A
	9/7/2022	Volumetric Flow –High (Normal) Load	scfh	≤ 7.5% of the mean reference value	2.58%	1.000
	9/8/2022	Volumetric Flow – Low Load	scfh	≤ 7.5% of the mean reference value	2.84%	1.000

The gas cylinders used to perform the RATA are summarized below.

GAS CYLINDER INFORMATION				
Parameter	**Gas Vendor**	**Cylinder Serial Number**	**Cylinder Value**	**Expiration Date**
NO_X	Airgas	CC734120	91.25 ppm	3/31/2030
NO_X	Airgas	EB0056532	179.3 ppm	7/27/2028
SO_2	Airgas	CC366403	253.7 ppm	6/27/2030
SO_2	Airgas	CC127903	480.3 ppm	4/18/2030
CO_2	Airgas	ALM015018	10.36%	1/25/2030
CO_2	Airgas	CC235318	19.39%	4/1/2029
CO_2	Airgas	LL37299	9.896%	3/16/2030
CO_2	Airgas	LL107691	18.67%	2/17/2030
O_2	Airgas	LL37299	10.03%	3/16/2030
O_2	Airgas	LL107691	19.49%	2/14/2030

No deviations, additions, or exclusions from the test protocol, test methods, the Mostardi Platt Quality Manual, or the ASTM D7036-12 occurred. The specific test conditions encountered did not interfere with the collection of the data.

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 1201 S. Washington Ave. Lansing, Michigan 48910	Nathan Hude Environmental Regulatory Compliance – Air (517) 705-6170 (phone) Nathan.hude@lbwl.com
Test Facility	Lansing Board of Water and Light Erickson Station 3725 S. Canal Road Lansing, Michigan 48917	
Testing Company Supervisor	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Stuart Burton Project Manager 630-993-2100 (phone) sburton@mp-mail.com QI Group V (certified on 1/4/18)
Testing Company Personnel		Christopher Buglio Test Engineer
		Kenneth Beckham Test Engineer
		Tiernan Long Test Engineer
		Timothy Yanowsky Test Technician

Copies of the QI certifications for test personnel are included in Appendix B.

2.0 TEST METHODOLOGY

Emission testing was conducted following the United States Environmental Protection Agency (USEPA) methods specified in 40CFR75, 40 Code of Federal Regulations (40CFR60), Appendix A, and ASTM E337-02 in addition to the Mostardi Platt Quality Manual and the test protocol. Schematics of the test section diagrams and sampling trains used are included in Appendix C and D respectively. Calculation and nomenclature are included in Appendix E. Copies of analyzer print-outs for each test run are included in Appendix F. CEM data and process data as provided by Lansing Board of Water and Light are included in Appendix G.

The following methodologies were used during the test program:

Method 1 Sample and Velocity Traverse Determination

Test measurement points were selected in accordance with USEPA Method 1, 40CFR60, Appendix A. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION AT UNIT 1 STACK							
Stack Diameter (Feet)	**Stack Area (Square Feet)**	**No. of Ports**	**Port Length (Inches)**	**Upstream Diameters**	**Downstream Diameters**	**Test Parameter**	**Number of Sampling Points**
17.0	226.98	4	78.0	7.94	11.76	Volumetric Flow	16

Method 2 Volumetric Flow Rate Determination

Gas velocity was measured following USEPA Method 2, 40CFR60, Appendix A, for purposes of calculating stack gas volumetric flow rate. A 12-foot-long S-type pitot tube, 0-10-inch differential pressure gauge, and K-type 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. Copies of field data sheets are included in Appendix H. Calibration data is presented in Appendix I. This testing met the performance specifications as outlined in the Method.

Method 3 Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Stack gas molecular weight was determined in accordance with USEPA Method 3, 40CFR60, Appendix A, during each volumetric flow rate determination. A Fyrite analyzer was used to determine stack gas O_2 and CO_2 content and, by difference, nitrogen content. Multiple gas extractions were performed during each test run to ensure a stable reading. Chemicals are changed frequently and inspected for reactivity prior to each use. This testing met the performance specifications as outlined in the Method.

Method 3A Carbon Dioxide (CO_2) Determination

Stack gas CO_2 concentrations were determined in accordance with USEPA Method 3A, 40CFR60, Appendix A. A Thermo Scientific Model 410i Optical Filter Carbon Dioxide Analyzer was used to determine carbon dioxide concentrations in the manner specified in the Method. The instrument has a nondispersive infrared-based detector and operated in the nominal range of 0% to 20% with the specific range determined by the high-level span calibration gas of 19.39%.

The Model 410i operates on the principle that CO_2 absorbs infrared radiation at a wavelength of 4.26 microns. The sample is drawn into the Model 410i through the sample bulkhead. The sample flows through the optical bench. Radiation from an infrared source is chopped and then passed through a rotating optical wheel alternating between sample and reference filters. The radiation then enters the optical bench where absorption by the sample gas occurs. The infrared radiation then exits the optical bench and falls on an infrared detector. The chopped detector signal is modulated by the alternation between the filters with an, amplitude related to the concentration of CO_2 in the sample cell. Because infrared absorption is a non-linear measurement, it is necessary to transform the basic analyzer signal into a linear output. The Model 410i uses an internally stored calibration curve to accurately linearize the instrument output over any range up to a concentration of 10,000 ppm. The Model 410i outputs the CO_2 concentration to the front panel display, the analog outputs, and also makes the data available over the serial or ethernet connection.

Stack gas was delivered to the analyzer through an EPM in-situ dilution sampling system. Stack gas concentrations were diluted at a nominal 100:1 ratio utilizing purified dilution air. The entire system was calibrated in accordance with the Method, using USEPA Protocol gases introduced at the probe, before and after each test run.

A list of calibration gases used and the results of all calibration and other required quality assurance checks are found in Appendix I. Copies of the gas cylinder certifications are found in Appendix J. This testing met the performance specifications as outlined in the Method.

Moisture (H_2O) Determination

ASTM Method E337-02, reapproved 2002, was used to determine the moisture content of the gas stream using wet bulb/dry bulb measurements during each volumetric flow test run in order to calculate the gas volumetric air flow on a dry basis. The water vapor content was calculated as follows:

$$\text{Bws} = \left[\frac{e' - AP(t - t')}{P}\right]$$

where:

e' = saturated vapor pressure of water, in. Hg, at the wet bulb temperature, t'

A = $3.67 \times 10^{-4} [1 + 0.00064(t' - 32)]$

P = absolute pressure, in. Hg, in duct

t = dry bulb temperature, °F

t' = wet bulb temperature, °F

This testing met the performance specifications as outlined in the Method.

Method 6C Sulfur Dioxide (SO_2) Determination

Stack gas SO_2 concentrations and emission rates were determined in accordance with USEPA Method 6C, 40CFR60, Appendix A. A Thermo Scientific Model 43i Pulsed Fluorescence Sulfur Dioxide Analyzer was used to determine sulfur dioxide concentrations, in the manner specified in the Method. The instrument operated in the nominal range of 0 ppm to 500 ppm with the specific range determined by the high-level span calibration gas of 480.3 ppm.

The Model 43i operates on the principle that SO_2 molecules absorb ultraviolet (UV) light and become excited at one wavelength, then decay to a lower energy state emitting UV light at a different wavelength. Specifically,

$$SO_2 + hv_1 \rightarrow SO_2^* \rightarrow SO_2 + hv_2$$

The sample is drawn into the Model 43*i* through the sample bulkhead. The sample flows through a hydrocarbon "kicker", which removes hydrocarbons from the sample by forcing the hydrocarbon molecules to permeate through the tube wall. The SO_2 molecules pass through the hydrocarbon "kicker" unaffected.

The sample flows into the fluorescence chamber, where pulsating UV light excites the SO_2 molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selective mirrors that reflect only the wavelengths which excite SO_2 molecules.

As the excited SO_2 molecules decay to lower energy states, they emit UV light that is proportional to the SO_2 concentration. The bandpass filter allows only the wavelengths emitted by the excited SO_2 molecules to reach the photomultiplier tube (PMT). The PMT detects the UV light emission from the decaying SO_2 molecules. The photodetector, located at the back of the fluorescence chamber, continuously monitors the pulsating UV light source and is connected to a circuit that compensates for fluctuations in the lamp intensity.

As the sample leaves the optical chamber, it passes through a flow sensor, a capillary, and the "shell" side of the hydrocarbon kicker. The Model 43*i* outputs the SO_2 concentration to the front panel display, the analog outputs, and also makes the data available over the serial or Ethernet connection.

Stack gas was delivered to the analyzer through an EPM in-situ dilution sampling system. Stack gas concentrations were diluted at a nominal 100:1 ratio utilizing purified dilution air. The entire system was calibrated in accordance with the Method, using USEPA Protocol gases introduced at the probe, before and after each test run.

A list of calibration gases used and the results of all calibration and other required quality assurance checks are found in Appendix I. Copies of the gas cylinder certifications are found in Appendix J. This testing met the performance specifications as outlined in the Method.

Method 7E Nitrogen Oxides (NO_X) Determination

Stack gas NO_X concentrations and emission rates were determined in accordance with USEPA Method 7E, 40CFR60, Appendix A. A Thermo Scientific Model 42i Chemiluminescence Nitrogen Oxides Analyzer was used to determine nitrogen oxides concentrations, in the manner specified in the Method. The instrument operated in the nominal range of 0 ppm to 500 ppm with the specific range determined by the high-level span calibration gas of 179.3 ppm.

The Model 42i High Level is based on the principle that nitric oxide (NO) and ozone (O_3) react to produce a characteristic luminescence with an intensity linearly proportional to the NO concentration. Infrared light emission results when electronically excited nitrogen dioxide (NO_2) molecules decay to lower energy states. Specifically,

$$NO + O_3 \rightarrow NO_2 + O_2 + h\upsilon$$

NO_2 must first be transformed into NO before it can be measured using the chemiluminescent reaction. NO_2 is converted to NO by a molybdenum NO_2-to-NO converter heated to about 326°C. The flue gas air sample is drawn into the Model 42i High Level through the sample bulkhead. The sample flows through a particulate filter, a capillary, and then to the mode solenoid valve. The solenoid valve routes the sample either straight to the reaction chamber (NO mode) or through the NO_2-to-NO converter and then to the reaction chamber (NO_X mode).

Dry air enters the Model 42i High Level through the dry air bulkhead, through a flow sensor, and then through a silent discharge ozonator. The ozonator generates the necessary ozone concentration needed for the chemiluminescent reaction. The ozone reacts with the NO in the ambient air sample to produce electronically excited NO_2 molecules. A photomultiplier tube (PMT) housed in a thermoelectric cooler detects the NO_2 luminescence.

The NO and NO_X concentrations calculated in the NO and NO_X modes are stored in memory. The difference between the concentrations are used to calculate the NO_2 concentration. The Model 42i High Level outputs NO, NO_2, and NO_X concentrations to both the front panel display and the analog outputs.

Stack gas was delivered to the analyzer through an EPM in-situ dilution sampling system. Stack gas concentrations were diluted at a nominal 100:1 ratio utilizing purified dilution air. The entire system was calibrated in accordance with the Method, using USEPA Protocol gases introduced at the probe, before and after each test run.

A list of calibration gases used and the results of all calibration and other required quality assurance checks are found in Appendix I. Copies of the gas cylinder certifications are found in Appendix J. The NO_2 to NO converter test can be found in Appendix K. This testing met the performance specifications as outlined in the Method.

3.0 TEST RESULT SUMMARIES

Client:	Lansing Board of Water and Light	**Location:**	Unit 1 Stack
Facility:	Erickson Station	**Date:**	9/8/22
Project #:	M223207	**Test Method:**	7E, 3A
Fuel Type:	Sub Bituminous Coal	**Fuel Factor:**	1840

NO_x lb/mmBtu RATA

CEM Analyzer Information

NO_x Monitor/Model:	Teledyne Monitor Labs T200	**NO_x Serial # :**	337
CO_2 Monitor/Model:	Teledyne Monitor Labs T360M	**CO_2 Serial # :**	63

1=accept 0=reject	Test Run	Test Date	Start Time	End Time	RM NO_x lb/mmBtu	CEM NO_x lb/mmBtu	(RM-CEM) Difference (di)	(RM-CEM) Difference^2 (di^2)
1	1	09/08/22	10:45	11:05	0.132	0.132	0.000	0.000000
1	2	09/08/22	11:30	11:50	0.131	0.132	-0.001	0.000001
1	3	09/08/22	12:12	12:32	0.130	0.132	-0.002	0.000004
1	4	09/08/22	12:54	13:14	0.130	0.134	-0.004	0.000016
1	5	09/08/22	13:36	13:56	0.131	0.134	-0.003	0.000009
1	6	09/08/22	14:17	14:37	0.132	0.134	-0.002	0.000004
1	7	09/08/22	14:58	15:18	0.129	0.134	-0.005	0.000025
1	8	09/08/22	15:40	16:00	0.127	0.131	-0.004	0.000016
0	9	09/08/22	16:22	16:42	0.125	0.130	-0.005	0.000025
1	10	09/08/22	17:04	17:24	0.126	0.130	-0.004	0.000016

n	**9**	
t(0.025)	**2.306**	
Mean Reference Method Value	**0.130**	**RM avg**
Mean CEM Value	**0.133**	**CEM avg**
Sum of Differences	**-0.025**	**di**
Mean Difference	**-0.003**	**d**
Sum of Differences Squared	**0.000**	**di^2**
Standard Deviation	**0.002**	**sd**
Confidence Coefficient 2.5% Error (1-tail)	**0.001**	**cc**
Relative Accuracy	**3.11**	**RA**
Bias Adjustment Factor	**1.000**	**BAF**

Client: Lansing Board of Water and Light | **Location:** Unit 1 Stack
Facility: Erickson Station | **Date:** 9/8/22
Project #: M223207 | **Test Method:** 6C

SO_2 ppmv RATA

CEM Analyzer Information

SO_2 Monitor/Model:	Teledyne Monitor Labs T100H	SO_2 Serial # :	61

1=accept 0=reject	Test Run	Test Date	Start Time	End Time	RM SO_2 ppmv	CEM SO_2 ppmv	(RM-CEM) Difference (di)	(RM-CEM) Difference^2 (di^2)
1	1	09/08/22	10:45	11:05	206.8	211.4	-4.6	21.16
1	2	09/08/22	11:30	11:50	207.8	208.3	-0.5	0.25
0	3	09/08/22	12:12	12:32	200.9	206.8	-5.9	34.81
1	4	09/08/22	12:54	13:14	200.3	204.1	-3.8	14.44
1	5	09/08/22	13:36	13:56	200.5	204.6	-4.1	16.81
1	6	09/08/22	14:17	14:37	197.7	201.8	-4.1	16.81
1	7	09/08/22	14:58	15:18	196.9	202.1	-5.2	27.04
1	8	09/08/22	15:40	16:00	200.0	204.1	-4.1	16.81
1	9	09/08/22	16:22	16:42	199.5	205.1	-5.6	31.36
1	10	09/08/22	17:04	17:24	200.3	205.1	-4.8	23.04

n	9	
t(0.025)	2.306	
Mean Reference Method Value	201.089	RM avg
Mean CEM Value	205.178	CEM avg
Sum of Differences	-36.800	di
Mean Difference	-4.089	d
Sum of Differences Squared	167.720	di^2
Standard Deviation	1.468	sd
Confidence Coefficient 2.5% Error (1-tail)	1.129	cc
Relative Accuracy	2.59	RA
Bias Adjustment Factor	1.000	BAF

Client: Lansing Board of Water and Light | **Location:** Unit 1 Stack
Facility: Erickson Station | **Date:** 9/8/22
Project #: M223207 | **Test Method:** 3A

CO_2 % (wet) RATA

CEM Analyzer Information

CO2 Monitor/Model:	Teledyne Monitor Labs T360M	**CO2 Serial # :**	63

1=accept 0=reject	Test Run	Test Date	Start Time	End Time	RM CO_2 % (wet)	CEM CO_2 % (wet)	(RM-CEM) Difference (di)	(RM-CEM) Difference^2 (di^2)
1	1	09/08/22	10:45	11:05	11.1	11.4	-0.3	0.09
1	2	09/08/22	11:30	11:50	11.3	11.5	-0.2	0.04
1	3	09/08/22	12:12	12:32	11.2	11.5	-0.3	0.09
1	4	09/08/22	12:54	13:14	11.2	11.5	-0.3	0.09
1	5	09/08/22	13:36	13:56	11.2	11.5	-0.3	0.09
1	6	09/08/22	14:17	14:37	11.1	11.5	-0.4	0.16
1	7	09/08/22	14:58	15:18	11.2	11.5	-0.3	0.09
1	8	09/08/22	15:40	16:00	11.1	11.5	-0.4	0.16
0	9	09/08/22	16:22	16:42	11.1	11.5	-0.4	0.16
1	10	09/08/22	17:04	17:24	11.2	11.5	-0.3	0.09

n	9	
t(0.025)	2.306	
Mean Reference Method Value	11.178	RM avg
Mean CEM Value	11.489	CEM avg
Sum of Differences	-2.800	di
Mean Difference	-0.311	d
Sum of Differences Squared	0.900	di^2
Standard Deviation	0.060	sd
Confidence Coefficient 2.5% Error (1-tail)	0.046	cc
Relative Accuracy	3.20	RA

Client: Lansing Board of Water & Light **Test Location:** Unit 1 Stack
Facility: Erickson **Test Date:** 9/7/2022
Project #: M223207 **Test Method:** 2

Volumetric Flow RATA - High(Normal) Load
CEM Analyzer Information

Flow Monitor/Model:	Teledyne Ultraflow 150	**Flow Serial # :**	R-1108 1K-07 10

1=accept 0=reject	Test Run	Test Date	Start Time	End Time	Reference Method Flow SCFH	CEM Flow SCFH	(RM-CEM) Difference (di)	(RM-CEM) Difference ^{2} (di^2)
0	1	09/07/22	11:27	11:37	19,102,000	19,917,000	-815,000	664,225,000,000
1	2	09/07/22	11:40	11:55	19,640,000	20,053,000	-413,000	170,569,000,000
1	3	09/07/22	12:15	12:25	19,728,000	20,062,000	-334,000	111,556,000,000
1	4	09/07/22	12:40	12:55	20,206,000	19,991,000	215,000	46,225,000,000
1	5	09/07/22	13:50	14:00	19,636,000	20,091,000	-455,000	207,025,000,000
1	6	09/07/22	14:05	14:20	20,242,000	19,986,000	256,000	65,536,000,000
1	7	09/07/22	15:20	15:30	19,322,000	20,062,000	-740,000	547,600,000,000
1	8	09/07/22	15:35	15:50	20,210,000	20,095,000	115,000	13,225,000,000
1	9	09/07/22	16:05	16:15	19,268,000	19,912,000	-644,000	414,736,000,000
1	10	09/07/22	16:18	16:30	19,908,000	19,876,000	32,000	1,024,000,000

n	**9**	
t(0.025)	**2.306**	
Mean Reference Method Value	**19795555.556**	RM avg
Mean CEM Value	**20014222.222**	CEM avg
Sum of Differences	**-1968000.000**	di
Mean Difference	**-218666.667**	d
Sum of Differences Squared	**1577496000000.000**	di^2
Standard Deviation	**378675.323**	sd
Confidence Coefficient 2.5% Error (1-tail)	**291075.098**	cc
Relative Accuracy	**2.58**	RA
Bias Adjustment Factor	**1.000**	BAF

Client: Lansing Board of Water & Light
Facility: Erickson
Project #: M223207

Test Location: Unit 1 Stack
Test Date: 9/8/2022
Test Method: 2

Volumetric Flow RATA - Low Load

CEM Analyzer Information

Flow Monitor/Model:	Teledyne Ultraflow 150	Flow Serial # :	R-1108 1K-07 10

1=accept 0=reject	Test Run	Test Date	Start Time	End Time	Reference Method Flow SCFH	CEM Flow SCFH	(RM-CEM) Difference (di)	(RM-CEM) Difference ^{2} (di^2)
1	1	09/08/22	6:45	7:00	18,864,000	19,567,000	-703,000	494,209,000,000
1	2	09/08/22	7:02	7:15	18,874,000	19,493,000	-619,000	383,161,000,000
1	3	09/08/22	7:18	7:30	18,899,000	19,592,000	-693,000	480,249,000,000
0	4	09/08/22	7:45	8:00	18,647,000	19,589,000	-942,000	887,364,000,000
1	5	09/08/22	8:05	8:15	19,379,000	19,555,000	-176,000	30,976,000,000
1	6	09/08/22	8:20	8:30	19,340,000	19,521,000	-181,000	32,761,000,000
1	7	09/08/22	8:45	9:00	19,290,000	19,339,000	-49,000	2,401,000,000
1	8	09/08/22	9:05	9:15	19,126,000	19,465,000	-339,000	114,921,000,000
1	9	09/08/22	9:20	9:30	19,053,000	19,283,000	-230,000	52,900,000,000
1	10	09/08/22	9:45	9:55	19,392,000	19,304,000	88,000	7,744,000,000

n	9	
t(0.025)	2.306	
Mean Reference Method Value	19135222.222	RM avg
Mean CEM Value	19457666.667	CEM avg
Sum of Differences	-2902000.000	di
Mean Difference	-322444.444	d
Sum of Differences Squared	1599322000000.000	di^2
Standard Deviation	288007.861	sd
Confidence Coefficient 2.5% Error (1-tail)	221382.042	cc
Relative Accuracy	2.84	RA
Bias Adjustment Factor	1.000	BAF

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 the program 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. The test program was performed in accordance with the test protocol, test methods, the Mostardi Platt Quality Manual, and the ASTM D7036-12, as applicable.

MOSTARDI PLATT

Stuart L. Burton — Program Manager

Scott W. Banach — Quality Assurance

APPENDICES

Appendix A - Company AETB Certification

mostardi platt

March 23, 2012

Effective immediately, Mostardi Platt self-certifies that all Part 75 test projects conform to the ASTM D 7036-04 Standard Practice. The following contact information is provided as required by the Standard:

Mostardi Platt
888 Industrial Drive
Elmhurst, Illinois 60126

630-993-2100

tplatt@mp-mail.com

Also, attached is a list of each Qualified Individual (QI) with the type of exam (e.g., Group I, II, III IV and/or V), the date the exam was taken and the name and email address of the exam provider.

Should you have any questions or need additional information, please contact Thomas Platt, P.E. at 630-993-2683.

Approved:

By: ______________________
Robert J. Platt
Chief Executive Officer

QSTI AETB Import Data

QI Last Name [REQUIRED]	QI First Name [REQUIRED]	QI Middle Initial	AETB Name [REQUIRED]	AETB Phone Number [REQUIRED]	AETB Email [REQUIRED]	Exam Date mm/dd/yyyy [REQUIRED]	Exam Provider Name [REQUIRED]	Exam Provider Email [REQUIRED]	Comment
Burton	Stuart	L	Mostard Platt	630-993-2100	tplatt@mp-mail.com	1/4/2018	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)
Carlisle	Robert	W	Mostard Platt	630-993-2100	tplatt@mp-mail.com	1/8/2021	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)
Colangelo	Nicholas	C	Mostard Platt	630-993-2100	tplatt@mp-mail.com	2/1/2019	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)
Coleman	Paul	F	Mostard Platt	630-993-2100	tplatt@mp-mail.com	3/15/2018	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)
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Howe	Jacob	W	Mostard Platt	630-993-2100	tplatt@mp-mail.com	2/17/2021	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)
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Trezak	Christopher	S	Mostard Platt	630-993-2100	tplatt@mp-mail.com	4/14/2020	Source Evaluation Society	qstiprogram@gmail.com	Group V (Part 75)

9/19/2022

Appendix B - QI Certification(s) for Field Personnel

mostardi platt

Qualified Individual

Stuart L. Burton

Has satisfactorily completed the requirements of

ASTM D 7036 – 04, Section 8.3

Standard Practice for Competence of Air Emission Testing Bodies

Examinations provided by Source Evaluation Society: www.sesnews.org, (919) 544-6338

All Part 75 test methods, under my supervision, shall conform to the company's Quality Manual and to this practice, in all respects.

Passed Group V Exam on 1/4/2018

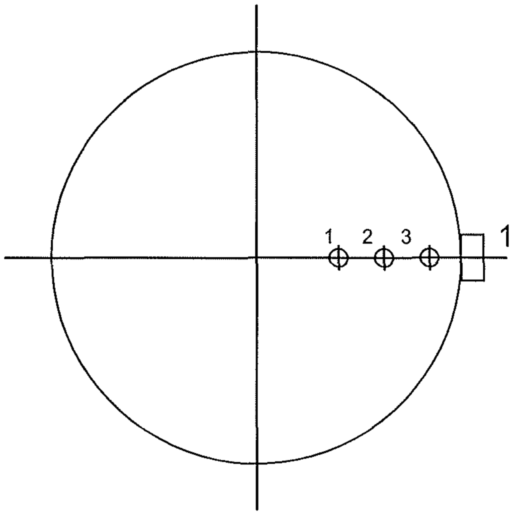
Expiration Date: 1/4/2023

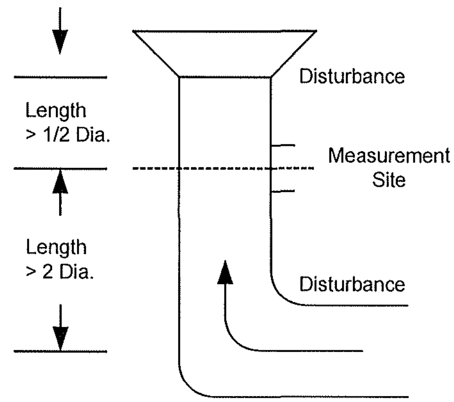
Signature: [signature] Date: 2-23-18

Quality Manager: Thomas B. Platt Technical Director: Matthew Bauschel

Appendix C - Test Section Diagrams

GASEOUS TRAVERSE FOR ROUND DUCTS



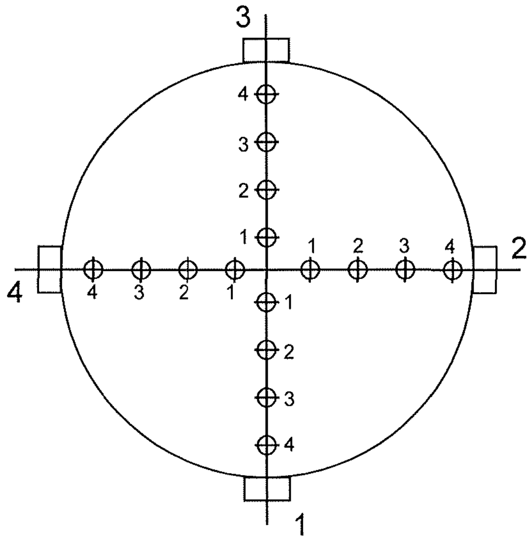


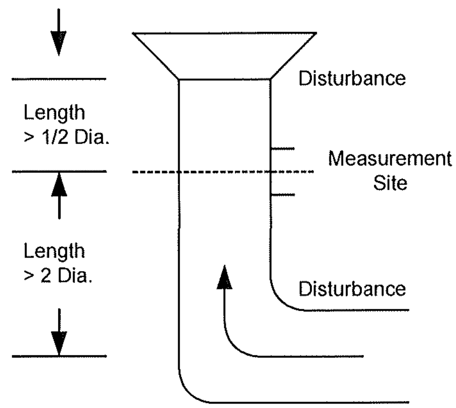
Job:	Lansing Board of Water and Light Erickson Station Lansing, Michigan
Date:	September 8, 2022
Test Location:	Unit 1 Stack
Stack Diameter (Feet):	17.0
Stack Area (Square Feet):	226.98
No. Sample Points:	3
No of Ports:	1
Port Length (Inches):	78.0

Distance from inside wall
at port to traverse point:

1. 6.56 Feet (2.0 Meters)
2. 3.94 Feet (1.2 Meters)
3. 1.31 Feet (0.4 Meters)

EQUAL AREA TRAVERSE FOR ROUND DUCTS





Job: Lansing Board of Water and Light
Erickson Station
Lansing, Michigan

Date: September 7 and 8, 2022

Test Location: Unit 1 Stack

Stack Diameter (Feet): 17.0

Stack Area (Square Feet): 226.98

No. Sample Points Across Diameter: 8

No. of Ports 4

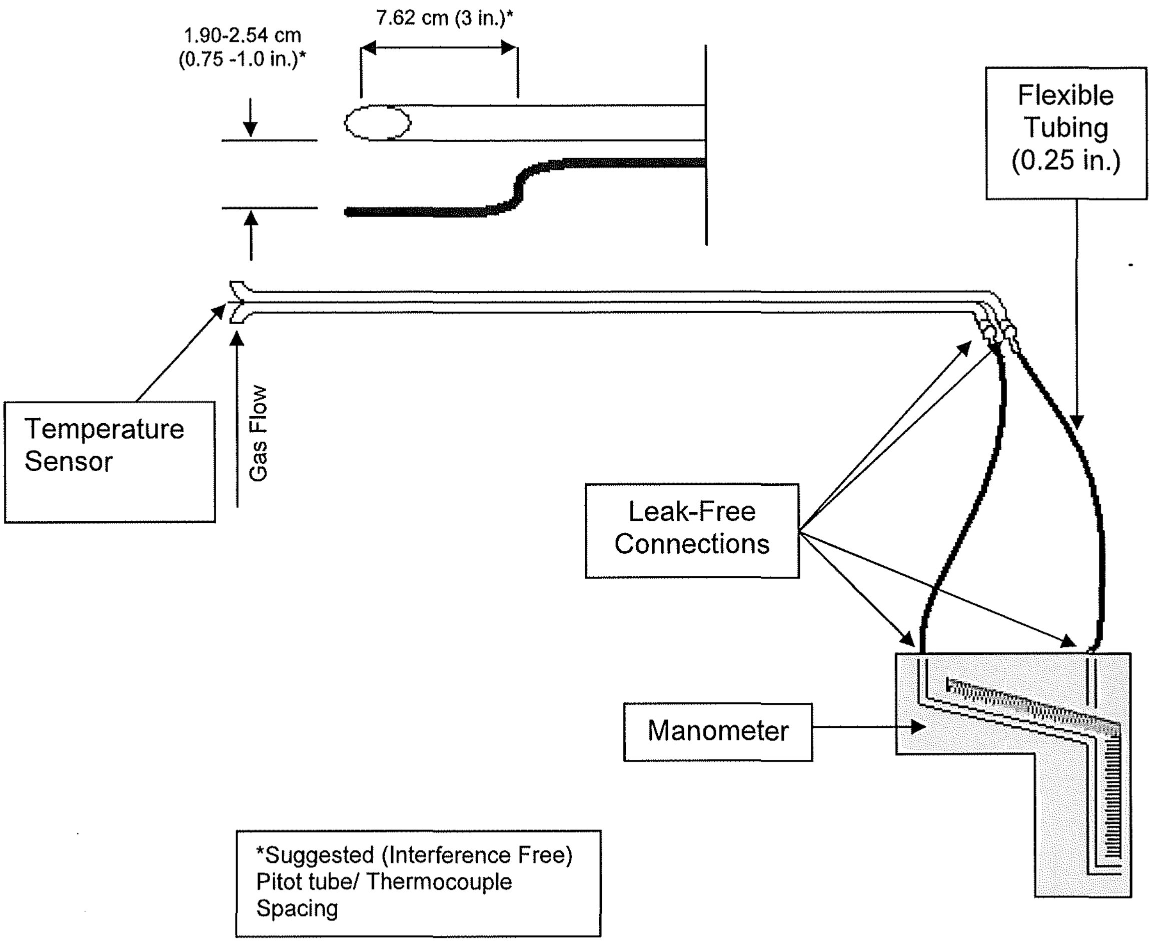
Port Length (Inches): 78.0

Distance from inside wall
at port to traverse point:

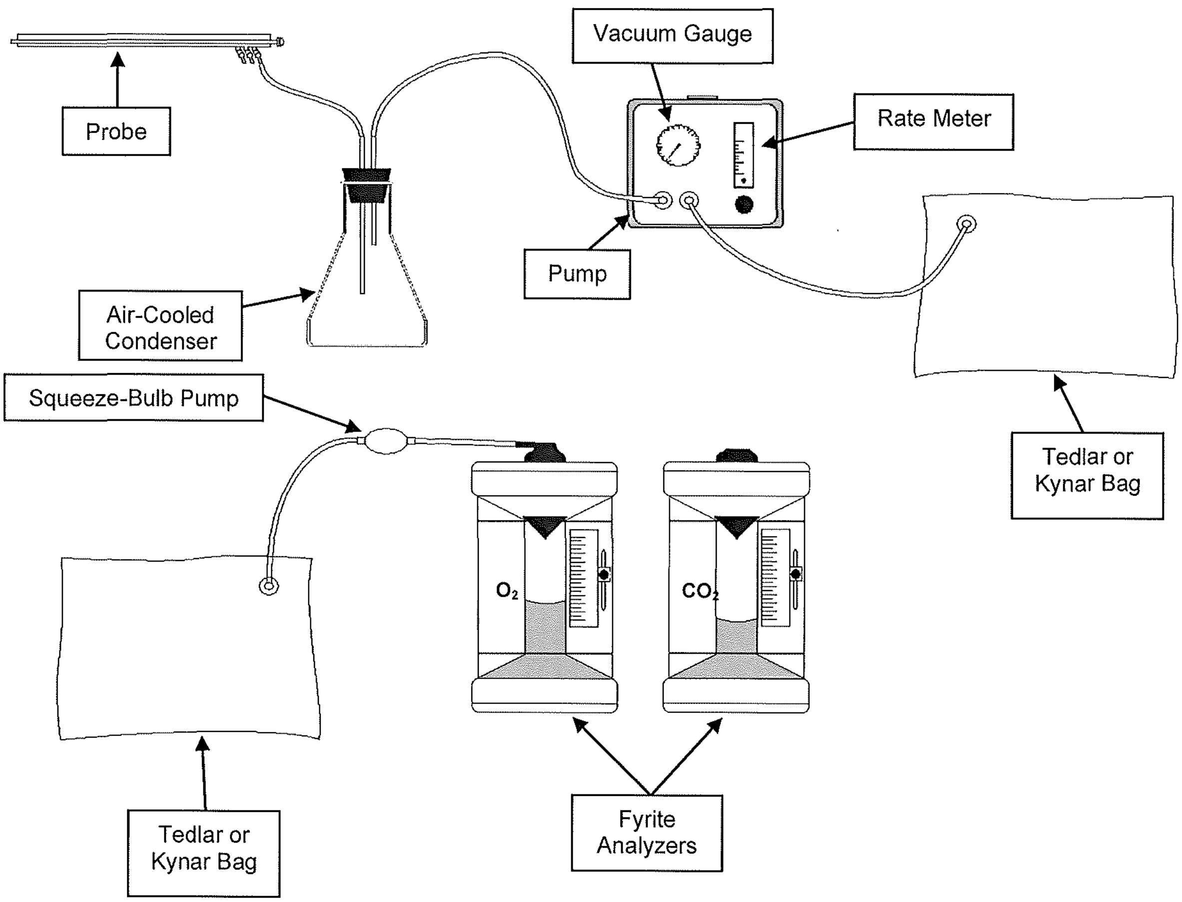
1. 5.49 Feet (32.3 % of diameter)
2. 3.30 Feet (19.4 % of diameter)
3. 1.79 Feet (10.5 % of diameter)
4. 0.54 Feet (3.2 % of diameter)

Appendix D - Sample Train Diagrams

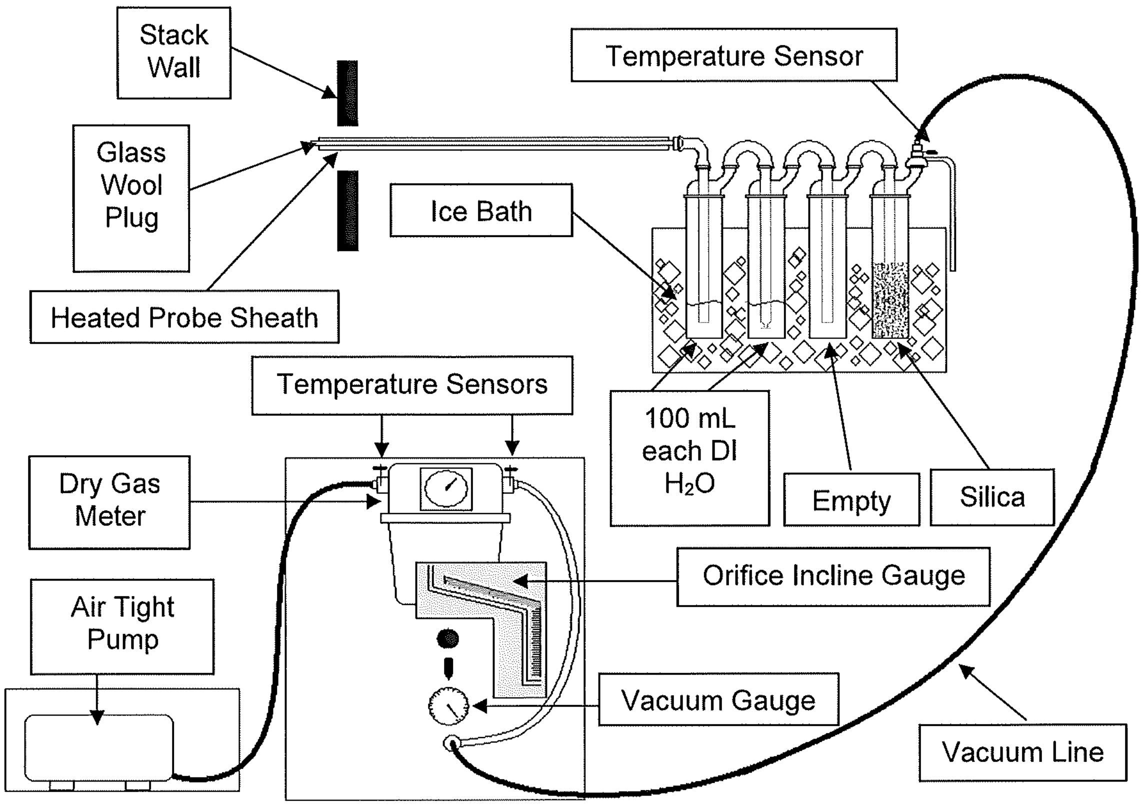
USEPA Method 2 – Type S Pitot Tube Manometer Assembly



USEPA Method 3 - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Fyrite Gas Analyzer



USEPA Method 4- Moisture Content Sample Train Diagram



USEPA Methods 3A, 6C, and 7E - Dilution Probe Gaseous Sample Train Diagram