

## 1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted an Appendix E emissions test program for Lansing Board of Water and Light. at the Delta Energy Park Facility on EUCTGSC1 Stack while firing natural gas on December 14 and 15, 2021. This report summarizes the results of the test program and test methods used in accordance with Mostardi Platt Test Protocol M214404B dated September 30, 2021. 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 Date	Test Parameters
EUCTGSC1 Stack	December 14 and 15, 2021	Nitrogen Oxides (NO <sub>x</sub> ) and Oxygen (O <sub>2</sub> )

The purpose of this test program was to generate a curve relating the NO<sub>x</sub> emission rate to the heat input for four load conditions while firing on natural gas at EUCTGSC1 Stack. This testing was performed in order to satisfy the requirement of the Title 40, *Code of Federal Regulations*, Part 75, Appendix E (40CFR75). Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

Date	Fuel Type	Operating Condition	Operating Load (MW)	Heat Input, MMBtu/hr	NO <sub>x</sub> Emission Rate, lb/mmBtu	NO <sub>x</sub> Emission Rate, ppmv @ 15% O <sub>2</sub>
12/15/21	Natural Gas	Low	37.0	389.5	0.072	19.55
12/15/21		Low/Mid	43.0	432.7	0.070	19.01
12/14/21		Mid/High	50.0	482.6	0.076	20.61
12/14/21		High	57.0	545.7	0.084	22.92

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 <sub>x</sub>	Airgas	CC422303	18.05 ppm	4/27/2023
NO <sub>x</sub>	Airgas	XC025254B	35.53 ppm	5/17/2022
O <sub>2</sub>	Airgas	SG9139271BAL	11.99%	11/22/2029
O <sub>2</sub>	Airgas	CC48111	22.28%	6/19/2028

No deviations, additions, or exclusions from the test protocol, test methods, the Mostardi Platt Quality Manual, or the ASTM Standard D 7036-12 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 1232 Haco Drive P.O. Box 13007 Lansing, Michigan 48912	Mr. Nathan Hude Environmental Regulatory Compliance (517) 702-6170 (cell phone) nathan.hude@lbwl.com
Test Facility	Lansing Board of Water and Light Delta Energy Park Facility 3725 South Canal Road Lansing, Michigan 48917 Permit to Install 74-18A	
Testing Company Supervisor	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Ryan Simon Project Manager 630-993-2100 (phone) rimons@mp-mail.com QI Group V (certified on 1/4/2018)
Testing Company Personnel		Mr. Weslee Rogman Test Technician

A copy of the QI certification for test personnel is included in Appendix B. Mr. Matthew Karl from EGLE was onsite to observe the test program.

## 2.0 TEST METHODOLOGY

Emission testing was conducted following the United States Environmental Protection Agency (USEPA) methods specified in 40CFR75 and 40CFR60, Appendix A in addition to the Mostardi Platt Quality Manual. A drawing depicting the sampling ports and test point locations is found in Appendix C and a drawing depicting the sampling train is found in Appendix D. Calculation and nomenclature explanations are found in Appendix E, and reference test method data are found in Appendix F. Operating data as provided by Buckeye Power Inc. are found in Appendix G.

The following methodologies were used during the test program:

### Gaseous Sample Plan

Mostardi Platt completed twelve test runs on natural gas in which sampling was conducted on both sides of the duct concurrently. Two points per port were sampled per side for a total of 16 points.

### Method 3A Oxygen (O<sub>2</sub>) Determination

Stack gas O<sub>2</sub> concentrations and lbs/mmBtu emission rates were determined in accordance with USEPA Method 3A. The O<sub>2</sub> instrument operated in the nominal range of 0% to 25% with the specific range determined by the high-level calibration gas. High-range calibrations were performed using USEPA Protocol gas. NO<sub>x</sub> calibration gas was introduced to check instrument zero. A mid-range % O<sub>2</sub> level in balance nitrogen was also introduced. Zero and mid-range calibrations were performed using USEPA Protocol gas after each test run. Copies of the gas



cylinder certifications are found in Appendix G. This testing met the performance specifications as outlined in the Method.

### Method 7E Nitrogen Oxide (NO<sub>x</sub>) Determination

Stack gas NO<sub>x</sub> concentrations and emission rates were determined in accordance with USEPA Method 7E, 40CFR60, Appendix A. A Thermo Scientific Model 42iHL 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 50 ppm with the specific range determined by the high-level span calibration gas of 35.53 ppm.

The analyzer is based on the principle that nitric oxide (NO) and ozone (O<sub>3</sub>) 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<sub>2</sub>) molecules decay to lower energy states. Specifically,



NO<sub>2</sub> must first be transformed into NO before it can be measured using the chemiluminescent reaction. NO<sub>2</sub> is converted to NO by stainless steel NO<sub>2</sub>-to-NO converters heated to about 627 degrees C for the NO<sub>x</sub> analyzer. The flue gas air sample is drawn into the analyzer 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<sub>2</sub>-to-NO converter and then to the reaction chamber (NO<sub>x</sub> mode).

Dry air enters the analyzers 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<sub>2</sub> molecules. A photomultiplier tube (PMT) housed in a thermoelectric cooler detects the NO<sub>2</sub> luminescence.

The NO and NO<sub>x</sub> concentrations calculated in the NO and NO<sub>x</sub> modes are stored in memory. The difference between the concentrations are used to calculate the NO<sub>2</sub> concentration.

Stack gas was delivered to the analyzer via a Teflon® sampling line, heated to a minimum temperature of 250°F. Excess moisture in the stack gas was removed using a refrigerated condenser. The entire system was calibrated in accordance with the Method, using certified calibration gases introduced at the probe, before and after each test run. This testing met the performance specifications as outlined in the Method.

A list of calibration gases used and the results of all calibration and other required quality assurance checks can be found in Appendix H. Copies of calibration gas certifications are found in Appendix I. Copies of the NO<sub>2</sub> to NO converter efficiency tests can be found in Appendix J. This testing met the performance specifications as outlined in the Method.



### 3.0 TEST RESULT SUMMARIES

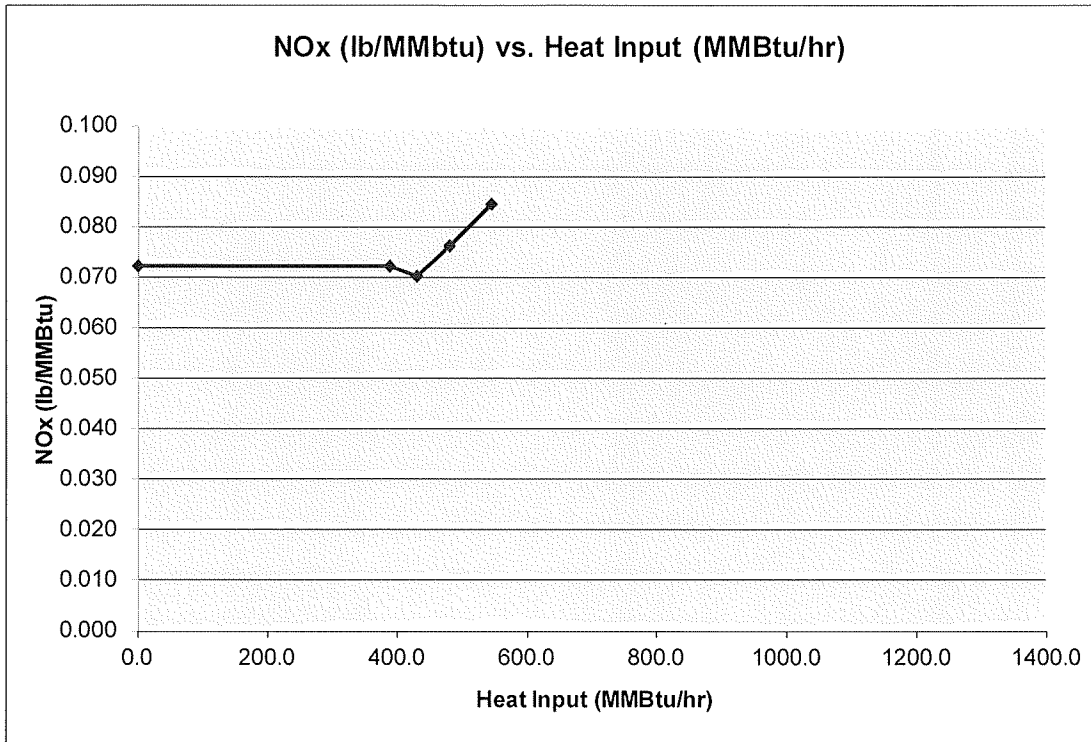
Lansing Board of Water and Light Delta Energy Park EUCTGSC1 Appendix E Emission Test Natural Gas Results Summary													
Date	Run	Start Time	End Time	Load Condition	Operating Load MW	Fuel Usage, 100 scf/hr	Heat Input mmBtu/hr	F-Factor	O <sub>2</sub> % dry	NO <sub>x</sub> ppmvd	NO <sub>x</sub> ppmvd @ 15%O <sub>2</sub>	NO <sub>x</sub> lb/mmBtu	NO <sub>x</sub> lb/hr
12/14/2021	1-1	9:06	10:03	High	57.0	5200.7	546.1	8710	13.6	28.3	22.87	0.084	45.87
12/14/2021	1-2	10:18	11:15	High	57.0	5200.4	546.0	8710	13.7	28.3	23.19	0.085	46.41
12/14/2021	1-3	11:31	12:31	High	57.0	5175.9	543.5	8710	13.7	27.7	22.70	0.084	45.65
Average					57.0	5192.3	545.2	8710	13.67	28.10	22.92	0.084	45.98
12/14/2021	2-1	13:03	13:59	Mid/High	50.0	4597.3	482.7	8710	13.8	25.4	21.11	0.078	37.65
12/14/2021	2-2	14:15	15:11	Mid/High	50.0	4595.8	482.6	8710	13.7	24.9	20.40	0.075	36.20
12/14/2021	2-3	15:28	16:36	Mid/High	50.0	4595.1	482.5	8710	13.9	24.1	20.31	0.075	36.19
Average					50.0	4596.1	482.6	8710	13.80	24.80	20.61	0.076	36.68
12/15/2021	3-1	8:03	8:58	Low/Mid	43.0	4125.6	433.2	8710	13.5	22.7	18.10	0.067	29.02
12/15/2021	3-2	9:13	10:07	Low/Mid	43.0	4122.1	432.8	8710	14.2	22.7	19.99	0.074	32.03
12/15/2021	3-3	10:24	11:19	Low/Mid	43.0	4108.8	431.4	8710	13.7	23.2	19.01	0.070	30.20
Average					43.0	4118.8	432.5	8710	13.80	22.87	19.03	0.070	30.42
12/15/2021	4-1	11:46	12:39	Low	37.0	3711.7	389.8	8710	13.8	23.5	19.53	0.072	28.07
12/15/2021	4-2	12:55	13:47	Low	37.0	3707.8	389.3	8710	13.8	24.1	20.03	0.074	28.81
12/15/2021	4-3	14:02	14:55	Low	37.0	3708.0	389.4	8710	13.7	23.3	19.09	0.070	27.26
Average					37.0	3709.2	389.5	8710	13.77	23.63	19.55	0.072	28.04





Megawatts (MW)	Fuel Heat Input (MMBtu/hr) X	NOx (ppmvd)	O2 (% dry)	NOx (lb/MMBtu) Y	b	m
0	0.0			0.07216	0.072160	0.0000000
37	389.5	23.6	13.77	0.07216	0.090467	-0.0000470
43	432.5	22.9	13.80	0.07014	0.018979	0.0001183
50	482.6	24.8	13.80	0.07607	0.010243	0.0001364
57	545.2	28.1	13.67	0.08461		

$$Y = b + mx$$



If Heat Input is:            NOx (lb/MMbtu) is:

<389.5                            =0.07216

>=389.5 and <432.4666666666667 =0.090467 + -0.000047 \* Heat Input (MMBtu/hr)

>=432.4666666666667        an=0.018979 + 0.0001183 \* Heat Input (MMBtu/hr)

>=482.6                            =0.010243 + 0.0001364 \* Heat Input (MMBtu/hr)



## 4.0 PROCESS DATA

Plant operating data was recorded during each test run in order to correlate emission rates to fuel use in accordance with permit conditions and applicable regulations. Plant operating data is found in Appendix G.

## 5.0 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 site specific test plan, test methods, the Mostardi Platt Quality Manual, and the ASTM Standard D 7036-12, as applicable.

MOSTARDI PLATT



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Ryan Simon

Program Manager



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Scott W. Banach

Quality Assurance



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## APPENDICES



## Appendix A – Mostardi Platt Self-Certification



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](mailto: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

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



QSTI AETB Import Data

QJ Last Name [REQUIRED]	QJ First Name [REQUIRED]	QJ 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
Avila	Nicholas	N	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	8/6/2019	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Burton	Stuart	L	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Carlisle	Robert	W	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/8/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Carlson	Jeremy	J	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/19/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Colangelo	Nicholas	C	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/1/2019	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Coleman	Paul	F	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	3/15/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Crivlare	Jeffrey	M	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Dyra	Sean	P	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/24/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Ehlers	Eric	L	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/17/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Eldridge	Christopher	S	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/18/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Gross	Jeffrey	M	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	11/20/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Gutwein	Chet	A	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	4/15/2015	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group I & III
Gutwein	Chet	A	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	10/13/2015	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group II & IV
Hendricks	Benjamin	W	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/30/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Howe	Jacob	W	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/17/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Jensen	Christopher	E	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Jones	Kyle	L	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/11/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Kaschinske	Jordan	R	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/8/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Kossack	Daniel	J	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	11/22/2016	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Kukla	Joshua	R	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2019	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Lawlor	Brendan	J.	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	3/3/2017	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Lipinski	Michal		Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/31/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
McGough	Scott	W	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/27/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Nestor	John	S	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Panek	Damian	P	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/19/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Peterson	Mark	E	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Platt	Martin	E	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	7/3/2019	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Reice	Charlie	R	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/13/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Russ	Allen	L	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/8/2021	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Russ	Timothy	E	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	4/8/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Sands	Stuart	T	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Sather	Michael	P	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/7/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Simon	Ryan	K	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	1/4/2018	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Sollars	Richard	J	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	9/9/2016	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Spoolstra	Ryan	N	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	2/7/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)
Trezak	Christopher	S	Mostard Platt	630-993-2100	<a href="mailto:tplatt@mp-mail.com">tplatt@mp-mail.com</a>	4/14/2020	Source Evaluation Society	<a href="mailto:qstiprogram@gmail.com">qstiprogram@gmail.com</a>	Group V (Part 75)

3/22/2021

## Appendix B – QI Certificate



**Qualified Individual**

***Ryan K. Simon***

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](http://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

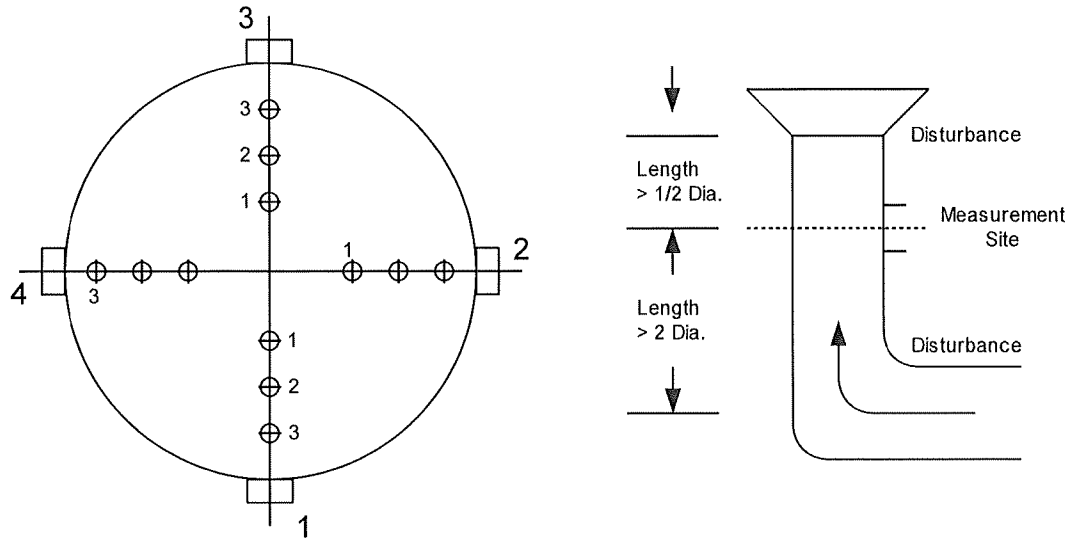
Expiration Date: 1/4/2023

Signature:  Date: 1/25/2018

Quality Manager:  Technical Director: 

## Appendix C - Test Section Diagram

## EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Lansing Board of Water & Light  
Delta Energy Park

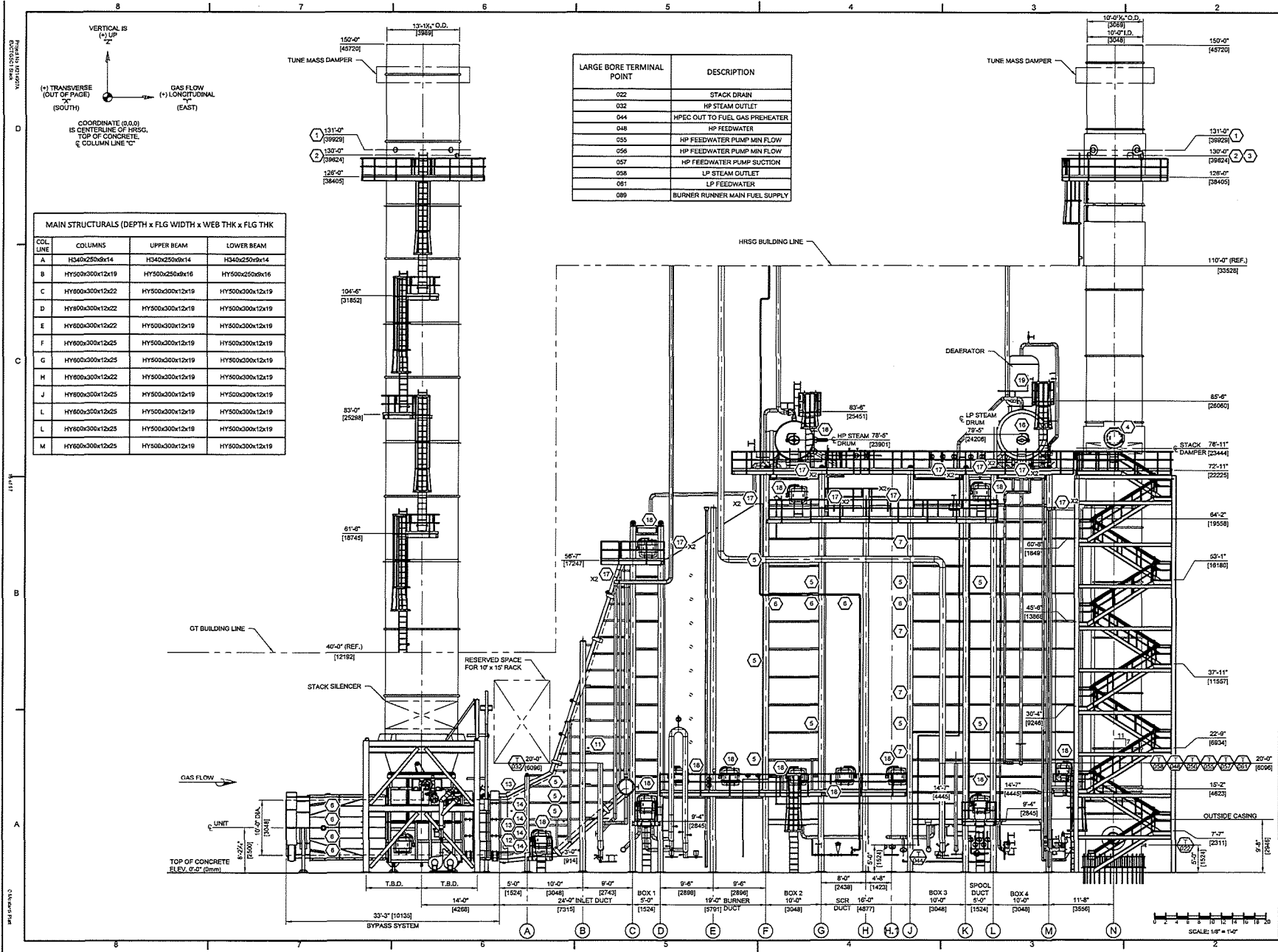
Date: December 14 and 15, 2021

Test Location: EUCTGSC1 Stack

Duct Diameter: 13 Feet

Duct Area: 132.75 Square Feet

No. Points Across Diameter: 6



LARGE BORE TERMINAL POINT	DESCRIPTION
022	STACK DRAIN
032	HP STEAM OUTLET
044	HPEC OUT TO FUEL GAS PREHEATER
048	HP FEEDWATER
055	HP FEEDWATER PUMP MIN FLOW
056	HP FEEDWATER PUMP MIN FLOW
057	HP FEEDWATER PUMP SUCTION
058	LP STEAM OUTLET
061	LP FEEDWATER
069	BURNER RUNNER MAIN FUEL SUPPLY

COL LINE	COLUMNS	UPPER BEAM	LOWER BEAM
A	H340x250x9x14	H340x250x9x14	H340x250x9x14
B	HY500x300x12x19	HY500x250x9x16	HY500x250x9x16
C	HY800x300x12x22	HY500x300x12x19	HY500x300x12x19
D	HY800x300x12x22	HY500x300x12x19	HY500x300x12x19
E	HY800x300x12x22	HY500x300x12x19	HY500x300x12x19
F	HY800x300x12x25	HY500x300x12x19	HY500x300x12x19
G	HY800x300x12x25	HY500x300x12x19	HY500x300x12x19
H	HY800x300x12x22	HY500x300x12x19	HY500x300x12x19
J	HY800x300x12x25	HY500x300x12x19	HY500x300x12x19
L	HY800x300x12x25	HY500x300x12x19	HY500x300x12x19
M	HY800x300x12x25	HY500x300x12x19	HY500x300x12x19

**GENERAL NOTES:**  
 1. TWO (2) UNITS REQUIRED AS SHOWN.  
 2. ALL PLATFORM ELEVATIONS ARE TO TOP OF GRATING.

MARK NO.	QUANTITY	CONN. SIZE	DESCRIPTION
1	4 PER STACK	6"-150#	STACK EPA PORT
2	2 PER STACK	4"-150#	STACK CEAS PORT
3	4	2"-3000#	STACK THERMOWELL
4	2	24" DIA.	STACK MANWAY
5	24	2"-3000#	GAS PATH THERMOWELL
6	8	3"-3000#	GAS PATH PRESS PORT
7	4	8"-150#	SCR TEST GRID
8	12	4"-3000# THIRD CAPPED	TEST PORTS
9	1	10"-150#	HOT FLUE GAS TO APCU SKID
10	54	3"-150#	AMMONIA INJECTION GRID
11	2	2"-3000#	INLET DUCT TEST CONNECTION
12	1	4"-150#	INLET DUCT TEST PORT
13	3	8"-150#	INLET DUCT TEMP TEST GRID
14	4	2"-3000#	INLET DUCT TEST PORT
15	8	4" X 4"	BURNER VIEW PORTS
16	4	14" x 38"	DRUM MANWAY
17	20	2"-3000# THIRD CAPPED	SKY CLIMBER CONNECTION
18	23	24" x 24"	ACCESS DOOR
19	1	3"-300#	DA DRUM MANWAY
20	1	4"-150#	TEST PORT
21	1	4"-150#	NOX PORT

**REFERENCE DRAWINGS:**  
 V17520-GAND-0001 THRU 0003 : GENERAL ARRANGEMENTS  
 V17520-SEND-0001 THRU 0002 : BOILER SETTINGS  
 V17520-RND-0001 THRU 0009 : PIPES  
 V17520-FLND-0001 : FOUNDATION DIAGRAM  
 V17520-GENF-0001 : GENERAL NOTES AND DATA

NO.	REVISION	DATE	BY	CHKD.	APP'D.

HRSG for  
**BWL** New Gas Combined Cycle Plant (NGCCP)  
 Lansing Board of Water and Light  
 SITE: ERICKSON

**VoostPower**  
 13311 18th Park Blvd  
 Suite 200  
 Louisville, KY 40223 USA  
 WWW.VOOSTPOWER.COM

FOR RECORD  
 Title: V17520-GAND-0001  
 Date: 01

## Appendix D - Sample Train Diagram

# USEPA Methods 3A and 7E Extractive Gaseous Sampling Diagram

