CPV Valley Energy Center
50 Braintree Hill Office Park
Suite 300
Braintree, MA 02184

November 16, 2018

Mr. Christopher M. Hogan
Chief, Major Project Management Unit
New York State Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, New York 12233-1750
Federal Express Track # 7737 3755 7910, 7737 3755 8011

Re: CPV Valley, LLC
Title V and Title IV Air Permit Applications
Response to Notice of Incomplete Applications

Dear Mr. Hogan:

This letter responds to your letter dated October 25, 2018, indicating that the Title V and Title IV Air Permit Applications submitted by CPV Valley, LLC ("CPV Valley") on August 29, 2018 (and received by the Department on August 30, 2018) requires additional information in order for the Department to consider the applications complete. CPV Valley respectfully disagrees that the applications are incomplete; rather, the information sought by your October 25 letter is in the nature of supplemental information to assist the Department in its review, and as a result, CPV Valley is entitled to the benefit of the application shield contained in Environmental Conservation Law § ECL 19-0311(5)(b) and guidance issued by the Environmental Protection Agency ("EPA") implementing the Title V application shield.

Nonetheless, CPV Valley provides the following supplemental information in response to your letter:

Additional Technical Information

CPV Valley respectfully disagrees that any of the following information is explicitly required pursuant to 6 NYCRR § 201-6.2(d) to be included with the applications, and in fact, some of the information has already been provided to the Department, or made available upon request.

1) Plot Plan. A plot plan was submitted with the August 29, 2018 Title V application. An updated plot plan of the Facility based on the as-built plans identifying all permitted emission points is included herewith.
2) Process Flow Diagram. An updated process flow diagram based on the as-built plans is included herewith.

3) Stack Test and Performance Test Results. The Facility did not commence operation on August 19, 2018. The Facility commenced operation (First Fire) on January 17, 2018 on low sulfur diesel. The results of the Stack Tests on low sulfur diesel were previously submitted to the Department's Region 3 office per attached letter dated July 3rd, 2018. The results of the Performance Test on low sulfur diesel were previously submitted to the Department's Region 3 office per attached letter dated June 22nd, 2018. Copies of those documents are included herewith. The Facility commenced operation (First Fire) on natural gas on July 23, 2018, and Stack Tests were performed on September 25th-27th and October 10th-11th, 2018. Based on confirmation from Mr. Sweikert on November 07, 2018 with respect to the Department's request for supplemental information on Stack Test and Performance Test Results, copies of the results of the Stack Tests on natural gas are included herewith.
4) Continuous Emission Monitoring Plan. The Continuous Emissions Monitors ("CEMs") were certified on May 10, 2018 for Unit 1 and May 12, 2018 for Unit 2, and the CEM certifications were submitted to the Department and EPA per the attached letter dated June 22nd, 2018. Copies of the CEM certifications are included herewith, together with a CEM Plan.
5) Opacity Monitoring Plan. CPV Valley is not aware of any documented and verified opacity violations during startup of the Facility on low sulfur diesel. While CPV Valley is aware of complaints, it is not aware that any DEC personnel were certified to undertake opacity monitoring. Nonetheless, CPV Valley prepared an Opacity Monitoring Plan in February, 2018, and was advised by the Department's Region 3 personnel that it need not be submitted, but only be available at the Facility upon request. Consistent with that instruction, the Opacity log was inspected many times by DEC personnel when they visited the Facility. The Opacity Monitoring Plan has since been updated, and a copy is included herewith.

Revised Applications

The issues noted by Staff in the Title V application have been corrected, and revised applications including these corrections are included herewith.

Conclusion

CPV Valley, as noted above, respectfully disagrees that any of these items are required in order to have a complete application, but rather constitute supplemental information to assist the Department in its review of the applications. Moreover, CPV Valley respectfully disagrees with the statement in your letter that the application cannot be deemed complete until draft permits have been prepared and notice provided to the EPA. This statement is completely contradicted by the Department's past practice with respect to Title V and SPDES applications (especially renewal applications), which have been allowed to languish for years without action by the Department, yet the facilities continue to operate. While perhaps a Notice of Complete Application cannot be issued until that time, the applications should otherwise be complete without necessity of a formal notice.

We trust the enclosed information completely responds to your October 25, 2018 letter. Please feel free to contact me should you have any questions.

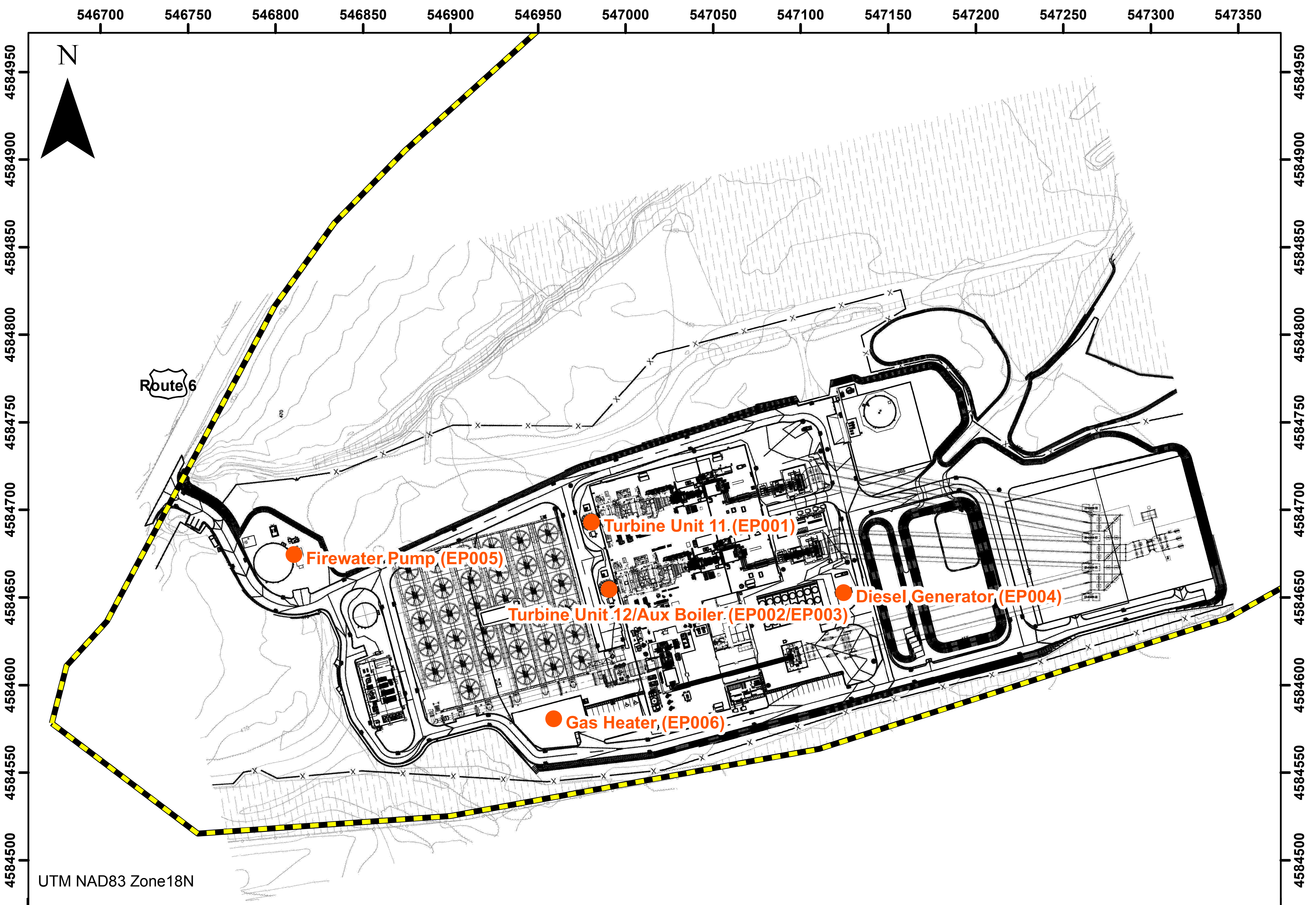
Very truly yours,

Donald G. Atwood

/rel
enclosures
cc: George Sweikert, RAPCE, Region 3 –
Federal Express Track # 7737 3755 7910, 7737 3755 8011
Kelly Turturro, Regional Director, Region 3
Khai Gibbs, Esq.
Mark Sanza, Esq.
Ruth Leistensnider, Esq.
Ben Stanley, DGC Ops

ATTACHMENT 1

Plot Plan



CPV Valley Property Boundary

Existing Emission Point

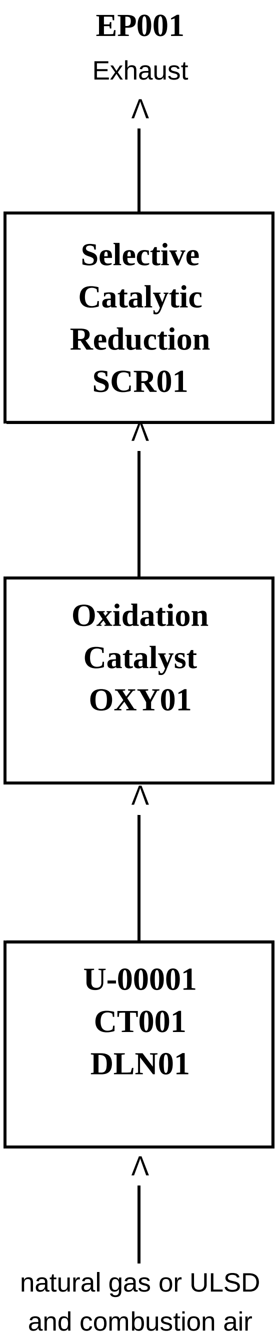
Title:	CPV Valley Energy Center Site Plan
Date:	November 2018

0 50 100 Meters

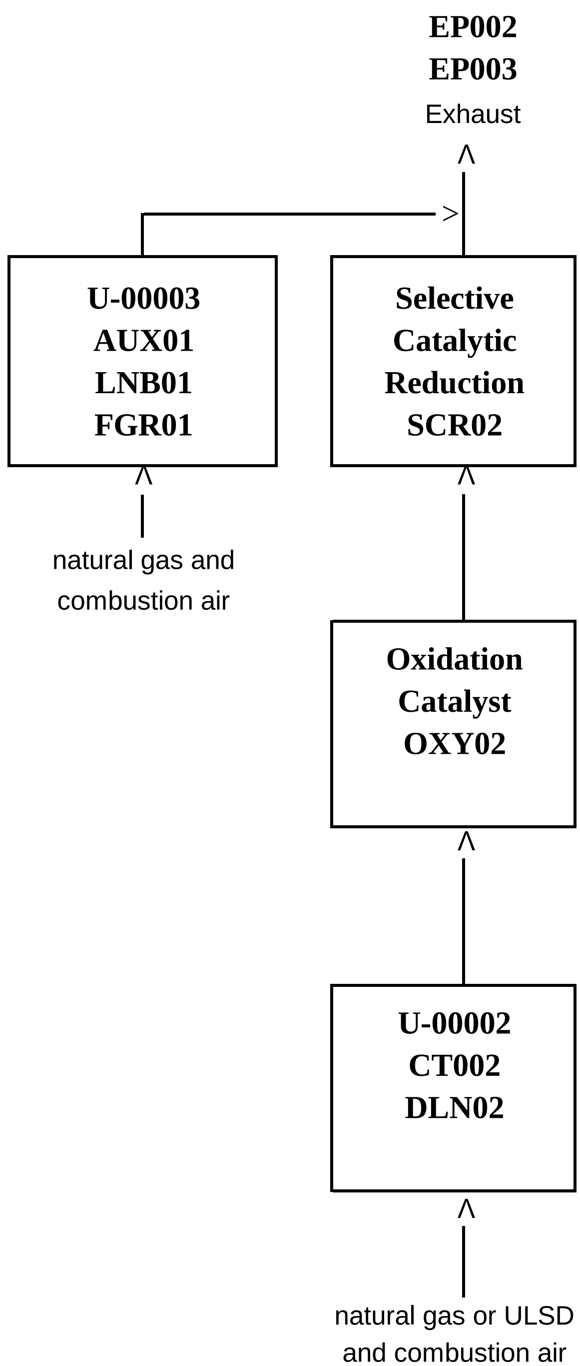
ATTACHMENT 2

Process Flow Diagram

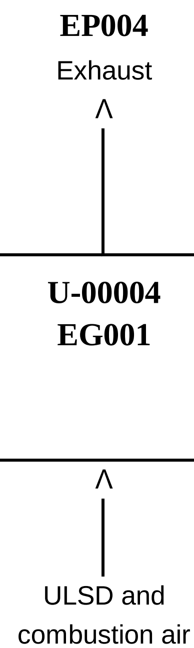
Process Flow Diagram - EP001



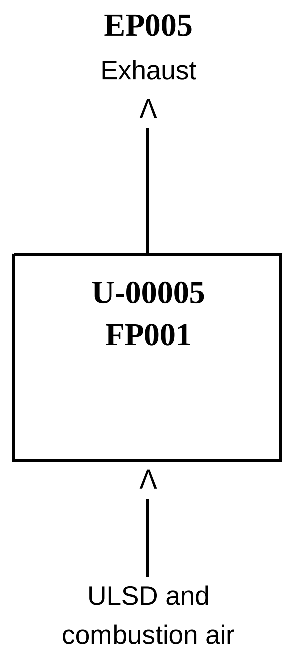
Process Flow Diagram - EP002 & EP003



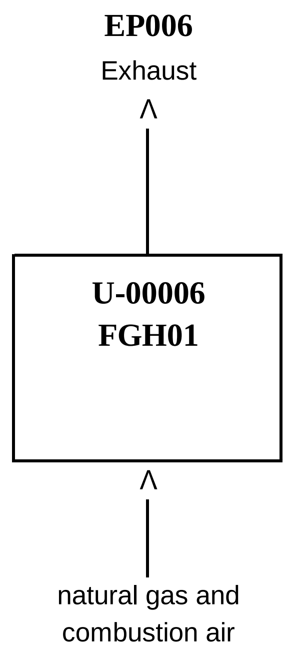
Process Flow Diagram - EP004



Process Flow Diagram - EP005



Process Flow Diagram - EP006



ATTACHMENT 3

Stack Test and Performance Test Results

CPV Valley Energy Center
3330 Route 6
Middletown, NY 10940

Tuesday, July 03, 2018

Regional Air Pollution Control Engineer
NYSDEC – Region 3
21 South Putt Corners Road
New Paltz, NY 12561
Certified Mail: 7017 0190 0000 0941 4359

Division of Air Resources
NYSDEC – Bureau of Quality Assurance
625 Broadway
Albany, NY 12233-3258
Certified Mail: 7017 0190 0000 0941 4366

USEPA Region II
Air Compliance Branch
290 Broadway
New York, NY 10007-1866
Certified Mail: 7017 0190 0000 0941 4373

Re: CPV Valley Energy Center
NYSDEC State Facility Air Permit ID: 3-3356-00136/00001
Unit #1 and #2 Emissions Compliance Stack Test Report

Dear Sir / Madam:

CPV Valley Energy Center is submitting the Unit #1 and #2 emissions test report to validates compliance with the State Facility Air Permit requirements. Air Hygiene was contracted to perform stack compliance testing to determine the pollutant emissions from Unit #1 and #2 and to verify compliance with the emission limits listed in the State Facility Air Permit 3-3356-00136/00001. Air Hygiene adhere to all applicable testing requirements listed in the stack testing protocol and the State Facility Air Permit. Emissions testing was conducted on May 8th to 9th for Unit #1 and May 10th to 12th for Unit #2. Please see ***Attachment A*** for the Unit #1 and U#2 stack test report.

If there are any questions regarding this submittal, please contact Benjamin Stanley at (845) 649-8300.

Sincerely,

Benjamin Stanley
DGC Operations, LLC on behalf of CPV Valley LLC
Plant Manager

CC: Donald Atwood
Chris Allgeier
Steve Barthelme
Jonathan Moore

Attachment A

Unit #1 and #2 Stack Test Report

CPV Valley Energy Center
3330 Route 6
Middletown, NY 10940

Friday, June 22, 2018

Regional Air Pollution Control Engineer
NYSDEC – Region 3
21 South Putt Corners Road
New Paltz, NY 12561
Certified Mail: 7017 0190 0000 0941 4441

Division of Air Resources
NYSDEC – Bureau of Quality Assurance
625 Broadway
Albany, NY 12233-3258
Certified Mail: 7017 0190 0000 0941 4465

USEPA Region II
Air Compliance Branch
290 Broadway
New York, NY 10007-1866
Certified Mail: 7017 0190 0000 0941 4472

USEPA -Clean Air Markets Division
1200 Pennsylvania Avenue, NW
Mail Code 6204J
Washington, DC 20005
Certified Mail: 7017 0190 0000 0941 4489

Dear Sir/Madam:

CPV – Valley Energy Center would like to submit the initial certification summary for Unit 1 & 2. The certification events were completed for Unit 1 on 05/10/2018 and Unit 2 on 05/12/2018. Where applicable, the USEPA Emissions Collection and Monitoring Plan System Software (ECMPS) was utilized to format the information.

The following table outlines the completion dates of the certification tests.

Unit No.	RATA Test	Linearity Test	7-Day Drift Test	Cycle Response Test
1	05/09/2018	05/10/2018	04/29/18 – 05/08/18	05/08/2018
2	05/12/2018	05/11/2018	04/24/18 – 05/03/18	05/08/2018

Attached to this is a complete summary of the certification events, Attachment 1 – Unit 1 and Attachment 2 – Unit 2. Each attachment includes a summary of the test events and a copy of the monitoring plan using the USEPA ECMPS software.

If there are any questions, or you require further information, please contact Ben Stanley at (845) 649-8300.

Thank you.

Regards,

Ben Stanley
DGC Operations, LLC on behalf of CPV Valley LLC
Plant Manager

CC: Donald Atwood
Chris Allgeier
Steve Barthelme
Jonathan Moore

ATTACHMENT 1

Unit 1

40 CFR Part 75 Form
Monitoring Plan
RATA Test Summary
Linearity Test Summary
Cycle Response Test
7-day drift test

United States
Environmental Protection Agency
Acid Rain Program

OMB No. 2060-0258

EPA

Certification Application

For more information, see instructions and refer to 40 CFR 75.63

This submission is for: • Initial Certification • Recertification

STEP 1
Identify the source by plant name, State, and ORIS Code from NADB

Plant Name VALLEY ENERGY CENTER	State NY	ORIS Code 56940

STEP 2
Identify unit short name/common stack description and boiler ID#/common stack ID#

Unit Short Name/Common Stack Description Unit 1	Boiler/Common Stack ID# 1

STEP 3
Mark the appropriate box and fill in if necessary

- Included is a copy of the monitoring plan))))))))))))))))))• No. of pages 8
- No monitoring plan included

STEP 4
Provide the requested information for the monitoring systems and for the test data that are being submitted

Use page 2 to provide information for additional units/common stacks at this source or for units/common stacks with more than 10 systems

MONITORING SYSTEMS			TEST DATA		
System ID#	Para-meter Monitored	Primary/ Backup	Testing Date(s) *(mm/dd/yy-mm/dd/yy)*	Number of Tests (Total)	Number of Failed Tests
NOX	Nox	P	04/29/18 - 05/10/18	4	0
NOX	O2	P	04/29/18 - 05/10/18	4	0

STEP 5
Complete the boxes

Included are test results for systems listed in Step 4 Table(s))))))))))))• No. of pages 10

Included is DAHS verification test information))))))))))))))))))• No. of pages 14

STEP 6
Read the certification, enter the name of the designated representative, and sign and date

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name BEN STANLEY - DGC OPERATIONS, LLC

Signature | Date 6/22/2018

VIM TECHNOLOGIES

June 22, 2018

CPV Valley Energy Center
3330 RT 6
Middletown, NY 10940

Attn: Duc Tran
Subject: DAHS Certification Statement for ORISPL 56940

Dear Duc,

VIM Technologies, Inc. certifies that the CEMLink6 automated Data Acquisition and Handling System (DAHS) component of each CEM System was tested and that proper computation of hourly averages for each formula submitted in the 40 CFR Part 75 monitoring plan was verified according to the requirements of 40 CFR Part 75 and EPA Policy Manual Question 13.22

VIM Technologies, Inc. certifies that the automated CEMLink6 DAHS component of each CEM System was tested and that proper computation of the missing data substitution procedures was verified according to 40 CFR Part 75 Subpart D and those routines permitted and defined in the EPA Policy Manual. VIM Technologies, Inc. has developed and confirmed over 65 test cases covering all possible data substitution scenarios permitted by 40 CFR Part 75.

Signed: ______________________ Date: 6/22/18
Matt Caldwell

Title: President

CC: Rudi Muenster

Attachments: Formula Certification Report for 1 and 2

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: CO2 Mass Rate (tons/hr)
Formula: G-4 (Gas)

Source: 1

Date/Time	Hour	HTIP_Gas	GAS_FC	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 15:00:00	15	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 16:00:00	16	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 17:00:00	17	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 18:00:00	18	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 19:00:00	19	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 20:00:00	20	505.4	1040	30.0	30.0	0.0	1.00

Source: 2

Date/Time	Hour	HTIP_Gas	GAS_FC	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 15:00:00	15	505.4	1040	30.0	30.0	0.0	1.00
5/1/18 16:00:00	16	421.2	1040	25.0	25.0	0.0	1.00
5/1/18 17:00:00	17	421.2	1040	25.0	25.0	0.0	1.00
5/1/18 18:00:00	18	421.2	1040	25.0	25.0	0.0	1.00
5/1/18 19:00:00	19	421.2	1040	25.0	25.0	0.0	1.00
5/1/18 20:00:00	20	421.2	1040	25.0	25.0	0.0	1.00

CO_2 Mass Rate = 1040 * Heat input * 1/385 * (44/2000)

*Simulated on Gas

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: CO_2 Mass Rate (tons/hr)
Formula: G-4 (oil)

Source: 1

Date/Time	Hour	HTIP_Oil	OIL_FC	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	1195.1	1420	97.0	97.0	0.0	1.00
5/1/18 15:00:00	15	1253.8	1420	101.7	101.7	0.0	1.00
5/1/18 16:00:00	16	1253.8	1420	101.7	101.7	0.0	1.00
5/1/18 17:00:00	17	1253.8	1420	101.7	101.7	0.0	1.00
5/1/18 18:00:00	18	1253.8	1420	101.7	101.7	0.0	1.00
5/1/18 19:00:00	19	1253.8	1420	101.7	101.7	0.0	1.00
5/1/18 20:00:00	20	1253.8	1420	101.7	101.7	0.0	1.00

Source: 2

Date/Time	Hour	HTIP_Oil	OIL_FC	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	587.7	1420	47.7	47.7	0.0	0.90
5/1/18 16:00:00	16	1214.6	1420	98.6	98.6	0.0	1.00
5/1/18 17:00:00	17	1312.6	1420	106.5	106.5	0.0	1.00
5/1/18 18:00:00	18	1312.6	1420	106.5	106.5	0.0	1.00
5/1/18 19:00:00	19	1312.6	1420	106.5	106.5	0.0	1.00
5/1/18 20:00:00	20	1312.6	1420	106.5	106.5	0.0	1.00
5/1/18 21:00:00	21	1312.6	1420	106.5	106.5	0.0	1.00

CO_2 Mass Rate = 1420 * Heat input * 1/385 * (44/2000)

Formula Verification Report:
Oris Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: CO2 Mass Rate (tons/hr)
Formula: G-4A (combined)

Source: 1

Date/Time	Hour	CO2_Gas	GAS_ON	CO2_Oil	Oil_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	0.0	0.00	97.0	1.00	97.0	97.0	0.0	1.00
5/1/18 15:00:00	15	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00
5/1/18 16:00:00	16	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00
5/1/18 17:00:00	17	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00
5/1/18 18:00:00	18	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00
5/1/18 19:00:00	19	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00
5/1/18 20:00:00	20	0.0	0.00	101.7	1.00	101.7	101.7	0.0	1.00

Source: 2

Date/Time	Hour	CO2_Gas	GAS_ON	CO2_Oil	Oil_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	0.0	0.00	47.7	0.90	47.7	47.7	0.0	0.90
5/1/18 16:00:00	16	0.0	0.00	98.6	1.00	98.6	98.6	0.0	1.00
5/1/18 17:00:00	17	0.0	0.00	106.5	1.00	106.5	106.5	0.0	1.00
5/1/18 18:00:00	18	0.0	0.00	106.5	1.00	106.5	106.5	0.0	1.00
5/1/18 19:00:00	19	0.0	0.00	106.5	1.00	106.5	106.5	0.0	1.00
5/1/18 20:00:00	20	0.0	0.00	106.5	1.00	106.5	106.5	0.0	1.00
5/1/18 21:00:00	21	0.0	0.00	106.5	1.00	106.5	106.5	0.0	1.00

CO2 mass = CO2 tons/hr (gas) * Gas Operating time + CO2 tons/hr (oil) * Oil Operating Time/Unit operating time

Formula Verification Report
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: Total Heat Input Rate (combined)
Formula: F-8

Source: 1

Date/Time	Hour	FD_GAS	GAS_ON	FD_OIL	OIL_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 15:00:00	15	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 16:00:00	16	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 17:00:00	17	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 18:00:00	18	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 19:00:00	19	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00
5/1/18 20:00:00	20	8710	0.00	9190	1.00	9190.0	9190.0	0.0	1.00

Source: 2

Date/Time	Hour	FD_GAS	GAS_ON	FD_OIL	OIL_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 16:00:00	16	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 17:00:00	17	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 18:00:00	18	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 19:00:00	19	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 20:00:00	20	8710	0	9190	1	9190.0	9190.0	0.0	1.00
5/1/18 21:00:00	21	8710	0	9190	1	9190.0	9190.0	0.0	1.00

FD Total = FD (gas) * Gas Operating time + FD (oil) * Oil Operating Time/Unit operating time

Formula Verification Report
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: **6/22/2018**
Pollutant/Parameter: **Total Heat Input Rate (combined)**
Formula: **D-15A**

Source: 1

Date/Time	Hour	HI_GAS	GAS_ON	HI_OIL	OIL_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	0.00	0.00	1195.1	1.00	1195.1	1195.1	0.0	1.00
5/1/18 15:00:00	15	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00
5/1/18 16:00:00	16	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00
5/1/18 17:00:00	17	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00
5/1/18 18:00:00	18	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00
5/1/18 19:00:00	19	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00
5/1/18 20:00:00	20	0.00	0.00	1253.8	1.00	1253.8	1253.8	0.0	1.00

Source: 2

Date/Time	Hour	HI_Gas	GAS_ON	HI_OIL	OIL_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	0.0	0.00	587.7	0.90	587.7	587.7	0.0	0.90
5/1/18 16:00:00	16	0.0	0.00	1214.6	1.00	1214.6	1214.6	0.0	1.00
5/1/18 17:00:00	17	0.0	0.00	1312.6	1.00	1312.6	1312.6	0.0	1.00
5/1/18 18:00:00	18	0.0	0.00	1312.6	1.00	1312.6	1312.6	0.0	1.00
5/1/18 19:00:00	19	0.0	0.00	1312.6	1.00	1312.6	1312.6	0.0	1.00
5/1/18 20:00:00	20	0.0	0.00	1312.6	1.00	1312.6	1312.6	0.0	1.00
5/1/18 21:00:00	21	0.0	0.00	1312.6	1.00	1312.6	1312.6	0.0	1.00

Heat input = mmBtu/hr (gas) * Gas Operating time + mmBtu/hr (oil) * Oil Operating Time/Unit operating time

Formula Verification Report
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: Heat Input Rate (Oil)
Formula: F-19 (D-8)

Source: 1

Date/Time	Hour	Fuel Flow	GCV_OIL	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	61000	19591	1195.1	1195.1	0.0	1.00
5/1/18 15:00:00	15	64000	19591	1253.8	1253.8	0.0	1.00
5/1/18 16:00:00	16	64000	19591	1253.8	1253.8	0.0	1.00
5/1/18 17:00:00	17	64000	19591	1253.8	1253.8	0.0	1.00
5/1/18 18:00:00	18	64000	19591	1253.8	1253.8	0.0	1.00
5/1/18 19:00:00	19	64000	19591	1253.8	1253.8	0.0	1.00
5/1/18 20:00:00	20	64000	19591	1253.8	1253.8	0.0	1.00

Source: 2

Date/Time	Hour	Fuel Flow	GCV_Oil	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	30000	19591	587.7	587.7	0.0	0.90
5/1/18 16:00:00	16	62000	19591	1214.6	1214.6	0.0	1.00
5/1/18 17:00:00	17	67000	19591	1312.6	1312.6	0.0	1.00
5/1/18 18:00:00	18	67000	19591	1312.6	1312.6	0.0	1.00
5/1/18 19:00:00	19	67000	19591	1312.6	1312.6	0.0	1.00
5/1/18 20:00:00	20	67000	19591	1312.6	1312.6	0.0	1.00
5/1/18 21:00:00	21	67000	19591	1312.6	1312.6	0.0	1.00

Heat Input = Fuel Flow * GCV_Oil/10^6

Formula Verification Report
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: Heat Input Rate (Gas)
Formula: F-20 (D-6)

Source: 1

Date/Time	Hour	Fuel Flow	GCV_Gas	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	4860	104000	505.4	505.4	0.0	1.00
5/1/18 15:00:00	15	4860	104000	505.4	505.4	0.0	1.00
5/1/18 16:00:00	16	4860	104000	505.4	505.4	0.0	1.00
5/1/18 17:00:00	17	4860	104000	505.4	505.4	0.0	1.00
5/1/18 18:00:00	18	4860	104000	505.4	505.4	0.0	1.00
5/1/18 19:00:00	19	4860	104000	505.4	505.4	0.0	1.00
5/1/18 20:00:00	20	4860	104000	505.4	505.4	0.0	1.00

Source: 2

Date/Time	Hour	Fuel Flow	GCV_Gas	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	4860	104000	505.4	505.4	0.0	1.00
5/1/18 16:00:00	16	4860	104000	505.4	505.4	0.0	1.00
5/1/18 17:00:00	17	4050	104000	421.2	421.2	0.0	1.00
5/1/18 18:00:00	18	4050	104000	421.2	421.2	0.0	1.00
5/1/18 19:00:00	19	4050	104000	421.2	421.2	0.0	1.00
5/1/18 20:00:00	20	4050	104000	421.2	421.2	0.0	1.00
5/1/18 21:00:00	21	4050	104000	421.2	421.2	0.0	1.00

Heat Input = Fuel Flow * GCV_Gas/10^6

* Simulated on Gas

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: **6/22/2018**
Pollutant/Parameter: **NOx Mass Rate (lb/hr)**
Formula Code: **F-24A**

Source: **1**

Date/Time	Hour	NOx Rate	Adj. NOx Rate	Heat Input	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	0.163	0.163	1195.1	194.8	194.8	0.0	1.00
5/1/18 15:00:00	15	0.045	0.045	1253.8	56.4	56.4	0.0	1.00
5/1/18 16:00:00	16	0.022	0.022	1253.8	27.6	27.6	0.0	1.00
5/1/18 17:00:00	17	0.022	0.022	1253.8	27.6	27.6	0.0	1.00
5/1/18 18:00:00	18	0.022	0.022	1253.8	27.6	27.6	0.0	1.00
5/1/18 19:00:00	19	0.022	0.022	1253.8	27.6	27.6	0.0	1.00
5/1/18 20:00:00	20	0.022	0.022	1253.8	27.6	27.6	0.0	1.00

Source: **2**

Date/Time	Hour	NOx Rate	Adj. NOx Rate	Heat Input	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	0.235	0.235	587.7	138.1	138.1	0.0	0.90
5/1/18 16:00:00	16	0.167	0.167	1214.6	202.8	202.8	0.0	1.00
5/1/18 17:00:00	17	0.043	0.043	1312.6	56.4	56.4	0.0	1.00
5/1/18 18:00:00	18	0.021	0.021	1312.6	27.6	27.6	0.0	1.00
5/1/18 19:00:00	19	0.022	0.022	1312.6	28.9	28.9	0.0	1.00
5/1/18 20:00:00	20	0.022	0.022	1312.6	28.9	28.9	0.0	1.00
5/1/18 21:00:00	21	0.022	0.022	1312.6	28.9	28.9	0.0	1.00

NOx mass = Adjusted NOx Rate * Heat input
Bias = 1.00

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: NOx Emissions Rate (lb/mmBtu) (gas)
Formula Code: F-5

Source: 1

Date/Time	Hour	NOx concentration	O2	F_fact	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	47.5	14.2	9190	0.163	0.163	0.0	1.00
5/1/18 15:00:00	15	13.4	14.0	9190	0.045	0.045	0.0	1.00
5/1/18 16:00:00	16	6.6	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 17:00:00	17	6.5	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 18:00:00	18	6.5	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 19:00:00	19	6.5	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 20:00:00	20	6.5	14.0	9190	0.022	0.022	0.0	1.00

Source: 2

Date/Time	Hour	NOx concentration	O2	F_fact	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	44.1	16.6	9190	0.235	0.235	0.0	0.90
5/1/18 16:00:00	16	48.1	14.3	9190	0.167	0.167	0.0	1.00
5/1/18 17:00:00	17	12.8	14.0	9190	0.043	0.043	0.0	1.00
5/1/18 18:00:00	18	6.2	14.0	9190	0.021	0.021	0.0	1.00
5/1/18 19:00:00	19	6.5	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 20:00:00	20	6.5	14.0	9190	0.022	0.022	0.0	1.00
5/1/18 21:00:00	21	6.5	14.0	9190	0.022	0.022	0.0	1.00

NOx Emissions Rate = 1.194*10^-7 * NOx * 8710 * (20.9/(20.9-O2))

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: SO2 Mass Rate (lb/hr) (oil)
Formula: D-2

Source: 1

Date/Time	Hour	Oil_Mass	%_Sulfur	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	61000.0	0.03480	42.5	42.5	0.0	1.00
5/1/18 15:00:00	15	64000.0	0.03480	44.5	44.5	0.0	1.00
5/1/18 16:00:00	16	64000.0	0.03480	44.5	44.5	0.0	1.00
5/1/18 17:00:00	17	64000.0	0.03480	44.5	44.5	0.0	1.00
5/1/18 18:00:00	18	64000.0	0.03480	44.5	44.5	0.0	1.00
5/1/18 19:00:00	19	64000.0	0.03480	44.5	44.5	0.0	1.00
5/1/18 20:00:00	20	64000.0	0.03480	44.5	44.5	0.0	1.00

Source: 2

Date/Time	Hour	Oil_Mass	%_Sulfur	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	30000.0	0.03480	20.9	20.9	0.0	0.90
5/1/18 16:00:00	16	62000.0	0.03480	43.2	43.2	0.0	1.00
5/1/18 17:00:00	17	67000.0	0.03480	46.6	46.6	0.0	1.00
5/1/18 18:00:00	18	67000.0	0.03480	46.6	46.6	0.0	1.00
5/1/18 19:00:00	19	67000.0	0.03480	46.6	46.6	0.0	1.00
5/1/18 20:00:00	20	67000.0	0.03480	46.6	46.6	0.0	1.00
5/1/18 21:00:00	21	67000.0	0.03480	46.6	46.6	0.0	1.00

SO2 mass = 2 * Oil Rate * % sulfur/100

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: SO2 Mass Rate (lb/hr) (gas)
Formula: D-5

Source: 1

Date/Time	Hour	Heat Input	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	505.4	0.30324	0.30324	0.0	1.00
5/1/18 15:00:00	15	505.4	0.30324	0.30324	0.0	1.00
5/1/18 16:00:00	16	505.4	0.30324	0.30324	0.0	1.00
5/1/18 17:00:00	17	505.4	0.30324	0.30324	0.0	1.00
5/1/18 18:00:00	18	505.4	0.30324	0.30324	0.0	1.00
5/1/18 19:00:00	19	505.4	0.30324	0.30324	0.0	1.00
5/1/18 20:00:00	20	505.4	0.30324	0.30324	0.0	1.00

Source: 2

Date/Time	Hour	Heat Input	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	505.4	0.30324	0.30324	0.0	1.00
5/1/18 16:00:00	16	505.4	0.30324	0.30324	0.0	1.00
5/1/18 17:00:00	17	421.2	0.25272	0.25272	0.0	1.00
5/1/18 18:00:00	18	421.2	0.25272	0.25272	0.0	1.00
5/1/18 19:00:00	19	421.2	0.25272	0.25272	0.0	1.00
5/1/18 20:00:00	20	421.2	0.25272	0.25272	0.0	1.00
5/1/18 21:00:00	21	421.2	0.25272	0.25272	0.0	1.00

SO2 mass = Heat Input * 0.0006

*Simulated on Gas

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: SO2 Mass Rate (lb/hr) (combined)
Formula: D-12

Source: 1

Date/Time	Hour	SO2_Gas	GAS_ON	SO2_Oil	Oil_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	0.00000	0.00	42.5	1.00	42.5000	42.5000	0.0	1.00
5/1/18 15:00:00	15	0.00000	0.00	44.5	1.00	44.5000	44.5000	0.0	1.00
5/1/18 16:00:00	16	0.00000	0.00	44.5	1.00	44.5440	44.5440	0.0	1.00
5/1/18 17:00:00	17	0.00000	0.00	44.5	1.00	44.5440	44.5440	0.0	1.00
5/1/18 18:00:00	18	0.00000	0.00	44.5	1.00	44.5440	44.5440	0.0	1.00
5/1/18 19:00:00	19	0.00000	0.00	44.5	1.00	44.5440	44.5440	0.0	1.00
5/1/18 20:00:00	20	0.00000	0.00	44.5	1.00	44.5440	44.5440	0.0	1.00

Source: 2

Date/Time	Hour	SO2_Gas	GAS_ON	SO2_Oil	Oil_ON	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	0.00000	0.0	20.9	0.90	20.9000	20.9000	0.0	0.90
5/1/18 16:00:00	16	0.00000	0.0	43.2	1.00	43.2000	43.2000	0.0	1.00
5/1/18 17:00:00	17	0.00000	0.0	46.6	1.00	46.6000	46.6000	0.0	1.00
5/1/18 18:00:00	18	0.00000	0.0	46.6	1.00	46.6000	46.6000	0.0	1.00
5/1/18 19:00:00	19	0.00000	0.0	46.6	1.00	46.6000	46.6000	0.0	1.00
5/1/18 20:00:00	20	0.00000	0.0	46.6	1.00	46.6000	46.6000	0.0	1.00
5/1/18 21:00:00	21	0.00000	0.0	46.6	1.00	46.6000	46.6000	0.0	1.00

SO2 mass = SO2 lb/hr (gas) * Gas Operating time + SO2 lb/hr (oil) * Oil Operating Time/Unit operating time

Formula Verification Report:
ORIS Code: 56940
Plant: Valley Energy Center

Report Date: 6/22/2018
Pollutant/Parameter: SO2 Mass Rate (lb/hr) (combined)
Formula: D-1H

Source: 1

Date/Time	Hour	Sulfur_NNG	GCV_NNG	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 14:00:00	14	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 15:00:00	15	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 16:00:00	16	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 17:00:00	17	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 18:00:00	18	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 19:00:00	19	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 20:00:00	20	0.00020	104000.00	0.000001	0.000001	0.0	1.00

Source: 2

Date/Time	Hour	Sulfur_NNG	GCV_NNG	Calculation	DAS System	ABS Difference	Unit Oper(Hr)
5/1/18 15:00:00	15	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 16:00:00	16	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 17:00:00	17	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 18:00:00	18	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 19:00:00	19	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 20:00:00	20	0.00020	104000.00	0.000001	0.000001	0.0	1.00
5/1/18 21:00:00	21	0.00020	104000.00	0.000001	0.000001	0.0	1.00

SO2 mass = (2.0 / 7000) * (10^6) * S_NNG/GCV_NNG)
* Simulated on gas

ECMPS Client Tool
Version 1.0 2018 Q2

Monitoring Plan Printout Report

June 22, 2018 04:36 PM

Facility Name: Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
Monitoring Plan Location IDs:	1
State:	NY
County:	Orange County
Latitude:	41.4130
Longitude:	-74.4350

Reporting Frequency

Monitoring Plan Location IDs	Reporting Frequency	Begin Quarter	End Quarter
1	Q - Quarterly	2017 QTR 3	

Monitoring Location Attributes

Unit/Stack/Pipe Identifier	Duct Indicator	Ground Elevation	Stack Height	Cross Area Exit	Cross Area Flow	Material Code	Shape Code	Begin Date	End Date
1		464	275	284		OTHER	ROUND	08/18/2017	

Unit Operation Information

Unit Identifier	Non-Load Based Ind	Commence Commercial Operation Date	Commence Operation Date	Boiler/Turbine Type			Max Heat Input		
				Code	Begin Date	End Date	Value (mmBtu)	Begin Date	End Date
1	0	01/25/2018	01/24/2018	CC	01/01/2018		2734.0	01/24/2018	

Unit Type Codes: CC - Combined cycle

Unit Program Information

Unit Identifier	Program Code	Unit Class	Unit Monitor Certification Begin Date	Unit Monitor Certification Deadline
1	ARP	P2	01/25/2018	07/24/2018
	CSNOX	A	01/25/2018	07/24/2018
	CSOSG2	A	01/25/2018	07/24/2018
	CSSO2G1	A	01/25/2018	07/24/2018
	RGGI	A	01/25/2018	07/24/2018

Facility Name: Valley Energy Center

Facility ID (ORISPL): **56940**

Unit Fuel

Unit Identifier	Fuel Type	Fuel Indicator	Demonstration Method for GCV	Demonstration Method for Daily Sulfur	Ozone Season Indicator	Begin Date	End Date
1	DSL	S				01/24/2018	
	NNG	P				01/24/2018	

Fuel Type Codes: NNG - Natural Gas

DSL - Diesel Oil

Fuel Indicator Codes: S - Secondary

P - Primary

Unit Controls

Unit Identifier	Parameter	Control Equipment	Original Ind	Seasonal Ind	Installation Date	Optimization Date	Retirement Date
1	NOX	SCR	Y				

Control Equipment Descriptions: SCR - Selective Catalytic Reduction

Monitoring Method

Unit/Stack/Pipe Identifier	Parameter	Methodology	Substitute Data Approach	Bypass Approach Code	Begin Date/Hour	End Date/Hour
1	CO2	AD	SPTS		08/18/2017 00	
	HI	AD	SPTS		08/18/2017 00	
	NOX	NOXR			08/18/2017 00	
	NOXR	CEM	SPTS		08/18/2017 00	
	OP	EXP			08/18/2017 00	
	SO2	AD	SPTS		08/18/2017 00	

Parameter Codes: SO2 - SO2 Hourly Mass Rate (lb/hr)
OP - Opacity
NOXR - NOx Emission Rate (lb/mmBtu)
NOX - NOx Hourly Mass Rate (lb/hr)
HI - Heat Input Rate (mmBtu/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)

Methodology Codes: NOXR - NOx Mass Calculated from NOx Emission Rate
EXP - Exempt
CEM - Continuous Emission Monitor
AD - Appendix D

Substitute Data Codes: SPTS - Standard Part 75 for Missing Data

Facility Name: **Valley Energy Center**

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

June 22, 2018 04:36 PM

Monitoring System / Analytical Components

Unit/Stack /Pipe Identifier	System					Component									
	ID	Type	Des	Begin Date/Hour	End Date/Hour	ID	Type	SAM	BAS	Manufacturer	Model or Version	Serial Number	Begin Date/Hour	End Date/Hour	Hg Converter Indicator
1	GAS	GAS	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						GAB	GFFM	ORF		FLUIDIC TECHNOLOGIES	FAB3110	FAB3110-1A	08/18/2017 00		
						GAS	GFFM	ORF		GTE	3044SS PADDLE	3033514	08/18/2017 00		
	NOX	NOX	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						NOX	NOX	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						O2D	O2	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						PRB	PRB	EXT		UNIVERSAL	270SF	TBD	08/18/2017 00		
	OIL	OILM	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						OIL	OFFM	TUR		FTI	FT-40C4U3-LEA-3	160405M51314	08/18/2017 00		

System Types Descriptions:
GAS - Gas Fuel Flow
NOX - NOx Emission Rate
OILM - Mass of Oil Fuel Flow

System Designations Descriptions:
P - Primary

Sample Acquisition Method (SAM):
TUR - Turbine
ORF - Orifice
EXT - Dry Extractive

Component Types Descriptions:
DAHS - Data Acquisition and Handling System
GFFM - Gas Fuel Flowmeter
NOX - NOx Concentration
O2 - O2 Concentration
PRB - Probe
OFFM - Oil Fuel Flowmeter

Monitoring System Fuel Flow

Unit/Stack/Pipe Identifier	System ID	Fuel Code	Max Fuel Flow Rate	Units of Measure	Source Code	Begin Date/Hour	End Date/Hour
1	GAS	NNG	28000.0	HSCF	URV	08/18/2017 00	
	OIL	DSL	120000.0	LBHR	URV	08/18/2017 00	

System Fuel Codes Descriptions: NNG - Natural Gas
DSL - Diesel Oil

Units of Measure Descriptions: LBHR - Pounds / Hour
HSCF - Hundred Standard Cubic Feet / Hour

Source Codes Descriptions: URV - Upper Range Value

Analyzer Range Data

Unit/Stack/Pipe Identifier	Component Type	Component ID	Range Code	Dual Range Indicator	Begin Date/Hour	End Date/Hour
1	NOX	NOX	Auto Ranging	Y	08/18/2017 00	
	O2	O2D	High Range		08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration
O2 - O2 Concentration

Emissions Formulas

Unit/Stack/Pipe Identifier	Parameter	Formula ID	Formula Code	Formula	Begin Date/Hour	End Date/Hour
1	NOXR	100	F-5	NOx_lb/mmBtu = S#(NOX-NOX) * (1.194*10**-7) * F#(107) * (20.9 / (20.9 - S#(O2D-NOX)))	08/18/2017 00	
	HI	101	F-20	HI_gas = (F#(112) * GCV_gas) / 10**6	08/18/2017 00	
	SO2	102	D-5	M_SO2_gas = F#(111) * F#(101)	08/18/2017 00	
	CO2	103	G-4	W_CO2_gas = (1040 * F#(101) * 1/385 * 44.0) / 2000	08/18/2017 00	
	HI	104	D-8	HI_oil = S#(OIL-OIL)_oilrate * (GCV_oil / 10**6)	08/18/2017 00	
	SO2	105	D-2	M_SO2_oil = 2.0 * S#(OIL-OIL)_oilrate * (%S_oil / 100)	08/18/2017 00	
	CO2	106	G-4	W_CO2_oil = (1420 * F#(104) * 1/385 * 44.0) / 2000	08/18/2017 00	
	FD	107	F-8	Fd = (X_oil * 9190) + (X_gas * 8710)	08/18/2017 00	
	HI	108	D-15A	HI_total = (F#(101) * T_gas + F#(104) * T_oil) / T_unit	08/18/2017 00	
	CO2	109	G-4A	CO2_total = (F#(103) * T_gas + F#(106) * T_oil) / T_unit	08/18/2017 00	
	SO2	110	D-12	SO2_total = (F#(102) * T_gas + F#(105) * T_oil) / T_unit	08/18/2017 00	
	SO2R	111	D-1H	ER_SO2_gas = (2.0 / 7000) * (10**6) * S_NNG/GCV_NNG)	08/18/2017 00	
	FGAS	112	N-GAS	N_gas = S#(GAS-GAS) + S#(GAB-GAS)	08/18/2017 00	
	NOX	113	F-24A	NOx mass = F#(NOX)*F#(HT)*t_unit	08/18/2017 00	

Parameter Codes Descriptions:

NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
SO2 - SO2 Hourly Mass Rate (lb/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)
FD - F-Factor Dry-basis
SO2R - SO2 Hourly Emission Rate (lb/mmBtu)
FGAS - Gas Hourly Flow Rate (hscf)
NOX - NOx Hourly Mass Rate (lb/hr)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Monitoring Plan Printout Report

June 22, 2018 04:36 PM

Formula Codes Descriptions:

N-GAS - FGAS (net gas flow rate)
G-4A - CO2 (from CO2 rate for multiple fuels)
G-4 - CO2 (from HI, Fc)
F-8 - FD/FC/FW (from multiple fuels)
F-5 - NOXR/SO2R (from NOX or SO2 dry, O2 dry, Fd)
F-24A - NOX (from NOX rate, HI)
F-20 - HI (same as D-6)
D-8 - HI (from oil flow rate, GCV)
D-5 - SO2 (from gas SO2 emission rate, HI)
D-2 - SO2 (from OILM, oil sulfur content)
D-1H - SO2R (from gas sulfur content, GCV)
D-15A - HI (from HI rate for multiple fuels)
D-12 - SO2 (from SO2 rate for multiple fuels)

Span Values

Unit/Stack /Pipe Identifier	Comp Type	Scale	Method	MPC/ MPF	MEC	Span Value	Full-Scale Range	Units of Measure	Scale Transition Point	Def. High Range Value	Flow Full Range (SCFH)	Flow Span Value (SCFH)	Begin Date/Hour	End Date/Hour
1	NOX	H	ME	100.0	6.0	100.000	100.000	PPM	9.5				08/18/2017 00	
	NOX	L	PL		6.0	10.000	10.000	PPM	9.5				08/18/2017 00	
	O2	H				25.000	25.000	PCT					08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration
O2 - O2 Concentration

Span Method Codes Descriptions: PL - Permit Limit for NOX MEC
ME - Manufacturer's Estimate for NOX MPC

Units of Measure Descriptions: PPM - Parts per Million
PCT - Percentage

Unit/Stack/Pipe Load or Operating Level Information

Unit/Stack/Pipe Identifier	Maximum Hourly Load	Units of Measure	Upper Bound of Range of Operation	Lower Bound of Range of Operation	Designated Normal Op. Level	Second Most Frequently Used Op. Level	Second Normal Indicator	Load Analysis Date	Begin Date/Hour	End Date/Hour
1	380	MW	230	50	High	Mid	Yes	12/31/2017	12/31/2017 00	

Units of Measure Descriptions: MW - Megawatt

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Monitoring Plan Printout Report

June 22, 2018 04:36 PM

Monitoring Defaults

Unit/Stack/Pipe Identifier	Parameter	Value	Units of Measure	Purpose Code	Fuel Type	Operating Condition	Source of Value	Begin Date/Hour	End Date/Hour
1	NORX	1.1440	LBMMBTU	MD	NFS	A	DEF	08/18/2017 00	
	O2X	19.0000	PCT	DC	NFS	A	DEF	08/18/2017 00	

Parameter Codes Descriptions: O2X - Maximum O2 Concentration (pct)
NORX - Maximum NOx Emission Rate (lb/mmBtu)

Units of Measure Descriptions: PCT - Percentage
LBMMBTU - Pounds / mmBtu

Purpose Codes Descriptions: MD - Missing Data (or Unmonitored Bypass Stack or Emergency Fuel) Default
DC - Diluent Cap

Fuel Type Codes Descriptions: NFS - Non-Fuel Specific

Operating Conditions Descriptions: A - Any Hour

Source Codes Descriptions: DEF - Default Value from Part 75

Facility Name: Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
State:	NY
County:	Orange County

Unit/Stack/Pipe ID: 1

7-Day Calibration

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/08/2018 12:35
Test Number:	1_NOxL_7Day	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	Low	**Span Value:**	10.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:24:00 PM

Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Reported		Recalculated	
					Results	APS	Results	APS
04/29/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
04/29/2018 12	HIGH	8.170	81.7	8.300	1.30		1.30	
04/30/2018 17	ZERO	0.000	0	0.000	0.00		0.00	
04/30/2018 17	HIGH	8.170	81.7	8.200	0.30		0.30	
05/01/2018 16	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 16	HIGH	8.170	81.7	8.100	0.70		0.70	
05/02/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/02/2018 12	HIGH	8.170	81.7	8.200	0.30		0.30	
05/03/2018 10	ZERO	0.000	0	0.000	0.00		0.00	
05/03/2018 10	HIGH	8.170	81.7	8.200	0.30		0.30	
05/07/2018 14	ZERO	0.000	0	0.100	1.00		1.00	
05/07/2018 14	HIGH	8.170	81.7	8.200	0.30		0.30	
05/08/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/08/2018 12	HIGH	8.170	81.7	8.000	1.70		1.70	

Additional Information:
No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Unit/Stack/Pipe ID: 1

7-Day Calibration

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/08/2018 12:41
Test Number:	1_NoxH_7Day	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSAPS
Span Scale Level:	High	**Span Value:**	100.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:24:00 PM

					Reported		Recalculated	
Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Results	APS	Results	APS
04/29/2018 12	ZERO	0.000	0	0.100	0.10		0.10	
04/29/2018 12	HIGH	89.520	89.5	90.400	0.90		0.90	
04/30/2018 17	ZERO	0.000	0	0.100	0.10		0.10	
04/30/2018 17	HIGH	89.520	89.5	89.300	0.20		0.20	
05/01/2018 16	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 16	HIGH	89.520	89.5	88.800	0.70		0.70	
05/02/2018 12	ZERO	0.000	0	0.100	0.10		0.10	
05/02/2018 12	HIGH	89.520	89.5	88.300	1.20		1.20	
05/03/2018 10	ZERO	0.000	0	0.000	0.00		0.00	
05/03/2018 10	HIGH	89.520	89.5	88.400	1.10		1.10	
05/07/2018 14	ZERO	0.000	0	0.100	0.10		0.10	
05/07/2018 14	HIGH	89.520	89.5	88.200	1.30		1.30	
05/08/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/08/2018 12	HIGH	89.520	89.5	88.100	1.40		1.40	

Additional Information:
No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): **56940**

Unit/Stack/Pipe ID: **1**

7-Day Calibration

Component ID:	O2D	**Component Type:**	O2	**Test Completion:**	05/08/2018 12:44
Test Number:	1_O2_7Day	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	25.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:24:00 PM

Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Reported		Recalculated	
					Results	APS	Results	APS
04/29/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
04/29/2018 12	HIGH	20.930	83.7	20.900	0.00		0.00	
04/30/2018 17	ZERO	0.000	0	0.000	0.00		0.00	
04/30/2018 17	HIGH	20.930	83.7	20.900	0.00		0.00	
05/01/2018 16	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 16	HIGH	20.930	83.7	20.900	0.00		0.00	
05/02/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/02/2018 12	HIGH	20.930	83.7	20.900	0.00		0.00	
05/03/2018 10	ZERO	0.000	0	0.000	0.00		0.00	
05/03/2018 11	HIGH	20.930	83.7	20.900	0.00		0.00	
05/07/2018 14	ZERO	0.000	0	0.000	0.00		0.00	
05/07/2018 14	HIGH	20.930	83.7	20.900	0.00		0.00	
05/08/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/08/2018 12	HIGH	20.930	83.7	20.900	0.00		0.00	

Additional Information:

No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Unit/Stack/Pipe ID: 1

Cycle Time Test

Component ID: NOX
Test Number: 1_NoxH_Cycle_Cert
Span Scale Level: High
Total Cycle Time: 3

Component Type: NOX
Reason for Test: INITIAL
Span Value: 100.000
Calculated Total Cycle Time: 3

Test Completion: 05/08/2018 09:24
Reported Test Results: PASSED
EPA Calculated Result: PASSED

Evaluation Status: No Errors

Submission Status: Data loaded on EPA Host System
Submission Date/Time: 06/22/2018 4:24:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	09:12	09:15	ZERO	0.000	43.900	0.200	3	3
2018/05/08	09:22	09:24	HIGH	89.520	42.800	87.600	2	2

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Unit/Stack/Pipe ID: 1

Cycle Time Test

Component ID: NOX
Test Number: 1_NoxL_Cycle_Cert
Span Scale Level: Low
Total Cycle Time: 2

Component Type: NOX
Reason for Test: INITIAL
Span Value: 10.000
Calculated Total Cycle Time: 2

Test Completion: 05/08/2018 10:50
Reported Test Results: PASSED
EPA Calculated Result: PASSED

Evaluation Status: No Errors

Submission Status: Data loaded on EPA Host System
Submission Date/Time: 06/22/2018 4:24:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	10:39	10:41	ZERO	0.000	4.200	0.000	2	2
2018/05/08	10:48	10:50	HIGH	8.170	4.200	8.100	2	2

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Facility Name: **Valley Energy Center**

Facility ID (ORISPL): **56940**

QA/Cert Test Detail Report

June 22, 2018 04:39 PM

Unit/Stack/Pipe ID: **1**

Cycle Time Test

Component ID:	O2D	**Component Type:**	O2	**Test Completion:**	05/08/2018 18:21
Test Number:	1_O2_Cycle_Cert	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	25.000	**EPA Calculated Result:**	PASSED
Total Cycle Time:	3	**Calculated Total Cycle Time:**	3		
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:24:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	18:11	18:14	ZERO	0.000	13.700	0.000	3	3
2018/05/08	18:18	18:21	HIGH	20.930	13.900	20.900	3	3

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Unit/Stack/Pipe ID: **1**

Linearity Check

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/10/2018 10:24
Test Number:	1_NOXH_CERTLIN	**Reason for Test:**	QA	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	100.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:24:00 PM

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
Low	CO,NO,BALN	G12018	EB0073000	03/19/2021
High	CO2,NO,NOX,BALN	B52017	CC329952	12/17/2025
Mid	NO,NOX,BALN	B22017	CC503502	11/01/2025

Summary Statistics:

Facility Name: **Valley Energy Center**

QA/Cert Test Detail Report

June 22, 2018 04:39 PM

Facility ID (ORISPL): **56940**

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	89.520	89.520	50.890	50.890	24.600	24.600
Mass CEM Value	88.400	88.300	51.433	51.433	25.067	25.067
Alt. Perf. Indicator						
Results	1.3	1.4	1.1	1.1	1.9	1.9

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/10/2018 09:51	LOW	25.000	24.600	24.6%
05/10/2018 10:16	LOW	25.100	24.600	24.6%
05/10/2018 10:04	LOW	25.100	24.600	24.6%
05/10/2018 10:00	HIGH	88.200	89.520	89.5%
05/10/2018 10:12	HIGH	88.200	89.520	89.5%
05/10/2018 10:24	HIGH	88.500	89.520	89.5%
05/10/2018 09:55	MID	51.400	50.890	50.9%
05/10/2018 10:20	MID	51.500	50.890	50.9%
05/10/2018 10:08	MID	51.400	50.890	50.9%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: **1**

Linearity Check

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/08/2018 10:29
Test Number:	1_Nox_L_CertLin	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSAPS
Span Scale Level:	Low	**Span Value:**	10.000	**EPA Calculated Result:**	PASSAPS
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:24:00 PM

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,CO2,NO,NOX,BALN	B52017	CC192317	09/26/2020

Low	CO,NO,BALN	G12017	EB0072315	07/04/2020
Mid	NO,BALN	G12017	EB0101725	12/03/2020

Summary Statistics:

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	8.170	8.170	5.090	5.090	2.420	2.420
Mass CEM Value	8.000	8.000	5.367	5.367	2.500	2.500
Alt. Perf. Indicator			Y	Y		
Results	2.1	2.1	0.0	0.0	3.3	3.3

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/08/2018 10:09	MID	5.400	5.090	50.9%
05/08/2018 09:52	MID	5.300	5.090	50.9%
05/08/2018 10:24	MID	5.400	5.090	50.9%
05/08/2018 09:58	HIGH	8.000	8.170	81.7%
05/08/2018 10:29	HIGH	8.000	8.170	81.7%
05/08/2018 10:15	HIGH	8.000	8.170	81.7%
05/08/2018 10:02	LOW	2.500	2.420	24.2%
05/08/2018 09:48	LOW	2.500	2.420	24.2%
05/08/2018 10:19	LOW	2.500	2.420	24.2%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: **1**

Linearity Check

Component ID:	O2D	**Component Type:**	O2	**Test Completion:**	05/10/2018 07:38
Test Number:	1_O2_CERTLIN	**Reason for Test:**	QA	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	25.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:24:00 PM

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,CO2,O2,BALN	B22017	EB0095428	09/17/2025
Low	CO2,O2,BALN	L12013	EB0049201	08/13/2021
Mid	O2,BALN	G12018	EB0060674	04/01/2026

Summary Statistics:

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	20.930	20.930	13.820	13.820	6.360	6.360
Mass CEM Value	20.900	20.900	13.700	13.700	6.100	6.100
Alt. Perf. Indicator						
Results	0.1	0.1	0.9	0.9	4.1	4.1

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/10/2018 07:18	LOW	6.100	6.360	25.4%
05/10/2018 07:05	LOW	6.100	6.360	25.4%
05/10/2018 07:30	LOW	6.100	6.360	25.4%
05/10/2018 07:09	MID	13.700	13.820	55.3%
05/10/2018 07:21	MID	13.700	13.820	55.3%
05/10/2018 07:34	MID	13.700	13.820	55.3%
05/10/2018 07:38	HIGH	20.900	20.930	83.7%
05/10/2018 07:26	HIGH	20.900	20.930	83.7%
05/10/2018 07:13	HIGH	20.900	20.930	83.7%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: 1

Relative Accuracy Test

Facility Name: Valley Energy Center

QA/Cert Test Detail Report

June 22, 2018 04:39 PM

Facility ID (ORISPL): 56940

System ID:	NOX	**System Parameter:**	NOX	**Test Completion:**	05/09/2018 17:49
Test Number:	1_RATA_Cert	**Reason for Test:**	QA	**Reported Test Results:**	PASSED
# of Op. Levels:	1	**Grace Period Test?**		**EPA Calculated Result:**	PASSED

Evaluation Status:	No Errors	**Reported BAF:**	1.000
Submission Status:	Data loaded on EPA Host System	**EPA Calculated BAF:**	1.000
Submission Date:	06/22/2018 4:24:00 PM	**RATA Frequency:**	4QTRS

Air Emissions Testing Data

QI Name:	Stockwell, Michael D	**AETB Name:**	Air Hygiene International Inc.
Exam Date:	01/06/2017	**AETB Phone Number:**	888-461-8778
Provider Name:	Source Evaluation Society	**AETB Email:**	info@airhygiene.com
Provider Email:	qstiprogram@gmail.com		

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,NO,NOX,BALN	G12016	EB0026154	09/30/2019
Mid	CO,NO,NOX,BALN	G12017	EB0098858	09/18/2020
Low	CO,NO,NOX,BALN	G12018	EB0027723	01/25/2021
High	CO2,O2,BALN	G12017	EB0032327	01/07/2025
Mid	CO2,O2,BALN	G12018	EB0081248	03/12/2026
Low	ZERO			

Operating Level: High

Reference Method Used: 7E,3A: NOX RM 7E and CO2/O2 RM 3A

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	0.01989	0.01989	**Relative Accuracy**	5.45	5.45
Mean of Reference Method Values	0.02044	0.02044	**Bias Adjustment Factor**	1.000	1.000
Mean of Difference	0.00056	0.00056	**APS Indicator**		
Standard Deviation of Difference	0.00073	0.00073	**T-Value**	2.306	2.306
Confidence Coefficient	0.00056	0.00056	**Gross Unit Load or Velocity**	178	178

Facility Name: **Valley Energy Center**

Facility ID (ORISPL): **56940**

QA/Cert Test Detail Report

June 22, 2018 04:39 PM

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	05/09/2018 12:46	05/09/2018 13:07	RUNUSED	0.02000	0.02100	178
2	05/09/2018 13:27	05/09/2018 13:48	RUNUSED	0.02000	0.02100	177
3	05/09/2018 14:03	05/09/2018 14:24	RUNUSED	0.02000	0.02000	176
4	05/09/2018 14:38	05/09/2018 14:59	RUNUSED	0.02000	0.02200	177
5	05/09/2018 15:16	05/09/2018 15:37	RUNUSED	0.02000	0.02000	177
6	05/09/2018 15:48	05/09/2018 16:09	RUNUSED	0.02000	0.02000	179
7	05/09/2018 16:23	05/09/2018 16:44	RUNUSED	0.02000	0.02000	179
8	05/09/2018 16:55	05/09/2018 17:16	RUNUSED	0.02000	0.02000	179
9	05/09/2018 17:28	05/09/2018 17:49	RUNUSED	0.01900	0.02000	180

Additional Information:

No comment.

*Performance Spec: RA <= 10% or Mean Difference <= +/- 2.0fps:
Reduced Frequency Spec: RA <= 7.5% or Mean Difference +/- 1.5 fps (Appendix A &3.3.4)

ATTACHMENT 2

Unit 2

40 CFR Part 75 Form
Monitoring Plan
RATA Test Summary
Linearity Test Summary
Cycle Response Test
7-day drift test

United States
Environmental Protection Agency
Acid Rain Program

OMB No. 2060-0258

EPA

Certification Application

For more information, see instructions and refer to 40 CFR 75.63

This submission is for: • Initial Certification • Recertification

STEP 1
Identify the source by plant name, State, and ORIS Code from NADB

Plant Name	State	ORIS Code
VALLEY ENERGY CENTER	NY	56940

STEP 2
Identify unit short name/common stack description and boiler ID#/common stack ID#

Unit Short Name/Common Stack Description	Boiler/Common Stack ID#
Unit 2	2

STEP 3
Mark the appropriate box and fill in if necessary

• Included is a copy of the monitoring plan))))))))))))))))))) • No. of pages 8

• No monitoring plan included

STEP 4
Provide the requested information for the monitoring systems and for the test data that are being submitted

Use page 2 to provide information for additional units/common stacks at this source or for units/common stacks with more than 10 systems

MONITORING SYSTEMS			TEST DATA		
System ID#	Para-meter Monitored	Primary/ Backup	Testing Date(s) *(mm/dd/yy-mm/dd/yy)*	Number of Tests (Total)	Number of Failed Tests
NOX	Nox	P	04/24/18 - 05/12/18	4	0
NOX	O2	P	04/24/18 - 05/12/18	4	0

STEP 5
Complete the boxes

Included are test results for systems listed in Step 4 Table(s))))))))))))) • No. of pages 10

Included is DAHS verification test information))))))))))))))))))) • No. of pages 14

STEP 6
Read the certification, enter the name of the designated representative, and sign and date

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name Ben Stanley DGL Operations, LLC

Signature

Date 6/22/2018

EPA Form 7610-14 (1-93)

Facility Name: Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
Monitoring Plan Location IDs:	2
State:	NY
County:	Orange County
Latitude:	41.4130
Longitude:	-74.4350

Reporting Frequency

Monitoring Plan Location IDs	Reporting Frequency	Begin Quarter	End Quarter
2	Q - Quarterly	2017 QTR 3	

Monitoring Location Attributes

Unit/Stack/Pipe Identifier	Duct Indicator	Ground Elevation	Stack Height	Cross Area Exit	Cross Area Flow	Material Code	Shape Code	Begin Date	End Date
2		464	275	284		OTHER	ROUND	08/18/2017	

Unit Operation Information

Unit Identifier	Non-Load Based Ind	Commence Commercial Operation Date	Commence Operation Date	Boiler/Turbine Type			Max Heat Input		
				Code	Begin Date	End Date	Value (mmBtu)	Begin Date	End Date
2	0	01/24/2018	01/18/2018	CC	01/01/2018		2734.0	01/18/2018	

Unit Type Codes: CC - Combined cycle

Unit Program Information

Unit Identifier	Program Code	Unit Class	Unit Monitor Certification Begin Date	Unit Monitor Certification Deadline
2	ARP	P2	01/24/2018	07/23/2018
	CSNOX	A	01/24/2018	07/23/2018
	CSOSG2	A	01/24/2018	07/23/2018
	CSSO2G1	A	01/24/2018	07/23/2018
	RGGI	A	01/24/2018	07/23/2018

Unit Fuel

Unit Identifier	Fuel Type	Fuel Indicator	Demonstration Method for GCV	Demonstration Method for Daily Sulfur	Ozone Season Indicator	Begin Date	End Date
2	DSL	S				01/18/2018	
	NNG	P				01/18/2018	

Fuel Type Codes: NNG - Natural Gas
DSL - Diesel Oil

Fuel Indicator Codes: S - Secondary
P - Primary

Unit Controls

Unit Identifier	Parameter	Control Equipment	Original Ind	Seasonal Ind	Installation Date	Optimization Date	Retirement Date
2	NOX	SCR	Y				

Control Equipment Descriptions: SCR - Selective Catalytic Reduction

Monitoring Method

Unit/Stack/Pipe Identifier	Parameter	Methodology	Substitute Data Approach	Bypass Approach Code	Begin Date/Hour	End Date/Hour
2	CO2	AD	SPTS		08/18/2017 00	
	HI	AD	SPTS		08/18/2017 00	
	NOX	NOXR			08/18/2017 00	
	NOXR	CEM	SPTS		08/18/2017 00	
	OP	EXP			08/18/2017 00	
	SO2	AD	SPTS		08/18/2017 00	

Parameter Codes:
SO2 - SO2 Hourly Mass Rate (lb/hr)
OP - Opacity
NOXR - NOx Emission Rate (lb/mmBtu)
NOX - NOx Hourly Mass Rate (lb/hr)
HI - Heat Input Rate (mmBtu/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)

Methodology Codes:
NOXR - NOx Mass Calculated from NOx Emission Rate
EXP - Exempt
CEM - Continuous Emission Monitor
AD - Appendix D

Substitute Data Codes:
SPTS - Standard Part 75 for Missing Data

Facility Name: Valley Energy Center

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

June 22, 2018 04:38 PM

Monitoring System / Analytical Components

Unit/Stack /Pipe Identifier	System					Component									
	ID	Type	Des	Begin Date/Hour	End Date/Hour	ID	Type	SAM	BAS	Manufacturer	Model or Version	Serial Number	Begin Date/Hour	End Date/Hour	Hg Converter Indicator
2	GAS	GAS	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						GAB	GFFM	ORF		FLUIDIC TECHNOLOGIES	FAB3110	FAB3110-1B	08/18/2017 00		
						GAS	GFFM	ORF		GTE	3044SS PADDLE	3033515	08/18/2017 00		
	NOX	NOX	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						NOX	NOX	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						O2D	O2	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						PRB	PRB	EXT		UNIVERSAL	270SF	TBD	08/18/2017 00		
	OIL	OILM	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						OIL	OFFM	TUR		FTI	FT-40C4U3-LEA-3	160405M51315	08/18/2017 00		

System Types Descriptions: GAS - Gas Fuel Flow
NOX - NOx Emission Rate
OILM - Mass of Oil Fuel Flow

System Designations Descriptions: P - Primary

Sample Acquisition Method (SAM): TUR - Turbine
ORF - Orifice
EXT - Dry Extractive

Component Types Descriptions: DAHS - Data Acquisition and Handling System
GFFM - Gas Fuel Flowmeter
NOX - NOx Concentration
O2 - O2 Concentration
PRB - Probe
OFFM - Oil Fuel Flowmeter

Facility Name: **Valley Energy Center**

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

June 22, 2018 04:38 PM

Monitoring System Fuel Flow

Unit/Stack/Pipe Identifier	System ID	Fuel Code	Max Fuel Flow Rate	Units of Measure	Source Code	Begin Date/Hour	End Date/Hour
2	GAS	NNG	28000.0	HSCF	URV	08/18/2017 00	
	OIL	DSL	120000.0	LBHR	URV	08/18/2017 00	

System Fuel Codes Descriptions: NNG - Natural Gas

DSL - Diesel Oil

Units of Measure Descriptions: LBHR - Pounds / Hour

HSCF - Hundred Standard Cubic Feet / Hour

Source Codes Descriptions: URV - Upper Range Value

Analyzer Range Data

Unit/Stack/Pipe Identifier	Component Type	Component ID	Range Code	Dual Range Indicator	Begin Date/Hour	End Date/Hour
2	NOX	NOX	Auto Ranging	Y	08/18/2017 00	
	O2	O2D	High Range		08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration

O2 - O2 Concentration

Emissions Formulas

Unit/Stack/Pipe Identifier	Parameter	Formula ID	Formula Code	Formula	Begin Date/Hour	End Date/Hour
2	NOXR	100	F-5	NOx_lb/mmBtu = S#(NOX-NOX) * (1.194*10**-7) * F#(107) * (20.9 / (20.9 - S#(O2D-NOX)))	08/18/2017 00	
	HI	101	F-20	HI_gas = (F#(112) * GCV_gas) / 10**6	08/18/2017 00	
	SO2	102	D-5	M_SO2_gas = F#(111) * F#(101)	08/18/2017 00	
	CO2	103	G-4	W_CO2_gas = (1040 * F#(101) * 1/385 * 44.0) / 2000	08/18/2017 00	
	HI	104	D-8	HI_oil = S#(OIL-OIL)_oilrate * (GCV_oil) / 10**6)	08/18/2017 00	
	SO2	105	D-2	M_SO2_oil = 2.0 * S#(OIL-OIL)_oilrate * (%S_oil) / 100)	08/18/2017 00	
	CO2	106	G-4	W_CO2_oil = (1420 * F#(104) * 1/385 * 44.0) / 2000	08/18/2017 00	
	FD	107	F-8	Fd = (X_oil * 9190) + (X_gas * 8710)	08/18/2017 00	
	HI	108	D-15A	HI_total = F#(101) * T_gas + F#(104) * T_oil) / T_unit	08/18/2017 00	
	CO2	109	G-4A	CO2_total = (F#(103) * T_gas + F#(106) * T_oil) / T_unit	08/18/2017 00	
	SO2	110	D-12	SO2_total = (#(102) * T_gas + F#(105) * T_oil) / T_unit	08/18/2017 00	
	SO2R	111	D-1H	ER_SO2_gas = (2.0 / 7000) * (10**6) * S_NNG/GCV_NNG)	08/18/2017 00	
	FGAS	112	N-GAS	N_gas = S#(GAS-GAS) + S#(GAB-GAS)	08/18/2017 00	
	NOX	113	F-24A	NOx mass = F#(NOX)*F#(HT)*t_unit	08/18/2017 00	

Parameter Codes Descriptions:

NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
SO2 - SO2 Hourly Mass Rate (lb/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)
FD - F-Factor Dry-basis
SO2R - SO2 Hourly Emission Rate (lb/mmBtu)
FGAS - Gas Hourly Flow Rate (hscf)
NOX - NOx Hourly Mass Rate (lb/hr)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Monitoring Plan Printout Report

June 22, 2018 04:38 PM

Formula Codes Descriptions:

N-GAS - FGAS (net gas flow rate)
G-4A - CO2 (from CO2 rate for multiple fuels)
G-4 - CO2 (from HI, Fc)
F-8 - FD/FC/FW (from multiple fuels)
F-5 - NOXR/SO2R (from NOX or SO2 dry, O2 dry, Fd)
F-24A - NOX (from NOX rate, HI)
F-20 - HI (same as D-6)
D-8 - HI (from oil flow rate, GCV)
D-5 - SO2 (from gas SO2 emission rate, HI)
D-2 - SO2 (from OILM, oil sulfur content)
D-1H - SO2R (from gas sulfur content, GCV)
D-15A - HI (from HI rate for multiple fuels)
D-12 - SO2 (from SO2 rate for multiple fuels)

Span Values

Unit/Stack /Pipe Identifier	Comp Type	Scale	Method	MPC/ MPF	MEC	Span Value	Full-Scale Range	Units of Measure	Scale Transition Point	Def. High Range Value	Flow Full Range (SCFH)	Flow Span Value (SCFH)	Begin Date/Hour	End Date/Hour
2	NOX	H	ME	100.0	6.0	100.000	100.000	PPM	9.5				08/18/2017 00	
	NOX	L	PL		6.0	10.000	10.000	PPM	9.5				08/18/2017 00	
	O2	H				25.000	26.000	PCT					08/18/2017 00	

Component Types Descriptions:
NOX - NOx Concentration
O2 - O2 Concentration

Span Method Codes Descriptions:
PL - Permit Limit for NOX MEC
ME - Manufacturer's Estimate for NOX MPC

Units of Measure Descriptions:
PPM - Parts per Million
PCT - Percentage

Unit/Stack/Pipe Load or Operating Level Information

Unit/Stack/Pipe Identifier	Maximum Hourly Load	Units of Measure	Upper Bound of Range of Operation	Lower Bound of Range of Operation	Designated Normal Op. Level	Second Most Frequently Used Op. Level	Second Normal Indicator	Load Analysis Date	Begin Date/Hour	End Date/Hour
2	380	MW	230	50	High	Mid	Yes	12/31/2017	12/31/2017 00	

Units of Measure Descriptions: MW - Megawatt

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Monitoring Plan Printout Report

June 22, 2018 04:38 PM

Monitoring Defaults

Unit/Stack/Pipe Identifier	Parameter	Value	Units of Measure	Purpose Code	Fuel Type	Operating Condition	Source of Value	Begin Date/Hour	End Date/Hour
2	NORX	1.1440	LBMMBTU	MD	NFS	A	DEF	08/18/2017 00	
	O2X	19.0000	PCT	DC	NFS	A	DEF	08/18/2017 00	

Parameter Codes Descriptions:	O2X - Maximum O2 Concentration (pct)
	NORX - Maximum NOx Emission Rate (lb/mmBtu)
Units of Measure Descriptions:	PCT - Percentage
	LBMMBTU - Pounds / mmBtu
Purpose Codes Descriptions:	MD - Missing Data (or Unmonitored Bypass Stack or Emergency Fuel) Default
	DC - Diluent Cap
Fuel Type Codes Descriptions:	NFS - Non-Fuel Specific
Operating Conditions Descriptions:	A - Any Hour
Source Codes Descriptions:	DEF - Default Value from Part 75

Facility Name: Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
State:	NY
County:	Orange County

Unit/Stack/Pipe ID: **2**

7-Day Calibration

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/02/2018 12:12
Test Number:	2_NoxL_7Day	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	Low	**Span Value:**	10.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:26:00 PM

Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Reported		Recalculated	
					Results	APS	Results	APS
04/24/2018 09	ZERO	0.000	0	0.000	0.00		0.00	
04/24/2018 09	HIGH	8.680	86.8	8.700	0.20		0.20	
04/25/2018 11	ZERO	0.000	0	0.000	0.00		0.00	
04/25/2018 11	HIGH	8.680	86.8	8.600	0.80		0.80	
04/28/2018 15	ZERO	0.000	0	0.000	0.00		0.00	
04/28/2018 15	HIGH	8.680	86.8	8.600	0.80		0.80	
04/29/2018 14	ZERO	0.000	0	0.000	0.00		0.00	
04/29/2018 15	HIGH	8.680	86.8	8.500	1.80		1.80	
04/30/2018 01	ZERO	0.000	0	0.000	0.00		0.00	
04/30/2018 01	HIGH	8.680	86.8	8.500	1.80		1.80	
05/01/2018 18	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 18	HIGH	8.680	86.8	8.500	1.80		1.80	
05/02/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/02/2018 12	HIGH	8.680	86.8	8.500	1.80		1.80	

Additional Information:
No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Unit/Stack/Pipe ID: 2

7-Day Calibration

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/02/2018 12:15
Test Number:	2_NoxH_7Day	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	100.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:26:00 PM

Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Reported		Recalculated	
					Results	APS	Results	APS
04/24/2018 09	ZERO	0.000	0	0.100	0.10		0.10	
04/24/2018 09	HIGH	88.750	88.8	89.100	0.40		0.40	
04/25/2018 11	ZERO	0.000	0	0.000	0.00		0.00	
04/25/2018 11	HIGH	88.750	88.8	89.400	0.70		0.70	
04/28/2018 15	ZERO	0.000	0	0.000	0.00		0.00	
04/28/2018 15	HIGH	88.750	88.8	88.500	0.30		0.30	
04/29/2018 14	ZERO	0.000	0	0.000	0.00		0.00	
04/29/2018 15	HIGH	88.750	88.8	88.200	0.60		0.60	
04/30/2018 01	ZERO	0.000	0	0.000	0.00		0.00	
04/30/2018 01	HIGH	88.750	88.8	88.100	0.70		0.70	
05/01/2018 18	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 18	HIGH	88.750	88.8	88.100	0.70		0.70	
05/02/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/02/2018 12	HIGH	88.750	88.8	87.900	0.90		0.90	

Additional Information:

No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): **56940**

QA/Cert Test Detail Report

June 22, 2018 04:40 PM

Unit/Stack/Pipe ID: **2**

7-Day Calibration

Component ID: O2D
Test Number: 2_O2_7Day
Span Scale Level: High

Component Type: O2
Reason for Test: INITIAL
Span Value: 25.000

Test Completion: 05/03/2018 14:17
Reported Test Results: PASSED
EPA Calculated Result: PASSED

Evaluation Status: No Errors

Submission Status: Data loaded on EPA Host System
Submission Date/Time: 06/22/2018 4:26:00 PM

Injection Date/Hour	Gas Level	Reference Value	Reference Value % of Span	Measured Value	Reported		Recalculated	
					Results	APS	Results	APS
04/25/2018 11	ZERO	0.000	0	0.000	0.00		0.00	
04/25/2018 11	HIGH	20.890	83.6	20.900	0.00		0.00	
04/28/2018 15	ZERO	0.000	0	0.000	0.00		0.00	
04/28/2018 15	HIGH	20.890	83.6	20.900	0.00		0.00	
04/29/2018 14	ZERO	0.000	0	0.000	0.00		0.00	
04/29/2018 15	HIGH	20.890	83.6	20.900	0.00		0.00	
04/30/2018 01	ZERO	0.000	0	0.000	0.00		0.00	
04/30/2018 01	HIGH	20.890	83.6	20.900	0.00		0.00	
05/01/2018 18	ZERO	0.000	0	0.000	0.00		0.00	
05/01/2018 18	HIGH	20.890	83.6	20.900	0.00		0.00	
05/02/2018 12	ZERO	0.000	0	0.000	0.00		0.00	
05/02/2018 12	HIGH	20.890	83.6	20.900	0.00		0.00	
05/03/2018 14	ZERO	0.000	0	0.000	0.00		0.00	
05/03/2018 14	HIGH	20.890	83.6	20.900	0.00		0.00	

Additional Information:

No comment.

*Performance Spec: CE <= 2.5% of Span   Alternate Performance Spec: |R-A| <= 5 ppm (Appendix A &3.1)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Unit/Stack/Pipe ID: 2

Cycle Time Test

Component ID: NOX
Component Type: NOX
Test Completion: 05/08/2018 15:17
Test Number: 2_NoxH_Cycle_Cert
Reason for Test: INITIAL
Reported Test Results: PASSED
Span Scale Level: High
Span Value: 100.000
EPA Calculated Result: PASSED
Total Cycle Time: 3
Calculated Total Cycle Time: 3

Evaluation Status: No Errors
Submission Status: Data loaded on EPA Host System
Submission Date/Time: 06/22/2018 4:26:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	15:05	15:08	ZERO	0.000	6.200	0.000	3	3
2018/05/08	15:14	15:17	HIGH	88.750	6.300	87.100	3	3

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Unit/Stack/Pipe ID: 2

Cycle Time Test

Component ID: NOX
Component Type: NOX
Test Completion: 05/08/2018 14:18
Test Number: 2_NoxL_Cycle_Cert
Reason for Test: INITIAL
Reported Test Results: PASSED
Span Scale Level: Low
Span Value: 10.000
EPA Calculated Result: PASSED
Total Cycle Time: 3
Calculated Total Cycle Time: 3

Evaluation Status: No Errors
Submission Status: Data loaded on EPA Host System
Submission Date/Time: 06/22/2018 4:26:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	14:04	14:06	ZERO	0.000	6.900	0.000	2	2
2018/05/08	14:15	14:18	HIGH	8.680	7.000	8.200	3	3

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

Unit/Stack/Pipe ID: 2

Cycle Time Test

Component ID:	O2D	**Component Type:**	O2	**Test Completion:**	05/08/2018 15:40
Test Number:	2_O2_CYCLE_CERT	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	25.000	**EPA Calculated Result:**	PASSED
Total Cycle Time:	2	**Calculated Total Cycle Time:**	2		
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
				Submission Date/Time:	06/22/2018 4:26:00 PM

Date	Start Time	End Time	Gas Level	Reference Gas Value	Stable Values		Injection Cycle Time	
					Starting	Ending	Results	Recalculated
2018/05/08	15:29	15:31	ZERO	0.000	13.700	0.000	2	2
2018/05/08	15:39	15:40	HIGH	20.890	12.900	20.800	1	1

Additional Information:

No comment.

*Performance Spec: Cycle Time <= 15 minutes (Appendix A &3.5)

Unit/Stack/Pipe ID: 2

Linearity Check

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/11/2018 09:20
Test Number:	2_NOX_L_CERTLIN	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	Low	**Span Value:**	10.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:26:00 PM

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,CO2,NO,BALN	B52017	CC280797	12/06/2020
Mid	CO,NO,BALN	G12017	EB0101725	10/03/2020
Low	CO,NO,BALN	G12017	EB0072315	07/04/2020

Summary Statistics:

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	8.680	8.680	5.090	5.090	2.420	2.420
Mass CEM Value	8.500	8.500	5.300	5.300	2.333	2.333
Alt. Perf. Indicator						
Results	2.1	2.1	4.1	4.1	3.6	3.6

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/11/2018 09:16	MID	5.300	5.090	50.9%
05/11/2018 09:04	MID	5.300	5.090	50.9%
05/11/2018 08:52	MID	5.300	5.090	50.9%
05/11/2018 09:00	LOW	2.300	2.420	24.2%
05/11/2018 08:48	LOW	2.400	2.420	24.2%
05/11/2018 09:12	LOW	2.300	2.420	24.2%
05/11/2018 09:20	HIGH	8.500	8.680	86.8%
05/11/2018 08:56	HIGH	8.500	8.680	86.8%
05/11/2018 09:08	HIGH	8.500	8.680	86.8%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: **2**

Linearity Check

Component ID:	NOX	**Component Type:**	NOX	**Test Completion:**	05/10/2018 17:20
Test Number:	2_NOXH_CERTLIN	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	100.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:26:00 PM

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
Low	CO,NO,BALN	G12018	EB0073000	03/19/2021

High	CO2,NO,NOX,BALN	B52017	CC477949	09/25/2025
Mid	NO,NOX,BALN	B22017	CC503502	11/01/2025

Summary Statistics:

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	88.750	88.750	50.890	50.890	24.600	24.600
Mass CEM Value	87.100	87.100	51.967	51.967	25.433	25.433
Alt. Perf. Indicator						
Results	1.9	1.9	2.1	2.1	3.4	3.4

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/10/2018 16:52	MID	52.000	50.890	50.9%
05/10/2018 17:04	MID	51.900	50.890	50.9%
05/10/2018 17:17	MID	52.000	50.890	50.9%
05/10/2018 17:13	LOW	25.400	24.600	24.6%
05/10/2018 17:00	LOW	25.500	24.600	24.6%
05/10/2018 16:48	LOW	25.400	24.600	24.6%
05/10/2018 16:56	HIGH	87.200	88.750	88.8%
05/10/2018 17:20	HIGH	86.900	88.750	88.8%
05/10/2018 17:08	HIGH	87.200	88.750	88.8%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: 2

Linearity Check

Component ID:	O2D	**Component Type:**	O2	**Test Completion:**	05/11/2018 10:56
Test Number:	2_O2_CERTLIN	**Reason for Test:**	INITIAL	**Reported Test Results:**	PASSED
Span Scale Level:	High	**Span Value:**	25.000	**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Submission Status:**	Data loaded on EPA Host System
Grace period Tested?				**Submission Date/Time:**	06/22/2018 4:26:00 PM

Facility Name: Valley Energy Center

Facility ID (ORISPL): 56940

QA/Cert Test Detail Report

June 22, 2018 04:40 PM

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,CO2,O2,BALN	B52017	EB0095371	09/19/2025
Low	CO2,O2,BALN	L12013	EB0049201	08/13/2021
Mid	O2,BALN	G12018	EB0060674	04/01/2026

Summary Statistics:

	High		Mid		Low	
	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
Reference Value	20.890	20.890	13.820	13.820	6.360	6.360
Mass CEM Value	20.900	20.900	13.800	13.800	6.200	6.200
Alt. Perf. Indicator						
Results	0.0	0.0	0.1	0.1	2.5	2.5

Injection Statistics:

Date	Gas Level	Measured Value	Reference Value	Reference Value as % of Span
05/11/2018 10:44	HIGH	20.900	20.890	83.6%
05/11/2018 10:32	HIGH	20.900	20.890	83.6%
05/11/2018 10:56	HIGH	20.900	20.890	83.6%
05/11/2018 10:27	MID	13.800	13.820	55.3%
05/11/2018 10:40	MID	13.800	13.820	55.3%
05/11/2018 10:52	MID	13.800	13.820	55.3%
05/11/2018 10:23	LOW	6.200	6.360	25.4%
05/11/2018 10:48	LOW	6.200	6.360	25.4%
05/11/2018 10:36	LOW	6.200	6.360	25.4%

Additional Information:

No comment.

*Performance Spec: LE <= 5.0% of Reference Value; Alternate Performance Spec: |R-A| <= 5ppm (Appendix A &3.2)

Unit/Stack/Pipe ID: 2

Relative Accuracy Test

Facility Name: Valley Energy Center

QA/Cert Test Detail Report
June 22, 2018 04:40 PM

Facility ID (ORISPL): 56940

System ID:	NOX	**System Parameter:**	NOX	**Test Completion:**	05/12/2018 11:14
Test Number:	2_RATA_Cert	**Reason for Test:**	QA	**Reported Test Results:**	PASSED
# of Op. Levels:	1	**Grace Period Test?**		**EPA Calculated Result:**	PASSED

Evaluation Status:	No Errors	**Reported BAF:**	1.052
Submission Status:	Data loaded on EPA Host System	**EPA Calculated BAF:**	1.052
Submission Date:	06/22/2018 4:26:00 PM	**RATA Frequency:**	4QTRS

Air Emissions Testing Data

QI Name:	Stockwell, Michael D	**AETB Name:**	Air Hygiene International Inc.
Exam Date:	01/06/2017	**AETB Phone Number:**	888-461-8778
Provider Name:	Source Evaluation Society	**AETB Email:**	info@airhygiene.com
Provider Email:	qstiprogram@gmail.com		

Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	CO,NO,NOX,BALN	G12016	EB0026154	09/30/2019
Mid	CO,NO,NOX,BALN	G12017	EB0098858	09/18/2020
Low	CO,NO,NOX,BALN	G12018	EB0027723	01/25/2021
High	CO2,O2,BALN	G12017	EB0032327	01/07/2025
Mid	CO2,O2,BALN	G12018	EB0081248	03/12/2026
Low	ZERO			

Operating Level: High
Reference Method Used: 7E,3A: NOX RM 7E and CO2/O2 RM 3A

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	0.02133	0.02133	**Relative Accuracy**	7.01	7.01
Mean of Reference Method Values	0.02244	0.02244	**Bias Adjustment Factor**	1.052	1.052
Mean of Difference	0.00111	0.00111	**APS Indicator**		
Standard Deviation of Difference	0.00060	0.00060	**T-Value**	2.306	2.306
Confidence Coefficient	0.00046	0.00046	**Gross Unit Load or Velocity**	188	188

Facility Name: **Valley Energy Center**

Facility ID (ORISPL): **56940**

QA/Cert Test Detail Report

June 22, 2018 04:40 PM

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	05/11/2018 12:06	05/11/2018 12:27	RUNUSED	0.02100	0.02300	184
2	05/11/2018 12:41	05/11/2018 13:02	RUNUSED	0.02200	0.02200	185
3	05/11/2018 13:15	05/11/2018 13:36	RUNUSED	0.02200	0.02300	185
4	05/11/2018 13:48	05/11/2018 14:09	NOTUSED	0.02200	0.02300	185
5	05/11/2018 14:23	05/11/2018 14:44	RUNUSED	0.02100	0.02200	185
6	05/11/2018 15:00	05/11/2018 15:21	RUNUSED	0.02200	0.02300	185
7	05/12/2018 08:08	05/12/2018 08:29	RUNUSED	0.02100	0.02200	192
8	05/12/2018 08:59	05/12/2018 09:20	RUNUSED	0.02100	0.02300	193
9	05/12/2018 09:32	05/12/2018 09:53	RUNUSED	0.02100	0.02200	192
10	05/12/2018 10:53	05/12/2018 11:14	RUNUSED	0.02100	0.02200	192

Additional Information:

No comment.

*Performance Spec: RA <= 10% or Mean Difference <= +/- 2.0fps:
Reduced Frequency Spec: RA <= 7.5% or Mean Difference +/- 1.5 fps (Appendix A &3.3.4)

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com*®.

OFFICIAL USE

Certified Mail Fee $

Extra Services & Fees (*check box, add fee as appropriate*)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $

Total Postage $

Postmark Here

Sent To: USEPA Region II
Air Compliance Branch
Street and Apt: 290 Broadway
City, State, ZIP: New York, NY 10007-1866

PS Form 3800

7017 0190 0000 0941 4472

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL®

7017 0190 0000 0941 4472

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com*®.

OFFICIAL USE

Certified Mail Fee $

Extra Services & Fees (*check box, add fee as appropriate*)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $

Total Postage $

Postmark Here

Sent To: Division of Air Resources
NYSDEC – Bureau of Quality Assurance
Street and Apt: 625 Broadway
City, State, ZIP: Albany, NY 12233-3258

PS Form 3800

7017 0190 0000 0941 4465

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL®

7017 0190 0000 0941 4465

CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com*®.

OFFICIAL USE

Certified Mail Fee $

Extra Services & Fees (*check box, add fee as appropriate*)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $

Total Postage $

Postmark Here

Sent To: Regional Air Pollution Control Engineer
NYSDEC – Region 3
Street and Apt: 21 South Putt Corners Road
City, State, ZIP: New Paltz, NY 12561

PS Form 3800

7017 0190 0000 0941 4441

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL®

7017 0190 0000 0941 4441

CERTIFIED MAIL RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com*®.

OFFICIAL USE

Certified Mail Fee $

Extra Services & Fees (*check box, add fee as appropriate*)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage $

Total Postage $

Postmark Here

Sent To: USEPA -Clean Air Markets Division
Street and Apt: 1200 Pennsylvania Avenue, NW
Mail Code 6204J
City, State, ZIP: Washington, DC 20005

PS Form 3800

7017 0190 0000 0941 4489

7017 0190 0000 0941 4489

CERTIFIED MAIL®

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: *COMPLETE THIS SECTION*

- **Complete items 1, 2, and 3.**
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

USEPA -Clean Air Markets Division
1200 Pennsylvania Avenue, NW
Mail Code 6204J
Washington, DC 20005

9590 9402 2759 6351 7202 47

2. Article Number (*Transfer from service label*)

7017 0190 0000 0941 4489

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: *COMPLETE THIS SECTION*

- **Complete items 1, 2, and 3.**
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

USEPA Region II
Air Compliance Branch
290 Broadway
New York, NY 10007-1866

9590 9402 2759 6351 7202 30

2. Article Number (*Transfer from service label*)

7017 0190 0000 0941 4472

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: *COMPLETE THIS SECTION*

- **Complete items 1, 2, and 3.**
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Division of Air Resources
NYSDEC – Bureau of Quality
Assurance
625 Broadway
Albany, NY 12233-3258

9590 9402 2759 6351 7202 23

2. Article Number (*Transfer from service label*)

7017 0190 0000 0941 4465

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Regional Air Pollution Control
Engineer
NYSDEC – Region 3
21 South Putt Corners Road
New Paltz, NY 12561

9590 9402 2759 6351 7202 16

2. Article Number *(Transfer from service label)*

7017 0190 0000 0941 4441

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

CPV Valley Energy Center
3330 Route 6
Middletown, NY 10940

November 13th, 2018

Regional Air Pollution Control Engineer
NYSDEC – Region 3
21 South Putt Corners Road
New Paltz, NY 12561
FedEx Mail Tracking # 7737 0990 1539, #7737 0990 1594, #7737 0990 1469

Division of Air Resources
NYSDEC – Bureau of Quality Assurance
625 Broadway
Albany, NY 12233-3258
FedEx Mail Tracking # 7737 1012 0238

USEPA Region II
Air Compliance Branch
290 Broadway
New York, NY 10007-1866
FedEx Mail Tracking # 7737 1007 4062

Re: CPV Valley Energy Center
NYSDEC State Facility Air Permit ID: 3-3356-00136/00001
Emissions Compliance Test Report

Dear Sir / Madam:

CPV Valley Energy Center is submitting the 2018 Emissions Compliance Test Report for Natural Gas operation in accordance with the State Facility Air Permit requirements. The Emissions Compliance Testing was performed at The Facility on Units No.1 and No.2 September 25-27, 2018 and October 10-11, 2018.

During the September testing, it was believed there was contamination in the first run of testing (unrelated to the unit operation) and as a result the Unit No.2 (Basel Load, 100% without duct burner) requirement for Particulate Matter (PM) test result was erroneously high. Unit No.2 retested and passed Base Load (100% without duct burner) for PM October 10-11, 2018.

Enclosed is the Emission Compliance Test report for Units No.1 and No.2 performed during September and October 2018.

Attachment A: Emissions Compliance Test Report Unit Nos. 1 & 2

If there are any questions regarding this submittal, please contact Donald Atwood at (781) 848-2202.

Sincerely,

Donald Atwood
Competitive Power Ventures, Inc.
Asset Manager Representative

CC: Ben Stanley

Attachment A

Emissions Compliance Test Report

Unit Nos. 1 & 2

EMISSION COMPLIANCE TEST
FOR THE
SIEMENS, SCC6-5000F,
UNIT #CTG-1 AND CTG-2
PREPARED FOR
CPV VALLEY, LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
SEPTEMBER 25-27 AND OCTOBER 10-11, 2018

EMISSION COMPLIANCE TEST
FOR THE
SIEMENS, SCC6-5000F,
UNIT #CTG-1 AND CTG-2
PREPARED FOR
CPV VALLEY, LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
SEPTEMBER 25-27 AND OCTOBER 10-11, 2018

Prepared and Reviewed by:

Logan K. Tsotsoros

Logan Tsotsoros
AHU Support Staff

Thomas K. Graham

Thomas K. Graham, PE, QSTI
Director of Education

I, Patrick K. McGovern, Jr.

Patrick K. McGovern, Jr., QSTI
Sr. Regional Manager-Shreveport, LA
certify that this testing was conducted and this report was created in conformance with the requirements of ASTM D7036

(this page intentionally left blank)

Table of Contents

APPENDICES

Emissions Compliance Test
Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2
CPV Valley, LLC
CPV Valley Energy Center
Middletown, New York
September 25-27 and October 10-11, 2018

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the Emissions Compliance Test for nitrogen oxides (NOx), carbon monoxide (CO), total hydrocarbons/volatile organic compounds (THC/VOC), sulfur dioxide (SO_2) [from fuel analysis], opacity / visual emissions (VE), ammonia (NH_3), particulate matter (PM), sulfuric acid mist (H_2SO_4), flow, moisture (H_2O), carbon dioxide (CO_2), and oxygen (O_2) from the exhaust of the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2 for CPV Valley, LLC at the CPV Valley Energy Center in Middletown, New York. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on September 25-27 and October 10-11, 2018.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct an initial compliance emission test to document levels of selected pollutants at two test loads (base load without duct burners firing and base load with duct burners firing). The information will be used to confirm compliance with the operating permit issued by the New York State Department of Environmental Conservation (NYDEC). The specific objective was to determine the emission concentration of NOx, CO, THC/VOC, SO_2 [from fuel], VE, NH_3, PM, H_2SO_4, flow, H_2O, CO_2, and O_2 from the exhaust of CPV Valley, LLC's Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

1.2.1 Participating Organizations
- New York State Department of Environmental Conservation (NYDEC)
- CPV Valley, LLC
- Siemens Energy, Inc.
- Air Hygiene

1.2.2 Industry
- Electric Utility / Electric Services

1.2.3 Air Permit Requirements
- Air Permit Number: 3-3356-00136/00001

1.2.4 Plant Location
- CPV Valley Energy Center in Middletown, New York
  - GPS Coordinates [Latitude 41.14750, Longitude -80.85333]
  - Physical Address: 3330 U.S. Route 6, Middletown, New York 10940
  - Federal Registry System / Facility Registry Service (FRS) No. – 110043332471
  - Source Classification Code (SCC)
    - 20100201 (CTGs)
    - 10100601 (DBs)

1.2.5 Equipment Tested
- Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2

1.2.6 Emission Points
- Exhaust from the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2
- For all gases (NOx, CO, VOCs, CO_2, and O_2), one sample point in the exhaust duct from the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2, determined after conducting a stratification test (refer to Appendix F)
- For all PM testing, 12 sampling points in the exhaust duct from the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2
- For all H_2SO_4 testing, one sampling point in the exhaust duct from the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2
- For all NH_3 testing, three sampling points in the exhaust duct from the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2

1.2.7 Emission Parameters Measured
- NOx
- CO
- THC/VOC
- VE (Opacity)
- SO_2 [from fuel]
- NH_3
- PM
- H_2SO_4
- Flow
- H_2O
- CO_2
- O_2

1.2.8 Dates of Emission Test
- September 25-27 and October 10-11, 2018

1.2.9 Federal Certifications
- Stack Testing Accreditation Council AETB Certificate No. 3796.02
- International Standard ISO/IEC 17025:2005 Certificate No. 3796.01

1.3 KEY PERSONNEL

CPV Valley, LLC:	Ben Stanley (b.stanley@dgc-ops.com)	845-649-8300
Siemens Energy, Inc.:	Jordan Haywood (Jordan.haywood@siemens.com)	407-736-3045
Air Hygiene:	Pat McGovern (pmcgovern@airhygiene.com)	918-307-8865
Air Hygiene:	Michael Stockwell	918-307-8865
Air Hygiene:	Swanson Bierman	918-307-8865
Air Hygiene:	Andrew McMahan	918-307-8865
Air Hygiene:	Mike Plummer	918-307-8865
Air Hygiene:	James Reynolds	918-307-8865
Air Hygiene:	Alex Martinez	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on CPV Valley, LLC's Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2 located at the CPV Valley Energy Center on September 25-27 and October 10-11, 2018 are summarized in the following tables and relate only to the items tested.

TABLE 2.1
SUMMARY OF SIEMENS, SCC6-5000F, UNIT #CTG-1 RESULTS

Parameter	Base Load [9/24-25]	100% W/Db Load [9/24-25]	Permit Limits
Turbine Fuel Flow (SCFH)	2,092,202	2,121,629	--
Duct Burner Fuel Flow (lb/min)	0	268	--
Total Fuel Flow (SCFH)	2,092,202	2,500,805	--
Stack Flow (RM19) (SCFH)	51,771,034	52,506,949	--
Stack Moisture (% Method 4)	8.4	11.4	--
Power Output (megawatts)	206.5	210.2	--
NOx (ppmvd)	1.84	2.71	--
NOx (ppm@15%O_2)	1.48	1.85	2.0
CO (ppmvd)	0.00	0.00	--
CO (ppm@15%O_2)	0.00	0.00	2.0
VOC as CH_4 (ppmvd)	0.40	0.07	--
VOC as CH_4 (ppm@15%O_2)	0.33	0.05	0.7[1]/1.8[2]
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	--
SO_2 from Fuel Sulfur (lb/MMBtu)	0.0001	0.0001	0.0022
Total PM (mg)	3.69	3.23	--
Total PM (g/dscf)	4.20E-05	3.69E-05	--
Total PM (gr/dscf)	6.48E-04	5.69E-04	--
Total PM (lb/hr)	4.42	3.96	--
Total PM (lb/MMBtu)	0.0023	0.0017	0.0073
H_2SO_4 (mg)	0.01	0.01	--
H_2SO_4 (g/dscf)	2.42E-07	2.75E-07	--
H_2SO_4 (gr/dscf)	3.74E-06	4.25E-06	--
H_2SO_4 (lb/MMBtu)	0.000013	0.000013	0.0007
NH_3 (ppmvd)	5.03	4.56	--
NH_3 (ppm@15%O_2)	4.03	3.08	5.0
Opacity (%)	0	0	20
CO_2 (%)	4.16	4.81	--
O_2 (%)	13.57	12.26	--

Notes: [1] - Base (no DB); [2] - 100% with DB

TABLE 2.2
SUMMARY OF SIEMENS, SCC6-5000F, UNIT #CTG-2 RESULTS

Parameter	100% W/Db Load [9/24-25]	Base Load [9/24-25& 10/10-11]	Permit Limits
Turbine Fuel Flow (SCFH)	2,119,806	2,080,101	--
Duct Burner Fuel Flow (lb/min)	271	0	--
Total Fuel Flow (SCFH)	2,502,750	2,080,101	--
Stack Flow (RM19) (SCFH)	50,738,337	50,635,710	--
Stack Moisture (% Method 4)	10.8	9.0	--
Power Output (megawatts)	209.6	205.1	--
NOx (ppmvd)	2.48	2.01	--
NOx (ppm@15%O_2)	1.64	1.59	2.0
CO (ppmvd)	0.31	0.27	--
CO (ppm@15%O_2)	0.21	0.21	2.0
THC (ppmvd)	2.04	2.21	--
THC (ppm@15%O_2)	1.35	1.75	--
CH_4 (ppmvd)	--	2.00	--
C_2H_6 (ppmvd)	--	0.10	--
VOC as CH_4 (ppmvd)	2.04	0.32	--
VOC as CH_4 (ppm@15%O_2)	1.35	0.26	0.7[1]/1.8[2]
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	--
SO_2 from Fuel Sulfur (lb/MMBtu)	0.0001	0.0001	0.0022
Total PM (mg)	15.43	2.47	--
Total PM (g/dscf)	1.62E-04	2.85E-05	--
Total PM (gr/dscf)	2.50E-03	4.39E-04	--
Total PM (lb/hr)	17.46	2.88	--
Total PM (lb/MMBtu)	0.0072	0.0015	0.0073
H_2SO_4 (mg)	0.01	0.01	--
H_2SO_4 (g/dscf)	2.48E-07	2.92E-07	--
H_2SO_4 (gr/dscf)	3.82E-06	4.50E-06	--
H_2SO_4 (lb/MMBtu)	0.000011	0.000016	0.0007
NH_3 (ppmvd)	4.39	5.23	--
NH_3 (ppm@15%O_2)	2.91	4.17	5.0
Opacity (%)	0	0	20
CO_2 (%)	4.92	4.13	--
O_2 (%)	11.95	13.45	--

Notes: [1] - Base (no DB); [2] - 100% with DB

The results of all measured pollutant emissions were below the required limits. All testing was performed without any real or apparent errors. All testing was conducted according to the approved testing protocol. During the September 25-27 testing, CTG-2 failed Base load (100% without duct burner) for PM. Results from this test are located in Appendix G. The CTG-2 PM (100% without duct burner) was re-tested October 10-11.

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

The CPV Valley Energy Center is located at 3330 U.S. Route 6 in Middletown, New York. CPV Valley Energy Center is an electric generation facility. The facility consists of two Siemens SCC6-5000F Combined Cycle Combustion Turbines (CTGs), designated as CTG-1 and CTG-2. Each CTG is rated for the turbine at 2,234 million British thermal units per hour (MMBtu/hr) based on higher heating value (HHV) on natural gas; and 2,145 MMBtu/hr (HHV) on ultra-low sulfur diesel (ULSD) fuel oil; and is rated at 500 MMBtu/hr on natural gas for the duct burner (DB). The CTGs are equipped with dry low NOx combustors, selective catalytic reduction (SCR), and catalytic oxidizers.

3.2 SAMPLING LOCATION

The stacks are vertical, circular, and measure 19 feet (ft) (228 inches) in diameter at the test ports which are approximately 175 ft above grade level with an exit elevation of approximately 275 ft above grade level. The test ports are located approximately 91.25 ft (1,095 inches) downstream and approximately 100 ft (1,200 inches) upstream from the nearest disturbances. All exhaust samples for gaseous emissions were continuously drawn from the exhaust system at the sample ports from a single point determined after conducting a stratification test (Appendix F). During the stratification test three points were traversed from each of the four ports. The probe was allowed to remain at a point for two times the system response time. For PM testing, an initial velocity traverse was performed across the stack from 12 total points. All PM sampling occurred from the same 12 points by leaving the probe at each for an equal amount of time in order to draw an isokinetic and representative sample. H_2SO_4 sampling occurred from a single test point.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Siemens, SCC6-5000F, Unit #CTG-1 and CTG-2 at the CPV Valley Energy Center was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on September 25-27 and October 10-11, 2018.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	S-Type Pitot Tube
Oxygen	EPA Method 3A	Paramagnetic Cell
Carbon Dioxide	EPA Method 3A	Nondispersive Infrared Analyzer

Pollutant or Parameter	Sampling Method	Analysis Method
Stack Moisture Content	EPA Method 4	Gravimetric Analysis
Nitrogen Oxides	EPA Method 7E	Chemiluminescent Analyzer
Opacity	EPA Method 9	Visual Observation
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Volatile Organic Compounds	EPA Method 18/25A	Gas Chromatograph and Flame Ionization Detector
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor
Particulate Matter	EPA Method 201A	Front Half Filterables
Particulate Matter	EPA Method 202	Back Half Condensables
Sulfuric Acid Mist	CTM-013 (Method 8A)	Wet Chemistry Solubility
Ammonia Slip	CTM-027	Ion Specific Electrode
Sulfur Content Analysis	ASTM 5504	Fuel Gas Sample and Laboratory Analysis
Sulfur Dioxide	40 CFR 75, Appendix D	Calculation

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 3A, 4, 7E, 9, 10, 18, 19, 25A; 40 CFR 51, Appendix M, Method 201A and 202; Conditional Test Method (CTM)-013 (Method 8A) and Conditional Test Method (CTM)-027.

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the real-time analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the wet based analyzers prior to gas conditioning.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. NOx calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds.

Figure 4.2 represents the sample system used for the PM tests. The sample system included a heated stainless steel probe sheath with a glass liner and stainless nozzle. The nozzle and probe assembly were inserted into the sample ports of the stack to extract gas measurements from the emission stream through a filter and glass impinger train in an isokinetic fashion. Differential pressure was monitored with S-type Pitot tubes and oil filled manometers. Total sample volumes were measured with dry gas meters. The resulting Method 2 velocity heads were combined with Method 3A (molecular weight) and Method 4 (moisture content) data to determine the stack gas volumetric flow rates. These results were combined with pollutant concentrations (i.e. mg/scf, parts per million, etc.) to determine emission rates (i.e. pounds per hour). Per the requirements of Method 202, the back half of the test train included a condenser and dry impinger train configuration. Sample collection included a nitrogen purge and hexane rinse. Glassware that was used to collect and analyze Method 202 condensable particulate samples was cleaned prior to the test with soap and water, and rinsed using tap water, deionized water, acetone, and finally, hexane. After cleaning, Air Hygiene incorporated a glassware bake at 300^{o}C for six hours rather than the alternative of collecting a field train proof blank. During testing the temperature of the CPM filter assembly was maintain as close as possible to 85° F in accordance with EPA Method 202.

Figure 4.3 represents the sample system used for the H_2SO_4 tests. The sample system included a heated stainless steel probe sheath with a glass liner. The probe assembly was inserted into a sample port of the stack to extract gas measurements from the emission stream through a filter and glass impinger train at a constant flow rate of approximately 10 liters per minute (LPM). Total sample volumes were measured with dry gas meters. The corresponding PM test run Method 2 velocity heads were combined with Method 3A (molecular weight) and Method 4 (moisture content) data to determine the stack gas volumetric flow rate. These results were combined with pollutant concentrations (i.e. parts per million, mg/scf, etc.) to determine emission rates (i.e. pounds per hour).

Figure 4.4 represents the sample system used for the NH_3 tests. A heated stainless steel probe with a glass liner and glass nozzle was inserted into the sample ports of the stack to extract gas measurements from the emission stream through a glass impinger train. Differential pressures were monitored with oil filled manometers and total sample volumes were measured with dry gas meters.

The stack gas analysis for O_2 and CO_2 concentrations was performed in accordance with procedures set forth in EPA Method 3A. The O_2 analyzer uses a paramagnetic cell detector and the CO_2 analyzer uses a continuous nondispersive infrared analyzer.

EPA Method 7E was used to determine concentrations of NOx. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO_2 in nitrogen certified gas cylinder was used to verify at least a 90 percent NO_2 conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

THC emission concentrations were quantified in accordance with procedures set forth in EPA Method 25A. A continuous flame ionization (FID) analyzer was used for this purpose. VOC emission concentrations were quantified in conjunction with procedures outlined in EPA Method 18 for Tedlar bag sampling and analysis of methane and ethane content. However, when THC results were below VOC limits, no methane or ethane analysis occurred and no subtractions from the THC concentrations to determine VOC concentrations are included in the report.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NOx	THERMO 42 series	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO_2 to NO. Chemiluminescence of reaction of NO with O_3. Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48 series	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
CO_2	SERVOMEX 1440	0-20%	0.1%	Nondispersive infrared
VOC	THERMO 51 series	User may select up to 10,000 ppm	0.1 ppm	GC Column and Flame Ionization Detector
O_2	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.

E:\SHARED\DRAWINGS\EMISSIONS TESTING LAB.PPT 04/18/08 DRAWING:08-001 TKG

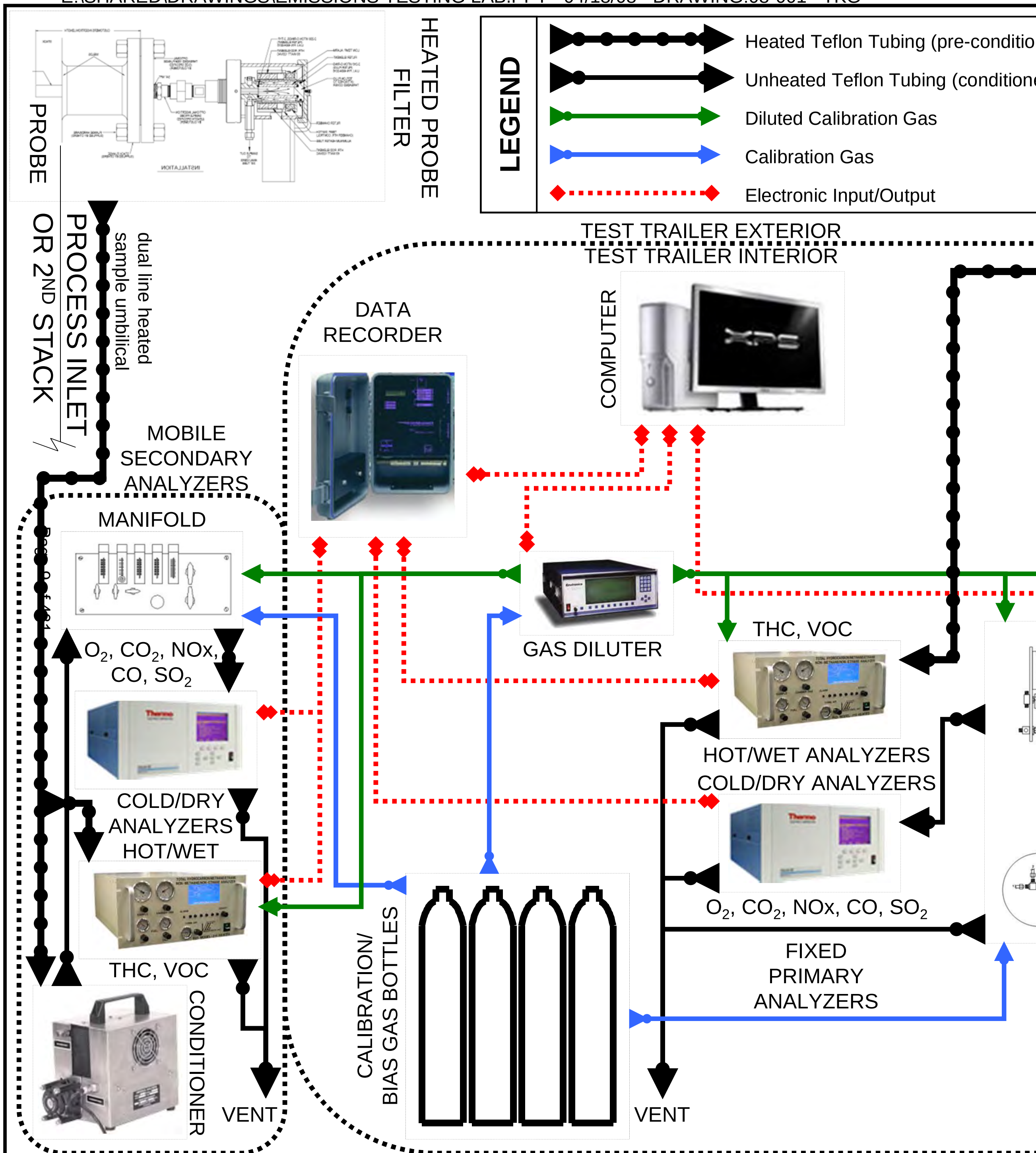


Figure 4.1
EMISSIONS TESTING LAB

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

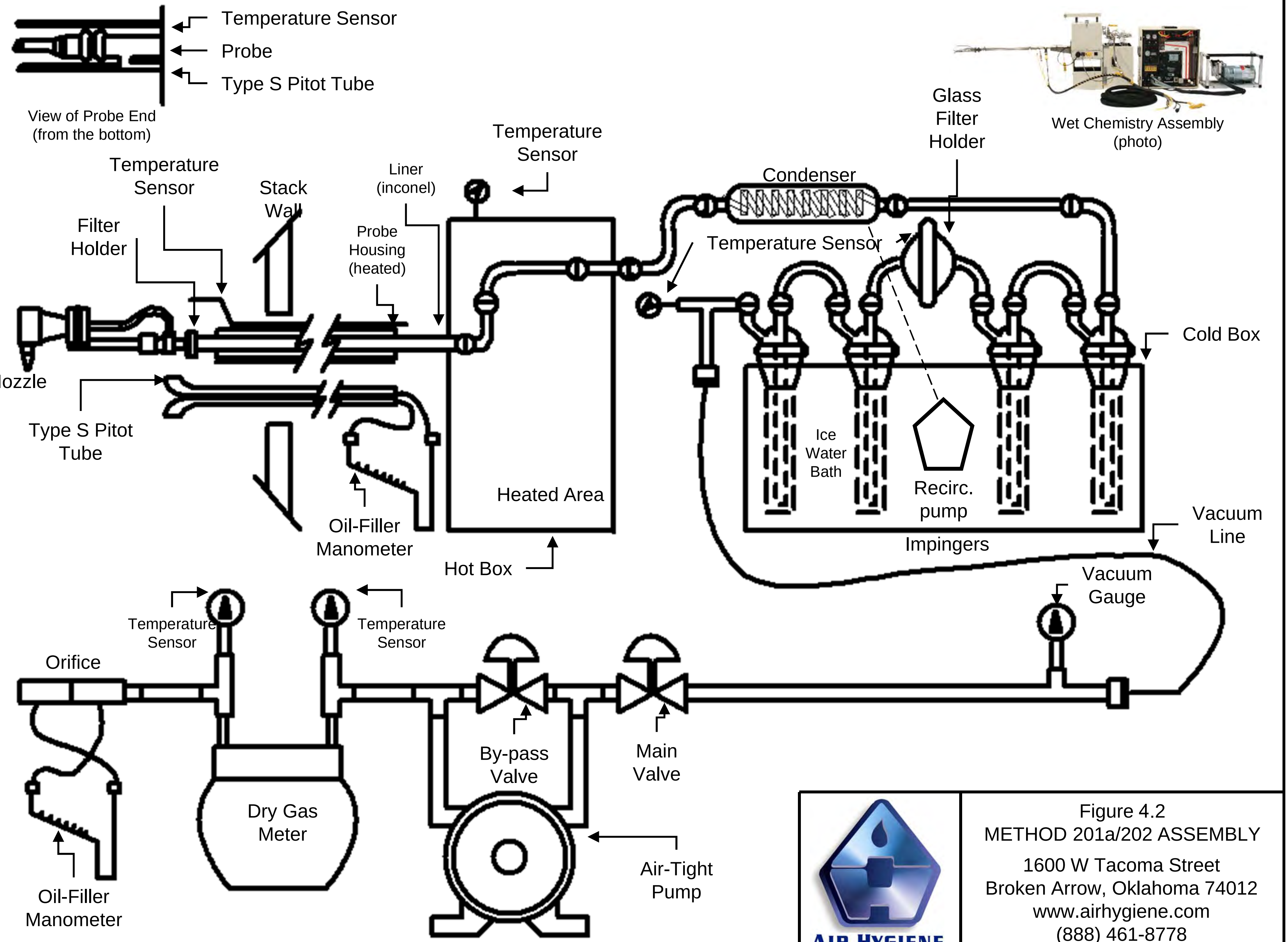
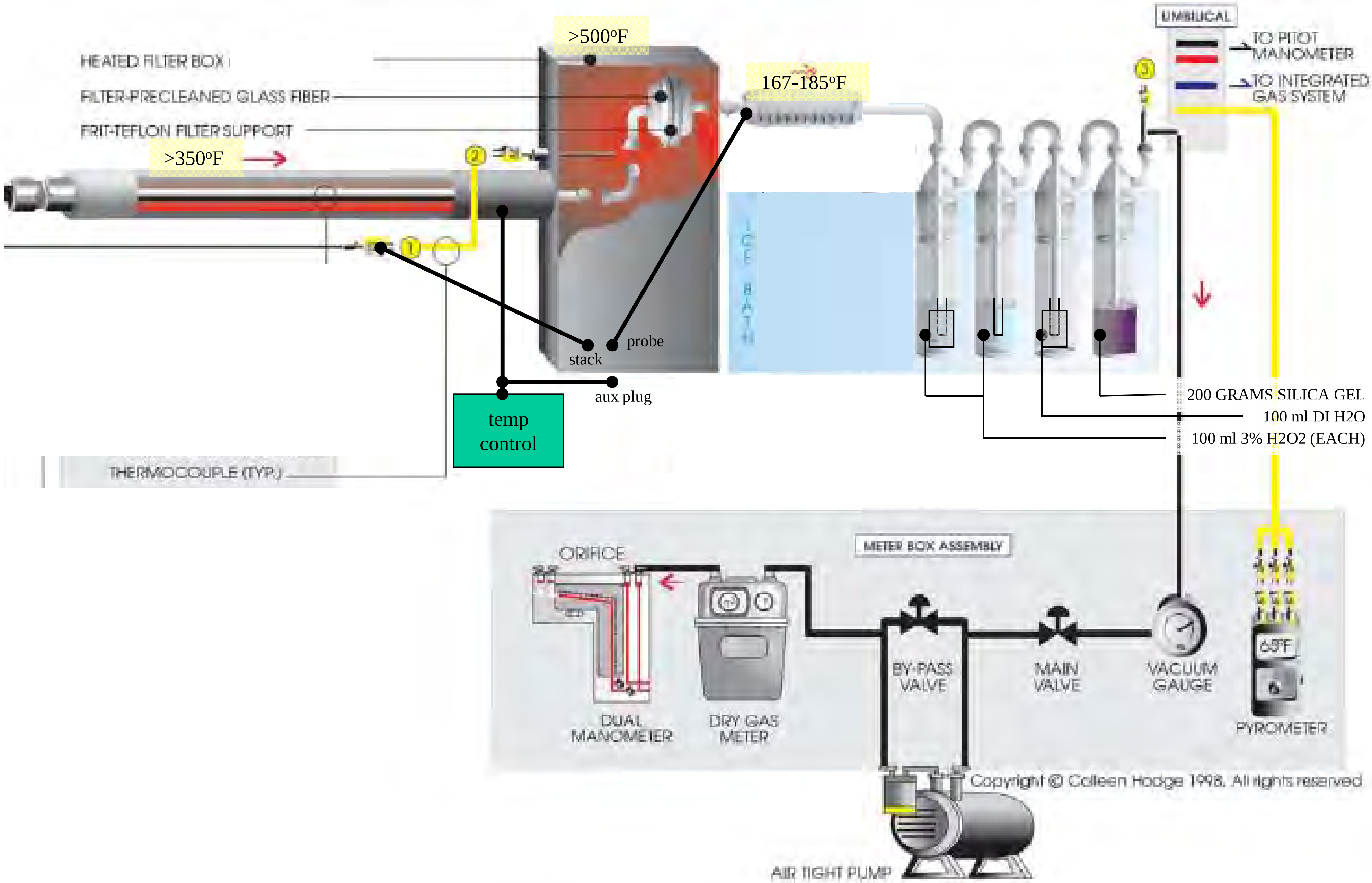


Figure 4.2
METHOD 201a/202 ASSEMBLY

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778



TEST NOTES:
10 LPM SAMPLE FLOW
Delta H @ 0.35 IS ABOUT 10 LPM ON STANDARD CONSOLE
15 MIN AMBIENT AIR PURGE

Figure 4.3
CTM-013 TESTING ASSEMBLY

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

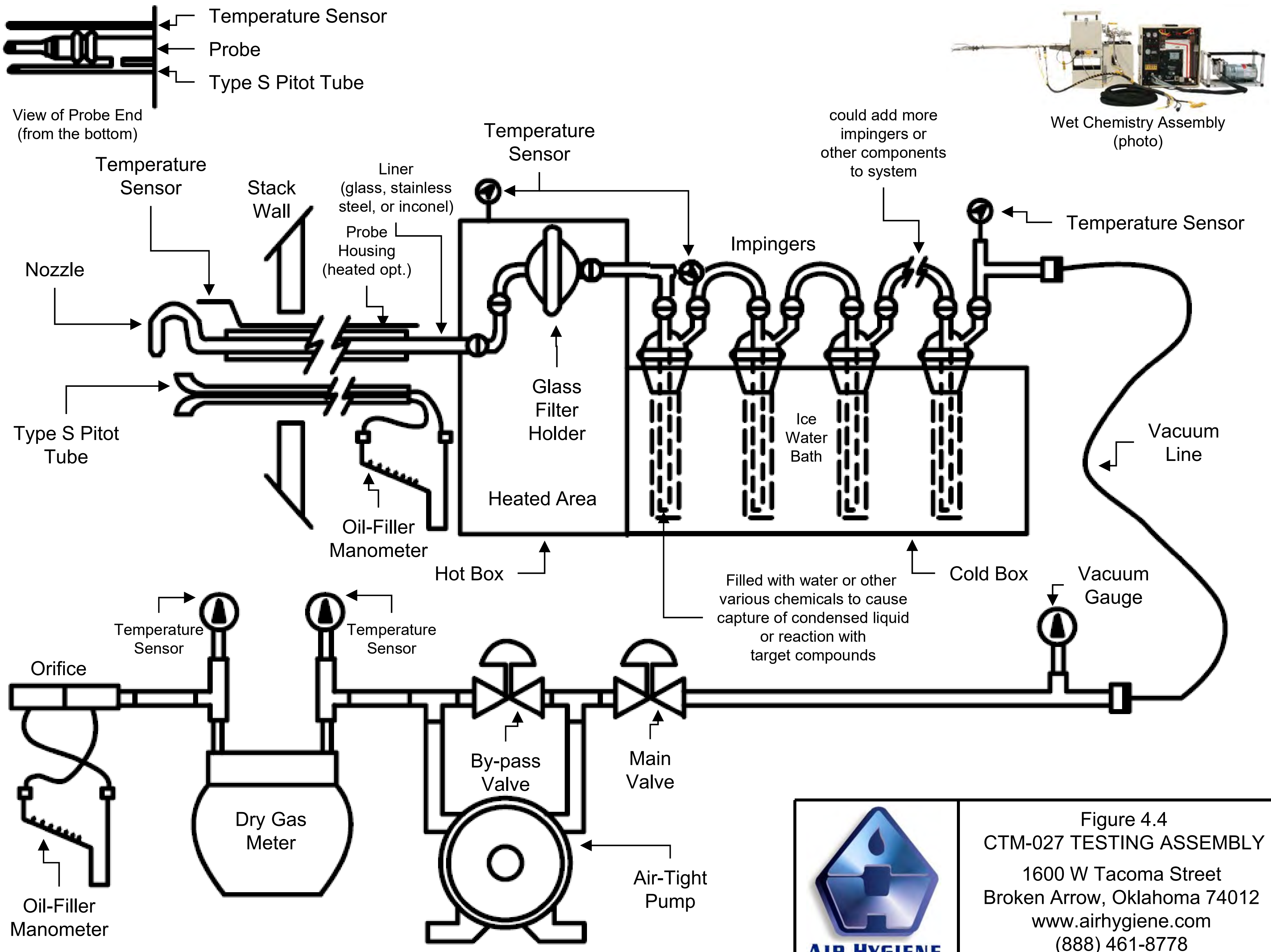


Figure 4.4
CTM-027 TESTING ASSEMBLY

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

APPENDIX A

TEST RESULTS AND CALCULATIONS

TABLE A.1:
EMISSIONS TESTING SCHEDULE

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
CTG-1	Base	Stratification Test	1	09/24/18	16:03:46	16:55:46	DAHS
CTG-1	Base	NOx, CO, VOC, CO2, O2	1	09/25/18	15:52:48	16:52:18	DAHS
CTG-1	Base	NOx, CO, VOC, CO2, O2	2	09/25/18	17:13:46	18:13:16	DAHS
CTG-1	Base	NOx, CO, VOC, CO2, O2	3	09/25/18	18:51:46	19:51:16	DAHS
CTG-1	100% W/Db	NOx, CO, VOC, CO2, O2	1	09/25/18	9:20:46	10:20:16	DAHS
CTG-1	100% W/Db	NOx, CO, VOC, CO2, O2	2	09/25/18	10:44:46	11:44:16	DAHS
CTG-1	100% W/Db	NOx, CO, VOC, CO2, O2	3	09/25/18	12:10:46	13:10:16	DAHS
CTG-1	Base	PM	1-Base-PM-1	09/24/18	9:52:00	14:08:00	DAHS
CTG-1	Base	PM	1-Base-PM-2	09/24/18	15:02:00	19:13:00	DAHS
CTG-1	Base	PM	1-Base-PM-3	09/25/18	15:36:00	20:02:00	DAHS
CTG-1	100% W/Db	PM	1-100 w/DB-PM-1	09/24/18	23:32:00	3:48:00	DAHS
CTG-1	100% W/Db	PM	1-100 w/DB-PM-2	09/25/18	4:11:00	8:27:00	DAHS
CTG-1	100% W/Db	PM	1-100 w/DB-PM-3	09/25/18	9:20:00	13:40:00	DAHS
CTG-1	Base	H2SO4	1-Base-SO3-1	09/24/18	12:32:00	14:34:00	DAHS
CTG-1	Base	H2SO4	1-Base-SO3-2	09/25/18	20:28:00	22:28:00	DAHS
CTG-1	Base	H2SO4	1-Base-SO3-3	09/25/18	23:01:00	1:01:00	DAHS
CTG-1	100% W/Db	H2SO4	1-100 w/DB-SO3-1	09/25/18	0:32:00	2:32:00	DAHS
CTG-1	100% W/Db	H2SO4	1-100 w/DB-SO3-2	09/25/18	3:14:00	5:14:00	DAHS
CTG-1	100% W/Db	H2SO4	1-100 w/DB-SO3-3	09/25/18	6:31:00	8:31:00	DAHS
CTG-1	Base	NH3	1-Base-NH3-1	09/25/18	15:54:00	16:58:00	DAHS
CTG-1	Base	NH3	1-Base-NH3-2	09/25/18	17:13:00	18:13:00	DAHS
CTG-1	Base	NH3	1-Base-NH3-3	09/25/18	18:44:00	19:44:00	DAHS
CTG-1	100% W/Db	NH3	1-100 w/DB-NH3-1	09/25/18	9:21:00	10:24:00	DAHS
CTG-1	100% W/Db	NH3	1-100 w/DB-NH3-2	09/25/18	10:45:00	11:48:00	DAHS
CTG-1	100% W/Db	NH3	1-100 w/DB-NH3-3	09/25/18	12:10:00	13:14:00	DAHS

TABLE A.2:
EMISSIONS TESTING SCHEDULE

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
CTG-2	100% W/Db	Stratification Test	1	09/24/18	16:45:24	17:38:24	DAHS
CTG-2	100% W/Db	NOx, CO, VOC, CO2, O2	1	09/25/18	9:25:24	10:24:54	DAHS
CTG-2	100% W/Db	NOx, CO, VOC, CO2, O2	2	09/25/18	11:24:24	12:23:54	DAHS
CTG-2	100% W/Db	NOx, CO, VOC, CO2, O2	3	09/25/18	12:51:24	13:50:54	DAHS
CTG-2	Base	NOx, CO, VOC, CO2, O2	1	09/25/18	15:40:24	16:39:54	DAHS
CTG-2	Base	NOx, CO, VOC, CO2, O2	2	09/25/18	17:15:24	18:14:54	DAHS
CTG-2	Base	NOx, CO, VOC, CO2, O2	3	09/25/18	18:44:24	19:43:54	DAHS
CTG-2	100% W/Db	PM	2-100 w/DB-PM-1	09/24/18	23:36:00	3:53:00	DAHS
CTG-2	100% W/Db	PM	2-100 w/DB-PM-2	09/25/18	5:03:00	9:10:00	DAHS
CTG-2	100% W/Db	PM	2-100 w/DB-PM-3	09/25/18	10:20:00	14:39:00	DAHS
CTG-2	Base	PM	2-Base-PM-1	10/10/18	19:14:00	23:24:00	DAHS
CTG-2	Base	PM	2-Base-PM-2	10/10/18	23:30:00	3:57:00	DAHS
CTG-2	Base	PM	2-Base-PM-3	10/11/18	4:17:00	8:32:00	DAHS
CTG-2	100% W/Db	H2SO4	2-100 w/DB-SO3-1	09/25/18	12:31:00	14:31:00	DAHS
CTG-2	100% W/Db	H2SO4	2-100 w/DB-SO3-2	09/25/18	3:47:00	5:47:00	DAHS
CTG-2	100% W/Db	H2SO4	2-100 w/DB-SO3-3	09/25/18	6:29:00	8:29:00	DAHS
CTG-2	Base	H2SO4	2-Base-SO3-1	09/24/18	12:22:00	14:22:00	DAHS
CTG-2	Base	H2SO4	2-Base-SO3-2	09/25/18	20:29:00	22:29:00	DAHS
CTG-2	Base	H2SO4	2-Base-SO3-3	09/25/18	23:10:00	1:10:00	DAHS
CTG-2	100% W/Db	NH3	2-100 w/DB-NH3-1	09/25/18	9:25:00	10:26:00	DAHS
CTG-2	100% W/Db	NH3	2-100 w/DB-NH3-2	09/25/18	11:24:00	12:24:00	DAHS
CTG-2	100% W/Db	NH3	2-100 w/DB-NH3-3	09/25/18	12:57:00	13:57:00	DAHS
CTG-2	Base	NH3	2-Base-NH3-1	09/25/18	15:40:00	16:40:00	DAHS
CTG-2	Base	NH3	2-Base-NH3-2	09/25/18	17:15:00	18:15:00	DAHS
CTG-2	Base	NH3	2-Base-NH3-3	09/25/18	18:44:00	19:44:00	DAHS

TABLE A.3
SIEMENS, SCC6-5000F, UNIT #CTG-1 BASE LOAD[9/24-25] DATA SUMMARY

Parameter	Base Load, Run - 1	Base Load, Run - 2	Base Load, Run - 3	Average
Turbine Fuel Flow (SCFH)	2,095,143	2,091,745	2,089,719	2,092,202
Duct Burner Fuel Flow (lb/min)	0	0	0	0
Total Fuel Flow (SCFH)	2,095,143	2,091,745	2,089,719	2,092,202
Stack Flow (RM19) (SCFH)	51,977,206	51,486,411	51,849,484	51,771,034
Stack Moisture (% Method 4)	6.4	9.0	9.6	8.4
Power Output (megawatts)	206.9	206.4	206.1	206.5
NOx (ppmvd)	2.11	1.75	1.65	1.84
NOx (ppm@15%O_2)	1.70	1.40	1.33	1.48
CO (ppmvd)	0.00	0.00	0.00	0.00
CO (ppm@15%O_2)	0.00	0.00	0.00	0.00
VOC as CH_4 (ppmvd)	0.54	0.19	0.49	0.40
VOC as CH_4 (ppm@15%O_2)	0.44	0.15	0.39	0.33
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	0.039	0.039
SO_2 from Fuel Sulfur (lb/MMBtu)	0.00011	0.00011	0.00011	0.00011
Total PM (mg)	6.08	2.09	2.89	3.69
Total PM (g/dscf)	6.84E-05	2.40E-05	3.35E-05	4.20E-05
Total PM (gr/dscf)	1.06E-03	3.71E-04	5.17E-04	6.48E-04
Total PM (lb/hr)	7.26	2.52	3.50	4.42
Total PM (lb/MMBtu)	0.0037	0.0013	0.0018	0.0023
H_2SO_4 (mg)	0.01	0.01	0.01	0.01
H_2SO_4 (g/dscf)	2.92E-07	2.18E-07	2.18E-07	2.42E-07
H_2SO_4 (gr/dscf)	4.50E-06	3.36E-06	3.37E-06	3.74E-06
H_2SO_4 (lb/MMBtu)	0.000015	0.000011	0.000012	0.000013
NH_3 (ppmvd)	4.83	5.04	5.22	5.03
NH_3 (ppm@15%O_2)	3.91	4.02	4.16	4.03
Opacity (%)	0	0	0	0
CO_2 (%)	4.14	4.17	4.16	4.16
O_2 (%)	13.59	13.53	13.59	13.57

TABLE A.4
SIEMENS, SCC6-5000F, UNIT #CTG-1 100% W/DB LOAD[9/24-25] DATA SUMMARY

Parameter	100% W/Db Load, Run - 1	100% W/Db Load, Run - 2	100% W/Db Load, Run - 3	Average
Turbine Fuel Flow (SCFH)	2,128,585	2,122,302	2,114,001	2,121,629
Duct Burner Fuel Flow (lb/min)	268	268	268	268
Total Fuel Flow (SCFH)	2,507,761	2,501,478	2,493,177	2,500,805
Stack Flow (RM19) (SCFH)	51,790,579	53,428,357	52,301,913	52,506,949
Stack Moisture (% Method 4)	10.1	13.5	10.5	11.4
Power Output (megawatts)	211.1	210.3	209.3	210.2
NOx (ppmvd)	2.61	2.75	2.77	2.71
NOx (ppm@15%O_2)	1.75	1.91	1.89	1.85
CO (ppmvd)	0.00	0.00	0.00	0.00
CO (ppm@15%O_2)	0.00	0.00	0.00	0.00
VOC as CH_4 (ppmvd)	0.08	0.00	0.14	0.07
VOC as CH_4 (ppm@15%O_2)	0.05	0.00	0.10	0.05
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	0.039	0.039
SO_2 from Fuel Sulfur (lb/MMBtu)	0.00011	0.00011	0.00011	0.00011
Total PM (mg)	5.04	1.98	2.66	3.23
Total PM (g/dscf)	5.83E-05	2.30E-05	2.93E-05	3.69E-05
Total PM (gr/dscf)	9.00E-04	3.55E-04	4.52E-04	5.69E-04
Total PM (lb/hr)	6.23	2.46	3.20	3.96
Total PM (lb/MMBtu)	0.0027	0.0011	0.0013	0.0017
H_2SO_4 (mg)	0.01	0.01	0.01	0.01
H_2SO_4 (g/dscf)	3.20E-07	2.70E-07	2.35E-07	2.75E-07
H_2SO_4 (gr/dscf)	4.94E-06	4.16E-06	3.63E-06	4.25E-06
H_2SO_4 (lb/MMBtu)	0.000015	0.000012	0.000011	0.000013
NH_3 (ppmvd)	4.72	4.61	4.35	4.56
NH_3 (ppm@15%O_2)	3.13	3.16	2.95	3.08
Opacity (%)	0	0	0	0
CO_2 (%)	4.80	4.82	4.82	4.81
O_2 (%)	12.11	12.40	12.25	12.26

TABLE A.5
SIEMENS, SCC6-5000F, UNIT #CTG-2 100% W/DB LOAD[9/24-25] DATA SUMMARY

Parameter	100% W/Db Load, Run - 1	100% W/Db Load, Run - 2	100% W/Db Load, Run - 3	Average
Turbine Fuel Flow (SCFH)	2,129,501	2,119,978	2,109,939	2,119,806
Duct Burner Fuel Flow (lb/min)	271	271	271	271
Total Fuel Flow (SCFH)	2,512,210	2,502,922	2,493,119	2,502,750
Stack Flow (RM19) (SCFH)	50,847,815	50,755,979	50,611,217	50,738,337
Stack Moisture (% Method 4)	10.2	11.0	11.3	10.8
Power Output (megawatts)	210.7	209.5	208.6	209.6
NOx (ppmvd)	2.43	2.50	2.52	2.48
NOx (ppm@15%O_2)	1.60	1.65	1.67	1.64
CO (ppmvd)	0.42	0.27	0.25	0.31
CO (ppm@15%O_2)	0.28	0.18	0.16	0.21
THC (ppmvd)	1.81	2.54	1.77	2.04
THC (ppm@15%O_2)	1.19	1.67	1.17	1.35
CH_4 (ppmvd)	--	--	--	--
C_2H_6 (ppmvd)	--	--	--	--
VOC as CH_4 (ppmvd)	1.81	2.54	1.77	2.04
VOC as CH_4 (ppm@15%O_2)	1.19	1.67	1.17	1.35
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	0.039	0.04
SO_2 from Fuel Sulfur (lb/MMBtu)	0.00011	0.00011	0.00011	0.00011
Total PM (mg)	5.35	26.09	14.84	15.43
Total PM (g/dscf)	5.97E-05	2.83E-04	1.43E-04	1.62E-04
Total PM (gr/dscf)	9.21E-04	4.37E-03	2.21E-03	2.50E-03
Total PM (lb/hr)	5.99	31.06	15.34	17.46
Total PM (lb/MMBtu)	0.0027	0.0126	0.0064	0.0072
H_2SO_4 (mg)	0.01	0.01	0.01	0.01
H_2SO_4 (g/dscf)	1.93E-07	2.65E-07	2.85E-07	2.48E-07
H_2SO_4 (gr/dscf)	2.97E-06	4.09E-06	4.40E-06	3.82E-06
H_2SO_4 (lb/MMBtu)	0.000009	0.000012	0.000013	0.000011
NH_3 (ppmvd)	1.52	5.97	5.68	4.39
NH_3 (ppm@15%O_2)	1.01	3.96	3.77	2.91
Opacity (%)	0	0	0	0
CO_2 (%)	4.89	4.92	4.95	4.92
O_2 (%)	11.93	11.95	11.96	11.95

TABLE A.6
SIEMENS, SCC6-5000F, UNIT #CTG-2 BASE LOAD[9/24-25&10/10-11] DATA SUMMARY

Parameter	Base Load, Run - 1	Base Load, Run - 2	Base Load, Run - 3	Average
Turbine Fuel Flow (SCFH)	2,095,738	2,052,599	2,091,966	2,080,101
Duct Burner Fuel Flow (lb/min)	0	0	0	0
Total Fuel Flow (SCFH)	2,095,738	2,052,599	2,091,966	2,080,101
Stack Flow (RM19) (SCFH)	51,012,770	49,960,821	50,933,540	50,635,710
Stack Moisture (% Method 4)	9.0	8.7	9.4	9.0
Power Output (megawatts)	204.1	205.6	205.5	205.1
NOx (ppmvd)	2.05	2.00	1.99	2.01
NOx (ppm@15%O_2)	1.62	1.58	1.58	1.59
CO (ppmvd)	0.27	0.27	0.26	0.27
CO (ppm@15%O_2)	0.22	0.22	0.21	0.21
THC (ppmvd)	2.41	1.46	2.76	2.21
THC (ppm@15%O_2)	1.91	1.15	2.18	1.75
CH_4 (ppmvd)	2.00	2.00	2.00	2.00
C_2H_6 (ppmvd)	0.10	0.10	0.10	0.10
VOC as CH_4 (ppmvd)	0.31	0.00	0.66	0.32
VOC as CH_4 (ppm@15%O_2)	0.24	0.00	0.52	0.26
SO_2 from Fuel Sulfur (grains/100scf)	0.039	0.039	0.039	0.04
SO_2 from Fuel Sulfur (lb/MMBtu)	0.00011	0.00011	0.00011	0.00011
Total PM (mg)	2.96	2.15	2.30	2.47
Total PM (g/dscf)	3.58E-05	2.32E-05	2.64E-05	2.85E-05
Total PM (gr/dscf)	5.52E-04	3.59E-04	4.08E-04	4.39E-04
Total PM (lb/hr)	3.57	2.44	2.63	2.88
Total PM (lb/MMBtu)	0.0019	0.0012	0.00141	0.0015
H_2SO_4 (mg)	0.01	0.01	0.01	0.01
H_2SO_4 (g/dscf)	2.91E-07	2.43E-07	3.42E-07	2.92E-07
H_2SO_4 (gr/dscf)	4.49E-06	3.75E-06	5.27E-06	4.50E-06
H_2SO_4 (lb/MMBtu)	0.000016	0.000013	0.000018	0.000016
NH_3 (ppmvd)	4.93	5.28	5.49	5.23
NH_3 (ppm@15%O_2)	3.93	4.21	4.38	4.17
Opacity (%)	0	0	0	0
CO_2 (%)	4.13	4.13	4.14	4.13
O_2 (%)	13.44	13.44	13.45	13.45

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

Ideal Gas Conversion Factor = 385.23 SCF/lb-mol at 68 deg F & 14.696 psia

Fuel Heating Value is based upon Air Hygiene's fuel gas calculation sheet. All calculations are based upon a correction to 68 deg F & 14.696 psia

High Heating Values (HHV) are used for the Fuel Heating Value, F-Factor, and Fuel Flow Data per EPA requirements.

ASTM D 3588		40CFR60, App. A., RM 19, Table 19-1	
Molecular Weight of NOx (lb/lb-mole) =	46.01	Conversion Constant for NOx =	0.0000001194351
Molecular Weight of CO (lb/lb-mole) =	28.00	Conversion Constant for CO =	0.0000000726839
Molecular Weight of NH_3 (lb/lb-mole) =	64.00	Conversion Constant for NH_3 =	0.0000001661345
Molecular Weight of THC (propane) (lb/lb-mole) =	44.00	Conversion Constant for THC =	0.0000001142175
Molecular Weight of VOC (methane) (lb/lb-mole) =	16.00	Conversion Constant for VOC (methane) =	0.0000000415336
Molecular Weight of NH_3 (lb/lb-mole) =	17.03	Conversion Constant for NH_3 =	0.0000000442074
Molecular Weight of HCHO (lb/lb-mole) =	30.03	Conversion Constant for HCHO =	0.0000000779534
Molecular Weight of CO_2 (lb/lb-mole) =	44.01	Conversion Constant for CO_2 =	0.0000001142434

NOTE: units are lb/ppm*ft^3

Formulas:

1. Corrected Raw Average (C_{Gas}), 40CFR60, App. A, RM 7E, Eq. 7E-5 (08/15/06)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right)$$

2. Correction to % O_2, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O2)}} \right)$$

3. Correction to % O_2 and ISO Conditions

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_r}{P_o}} \times e^{(19 \times (H_O - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

4. Method 19 stack exhaust flow (scfh) [ref. EPA EMC FAQ Method 19]

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1{,}000{,}000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O2)}} \right)$$

5. Emission Rate in lb/hr

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G}$$

6. Emission Rate in tons per year

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000}$$

7. Emission Concentration in lb/MMBtu (O_2 based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O2)}}$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp\cdot hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1341.022} \; or \; \frac{E_{lb/hr} \times 453.6}{hp}$$

RM 7E, (08-15-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

ACE = Analyzer calibration error, percent of calibration span.
B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100.
C_{Avg} = Average unadjusted gas concentration indicated by data recorder for the test run.
C_D = Pollutant concentration adjusted to dry conditions.
C_{Dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode.
C_{Gas} = Average effluent gas concentration adjusted for bias.
C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas.
C_{MA} = Actual concentration of the upscale calibration gas, ppmv.
C_O = Average of the initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas.
C_S = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode.
C_{SS} = Concentration of NOx measured in the spiked sample.
C_{Spike} = Concentration of NOx in the undiluted spike gas.
C_{Calc} = Calculated concentration of NOx in the spike gas diluted in the sample.
C_V = Manufacturer certified concentration of a calibration gas (low, mid, or high).
C_W = Pollutant concentration measured under moist sample conditions, wet basis.
CS = Calibration span.
D = Drift assessment, percent of calibration span.
E_p = The predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response.
Eff_{NO2} = NO_2 to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NOFinal = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NOxCorr = The NOx concentration corrected for the converter efficiency.
NOxFinal = The final NOx concentration observed during the converter efficiency test in Section 16.2.2.
NOxPeak = The highest NOx concentration observed during the converter efficiency test in Section 16.2.2.
Q_{Spike} = Flow rate of spike gas introduced in system calibration mode, L/min.
Q_{Total} = Total sample flow rate during the spike test, L/min.
R = Spike recovery, percent.
SB = System bias, percent of calibration span.
SB_i = Pre-run system bias, percent of calibration span.
SB_f = Post-run system bias, percent of calibration span.
SB / D_{Alt} = Alternative absolute difference criteria to pass bias and/or drift checks.
SCE = System calibration error, percent of calibration span.
SCE_i = Pre-run system calibration error, percent of calibration span.
SCE_{final} = Post-run system calibration error, percent of calibration span.
Z = Zero calibration gas, designator.

40CFR60.355(b)(1), (09-20-06), Nomenclature. The terms used in the equations are defined as follows:

P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H_2O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

Small Engine and FTIR Nomenclature. The terms used in the equations are defined as follows:

bhp = brake horsepower
hp = horsepower
Q_{sys} = system flow (lpm)
Q_m = matrix spike flow (lpm)

RM 19, (07-29-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
B_{wa} = Moisture fraction of ambient air, percent.
Btu = British thermal unit
$\%_C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
$\%_{CO2d}$,$\%_{CO2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
E = Pollutant emission rate, ng/J (lb/million Btu).
E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
E_d = Average pollutant rate for each sampling period (e.g.,24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million E
E_{di} = Average inlet SO_2 rate for each sampling period d, ng/J (lb/million Btu).
E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O_2.
E_{jo},E_{ji} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
E_h = Hourly average pollutant, ng/J (lb/million Btu).
E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
ft^3 = cubic feet
G = ideal gas conversion factor
(385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
GCM = gross Btu per SCF (constant, compound based)
GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
$\%_H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
$\%_{H2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
H_r = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
K = volume of combustion component per pound of component (constant)
K = Conversion factor, 10^{-5} (kJ/J)/(%) [10^6 Btu/million Btu].
K_c = (9.57 scm/kg)/% [(1.53 scf/lb)/%].
K_{cc} = (2.0 scm/kg)/% [(0.321 scf/lb)/%].
K_{hd} = (22.7 scm/kg)/% [(3.64 scf/lb)/%].
K_{hw} = (34.74 scm/kg)/% [(5.57 scf/lb)/%].
K_n = (0.86 scm/kg)/% [(0.14 scf/lb)/%].
K_o = (2.85 scm/kg)/% [(0.46 scf/lb)/%].
K_s = (3.54 scm/kg)/% [(0.57 scf/lb)/%].
K_{sulfur} = $2x10^4$ Btu/wt%-MMBtu
K_w = (1.30 scm/kg)/% [(0.21 scf/lb)/%].
lb = pound
ln = Natural log of indicated value.
L_p,L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
$\%_N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
$M_{\%}$ = mole percent
mol = mole
MW = molecular weight (lb/lb-mol)
MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)[1]
NCM = net Btu per SCF (constant based on compound)
$\%_O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
$\%_{O2d}$, $\%_{O2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
P_B = barometric pressure, in Hg
P_s = Potential SO2 emissions, percent.
$\%_S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
S_e = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
$\%_{Sf}$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
S(wt%) = weight percent of sulfur, per lab analysis by appropriate ASTM standard
S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
S_o = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
$\%S_p$, $\%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
SCF = standard cubic feet
SH = specific humidity, pounds of water per pound of air
$t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
T_{amb} = ambient temperature, ^oF
W/D Factor = 1.0236 = conv. at 14.696 psia and
68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
X_{CO2}=CO_2 Correction factor, percent.
X_k = Fraction of total heat input from each type of fuel k.

Nomenclature

- $\%CO$ = carbon monoxide concentration (%)
- $\%CO_2$ = carbon dioxide concentration (%)
- $\%N_2$ = nitrogen concentration (%)
- $\%O_2$ = oxygen concentration (%)
- $\%O_{2,wet}$ = Oxygen content of gas stream, % by volume of wet gas. (Note: The oxygen percentage used in Method 201A, Equation 3 is on a wet gas basis. That means that since oxygen is typically measured on a dry gas basis, the measured percent O2 must be multiplied by the quantity (1 - B_{ws}) to convert to the actual volume fraction. Therefore, $\%O_{2,wet} = (1 - B_{ws}) * \%O_{2, dry}$)
- $(\%EA)_{avg}$ = average excess air (%)
- $(F_o)_{avg}$ = average calculated fuel factor
- $[(\Delta p)^{0.5}]_{avg}$ = Average of square roots of the velocity pressures measured during the preliminary traverse, inches W.C.
- μ = Gas viscosity, micropoise
- 12.0 = Constant calculated as 60 percent of 20.5 square inch cross-sectional area of combined cyclone head, square inches
- 17.03 = mg/milliequivalents for ammonium ion
- 22.4 = liters of ideal gas per lb-mol of substance at 0^oC and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)
- 24.04 = liters of ideal gas per lb-mol of substance at 20^oC and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)
- 5.02×10^4 = constant derived from the molecular weight and correcting standard temperature and pressure (ref. Bay Area Air Quality Management District, Source Test Procedure ST-1B, Ammonia Integrated Sampling, Adopted January 20, 1982, Regulation 7-303)
- A = distance upstream (in.)
- A_D = stack diameters upstream (dia.)
- An = Area of nozzle, square feet
- A_s = area of stack (ft^2)
- B = distance downstream (in.)
- B_D = stack diameters downstream (dia.)
- b_f = Average blockage factor calculated in Equation 26, dimensionless
- B_{wm} = meter moisture content (%)
- B_{ws} = stack moisture content (%)
- C = Cunningham correction factor for particle diameter, Dp, and calculated using the actual stack gas temperature, dimensionless
- C_1 = -150.3162 (micropoise)
- C_2 = 18.0614 (micropoise/$K^{0.5}$) = 13.4622 (micropoise/$R^{0.5}$)
- $C_3 = 1.19183 \times 10^6$ (micropoise/K^2) = 3.86153×10^6 (micropoise/R^2)
- C_4 = 0.591123 (micropoise)
- C_5 = 91.9723 (micropoise)
- $C_6 = 4.91705 \times 10^{-5}$ (micropoise/K^2) = 1.51761×10^{-5} (micropoise/R^2)
- C_a = Acetone blank concentration, mg/mg
- C_b = Concentration of NH3 ion in the back half of train (breakthrough)
- C_f = Concentration of NH3 ion in the front half of train (main catch)
- C_{fPM10} = Conc. of filterable PM_{10}, gr/dscf
- $C_{fPM2.5}$ = Conc. of filterable $PM_{2.5}$, gr/dscf
- C_k = K Factor Constant, 849.8

Nomenclature

- C_n = nozzle diameter constant, 0.03575
- C_p' = Coefficient for the pitot used in the preliminary traverse, dimensionless
- C_p = Pitot coefficient for the combined cyclone pitot, dimensionless
- C_{cpm} = Concentration of the condensable PM in the stack gas, dry basis, corrected to standard conditions, milligrams/dry standard cubic foot.
- C_r = Re-estimated Cunningham correction factor for particle diameter equivalent to the actual cut size diameter and calculated using the actual stack gas temperature, dimensionless
- D_{50} = Particle cut diameter, micrometers
- $D_{50(N+1)}$ = D_{50} value for cyclone IV calculated during the N+1 iterative step, micrometers
- D_{50-1} = Re-calculated particle cut diameters based on re-estimated C_r, micrometers
- D_{50LL} = Cut diameter for cyclone I corresponding to the 2.25 micrometer cut diameter for cyclone IV, micrometer
- D_{50N} = D_{50} value for cyclone IV calculated during the Nth iterative step, micrometers
- D_{50T} = Cyclone I cut diameter corresponding to the middle of the overlap zone shown in Method 201A, Figure 10 of Section 17, micrometers
- D_e = equivalent stack diameter (in.)
- ΔH@ = ΔH @ 0.75 scfm (in. H2O)
- ΔH_{avg} = average orifice pressure (in. H_2O)
- D_n = Inner diameter of sampling nozzle mounted on Cyclone I, inches
- D_{na} = actual nozzle diameter (in.)
- D_p = Physical particle size, micrometers
- Δp = velocity head (in. H_2O)
- Δp_1 = velocity head at first current traverse point (in. H_2O)
- $\Delta p'_1$ = velocity head at first preliminary traverse point (in. H_2O)
- Δp_{avg} = average pitot tube differential pressure (in. H_2O)
- Δp_n = velocity head at subsequent current traverse point (in. H_2O)
- Δp_{RM2} = method 2 velocity head (in. H_2O)
- D_s = diameter of stack (in.)
- F_d = fuel f-factor (dscf/MMBtu)
- f_{O2} = stack gas fraction of O_2, by volume, dry basis
- I = Percent isokinetic sampling, dimensionless
- K_1 = standard volume correction, 17.65°R/in. Hg
- K_4 = isokinetic conversion constant, 0.0945min•in.Hg/sec•°R
- K_5 = water mass to std water vapor, 0.04715 ft^3/g
- K_p = 85.49, ((ft/sec)/(pounds/mole -°R))
- L = length of stack (in.)
- L_{fw} = distance to far wall of stack (in.)
- L_{nw} = distance to near wall of stack (in.) [reference]
- $m_{\#x}$ = weight measurements (g)
- M_1 = Milligrams of PM collected on the filter, less than or equal to 2.5 micrometers
- M_2 = Milligrams of PM recovered from Container #2 (acetone blank corrected), greater than 10 micrometers
- M_3 = Milligrams of PM recovered from Container #3 (acetone blank corrected), less than or equal to 10 and greater than 2.5 micrometers
- M_4 = Milligrams of PM recovered from Container #4 (acetone blank corrected), less than or equal to 2.5 micrometers

Nomenclature

- m_a = Mass of residue of acetone after evaporation, mg
- m_c = Mass of the NH4+ added to sample to form ammonium sulfate, mg
- m_{cpm} = Mass of the total condensable PM, mg
- M_d = Molecular weight of dry gas, pounds/pound mole
- m_{fb} = Mass of total CPM in field train recovery blank, mg
- m_{fx} = final weight, avg of last two measurements (g)
- mg = Milligram
- mg/L = Milligram per liter
- m_i = Mass of inorganic CPM, mg
- m_{ib} = Mass of inorganic CPM in field train recovery blank, mg
- M_n = total particulates (mg)
- m_o = Mass of organic CPM, mg
- m_{ob} = Mass of organic CPM in field train blank, mg
- m_r = Mass of dried sample from inorganic fraction, mg
- m_{tx} = tare weight (g)
- MW = molecular weight (lb/lb-mole)
- M_w = Molecular weight of wet gas, pounds/pound mole
- N = Normality of ammonium hydroxide titrant
- N_a = null angle (deg.)
- N_{re} = Reynolds number, dimensionless
- N_{tp} = Number of iterative steps or total traverse points
- P_b = P_{bar} = barometric pressure (in. Hg)
- P_{bar} = barometric pressure (in. Hg)
- ppmCO = carbon monoxide concentration (ppm)
- ppmv = Parts per million by volume
- ppmw = Parts per million by weight
- P_s = absolute stack pressure (in. Hg)
- P_{static} = static pressure (in. H_2O)
- P_{std} = standard pressure, 29.92 in. Hg
- Θ = total sampling time (min)
- Q_{aw} = average stack wet flow rate (ascf/min)
- Q_I = Sampling rate for cyclone I to achieve specified D_{50}
- Q_m = estimated orifice flow rate, 0.750 acfm, else Vm/Q from previous run
- Q_s = Sampling rate for cyclone I to achieve specified D_{50}
- $Q_{s(std)}$ = total cyclone flow rate at standard conditions (dscf/min)
- Q_{sd} = dry standard stack flow rate (dscfm)
- Q_{sST} = Dry gas sampling rate through the sampling assembly, dscfm
- Q_{sw} = wet standard stack flow rate (ascfm)
- R_{max} = Nozzle/stack velocity ratio parameter, dimensionless
- R_{min} = Nozzle/stack velocity ratio parameter, dimensionless
- t_1 = Sampling time at point 1, min
- t_m = average gas meter temperature (^oF)
- t_m = average meter temperature (^oF)
- T_m = Meter box and orifice gas temperature, ^oR
- t_n = Sampling time at point n, min

Nomenclature

- t_r = Total projected run time, min
- T_s = Absolute stack gas temperature, ^oR
- T_{std} = standard temperature, 68^{o}F, 528^{o}R
- T_u = absolute temperature offset, 460^{o}R
- V_a = Volume of acetone blank, ml
- V_{aw} = Volume of acetone used in sample recovery wash, ml
- V_b = Volume of aliquot taken for IC analysis, ml
- V_c = Quantity of water captured in impingers and silica gel, ml
- V_f = final impinger volume (ml)
- V_i = initial impinger volume (ml)
- V_{ic} = Volume of impinger contents sample, ml
- V_m = Dry gas meter volume sampled, acf
- $V_{m(std)}$ = standard meter volume (dscf)
- v_{max} = Maximum gas velocity calculated from Equations 18 or 19, ft/sec
- v_{max} = maximum nozzle velocity (ft/sec)
- V_{mf} = final dry gas meter reading (dcf)
- V_{mi} = initial dry gas meter reading (dcf)
- v_{min} = Minimum gas velocity calculated from Method 201A, Equations 16 or 17, ft/sec
- V_{ms} = Dry gas meter volume sampled, corrected to standard conditions, dscf
- v_n = Sample gas velocity in the nozzle, ft/sec
- v_{org} = organics wash volume (ml)
- V_p = Volume of water added during train purge
- v_s = average stack gas velocity (ft/sec)
- v_{sl} = local velocity (ft/sec)
- V_t = total impinger volume (ml) = ;(V_f-V_i)
- V_t = Volume of NH4OH titrant, ml
- $V_{w(std)}$ = volume of water vapor in gas sample at standard conditions (scf)
- v_x = blank volume (ml)
- W = width of stack (in.)
- $W_{2,3,4}$ = Weight of PM recovered from Containers #2, #3, and #4, mg
- W_a = Weight of blank residue in acetone used to recover samples, mg
- W_f = final impinger weight (g)
- W_i = initial impinger weight (g)
- W_t = total impinger weight (g) = ;(W_f-W_i)
- w_x = blank weight of solids (g)
- Y = meter calibration factor (a.k.a gamma)
- Z = Ratio between estimated cyclone IV D_{50} values, dimensionless
- γ = Dry gas meter gamma value, dimensionless
- ΔH = Meter box orifice pressure drop, inches W.C.
- $\Delta H@$ = Pressure drop across orifice at flow rate of 0.75 scfm at standard conditions, inches W.C. (Note: Specific to each orifice and meter box.)
- Δp_1 = Velocity pressure measured at point 1, inches W.C.
- Δp_{avg} = Average velocity pressure, inches W.C.
- Δp_m = Observed velocity pressure using S-type pitot tube in preliminary traverse, inches W.C.
- Δp_{max} = Maximum velocity pressure, inches W.C.

Nomenclature

- Δp_{min} = Minimum velocity pressure, inches W.C.
- Δp_n = Velocity pressure measured at point n during the test run, inches W.C.
- Δp_s = Velocity pressure calculated in Method 201a, Equation 25, inches W.C.
- Δp_{s1} = Velocity pressure adjusted for combined cyclone pitot tube, inches W.C.
- Δp_{s2} = Velocity pressure corrected for blockage, inches W.C.
- θ = Total run time, min
- ρ_a = Density of acetone, mg/ml (see label on bottle)
- Σ_n = total number of sampling points

EXAMPLE CALCULATIONS (Reference Method 1 - Circular Stack)

Diameter of Stack (in.)

$$D(in.) = L_{fw} - L_{nw}$$

D (in.) = 235.25 in. - 7.25 in. = 228.00 in.

Area of Stack (ft^2)

$$A_s(ft^2) = \pi \times \left(\frac{D}{2 \times 12}\right)^2$$

A_s (ft^2) = 3.14 x ($\frac{228.00 \text{ in.}}{2 \text{ x } 12\text{in./ft}}$)^2 = 283.53 ft^2

Stack Diameters Downstream

$$B_D(dia.) = \frac{B}{D}$$

B_D (dia.) = $\frac{1095.00 \text{ in.}}{228.00 \text{ in.}}$ = 4.80 diameters

Stack Diameters Upstream

$$A_D(dia.) = \frac{A}{D}$$

A_D (dia.) = $\frac{1200.00 \text{ in.}}{228.00 \text{ in.}}$ = 5.26 diameters

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 3a) [Values from Run 1 test]

Carbon Monoxide Concentration (%)

$$\%CO = \frac{ppmCO}{10{,}000}$$

$$\%CO\ (\%) = \frac{0.00 \quad ppm}{10{,}000\ ppm/\%} = 0.0000 \quad \%$$

Nitrogen Concentration (%)

$$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$$

$\%N_2$ (%) = 100 - 4.14 % - 13.60 % - 0.00 / 10,000 % = 82.26 %

Stack Dry Molecular Weight (lb/lb-mole)

$$M_d\,(lb/lb-mol) = \sum\left(\frac{MW_{comp}}{100} \times \%component\right)$$

$$M_d\ (lb/lb\text{-}mol) = \left(\frac{44\ lb/lb\text{-}mol}{100} \times 4.14\ \%\right) + \left(\frac{32\ lb/lb\text{-}mol}{100} \times 13.60\ \%\right) + \left(\frac{28\ lb/lb\text{-}mol}{100} \times \left[\frac{0.00}{10{,}000} + 82.26\right]\right) = \frac{29.21\ lb}{lb\text{-}mol}$$

Stack Wet Molecular Weight (lb/lb-mole)

$$M_S\,(lb/lb-mol) = \left[M_d \times \left(1 - \frac{B_{WS}}{100}\right)\right] + \left[MW_{H_2O} \times \frac{B_{WS}}{100}\right]$$

$$M_S\ (lb/lb\text{-}mol) = \left\{\frac{29.21\ lb}{lb\text{-}mol} \times \left(1 - \frac{8.16\ \%}{100}\right)\right\} + \left\{\frac{18\ lb}{lb\text{-}mol} \times \frac{8.16\ \%}{100}\right\} = \frac{28.29\ lb}{lb\text{-}mol}$$

Average Calculated Fuel Factor (F_o)

$$F_{o(avg)} = \frac{\left[20.9 - (\%O_2)_{avg} - \left(0.5 \times (\%CO)_{avg}\right)\right]}{(\%CO_2)_{avg} + (\%CO)_{avg}}$$

$$F_{o(avg)} = \frac{20.9\% - 13.60\ \% - (0.5 \times 0.000\ \%)}{4.14\ \% + 0.000\ \%} = 1.763$$

Average Excess Air (%)

$$\%EA_{avg}\,(\%) = \frac{100 \times \left[(\%O_2)_{avg} - \left(0.5 \times (\%CO)_{avg}\right)\right]}{\left(0.264 \times (N_2)_{avg}\right) - \left[(\%O_2)_{avg} - \left(0.5 \times (\%CO)_{avg}\right)\right]}$$

$$(\%EA)_{AVG} = \frac{100 \times \{13.60\ \% - (0.5 \times 0.000\ \%)\}}{(0.264 \times 82.26\ \%) - \{13.60\ \% - (0.5 \times 0.000\ \%)\}} = 167.56 \quad \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 2) [Values from Run 1 test]

Absolute Stack Pressure (in. Hg)

$$P_S(in.Hg) = P_b + \frac{P_{static}}{13.6}$$

P_s (in. Hg) = 29.97 in. Hg + $\frac{-0.87 \text{ in. } H_2O}{13.6 \text{ in. } H_2O\text{/in. Hg}}$ = 29.91 in. Hg

Average Stack Gas Velocity (ft/sec)

$$v_s(ft/\sec) = K_p \times C_p \times \left(\sqrt{\Delta p}\right)_{avg} \times \sqrt{\frac{(t_s)_{avg} + T_u}{P_s \times M_s}}$$

v_{sl} (ft/sec) =

$$\left(\frac{85.49 \text{ ft}}{\text{sec}} \frac{\text{(lb/lb-mol)(in. Hg)}}{(^oR)(\text{in. } H_2O)}\right)^{1/2} \times 0.72 \times 1.19 \text{ in.} H_2O^{1/2} \times \sqrt{\frac{217.08 + 460\ ^oR}{29.91 \text{ in. Hg} \times 28.29 \text{ lb/lb-mol}}} = \frac{65.8 \text{ ft}}{\text{sec}}$$

Average Stack Dry Standard Flow Rate (dscfh)

$$Q_{sd}(dscfh) = \frac{60 \times 60 \times \left(1 - \frac{B_{ws}}{100}\right) \times v_s \times A_s \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sd} \text{ (dscf/hr)} = \frac{3600 \text{ sec}}{\text{hr}} \times \left(1 - \frac{8.16\ \%}{100}\right) \times \frac{65.88 \text{ ft}}{\text{sec}} \times 283.53 \text{ ft}^2 \times \frac{68.00 + 460\ ^oR}{217.08 + 460\ ^oR} \times \frac{29.91 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{48{,}135{,}876.34 \text{ dscf}}{\text{hr}}$$

Average Stack Wet Flow Rate (acfm)

$$Q_{aw}(acfm) = 60 \times v_s \times A_s$$

$$Q_{aw} \text{ (acf/min)} = \frac{60 \text{ sec}}{\text{min}} \times \frac{65.88 \text{ ft}}{\text{sec}} \times 283.53 \text{ ft}^2 = \frac{1{,}120{,}665.49 \text{ acf}}{\text{min}}$$

Average Stack Wet Standard Flow Rate (ascfh)

$$Q_{sw}(ascfh) = \frac{60 \times Q_{aw} \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sw} \text{ (ascf/hr)} = \frac{60 \text{ min}}{\text{hr}} \times \frac{1{,}120{,}665.49 \text{ acf}}{\text{min}} \times \frac{68.00 + 460\ ^oR}{217.08 + 460\ ^oR} \times \frac{29.91 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{52{,}410{,}248.13 \text{ ascf}}{\text{hr}}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 4) [Values from Run 1 test]

Water Volume Weighed (scf)

$$V_{wsg\,(std)}\,(scf) = W_t \times K_5$$

$V_{wsg(std)}$ = 167.50 g x 0.04715 ft^3/g = 7.898 scf

Standard Meter Volume (dscf)

$$V_{m(std)}\,(dscf) = \frac{K_1 \times Y \times V_m \times \left(P_b + \frac{\Delta H_{avg}}{13.6}\right)}{(t_m)_{avg} + T_u}$$

$$V_{m(std)} = \frac{\frac{17.65\ ^oR}{in.\ Hg} \times 0.96 \times 93.27\ dcf \times \left(29.97\ in.\ Hg + \frac{0.40\ in.\ H_2O}{13.6\ in.\ H_2O\ /\ in.\ Hg}\right)}{74.08\ ^oF + 460\ ^oR} = 88.94\ dscf$$

Calculated Moisture Content (%)

$$B_{ws\,(calc)}(\%) = 100 \times \frac{V_{wsg\,(std)}}{V_{wsg\,(std)} + V_{m(std)}}$$

$$B_{ws(calc)} = 100 \times \frac{7.90\ dscf}{7.90\ dscf + 88.94\ dscf} = 8.16\ \%$$

Saturated Moisture Content (%)

$$B_{ws\,(svp)}(\%) = 100 \times \frac{10^{6.691 - \frac{3144}{t_{s(avg)} + 390.86}}}{P_b + \frac{P_{static}}{13.6}} \le 100$$

$$B_{ws(svp)} = 100 \times \frac{10^{\left(6.691 - \frac{3144}{217.08\ ^oF + 390.86}\right)}}{29.97\ in.\ Hg + \frac{-0.87\ in.\ H_2O}{13.6\ in.\ H_2O\ /\ in.\ Hg}} \le 100 = 100.00\ \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Isokinetic Sampling) [Values from Run 1 test]

Desired Orifice (in. H_2O) (first point)

$$\Delta H_d\,(in.H_2O) = K \times \Delta p$$

ΔH_d (in. H_2O) = x

in. H_2O = in. H_2O

Absolute Meter Pressure (in. Hg)

$$P_m\,(in.Hg) = P_b + \frac{\Delta H\,@}{13.6}$$

$$P_m\,(\text{in. Hg}) = 29.97\ \text{in. Hg} + \frac{1.84\ \text{in. } H_2O}{13.6\ \text{in. } H_2O/\text{in. Hg}} = 30.11\ \text{in. Hg}$$

Recommended Nozzle Diameter (in.)

$$D_m\,(in.) = \sqrt{\frac{C_n \times Q_m \times P_m}{(t_m + T_u) \times C_p} \times \left(\frac{1-\frac{B_{wm}}{100}}{1-\frac{B_{ws}}{100}}\right) \times \sqrt{(t_s + T_u) \times \left[\frac{M_d \times \left(1-\frac{B_{ws}}{100}\right) + \left(18 \times \frac{B_{ws}}{100}\right)}{P_s \times \Delta p_{avg}}\right]}}$$

$$D_{ni}\,(\text{in.}) = \sqrt{\frac{\frac{0.03575\ (\text{lb-mole}\cdot{}^{o}\text{R}\cdot\text{in. } H_2O)^{1/2}\cdot\text{min}\cdot\text{in.}^2}{\text{acf}\cdot\text{in. Hg}^{3/4}\cdot\text{lb}^{1/2}} \times 0.75\ \text{acf} \times 30.11\ \text{in. Hg}}{\left(74.08\ {}^{o}\text{F} + 460{}^{o}\text{R}\right) \times 0.72} \times \left(\frac{1-\frac{0.00\ \%}{100}}{1-\frac{8.16\ \%}{100}}\right) \times \sqrt{(217.08\ {}^{o}\text{F} + 460{}^{o}\text{R}) \times \frac{\frac{29.21\ \text{lb}}{\text{lb-mole}} \times \left(1-\frac{8.16\ \%}{100}\right) + \left(\frac{18\ \text{lb}}{\text{lb-mol}} \times \frac{8.16\ \%}{100}\right)}{29.91\ \text{in. Hg} \times 1.19\ \text{in. } H_2O}}} = 0.220\ \text{in.}$$

ΔP to ΔH Isokinetic Factor

$$K = C_k \times C_p^2 \times \Delta H\,@ \times D_{na}^4 \times \left[\frac{M_d \times \left(1-\frac{B_{wm}}{100}\right) + \left(18 \times \frac{B_{wm}}{100}\right)}{M_d \times \left(1-\frac{B_{ws}}{100}\right) + \left(18 \times \frac{B_{ws}}{100}\right)}\right] \times \left(\frac{1-\frac{B_{ws}}{100}}{1-\frac{B_{wm}}{100}}\right)^2 \times \left(\frac{t_m + T_u}{ts + T_u}\right) \times \frac{P_s}{P_m}$$

$$K = \frac{849.8}{\text{in. } H_2O\cdot\text{in.}^4} \times 0.72^2 \times 1.84\ \text{in. } H_2O \times 0.15^4 \times \left(\frac{1-\frac{8.16\ \%}{100}}{1-\frac{0.00\ \%}{100}}\right)^2 \times \left(\frac{74.08\ {}^{o}\text{F} + 460{}^{o}\text{R}}{217.08\ {}^{o}\text{F} + 460{}^{o}\text{R}}\right) \times \left(\frac{\frac{29.21\ \text{lb}}{\text{lb/mole}} \times \left(1-\frac{0.00\ \%}{100}\right) + \left(\frac{18\ \text{lb}}{\text{lb-mol}} \times \frac{0.00\ \%}{100}\right)}{\frac{29.21\ \text{lb}}{\text{lb/mole}} \times \left(1-\frac{8.16\ \%}{100}\right) + \left(\frac{18\ \text{lb}}{\text{lb-mol}} \times \frac{8.16\ \%}{100}\right)}\right) \times \frac{29.91\ \text{in. Hg}}{30.11\ \text{in. Hg}} = 0.29$$

Percent Isokinetic (%) (first point)

$$I(\%) = \frac{K_4 \times \left((t_s)_{avg} + T_u\right) \times V_{m(std)}}{\left(\Theta \times (v_{s(l)})_{avg} \times P_s \times \pi \times \left(\frac{D_{na}}{2} \times \frac{1}{12}\right)^2\right) \times \left(1-\frac{B_{ws}}{100}\right)}$$

$$I\,(\%) = \frac{\frac{0.0945\ \text{min}\cdot\text{in. Hg}}{\text{sec}\cdot{}^{o}\text{R}} \times (211.00\ {}^{o}\text{F} + 460\ {}^{o}\text{R}) \times 8.02\ \text{dscf}}{20.75\ \text{min} \times \frac{65.22\ \text{ft}}{\text{sec}} \times 29.91\ \text{in. Hg} \times 3.14 \times \left(\frac{0.15\ \text{in.}}{2} \times \frac{\text{ft.}}{12\ \text{in.}}\right)^2 \times \left(1-\frac{8.16\ \%}{100}\right)} = 109.58\ \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Isokinetic Sampling) [Values from Run 1 test]

Cumulative Percent Isokinetic (%) (weighted average of all points)

$$I(\%) = \sum_{1-n} \frac{\lfloor I(\%) \times V_{m(std)} \rfloor_{1-n}}{V_{m(std)1-n}}$$

Using Method 5, Eq 5-8 to determine intermediate isokinetics at each point, weighted averaging of the cumulative isokinetics is necessary since all points are not equal, and determined by using the dry standard meter volume collected at each point to weight the cumulative average. Intermediate isokinetics and dry standard meter volumes are found at each point. At each point the cumulative sum is found of each value and the quotient of the two used to determine the cumulative isokinetics for each residual point (n).

Pt	In (%)	x	Vm(std)n	=	I (%)n	∑(I (%)n)	/	∑(Vm(std)n)	=	I (%)
A-1	109.58	x	8.024	=	879.24	879.24	/	8.02	=	109.6
A-2	100.94	x	7.385	=	745.42	1624.65	/	15.41	=	105.4
A-3	101.96	x	7.443	=	758.92	2383.57	/	22.85	=	104.3
B-1	106.52	x	6.581	=	700.94	3084.51	/	29.43	=	104.8
B-2	105.20	x	6.495	=	683.28	3767.79	/	35.93	=	104.9
B-3	109.24	x	6.749	=	737.31	4505.10	/	42.68	=	105.6
C-1	101.63	x	7.663	=	778.81	5283.90	/	50.34	=	105.0
C-2	101.83	x	7.672	=	781.31	6065.22	/	58.01	=	104.6
C-3	99.19	x	7.473	=	741.28	6806.49	/	65.49	=	103.9
D-1	104.36	x	7.596	=	792.75	7599.24	/	73.08	=	104.0
D-2	100.50	x	7.840	=	787.84	8387.08	/	80.92	=	103.6
D-3	102.82	x	8.021	=	824.68	9211.76	/	88.94	=>	103.6

Last Pt

Percent Isokinetic (%) (intermediate equation, all points)
[equivalent to taking an average of point-by-point isokinetics without weighting the average (e.g. all points equal)]

$$I(\%) = \frac{K_4 \times \left((t_s)_{avg} + T_u\right) \times V_{m(std)}}{\left(\Theta \times \left(v_{s(l)}\right)_{avg} \times P_s \times \pi \times \left(\frac{D_{na}}{2} \times \frac{1}{12}\right)^2\right) \times \left(1 - \frac{B_{ws}}{100}\right)}$$

$$I(\%) = \frac{\frac{0.0945 \text{ min}\cdot\text{in. Hg}}{\text{sec}\cdot{}^{o}\text{R}} \times (217.08\ {}^{o}\text{F} + 460\ {}^{o}\text{R}) \times 88.94 \text{ dscf}}{243.00 \text{ min} \times \frac{65.88 \text{ ft}}{\text{sec}} \times 29.91 \text{ in. Hg} \times 3.14 \times \left(\frac{0.15 \text{ in.}}{2} \times \frac{\text{ft.}}{12 \text{ in.}}\right)^2 \times \left(1 - \frac{8.16\ \%}{100}\right)} = 103.62\ \%$$

Raw Data Percent Isokinetic (%)
[utilizes the raw data equation for isokinetics from Method 5]

$$I(\%) = \frac{100\left((t_s)_{avg} + T_u\right)\left[K_4 V_{1c} + \frac{V_m Y}{(t_m)_{avg} + T_u}\left(P_{bar} + \frac{\Delta H}{13.6}\right)\right]}{60\left(\Theta \times \left(v_{s(l)}\right)_{avg} \times P_s \times \pi \times \left(\frac{D_{na}}{2} \times \frac{1}{12}\right)^2\right)}$$

I (%) =

$$\frac{100 \times (217.08\ {}^{o}\text{F} + 460\ {}^{o}\text{R}) \times \left[\frac{0.002669 \text{ ft}^3\cdot\text{in. Hg}}{\text{ml}\cdot{}^{o}\text{R}} \times 167.8 \text{ ml} + \frac{93.27 \text{ dcf} \times 0.962}{74.08\ {}^{o}\text{F} + 460\ {}^{o}\text{R}}\left(29.97 \text{ in Hg} + \frac{1.190}{13.6}\right)\right]}{60 \times 243.00 \text{ min} \times \frac{65.88 \text{ ft}}{\text{sec}} \times 29.91 \text{ in. Hg} \times 3.14 \times \left(\frac{0.15 \text{ in.}}{2} \times \frac{\text{ft.}}{12 \text{ in.}}\right)^2} = 103.75\ \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Gravimetric Analysis) [Values from Run 1 test]

Blank Concentration [Acetone Blank Weight of Solids] (mg/ml)

$$C_x(mg/ml) = \frac{1000 \times w_x}{v_x}$$

$$C_x \text{ (mg/ml)} = \frac{1000 \text{ mg}}{\text{g}} \times \frac{0.0010 \text{ g}}{202.28 \text{ ml}} = \frac{0.0049 \text{ mg}}{\text{ml}} = \frac{0.0049 \text{ mg}}{\text{ml}}$$

Blank Adjustment [Acetone Blank Weight of Solids and Nozzle Wash PM>10] (mg)

$$W_x(mg) = v_x \times C_x$$

W_x (mg) = 70 ml x 0.0049 mg/ml = 0.35 mg < Sample Gain

Adjusted Sample Gain [Nozzle Wash PM>10] (mg)

$$m_{xadj}(mg) = m_x - W_x$$

m_{xadj} (mg) = 1.3 mg - 0.35 mg = 0.95 mg

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Analysis) [Values from Run 1 test - Total $PM_{10}/PM_{2.5}$ Mass]

Stack Total Concentration (g/dscf)

$$c_s(g/dscf) = 0.001 \times \frac{M_n}{V_{m(std)}}$$

$$c_s\ (g/dscf) = \frac{g}{1000\ mg} \times \frac{6.08\ mg}{88.94\ dscf} = \frac{6.84E\text{-}05\ g}{dscf}$$

Stack Total Concentration (gr/dscf)

$$c'_s(gr/dscf) = 0.001 \times \frac{M_n}{V_{m(std)}} \times \frac{7000}{453.592}$$

$$c'_s\ (gr/dscf) = \frac{g}{1000\ mg} \times \frac{6.08\ mg}{88.94\ dscf} \times \frac{7000\ gr}{lb} \times \frac{lb}{453.592\ g} = \frac{1.06E\text{-}03\ gr}{dscf}$$

Total Emissions Rate (kg/hr)

$$E(kg/hr) = c_s \times Q_{sd} \times \frac{kg}{1000\ g}$$

$$E\ (kg/hr) = \frac{kg}{1000\ g} \times \frac{6.84E\text{-}05\ g}{dscf} \times \frac{48{,}135{,}876\ dscf}{hr} = \frac{3.29\ kg}{hr}$$

Total Emissions Rate (lb/hr)

$$E'(lb/hr) = \frac{M_n \times Q_{sd}}{V_{m(std)}} \times \frac{lb \times g}{453.592 g \times 1000 mg}$$

$$E'\ (lb/hr) = \frac{g}{1000\ mg} \times \frac{lb}{453.592\ g} \times \frac{6.08\ mg}{88.94\ dscf} \times \frac{48{,}135{,}876\ dscf}{hr} = \frac{7.26\ lb}{hr}$$

Total Emissions Rate (tpy)

$$E''(ton/yr) = E' \times \frac{8760}{2000}$$

$$E''\ (tpy) = \frac{ton}{2000\ lb} \times \frac{8{,}760\ hr}{yr} \times \frac{7.26\ lb}{hr} = \frac{31.79\ ton}{yr}$$

Total Emissions Rate (lb/MMBtu)

Oxygen Based:

$$E'''(lb/MMBtu) = \frac{M_n \times F_d}{V_{m(std)} \times 1000 \times 453.592} \times \left(\frac{20.9}{20.9 - \%O_2}\right)$$

$$E'''\ (lb/MMBtu) = \frac{g}{1000\ mg} \times \frac{lb}{453.592\ g} \times \frac{6.08\ mg}{88.94\ dscf} \times \frac{8{,}633.27\ dscf}{MMBtu} \times \left(\frac{20.9}{20.9 - 13.6\ \%}\right) = \frac{0.0037\ lb}{MMBtu}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Stack Gas Viscosity (µP) [based on preliminary data]

$$\mu(\mu P) = C_1 + C_2\sqrt{T_s} + C_3 T_s^{-2} + C4(\%O_{2,wet}) - C_5 B_{ws} + C_6 B_{ws} T_s^2$$

µ (µP) = -150.3162 µP + 13.4622 $\sqrt{206 + 460}$ + 3.86153x10^6 (206 + 460)$^{-2}$ + 0.591123 (13.6 x (1 - 12.00 /100) - 91.9723 (12.00 /100) + 1.51761x10^{-5} (12.00 /100)(206 + 460)^2 = 202.65 µP

Cunningham Correction Factor
[based on preliminary data for a 2.25 micrometer diameter particle]

$$C = 1 + 0.0057193\left[\frac{\mu}{P_s D_{50}}\right]\left[\frac{T_s}{M_w}\right]^{0.5}$$

C = 1 + 0.0057193 x ($\frac{202.65 \text{ µP}}{29.76 \text{ in Hg x } 2.25 \text{ µm}}$)($\frac{206 + 460\ ^oR}{27.86 \text{ lb / lb-mole}}$)$^{0.5}$ = 1.08

First calculation set using Cyclone I or Cyclone I and IV, assuming N_{re}<3,162

Lower Limit Cut Diameter for Cyclone I (µm)
[assumes N_{re}<3,162]

$$D_{50LL}(\mu m) = 9.507 C^{0.3007}\left[\frac{M_w P_s}{T_s}\right]^{0.1993}$$

D_{50LL} (µm) = 9.507 x 1.08 $^{0.3007}$ x ($\frac{29.76 \text{ in Hg x } 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR}$)$^{0.1993}$ = 10.18 µm

Cut Diameter for Cyclone I for the Middle of the Overlap Zone (µm)
[assumes N_{re}<3,162]

$$D_{50T}(\mu m) = \left(\frac{11 + D_{50LL}}{2}\right)$$

D_{50T} (µm) = $\frac{11 + 10.18 \text{ µm}}{2}$ = 10.59 µm

Sampling Rate Using Both PM_{10} and $PM_{2.5}$ Cyclones (dscfm)
[assumes N_{re}<3,162]

$$Q_s(dscfm) = Q_I(dscfm) = 0.07296(\mu)\left[\frac{T_s}{M_w P_s}\right]^{0.2949}\left[\frac{1}{D_{50T}}\right]^{1.4102}$$

Qs (dscfm) =

0.07296 x 202.65 µP x ($\frac{206 + 460\ ^oR}{29.76 \text{ in Hg x } 27.86 \text{ lb / lb-mole}}$)$^{0.2949}$ x ($\frac{1}{10.59 \text{ µm}}$)$^{1.4102}$ = 0.50 dscfm

Reynolds Number (dimensionless)
[verification of N_{re}<3,162, using Cyclone I and IV]

$$N_{re} = 8.64\times10^5\left[\frac{P_s M_w}{T_s}\right]\left[\frac{Q_s}{\mu}\right]$$

Correct

N_{re} = 8.64 x 10^5 x $\frac{29.76 \text{ in Hg x } 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR}$ x $\frac{0.50 \text{ dscfm}}{202.65 \text{ µP}}$ = 2638.90 < 3,162

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Second calculation set using Cyclone IV, assuming N_{re}<3,162

Particle Cut Diameter for N_{re} Less than 3,162 for Cyclone IV (µm)
[assumes N_{re}<3,162]

$$D_{50}(\mu m) = 0.0024302\left[\frac{\mu}{Q_s}\right]^{1.1791}\left[\frac{1}{C}\right]^{0.5}\left[\frac{T_s}{P_s M_w}\right]^{0.6790}$$

D_{50} (µm) =

$$0.0024302 \times \left(\frac{202.65 \ \mu P}{0.50 \ dscfm}\right)^{1.1791} \times \left(\frac{1}{1.08}\right)^{0.5} \times \left(\frac{206 + 460\ ^oR}{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}\right)^{0.6790} = 2.40 \ \mu m$$

Sampling Rate Using Only $PM_{2.5}$ Cyclone for N_{re} Less than 3,162 (dscfm)

$$Q_{IV}(dscfm) = 0.0060639\left(\frac{\mu}{C^{0.4242}}\right)\left[\frac{P_s M_w}{T_s}\right]^{-0.5759}\left[\frac{1}{D_{50}}\right]^{0.8481}$$

Q_{IV} (dscfm) =

$$0.0060639 \times \left(\frac{202.65 \ \mu P}{1.08^{0.4242}}\right) \times \left(\frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR}\right)^{-0.5759} \times \left(\frac{1}{2.40 \ \mu m}\right)^{0.8481} = 0.50 \ dscfm$$

Reynolds Number (dimensionless)
[verification of N_{re}<3,162, using Cyclone IV only]

$$N_{re} = 8.64\times10^5\left[\frac{P_s M_w}{T_s}\right]\left[\frac{Q_s}{\mu}\right]$$

Correct

$$N_{re} = 8.64 \times 10^5 \times \frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR} \times \frac{0.50 \ dscfm}{202.65 \ \mu P} = 2638.86 < 3,162$$

Third calculation set using Cyclone I or Cyclone I and IV, assuming N_{re}≥3,162

Lower Limit Cut Diameter for Cyclone I (µm)
[assumes N_{re}≥3,162]

$$D_{50LL}(\mu m) = 10.0959 C^{0.4400}\left[\frac{M_w P_s}{T_s}\right]^{0.0600}$$

$$D_{50LL}(\mu m) = 10.0959 \times 1.08^{0.4400} \times \left(\frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR}\right)^{0.0600} = 10.60 \ \mu m$$

Cut Diameter for Cyclone I for the Middle of the Overlap Zone (µm)
[assumes N_{re}≥3,162]

$$D_{50T}(\mu m) = \left(\frac{11 + D_{50LL}}{2}\right)$$

$$D_{50T}(\mu m) = \frac{11 + 10.60 \ \mu m}{2} = 10.80 \ \mu m$$

Sampling Rate Using Both PM_{10} and $PM_{2.5}$ Cyclones (dscfm)
[assumes N_{re}≥3,162]

$$Q_s(dscfm) = Q_I(dscfm) = 0.07296(\mu)\left[\frac{T_s}{M_w P_s}\right]^{0.2949}\left[\frac{1}{D_{50T}}\right]^{1.4102}$$

Qs (dscfm) =

$$0.07296 \times 202.65 \ \mu P \times \left(\frac{206 + 460\ ^oR}{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}\right)^{0.2949} \times \left(\frac{1}{10.80 \ \mu m}\right)^{1.4102} = 0.48 \ dscfm$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Reynolds Number (dimensionless)
[verification of $N_{re} \geq 3{,}162$, using Cyclone I and IV]

$$N_{re} = 8.64 \times 10^5 \left[\frac{P_s M_w}{T_s}\right]\left[\frac{Q_s}{\mu}\right]$$

Wrong Assumption

$$N_{re} = 8.64 \times 10^5 \times \frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR} \times \frac{0.48 \text{ dscfm}}{202.65\ \mu P} = 2565.96 < 3{,}162$$

Fourth calculation set using Cyclone IV, assuming $N_{re} \geq 3{,}162$

Particle Cut Diameter for N_{re} Greater than or Equal to 3,162 for Cyclone IV (μm)
[assumes $N_{re} \geq 3{,}162$]

$$D_{50}(\mu m) = 0.019723 \left[\frac{\mu}{Q_s}\right]^{0.8058}\left[\frac{1}{C}\right]^{0.5}\left[\frac{T_s}{P_s M_w}\right]^{0.3058}$$

D_{50} (μm) =

$$0.019723 \times \left(\frac{202.65\ \mu P}{0.48 \text{ dscfm}}\right)^{0.8058} \times \left(\frac{1}{1.08}\right)^{0.5} \times \left(\frac{206 + 460\ ^oR}{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}\right)^{0.3058} = 2.30 \ \mu m$$

Sampling Rate Using Only $PM_{2.5}$ Cyclone for N_{re} Greater than or Equal to 3,162 (dscfm)

$$Q_{IV}(dscfm) = 0.007657\left(\frac{\mu}{C^{0.6205}}\right)\left[\frac{P_s M_w}{T_s}\right]^{-0.3795}\left[\frac{1}{D_{50}}\right]^{1.241}$$

Q_{IV} (dscfm) =

$$0.007657 \times \left(\frac{202.65\ \mu P}{1.08^{0.6205}}\right) \times \left(\frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR}\right)^{-0.3795} \times \left(\frac{1}{2.30\ \mu m}\right)^{1.241} = 0.48 \text{ dscfm}$$

Reynolds Number (dimensionless)
[verification of $N_{re} \geq 3{,}162$, using Cyclone IV only]

$$N_{re} = 8.64 \times 10^5 \left[\frac{P_s M_w}{T_s}\right]\left[\frac{Q_s}{\mu}\right]$$

Wrong Assumption

$$N_{re} = 8.64 \times 10^5 \times \frac{29.76 \text{ in Hg} \times 27.86 \text{ lb / lb-mole}}{206 + 460\ ^oR} \times \frac{0.50 \text{ dscfm}}{202.65\ \mu P} = 2638.90 < 3{,}162$$

Meter Box Orifice Pressure Drop (in H_2O)

$$\Delta H(inH_2O) = \left[\frac{Q_s(1-B_{ws})P_s}{T_s}\right]^2\left[\frac{1.083 T_m M_d \Delta H_@}{P_{bar}}\right]$$

$$\Delta H (\text{in } H_2O) = \left(\frac{0.50 \text{ dscfm} \times (1 - 12.00/100) \times 29.76 \text{ in Hg}}{206 + 460\ ^oR}\right)^2$$
$$\times \left(\frac{1.083 \times (85.00 + 460\ ^oR) \times 29.21 \text{ lb / lb-mole} \times 1.838 \text{ in } H_2O}{29.82 \text{ in Hg}}\right) = 0.406 \text{ in } H_2O$$

50 ^oF above stack temperature	T_{s+50} =	256	ΔH_{+50} =	0.351	in H_2O
50 ^oF below stack temperature	T_{s+50} =	156	ΔH_{+50} =	0.475	in H_2O

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Adusted Velocity Pressure (in H_2O) [point A-1]

$$\Delta p_s(inH_2O) = \Delta p_m \left[\frac{C_p}{C'_p}\right]^2$$

Δp_s (in H_2O) = 1.40 in H_2O x $\left(\frac{0.72}{0.72}\right)^2$ = 1.40 in H_2O

Average Probe Blockage Factor

$$b_f = \frac{22.0}{A}$$

$b_f = \frac{22.0}{40828.14 \text{ in}^2}$ = 5.39E-04

Velocity Pressure Adjusted for Blockage Factor (in H_2O) [point A-1]

$$\Delta p_{s2}(inH_2O) = \Delta p_{s1}\left[\frac{1}{(1-b_f)}\right]^2$$

Δp_s (in H_2O) = 1.80 in H_2O x $\left(\frac{1}{(1 - 5.39\text{E-}04)}\right)^2$ = 1.80 in H_2O

Velocity of Stack Gas Adjusted for Blockage Factor (ft/sec)

$$v_s = K_p C_p \left(\sqrt{(\Delta p)}\right)_{avg}\left[\sqrt{\frac{T_s}{P_s M_w}}\right]$$

v_s (ft/sec) =

$\frac{85.49 \text{ ft/sec}}{\text{lb/mole - }^oR}$ x 0.72 x 1.15 x $\left(\frac{206 + 460\ ^oR}{29.76 \text{ in Hg x } 27.86 \text{ lb / lb-mole}}\right)^{0.5}$ = 63.53 $\frac{ft}{sec}$

Calculated Nozzle Diameter for Acceptable Sampling Rate (in)

$$D(in) = \left[\frac{3.056 Q_s}{v_s}\right]^{0.5}$$

D (in) = $\left(\frac{3.056 \text{ x } 0.50 \text{ dscfm}}{63.53 \text{ ft/sec}}\right)^{0.5}$ = 0.155 in

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Velocity of Gas in Nozzle 3 (diam. = 0.151 in), (ft/sec)

$$v_n \text{ (ft/sec)} = \frac{\dfrac{0.50 \text{ dscfm}}{60 \text{ min / sec}}}{1.24\text{E-}04 \text{ ft}^2} = 66.64 \ \frac{ft}{sec}$$

$$v_n = \frac{\left(\dfrac{Q_s}{60 \dfrac{\min}{\sec}}\right)}{A_n}$$

Minimum Nozzle Velocity to Stack Velocity Ratio Parameter (dimensionless)
Nozzle 3 (diam. = 0.151 in)

$$R_{\min} = \left[0.2457 + \left(0.3072 - \frac{0.2603\,(\mu)(Q_s)^{0.5}}{v_n^{\ 1.5}}\right)^{0.5}\right]$$

R_{min} =

$$0.2457 + \left(0.3072 - \frac{0.2603 \times 202.65 \ \mu P \times (0.50 \text{ dscfm})^{0.5}}{64.91 \ in^{1.5}}\right)^{0.5} = 0.73$$

Maximum Nozzle Velocity to Stack Velocity Ratio Parameter (dimensionless)
Nozzle 3 (diam. = 0.151 in)

$$R_{\max} = \left[0.4457 + \left(0.5690 + \frac{0.2603(\mu)(Q_s)^{0.5}}{v_n^{\ 1.5}}\right)^{0.5}\right]$$

R_{max} =

$$0.4457 + \left(0.5690 + \frac{0.2603 \times 202.65 \ \mu P \times (0.50 \text{ dscfm})^{0.5}}{64.91 \ in^{1.5}}\right)^{0.5} = 1.25$$

Minimum Gas Velocity for R_{min} Less than 0.5 (ft/sec) **Nozzle 3 (diam. = 0.151 in)**

$$v_{\min}\ (ft/\sec) = v_n(0.5)$$

$$v_{min} \text{ (ft/sec)} = 0.5 \times \ \frac{ft}{sec} = \ \frac{ft}{sec}$$

Minimum Gas Velocity for R_{min} Greater than or Equal to 0.5 (ft/sec) **Nozzle 3 (diam. = 0.151 in)**

$$v_{\min}\ (ft/\sec) = v_n R_{\min}$$

$$v_{min} \text{ (ft/sec)} = 64.91 \ \frac{ft}{sec} \times 0.73 = 47.49 \ \frac{ft}{sec}$$

Maximum Gas Velocity for R_{max} Less than 1.5 (ft/sec) **Nozzle 3 (diam. = 0.151 in)**

$$v_{\max}\ (ft/\sec) = v_n R_{\max}$$

$$v_{max} \text{ (ft/sec)} = 64.91 \ \frac{ft}{sec} \times 1.25 = 80.87 \ \frac{ft}{sec}$$

Maximum Gas Velocity for R_{max} Greater than or Equal to 1.5 (ft/sec) **Nozzle 3 (diam. = 0.151 in)**

$$v_{\max}\ (ft/\sec) = v_n(1.5)$$

$$v_{max} \text{ (ft/sec)} = 1.5 \times \ \frac{ft}{sec} = \ \frac{ft}{sec}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Preliminary test]

Minimum Velocity Pressure (in H_2O)

$$\Delta p_{min}\ (inH_2O) = 1.3686 \times 10^{-4}\left[\frac{P_s M_w}{T_s}\right]\left[\frac{v_{min}}{C_p}\right]^2$$

Δp_{min} (in H_2O) =

$$1.3686 \times 10^{-4} \times \left(\frac{29.76\ \text{in Hg} \times 27.86\ \text{lb / lb-mole}}{206 + 460\ ^oR}\right) \times \left(\frac{47.49\ \text{ft/sec}}{0.72}\right)^2 = 0.73\ \text{in } H_2O$$

Maximum Velocity Pressure (in H_2O)

$$\Delta p_{max}\ (inH_2O) = 1.3686 \times 10^{-4}\left[\frac{P_s M_w}{T_s}\right]\left[\frac{v_{max}}{C_p}\right]^2$$

Δp_{max} (in H_2O) =

$$1.3686 \times 10^{-4} \times \left(\frac{29.76\ \text{in Hg} \times 27.86\ \text{lb / lb-mole}}{206 + 460\ ^oR}\right) \times \left(\frac{80.87\ \text{ft/sec}}{0.72}\right)^2 = 2.13\ \text{in } H_2O$$

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Run 1 test]

Adusted Velocity Pressure (in H_2O) [point A-1]

$$\Delta p_s\ (inH_2O) = \Delta p_m\left[\frac{C_p}{C'_p}\right]^2$$

$$\Delta p_s\ (\text{in } H_2O) = 1.40\ \text{in } H_2O \times \left(\frac{0.72}{0.72}\right)^2 = 1.40\ \text{in } H_2O$$

Average Probe Blockage Factor

$$b_f = \frac{22.0}{A}$$

$$b_f = \frac{22.0}{40828.14\ \text{in}^2} = 5.39\text{E-}04$$

Velocity Pressure Adjusted for Blockage Factor (in H_2O) [point A-1]

$$\Delta p_{s2}\ (inH_2O) = \Delta p_{s1}\left[\frac{1}{(1-b_f)}\right]^2$$

$$\Delta p_s\ (\text{in } H_2O) = 1.80\ \text{in } H_2O \times \left(\frac{1}{(1 - 5.39\text{E-}04)}\right)^2 = 1.80\ \text{in } H_2O$$

Sampling Dwell Time at Each Point (minutes) [point A-1]

$$t_n\ (\text{min}) = \left[\frac{C_p\sqrt{\Delta p_n}}{C'_p\left(\sqrt{\Delta p_n}\right)_{avg}}\right]\left[\frac{t_r}{N_{tp}}\right]$$

$$t_n\ (\text{min}) = \left(\frac{0.72 \times (1.80)^{0.5}}{0.72 \times 1.30}\right) \times \left(\frac{240.00\ \text{min}}{12.00}\right) = 20.65\ \text{minutes}$$

Dry Gas Volume Sampled at Standard Conditions (dscf) [point A-1]

$$v_{ms}\ (dscf) = \left[\frac{528}{29.92}\right]\left[y \cdot v_m\right]\left[\frac{\left(P_{bar} + \frac{\Delta H}{13.6}\right)}{T_m}\right]$$

$$v_{ms}\ (\text{dscf}) = \left(\frac{528}{29.92}\right)(0.962 \times 8.35\ \text{dscf}) \times \left(\frac{29.97\ \text{in Hg} + 0.40\ \text{in } H_2O / 13.6}{70.00 + 460\ ^oR}\right) = 8.02\ \text{dscf}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Run 1 test]

Sample Flow Rate at Standard Conditions (dscfm)

$$Q_{sST}\,(dscfm) = \frac{v_{ms}}{\Theta}$$

$$Q_{sST}\text{ (dscfm)} = \frac{88.94 \text{ dscf}}{243.00 \text{ min}} = \frac{0.37 \text{ dscf}}{\text{min}}$$

Sampling Rate (dscfm) [e.g. cyclone flow rate]

$$Q_s\,(dscfm) = \frac{29.92}{528} Q_{sST} \left[\frac{1}{(1-B_{ws})}\right]\left[\frac{T_s}{P_s}\right]$$

$$Q_s\text{ (dscfm)} = \frac{29.92 \text{ in Hg}}{528\ ^{o}\text{R}} \times \frac{0.37 \text{ dscf}}{\text{min}} \times \frac{1}{(1- \ 8.16 \ /100)} \times \frac{217 \ + 460\ ^{o}\text{R}}{29.91 \text{ in Hg}} = 0.51 \text{ dscfm}$$

Reynolds Number (dimensionless)

$$N_{re} = 8.64 \times 10^5 \left[\frac{P_s M_w}{T_s}\right]\left[\frac{Q_s}{\mu}\right]$$

$$N_{re} = 8.64 \times 10^5 \times \frac{29.91 \text{ in Hg} \times 28.29 \text{ lb / lb-mole}}{217 \ + 460\ ^{o}\text{R}} \times \frac{0.51 \text{ dscfm}}{208.85\ \mu\text{P}} = 2643.03$$

Actual Particle Cut Diameter for Cyclone I (µm)

$$D_{50}\,(\mu m) = 0.15625 \left[\frac{T_s}{M_w P_s}\right]^{0.2091} \left[\frac{\mu}{Q_s}\right]^{0.7091}$$

$$D_{50}\ (\mu\text{m}) = 0.15625 \times \left(\frac{217 \ + 460\ ^{o}\text{R}}{29.91 \text{ in Hg} \times 28.29 \text{ lb / lb-mole}}\right)^{0.2091} \times \left(\frac{208.85\ \mu\text{P}}{0.51 \text{ dscfm}}\right)^{0.7091} = 10.60\ \mu\text{m}$$

Actual Particle Cut Diameter for Cyclone IV is determined by:

Cunningham Correction Factor (dimensionless)
[for a 2.5 micrometer diameter particle (estimated size)]

$$C = 1 + 0.0057193 \left[\frac{\mu}{P_s D_{50}}\right]\left[\frac{T_s}{M_w}\right]^{0.5}$$

$$C = 1 + 0.0057193 \times \left(\frac{208.85\ \mu\text{P}}{29.91 \text{ in Hg} \times 2.5\ \mu\text{m}}\right)\left(\frac{217 \ + 460\ ^{o}\text{R}}{28.29 \text{ lb / lb-mole}}\right)^{0.5} = 1.08$$

Particle Cut Diameter for N_{re} Less than 3,162 for Cyclone IV (µm)

$$D_{50}\,(\mu m) = 0.0024302 \left[\frac{\mu}{Q_s}\right]^{1.1791} \left[\frac{1}{C}\right]^{0.5} \left[\frac{T_s}{P_s M_w}\right]^{0.6790}$$

$$D_{50}\ (\mu\text{m}) = 0.0024302 \times \left(\frac{208.85\ \mu\text{P}}{0.51 \text{ dscfm}}\right)^{1.1791} \times \left(\frac{1}{1.08}\right)^{0.5} \times \left(\frac{217 \ + 460\ ^{o}\text{R}}{29.91 \text{ in Hg} \times 28.29 \text{ lb / lb-mole}}\right)^{0.6790} = 2.41\ \mu\text{m}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Constant Flow, Variable Time Isokinetic QA/QC) [Values from Run 1 test]

Particle Cut Diameter for N_{re} Greater than or Equal to 3,162 for Cyclone IV (µm)

$$D_{50}(\mu m) = 0.019723\left[\frac{\mu}{Q_s}\right]^{0.8058}\left[\frac{1}{C}\right]^{0.5}\left[\frac{T_s}{P_s M_w}\right]^{0.3058}$$

D_{50} (µm) =

$0.019723 \times \left(\frac{\mu P}{dscfm}\right)^{0.8058} \times \left(\frac{1}{\ }\right)^{0.5}$

$\times \left(\frac{+ 460\ ^oR}{in\ Hg \times \quad lb / lb\text{-}mole}\right)^{0.3058} =$ µm

Re-estimated Cunninham Correction Factor (dimensionless)

$$C_r = 1 + 0.0057193\left[\frac{\mu}{P_s D_{50}}\right]\left[\frac{T_s}{M_w}\right]^{0.5}$$

$C = 1 + 0.0057193 \times \left(\frac{208.85\ \mu P}{29.91\ in\ Hg \times 2.41\ \mu m}\right)\left(\frac{217 + 460\ ^oR}{28.29\ lb / lb\text{-}mole}\right)^{0.5} = 1.08$

Re-calculated Particle Cut Diameter for N_{re} Less than 3,162 for Cyclone IV (µm)

$$D_{50-1}(\mu m) = 0.0024302\left[\frac{\mu}{Q_s}\right]^{1.1791}\left[\frac{1}{C}\right]^{0.5}\left[\frac{T_s}{P_s M_w}\right]^{0.6790}$$

D_{50-1} (µm) =

$0.0024302 \times \left(\frac{208.85\ \mu P}{0.51\ dscfm}\right)^{1.1791} \times \left(\frac{1}{1.08}\right)^{0.5}$

$\times \left(\frac{217 + 460\ ^oR}{29.91\ in\ Hg \times 28.29\ lb / lb\text{-}mole}\right)^{0.6790} = 2.41$ µm

Particle Cut Diameter for N_{re} Greater than or Equal to 3,162 for Cyclone IV (µm)

$$D_{50-1}(\mu m) = 0.019723\left[\frac{\mu}{Q_s}\right]^{0.8058}\left[\frac{1}{C}\right]^{0.5}\left[\frac{T_s}{P_s M_w}\right]^{0.3058}$$

D_{50-1} (µm) =

$0.019723 \times \left(\frac{\mu P}{dscfm}\right)^{0.8058} \times \left(\frac{1}{\ }\right)^{0.5}$

$\times \left(\frac{+ 460\ ^oR}{in\ Hg \times \quad lb / lb\text{-}mole}\right)^{0.3058} =$ µm

Ratio (Z) Between D_{50} and D_{50-1} Values (dimensionless)

$$Z = \frac{D_{50-1}}{D_{50}}$$

$Z = \frac{2.41\ \mu m}{2.41\ \mu m} = 1.00$

$$0.99 \le \left[Z = \left(\frac{D_{50}}{D_{50-1}}\right)\right] \le 1.01$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Analysis) [Values from Run 1 test - H_2SO_4 (IC)]

Stack H_2SO_4 Mass (mg)

$$M_n(mg) = \frac{M_{n(lab)}}{V_{s(lab)}} \times V_{sample} \times \frac{L}{1000ml}$$

M_n (mg) = $\frac{L}{1000\ ml}$ x 0.10 $\frac{mg}{L}$ x 107.00 ml = 0.01 mg

Stack H_2SO_4 Concentration (g/dscf)

$$c_s(g/dscf) = 0.001 \times \frac{M_n}{V_{m(std)}}$$

c_s (g/dscf) = $\frac{g}{1000\ mg}$ x $\frac{0.01\ mg}{37.73\ dscf}$ = $\frac{2.90E-07\ g}{dscf}$

Stack H_2SO_4 Concentration (gr/dscf)

$$c'_s(gr/dscf) = 0.001 \times \frac{M_n}{V_{m(std)}} \times \frac{7000}{453.592}$$

c'$_s$ (gr/dscf) = $\frac{g}{1000\ mg}$ x $\frac{0.01\ mg}{37.73\ dscf}$ x $\frac{7000\ gr}{lb}$ x $\frac{lb}{453.592\ g}$ = $\frac{4.50E-06\ gr}{dscf}$

Stack H_2SO_4 Concentration (g/L)

$$c''_s(g/L) = c_s \times \frac{dscf}{28.31685dsL}$$

c'$_s$ (gr/dscf) = 2.92E-07 $\frac{g}{dscf}$ x $\frac{dscf}{28.31685\ dsL}$ = $\frac{1.00E-08\ g}{L}$

Stack H_2SO_4 Concentration (ppmvd)

$$c'''_s(ppmvd) = \frac{M_n}{V_{m(std)}} \times Ideal\ Gas\ Constant \times \frac{10^6 parts}{million\ parts} \times \frac{1}{Mol\ Wt}$$

c'''$_s$ (ppmvd) = 1.03E-08 $\frac{g}{L}$ x $\frac{24.04\ L\ gas}{lb\text{-}mol}$ x $\frac{10^6\ parts}{MM\ parts}$ x $\frac{lb\text{-}mol}{98.0790\ lb}$ = 0.0025 ppmvd

H_2SO_4 Emissions Rate (lb/MMBtu)

Oxygen Based:

$$E'''(lb/MMBtu) = \frac{M_n \times F_d}{V_{m(std)} \times 1000 \times 453.592} \times \left(\frac{20.9}{20.9 - \%O_2}\right)$$

E''' (lb/MMBtu) = $\frac{g}{1000\ mg}$ x $\frac{lb}{453.592\ g}$ x $\frac{0.01\ mg}{37.73\ dscf}$ x $\frac{8,633.27\ dscf}{MMBtu}$ x ($\frac{20.9}{20.9 - 13.4\ \%}$) = $\frac{0.000015\ lb}{MMBtu}$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (FFACTOR)

RM 19, (02-27-14),
2.0 Summary of Method,
2.1 Emission Rates. Oxygen (O_2) or carbon dioxide (CO_2) concentrations and appropriate F factors (ratios of combustion gas volumes to heat inputs) are used to calculate pollutant emission rates from pollutant concentrations.

RM 19, (02-27-14),
12.2 Emission Rates of PM, SO_2, and NOx. Select from the following sections the applicable procedure to compute the PM, SO_2, or NOx emission rate (E) in lb/MMBtu. The pollutant concentration must be in lb/scf and the F factor must be in scf/MMBtu. If the pollutant concentration (C) is not in the appropriate units, use Table 19–1 in Section 17.0 to make the proper conversion. An F factor is the ratio of the gas volume of the products of combustion to the heat content of the fuel. The dry F factor (F_d) includes all components of combustion less water, the wet F factor (F_w) includes all components of combustion, and the carbon F factor (F_c) includes only carbon dioxide.

Mark's Std Hdbk, 10th ed.,pg 4-26
High Heat Value Dry (HHV_{dry}), calc for Methane (single component for the fuel gas)

$$HHV_{dry}(Btu/SCF)=\left[\left(\frac{M_{\%}}{100}\right)\times GCM\right]$$

$$HHV_{dry} = \frac{97.80\ \%}{100.00} \times \frac{994.85\ Btu}{SCF} = \frac{972.91\ \ Btu}{SCF}$$

Mark's Std Hdbk, 10th ed., pg 4-26
Low Heat Value Dry (LHV_{dry}), calc for Methane (single component for the fuel gas)

$$LHV_{dry}(Btu/SCF)=\left[\left(\frac{M_{\%}}{100}\right)\times NCM\right]$$

$$LHV_{dry} = \frac{97.80\ \%}{100.00} \times \frac{895.75\ Btu}{SCF} = \frac{876.00\ \ Btu}{SCF}$$

Civil Eng. Ref. Man.,7th Ed.,pg 14-9/GPA Ref. Bulletin 181-86, App. C
High Heat Value Wet (HHV_{wet}), calc for entire sample (all components of the fuel gas)

$$HHV_{wet}(Btu/SCF)=\frac{HHV_{dry}}{W/D.factor}$$

$$HHV_{wet} = \frac{1{,}005.86\ Btu/SCF}{1.0236} = 982.67\ Btu/SCF$$

Civil Eng. Ref. Man.,7th Ed.,pg 14-9/GPA Ref. Bulletin 181-86, App. C
Low Heat Value Wet (LHV_{wet}), calc for entire sample (all components of the fuel gas)

$$LHV_{wet}(Btu/SCF)=\frac{LHV_{dry}}{W/D.factor}$$

$$LHV_{wet} = \frac{906.15\ Btu/SCF}{1.0236} = 885.26\ Btu/SCF$$

Lbs Component per Lb-Mol of Gas (CM), calc for Methane (single component for the fuel gas)

$$CM(lb/lb-mol)=\left[\left(\frac{M_{\%}}{100}\right)\times MW\right]$$

$$CM = \frac{97.80\ \%}{100.00} \times \frac{16.04\ \ lb}{lb\text{-}mol} = 15.69\ lb/lb\text{-}mol$$

ASTM D 3588
Fuel Molecular Weight (MW_{Fuel})

$$MW_{Fuel}(lb/lb\cdot mol)=\left[\sum(CM)\right]$$

MW_{Fuel} = 15.69 lb/lb-mol
+ 0.55 lb/lb-mol
+ etc. = 16.357 lb/lb-mol

Btu per Lb of Gas Gross (**GCV**)

$$GCV(Btu/lb)=\left[\frac{HHV_{dry}\times G}{MW_{Fuel}}\right]$$

$$GCV = \frac{1{,}005.86\ Btu/SCF \times 385.23\ ft^3/lbmol}{16.357\ lb/lb\text{-}mol} = 23{,}689.40\ Btu/lb$$

ASTM D 3588 (SG)
Specific Gravity

$$SG=\left[\frac{MW_{Fuel}}{MW_{AIR}}\right]$$

$$SG = \frac{16.36\ lb/lb\text{-}mol}{28.96\ lb/lb\text{-}mol} = 0.5648$$

Btu per Lb of Gas Net (**NCV**)

$$NCV(Btu/lb)=\left[\frac{LHV_{dry}\times G}{MW_{Fuel}}\right]$$

$$NCV = \frac{906.15\ Btu/SCF \times 385.23\ ft^3/lbmol}{16.357\ lb/lb\text{-}mol} = 21{,}341.06\ Btu/lb$$

Weight Percent of Component ($C_{\%}$), methane

$$C_{\%}(\%)=\left[\left(\frac{CM}{MW_{Fuel}}\right)\times 100\right]$$

$$C_{\%} = \frac{15.69\ lb/lb\text{-}mol}{16.36\ lb/lb\text{-}mol} \times 100 = 95.92\ \%$$

Weight Percent of Volatile Organic Compounds ($VOC_{\%}$)

$$VOC_{\%}(\%)=\left[\sum_{C_3H_8}^{C_8H_{18}} M_{\%}\right]$$

$VOC_{\%}$ = 0.12 % + 0.00 % + 0.00 % + etc. = 0.12 %

RM 19, (02-27-14), 12.3.2 Determined **F Factors**. If the fuel burned is not listed in Table 19–2 or if the owner or operator chooses to determine an F factor rather than use the values in Table 19–2, use the procedure below: 12.3.2.1 Equations. Use the eq

$$F_d=\frac{K(K_{hd}\%H+K_c\%C+K_s\%S+K_n\%N-K_o\%O)}{GCV} \quad \text{Eq. 19-13}$$

RM 19, (02-27-14),
12.1 Nomenclature

K (scf/lb)/%

H	3.64
C	1.53
S	0.57
N_2	0.14
O_2	0.46

$$F_d = \frac{10^6 Btu}{MMBtu} \times \left\{ \frac{3.64\ SCF}{lb\cdot\%} \times 24.80\ \% + \frac{1.53\ SCF}{lb\cdot\%} \times 74.62\ \% + \frac{0.57\ SCF}{lb\cdot\%} \times 0.00\ \% + \frac{0.14\ SCF}{lb\cdot\%} \times 0.51\ \% - \frac{0.46\ SCF}{lb\cdot\%} \times 0.07\ \% \right\} \times \frac{lb}{23{,}689.40\ Btu} = \frac{8{,}632.22\ SCF}{MMBtu}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

Note: RHsp (gr/lb) calculated using temperature, relative humidity, and barometric pressure with psychrometric chart, psychrometric calculator, or built in psychrometric algorithm.

$$RH_{sp}(lb/lb) = \left[\left(\frac{gr}{lb}\right) \times \frac{lb}{7000gr}\right]$$

$$RH_{sp} = \frac{68.12\ gr}{lb} \times \frac{l\ lb}{7000\ gr} = 0.009731 \frac{lb\ H_2O}{lb\ Air}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Analyzer Calibration Error

RM 7E, (02-27-14), 12.2 Analyzer Calibration Error. For non-dilution systems, use Equation 7E-1 to calculate the analyzer calibration error for the low-, mid-, and high-level calibration gases. (calc for NOx analyzer mid gas, if applicable)

$$ACE = \left(\frac{C_{Dir} - C_V}{CS}\right) \times 100$$

Eq. 7E-1

$$ACE = \frac{4.83\ ppm - 4.92\ ppm}{8.90\ ppm} \times 100 = -1.01\ \%$$

Calibration Error and Estimated Point, RM 25A, THC/VOC Analyzer

RM 25A, (02-27-14), 8.4 Calibration Error Test. Immediately prior to the test series (within 2 hours of the start of the test), introduce zero gas and high-level calibration gas at the calibration valve assembly. Adjust the analyzer output to the appropriate levels, if necessary. Calculate the predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response. Then introduce low-level and mid-level calibration gases successively to the measurement system. ... These differences must be less than 5 percent of the respective calibration gas value. (calc for THC/VOC analyzer mid gas, if applicable)

$$E_P = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)}$$

Eq. of a line
y=mx+b

$$E_p = \frac{8.28\ ppm - 0.00\ ppm}{8.29\ ppm - 0.00\ ppm} \times 5.11\ ppm + 0.00 = 5.10\ ppm$$

$$ACE = \left(\frac{C_{Dir} - C_V}{CS}\right) \times 100$$

Eq. 7E-1

$$ACE_{VOC} = \frac{4.85\ ppm - 5.10\ ppm}{5.11\ ppm} \times 100 = -4.97\ \%$$

EXAMPLE CALCULATIONS (BIAS, DRIFT, AND CORRECTED RAW AVERAGE)

System Bias

RM 7E, (02-27-14), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for NOx analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{CS}\right) \times 100$$

Eq. 7E-2

$$SB = \frac{4.85\ ppm - 4.83\ ppm}{8.90\ ppm} \times 100 = 0.22\ \%$$

Drift Assessment

RM 7E, (02-27-14), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for NOx analyzer upscale drift, Run 1, if applicable)

$$D = \left|SB_{final} - SB_i\right|$$

Eq. 7E-4

$$D = |\ 0.94\ \% - 0.22\ \%\ | = 0.72\ \%$$

Alternative Drift and Bias

RM 7E, (02-27-14), 13.2 / 13.3 System Bias and Drift. Alternatively, the results are acceptable if |Cs – Cdir| is ≤ 0.5 ppmv or if |Cs – Cv| is ≤ 0.5 ppmv (as applicable). (calc for NOx analyzer initial upscale, Run 1, if applicable)

$$SB/D_{Alt} = \left|C_S - C_{Dir}\right|$$

Eq. Section 13.2 and 13.3

$$SB / D_{Alt} = |\ 4.85\ ppm - 4.83\ ppm\ | = 0.02\ ppm$$

Bias Adjusted Average

RM 7E, (02-27-14), 12.6 Effluent Gas Concentration. For each test run, calculate Cavg, the arithmetic average of all valid NOx concentration values (e.g., 1-minute averages). Then adjust the value of Cavg for bias, using Equation 7E-5b. (calc for NOx analyzer, Run 1, if applicable)

$$C_{Gas} = \left(C_{Avg} - C_O\right) \times \left(\frac{C_{MA}}{C_M - C_O}\right)$$

Eq. 7E-5b

$$C_{Gas} = \left(2.08\ ppm - -0.01\ ppm\right)\left(\frac{4.92\ ppm}{4.88\ ppm - -0.01\ ppm}\right) = 2.11\ ppm$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (RUNS)

Stack Exhaust Flow (Q_S) - RM19

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1{,}000{,}000}\right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O2)}}\right)$$

Note: Equation presented in EPA Emission Measurement Center (EMC), Frequently Asked Questions (FAQ) for Method 19

$$Q_S = \frac{8{,}632.22 \text{ SCF}}{\text{MMBtu}} \times \frac{2{,}095{,}143.00 \text{ SCF}}{\text{hr}} \times \frac{1{,}005.86 \text{ Btu}}{\text{SCF}} \times \frac{\text{MMBtu}}{10^6 \text{ Btu}} \times \left(\frac{20.90\%}{20.9\% - 13.6\ \%}\right) = 51{,}977{,}205.83 \text{ SCFH}$$

Moisture Correction

RM 7E, (02-27-14), 12.10 Moisture Correction. Use Equation 7E-10 if your measurements need to be corrected to a dry basis. (calc for NOx analyzer, Run 1, if applicable) Note: Calculations may not match as Run 1 results are typically also bias adjusted

$$C_W = C_D \times (1 - B_{WS})$$

$$C_D = \frac{C_W}{1 - B_{WS}}$$ Eq. 7E-10

$C_D = \frac{1.97 \text{ ppmvw}}{1 - 0.06} = 2.11$ ppmvc or inversely, $C_W = 2.11$ ppmvd $\times (1 - 0.06) = 1.97$ ppmvw

Diluent-Corrected Pollutant Concentration, O_2 Based

RM 20, (11-26-02), 7.3.1 Correction of Pollutant Concentration Using O_2 Concentration. Calculate the O_2 corrected pollutant concentration, as follows: (calc for NOx gas, Run 1, if applicable) [now contained in applicable Subpart]

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O2)}}\right)$$ Eq. 20-4

$C_{adj} = 2.11$ ppm $\times \left(\frac{20.9\% - 15.00\ \%}{20.9\% - 13.59\ \%}\right) = 1.70$ ppm@15%O_2

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

APPENDIX B

EMISSION DATA RECORDS

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
Unit Operations Data

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**206.87**	**2095143.28**	**0.00**	**89.11**
Time	CT MEGAWATT SELECT MW 11HAD00EU001 XQ04	VOLUMETRIC TOTAL GAS FLOW SCFH 11HAD00EU001 XQ27	HRSG1 DB NG FLOW1 KPPH 11HHA10CF001 XQ01	TOTAL GAS FUEL FLOW KPPH 11MBP10CF910 XQ07
Note: System time offset one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 16:52:00:000	206.99046	2092509.8	0.0034248	89.15962
2018/09/25 16:53:00:000	206.99046	2093407.2	0.0034248	89.13533
2018/09/25 16:54:00:000	206.99046	2097966.5	0.0034248	89.13533
2018/09/25 16:55:00:000	206.6563	2097102	0.0034248	89.08363
2018/09/25 16:56:00:000	207.15526	2096651.5	0.0034248	89.08363
2018/09/25 16:57:00:000	207.15526	2096047.1	0.0034248	89.10239
2018/09/25 16:58:00:000	206.94987	2096424.8	0.0034248	89.10239
2018/09/25 16:59:00:000	206.94987	2096772.5	0.0034248	89.10239
2018/09/25 17:00:00:000	206.94987	2094151.4	0.0034248	89.1956
2018/09/25 17:01:00:000	206.94987	2097167.5	0.0034248	89.072205
2018/09/25 17:02:00:000	206.94987	2092217.2	0.0034248	89.21742
2018/09/25 17:03:00:000	206.94987	2095334.4	0.0034248	89.14716
2018/09/25 17:04:00:000	206.94987	2096876.1	0.0034248	89.14716
2018/09/25 17:05:00:000	206.94987	2097472.5	0.0034248	89.14716
2018/09/25 17:06:00:000	206.94987	2096614.5	0.0034248	89.14716
2018/09/25 17:07:00:000	206.94987	2096155.2	0.0034248	89.14716
2018/09/25 17:08:00:000	206.94987	2095696.1	0.0034248	89.14716
2018/09/25 17:09:00:000	206.94987	2095636	0.0034248	89.08043
2018/09/25 17:10:00:000	206.94987	2094032.4	0.0034248	89.08043
2018/09/25 17:11:00:000	206.94987	2094226.5	0.0034248	89.08043
2018/09/25 17:12:00:000	206.94987	2097049.6	0.0034248	89.15825
2018/09/25 17:13:00:000	206.94987	2096774.2	0.0034248	89.15825
2018/09/25 17:14:00:000	206.94987	2094190.4	0.0034248	89.15825
2018/09/25 17:15:00:000	206.94987	2094475.4	0.0034248	89.07872
2018/09/25 17:16:00:000	206.94987	2094886.4	0.0034248	89.07872
2018/09/25 17:17:00:000	206.75887	2094500.2	0.0034248	89.07872
2018/09/25 17:18:00:000	206.75887	2093104.8	0.0034248	89.07872
2018/09/25 17:19:00:000	206.75887	2093337.5	0.0034248	89.18068
2018/09/25 17:20:00:000	206.88487	2092853.1	0.0034248	88.94061
2018/09/25 17:21:00:000	206.88487	2097154.5	0.0034248	89.0938
2018/09/25 17:22:00:000	206.88487	2099829.2	0.0034248	89.12959
2018/09/25 17:23:00:000	206.88487	2093591.4	0.0034248	89.12959
2018/09/25 17:24:00:000	206.88487	2095542.2	0.0034248	89.06823
2018/09/25 17:25:00:000	206.88487	2095484	0.0034248	89.19249
2018/09/25 17:26:00:000	206.62627	2094707.4	0.0034248	89.00996
2018/09/25 17:27:00:000	206.62627	2094246.5	0.0034248	89.15744
2018/09/25 17:28:00:000	206.87631	2094093.4	0.0034248	89.15744
2018/09/25 17:29:00:000	206.87631	2093450.2	0.0034248	89.09917
2018/09/25 17:30:00:000	206.87631	2097591.5	0.0034248	89.154434
2018/09/25 17:31:00:000	206.87631	2097909	0.0034248	89.154434
2018/09/25 17:32:00:000	206.87631	2095809.4	0.0034248	89.154434
2018/09/25 17:33:00:000	206.87631	2096137.8	0.0034248	89.154434
2018/09/25 17:34:00:000	206.87631	2091909.4	0.0034248	89.10352
2018/09/25 17:35:00:000	206.26053	2091428.1	0.0034248	88.936356
2018/09/25 17:36:00:000	206.8802	2094122.2	0.0034248	89.00545
2018/09/25 17:37:00:000	206.8802	2093325.4	0.0034248	89.16067
2018/09/25 17:38:00:000	206.5308	2092300.4	0.0034248	89.16067
2018/09/25 17:39:00:000	207.01653	2092746.1	0.0034248	89.125916
2018/09/25 17:40:00:000	207.01653	2097315.5	0.0034248	89.125916
2018/09/25 17:41:00:000	207.01653	2096189.6	0.0034248	89.125916
2018/09/25 17:42:00:000	206.7468	2098122.2	0.0034248	89.125916
2018/09/25 17:43:00:000	206.7468	2093744.5	0.0034248	89.125916
2018/09/25 17:44:00:000	206.7468	2094777.4	0.0034248	89.09584
2018/09/25 17:45:00:000	206.7468	2096146.1	0.0034248	89.09584
2018/09/25 17:46:00:000	206.7468	2095318.5	0.0034248	89.09584
2018/09/25 17:47:00:000	206.7468	2095149.4	0.0034248	89.008415
2018/09/25 17:48:00:000	206.7468	2095221.9	0.0034248	89.12211
2018/09/25 17:49:00:000	206.7468	2095183.2	0.0034248	89.12211
2018/09/25 17:50:00:000	206.7468	2093189	0.0034248	89.0507
2018/09/25 17:51:00:000	206.65353	2093228.4	0.0034248	89.0507

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**206.42**	**2091745.53**	**0.00**	**89.00**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG1 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	11HAD00EU001	11HAD00EU001	11HHA10CF001	11MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 18:13:00:000	206.64647	2099081.2	0.0034248	89.04799
2018/09/25 18:14:00:000	206.64647	2094539	0.0034248	89.04799
2018/09/25 18:15:00:000	206.64647	2094997.1	0.0034248	89.04799
2018/09/25 18:16:00:000	206.64647	2094302.8	0.0034248	89.04799
2018/09/25 18:17:00:000	206.64647	2094282.8	0.0034248	89.04799
2018/09/25 18:18:00:000	206.58878	2090318.4	0.0034248	89.04799
2018/09/25 18:19:00:000	206.58878	2092167	0.0034248	88.96357
2018/09/25 18:20:00:000	206.58878	2091505.9	0.0034248	89.02887
2018/09/25 18:21:00:000	206.58878	2092198.2	0.0034248	89.02887
2018/09/25 18:22:00:000	206.58878	2092189.2	0.0034248	89.02887
2018/09/25 18:23:00:000	206.58878	2093576.4	0.0034248	89.02887
2018/09/25 18:24:00:000	206.58878	2094983.2	0.0034248	89.02887
2018/09/25 18:25:00:000	206.45906	2093198.9	0.0034248	89.02887
2018/09/25 18:26:00:000	206.45906	2091887.5	0.0034248	89.02887
2018/09/25 18:27:00:000	206.45906	2090737.2	0.0034248	88.97801
2018/09/25 18:28:00:000	206.61256	2091603.9	0.0034248	88.97801
2018/09/25 18:29:00:000	206.61256	2091672.9	0.0034248	89.07643
2018/09/25 18:30:00:000	206.61256	2091440.2	0.0034248	89.07643
2018/09/25 18:31:00:000	206.22247	2091084.4	0.0034248	89.0008
2018/09/25 18:32:00:000	206.55214	2091603.4	0.0034248	89.0008
2018/09/25 18:33:00:000	206.55214	2091855.6	0.0034248	89.0008
2018/09/25 18:34:00:000	206.55214	2095436	0.0034248	89.03546
2018/09/25 18:35:00:000	206.55214	2093949.6	0.0034248	89.004074
2018/09/25 18:36:00:000	206.41148	2092255.5	0.0034248	89.004074
2018/09/25 18:37:00:000	206.41148	2091066.6	0.0020549	89.004074
2018/09/25 18:38:00:000	206.41148	2091230.2	0.0020549	89.004074
2018/09/25 18:39:00:000	206.41148	2093310.5	0.0020549	89.004074
2018/09/25 18:40:00:000	206.41148	2092486.4	0.0020549	89.228745
2018/09/25 18:41:00:000	206.41148	2093448	0.0020549	89.02167
2018/09/25 18:42:00:000	206.41148	2092775	0.0020549	89.02167
2018/09/25 18:43:00:000	206.57852	2075268.5	0.0020549	88.90518
2018/09/25 18:44:00:000	206.43597	2073803.5	0.0020549	88.63934
2018/09/25 18:45:00:000	206.6159	2096943.5	0.0020549	89.24779
2018/09/25 18:46:00:000	206.6159	2080692.2	0.0020549	88.86258
2018/09/25 18:47:00:000	205.85535	2099319.2	0.0020549	89.22862
2018/09/25 18:48:00:000	205.7944	2086660.5	0.0020549	88.70805
2018/09/25 18:49:00:000	205.7944	2084174.8	0.0020549	88.86585
2018/09/25 18:50:00:000	206.63008	2099535	0.0020549	88.89804
2018/09/25 18:51:00:000	205.84076	2083590.9	0.0020549	88.89804
2018/09/25 18:52:00:000	206.42455	2102724.2	0.0020549	89.10206
2018/09/25 18:53:00:000	206.42455	2092766	0.0020549	88.96239
2018/09/25 18:54:00:000	206.42455	2083329.9	0.0020549	88.96239
2018/09/25 18:55:00:000	206.42455	2098301.8	0.0020549	89.09124
2018/09/25 18:56:00:000	206.42455	2101161.8	0.0020549	89.09124
2018/09/25 18:57:00:000	206.42455	2083091	0.0020549	88.91807
2018/09/25 18:58:00:000	206.42455	2089365	0.0020549	88.9963
2018/09/25 18:59:00:000	206.42455	2090626	0.0020549	89.129105
2018/09/25 19:00:00:000	206.42455	2095282.2	0.0020549	89.03006
2018/09/25 19:01:00:000	206.42455	2099796.8	0.0020549	89.03006
2018/09/25 19:02:00:000	206.42455	2084763.2	0.0020549	88.932434
2018/09/25 19:03:00:000	206.21455	2083993.1	0.0020549	88.932434
2018/09/25 19:04:00:000	206.21455	2092370.2	0.0020549	88.985275
2018/09/25 19:05:00:000	206.01367	2092254.1	0.0020549	88.985275
2018/09/25 19:06:00:000	206.01367	2092981.6	0.0020549	89.03348
2018/09/25 19:07:00:000	206.41437	2091353.9	0.0020549	88.8981
2018/09/25 19:08:00:000	206.41437	2093146.6	0.0020549	88.928246
2018/09/25 19:09:00:000	206.01884	2092370.8	0.0020549	88.928246
2018/09/25 19:10:00:000	206.43898	2095733.4	0.0020549	89.04379
2018/09/25 19:11:00:000	206.43898	2091357.4	0.0020549	88.968445
2018/09/25 19:12:00:000	206.43898	2092791.8	0.0020549	89.04931

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**206.13**	**2089719.89**	**0.00**	**88.89**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG1 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	11HAD00EU001	11HAD00EU001	11HHA10CF001	11MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 19:51:00:000	206.56883	2116054.8	0.0034248	89.16432
2018/09/25 19:52:00:000	205.9256	2068775.8	0.0034248	88.81766
2018/09/25 19:53:00:000	205.82968	2073306.9	0.0034248	88.8491
2018/09/25 19:54:00:000	207.25995	2091374.8	0.0034248	88.87486
2018/09/25 19:55:00:000	206.66446	2119962.8	0.0034248	88.87486
2018/09/25 19:56:00:000	205.99844	2077905.2	0.0034248	88.80574
2018/09/25 19:57:00:000	206.85045	2096751.8	0.0034248	89.06781
2018/09/25 19:58:00:000	206.16284	2080167	0.0034248	89.0939
2018/09/25 19:59:00:000	206.21808	2085168	0.0034248	88.792435
2018/09/25 20:00:00:000	206.21808	2094434.4	0.0034248	89.0389
2018/09/25 20:01:00:000	206.56924	2088555.6	0.0034248	89.0389
2018/09/25 20:02:00:000	206.28168	2085515.9	0.0034248	88.94696
2018/09/25 20:03:00:000	206.28168	2102217.8	0.0034248	89.107285
2018/09/25 20:04:00:000	206.28168	2084002	0.0034248	88.90076
2018/09/25 20:05:00:000	206.60124	2084337.8	0.0034248	88.96069
2018/09/25 20:06:00:000	206.60124	2105807.5	0.0034248	88.96069
2018/09/25 20:07:00:000	206.22162	2086970.2	0.0034248	88.82686
2018/09/25 20:08:00:000	206.22162	2085613.5	0.0034248	88.953
2018/09/25 20:09:00:000	206.22162	2088950.4	0.0034248	88.953
2018/09/25 20:10:00:000	206.22162	2092689.9	0.0034248	88.953
2018/09/25 20:11:00:000	206.22162	2094461	0.0034248	88.88961
2018/09/25 20:12:00:000	206.22162	2090973.9	0.0034248	88.88961
2018/09/25 20:13:00:000	206.22162	2091851.4	0.0034248	88.88961
2018/09/25 20:14:00:000	206.22162	2092508	0.0034248	88.88961
2018/09/25 20:15:00:000	206.22162	2092375.2	0.0034248	88.88961
2018/09/25 20:16:00:000	206.22162	2092007	0.0034248	88.88961
2018/09/25 20:17:00:000	205.9125	2088731.5	0.0034248	88.77124
2018/09/25 20:18:00:000	205.9125	2087706	0.0034248	88.84733
2018/09/25 20:19:00:000	205.9125	2086710.5	0.0034248	88.84733
2018/09/25 20:20:00:000	205.9125	2091696.9	0.0034248	88.8079
2018/09/25 20:21:00:000	205.9125	2087657.4	0.0034248	88.8079
2018/09/25 20:22:00:000	205.9125	2088221.1	0.0034248	88.92718
2018/09/25 20:23:00:000	205.9125	2088720.2	0.0034248	88.842316
2018/09/25 20:24:00:000	205.9125	2088217.6	0.0034248	88.74787
2018/09/25 20:25:00:000	205.9125	2085386.4	0.0034248	88.81616
2018/09/25 20:26:00:000	205.9125	2086311	0.0034248	88.81616
2018/09/25 20:27:00:000	205.9125	2087745.8	0.0034248	88.81616
2018/09/25 20:28:00:000	205.9125	2088240	0.0034248	88.81616
2018/09/25 20:29:00:000	205.9125	2088358.2	0.0034248	88.81616
2018/09/25 20:30:00:000	205.9125	2088962.5	0.0034248	88.94191
2018/09/25 20:31:00:000	205.9125	2089456.2	0.0034248	88.7471
2018/09/25 20:32:00:000	205.9125	2090222.5	0.0034248	88.86646
2018/09/25 20:33:00:000	206.20337	2089456.2	0.0034248	88.86646
2018/09/25 20:34:00:000	206.20337	2089701.5	0.0034248	88.94419
2018/09/25 20:35:00:000	206.20337	2092924	0.0034248	88.94419
2018/09/25 20:36:00:000	206.20337	2093724.8	0.0034248	88.94419
2018/09/25 20:37:00:000	206.20337	2089452.1	0.0034248	88.94419
2018/09/25 20:38:00:000	206.20337	2092892.4	0.0034248	88.94419
2018/09/25 20:39:00:000	206.20337	2089455.1	0.0034248	88.94419
2018/09/25 20:40:00:000	206.20337	2089094.5	0.0034248	88.94419
2018/09/25 20:41:00:000	206.20337	2089793.1	0.0034248	88.94419
2018/09/25 20:42:00:000	206.20337	2083521.6	0.0034248	88.87656
2018/09/25 20:43:00:000	206.20337	2085093.4	0.0034248	88.87656
2018/09/25 20:44:00:000	205.6989	2092485.1	0.0034248	88.77988
2018/09/25 20:45:00:000	205.6989	2088269.5	0.0034248	88.77988
2018/09/25 20:46:00:000	205.6989	2090368.8	0.0034248	88.86218
2018/09/25 20:47:00:000	205.6989	2081449.6	0.0034248	88.73709
2018/09/25 20:48:00:000	205.82227	2087796.6	0.0034248	88.85785
2018/09/25 20:49:00:000	205.82227	2089952.9	0.0034248	88.80904
2018/09/25 20:50:00:000	205.82227	2092679.5	0.0034248	88.78766

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
Unit Operations Data

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**211.11**	**2128585.04**	**16.10**	**90.64**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG1 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	11HAD00EU001	11HAD00EU001	11HHA10CF001	11MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 10:20:00:000	211.48035	2116300	16.117199	90.57444
2018/09/25 10:21:00:000	211.48035	2132331.2	16.09117	90.82739
2018/09/25 10:22:00:000	211.48035	2139236.5	16.09117	90.659004
2018/09/25 10:23:00:000	211.23233	2122908	16.09117	90.69632
2018/09/25 10:24:00:000	211.61517	2140348	16.09117	90.69632
2018/09/25 10:25:00:000	211.61517	2124879.2	16.111032	90.631996
2018/09/25 10:26:00:000	211.34164	2120075	16.111032	90.76417
2018/09/25 10:27:00:000	211.34164	2143322.8	16.111032	90.92467
2018/09/25 10:28:00:000	211.34164	2122605.5	16.111032	90.75724
2018/09/25 10:29:00:000	211.34164	2129441.5	16.111032	90.75724
2018/09/25 10:30:00:000	211.67445	2150751.8	16.111032	90.92613
2018/09/25 10:31:00:000	211.21979	2123427.8	16.111032	90.69119
2018/09/25 10:32:00:000	211.21979	2124796.5	16.102129	90.6312
2018/09/25 10:33:00:000	211.21979	2135802	16.102129	90.71254
2018/09/25 10:34:00:000	211.21979	2122920	16.102129	90.71254
2018/09/25 10:35:00:000	211.21979	2125975	16.102129	90.81316
2018/09/25 10:36:00:000	211.21979	2142698.8	16.102129	90.81316
2018/09/25 10:37:00:000	211.21979	2125467.2	16.102129	90.59698
2018/09/25 10:38:00:000	211.21979	2120096.8	16.102129	90.670456
2018/09/25 10:39:00:000	211.21979	2142163.8	16.102129	90.670456
2018/09/25 10:40:00:000	211.21979	2127503.5	16.102129	90.45266
2018/09/25 10:41:00:000	211.20375	2121072.2	16.102129	90.45266
2018/09/25 10:42:00:000	211.20375	2137666.2	16.102129	90.648026
2018/09/25 10:43:00:000	211.20375	2131402	16.102129	90.648026
2018/09/25 10:44:00:000	211.05135	2119903.5	16.102129	90.648026
2018/09/25 10:45:00:000	211.05135	2125672.2	16.102129	90.648026
2018/09/25 10:46:00:000	211.05135	2138397.8	16.102129	90.648026
2018/09/25 10:47:00:000	211.05135	2127592.2	16.102129	90.648026
2018/09/25 10:48:00:000	210.76817	2120087.5	16.102129	90.648026
2018/09/25 10:49:00:000	211.04117	2125884.8	16.102129	90.82149
2018/09/25 10:50:00:000	211.04117	2133908.2	16.102129	90.73563
2018/09/25 10:51:00:000	211.37761	2135211.2	16.087059	90.62367
2018/09/25 10:52:00:000	211.37761	2130496.5	16.087059	90.62367
2018/09/25 10:53:00:000	210.71857	2131022.5	16.087059	90.51688
2018/09/25 10:54:00:000	211.08418	2133932.5	16.087059	90.51688
2018/09/25 10:55:00:000	211.08418	2126612.5	16.087059	90.56998
2018/09/25 10:56:00:000	211.08418	2127805.8	16.104183	90.6356
2018/09/25 10:57:00:000	210.66232	2123234.2	16.104183	90.64386
2018/09/25 10:58:00:000	210.66232	2126248	16.104183	90.64386
2018/09/25 10:59:00:000	211.00533	2129352.5	16.104183	90.64386
2018/09/25 11:00:00:000	211.00533	2124210.5	16.104183	90.813065
2018/09/25 11:01:00:000	211.00533	2126705	16.104183	90.664474
2018/09/25 11:02:00:000	211.00533	2126785.2	16.104183	90.5453
2018/09/25 11:03:00:000	211.00533	2131659.8	16.104183	90.5453
2018/09/25 11:04:00:000	211.00533	2125475.5	16.104183	90.5453
2018/09/25 11:05:00:000	211.00533	2131051	16.104183	90.5453
2018/09/25 11:06:00:000	210.60077	2125163	16.104183	90.68649
2018/09/25 11:07:00:000	211.00725	2123977.5	16.104183	90.68649
2018/09/25 11:08:00:000	211.00725	2126057.5	16.104183	90.68649
2018/09/25 11:09:00:000	211.00725	2124345.2	16.104183	90.68649
2018/09/25 11:10:00:000	211.09702	2127602.2	16.104183	90.54216
2018/09/25 11:11:00:000	211.09702	2131676.5	16.104183	90.54216
2018/09/25 11:12:00:000	210.89598	2123775.2	16.104183	90.42555
2018/09/25 11:13:00:000	210.89598	2130829	16.104183	90.57951
2018/09/25 11:14:00:000	210.89598	2130943	16.104183	90.57951
2018/09/25 11:15:00:000	211.12488	2129908	16.104183	90.503235
2018/09/25 11:16:00:000	211.12488	2129468.8	16.104183	90.503235
2018/09/25 11:17:00:000	210.86754	2124269.2	16.104183	90.503235
2018/09/25 11:18:00:000	210.66824	2119036.8	16.104183	90.503235
2018/09/25 11:19:00:000	210.66824	2123610.2	16.086374	90.581635

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**210.34**	**2122302.42**	**16.11**	**90.36**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG1 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	11HAD00EU001	11HAD00EU001	11HHA10CF001	11MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 11:44:00:000	210.52037	2120418	16.10487	90.531006
2018/09/25 11:45:00:000	210.52037	2127214.8	16.10487	90.531006
2018/09/25 11:46:00:000	210.52037	2126690.5	16.10487	90.531006
2018/09/25 11:47:00:000	210.52037	2125035.5	16.10487	90.531006
2018/09/25 11:48:00:000	210.74509	2125670	16.10487	90.49521
2018/09/25 11:49:00:000	210.74509	2124724.8	16.10487	90.49521
2018/09/25 11:50:00:000	210.74509	2124490	16.10487	90.49521
2018/09/25 11:51:00:000	210.41583	2122780.2	16.10487	90.37451
2018/09/25 11:52:00:000	210.41583	2119236.2	16.10487	90.37451
2018/09/25 11:53:00:000	210.5239	2119803	16.10487	90.37451
2018/09/25 11:54:00:000	210.5239	2124700	16.10487	90.37451
2018/09/25 11:55:00:000	210.5239	2120789	16.10487	90.37451
2018/09/25 11:56:00:000	210.5239	2125804.8	16.10487	90.49695
2018/09/25 11:57:00:000	210.5239	2121981.2	16.10487	90.339714
2018/09/25 11:58:00:000	210.5239	2122448.5	16.10487	90.403694
2018/09/25 11:59:00:000	210.5239	2121992.2	16.10487	90.403694
2018/09/25 12:00:00:000	210.5239	2124186.2	16.10487	90.403694
2018/09/25 12:01:00:000	210.5239	2125309.5	16.10487	90.403694
2018/09/25 12:02:00:000	210.5239	2124789.2	16.10487	90.403694
2018/09/25 12:03:00:000	210.5239	2124952.8	16.10487	90.403694
2018/09/25 12:04:00:000	210.46133	2125066.2	16.10487	90.403694
2018/09/25 12:05:00:000	210.46133	2125542	16.10487	90.403694
2018/09/25 12:06:00:000	210.46133	2123810.5	16.10487	90.30316
2018/09/25 12:07:00:000	210.46133	2124242.2	16.10487	90.37359
2018/09/25 12:08:00:000	210.17078	2124709	16.10487	90.37359
2018/09/25 12:09:00:000	210.25044	2121489.2	16.10487	90.37359
2018/09/25 12:10:00:000	210.25044	2123445	16.10487	90.290344
2018/09/25 12:11:00:000	210.45561	2124078	16.10487	90.290344
2018/09/25 12:12:00:000	210.45561	2125115.5	16.117884	90.414764
2018/09/25 12:13:00:000	210.45561	2121459.5	16.117884	90.30348
2018/09/25 12:14:00:000	210.34253	2116806.2	16.117884	90.30348
2018/09/25 12:15:00:000	210.34253	2120096	16.117884	90.4102
2018/09/25 12:16:00:000	210.34253	2117794	16.097334	90.4102
2018/09/25 12:17:00:000	210.34253	2119002.2	16.097334	90.37479
2018/09/25 12:18:00:000	210.34253	2124024.2	16.097334	90.22237
2018/09/25 12:19:00:000	210.34253	2125842.5	16.097334	90.288414
2018/09/25 12:20:00:000	210.34253	2123173.8	16.097334	90.288414
2018/09/25 12:21:00:000	210.09712	2118778.2	16.097334	90.288414
2018/09/25 12:22:00:000	210.09712	2124820.5	16.097334	90.288414
2018/09/25 12:23:00:000	210.09712	2120403.2	16.097334	90.212166
2018/09/25 12:24:00:000	210.09712	2120038.8	16.111032	90.212166
2018/09/25 12:25:00:000	210.09712	2121054.8	16.111032	90.3448
2018/09/25 12:26:00:000	210.09712	2120821.5	16.111032	90.3448
2018/09/25 12:27:00:000	210.09712	2120247	16.111032	90.450775
2018/09/25 12:28:00:000	210.09712	2119518.5	16.111032	90.450775
2018/09/25 12:29:00:000	210.64842	2118431.5	16.111032	90.450775
2018/09/25 12:30:00:000	210.32823	2123664.2	16.111032	90.450775
2018/09/25 12:31:00:000	210.32823	2119287.2	16.111032	90.35276
2018/09/25 12:32:00:000	210.25775	2123081.8	16.100075	90.15761
2018/09/25 12:33:00:000	210.25775	2122206	16.100075	90.23875
2018/09/25 12:34:00:000	210.25775	2120855	16.100075	90.34223
2018/09/25 12:35:00:000	210.02289	2121021.8	16.100075	90.20767
2018/09/25 12:36:00:000	210.02289	2121781.8	16.100075	90.342606
2018/09/25 12:37:00:000	210.02289	2123969.8	16.100075	90.28888
2018/09/25 12:38:00:000	210.02289	2118681.8	16.100075	90.28888
2018/09/25 12:39:00:000	210.13275	2121207	16.112404	90.281784
2018/09/25 12:40:00:000	210.13275	2117412.2	16.112404	90.15707
2018/09/25 12:41:00:000	210.04501	2121432.5	16.112404	90.286964
2018/09/25 12:42:00:000	210.04501	2121805.8	16.112404	90.22057
2018/09/25 12:43:00:000	210.04501	2118912	16.112404	90.22057

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**209.27**	**2114001.84**	**16.10**	**90.00**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG1 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	11HAD00EU001	11HAD00EU001	11HHA10CF001	11MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	209.31358	2115002	9.58677	90.00289
2018/09/25 13:10:00:000	210.22772	2120308.5	16.108294	90.24419
2018/09/25 13:11:00:000	209.71103	2117708.8	16.108294	90.24419
2018/09/25 13:12:00:000	209.71103	2118607	16.108294	90.08908
2018/09/25 13:13:00:000	209.71103	2119009.5	16.102129	90.08908
2018/09/25 13:14:00:000	209.71103	2120395.2	16.102129	90.14778
2018/09/25 13:15:00:000	209.71103	2115919.8	16.102129	90.14778
2018/09/25 13:16:00:000	209.71103	2113974.5	16.102129	90.14778
2018/09/25 13:17:00:000	209.71103	2114394.8	16.102129	90.14778
2018/09/25 13:18:00:000	209.71103	2117719.2	16.102129	90.14778
2018/09/25 13:19:00:000	209.71103	2117234.2	16.102129	90.14778
2018/09/25 13:20:00:000	209.71103	2117004	16.102129	90.14778
2018/09/25 13:21:00:000	209.71103	2117936	16.102129	90.14778
2018/09/25 13:22:00:000	209.71103	2116195.5	16.102129	90.14778
2018/09/25 13:23:00:000	209.71103	2113952.2	16.102129	90.14778
2018/09/25 13:24:00:000	209.71103	2119100.8	16.102129	90.28032
2018/09/25 13:25:00:000	209.71103	2120193.2	16.102129	90.20247
2018/09/25 13:26:00:000	209.49774	2116773.8	16.102129	90.20247
2018/09/25 13:27:00:000	209.49774	2116484	16.102129	90.12979
2018/09/25 13:28:00:000	209.49774	2111807.5	16.102129	90.12979
2018/09/25 13:29:00:000	209.49774	2117844	16.102129	90.12979
2018/09/25 13:30:00:000	209.49774	2114737	16.102129	90.12979
2018/09/25 13:31:00:000	209.49774	2114531.5	16.102129	90.12979
2018/09/25 13:32:00:000	209.49774	2114812.5	16.098019	90.05994
2018/09/25 13:33:00:000	209.49774	2115912.5	16.098019	90.05994
2018/09/25 13:34:00:000	209.29831	2114198.5	16.098019	90.05994
2018/09/25 13:35:00:000	209.29831	2114719.8	16.098019	90.05994
2018/09/25 13:36:00:000	209.29831	2107062.5	16.098019	90.05994
2018/09/25 13:37:00:000	209.29831	2111946.5	16.098019	89.97656
2018/09/25 13:38:00:000	209.29831	2116451.5	16.098019	89.907135
2018/09/25 13:39:00:000	209.29831	2123952.8	16.098019	89.98874
2018/09/25 13:40:00:000	209.29831	2109316.5	16.098019	89.92592
2018/09/25 13:41:00:000	209.29831	2104508	16.098019	89.92592
2018/09/25 13:42:00:000	209.29831	2108646.2	16.098019	89.92592
2018/09/25 13:43:00:000	209.29831	2120345	16.098019	90.01801
2018/09/25 13:44:00:000	209.05458	2118048.8	16.098019	89.93681
2018/09/25 13:45:00:000	209.05458	2104046	16.098019	89.833115
2018/09/25 13:46:00:000	209.05458	2107801.5	16.098019	90.0179
2018/09/25 13:47:00:000	209.05458	2113493.8	16.098019	90.0179
2018/09/25 13:48:00:000	209.05458	2113356.5	16.098019	89.94121
2018/09/25 13:49:00:000	209.05458	2110914.5	16.098019	89.94121
2018/09/25 13:50:00:000	209.05458	2111504.2	16.098019	89.94121
2018/09/25 13:51:00:000	209.05458	2116488.5	16.098019	89.94121
2018/09/25 13:52:00:000	209.05458	2113376.8	16.098019	89.94121
2018/09/25 13:53:00:000	208.63916	2113555	16.098019	89.79225
2018/09/25 13:54:00:000	208.63916	2114255	16.098019	89.79225
2018/09/25 13:55:00:000	208.99493	2113951	16.098019	89.72542
2018/09/25 13:56:00:000	208.99493	2115173.5	16.098019	89.77428
2018/09/25 13:57:00:000	208.99493	2114126	16.098019	89.77428
2018/09/25 13:58:00:000	208.99493	2113314.2	16.098019	89.8209
2018/09/25 13:59:00:000	208.99493	2109122	16.098019	89.8209
2018/09/25 14:00:00:000	208.99493	2114408.5	16.098019	89.830246
2018/09/25 14:01:00:000	208.8409	2112427.2	16.098019	89.830246
2018/09/25 14:02:00:000	208.8409	2110720	16.098019	89.92894
2018/09/25 14:03:00:000	208.53719	2109238	16.098019	89.92894
2018/09/25 14:04:00:000	208.64731	2107288.8	16.098019	89.83522
2018/09/25 14:05:00:000	208.64731	2111991	16.098019	89.83522
2018/09/25 14:06:00:000	208.64731	2109375.5	16.098019	89.83522
2018/09/25 14:07:00:000	208.64731	2109820.5	16.098019	89.69255
2018/09/25 14:08:00:000	208.86307	2108894.8	16.098019	89.80907
2018/09/25 14:09:00:000	208.86307	2109715.2	16.098019	89.80907

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
NOx, CO, VOC, CO_2, and O_2 Data

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,095,143	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,095,143	SCFH

Weather Data

Barometric Pressure	30.28	in. Hg
Relative Humidity	96	%
Ambient Temperature	58	°F
Specific Humidity	0.009731	lb H_2O / lb air

Unit Data

Unit Load	206.9	megawatts
Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M19)	51,977,206	SCFH

Base Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 15:52:46	101940	13.58	2.25	-0.35	0.57	4.12
09/25/18 15:53:46	102000	13.57	2.23	-0.37	0.55	4.12
09/25/18 15:54:46	102060	13.58	2.23	-0.37	0.58	4.13
09/25/18 15:55:46	102120	13.58	2.16	-0.39	0.62	4.13
09/25/18 15:56:46	102180	13.59	2.16	-0.37	0.63	4.13
09/25/18 15:57:46	102240	13.58	2.13	-0.37	0.66	4.12
09/25/18 15:58:46	102300	13.60	2.13	-0.38	0.65	4.12
09/25/18 15:59:46	102360	13.59	2.10	-0.37	0.68	4.11
09/25/18 16:00:46	102420	13.59	2.08	-0.34	0.68	4.12
09/25/18 16:01:46	102480	13.58	2.03	-0.34	0.65	4.11
09/25/18 16:02:46	102540	13.60	2.05	-0.37	0.63	4.12
09/25/18 16:03:46	102600	13.58	2.07	-0.38	0.63	4.12
09/25/18 16:04:46	102660	13.58	2.06	-0.37	0.61	4.12
09/25/18 16:05:46	102720	13.58	2.04	-0.37	0.58	4.12
09/25/18 16:06:46	102780	13.57	2.02	-0.38	0.56	4.12
09/25/18 16:07:46	102840	13.57	2.00	-0.36	0.54	4.12
09/25/18 16:08:46	102900	13.55	1.99	-0.39	0.52	4.12
09/25/18 16:09:46	102960	13.54	1.98	-0.39	0.52	4.12
09/25/18 16:10:46	103020	13.53	1.99	-0.36	0.51	4.12
09/25/18 16:11:46	103080	13.52	2.02	-0.37	0.50	4.12
09/25/18 16:12:46	103140	13.48	2.01	-0.39	0.50	4.11
09/25/18 16:13:46	103200	13.41	2.03	-0.40	0.48	4.12
09/25/18 16:14:46	103260	13.40	2.04	-0.39	0.46	4.12
09/25/18 16:15:46	103320	13.39	2.04	-0.37	0.47	4.13
09/25/18 16:16:46	103380	13.41	2.06	-0.35	0.48	4.12
09/25/18 16:17:46	103440	13.46	2.04	-0.33	0.45	4.12
09/25/18 16:18:46	103500	13.56	2.05	-0.39	0.44	4.12
09/25/18 16:19:46	103560	13.44	2.10	-0.38	0.43	4.12
09/25/18 16:20:46	103620	13.44	2.07	-0.38	0.42	4.11
09/25/18 16:21:46	103680	13.42	2.06	-0.41	0.43	4.10
09/25/18 16:22:46	103740	13.43	2.06	-0.37	0.44	4.10
09/25/18 16:23:46	103800	13.45	2.08	-0.39	0.44	4.11
09/25/18 16:24:46	103860	13.45	2.07	-0.40	0.43	4.12
09/25/18 16:25:46	103920	13.42	2.04	-0.40	0.43	4.13
09/25/18 16:26:46	103980	13.41	2.04	-0.38	0.42	4.12
09/25/18 16:27:46	104040	13.69	2.08	-0.44	0.43	4.12
09/25/18 16:28:46	104100	13.97	2.07	-0.41	0.43	4.12
09/25/18 16:29:46	104160	13.65	2.07	-0.42	0.43	4.11
09/25/18 16:30:46	104220	13.50	2.12	-0.41	0.42	4.11
09/25/18 16:31:46	104280	13.48	2.09	-0.42	0.43	4.11
09/25/18 16:32:46	104340	13.49	2.07	-0.39	0.44	4.11
09/25/18 16:33:46	104400	13.49	2.08	-0.39	0.46	4.11
09/25/18 16:34:46	104460	13.48	2.12	-0.36	0.45	4.11
09/25/18 16:35:46	104520	13.44	2.11	-0.40	0.44	4.12
09/25/18 16:36:46	104580	13.44	2.11	-0.40	0.47	4.12
09/25/18 16:37:46	104640	13.44	2.12	-0.38	0.49	4.12
09/25/18 16:38:46	104700	13.43	2.16	-0.39	0.47	4.11
09/25/18 16:39:46	104760	13.44	2.14	-0.40	0.46	4.12
09/25/18 16:40:46	104820	13.47	2.15	-0.43	0.45	4.11
09/25/18 16:41:46	104880	13.47	2.13	-0.42	0.46	4.11
09/25/18 16:42:46	104940	13.41	2.09	-0.44	0.46	4.10
09/25/18 16:43:46	105000	13.41	2.12	-0.43	0.47	4.11
09/25/18 16:44:46	105060	13.42	2.13	-0.43	0.46	4.10
09/25/18 16:45:46	105120	13.45	2.08	-0.43	0.48	4.11
09/25/18 16:46:46	105180	13.50	2.09	-0.44	0.50	4.10
09/25/18 16:47:46	105240	13.52	2.07	-0.44	0.50	4.11
09/25/18 16:48:46	105300	13.54	2.09	-0.42	0.50	4.11
09/25/18 16:49:46	105360	13.52	2.10	-0.43	0.52	4.12
09/25/18 16:50:46	105420	13.46	2.10	-0.42	0.53	4.11
09/25/18 16:51:46	105480	13.55	2.09	-0.42	0.54	4.11
RAW AVERAGE		**13.51**	**2.08**	**-0.39**	**0.51**	**4.12**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.03	0.00	0.06	0.01	0.08
Bias	**Final Zero**	0.03	-0.02	-0.07	0.01	0.08
Bias	**Avg. Zero**	0.03	-0.01	-0.01	0.01	0.08
Bias	**Initial UpScale**	12.00	4.85	5.09	3.07	8.79
Bias	**Final UpScale**	11.98	4.91	4.97	3.13	8.75
Bias	**Avg. UpScale**	11.99	4.88	5.03	3.10	8.77
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	O_2	NOx	CO	VOC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.59	2.11	0.00	0.54	4.14
Concentration (ppm@ 15%O_2)	N/A	1.70	0.00	0.44	N/A

Non-Bias Adjusted Averages Include: *

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,091,745	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,091,745	SCFH

Weather Data

Barometric Pressure	30.22	in. Hg
Relative Humidity	93	%
Ambient Temperature	60	°F
Specific Humidity	0.010153	lb H_2O / lb air

Unit Data

Unit Load	206.4	megawatts
Meas. Stack Moisture	9.0	%
Stack Exhaust Flow (M19)	51,486,411	SCFH

Base Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 17:13:46	106800	13.44	2.13	-0.45	0.14	4.16
09/25/18 17:14:46	106860	13.88	2.11	-0.45	0.15	4.15
09/25/18 17:15:46	106920	13.65	2.12	-0.45	0.15	4.15
09/25/18 17:16:46	106980	13.69	2.15	-0.45	0.14	4.16
09/25/18 17:17:46	107040	13.89	2.15	-0.45	0.16	4.17
09/25/18 17:18:46	107100	13.41	2.12	-0.44	0.15	4.16
09/25/18 17:19:46	107160	13.42	2.13	-0.45	0.16	4.17
09/25/18 17:20:46	107220	13.42	2.14	-0.45	0.17	4.16
09/25/18 17:21:46	107280	13.44	2.12	-0.45	0.17	4.16
09/25/18 17:22:46	107340	13.41	2.11	-0.45	0.18	4.16
09/25/18 17:23:46	107400	13.40	2.12	-0.45	0.18	4.16
09/25/18 17:24:46	107460	13.42	2.11	-0.46	0.18	4.16
09/25/18 17:25:46	107520	13.42	2.10	-0.45	0.17	4.16
09/25/18 17:26:46	107580	13.41	2.08	-0.45	0.15	4.17
09/25/18 17:27:46	107640	13.40	2.13	-0.45	0.14	4.18
09/25/18 17:28:46	107700	13.39	1.99	-0.45	0.14	4.18
09/25/18 17:29:46	107760	13.38	1.93	-0.45	0.16	4.17
09/25/18 17:30:46	107820	13.39	2.14	-0.45	0.14	4.17
09/25/18 17:31:46	107880	13.39	2.12	-0.46	0.15	4.16
09/25/18 17:32:46	107940	13.38	2.09	-0.45	0.18	4.17
09/25/18 17:33:46	108000	13.38	2.10	-0.45	0.18	4.17
09/25/18 17:34:46	108060	13.38	1.65	-0.46	0.19	4.17
09/25/18 17:35:46	108120	13.39	2.11	-0.45	0.18	4.17
09/25/18 17:36:46	108180	13.38	1.80	-0.46	0.19	4.17
09/25/18 17:37:46	108240	13.38	1.38	-0.45	0.21	4.16
09/25/18 17:38:46	108300	13.38	1.63	-0.45	0.21	4.15
09/25/18 17:39:46	108360	13.37	1.49	-0.46	0.18	4.15
09/25/18 17:40:46	108420	13.37	1.71	-0.46	0.17	4.15
09/25/18 17:41:46	108480	13.36	2.12	-0.45	0.17	4.16
09/25/18 17:42:46	108540	13.36	1.68	-0.46	0.16	4.16
09/25/18 17:43:46	108600	13.36	1.90	-0.45	0.17	4.16
09/25/18 17:44:46	108660	13.36	1.34	-0.45	0.17	4.16
09/25/18 17:45:46	108720	13.36	1.47	-0.45	0.18	4.16
09/25/18 17:46:46	108780	13.37	1.11	-0.42	0.19	4.16
09/25/18 17:47:46	108840	13.36	1.48	-0.46	0.18	4.17
09/25/18 17:48:46	108900	13.36	1.33	-0.46	0.19	4.16
09/25/18 17:49:46	108960	13.36	1.39	-0.46	0.18	4.17
09/25/18 17:50:46	109020	13.36	1.49	-0.46	0.17	4.16
09/25/18 17:51:46	109080	13.36	1.84	-0.46	0.17	4.17
09/25/18 17:52:46	109140	13.35	0.97	-0.46	0.20	4.17
09/25/18 17:53:46	109200	13.37	0.99	-0.46	0.20	4.16
09/25/18 17:54:46	109260	13.38	1.08	-0.45	0.18	4.15
09/25/18 17:55:46	109320	13.37	1.47	-0.46	0.17	4.16
09/25/18 17:56:46	109380	13.37	1.79	-0.46	0.17	4.16
09/25/18 17:57:46	109440	13.36	1.38	-0.45	0.16	4.16
09/25/18 17:58:46	109500	13.36	1.27	-0.46	0.15	4.16
09/25/18 17:59:46	109560	13.36	1.63	-0.45	0.16	4.17
09/25/18 18:00:46	109620	13.36	1.10	-0.46	0.16	4.17
09/25/18 18:01:46	109680	13.36	1.60	-0.46	0.19	4.16
09/25/18 18:02:46	109740	13.36	1.03	-0.46	0.19	4.15
09/25/18 18:03:46	109800	13.36	1.39	-0.46	0.20	4.15
09/25/18 18:04:46	109860	13.35	1.21	-0.46	0.17	4.17
09/25/18 18:05:46	109920	13.36	1.71	-0.45	0.16	4.17
09/25/18 18:06:46	109980	13.36	1.50	-0.46	0.18	4.16
09/25/18 18:07:46	110040	13.36	1.21	-0.45	0.19	4.16
09/25/18 18:08:46	110100	13.36	1.14	-0.46	0.19	4.16
09/25/18 18:09:46	110160	13.36	0.72	-0.46	0.20	4.15
09/25/18 18:10:46	110220	13.36	1.80	-0.46	0.19	4.16
09/25/18 18:11:46	110280	13.36	1.47	-0.46	0.17	4.16
09/25/18 18:12:46	110340	13.37	1.27	-0.46	0.15	4.16
RAW AVERAGE		**13.40**	**1.68**	**-0.45**	**0.17**	**4.16**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.03	-0.02	-0.07	0.01	0.08
Bias	**Final Zero**	0.02	0.05	-0.14	0.08	0.06
Bias	**Avg. Zero**	0.02	0.02	-0.11	0.05	0.07
Bias	**Initial UpScale**	11.98	4.91	4.97	3.13	8.75
Bias	**Final UpScale**	11.91	4.45	5.05	3.24	8.89
Bias	**Avg. UpScale**	11.94	4.68	5.01	3.19	8.82
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	O_2	NOx	CO	VOC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.53	1.75	0.00	0.19	4.17
Concentration (ppm@ 15%O_2)	N/A	1.40	0.00	0.15	N/A

Non-Bias Adjusted Averages Include: *

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,089,719	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,089,719	SCFH

Weather Data

Barometric Pressure	29.98	in. Hg
Relative Humidity	99	%
Ambient Temperature	59	°F
Specific Humidity	0.010519	lb H_2O / lb air

Unit Data

Unit Load	206.1	megawatts
Meas. Stack Moisture	9.6	%
Stack Exhaust Flow (M19)	51,849,484	SCFH

Base Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 18:51:46	112680	13.34	2.14	-0.45	0.22	4.16
09/25/18 18:52:46	112740	13.36	2.08	-0.45	0.26	4.15
09/25/18 18:53:46	112800	13.36	2.05	-0.46	0.28	4.16
09/25/18 18:54:46	112860	13.36	2.03	-0.45	0.30	4.16
09/25/18 18:55:46	112920	13.37	2.00	-0.46	0.30	4.15
09/25/18 18:56:46	112980	13.39	2.00	-0.46	0.32	4.15
09/25/18 18:57:46	113040	13.37	1.98	-0.46	0.32	4.15
09/25/18 18:58:46	113100	13.38	1.96	-0.46	0.33	4.15
09/25/18 18:59:46	113160	13.37	1.99	-0.46	0.34	4.15
09/25/18 19:00:46	113220	13.37	1.96	-0.46	0.35	4.16
09/25/18 19:01:46	113280	13.37	1.98	-0.46	0.37	4.15
09/25/18 19:02:46	113340	13.37	1.96	-0.46	0.41	4.15
09/25/18 19:03:46	113400	13.36	1.94	-0.46	0.40	4.16
09/25/18 19:04:46	113460	13.38	1.92	-0.46	0.40	4.15
09/25/18 19:05:46	113520	13.38	1.94	-0.45	0.41	4.14
09/25/18 19:06:46	113580	13.36	1.93	-0.46	0.43	4.15
09/25/18 19:07:46	113640	13.38	1.90	-0.46	0.46	4.15
09/25/18 19:08:46	113700	13.38	1.88	-0.45	0.46	4.15
09/25/18 19:09:46	113760	13.37	1.92	-0.46	0.45	4.15
09/25/18 19:10:46	113820	13.38	1.92	-0.46	0.46	4.15
09/25/18 19:11:46	113880	13.38	1.89	-0.46	0.47	4.15
09/25/18 19:12:46	113940	13.39	1.79	-0.46	0.49	4.14
09/25/18 19:13:46	114000	13.39	1.74	-0.46	0.48	4.15
09/25/18 19:14:46	114060	13.39	1.94	-0.46	0.47	4.15
09/25/18 19:15:46	114120	13.39	1.84	-0.45	0.47	4.16
09/25/18 19:16:46	114180	13.40	1.60	-0.46	0.45	4.15
09/25/18 19:17:46	114240	13.40	1.52	-0.46	0.47	4.15
09/25/18 19:18:46	114300	13.40	1.72	-0.45	0.52	4.15
09/25/18 19:19:46	114360	13.41	1.17	-0.46	0.52	4.15
09/25/18 19:20:46	114420	13.42	1.67	-0.45	0.50	4.15
09/25/18 19:21:46	114480	13.42	1.58	-0.46	0.50	4.16
09/25/18 19:22:46	114540	13.43	1.61	-0.45	0.48	4.16
09/25/18 19:23:46	114600	13.42	1.60	-0.46	0.49	4.15
09/25/18 19:24:46	114660	13.43	1.55	-0.46	0.47	4.15
09/25/18 19:25:46	114720	13.43	1.36	-0.46	0.45	4.14
09/25/18 19:26:46	114780	13.43	1.63	-0.46	0.44	4.14
09/25/18 19:27:46	114840	13.42	1.12	-0.45	0.45	4.15
09/25/18 19:28:46	114900	13.41	1.55	-0.46	0.47	4.15
09/25/18 19:29:46	114960	13.41	0.93	-0.46	0.46	4.15
09/25/18 19:30:46	115020	13.39	1.36	-0.45	0.47	4.15
09/25/18 19:31:46	115080	13.39	1.01	-0.45	0.48	4.15
09/25/18 19:32:46	115140	13.40	1.10	-0.46	0.48	4.14
09/25/18 19:33:46	115200	13.39	1.19	-0.46	0.49	4.15
09/25/18 19:34:46	115260	13.40	1.29	-0.45	0.48	4.15
09/25/18 19:35:46	115320	13.39	0.42	-0.46	0.47	4.16
09/25/18 19:36:46	115380	13.39	0.98	-0.46	0.47	4.16
09/25/18 19:37:46	115440	13.40	1.22	-0.46	0.44	4.16
09/25/18 19:38:46	115500	13.40	1.17	-0.46	0.45	4.15
09/25/18 19:39:46	115560	13.40	1.21	-0.46	0.47	4.15
09/25/18 19:40:46	115620	13.40	0.88	-0.46	0.50	4.15
09/25/18 19:41:46	115680	13.39	0.86	-0.46	0.51	4.16
09/25/18 19:42:46	115740	13.40	1.20	-0.45	0.50	4.17
09/25/18 19:43:46	115800	13.40	1.36	-0.46	0.47	4.16
09/25/18 19:44:46	115860	13.40	1.34	-0.46	0.47	4.16
09/25/18 19:45:46	115920	13.41	1.24	-0.45	0.48	4.15
09/25/18 19:46:46	115980	13.40	0.72	-0.46	0.49	4.14
09/25/18 19:47:46	116040	13.40	0.87	-0.46	0.48	4.15
09/25/18 19:48:46	116100	13.40	0.97	-0.46	0.47	4.15
09/25/18 19:49:46	116160	13.40	1.22	-0.46	0.46	4.15
09/25/18 19:50:46	116220	13.40	1.42	-0.46	0.44	4.16
RAW AVERAGE		**13.39**	**1.54**	**-0.46**	**0.44**	**4.15**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.02	0.05	-0.14	0.08	0.06
Bias	**Final Zero**	0.02	-0.02	-0.03	0.05	0.05
Bias	**Avg. Zero**	0.02	0.02	-0.08	0.07	0.06
Bias	**Initial UpScale**	11.91	4.45	5.05	3.24	8.89
Bias	**Final UpScale**	11.85	4.68	5.16	3.04	8.80
Bias	**Avg. UpScale**	11.88	4.57	5.11	3.14	8.85
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	O_2	NOx	CO	VOC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.59	1.65	0.00	0.49	4.16
Concentration (ppm@ 15%O_2)	N/A	1.33	0.00	0.39	N/A
Non-Bias Adjusted Averages Include:				*	

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
NOx, CO, VOC, CO_2, and O_2 Data

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,128,585	SCFH
Duct Burner Fuel Flow	268	lb/min
Total Fuel Flow	2,507,761	SCFH

Weather Data

Barometric Pressure	30.39	in. Hg
Relative Humidity	95	%
Ambient Temperature	53	°F
Specific Humidity	0.007979	lb H_2O / lb air

Unit Data

Unit Load	211.1	megawatts
Meas. Stack Moisture	10.1	%
Stack Exhaust Flow (M19)	51,790,579	SCFH

100% W/Db Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 09:20:46	78420	12.07	2.39	-0.30	0.00	4.78
09/25/18 09:21:46	78480	12.06	2.41	-0.30	0.00	4.78
09/25/18 09:22:46	78540	12.07	2.47	-0.31	0.00	4.78
09/25/18 09:23:46	78600	12.07	2.38	-0.30	0.00	4.79
09/25/18 09:24:46	78660	12.06	2.43	-0.30	0.00	4.79
09/25/18 09:25:46	78720	12.08	2.48	-0.30	0.00	4.79
09/25/18 09:26:46	78780	12.08	2.38	-0.31	0.00	4.78
09/25/18 09:27:46	78840	12.06	2.41	-0.31	0.00	4.78
09/25/18 09:28:46	78900	12.07	2.45	-0.31	0.01	4.78
09/25/18 09:29:46	78960	12.07	2.48	-0.31	0.01	4.77
09/25/18 09:30:46	79020	12.05	2.42	-0.31	0.00	4.77
09/25/18 09:31:46	79080	12.07	2.43	-0.30	0.00	4.77
09/25/18 09:32:46	79140	12.07	2.44	-0.31	0.01	4.78
09/25/18 09:33:46	79200	12.07	2.56	-0.29	0.01	4.78
09/25/18 09:34:46	79260	12.08	2.51	-0.31	0.01	4.78
09/25/18 09:35:46	79320	12.07	2.41	-0.30	0.01	4.78
09/25/18 09:36:46	79380	12.08	2.47	-0.30	0.30	4.79
09/25/18 09:37:46	79440	12.08	2.48	-0.29	0.17	4.78
09/25/18 09:38:46	79500	12.06	2.59	-0.30	0.19	4.78
09/25/18 09:39:46	79560	12.06	2.64	-0.29	0.17	4.78
09/25/18 09:40:46	79620	12.08	2.58	-0.29	0.12	4.78
09/25/18 09:41:46	79680	12.07	2.50	-0.29	0.09	4.77
09/25/18 09:42:46	79740	12.07	2.58	-0.30	0.10	4.78
09/25/18 09:43:46	79800	12.07	2.64	-0.30	0.09	4.77
09/25/18 09:44:46	79860	12.06	2.56	-0.30	0.08	4.78
09/25/18 09:45:46	79920	12.06	2.62	-0.31	0.09	4.79
09/25/18 09:46:46	79980	12.06	2.58	-0.28	0.10	4.79
09/25/18 09:47:46	80040	12.06	2.59	-0.30	0.11	4.79
09/25/18 09:48:46	80100	12.06	2.54	-0.30	0.12	4.80
09/25/18 09:49:46	80160	12.06	2.65	-0.29	0.13	4.79
09/25/18 09:50:46	80220	12.06	2.72	-0.30	0.12	4.79
09/25/18 09:51:46	80280	12.05	2.70	-0.29	0.12	4.78
09/25/18 09:52:46	80340	12.06	2.71	-0.31	0.13	4.78
09/25/18 09:53:46	80400	12.06	2.63	-0.31	0.13	4.78
09/25/18 09:54:46	80460	12.06	2.65	-0.30	0.12	4.78
09/25/18 09:55:46	80520	12.06	2.68	-0.30	0.12	4.78
09/25/18 09:56:46	80580	12.06	2.68	-0.30	0.12	4.78
09/25/18 09:57:46	80640	12.07	2.64	-0.31	0.12	4.78
09/25/18 09:58:46	80700	12.08	2.56	-0.30	0.11	4.78
09/25/18 09:59:46	80760	13.06	2.63	-0.30	0.11	4.78
09/25/18 10:00:46	80820	12.61	2.66	-0.32	0.10	4.79
09/25/18 10:01:46	80880	12.19	2.72	-0.31	0.10	4.79
09/25/18 10:02:46	80940	12.16	2.62	-0.31	0.10	4.78
09/25/18 10:03:46	81000	12.51	2.61	-0.31	0.09	4.78
09/25/18 10:04:46	81060	12.34	2.60	-0.31	0.08	4.78
09/25/18 10:05:46	81120	12.49	2.64	-0.31	0.09	4.77
09/25/18 10:06:46	81180	12.24	2.60	-0.32	0.08	4.78
09/25/18 10:07:46	81240	12.24	2.55	-0.30	0.06	4.78
09/25/18 10:08:46	81300	12.28	2.63	-0.32	0.05	4.78
09/25/18 10:09:46	81360	12.30	2.75	-0.33	0.04	4.79
09/25/18 10:10:46	81420	12.37	2.71	-0.31	0.03	4.79
09/25/18 10:11:46	81480	12.11	2.68	-0.32	0.02	4.79
09/25/18 10:12:46	81540	12.12	2.64	-0.30	0.02	4.79
09/25/18 10:13:46	81600	12.21	2.61	-0.31	0.02	4.78
09/25/18 10:14:46	81660	12.16	2.66	-0.31	0.02	4.78
09/25/18 10:15:46	81720	12.14	2.76	-0.31	0.02	4.77
09/25/18 10:16:46	81780	12.12	2.64	-0.31	0.03	4.77
09/25/18 10:17:46	81840	12.11	2.75	-0.30	0.03	4.78
09/25/18 10:18:46	81900	12.13	2.67	-0.31	0.02	4.78
09/25/18 10:19:46	81960	12.11	2.65	-0.32	0.03	4.78
RAW AVERAGE		**12.14**	**2.58**	**-0.30**	**0.07**	**4.78**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.00	-0.02	0.05	0.00	0.07
	Final Zero	0.05	-0.05	-0.01	0.00	0.08
	Avg. Zero	0.02	-0.03	0.02	0.00	0.07
	Initial UpScale	11.85	4.90	5.15	3.13	8.86
	Final UpScale	11.86	4.89	5.11	3.07	8.79
	Avg. UpScale	12.08	4.89	5.13	3.10	8.82
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	O_2	NOx	CO	VOC	CO_2
Corrected Raw Average (ppm/% dry basis)	12.11	2.61	0.00	0.08	4.80
Concentration (ppm@ 15%O_2)	N/A	1.75	0.00	0.05	N/A

Non-Bias Adjusted Averages Include: *

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,122,302	SCFH
Duct Burner Fuel Flow	268	lb/min
Total Fuel Flow	2,501,478	SCFH

Weather Data

Barometric Pressure	30.36	in. Hg
Relative Humidity	94	%
Ambient Temperature	55	°F
Specific Humidity	0.008509	lb H_2O / lb air

Unit Data

Unit Load	210.3	megawatts
Meas. Stack Moisture	13.5	%
Stack Exhaust Flow (M19)	53,428,357	SCFH

100% W/Db Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 10:44:46	83460	12.40	2.70	-0.28	0.00	4.79
09/25/18 10:45:46	83520	12.38	2.80	-0.29	0.00	4.80
09/25/18 10:46:46	83580	12.37	2.79	-0.30	0.00	4.79
09/25/18 10:47:46	83640	12.37	2.76	-0.30	0.00	4.78
09/25/18 10:48:46	83700	12.39	2.77	-0.31	0.00	4.79
09/25/18 10:49:46	83760	12.41	2.66	-0.30	0.00	4.79
09/25/18 10:50:46	83820	12.40	2.73	-0.31	0.00	4.79
09/25/18 10:51:46	83880	12.42	2.67	-0.30	0.00	4.79
09/25/18 10:52:46	83940	12.41	2.71	-0.31	0.00	4.79
09/25/18 10:53:46	84000	12.41	2.68	-0.30	0.00	4.79
09/25/18 10:54:46	84060	12.41	2.65	-0.30	0.00	4.78
09/25/18 10:55:46	84120	12.43	2.71	-0.31	0.00	4.78
09/25/18 10:56:46	84180	12.42	2.56	-0.32	0.00	4.78
09/25/18 10:57:46	84240	12.46	2.59	-0.32	0.00	4.79
09/25/18 10:58:46	84300	12.21	2.66	-0.30	0.00	4.79
09/25/18 10:59:46	84360	12.21	2.68	-0.31	0.00	4.79
09/25/18 11:00:46	84420	12.21	2.75	-0.31	0.00	4.79
09/25/18 11:01:46	84480	12.69	2.76	-0.30	0.00	4.79
09/25/18 11:02:46	84540	12.38	2.66	-0.30	0.00	4.78
09/25/18 11:03:46	84600	12.26	2.70	-0.30	0.00	4.79
09/25/18 11:04:46	84660	12.32	2.70	-0.31	0.00	4.78
09/25/18 11:05:46	84720	12.24	2.72	-0.30	0.00	4.78
09/25/18 11:06:46	84780	12.24	2.67	-0.29	0.00	4.78
09/25/18 11:07:46	84840	12.24	2.69	-0.30	0.00	4.78
09/25/18 11:08:46	84900	12.23	2.75	-0.31	0.00	4.79
09/25/18 11:09:46	84960	12.23	2.69	-0.29	0.00	4.79
09/25/18 11:10:46	85020	12.23	2.68	-0.32	0.00	4.80
09/25/18 11:11:46	85080	12.23	2.73	-0.32	0.00	4.80
09/25/18 11:12:46	85140	12.23	2.80	-0.30	0.00	4.80
09/25/18 11:13:46	85200	12.23	2.61	-0.32	0.00	4.79
09/25/18 11:14:46	85260	12.24	2.73	-0.35	0.00	4.79
09/25/18 11:15:46	85320	12.23	2.72	-0.30	0.00	4.78
09/25/18 11:16:46	85380	12.23	2.72	-0.30	0.00	4.78
09/25/18 11:17:46	85440	12.23	2.71	-0.29	0.00	4.78
09/25/18 11:18:46	85500	12.23	2.72	-0.30	0.00	4.77
09/25/18 11:19:46	85560	12.22	2.70	-0.30	0.00	4.79
09/25/18 11:20:46	85620	12.22	2.72	-0.31	0.00	4.79
09/25/18 11:21:46	85680	12.22	2.77	-0.29	0.00	4.79
09/25/18 11:22:46	85740	12.22	2.70	-0.31	0.00	4.79
09/25/18 11:23:46	85800	12.22	2.79	-0.30	0.00	4.79
09/25/18 11:24:46	85860	12.22	2.65	-0.30	0.00	4.79
09/25/18 11:25:46	85920	12.22	2.70	-0.31	0.00	4.78
09/25/18 11:26:46	85980	12.23	2.72	-0.30	0.04	4.78
09/25/18 11:27:46	86040	12.22	2.66	-0.32	0.00	4.78
09/25/18 11:28:46	86100	12.23	2.76	-0.30	0.00	4.79
09/25/18 11:29:46	86160	12.22	2.79	-0.31	0.00	4.78
09/25/18 11:30:46	86220	12.21	2.81	-0.30	0.00	4.79
09/25/18 11:31:46	86280	12.21	2.74	-0.31	0.00	4.79
09/25/18 11:32:46	86340	12.22	2.71	-0.30	0.00	4.79
09/25/18 11:33:46	86400	12.22	2.71	-0.31	0.00	4.79
09/25/18 11:34:46	86460	12.21	2.74	-0.31	0.00	4.79
09/25/18 11:35:46	86520	12.21	2.69	-0.31	0.00	4.80
09/25/18 11:36:46	86580	12.22	2.65	-0.31	0.00	4.79
09/25/18 11:37:46	86640	12.22	2.62	-0.32	0.00	4.79
09/25/18 11:38:46	86700	12.22	2.69	-0.30	0.00	4.78
09/25/18 11:39:46	86760	12.22	2.70	-0.30	0.00	4.78
09/25/18 11:40:46	86820	12.22	2.78	-0.30	0.00	4.78
09/25/18 11:41:46	86880	12.23	2.72	-0.31	0.00	4.78
09/25/18 11:42:46	86940	12.21	2.72	-0.30	0.00	4.78
09/25/18 11:43:46	87000	12.22	2.70	-0.30	0.00	4.78
RAW AVERAGE		**12.28**	**2.71**	**-0.31**	**0.00**	**4.79**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.05	-0.05	-0.01	0.00	0.08
Bias	**Final Zero**	0.03	-0.06	0.09	0.00	0.08
Bias	**Avg. Zero**	0.04	-0.06	0.04	0.00	0.08
Bias	**Initial UpScale**	11.86	4.89	5.11	3.07	8.79
Bias	**Final UpScale**	12.00	4.90	5.12	3.12	8.79
Bias	**Avg. UpScale**	11.93	4.90	5.11	3.10	8.79
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	O_2	NOx	CO	VOC	CO_2
Corrected Raw Average (ppm/% dry basis)	12.40	2.75	0.00	0.00	4.82
Concentration (ppm@ 15%O_2)	N/A	1.91	0.00	0.00	N/A

Non-Bias Adjusted Averages Include: *

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-1
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,114,001	SCFH
Duct Burner Fuel Flow	268	lb/min
Total Fuel Flow	2,493,177	SCFH

Weather Data

Barometric Pressure	30.32	in. Hg
Relative Humidity	96	%
Ambient Temperature	58	°F
Specific Humidity	0.009718	lb H_2O / lb air

Unit Data

Unit Load	209.3	megawatts
Meas. Stack Moisture	10.5	%
Stack Exhaust Flow (M19)	52,301,913	SCFH

100% W/Db Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO_2 (%)
09/25/18 12:10:46	88620	12.20	2.61	-0.29	0.14	4.79
09/25/18 12:11:46	88680	12.20	2.79	-0.29	0.14	4.79
09/25/18 12:12:46	88740	12.21	2.76	-0.29	0.14	4.79
09/25/18 12:13:46	88800	12.21	2.70	-0.29	0.13	4.79
09/25/18 12:14:46	88860	12.21	2.63	-0.29	0.12	4.78
09/25/18 12:15:46	88920	12.21	2.61	-0.29	0.13	4.78
09/25/18 12:16:46	88980	12.20	2.69	-0.30	0.14	4.78
09/25/18 12:17:46	89040	12.20	2.71	-0.29	0.14	4.78
09/25/18 12:18:46	89100	12.21	2.70	-0.30	0.14	4.77
09/25/18 12:19:46	89160	12.21	2.69	-0.29	0.14	4.78
09/25/18 12:20:46	89220	12.19	2.77	-0.29	0.15	4.77
09/25/18 12:21:46	89280	12.21	2.76	-0.29	0.15	4.78
09/25/18 12:22:46	89340	12.21	2.73	-0.27	0.15	4.79
09/25/18 12:23:46	89400	12.20	2.73	-0.28	0.15	4.79
09/25/18 12:24:46	89460	12.21	2.70	-0.27	0.16	4.79
09/25/18 12:25:46	89520	12.21	2.79	-0.27	0.17	4.78
09/25/18 12:26:46	89580	12.20	2.70	-0.25	0.16	4.79
09/25/18 12:27:46	89640	12.19	2.66	-0.26	0.15	4.78
09/25/18 12:28:46	89700	12.20	2.67	-0.26	0.14	4.77
09/25/18 12:29:46	89760	12.20	2.66	-0.25	0.14	4.78
09/25/18 12:30:46	89820	12.20	2.71	-0.26	0.13	4.78
09/25/18 12:31:46	89880	12.20	2.69	-0.25	0.11	4.78
09/25/18 12:32:46	89940	12.20	2.64	-0.25	0.10	4.78
09/25/18 12:33:46	90000	12.20	2.65	-0.25	0.08	4.78
09/25/18 12:34:46	90060	12.19	2.69	-0.26	0.08	4.79
09/25/18 12:35:46	90120	12.20	2.69	-0.26	0.07	4.79
09/25/18 12:36:46	90180	12.20	2.75	-0.27	0.06	4.79
09/25/18 12:37:46	90240	12.20	2.75	-0.25	0.05	4.79
09/25/18 12:38:46	90300	12.19	2.75	-0.27	0.06	4.79
09/25/18 12:39:46	90360	12.20	2.78	-0.27	0.11	4.78
09/25/18 12:40:46	90420	12.21	2.72	-0.27	0.29	4.79
09/25/18 12:41:46	90480	12.20	2.74	-0.27	0.23	4.78
09/25/18 12:42:46	90540	12.20	2.73	-0.27	0.23	4.79
09/25/18 12:43:46	90600	12.19	2.75	-0.26	0.18	4.79
09/25/18 12:44:46	90660	12.19	2.73	-0.26	0.17	4.78
09/25/18 12:45:46	90720	12.20	2.73	-0.27	0.16	4.78
09/25/18 12:46:46	90780	12.20	2.69	-0.26	0.15	4.79
09/25/18 12:47:46	90840	12.19	2.77	-0.26	0.13	4.79
09/25/18 12:48:46	90900	12.19	2.81	-0.26	0.13	4.79
09/25/18 12:49:46	90960	12.20	2.79	-0.22	0.12	4.79
09/25/18 12:50:46	91020	12.19	2.79	-0.24	0.12	4.79
09/25/18 12:51:46	91080	12.19	2.86	-0.27	0.10	4.78
09/25/18 12:52:46	91140	12.18	2.81	-0.26	0.10	4.78
09/25/18 12:53:46	91200	12.19	2.80	-0.23	0.10	4.78
09/25/18 12:54:46	91260	12.20	2.77	-0.22	0.10	4.78
09/25/18 12:55:46	91320	12.19	2.73	-0.24	0.10	4.79
09/25/18 12:56:46	91380	12.20	2.87	-0.25	0.11	4.79
09/25/18 12:57:46	91440	12.20	2.88	-0.25	0.12	4.78
09/25/18 12:58:46	91500	12.20	2.80	-0.26	0.13	4.79
09/25/18 12:59:46	91560	12.20	2.75	-0.26	0.12	4.79
09/25/18 13:00:46	91620	12.20	2.77	-0.25	0.11	4.80
09/25/18 13:01:46	91680	12.20	2.80	-0.25	0.10	4.79
09/25/18 13:02:46	91740	12.19	2.73	-0.25	0.10	4.78
09/25/18 13:03:46	91800	12.19	2.64	-0.25	0.10	4.77
09/25/18 13:04:46	91860	12.19	2.71	-0.25	0.09	4.78
09/25/18 13:05:46	91920	12.19	2.72	-0.26	0.08	4.78
09/25/18 13:06:46	91980	12.20	2.78	-0.25	0.15	4.78
09/25/18 13:07:46	92040	12.20	2.69	-0.25	0.12	4.78
09/25/18 13:08:46	92100	12.19	2.68	-0.25	0.11	4.78
09/25/18 13:09:46	92160	12.19	2.70	-0.25	0.10	4.79
RAW AVERAGE		**12.20**	**2.73**	**-0.26**	**0.13**	**4.78**

		O_2	NOx	CO	VOC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.03	-0.06	0.09	0.00	0.08
Bias	**Final Zero**	0.03	0.00	0.06	0.01	0.08
Bias	**Avg. Zero**	0.03	-0.03	0.07	0.00	0.08
Bias	**Initial UpScale**	12.00	4.90	5.12	3.12	8.79
Bias	**Final UpScale**	12.00	4.85	5.09	3.07	8.79
Bias	**Avg. UpScale**	12.00	4.88	5.10	3.10	8.79
Upscale Cal Gas		12.05	4.92	5.13	3.22	8.92

EMISSIONS DATA	**O_2**	**NOx**	**CO**	**VOC**	**CO_2**
Corrected Raw Average (ppm/% dry basis)	12.25	2.77	0.00	0.14	4.82
Concentration (ppm@ 15%O_2)	N/A	1.89	0.00	0.10	N/A

Non-Bias Adjusted Averages Include: *

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
Opacity Data

Method Used (Circle One)	Method 9	203A	203B	Other: ________

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 1 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/24/18		11:15am	12:15pm

Company Name	CPV Valley LLC	
Facility Name	CPV Valley Energy Center	
Street Address	3330 US Route 6	
City: Middletown	State: NY	Zip: 10940

Process	Unit #: CTG-1	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

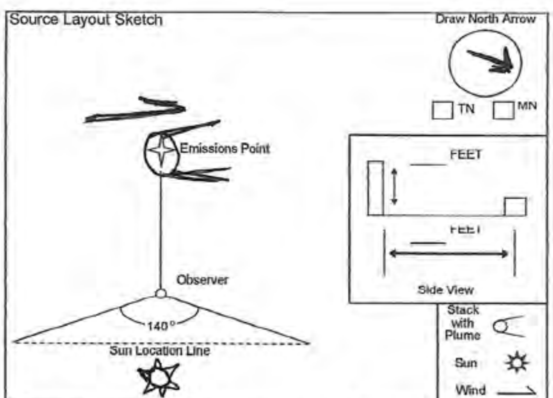
Describe Emissions Point			
Height of Emiss. Pt. Start	End	Height of Emiss. Pt. Rel. to Observer Start	End
Distance to Emiss. Pt. Start	End	Direction to Emiss. Pt. (Degrees) Start	End

Vetical Angle to Obs. Pt. Start	End	Direction to Obs. Pt. (Degrees) Start	End
Distance and Direction to Observation Point from Emission Point Start		End	

Describe Emissions Start: Clear		End: clear	
Emission Color Start: clear	End: clear	Water Droplet Plume Start: none	End: none

Describe Plume Background Start: cloudy	End: cloudy		
Background Color Start: white/gray	End: white/gray	Sky Conditions Start: Broken	End: Broken
Wind Speed Start: 10 mph	End: 12 mph	Wind Direction Start: ESE	End: E
Ambient Temp. Start: 60°F	End: 61°F	Wet Bulb Temp.	RH Percent: 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4161	-74.4362	

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature	Date: 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date: 07/06/18

Additional Information

Method Used (Circle One)			
Method 9	203A	203B	Other:

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code)	Page 2 of 2
sie-18-middletown.ny-start#1	
Continued on Form Number (AHI Project Code)	

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY · Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	Base Load
Control Equipment		Operating Mode: Base Load

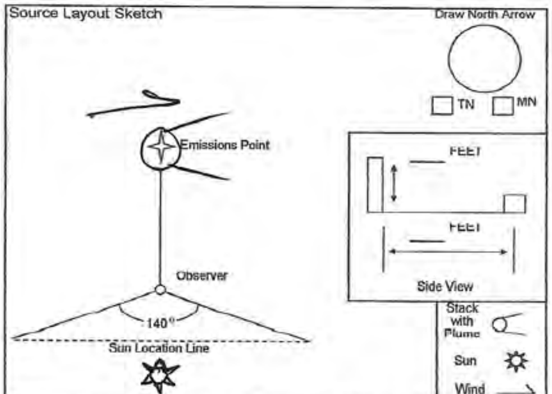
Describe Emissions Point	
Height of Emiss. Pt. Start / End	Height of Emiss. Pt. Rel. to Observer Start / End
Distance to Emiss. Pt. Start / End	Direction to Emiss. Pt. (Degrees) Start / End

Vetical Angle to Obs. Pt. Start / End	Direction to Obs. Pt. (Degrees) Start / End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions	
Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none

Describe Plume Background	
Start cloudy End cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 10 mph End 12mph	Wind Direction Start ESE End E
Ambient Temp. Start 60°F End 61°F	Wet Bulb Temp. · RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4161	-74.4362	

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/24/18		11:15am	12:15pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)	
Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 07/06/18

VISUAL EMISSIONS OBSERVATION FORM

Method Used (Circle One)
Method 9 203A 203B Other: ______

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	Base Load
Control Equipment		Operating Mode: Base Load

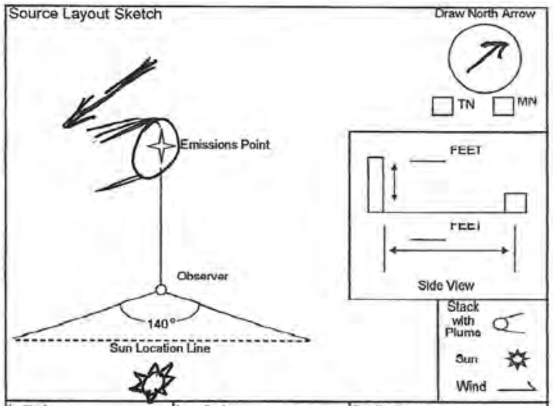
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start Cloudy End Cloudy	
Background Color Start White/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 11mph	Wind Direction Start ENE End E
Ambient Temp. Start 61°F End 62°F	Wet Bulb Temp.	RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

Form Number (AHI Project Code): sie-18-middletown.ny-start#1
Page 1 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
		12:30pm	1:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)
Method 9 203A 203B Other:

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY Zip: 10940

Process	Unit # CTG-1	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

Describe Emissions Point

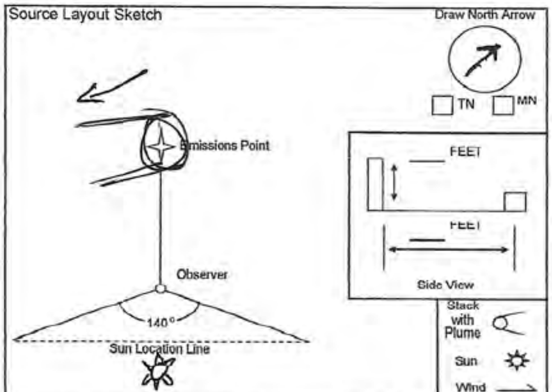
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End Clear
Emission Color Start Clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start Cloudy End Cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 11 mph	Wind Direction Start ENE End E
Ambient Temp. Start 61°F End 62°F	Wet Bulb Temp. RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 — Page 2 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
09/24/18		12:30pm	1:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)
Method 9 203A 203B Other: ______

Company Name: CPV Valley LLC
Facility Name: CPV Valley Energy Center
Street Address: 3330 US Route 6
City: Middletown State: NY Zip: 10940

Process | Unit #: CTG-1 | Operating Mode: Base Load
Control Equipment | Operating Mode: Base Load

Describe Emissions Point

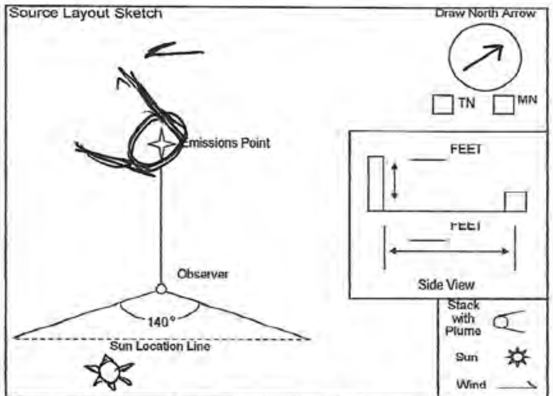
Height of Emiss. Pt. Start End | Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End | Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End | Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start End

Describe Emissions Start clear End clear
Emission Color Start clear End clear | Water Droplet Plume Start none End none

Describe Plume Background Start cloudy End cloudy
Background Color Start white/gray End white/gray | Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 10 mph | Wind Direction Start E End E
Ambient Temp. Start 61°F End 61°F | Wet Bulb Temp. | RH Percent 74%

Source Layout Sketch



Latitude 41.4068 | Longitude -74.4305 | Declination

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 | Page 1 of 2
Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/24/18		1:45 pm	2:45pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez
Observer's Signature | Date 9/24/18
Organization: Air Hygiene International, Inc.
Certified By: Compliance Assurance Associates, Inc. | Date 7/06/18

Method Used (Circle One)
Method 9 | 203A | 203B | Other: ______

Company Name	CPV Valley LLC	
Facility Name	CPV Valley Energy Center	
Street Address	3330 US Route 6	
City: Middletown	State: NY	Zip: 10940

Process	Unit #: CTG-1	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

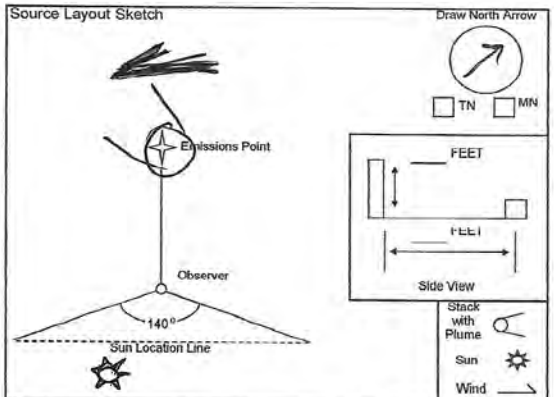
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start: Clear	End: clear
Emission Color Start: clear End: clear	Water Droplet Plume Start: none End: none

Describe Plume Background Start: cloudy End: cloudy	
Background Color Start: white/gray End: white/gray	Sky Conditions Start: Broken End: Broken
Wind Speed Start: 11 mph End: 10 mph	Wind Direction Start: E End: E
Ambient Temp. Start: 61°F End: 61°F	Wet Bulb Temp. / RH Percent: 74%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 — Page 2 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/24/18		1:45pm	2:45pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature: [signature]	Date: 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date: 07/06/18

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
Opacity Data

VISUAL EMISSIONS OBSERVATION FORM

Method Used (Circle One)
Method 9 203A 203B Other: ________

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

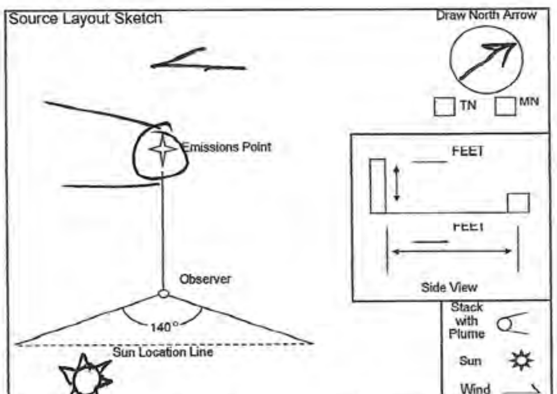
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds	
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 3mph End 3mph	Wind Direction Start NNE End NE
Ambient Temp. Start 58°F End 58°F	Wet Bulb Temp. RH Percent 97%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 — Page 1 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		3:30pm	4:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature: [signature]	Date: 9/25/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date: 7/6/18

Method Used (Circle One)			
Method 9	203A	203B	Other:

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

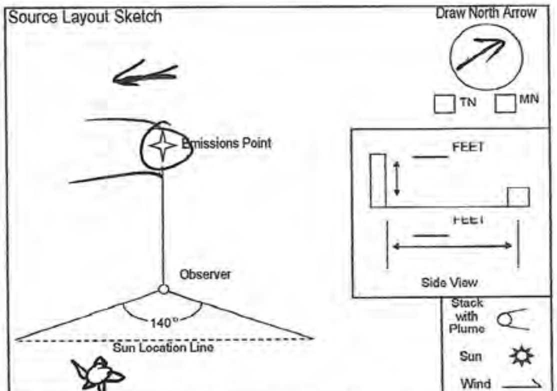
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds		
Background Color Start gray End gray	Sky Conditions Start overcast End overcast	
Wind Speed Start 3mph End 3mph.	Wind Direction Start NNE End NE	
Ambient Temp. Start 58°F End 58°F	Wet Bulb Temp.	RH Percent 97%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1

Page 2 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		3:30pm	4:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature	Date 9/25/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 7/6/18

Method Used (Circle One)
Method 9 | 203A | 203B | Other: ________

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

Describe Emissions Point

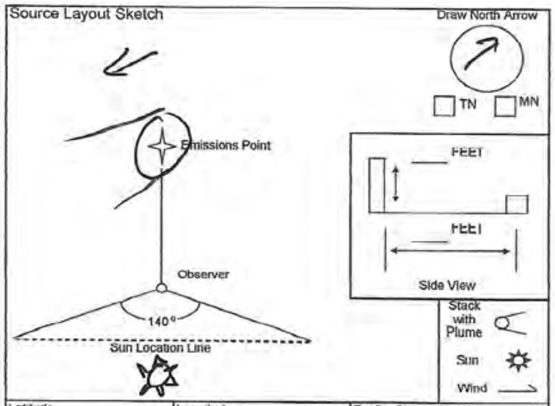
Height of Emiss. Pt. Start	End	Height of Emiss. Pt. Rel. to Observer Start	End
Distance to Emiss. Pt. Start	End	Direction to Emiss. Pt. (Degrees) Start	End

Vetical Angle to Obs. Pt. Start	End	Direction to Obs. Pt. (Degrees) Start	End
Distance and Direction to Observation Point from Emission Point Start		End	

Describe Emissions Start: clear		End: clear	
Emission Color Start: clear	End: clear	Water Droplet Plume Start: detached	End: detached

Describe Plume Background Start: gray clouds	End: gray clouds		
Background Color Start: gray	End: gray	Sky Conditions Start: overcast	End: overcast
Wind Speed Start: 4mph	End: 4mph	Wind Direction Start: NNE	End: N
Ambient Temp. Start: 56°F	End: 56°F	Wet Bulb Temp.	RH Percent: 100%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 | Page 1 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		1:00pm	2:00pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature	Date: 9/25/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date: 7/6/18

Method Used (Circle One)
Method 9 203A 203B Other: ______

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY Zip: 10940

Process	Unit #	Operating Mode
	CTG-1	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

Describe Emissions Point

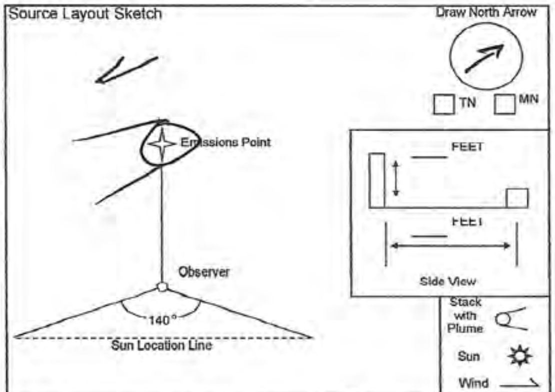
Height of Emiss. Pt. Start End — Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End — Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End — Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start End

Describe Emissions Start clear End clear
Emission Color Start clear End clear — Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds
Background Color Start gray End gray — Sky Conditions Start overcast End overcast
Wind Speed Start 4 mph End 4 mph — Wind Direction Start NNE End N
Ambient Temp. Start 56°F End 56°F — Wet Bulb Temp. — RH Percent 100%

Source Layout Sketch — Draw North Arrow



Latitude	Longitude	Declination
41.4067	-74.4305	

Additional Information

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 — Page 2 of 2
Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		1:00pm	2:00pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez
Observer's Signature — Date 9/25/18
Organization: Air Hygiene International, Inc.
Certified By: Compliance Assurance Associates, Inc. — Date 7/6/18

Method Used (Circle One) Method 9 203A 203B Other: ________

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY Zip: 10940

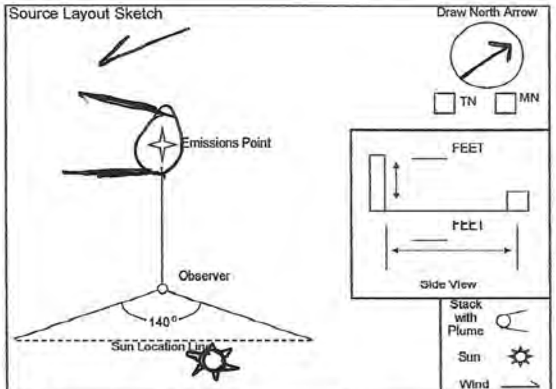
Process	Unit #	Operating Mode
	CTG-1	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

Describe Emissions Point

Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End
Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start ~~White~~ Clear End ~~White~~ Clear	Water Droplet Plume Start detached End detached
Describe Plume Background Start gray clouds End gray clouds	
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 9mph End 9mph	Wind Direction Start NE End NE
Ambient Temp. Start 51°F End 51°F	Wet Bulb Temp. RH Percent 95%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 1 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/25/18		8:30am	9:30am

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 9/25/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 7/06/18

Method Used (Circle One)			
Method 9	203A	203B	Other:

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #: CTG-1	Operating Mode: 100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

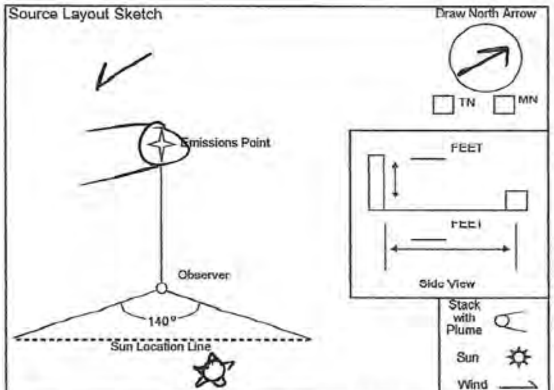
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds	
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 9mph End 9mph	Wind Direction Start NNE End NE
Ambient Temp. Start 51°F End 51°F	Wet Bulb Temp.	RH Percent 95%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Form Number (AHI Project Code)	Page 2 of 2
sie-18-middletown.ny-start#1	
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/25/18		8:30am	9:30am

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 09/25/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 07/06/18

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
PM Data

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Run Start Time	09:52	15:02	15:36		hh:mm	
Run Stop Time	14:08	19:13	20:02		hh:mm	
Test Date	09/24/18	09/24/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	0.962	0.962	0.962			
Pitot Tube Coefficient	0.7240	0.7240	0.7240			
Average Nozzle Diameter	0.151	0.152	0.152		in	
Stack Test Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	190.320	283.810	654.310		ft³	
Final Meter Volume	283.590	375.140	744.530		ft³	
Total Meter Volume	93.270	91.330	90.220	91.607	ft³	
Total Sampling Time	243.00	241.50	246.75	243.75	min	
Average Meter Temperature	74.08	73.92	75.42	74.47	°F	
Average Stack Temperature	217.08	217.75	205.00	213.28	°F	
Barometric Pressure	29.97	29.96	30.08	30.00	in Hg	
Stack Static Pressure	-0.87	-0.87	-0.87	-0.87	in H_2O	
Absolute Stack Pressure	29.91	29.90	30.02	29.94	in Hg	
Average Orifice Pressure Drop	0.40	0.40	0.40	0.40	in H_2O	
Absolute Meter Pressure	30.11	30.10	30.22	30.14	in Hg	
Avg Square Root Pitot Pressure	1.19	1.18	1.16	1.18	√(in H_2O)	
Moisture Content Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	154.20	162.00	154.90	157.03	g	
Silica Gel Weight Gain	13.30	17.40	19.80	16.83	g	
Total Water Volume Collected	167.80	179.72	175.02	174.18	ml	
Standard Water Vapor Volume	7.90	8.46	8.24	8.20	scf	
Standard Meter Volume	88.9	87.1	86.1	87.4	dscf	
Standard Metric Meter Volume	2.5	2.5	2.4	2.5	dscm	
Calculated Stack Moisture	8.16	8.85	8.73	8.58	%	
Saturated Stack Moisture	100.00	100.00	86.54	95.51	%	
Reported Stack Moisture Content	8.16	8.85	8.73	8.58	%	
Gas Analysis Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.1	4.1	4.1	4.1	%	
Oxygen Content	13.6	13.6	13.6	13.6	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.3	82.4	82.3	82.3	%	
Stack Dry Molecular Weight	29.21	29.20	29.20	29.20	lb/lb-mole	
Stack Wet Molecular Weight	28.29	28.21	28.22	28.24	lb/lb-mole	
Calculated Fuel Factor	1.763	1.793	1.780	1.779		
Fuel F-Factor	8633.27	8633.27	8632.22	8632.92	dscf/MMBtu	
Percent Excess Air	167.6	165.4	167.3	166.8	%	

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	65.88	65.64	63.84	65.12	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	
Actual Stack Flow Rate	1,120,665	1,116,601	1,086,097	1,107,788	acfm	
Wet Standard Stack Flow Rate	52,410	52,151	51,907	52,156	wkscfh	
Dry Standard Stack Flow Rate	48,135,876	47,534,391	47,375,970	47,682,079	dscfh	
Percent of Isokinetic Rate	103.6	103.0	100.1	102.2	%	
Emission Rate Data	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Total PM_{10}/$PM_{2.5}$ Mass	6.08	2.09	2.89	3.69	mg	--
Total PM_{10}/$PM_{2.5}$ Concentration	6.84E-05	2.40E-05	3.35E-05	4.20E-05	g/dscf	--
	1.06E-03	3.71E-04	5.17E-04	6.48E-04	gr/dscf	--
Total PM_{10}/$PM_{2.5}$ Emission Rate	3.29	1.14	1.59	2.01	kg/hr	--
	7.26	2.52	3.50	4.42	lb/hr	--
	31.79	11.02	15.33	19.38	tpy	--
	0.0037	0.0013	0.0018	0.0023	lb/MMBtu	0.0073
Filterable PM_{10} Mass	1.20	0.32	0.20	0.57	mg	--
Filterable PM_{10} Concentration	1.35E-05	3.71E-06	2.36E-06	6.52E-06	g/dscf	--
	2.08E-04	5.73E-05	3.64E-05	1.01E-04	gr/dscf	--
Filterable PM_{10} Emission Rate	0.65	0.18	0.11	0.31	kg/hr	--
	1.43	0.39	0.25	0.69	lb/hr	--
	6.26	1.70	1.08	3.02	tpy	--
	0.0007	0.0002	0.0001	0.0004	lb/MMBtu	--
Filterable $PM_{2.5}$ Mass	1.28	0.97	1.48	1.24	mg	--
Filterable $PM_{2.5}$ Concentration	1.44E-05	1.11E-05	1.72E-05	1.43E-05	g/dscf	--
	2.23E-04	1.71E-04	2.66E-04	2.20E-04	gr/dscf	--
Filterable $PM_{2.5}$ Emission Rate	0.69	0.53	0.82	0.68	kg/hr	--
	1.53	1.16	1.80	1.50	lb/hr	--
	6.71	5.10	7.87	6.56	tpy	--
	0.0008	0.0006	0.0009	0.0008	lb/MMBtu	--
Condensable $PM_{2.5}$ Mass	3.60	0.80	1.20	1.87	mg	--
Condensable $PM_{2.5}$ Concentration	4.05E-05	9.19E-06	1.39E-05	2.12E-05	g/dscf	--
	6.25E-04	1.42E-04	2.15E-04	3.27E-04	gr/dscf	--
Condensable $PM_{2.5}$ Emission Rate	1.95	0.44	0.66	1.02	kg/hr	--
	4.30	0.96	1.46	2.24	lb/hr	--
	18.81	4.22	6.37	9.80	tpy	--
	0.0022	0.0005	0.0008	0.0012	lb/MMBtu	--
RM 201A Quality Control	**1-Base-PM-1**	**1-Base-PM-2**	**1-Base-PM-3**	**Average**	**Units**	**Limits**
Cyclone Flow Rate	0.51	0.51	0.48	0.50	ft³/min	
Stack Viscosity	208.85	208.34	205.47	207.55	μP	
Cunningham Correction Factor	1.08	1.09	1.08	1.08		
Recalculated D50-1 for CIV	2.41	2.43	2.52	2.45		
Recalculated Cunninham	1.08	1.08	1.08	1.08		
Lower Limit Cut Diameter, CI (NRE<3162), D50LL	2.41	2.42	2.51	2.45		
Reynolds Number	2643.03	2622.56	2571.92	2,612.50		
Z	1.00	1.00	1.00	1.00		
No. Sampling Pts. Outside Dp	0	0	1	0	points	

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		CG /MP	
Date for Preliminary Run	(mm/dd/yy)	09/24/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	50	scf
Run Duration	chk Subpart	240	minutes
Unit Number		CTG-1	
Base Run Number		1-Base-PM	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/24/18	09/24/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8633.27	8633.27	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0028	samp-cp-0028	samp-cp-0028	
Meter Calibration Factor	(Y)	0.962	0.962	0.962	
Orifice Meter Coefficient	($\Delta H_@$)	1.838	1.838	1.838	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	4187/10	4187/10	4187/10	
Pitot Tube Coefficient	(C_p)	0.7240	0.7240	0.7240	
Nozzle Number	from ACS	3	3	3	must match cyc nozz tab (e.g. 3, 4, etc.)
Nozzle Diameter	(D_n)	0.151	0.152	0.152	in
Probe Number	from ACS	samp-hp-0151	samp-hp-0151	samp-hp-0151	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-hp-0011	samp-hp-0011	samp-hp-0011	
Impinger Case Number	from ACS	samp-cp-0017	samp-cp-0017	samp-cp-0017	

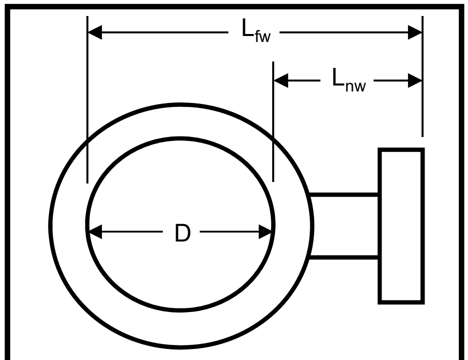
Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

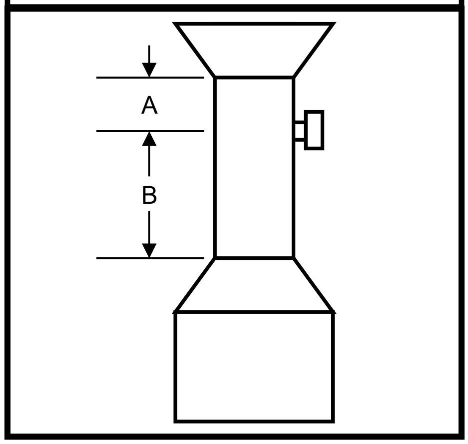
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	CPV Valley Energy Center	**Date**	09/24/18
Sampling Location	CTG-1 Stack	**Stack Type**	Circular
Operator	CG /MP	**Ports Available**	4
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4
Stack Size	Large (>24 inch diameter)	**Port ID (inches)**	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	235.25	in
Distance to Near Wall of Stack	(L_{nw})	7.25	in
Diameter of Stack	(D)	228.00	in
Area of Stack	(A_s)	283.53	ft²



Distance from Port to Disturbances			
Distance Upstream	(A)	1200.00	in
Diameters Upstream	(A_D)	5.26	diameters
Distance Downstream	(B)	1095.00	in
Diameters Downstream	(B_D)	4.80	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		**Minimum Number of[1] Traverse Points**	
Down Stream	**Up Stream**	**Particulate Points**	**Velocity Points**
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		12	12
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

○ Method 1 Trav

◉ 12 Point PM Trav

○ Velocity

Number of Traverse Points Used			
4	**Ports by**	3	**Across**
12	**Pts Used**	12	**Required**

Location of Traverse Points in Circular Stacks									
Traverse	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Point	Number of Traverse Points Across the Stack								
Number	2	4	6	8	10	12	14	16	18
1	.146	.067	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764

Traverse Point Locations			
Traverse Point Number	**Fraction of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
		in	in
1	0.044	10	17 2/8
2	0.146	33 2/8	40 4/8
3	0.296	67 4/8	74 6/8
4			
5			
6			
7			
8			
9			

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	CPV Valley Energy Center			
Sampling Location	CTG-1 Stack			
Operator	CG /MP			
Project #	sie-18-middletown.ny-start#1			
Pitot Leak Check	x	**PreTest**	x	**PostTest**

Preliminary Run Date	09/24/18		
Stack Type	Circular		
Ports Available	4		
Thermocouple ID	samp-hp-0151		
Pitot Coefficient	0.8200	**Pitot Identification**	A8162

Stack Dimensions			
Area of Stack	(A_s)	283.53	ft²
Diameter of Stack	(D)	228.00	in

Pressures			
Barometric Pressure	(P_b)	29.82	in Hg
Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.76	in Hg

Stack Gas Composition			
Composition Data:	**Estimated Composition**		
Carbon Dioxide Concentration	(%CO_2)	4.16	%vd
Oxygen Concentration	(%O_2)	13.55	%vd
Carbon Monoxide Concentration	(ppmCO)	0.00	ppmvd
Nitrogen Concentration	(%N_2)	82.29	%vd
Stack Moisture Content	(B_{ws})	12.00	%
Stack Dry Molecular Weight	(M_d)	29.21	lb/lb-mole
Stack Wet Molecular Weight	(M_w)	27.86	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	63.53	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	44,986,694	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	749,778	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	1,080,765	acf/min
Avg Stack Wet Std Flow Rate	(Q_{sw})	51,121,243	ascf/hr

40 CFR 60, Method 2G, Section 8.11.1 (but applies to all Method 2 type static pressure measurements):
If a Type S probe is used for this measurement, position the probe at or between any traverse point(s) and rotate the probe until a null differential pressure reading is obtained. Disconnect the tubing from one of the pressure ports; read and record the ΔP. For pressure devices with one-directional scales, if a deflection in the positive direction is noted with the negative side disconnected, then the static pressure is positive. Likewise, if a deflection in the positive direction is noted with the positive side disconnected, then the static pressure is negative.

Stack Cross Section Schematic

Velocity Traverse Data					
Run Number	1-Base-PM-V1				
Run Time	08:19	**Start**	08:35	**End**	
Traverse Point	**Velocity Head** (Δp)	**Null Angle** (N_a)	**Zero Deg Pressure** ($0^o{}_a$)	**Stack Temp** (t_s)	**Local Velocity** ($v_{s(l)}$)
	in H_2O	deg	in H_2O	°F	ft/sec
A-1	1.40	0	0.00	204	74.23
A-2	1.40	0	0.00	206	74.34
A-3	1.20	0	0.00	207	68.88
B-1	1.10	0	0.00	205	65.85
B-2	1.10	0	0.00	205	65.85
B-3	1.00	0	0.00	206	62.83
C-1	1.40	0	0.00	208	74.45
C-2	1.40	0	0.00	207	74.40
C-3	1.50	0	0.00	205	76.89
D-1	1.40	0	0.00	205	74.29
D-2	1.40	0	0.00	207	74.40
D-3	1.50	0	0.00	208	77.07
Average	1.32	0		206	
	1.15	**= Square roots of Δp**			
Standard deviation of null angles =				0.0	

METHOD 201A and OTM 27 - DETERMINATION OF NOZZLE SIZE AND POST RUN QUALITY CONTROL

Gas Analysis	Prelim	1-Base-PM-1	1-Base-PM-2	1-Base-PM-3	1-Base-PM-4	1-Base-PM-5	1-Base-PM-6	
Carbon Dioxide Content	4.2	4.1	4.1	4.1				%
Oxygen Content	13.6	13.6	13.6	13.6				%
Stack Moisture Content	12.0	8.2	8.9	8.7				%
Nitrogen plus CO Content	82.3	82.3	82.4	82.3				%

Corrected Velocity Head, $\Delta p_{2.5}$ (in H_2O)	Min.	1.28	Max.	1.93

Stack and Equipment Information	Prelim	1-Base-PM-1	1-Base-PM-2	1-Base-PM-3	1-Base-PM-4	1-Base-PM-5	1-Base-PM-6	
Barometric Pressure	29.82	29.97	29.96	30.08				in Hg
Stack Static Pressure	-0.87	-0.87	-0.87	-0.87				in H_2O
Absolute Stack Pressure	29.76	29.91	29.90	30.02				in Hg
Average Stack Temp	206	217	218	205				0.00
Average Stack Temp	666	677	678	665				°R
Average Meter Temp	85	74	74	75				0.00
Orifice Meter Coefficient	1.838	1.838	1.838	1.838				in H_2O
Pitot Coefficient	0.724	0.724	0.724	0.724				
Stack Dry Molecular Weight	29.21	29.21	29.20	29.20				lb/lb mole
Stack Wet Molecular Weight	27.86	28.29	28.21	28.22				lb/lb mole
Stack Viscosity	202.65	208.85	208.34	205.47				μP
Cunningham Correction Factor, for a 2.25 μm particle	1.08							
Cunningham Correction Factor, for a 2.5 μm particle		1.08	1.08	1.08				
Prelim Cut Dia., Cyclone I, D_{50LL}, N_{re}<3162	10.18	2.41	2.42	2.51				μm
Middle Zone Dia., Cyclone I, D_{50T}, N_{re}<3162	10.59							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.), N_{re}<3162	0.50							dscfm
Reynolds Number, Cyc I & IV, N_{re}<3162	2638.90	2643.03	2622.56	2571.92				
Dia. of 50% Prob. (D_{50}) Cyc IV (N_{re}<3162)	2.40	2.41	2.43	2.52				μm
Sampling Rate, Cyc IV, N_{re}<3,162	0.50							dscfm
Reynolds Number, Cyc IV, N_{re}<3162	2638.86	2643.03	2622.56	2571.92				
Prelim Cut Dia., Cyclone I, $D_{50LL\geq3162}$	10.60							μm
Middle Zone Dia., Cyclone I, $D_{50T\geq3162}$	10.80							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.)≥3162	0.48							dscfm
Reynolds Number, Cyc I & IV, N_{re}≥3162	2565.96							
Dia. of 50% Prob. (D_{50}) CIV (N_{re}≥3162)	2.30							μm
Sampling Rate, Cyc IV, N_{re}≥3,162	4.84							dscfm
Reynolds Number ≥ 3162	25659.77							
Cyclone Flow Rate	0.50	0.51	0.51	0.48				ft³/min
Recalculated D_{50-1} for C_{IV}		2.41	2.43	2.52				
Recalculated Cunninham		1.08	1.08	1.08				
Z		1.00	1.00	1.00				
Isokinetics		103.57	103.00	100.13				%
No. Sampling Pts. Outside Δp		0	0	1				
Sample Nozzle Diameter		0.151	0.152	0.152				in

Orifice Head and Nozzle Selection Calculation											
Nozzle No.	1	2	3	4	5	6	7	8	9	10	11
Nozzle diameter, D_n, in.	0.125	0.138	0.153	0.172	0.188	0.200	0.216	0.234	0.253	0.274	0.296
Nozzle velocity, v_n, ft/sec	97.25	79.79	64.91	51.36	42.99	37.99	32.57	27.75	23.74	20.24	17.34
R_{min}	0.76	0.75	0.73	0.70	0.66	0.63	0.57	0.50	0.50	0.50	0.50
v_{min}, ft/sec	74.28	59.90	47.49	35.94	28.56	23.96	18.66	13.88	11.87	10.12	8.67
R_{max}	1.23	1.23	1.25	1.26	1.28	1.30	1.32	1.35	1.39	1.43	1.49
v_{max}, ft/sec	119.16	98.45	80.87	64.94	55.16	49.34	43.08	37.55	32.98	29.03	25.79
Δp_{min}, in. H_2O @ $t_{s-50}$$^oF$	1.94	1.26	0.79	0.45	0.29	0.20	0.12	0.07	0.05	0.04	0.03
Δp_{min}, in. H_2O @ t_s	1.79	1.17	0.73	0.42	0.27	0.19	0.11	0.06	0.05	0.03	0.02
Δp_{max}, in. H_2O @ t_s	4.61	3.15	2.13	1.37	0.99	0.79	0.60	0.46	0.35	0.27	0.22
Δp_{min}, in. H_2O @ $t_{s+50}$$^oF$	4.29	2.93	1.98	1.27	0.92	0.74	0.56	0.43	0.33	0.25	0.20
ΔH, in. H_2O @ t_s+50°F						0.351					
ΔH, in. H_2O @ t_s						**0.406**					
ΔH, in. H_2O @ t_s-50°F						0.475					

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-1 Stack	**Operator**	CG /MP
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600 **Max. Fuel Factor** 1.836

Gas Analysis Data

Run Number	1-Base-PM-1		**Date**	09/24/18	**Run Start Time**	09:52	**Run Stop Time**	14:08
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:16	4.1	13.6	0.0	82.3	29.21	1.763	167.6	YES

Gas Analysis Data

Run Number	1-Base-PM-2		**Date**	09/24/18	**Run Start Time**	15:02	**Run Stop Time**	19:13
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:11	4.1	13.6	0.0	82.4	29.20	1.793	165.4	YES

Gas Analysis Data

Run Number	1-Base-PM-3		**Date**	09/25/18	**Run Start Time**	15:36	**Run Stop Time**	20:02
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:26	4.1	13.6	0.0	82.3	29.20	1.780	167.3	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-1 Stack	**Operator**	CG /MP
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/24/18	500	499.9	-0.1	Pass
Test Day 1	09/24/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		1-Base-PM-1		**Date**	09/24/18	**Start Time**	09:52	**Stop Time**	14:08
Meter Box Number		samp-cp-0028				**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	93.270	dcf		**Barometric Pressure**	(P_b)	29.97	in Hg
Average Stack Temp		$(t_s)_{avg}$	217	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.40	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	490.60	547.90	807.70	896.30				
Initial Value	$(V_i),(W_i)$	351.60	546.40	794.00	883.00				
Net Value	$(V_n),(W_n)$	139.0	1.5	13.7	13.3				
Results									
Total Weight		(W_t)	167.50	g		**Water Vol Weighed**	$(V_{wsg(std)})$	7.898	scf
Std Meter Volume		$(V_{m(std)})$	88.939	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	100.00	%
Calc Moisture Content		$(B_{ws(calc)})$	8.16	%		**Final Moisture Content**	(B_{ws})	8.16	%

Moisture Content Data									
Run Number		1-Base-PM-2		**Date**	09/24/18	**Start Time**	15:02	**Stop Time**	19:13
Meter Box Number		samp-cp-0028				**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	91.330	dcf		**Barometric Pressure**	(P_b)	29.96	in Hg
Average Stack Temp		$(t_s)_{avg}$	218	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.40	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	510.70	619.60	743.70	962.40				
Initial Value	$(V_i),(W_i)$	363.30	617.90	730.80	945.00				
Net Value	$(V_n),(W_n)$	147.4	1.7	12.9	17.4				
Results									
Total Weight		(W_t)	179.40	g		**Water Vol Weighed**	$(V_{wsg(std)})$	8.459	scf
Std Meter Volume		$(V_{m(std)})$	87.087	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	100.00	%
Calc Moisture Content		$(B_{ws(calc)})$	8.85	%		**Final Moisture Content**	(B_{ws})	8.85	%

Moisture Content Data									
Run Number		1-Base-PM-3		**Date**	09/25/18	**Start Time**	15:36	**Stop Time**	20:02
Meter Box Number		samp-cp-0028				**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	90.220	dcf		**Barometric Pressure**	(P_b)	30.08	in Hg
Average Stack Temp		$(t_s)_{avg}$	205	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	75	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.40	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	507.60	619.90	764.70	891.60				
Initial Value	$(V_i),(W_i)$	365.60	620.50	751.20	871.80				
Net Value	$(V_n),(W_n)$	142.0	-0.6	13.5	19.8				
Results									
Total Weight		(W_t)	174.70	g		**Water Vol Weighed**	$(V_{wsg(std)})$	8.237	scf
Std Meter Volume		$(V_{m(std)})$	86.131	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	86.54	%
Calc Moisture Content		$(B_{ws(calc)})$	8.73	%		**Final Moisture Content**	(B_{ws})	8.73	%

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	CG
Run Number	1-Base-PM-1

Filter #
000013
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	217.1	°F
Average Meter Temp	(t_m)	74.1	
Orifice Meter Coefficient	($\Delta H@$)	1.838	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.19	in H_2O
Stack Moisture Content	(B_{ws})	8.16	%
Stack Dry Molecular Weight	(M_d)	29.21	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.29	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	15.0	sec
	Pre (-)	5.0	in H_2O for	15.0	sec
PASS	**Post (+)**	5.0	in H_2O for	15.0	sec
	Post (-)	5.0	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1513	in
Suggested Nozzle Diameter	(D_{ni})	0.2201	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Pressures			
Barometric Pressure	(P_b)	29.97	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.91	in Hg
Absolute Meter Pressure	(P_m)	30.11	in Hg

Nozzle Measurements			**ID: 3**	
Pre	0.153	0.151	0.150	**PASS**
Post	0.153	0.151	0.150	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	09:52	**End**	14:08

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	351.6	546.4	794.0	883.0				
Post	490.6	547.9	807.7	896.3				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0028	samp-cp-0028	samp-cp-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	**1006**	**8664**	**samp-cp-0028**		samp-cp-0028					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_I$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	190.320	1.40	0.406	0.40	211	254	252	52	65	70	70	70	2.5	1.18	65.22	8.024	109.6	93.963
A-2	20.8	00:20:45	198.670	1.40	0.406	0.40	212	259	260	52	65	70	71	71	2.5	1.18	65.27	15.409	105.4	90.225
A-3	41.5	00:41:30	206.370	1.40	0.406	0.40	215	259	259	64	65	71	73	73	2.5	1.18	65.41	22.852	104.3	89.206
B-1	62.3	01:02:15	214.160	1.30	0.406	0.40	217	263	262	52	65	71	74	74	2.5	1.14	63.13	29.433	104.8	88.847
B-2	80.5	01:20:30	221.060	1.30	0.406	0.40	218	264	261	60	66	70	74	74	2.5	1.14	63.17	35.928	104.9	88.409
B-3	98.8	01:38:45	227.870	1.30	0.406	0.40	217	261	252	62	68	71	75	75	2.5	1.14	63.13	42.677	105.6	88.636
C-1	117.0	01:57:00	234.960	1.50	0.406	0.40	218	250	252	64	68	68	77	77	2.5	1.22	67.86	50.340	105.0	88.803
C-2	137.8	02:17:45	243.040	1.50	0.406	0.40	219	248	250	64	68	69	77	77	2.5	1.22	67.91	58.012	104.6	88.940
C-3	158.5	02:38:30	251.130	1.50	0.406	0.40	219	260	252	65	68	71	77	77	2.5	1.22	67.91	65.485	103.9	88.775
D-1	179.3	02:59:15	259.010	1.40	0.406	0.40	219	255	255	62	67	68	73	73	2.5	1.18	65.61	73.082	104.0	88.794
D-2	200.0	03:20:00	266.960	1.50	0.406	0.40	220	251	251	59	66	70	74	74	2.5	1.22	67.96	80.921	103.6	88.776
D-3	221.5	03:41:30	275.180	1.50	0.406	0.40	220	250	251	60	67	69	74	74	2.5	1.22	67.96	88.942	103.6	88.942
Last Pt	243.0	04:03:00	283.590																	
Final Val	243.0	04:03:00	283.590											**Max Vac**	2.5	**Final Values**		88.942	103.6	
Average Values				1.42		0.40	217	256	255	60	67	70	74	74		1.19	65.88			
													74							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	CG
Run Number	1-Base-PM-2

Filter #
000017
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	217.8	°F
Average Meter Temp	(t_m)	73.9	
Orifice Meter Coefficient	($\Delta H@$)	1.838	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.18	in H_2O
Stack Moisture Content	(B_{ws})	8.85	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.37	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.29	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	20.0	in Hg
PASS	**Post**	0.000	ft³/min@	20.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	15.0	sec
	Pre (-)	5.0	in H_2O for	15.0	sec
PASS	**Post (+)**	5.0	in H_2O for	15.0	sec
	Post (-)	5.0	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1517	in
Suggested Nozzle Diameter	(D_{ni})	0.1539	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Pressures			
Barometric Pressure	(P_b)	29.96	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.90	in Hg
Absolute Meter Pressure	(P_m)	30.10	in Hg

Nozzle Measurements		**ID: 3**		
Pre	0.151	0.153	0.151	**PASS**
Post	0.151	0.153	0.151	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	15:02	**End**	19:13

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	363.3	617.9	730.8	945.0				
Post	510.7	619.6	743.7	962.4				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0028	samp-cp-0028	samp-cp-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	1037	3130	samp-cp-0028		samp-cp-0028					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	283.810	1.50	0.406	0.40	223	262	255	68	70	75	74	74	2.5	1.22	68.22	7.408	98.8	86.217
A-2	20.8	00:20:45	291.580	1.50	0.406	0.40	222	257	259	60	69	68	74	74	2.5	1.22	68.17	15.064	100.4	87.660
A-3	41.5	00:41:30	299.610	1.50	0.406	0.40	220	260	261	62	69	70	74	74	2.5	1.22	68.07	22.729	101.0	88.178
B-1	62.3	01:02:15	307.650	1.40	0.406	0.40	218	262	257	60	62	71	73	73	2.5	1.18	65.67	29.320	101.4	87.959
B-2	80.5	01:20:30	314.550	1.40	0.406	0.40	218	260	255	60	64	74	74	74	2.5	1.18	65.67	36.127	102.4	88.351
B-3	98.8	01:38:45	321.690	1.40	0.406	0.40	218	260	254	61	68	72	72	72	2.5	1.18	65.67	42.682	102.4	88.101
C-1	117.0	01:57:00	328.540	1.40	0.406	0.40	216	256	250	66	68	71	71	71	2.5	1.18	65.57	50.228	102.6	88.059
C-2	137.8	02:17:45	336.410	1.40	0.406	0.40	217	260	255	65	67	70	72	72	2.5	1.18	65.62	57.530	102.3	87.656
C-3	158.5	02:38:30	344.040	1.40	0.406	0.40	216	257	250	62	69	72	74	74	2.5	1.18	65.57	65.224	102.7	87.875
D-1	179.3	02:59:15	352.110	1.30	0.406	0.40	216	259	257	62	68	70	76	76	2.5	1.14	63.19	72.822	103.3	87.933
D-2	200.0	03:20:00	360.110	1.30	0.406	0.40	215	259	254	61	68	70	76	76	2.5	1.14	63.14	79.965	103.1	87.482
D-3	220.8	03:40:45	367.630	1.30	0.406	0.40	214	255	255	61	68	71	77	77	2.5	1.14	63.09	87.085	103.0	87.085
Last Pt	241.5	04:01:30	375.140																	
Final Val	241.5	04:01:30	375.140											**Max Vac**	2.5	**Final Values**		87.085	103.0	
Average Values				1.40		0.40	218	259	255	62	68	71	74	74		1.18	65.64			
													74							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/07/18
Operator	CG / MP
Run Number	1-Base-PM-3

Filter #
000010
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	205.0	°F
Average Meter Temp	(t_m)	75.4	
Orifice Meter Coefficient	($\Delta H@$)	1.838	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.16	in H_2O
Stack Moisture Content	(B_{ws})	8.73	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.36	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.30	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	30.0	sec
	Pre (-)	5.0	in H_2O for	30.0	sec
PASS	**Post (+)**	5.0	in H_2O for	30.0	sec
	Post (-)	5.0	in H_2O for	30.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1517	in
Suggested Nozzle Diameter	(D_{ni})	0.1526	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Pressures			
Barometric Pressure	(P_b)	30.08	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.22	in Hg

Nozzle Measurements			ID: 3	
Pre	0.152	0.151	0.152	**PASS**
Post	0.152	0.151	0.152	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	15:36	**End**	20:02

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	365.6	620.5	751.2	871.8				
Post	507.6	619.9	764.7	891.6				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0028	samp-cp-0028	samp-cp-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	1006	8664	samp-cp-0028		samp-cp-0028					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	654.310	1.40	0.406	0.40	205	257	262	61	62	74	70	70	2.0	1.18	64.89	7.040	95.6	83.721
A-2	20.8	00:20:45	661.610	1.40	0.406	0.40	206	258	261	61	62	73	70	70	2.0	1.18	64.94	13.801	93.8	82.058
A-3	41.5	00:41:30	668.620	1.40	0.406	0.40	206	259	258	61	63	72	72	72	2.0	1.18	64.94	21.689	98.7	85.973
B-1	62.3	01:02:15	676.830	1.40	0.406	0.40	205	257	261	62	63	74	73	73	2.0	1.18	64.89	28.671	100.9	87.883
B-2	80.5	01:20:30	684.110	1.50	0.406	0.40	206	254	262	60	63	72	76	76	2.0	1.22	67.21	35.375	100.0	87.727
B-3	99.5	01:39:30	691.140	1.50	0.406	0.40	207	259	259	60	62	74	77	77	2.0	1.22	67.26	42.124	99.5	87.713
C-1	118.5	01:58:30	698.230	1.30	0.406	0.40	204	261	264	54	59	72	77	77	2.0	1.14	62.48	49.110	99.3	87.023
C-2	139.3	02:19:15	705.570	1.20	0.406	0.40	205	259	259	52	59	73	78	78	2.5	1.10	60.07	55.856	99.9	86.682
C-3	159.0	02:39:00	712.670	1.20	0.406	0.40	204	257	261	53	61	71	78	78	3.0	1.10	60.03	62.516	100.2	86.299
D-1	178.8	02:58:45	719.680	1.10	0.406	0.40	204	258	260	53	61	72	78	78	3.0	1.05	57.47	69.290	100.5	85.701
D-2	199.5	03:19:30	726.810	1.40	0.406	0.40	204	256	258	54	62	69	78	78	3.0	1.18	64.84	77.518	100.4	85.870
D-3	222.8	03:42:45	735.470	1.50	0.406	0.40	204	255	257	55	62	70	78	78	3.0	1.22	67.11	86.126	100.1	86.126
Last Pt	246.8	04:06:45	744.530																	
Final Val	246.8	04:06:45	744.530											**Max Vac**	3.0	**Final Values**		86.126	100.1	
Average Values				1.36		0.40	205	258	260	57	62	72	75	75		1.16	63.84			
													75							

Notes:

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
PM Data

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Run Start Time	23:32	04:11	09:20		hh:mm	
Run Stop Time	03:48	08:27	13:40		hh:mm	
Test Date	09/24/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base w/DB	Base w/DB	Base w/DB		% or w/DB	--
Meter Calibration Factor	0.962	0.962	0.962			
Pitot Tube Coefficient	0.7240	0.7240	0.7240			
Average Nozzle Diameter	0.151	0.152	0.152		in	
Stack Test Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Initial Meter Volume	375.620	467.130	559.420		ft³	
Final Meter Volume	466.630	557.450	652.730		ft³	
Total Meter Volume	91.010	90.320	93.310	91.547	ft³	
Total Sampling Time	243.75	246.75	246.75	245.75	min	
Average Meter Temperature	74.67	70.75	71.58	72.33	°F	
Average Stack Temperature	192.58	192.17	190.50	191.75	°F	
Barometric Pressure	29.84	29.77	30.39	30.00	in Hg	
Stack Static Pressure	-1.10	-1.10	-1.10	-1.10	in H_2O	
Absolute Stack Pressure	29.76	29.69	30.31	29.92	in Hg	
Average Orifice Pressure Drop	0.42	0.42	0.42	0.42	in H_2O	
Absolute Meter Pressure	29.98	29.91	30.53	30.14	in Hg	
Avg Square Root Pitot Pressure	1.20	1.16	1.19	1.18	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	182.10	106.50	153.00	147.20	g	
Silica Gel Weight Gain	19.70	18.00	18.00	18.57	g	
Total Water Volume Collected	202.16	124.72	171.31	166.07	ml	
Standard Water Vapor Volume	9.51	5.87	8.06	7.82	scf	
Standard Meter Volume	86.3	86.1	90.7	87.7	dscf	
Standard Metric Meter Volume	2.4	2.4	2.6	2.5	dscm	
Calculated Stack Moisture	9.93	6.38	8.17	8.16	%	
Saturated Stack Moisture	67.40	66.97	63.30	65.89	%	
Reported Stack Moisture Content	9.93	6.38	8.17	8.16	%	
Gas Analysis Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.9	4.9	4.7	4.8	%	
Oxygen Content	12.4	12.3	12.0	12.2	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.7	82.9	83.3	83.0	%	
Stack Dry Molecular Weight	29.28	29.27	29.23	29.26	lb/lb-mole	
Stack Wet Molecular Weight	28.16	28.55	28.32	28.34	lb/lb-mole	
Calculated Fuel Factor	1.742	1.775	1.889	1.802		
Fuel F-Factor	8633.27	8632.22	8632.22	8632.57	dscf/MMBtu	
Percent Excess Air	131.4	128.2	120.6	126.7	%	

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	Average	Units	Limits
Average Stack Gas Velocity	65.52	63.07	64.30	64.30	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	
Actual Stack Flow Rate	1,114,523	1,072,962	1,093,824	1,093,770	acfm	
Wet Standard Stack Flow Rate	53,814	51,719	53,963	53,165	wkscfh	
Dry Standard Stack Flow Rate	48,471,185	48,417,320	49,555,590	48,814,698	dscfh	
Percent of Isokinetic Rate	99.5	97.8	99.8	99.0	%	
Emission Rate Data	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	Average	Units	Limits
Total $PM_{10}/PM_{2.5}$ Mass	5.04	1.98	2.66	3.23	mg	--
Total $PM_{10}/PM_{2.5}$ Concentration	5.83E-05	2.30E-05	2.93E-05	3.69E-05	g/dscf	--
	9.00E-04	3.55E-04	4.52E-04	5.69E-04	gr/dscf	--
Total $PM_{10}/PM_{2.5}$ Emission Rate	2.83	1.11	1.45	1.80	kg/hr	--
	6.23	2.46	3.20	3.96	lb/hr	--
	27.30	10.77	14.03	17.37	tpy	--
	0.0027	0.0011	0.0013	0.0017	lb/MMBtu	0.0073
Filterable PM_{10} Mass	0.22	0.18	0.15	0.19	mg	--
Filterable PM_{10} Concentration	2.53E-06	2.13E-06	1.70E-06	2.12E-06	g/dscf	--
	3.90E-05	3.29E-05	2.62E-05	3.27E-05	gr/dscf	--
Filterable PM_{10} Emission Rate	0.12	0.10	0.08	0.10	kg/hr	--
	0.27	0.23	0.19	0.23	lb/hr	--
	1.18	1.00	0.81	1.00	tpy	--
	0.0001	0.0001	0.0001	0.0001	lb/MMBtu	--
Filterable $PM_{2.5}$ Mass	1.32	1.41	1.10	1.28	mg	--
Filterable $PM_{2.5}$ Concentration	1.53E-05	1.64E-05	1.22E-05	1.46E-05	g/dscf	--
	2.35E-04	2.53E-04	1.88E-04	2.26E-04	gr/dscf	--
Filterable $PM_{2.5}$ Emission Rate	0.74	0.79	0.60	0.71	kg/hr	--
	1.63	1.75	1.33	1.57	lb/hr	--
	7.14	7.67	5.82	6.88	tpy	--
	0.0007	0.0008	0.0005	0.0007	lb/MMBtu	--
Condensable $PM_{2.5}$ Mass	3.50	0.39	1.40	1.76	mg	--
Condensable $PM_{2.5}$ Concentration	4.05E-05	4.48E-06	1.54E-05	2.02E-05	g/dscf	--
	6.26E-04	6.91E-05	2.38E-04	3.11E-04	gr/dscf	--
Condensable $PM_{2.5}$ Emission Rate	1.97	0.22	0.77	0.98	kg/hr	--
	4.33	0.48	1.69	2.17	lb/hr	--
	18.98	2.09	7.39	9.49	tpy	--
	0.0019	0.0002	0.0007	0.0009	lb/MMBtu	--
RM 201A Quality Control	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	Average	Units	Limits
Cyclone Flow Rate	0.49	0.46	0.49	0.48	ft³/min	
Stack Viscosity	200.77	203.90	201.70	202.12	μP	
Cunningham Correction Factor	1.08	1.07	1.08	1.08		
Recalculated D50-1 for CIV	2.39	2.57	2.37	2.44		
Recalculated Cunninham	1.08	1.07	1.08	1.08		
Lower Limit Cut Diameter, CI (NRE<3162), D50LL	2.39	2.57	2.37	2.44		
Reynolds Number	2699.68	2554.88	2749.68	2,668.08		
Z	1.00	1.00	1.00	1.00		
No. Sampling Pts. Outside Dp	0	0	0	0	points	

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		MP / CG	
Date for Preliminary Run	(mm/dd/yy)	09/24/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	50	scf
Run Duration	chk Subpart	240	minutes
Unit Number		CTG-1	
Base Run Number		1-100 w/DB-PM	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/24/18	09/25/18	09/25/18	
Load		Base w/DB	Base w/DB	Base w/DB	% or w/DB
Fuel F-Factor		8633.27	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0028	SAMP-CP-0028	SAMP-CP-0028	
Meter Calibration Factor	(Y)	0.962	0.962	0.962	
Orifice Meter Coefficient	($\Delta H_@$)	1.838	1.838	1.838	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	4187/10	4187/10	4187/10	
Pitot Tube Coefficient	(C_p)	0.7240	0.7240	0.7240	
Nozzle Number	from ACS	3	3	3	must match cyc nozz tab (e.g. 3, 4, etc.)
Nozzle Diameter	(D_n)	0.151	0.152	0.152	in
Probe Number	from ACS	samp-hp-0151	samp-hp-0151	samp-hp-0151	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-hp-0011	samp-hp-0011	samp-hp-0011	
Impinger Case Number	from ACS	samp-cp-0017	samp-cp-0017	samp-cp-0017	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 201A and OTM 27 - DETERMINATION OF NOZZLE SIZE AND POST RUN QUALITY CONTROL

Gas Analysis	Prelim	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	1-100 w/DB-PM-4	1-100 w/DB-PM-5	1-100 w/DB-PM-6	
Carbon Dioxide Content	4.9	4.9	4.9	4.7				%
Oxygen Content	12.4	12.4	12.3	12.0				%
Stack Moisture Content	10.0	9.9	6.4	8.2				%
Nitrogen plus CO Content	82.7	82.7	82.9	83.3				%

Corrected Velocity Head, $\Delta p_{2.5}$ (in H_2O)	Min.	1.00	Max.	1.70

Stack and Equipment Information	Prelim	1-100 w/DB-PM-1	1-100 w/DB-PM-2	1-100 w/DB-PM-3	1-100 w/DB-PM-4	1-100 w/DB-PM-5	1-100 w/DB-PM-6	
Barometric Pressure	29.83	29.84	29.77	30.39				in Hg
Stack Static Pressure	-1.10	-1.10	-1.10	-1.10				in H_2O
Absolute Stack Pressure	29.75	29.76	29.69	30.31				in Hg
Average Stack Temp	191	193	192	191				0.00
Average Stack Temp	651	653	652	651				°R
Average Meter Temp	85	75	71	72				0.00
Orifice Meter Coefficient	1.838	1.838	1.838	1.838				in H_2O
Pitot Coefficient	0.724	0.724	0.724	0.724				
Stack Dry Molecular Weight	29.28	29.28	29.27	29.23				lb/lb mole
Stack Wet Molecular Weight	28.15	28.16	28.55	28.32				lb/lb mole
Stack Viscosity	200.26	200.77	203.90	201.70				μP
Cunningham Correction Factor, for a 2.25 μm particle	1.08							
Cunningham Correction Factor, for a 2.5 μm particle		1.07	1.08	1.07				
Prelim Cut Dia., Cyclone I, D_{50LL}, N_{re}<3162	10.24	2.39	2.57	2.37				μm
Middle Zone Dia., Cyclone I, D_{50T}, N_{re}<3162	10.62							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.), N_{re}<3162	0.48							dscfm
Reynolds Number, Cyc I & IV, N_{re}<3162	2690.55	2699.68	2554.88	2749.68				
Dia. of 50% Prob. (D_{50}) Cyc IV (N_{re}<3162)	2.39	2.39	2.56	2.37				μm
Sampling Rate, Cyc IV, N_{re}<3,162	0.48							dscfm
Reynolds Number, Cyc IV, N_{re}<3162	2690.51	2699.68	2554.88	2749.68				
Prelim Cut Dia., Cyclone I, $D_{50LL\geq3162}$	10.61							μm
Middle Zone Dia., Cyclone I, $D_{50T\geq3162}$	10.81							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.)≥3162	0.47							dscfm
Reynolds Number, Cyc I & IV, N_{re}≥3162	2624.92							
Dia. of 50% Prob. (D_{50}) CIV (N_{re}≥3162)	2.30							μm
Sampling Rate, Cyc IV, N_{re}≥3,162	4.73							dscfm
Reynolds Number ≥ 3162	26249.36							
Cyclone Flow Rate	0.48	0.49	0.46	0.49				ft³/min
Recalculated D_{50-1} for C_{IV}		2.39	2.57	2.37				
Recalculated Cunninham		1.08	1.07	1.08				
Z		1.00	1.00	1.00				
Isokinetics		99.45	97.79	99.76				%
No. Sampling Pts. Outside ∆p		0	0	0				
Sample Nozzle Diameter		0.151	0.152	0.152				in

Orifice Head and Nozzle Selection Calculation

Nozzle No.	1	2	3	4	5	6	7	8	9	10	11
Nozzle diameter, D_n, in.	0.125	0.138	0.156	0.172	0.188	0.200	0.216	0.234	0.253	0.274	0.296
Nozzle velocity, v_n, ft/sec	94.78	77.77	60.86	50.06	41.90	37.02	31.74	27.05	23.14	19.73	16.90
R_{min}	0.76	0.75	0.73	0.70	0.66	0.63	0.57	0.50	0.50	0.50	0.50
v_{min}, ft/sec	72.34	58.32	44.19	34.95	27.74	23.25	18.05	13.52	11.57	9.86	8.45
R_{max}	1.23	1.23	1.25	1.27	1.28	1.30	1.32	1.36	1.39	1.44	1.49
v_{max}, ft/sec	116.17	95.99	76.01	63.33	53.80	48.14	42.04	36.65	32.20	28.35	25.19
Δp_{min}, in. H_2O @ t_{s-50}°F	1.90	1.24	0.71	0.44	0.28	0.20	0.12	0.07	0.05	0.04	0.03
Δp_{min}, in. H_2O @ t_s	1.76	1.14	0.66	0.41	0.26	0.18	0.11	0.06	0.04	0.03	0.02
Δp_{max}, in. H_2O @ t_s	4.53	3.10	1.94	1.35	0.97	0.78	0.59	0.45	0.35	0.27	0.21
Δp_{min}, in. H_2O @ t_{s+50}°F	4.21	2.87	1.80	1.25	0.90	0.72	0.55	0.42	0.32	0.25	0.20
∆H, in. H_2O @ t_s+50°F	0.365										
∆H, in. H_2O @ t_s	**0.423**										
∆H, in. H_2O @ t_s-50°F	0.497										

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18		
Sampling Location	CTG-1 Stack	**Operator**	MP / CG		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	1-100 w/DB-PM-1		**Date**	09/24/18	**Run Start Time**	23:32	**Run Stop Time**	03:48
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:16	4.9	12.4	0.0	82.7	29.28	1.742	131.4	YES

Gas Analysis Data

Run Number	1-100 w/DB-PM-2		**Date**	09/25/18	**Run Start Time**	04:11	**Run Stop Time**	08:27
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:16	4.9	12.3	0.0	82.9	29.27	1.775	128.2	YES

Gas Analysis Data

Run Number	1-100 w/DB-PM-3		**Date**	09/25/18	**Run Start Time**	09:20	**Run Stop Time**	13:40
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:20	4.7	12.0	0.0	83.3	29.23	1.889	120.6	NO

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-1 Stack	**Operator**	MP / CG
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/24/18	500	499.9	-0.1	Pass
Test Day 1	09/24/18	500	499.9	-0.1	Pass

Moisture Content Data

Run Number		1-100 w/DB-PM-1		**Date**	09/24/18	**Start Time**	23:32	**Stop Time** 03:48
Meter Box Number		SAMP-CP-0028			**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	91.010	dcf	**Barometric Pressure**	(P_b)	29.84	in Hg
Average Stack Temp		$(t_s)_{avg}$	193	°F	**Stack Static Pressure**	(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	75	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7** / **Impinger 8**
		(g)	(g)	(g)	(g)			
Contents		Dry	Dry	DI Water	Sil Gel			
Final Value	$(V_f),(W_f)$	516.70	550.70	706.10	872.10			
Initial Value	$(V_i),(W_i)$	350.70	547.50	693.20	852.40			
Net Value	$(V_n),(W_n)$	166.0	3.2	12.9	19.7			
Results								
Total Weight		(W_t)	201.80	g	**Water Vol Weighed**	$(V_{wsg(std)})$	9.515	scf
Std Meter Volume		$(V_{m(std)})$	86.318	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	67.40	%
Calc Moisture Content		$(B_{ws(calc)})$	9.93	%	**Final Moisture Content**	(B_{ws})	9.93	%

Moisture Content Data

Run Number		1-100 w/DB-PM-2		**Date**	09/25/18	**Start Time**	04:11	**Stop Time** 08:27
Meter Box Number		SAMP-CP-0028			**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	90.320	dcf	**Barometric Pressure**	(P_b)	29.77	in Hg
Average Stack Temp		$(t_s)_{avg}$	192	°F	**Stack Static Pressure**	(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	71	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7** / **Impinger 8**
		(g)	(g)	(g)	(g)			
Contents		Dry	Dry	DI Water	Sil Gel			
Final Value	$(V_f),(W_f)$	462.90	620.30	751.20	871.80			
Initial Value	$(V_i),(W_i)$	364.40	620.60	742.90	853.80			
Net Value	$(V_n),(W_n)$	98.5	-0.3	8.3	18.0			
Results								
Total Weight		(W_t)	124.50	g	**Water Vol Weighed**	$(V_{wsg(std)})$	5.870	scf
Std Meter Volume		$(V_{m(std)})$	86.094	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	66.97	%
Calc Moisture Content		$(B_{ws(calc)})$	6.38	%	**Final Moisture Content**	(B_{ws})	6.38	%

Moisture Content Data

Run Number		1-100 w/DB-PM-3		**Date**	09/25/18	**Start Time**	09:20	**Stop Time** 13:40
Meter Box Number		SAMP-CP-0028			**Meter Cal Factor**	(Y)	0.962	
Total Meter Volume		(V_m)	93.310	dcf	**Barometric Pressure**	(P_b)	30.39	in Hg
Average Stack Temp		$(t_s)_{avg}$	191	°F	**Stack Static Pressure**	(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	72	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7** / **Impinger 8**
		(g)	(g)	(g)	(g)			
Contents		Dry	Dry	DI Water	Sil Gel			
Final Value	$(V_f),(W_f)$	493.70	550.40	763.30	889.70			
Initial Value	$(V_i),(W_i)$	351.30	549.50	753.60	871.70			
Net Value	$(V_n),(W_n)$	142.4	0.9	9.7	18.0			
Results								
Total Weight		(W_t)	171.00	g	**Water Vol Weighed**	$(V_{wsg(std)})$	8.063	scf
Std Meter Volume		$(V_{m(std)})$	90.652	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	63.30	%
Calc Moisture Content		$(B_{ws(calc)})$	8.17	%	**Final Moisture Content**	(B_{ws})	8.17	%

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	MP / CG
Run Number	1-100 w/DB-PM-1

Filter #
000010
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	192.6	°F
Average Meter Temp	(t_m)	74.7	
Orifice Meter Coefficient	$(\Delta H@)$	1.838	in H_2O
Square Root ΔP	$(\Delta p^{1/2}_{avg})$	1.20	in H_2O
Stack Moisture Content	(B_{ws})	9.93	%
Stack Dry Molecular Weight	(M_d)	29.28	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.29	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	15.0	in H_2O for	30.0	sec
	Pre (-)	15.0	in H_2O for	30.0	sec
PASS	**Post (+)**	15.0	in H_2O for	30.0	sec
	Post (-)	15.0	in H_2O for	30.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1513	in
Suggested Nozzle Diameter	(D_{ni})	0.2170	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Pressures			
Barometric Pressure	(P_b)	29.84	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	29.76	in Hg
Absolute Meter Pressure	(P_m)	29.98	in Hg

Nozzle Measurements			**ID: 3**	
Pre	0.151	0.152	0.151	**PASS**
Post	0.151	0.152	0.151	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	23:32	**End**	03:48

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	350.7	547.5	693.2	852.4				
Post	516.7	550.7	706.1	872.1				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0028	SAMP-CP-0028	SAMP-CP-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	**1006**	**8664**	**SAMP-CP-0028**		SAMP-CP-0028					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_i$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	375.620	1.50	0.423	0.42	193	242	258	49	56	70	74	74	2.5	1.22	66.92	7.236	96.0	85.003
A-2	20.8	00:20:45	383.240	1.40	0.423	0.42	192	246	256	46	56	70	74	74	2.5	1.18	64.60	13.998	96.2	83.728
A-3	40.8	00:40:45	390.360	1.50	0.423	0.42	191	253	255	47	61	70	76	76	2.5	1.22	66.82	21.491	97.3	85.176
B-1	61.5	01:01:30	398.280	1.20	0.423	0.42	192	245	260	47	63	71	76	76	2.5	1.10	59.81	27.441	98.5	84.402
B-2	79.3	01:19:15	404.570	1.30	0.423	0.42	193	236	245	47	64	72	76	76	2.5	1.14	62.30	33.932	99.5	84.612
B-3	97.8	01:37:45	411.430	1.30	0.423	0.42	194	255	258	48	65	71	76	76	2.5	1.14	62.35	40.573	100.6	85.073
C-1	116.3	01:56:15	418.450	1.50	0.423	0.42	193	242	249	50	66	72	75	75	2.5	1.22	66.92	48.535	100.9	85.883
C-2	137.8	02:17:45	426.850	1.40	0.423	0.42	193	236	255	47	65	71	74	74	2.5	1.18	64.65	55.885	100.9	85.943
C-3	158.5	02:38:30	434.590	1.40	0.423	0.42	193	225	254	47	65	70	74	74	2.5	1.18	64.65	63.264	100.9	86.028
D-1	179.3	02:59:15	442.360	1.70	0.423	0.42	193	223	257	47	64	70	74	74	2.5	1.30	71.24	71.165	99.9	86.086
D-2	201.5	03:21:30	450.680	1.60	0.423	0.42	192	224	256	47	64	69	74	74	2.5	1.26	69.06	78.828	99.5	86.163
D-3	223.0	03:43:00	458.750	1.50	0.423	0.42	192	229	252	47	64	70	73	73	2.5	1.22	66.87	86.325	99.5	86.325
Last Pt	243.8	04:03:45	466.630																	
Final Val	243.8	04:03:45	466.630											**Max Vac**	2.5	**Final Values**		86.325	99.5	
Average Values				1.44		0.42	193	238	255	47	63	71	75	75		1.20	65.52			
													75							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP / CG
Run Number	1-100 w/DB-PM-2

Filter #
05301
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	192.2	°F
Average Meter Temp	(t_m)	70.8	
Orifice Meter Coefficient	($\Delta H@$)	1.838	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.16	in H_2O
Stack Moisture Content	(B_{ws})	6.38	%
Stack Dry Molecular Weight	(M_d)	29.27	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.31	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	15.0	in Hg
Pitot	Pre (+)	15.0	in H_2O for	30.0	sec
	Pre (-)	15.0	in H_2O for	30.0	sec
PASS	Post (+)	15.0	in H_2O for	30.0	sec
	Post (-)	15.0	in H_2O for	30.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1517	in
Suggested Nozzle Diameter	(D_{ni})	0.1513	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Pressures			
Barometric Pressure	(P_b)	29.77	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	29.69	in Hg
Absolute Meter Pressure	(P_m)	29.91	in Hg

Nozzle Measurements			ID: 3	
Pre	0.152	0.152	0.151	PASS
Post	0.152	0.152	0.151	PASS

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	04:11	End	08:27

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	364.4	620.6	742.9	853.8				
Post	462.9	620.3	751.2	871.8				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0028	SAMP-CP-0028	SAMP-CP-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	1006	8664	SAMP-CP-0028		SAMP-CP-0028					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤85°F)	CPM Filter Temp (76.5±8.5°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity ($(v_s)_l$)	Cumul. Meter Volume ($(V_m)_{std}$)	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume ($(V_m)_{std}$)
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	467.130	1.40	0.423	0.42	190	225	256	48	52	70	71	71	1.0	1.18	64.13	7.317	96.9	87.013
A-2	20.8	00:20:45	474.810	1.30	0.423	0.42	191	231	251	46	50	68	70	70	1.0	1.14	61.85	14.047	96.4	85.056
A-3	40.8	00:40:45	481.860	1.40	0.423	0.42	191	228	261	45	51	69	71	71	1.5	1.18	64.18	21.335	96.5	85.602
B-1	61.5	01:01:30	489.510	1.30	0.423	0.42	191	226	253	45	51	69	71	71	1.5	1.14	61.85	27.223	96.1	84.762
B-2	79.3	01:19:15	495.690	1.30	0.423	0.42	192	225	256	45	51	71	70	70	2.0	1.14	61.90	33.466	96.9	85.132
B-3	97.0	01:37:00	502.230	1.400	0.423	0.42	193	226	256	47	52	72	70	70	2.0	1.18	64.28	40.196	97.4	85.873
C-1	115.5	01:55:30	509.280	1.400	0.423	0.42	193	226	255	47	52	72	71	71	2.0	1.18	64.28	47.942	97.7	86.348
C-2	137.0	02:17:00	517.410	1.400	0.423	0.42	193	238	250	47	54	71	71	71	2.0	1.18	64.28	55.402	97.4	86.249
C-3	158.5	02:38:30	525.240	1.40	0.423	0.42	193	246	261	48	54	68	71	71	2.0	1.18	64.28	62.995	97.4	86.356
D-1	180.0	03:00:00	533.210	1.30	0.423	0.42	193	244	262	49	56	70	71	71	2.0	1.14	61.94	70.722	97.6	86.283
D-2	202.3	03:22:15	541.320	1.30	0.423	0.42	193	261	253	49	56	71	71	71	2.0	1.14	61.94	78.487	97.8	86.266
D-3	224.5	03:44:30	549.470	1.30	0.423	0.42	193	263	257	49	57	72	71	71	2.0	1.14	61.94	86.090	97.8	86.090
Last Pt	246.8	04:06:45	557.450																	
Final Val	246.8	04:06:45	557.450											**Max Vac**	2.0	**Final Values**		86.090	97.8	
Average Values				1.35		0.42	192	237	256	47	53	70	71	71		1.16	63.07			
													71							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP / CG
Run Number	1-100 w/DB-PM-3

Filter #
05323
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	190.5	°F
Average Meter Temp	(t_m)	71.6	
Orifice Meter Coefficient	($\Delta H@$)	1.838	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.19	in H_2O
Stack Moisture Content	(B_{ws})	8.17	%
Stack Dry Molecular Weight	(M_d)	29.23	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.31	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	30.0	sec
	Pre (-)	5.0	in H_2O for	30.0	sec
PASS	**Post (+)**	5.0	in H_2O for	30.0	sec
	Post (-)	5.0	in H_2O for	30.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0028		
Meter Cal Factor	(Y)	0.962	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1523	in
Suggested Nozzle Diameter	(D_{ni})	0.1494	in
Probe Number	samp-hp-0151		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hp-0011		
Impinger Case Number	samp-cp-0017		

Nozzle Measurements			**ID: 3**	
Pre	0.152	0.152	0.153	**PASS**
Post	0.152	0.152	0.153	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Pressures			
Barometric Pressure	(P_b)	30.39	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	30.31	in Hg
Absolute Meter Pressure	(P_m)	30.53	in Hg

Run Time			
Start	09:20	**End**	13:40

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	351.3	549.5	753.6	871.7				
Post	493.7	550.4	763.3	889.7				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0028	SAMP-CP-0028	SAMP-CP-0028			samp-hp-0151	samp-hp-0151	samp-hp-0011	samp-cp-0017	**1037**	**3130**	**SAMP-CP-0028**		SAMP-CP-0028					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	559.420	1.30	0.423	0.42	191	261	262	51	59	74	71	71	2.0	1.14	61.46	7.479	102.4	88.939
A-2	20.8	00:20:45	567.110	1.30	0.423	0.42	191	258	251	53	59	74	71	71	2.0	1.14	61.46	15.143	103.7	90.037
A-3	41.5	00:41:30	574.990	1.30	0.423	0.42	190	262	260	54	59	73	71	71	2.0	1.14	61.42	22.476	102.6	89.093
B-1	62.3	01:02:15	582.530	1.40	0.423	0.42	191	248	251	54	63	72	70	70	2.0	1.18	63.78	29.171	102.7	89.973
B-2	80.0	01:20:00	589.400	1.40	0.423	0.42	191	248	253	55	62	71	70	70	2.0	1.18	63.78	34.842	100.3	87.951
B-3	97.8	01:37:45	595.220	1.40	0.423	0.42	190	248	255	54	65	72	71	71	2.0	1.18	63.73	41.105	99.7	87.815
C-1	115.5	01:55:30	601.660	1.50	0.423	0.42	189	249	257	54	68	71	72	72	2.0	1.22	65.92	48.900	99.1	88.074
C-2	137.0	02:17:00	609.690	1.50	0.423	0.42	190	250	252	54	65	72	72	72	2.0	1.22	65.97	56.880	98.9	88.549
C-3	158.5	02:38:30	617.910	1.50	0.423	0.42	190	251	252	54	65	73	72	72	2.0	1.22	65.97	64.976	99.0	89.071
D-1	180.0	03:00:00	626.250	1.50	0.423	0.42	191	258	262	58	65	72	73	73	2.0	1.22	66.02	73.570	99.4	89.757
D-2	202.3	03:22:15	635.120	1.50	0.423	0.42	191	254	261	59	63	71	73	73	2.0	1.22	66.02	82.174	99.7	90.318
D-3	224.5	03:44:30	644.000	1.50	0.423	0.42	191	252	261	59	63	72	73	73	2.0	1.22	66.02	90.633	99.8	90.633
Last Pt	246.8	04:06:45	652.730																	
Final Val	246.8	04:06:45	652.730											**Max Vac**	2.0	**Final Values**		90.633	99.8	
Average Values				1.43		0.42	191	253	256	55	63	72	72	72		1.19	64.30			
													72							

Notes:

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
Sulfuric Acid Mist Data

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
Run Start Time	12:32	20:28	23:01		hh:mm	
Run Stop Time	14:34	22:28	01:01		hh:mm	
Test Date	09/24/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	1.009	1.009	1.009			
Stack Test Data	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	220.520	728.050	775.610		ft^3	
Final Meter Volume	258.320	769.610	816.580		ft^3	
Total Meter Volume	37.800	41.560	40.970	40.110	ft^3	
Total Sampling Time	120.00	120.00	120.00	120.00	min	
Average Meter Temperature	75.17	76.63	69.92	73.90	°F	
Average Stack Temperature	217.08	217.75	205.00	213.28	°F	
Barometric Pressure	29.97	29.96	29.94	29.96	in Hg	
Stack Static Pressure	-0.87	-0.87	-0.87	-0.87	in H_2O	
Absolute Stack Pressure	29.91	29.90	29.88	29.89	in Hg	
Average Orifice Pressure Drop	0.43	0.43	0.43	0.43	in H_2O	
Absolute Meter Pressure	30.11	30.10	30.08	30.09	in Hg	
Moisture Content Data	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	58.80	165.50	82.00	102.10	g	
Silica Gel Weight Gain	18.60	7.10	8.70	11.47	g	
Total Water Volume Collected	77.54	172.91	90.86	113.77	ml	
Standard Water Vapor Volume	3.65	8.14	4.28	5.35	scf	
Standard Meter Volume	37.7	41.4	41.3	40.1	dscf	
Standard Metric Meter Volume	1.1	1.2	1.2	1.1	dscm	
Calculated Stack Moisture	8.82	16.44	9.39	11.55	%	
Saturated Stack Moisture	100.00	100.00	86.95	95.65	%	
Reported Stack Moisture Content	8.82	16.44	9.39	11.55	%	
Gas Analysis Data	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.1	4.2	4.2	4.2	%	
Oxygen Content	13.4	13.4	13.4	13.4	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.5	82.5	82.4	82.5	%	
Stack Dry Molecular Weight	29.19	29.20	29.21	29.20	lb/lb-mole	
Stack Wet Molecular Weight	28.20	27.36	28.16	27.91	lb/lb-mole	
Calculated Fuel Factor	1.829	1.817	1.786	1.811		
Fuel F-Factor	8633.27	8632.22	8632.22	8632.57	dscf/MMBtu	
Percent Excess Air	159.9	158.7	160.4	159.7	%	
Volumetric Flow Rate Data	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
Stack Cross-Sectional Area	285.40	285.40	285.40	285.40	ft^2	

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Sulfuric Acid Mist IC Analysis	**1-Base-SO3-1**	**1-Base-SO3-2**	**1-Base-SO3-3**	**Average**	**Units**	**Limits**
H_2SO_4 (IC) Sample Volume - Front Half Rinse	107.0	85.0	90.0	94.00	ml	--
H_2SO_4 (IC) Sample - Mass Per Volume	0.103	0.106	0.100	0.10	mg/L	--
H_2SO_4 (IC) Mass	0.01	0.01	0.01	0.01	mg	--
H_2SO_4 (IC) Concentration	2.92E-07	2.18E-07	2.18E-07	2.42E-07	g/dscf	--
	4.50E-06	3.36E-06	3.37E-06	3.74E-06	gr/dscf	--
	1.03E-08	7.68E-09	7.70E-09	8.56E-09	g/L	--
	0.0025	0.0019	0.0019	0.0021	ppmvd	--
H_2SO_4 (IC) Emission Rate	0.000015	0.000011	0.000012	0.000013	lb/MMBtu	0.0007

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		CG/MP	
Date for Preliminary Run	(mm/dd/yy)	09/24/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	8a, 2.4.1.3	10.6	scf
Run Duration	10 L/min	120	minutes
Unit Number		CTG-1	
Base Run Number		1-Base-SO3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/24/18	09/25/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8633.27	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0024	samp-cp-0024	samp-cp-0024	
Meter Calibration Factor	(Y)	1.009	1.009	1.009	
Orifice Meter Coefficient	($\Delta H_@$)	1.869	1.869	1.869	in H_2O
Non-Console Manometer Used		No	No	No	
Probe Number	from ACS	1	1	1	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ....) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-bh-0005	samp-bh-0005	samp-bh-0005	
Impinger Case Number	from ACS	samp-bc-0025	3028	samp-bc-0025	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18		
Sampling Location	CTG-1 Stack	**Operator**	CG/MP		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	1-Base-SO3-1		**Date**	09/24/18	**Run Start Time**	12:32	**Run Stop Time**	14:34
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:02	4.1	13.4	0.0	82.5	29.19	1.829	159.9	YES

Gas Analysis Data

Run Number	1-Base-SO3-2		**Date**	09/25/18	**Run Start Time**	20:28	**Run Stop Time**	22:28
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.2	13.4	0.0	82.5	29.20	1.817	158.7	YES

Gas Analysis Data

Run Number	1-Base-SO3-3		**Date**	09/25/18	**Run Start Time**	23:01	**Run Stop Time**	01:01
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
	4.2	13.4	0.0	82.4	29.21	1.786	160.4	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-1 Stack	**Operator**	CG/MP
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/24/18	500	499.9	-0.1	Pass
Test Day 1	09/24/18	500	499.9	-0.1	Pass
Test Day 2	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data								
Run Number		1-Base-SO3-1		**Date**	09/24/18	**Start Time** 12:32	**Stop Time**	14:34
Meter Box Number		samp-cp-0024			**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	37.800	dcf	**Barometric Pressure**	(P_b)	29.97	in Hg
Average Stack Temp		$(t_s)_{avg}$	217	°F	**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	75	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	720.90	674.20	605.40	878.60				
Initial Value	(V_i),(W_i)	681.10	658.40	602.20	860.00				
Net Value	(V_n),(W_n)	39.8	15.8	3.2	18.6				
Results									
Total Weight	(W_t)	77.40	g	**Water Vol Weighed**	($V_{wsg(std)}$)	3.649	scf		
Std Meter Volume	($V_{m(std)}$)	37.732	dscf	**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%		
Calc Moisture Content	($B_{ws(calc)}$)	8.82	%	**Final Moisture Content**	(B_{ws})	8.82	%		

Moisture Content Data									
Run Number	1-Base-SO3-2	**Date**	09/25/18	**Start Time**	20:28	**Stop Time**	22:28		
Meter Box Number	samp-cp-0024		**Meter Cal Factor**	(Y)	1.009				
Total Meter Volume	(V_m)	41.560	dcf	**Barometric Pressure**	(P_b)	29.96	in Hg		
Average Stack Temp	$(t_s)_{avg}$	218	°F	**Stack Static Pressure**	(P_{static})	-0.87	in H_2O		
Average Meter Temp	$(t_m)_{avg}$	77	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O		
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	785.30	763.20	606.20	894.50				
Initial Value	(V_i),(W_i)	714.80	668.20	606.20	887.40				
Net Value	(V_n),(W_n)	70.5	95.0	0.0	7.1				
Results									
Total Weight	(W_t)	172.60	g	**Water Vol Weighed**	($V_{wsg(std)}$)	8.138	scf		
Std Meter Volume	($V_{m(std)}$)	41.359	dscf	**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%		
Calc Moisture Content	($B_{ws(calc)}$)	16.44	%	**Final Moisture Content**	(B_{ws})	16.44	%		

Moisture Content Data									
Run Number	1-Base-SO3-3	**Date**	09/25/18	**Start Time**	23:01	**Stop Time**	01:01		
Meter Box Number	samp-cp-0024		**Meter Cal Factor**	(Y)	1.009				
Total Meter Volume	(V_m)	40.970	dcf	**Barometric Pressure**	(P_b)	29.94	in Hg		
Average Stack Temp	$(t_s)_{avg}$	205	°F	**Stack Static Pressure**	(P_{static})	-0.87	in H_2O		
Average Meter Temp	$(t_m)_{avg}$	70	°F	**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O		
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	740.50	686.80	597.10	889.90				
Initial Value	(V_i),(W_i)	665.40	680.80	596.20	881.20				
Net Value	(V_n),(W_n)	75.1	6.0	0.9	8.7				
Results									
Total Weight	(W_t)	90.70	g	**Water Vol Weighed**	($V_{wsg(std)}$)	4.277	scf		
Std Meter Volume	($V_{m(std)}$)	41.260	dscf	**Sat. Moisture Content**	($B_{ws(svp)}$)	86.95	%		
Calc Moisture Content	($B_{ws(calc)}$)	9.39	%	**Final Moisture Content**	(B_{ws})	9.39	%		

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	CG
Run Number	1-Base-SO3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	217.1	°F
Average Meter Temp	(t_m)	75.2	
Orifice Meter Coefficient	$(\Delta H@)$	1.869	in H_2O
Square Root ΔP	$(\Delta p^{1/2}{}_{avg})$		in H_2O
Stack Moisture Content	(B_{ws})	8.82	%
Stack Dry Molecular Weight	(M_d)	29.19	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	NA	in H_2O for	NA	sec
	Pre (-)	NA	in H_2O for	NA	sec
PASS	**Post (+)**	NA	in H_2O for	NA	sec
	Post (-)	NA	in H_2O for	NA	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	1		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0005		
Impinger Case Number	samp-bc-0025		

Pressures			
Barometric Pressure	(P_b)	29.97	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.91	in Hg
Absolute Meter Pressure	(P_m)	30.11	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	12:32	**End**	14:34

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	681.1	658.4	602.2	860.0				
Post	720.9	674.2	605.4	878.6				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			1	1	samp-bh-0005	samp-bc-0025	1013		samp-cp-0024		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_i$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	220.520	--	--	0.43	211	378	530	64	168		74	74	5.0	--	--	1.000	--	24.009
A-1	5.0	00:05:00	221.520	--	--	0.43	212	368	534	64	173		74	74	5.0	--	--	2.601	--	31.212
A-1	10.0	00:10:00	223.120	--	--	0.43	215	369	528	64	173		74	74	5.0	--	--	4.202	--	33.613
A-1	15.0	00:15:00	224.720	--	--	0.43	217	370	541	64	172		74	74	5.0	--	--	5.802	--	34.813
A-1	20.0	00:20:00	226.320	--	--	0.43	218	370	540	65	172		74	74	5.0	--	--	7.403	--	35.534
A-1	25.0	00:25:00	227.920	--	--	0.43	217	371	535	65	171		74	74	5.0	--	--	9.003	--	36.014
A-1	30.0	00:30:00	229.520	--	--	0.43	218	374	541	65	177		74	74	5.0	--	--	10.604	--	36.357
A-1	35.0	00:35:00	231.120	--	--	0.43	219	372	545	64	176		74	74	5.0	--	--	12.205	--	36.614
A-1	40.0	00:40:00	232.720	--	--	0.43	219	374	540	65	175		74	74	5.0	--	--	13.805	--	36.814
A-1	45.0	00:45:00	234.320	--	--	0.43	219	379	542	64	176		75	75	5.0	--	--	15.403	--	36.967
A-1	50.0	00:50:00	235.920	--	--	0.43	220	379	548	64	180		75	75	5.0	--	--	17.001	--	37.092
A-1	55.0	00:55:00	237.520	--	--	0.43	220	374	546	64	179		75	75	5.0	--	--	18.598	--	37.196
A-1	60.0	01:00:00	239.120	--	--	0.43	211	380	542	65	181		75	75	5.0	--	--	20.196	--	37.285
A-1	65.0	01:05:00	240.720	--	--	0.43	212	379	544	66	180		75	75	5.0	--	--	21.793	--	37.360
A-1	70.0	01:10:00	242.320	--	--	0.43	215	375	540	66	179		75	75	5.0	--	--	23.391	--	37.426
A-1	75.0	01:15:00	243.920	--	--	0.43	217	375	541	66	180		75	75	5.0	--	--	24.989	--	37.483
A-1	80.0	01:20:00	245.520	--	--	0.43	218	372	535	67	178		76	76	5.0	--	--	26.583	--	37.529
A-1	85.0	01:25:00	247.120	--	--	0.43	217	371	541	67	180		76	76	5.0	--	--	28.178	--	37.571
A-1	90.0	01:30:00	248.720	--	--	0.43	218	375	545	68	181		76	76	5.0	--	--	29.773	--	37.607
A-1	95.0	01:35:00	250.320	--	--	0.43	219	380	540	68	181		77	77	5.0	--	--	31.364	--	37.637
A-1	100.0	01:40:00	251.920	--	--	0.43	219	377	545	67	179		77	77	5.0	--	--	32.956	--	37.664
A-1	105.0	01:45:00	253.520	--	--	0.43	219	375	541	67	175		77	77	5.0	--	--	34.548	--	37.688
A-1	110.0	01:50:00	255.120	--	--	0.43	220	374	539	67	175		77	77	5.0	--	--	36.139	--	37.711
A-1	115.0	01:55:00	256.720	--	--	0.43	220	370	540	67	175		77	77	5.0	--	--	37.731	--	37.731
Last Pt	120.0	02:00:00	258.320	--	--											--				
Final Val	120.0	02:00:00	258.320											**Max Vac**	5.0	**Final Values**		37.731		
Average Values						0.43	217	374	540	66	177		75	75						
													75							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-Base-SO3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	217.8	°F
Average Meter Temp	(t_m)	76.6	
Orifice Meter Coefficient	$(\Delta H@)$	1.869	in H_2O
Square Root ΔP	$(\Delta p^{1/2}{}_{avg})$		in H_2O
Stack Moisture Content	(B_{ws})	16.44	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.31	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	NA	in H_2O for	NA	sec
PASS	**Pre (-)**	NA	in H_2O for	NA	sec
	Post (+)	NA	in H_2O for	NA	sec
	Post (-)	NA	in H_2O for	NA	sec

Sampling Equipment				
Meter Box Number	samp-cp-0024			
Meter Cal Factor	(Y)	1.009		
Nozzle Number				
Average Nozzle Diameter	(D_{na})	--		in
Suggested Nozzle Diameter	(D_{ni})			in
Probe Number	1			in
Probe Length	108			in
Liner Material	glass			
Sample Case / Oven Number	samp-bh-0005			
Impinger Case Number	3028			

Pressures			
Barometric Pressure	(P_b)	29.96	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.90	in Hg
Absolute Meter Pressure	(P_m)	30.10	in Hg

Nozzle Measurements		**ID:**		
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	20:28	**End**	22:28

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	714.8	668.2	606.2	887.4				
Post	785.3	763.2	606.2	894.5				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			**1**	**1**	samp-bh-0005	**3028**	**3028**		**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_i$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	728.050	--	--	0.43	223	377	523	63	170		77	77	1.5	--	--	1.710	--	41.051
A-2	5.0	00:05:00	729.770	--	--	0.43	222	376	524	59	171		78	78	1.5	--	--	3.408	--	40.894
A-3	10.0	00:10:00	731.480	--	--	0.43	220	377	522	60	171		77	77	1.5	--	--	5.118	--	40.947
A-4	15.0	00:15:00	733.200	--	--	0.43	218	375	522	60	171		77	77	1.5	--	--	6.839	--	41.033
A-5	20.0	00:20:00	734.930	--	--	0.43	218	375	521	60	171		77	77	1.5	--	--	8.539	--	40.989
A-6	25.0	00:25:00	736.640	--	--	0.43	218	376	520	60	172		77	77	1.5	--	--	10.260	--	41.039
B-1	30.0	00:30:00	738.370	--	--	0.43	216	377	521	60	172		78	78	1.5	--	--	11.987	--	41.098
B-2	35.0	00:35:00	740.110	--	--	0.43	217	377	520	61	171		78	78	1.5	--	--	13.674	--	41.023
B-3	40.0	00:40:00	741.810	--	--	0.43	216	376	519	61	171		77	77	1.5	--	--	15.435	--	41.159
B-4	45.0	00:45:00	743.580	--	--	0.43	216	376	518	61	172		77	77	1.5	--	--	17.145	--	41.148
B-5	50.0	00:50:00	745.300	--	--	0.43	215	377	514	60	171		78	78	1.5	--	--	18.882	--	41.197
B-6	55.0	00:55:00	747.050	--	--	0.43	214	376	517	60	172		77	77	1.5	--	--	20.682	--	41.364
C-1	60.0	01:00:00	748.860	--	--	0.43	223	377	521	59	171		77	77	1.5	--	--	22.333	--	41.230
C-2	65.0	01:05:00	750.520	--	--	0.43	222	376	523	59	172		78	78	1.5	--	--	24.050	--	41.229
C-3	70.0	01:10:00	752.250	--	--	0.43	220	377	523	60	171		77	77	1.5	--	--	25.810	--	41.296
C-4	75.0	01:15:00	754.020	--	--	0.43	218	377	524	61	170		77	77	1.5	--	--	27.551	--	41.326
C-5	80.0	01:20:00	755.770	--	--	0.43	218	377	524	61	171		76	76	1.5	--	--	29.284	--	41.342
C-6	85.0	01:25:00	757.510	--	--	0.43	218	377	524	61	171		76	76	1.5	--	--	31.048	--	41.397
D-1	90.0	01:30:00	759.280	--	--	0.43	216	376	525	61	172		76	76	1.5	--	--	32.751	--	41.370
D-2	95.0	01:35:00	760.990	--	--	0.43	217	376	525	62	171		75	75	1.5	--	--	34.468	--	41.362
D-3	100.0	01:40:00	762.710	--	--	0.43	216	375	527	62	170		75	75	1.5	--	--	36.185	--	41.354
D-4	105.0	01:45:00	764.430	--	--	0.43	216	376	527	62	171		75	75	1.5	--	--	37.912	--	41.359
D-5	110.0	01:50:00	766.160	--	--	0.43	215	377	527	63	171		75	75	1.5	--	--	39.629	--	41.352
D-6	115.0	01:55:00	767.880	--	--	0.43	214	377	525	63	170		74	74	1.5	--	--	41.359	--	41.359
Last Pt	120.0	02:00:00	769.610	--	--	0.43														
Final Val	120.0	02:00:00	769.610											**Max Vac**	1.5	**Final Values**		41.359		
Average Values						0.43	218	376	522	61	171		77	77						
													77							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-Base-SO3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	205.0	°F
Average Meter Temp	(t_m)	69.9	
Orifice Meter Coefficient	$(\Delta H@)$	1.869	in H_2O
Square Root ΔP	$(\Delta p^{1/2}{}_{avg})$		in H_2O
Stack Moisture Content	(B_{ws})	9.39	%
Stack Dry Molecular Weight	(M_d)	29.21	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.34	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	NA	in H_2O for	NA	sec
	Pre (-)	NA	in H_2O for	NA	sec
PASS	**Post (+)**	NA	in H_2O for	NA	sec
	Post (-)	NA	in H_2O for	NA	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	1		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0005		
Impinger Case Number	samp-bc-0025		

Pressures			
Barometric Pressure	(P_b)	29.94	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.88	in Hg
Absolute Meter Pressure	(P_m)	30.08	in Hg

Nozzle Measurements			ID:	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	23:01	**End**	01:01

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	665.4	680.8	596.2	881.2				
Post	740.5	686.8	597.1	889.9				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			1	1	samp-bh-0005	samp-bc-0025	3102		samp-cp-0024		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_i$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	775.610	--	--	0.43	205	374	523	66	170		71	71	1.0	--	--	1.729	--	41.488
A-2	5.0	00:05:00	777.330	--	--	0.43	206	375	523	66	171		70	70	1.0	--	--	3.450	--	41.406
A-3	10.0	00:10:00	779.040	--	--	0.43	206	375	524	66	171		70	70	1.0	--	--	5.142	--	41.137
A-4	15.0	00:15:00	780.720	--	--	0.43	205	374	522	67	171		70	70	1.0	--	--	6.864	--	41.184
A-5	20.0	00:20:00	782.430	--	--	0.43	206	374	522	66	170		70	70	1.0	--	--	8.576	--	41.164
A-6	25.0	00:25:00	784.130	--	--	0.43	207	374	523	62	172		70	70	1.0	--	--	10.308	--	41.231
B-1	30.0	00:30:00	785.850	--	--	0.43	204	375	524	59	172		70	70	1.0	--	--	12.030	--	41.244
B-2	35.0	00:35:00	787.560	--	--	0.43	205	374	523	57	172		70	70	1.0	--	--	13.761	--	41.284
B-3	40.0	00:40:00	789.280	--	--	0.43	204	375	523	57	171		70	70	1.0	--	--	15.493	--	41.316
B-4	45.0	00:45:00	791.000	--	--	0.43	204	375	526	57	171		70	70	1.0	--	--	17.215	--	41.316
B-5	50.0	00:50:00	792.710	--	--	0.43	204	375	525	57	171		70	70	1.0	--	--	18.947	--	41.339
B-6	55.0	00:55:00	794.430	--	--	0.43	204	376	526	58	172		71	71	1.0	--	--	20.565	--	41.130
C-1	60.0	01:00:00	796.040	--	--	0.43	205	377	527	57	171		70	70	1.0	--	--	22.297	--	41.164
C-2	65.0	01:05:00	797.760	--	--	0.43	206	376	526	57	171		70	70	1.0	--	--	24.029	--	41.193
C-3	70.0	01:10:00	799.480	--	--	0.43	206	375	526	57	172		69	69	1.0	--	--	25.764	--	41.223
C-4	75.0	01:15:00	801.200	--	--	0.43	205	376	525	57	171		70	70	1.0	--	--	27.496	--	41.244
C-5	80.0	01:20:00	802.920	--	--	0.43	206	375	524	58	171		70	70	1.0	--	--	29.258	--	41.306
C-6	85.0	01:25:00	804.670	--	--	0.43	207	375	524	58	171		71	71	1.0	--	--	31.007	--	41.343
D-1	90.0	01:30:00	806.410	--	--	0.43	204	374	520	58	172		70	70	1.0	--	--	32.709	--	41.316
D-2	95.0	01:35:00	808.100	--	--	0.43	205	375	522	58	170		70	70	1.0	--	--	34.431	--	41.317
D-3	100.0	01:40:00	809.810	--	--	0.43	204	375	523	59	170		69	69	1.0	--	--	36.115	--	41.275
D-4	105.0	01:45:00	811.480	--	--	0.43	204	376	524	59	170		69	69	1.0	--	--	37.790	--	41.225
D-5	110.0	01:50:00	813.140	--	--	0.43	204	377	525	60	171		69	69	1.0	--	--	39.525	--	41.244
D-6	115.0	01:55:00	814.860	--	--	0.43	204	377	525	60	171		69	69	1.0	--	--	41.260	--	41.260
Last Pt	120.0	02:00:00	816.580	--	--	0.43														
Final Val	120.0	02:00:00	816.580											**Max Vac**	1.0	**Final Values**		41.260		
Average Values						0.43	205	375	524	60	171		70	70						
													70							

Notes:

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
Sulfuric Acid Mist Data

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	1-100 w/DB-SO3-1	1-100 w/DB-SO3-2	1-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Run Start Time	00:32	03:14	06:31		hh:mm	
Run Stop Time	02:32	05:14	08:31		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base w/DB	Base w/DB	Base w/DB		% or w/DB	--
Meter Calibration Factor	1.009	1.009	1.009			
Stack Test Data	1-100 w/DB-SO3-1	1-100 w/DB-SO3-2	1-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Initial Meter Volume	323.350	369.670	416.300		ft^3	
Final Meter Volume	364.050	410.430	457.750		ft^3	
Total Meter Volume	40.700	40.760	41.450	40.970	ft^3	
Total Sampling Time	120.00	120.00	120.00	120.00	min	
Average Meter Temperature	73.42	70.50	69.17	71.03	°F	
Average Stack Temperature	192.42	191.21	191.75	191.79	°F	
Barometric Pressure	29.84	29.77	30.42	30.01	in Hg	
Stack Static Pressure	-0.87	-0.87	-0.87	-0.87	in H_2O	
Absolute Stack Pressure	29.78	29.71	30.36	29.95	in Hg	
Average Orifice Pressure Drop	0.43	0.43	0.43	0.43	in H_2O	
Absolute Meter Pressure	29.98	29.91	30.56	30.15	in Hg	
Moisture Content Data	1-100 w/DB-SO3-1	1-100 w/DB-SO3-2	1-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	99.30	96.60	83.80	93.23	g	
Silica Gel Weight Gain	10.70	8.70	14.40	11.27	g	
Total Water Volume Collected	110.20	105.49	98.38	104.69	ml	
Standard Water Vapor Volume	5.19	4.96	4.63	4.93	scf	
Standard Meter Volume	40.6	40.8	42.5	41.3	dscf	
Standard Metric Meter Volume	1.1	1.2	1.2	1.2	dscm	
Calculated Stack Moisture	11.33	10.86	9.83	10.67	%	
Saturated Stack Moisture	67.13	65.57	64.92	65.87	%	
Reported Stack Moisture Content	11.33	10.86	9.83	10.67	%	
Gas Analysis Data	1-100 w/DB-SO3-1	1-100 w/DB-SO3-2	1-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.9	4.9	4.9	4.9	%	
Oxygen Content	12.3	12.3	12.3	12.3	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.8	82.8	82.8	82.8	%	
Stack Dry Molecular Weight	29.28	29.28	29.28	29.28	lb/lb-mole	
Stack Wet Molecular Weight	28.00	28.05	28.17	28.07	lb/lb-mole	
Calculated Fuel Factor	1.755	1.755	1.755	1.755		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	128.7	128.7	128.7	128.7	%	
Volumetric Flow Rate Data	1-100 w/DB-SO3-1	1-100 w/DB-SO3-2	1-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Stack Cross-Sectional Area	285.40	285.40	285.40	285.40	ft^2	

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Sulfuric Acid Mist IC Analysis	**1-100 w/DB-SO3-1**	**1-100 w/DB-SO3-2**	**1-100 w/DB-SO3-3**	**Average**	**Units**	**Limits**
H_2SO_4 (IC) Sample Volume - Front Half Rinse	124.0	106.0	100.0	110.00	ml	--
H_2SO_4 (IC) Sample - Mass Per Volume	0.105	0.104	0.100	0.10	mg/L	--
H_2SO_4 (IC) Mass	0.01	0.01	0.01	0.01	mg	--
H_2SO_4 (IC) Concentration	3.20E-07	2.70E-07	2.35E-07	2.75E-07	g/dscf	--
	4.94E-06	4.16E-06	3.63E-06	4.25E-06	gr/dscf	--
	1.13E-08	9.53E-09	8.31E-09	9.72E-09	g/L	--
	0.0028	0.0023	0.0020	0.0024	ppmvd	--
H_2SO_4 (IC) Emission Rate	0.000015	0.000012	0.000011	0.000013	lb/MMBtu	0.0007

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		MP	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	8a, 2.4.1.3	10.6	scf
Run Duration	10 L/min	120	minutes
Unit Number		CTG-1	
Base Run Number		1-100 w/DB-SO3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		Base w/DB	Base w/DB	Base w/DB	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0024	samp-cp-0024	samp-cp-0024	
Meter Calibration Factor	(Y)	1.009	1.009	1.009	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.869	1.869	1.869	in H_2O
Non-Console Manometer Used		No	No	No	
Probe Number	from ACS	2	2	2	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ....) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-bh-0002	samp-bh-0002	samp-bh-0002	
Impinger Case Number	from ACS	samp-bc-0025	3028	samp-bc-0025	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18		
Sampling Location	CTG-1 Stack	**Operator**	MP		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	1-100 w/DB-SO3-1		**Date**	09/25/18	**Run Start Time**	00:32	**Run Stop Time**	02:32
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.9	12.3	0.0	82.8	29.28	1.755	128.7	YES

Gas Analysis Data

Run Number	1-100 w/DB-SO3-2		**Date**	09/25/18	**Run Start Time**	03:14	**Run Stop Time**	05:14
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.9	12.3	0.0	82.8	29.28	1.755	128.7	YES

Gas Analysis Data

Run Number	1-100 w/DB-SO3-3		**Date**	09/25/18	**Run Start Time**	06:31	**Run Stop Time**	08:31
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.9	12.3	0.0	82.8	29.28	1.755	128.7	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18
Sampling Location	CTG-1 Stack	**Operator**	MP
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/25/18	500	499.9	-0.1	Pass
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		1-100 w/DB-SO3-1		**Date**	09/25/18	**Start Time**	00:32	**Stop Time**	02:32
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	40.700	dcf		**Barometric Pressure**	(P_b)	29.84	in Hg
Average Stack Temp		$(t_s)_{avg}$	192	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	73	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	799.30	736.80	614.50	961.90				
Initial Value	$(V_i),(W_i)$	710.00	729.30	612.00	951.20				
Net Value	$(V_n),(W_n)$	89.3	7.5	2.5	10.7				
Results									
Total Weight		(W_t)	110.00	g		**Water Vol Weighed**	$(V_{wsg(std)})$	5.186	scf
Std Meter Volume		$(V_{m(std)})$	40.584	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	67.13	%
Calc Moisture Content		$(B_{ws(calc)})$	11.33	%		**Final Moisture Content**	(B_{ws})	11.33	%

Moisture Content Data									
Run Number		1-100 w/DB-SO3-2		**Date**	09/25/18	**Start Time**	03:14	**Stop Time**	05:14
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	40.760	dcf		**Barometric Pressure**	(P_b)	29.77	in Hg
Average Stack Temp		$(t_s)_{avg}$	191	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	71	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	774.90	686.90	586.60	877.80				
Initial Value	$(V_i),(W_i)$	688.30	678.20	585.30	869.10				
Net Value	$(V_n),(W_n)$	86.6	8.7	1.3	8.7				
Results									
Total Weight		(W_t)	105.30	g		**Water Vol Weighed**	$(V_{wsg(std)})$	4.965	scf
Std Meter Volume		$(V_{m(std)})$	40.771	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	65.57	%
Calc Moisture Content		$(B_{ws(calc)})$	10.86	%		**Final Moisture Content**	(B_{ws})	10.86	%

Moisture Content Data									
Run Number		1-100 w/DB-SO3-3		**Date**	09/25/18	**Start Time**	06:31	**Stop Time**	08:31
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	41.450	dcf		**Barometric Pressure**	(P_b)	30.42	in Hg
Average Stack Temp		$(t_s)_{avg}$	192	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	69	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	794.50	692.70	596.20	881.20				
Initial Value	$(V_i),(W_i)$	721.90	683.10	594.60	866.80				
Net Value	$(V_n),(W_n)$	72.6	9.6	1.6	14.4				
Results									
Total Weight		(W_t)	98.20	g		**Water Vol Weighed**	$(V_{wsg(std)})$	4.630	scf
Std Meter Volume		$(V_{m(std)})$	42.472	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	64.92	%
Calc Moisture Content		$(B_{ws(calc)})$	9.83	%		**Final Moisture Content**	(B_{ws})	9.83	%

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-100 w/DB-SO3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	192.4	°F
Average Meter Temp	(t_m)	73.4	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	11.33	%
Stack Dry Molecular Weight	(M_d)	29.28	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	2		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0002		
Impinger Case Number	samp-bc-0025		

Pressures			
Barometric Pressure	(P_b)	29.84	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.78	in Hg
Absolute Meter Pressure	(P_m)	29.98	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	00:32	**End**	02:32

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	710.0	729.3	612.0	951.2				
Post	799.3	736.8	614.5	961.9				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			2	2	samp-bh-0002	samp-bc-0025	3102		samp-cp-0024		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_I$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	323.350	--	--	0.43	191	374	501	61	174		74	74	1.0	--	--	1.713	--	41.117
A-1	5.0	00:05:00	325.070	--	--	0.43	191	375	522	59	176		74	74	1.0	--	--	3.416	--	40.997
A-1	10.0	00:10:00	326.780	--	--	0.43	193	377	524	56	175		74	74	1.0	--	--	5.120	--	40.958
A-1	15.0	00:15:00	328.490	--	--	0.43	193	376	523	55	174		73	73	1.0	--	--	6.806	--	40.837
A-1	20.0	00:20:00	330.180	--	--	0.43	193	377	524	55	175		74	74	1.0	--	--	8.499	--	40.797
A-1	25.0	00:25:00	331.880	--	--	0.43	193	377	524	55	174		73	73	1.0	--	--	10.206	--	40.824
A-1	30.0	00:30:00	333.590	--	--	0.43	192	376	522	55	175		74	74	1.0	--	--	11.889	--	40.763
A-1	35.0	00:35:00	335.280	--	--	0.43	191	374	524	55	174		74	74	1.0	--	--	13.573	--	40.718
A-1	40.0	00:40:00	336.970	--	--	0.43	191	374	522	55	174		74	74	1.0	--	--	15.236	--	40.629
A-1	45.0	00:45:00	338.640	--	--	0.43	192	375	523	55	174		74	74	1.0	--	--	16.899	--	40.558
A-1	50.0	00:50:00	340.310	--	--	0.43	193	374	525	55	173		74	74	1.0	--	--	18.613	--	40.609
A-1	55.0	00:55:00	342.030	--	--	0.43	193	374	523	55	172		73	73	1.0	--	--	20.329	--	40.658
A-1	60.0	01:00:00	343.750	--	--	0.43	193	375	522	56	173		74	74	1.0	--	--	22.032	--	40.675
A-1	65.0	01:05:00	345.460	--	--	0.43	193	374	524	55	172		74	74	1.0	--	--	23.726	--	40.672
A-1	70.0	01:10:00	347.160	--	--	0.43	193	373	524	55	171		74	74	1.0	--	--	25.429	--	40.686
A-1	75.0	01:15:00	348.870	--	--	0.43	193	372	523	56	172		73	73	1.0	--	--	27.115	--	40.673
A-1	80.0	01:20:00	350.560	--	--	0.43	192	374	525	57	172		73	73	1.0	--	--	28.802	--	40.661
A-1	85.0	01:25:00	352.250	--	--	0.43	193	373	525	56	172		73	73	1.0	--	--	30.488	--	40.651
A-1	90.0	01:30:00	353.940	--	--	0.43	193	372	523	56	172		73	73	1.0	--	--	32.175	--	40.642
A-1	95.0	01:35:00	355.630	--	--	0.43	193	371	523	57	171		72	72	1.0	--	--	33.864	--	40.637
A-1	100.0	01:40:00	357.320	--	--	0.43	192	371	524	55	172		73	73	1.0	--	--	35.571	--	40.652
A-1	105.0	01:45:00	359.030	--	--	0.43	193	372	523	55	172		73	73	1.0	--	--	37.257	--	40.644
A-1	110.0	01:50:00	360.720	--	--	0.43	192	371	523	55	171		73	73	1.0	--	--	38.934	--	40.627
A-1	115.0	01:55:00	362.400	--	--	0.43	192	372	524	55	171		72	72	1.0	--	--	40.583	--	40.583
Last Pt	120.0	02:00:00	364.050																	
Final Val	120.0	02:00:00	364.050											**Max Vac**	1.0	**Final Values**		40.583		
Average Values						0.43	192	374	523	56	173		73	73						
													73							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-100 w/DB-SO3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	191.2	°F
Average Meter Temp	(t_m)	70.5	
Orifice Meter Coefficient	$(\Delta H@)$	1.869	in H_2O
Square Root ΔP	$(\Delta p^{1/2}_{avg})$		in H_2O
Stack Moisture Content	(B_{ws})	10.86	%
Stack Dry Molecular Weight	(M_d)	29.28	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.34	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	2		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0002		
Impinger Case Number	3028		

Pressures			
Barometric Pressure	(P_b)	29.77	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.71	in Hg
Absolute Meter Pressure	(P_m)	29.91	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	03:14	**End**	05:14

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	688.3	678.2	585.3	869.1				
Post	774.9	686.9	586.6	877.8				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			2	2	samp-bh-0002	3028	1013		samp-cp-0024		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_i$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	369.670	--	--	0.43	192	377	512	55	171		70	70	1.0	--	--	1.702	--	40.850
A-2	5.0	00:05:00	371.370	--	--	0.43	192	377	522	53	170		70	70	1.0	--	--	3.414	--	40.970
A-3	10.0	00:10:00	373.080	--	--	0.43	191	376	526	53	171		71	71	1.0	--	--	5.123	--	40.984
A-4	15.0	00:15:00	374.790	--	--	0.43	192	377	524	53	170		70	70	1.0	--	--	6.805	--	40.830
A-5	20.0	00:20:00	376.470	--	--	0.43	192	375	523	53	171		70	70	1.0	--	--	8.517	--	40.882
A-6	25.0	00:25:00	378.180	--	--	0.43	191	376	523	54	170		70	70	1.0	--	--	10.219	--	40.877
B-1	30.0	00:30:00	379.880	--	--	0.43	192	375	524	54	171		70	70	1.0	--	--	11.911	--	40.839
B-2	35.0	00:35:00	381.570	--	--	0.43	191	374	526	55	170		71	71	1.0	--	--	13.600	--	40.800
B-3	40.0	00:40:00	383.260	--	--	0.43	192	375	524	55	170		71	71	1.0	--	--	15.399	--	41.064
B-4	45.0	00:45:00	385.060	--	--	0.43	192	374	524	55	172		71	71	1.0	--	--	17.108	--	41.059
B-5	50.0	00:50:00	386.770	--	--	0.43	191	373	523	55	170		71	71	1.0	--	--	18.807	--	41.033
B-6	55.0	00:55:00	388.470	--	--	0.43	191	374	523	55	170		71	71	1.0	--	--	20.495	--	40.991
C-1	60.0	01:00:00	390.160	--	--	0.43	192	373	524	55	172		71	71	1.0	--	--	22.164	--	40.919
C-2	65.0	01:05:00	391.830	--	--	0.43	191	373	524	55	172		71	71	1.0	--	--	23.833	--	40.857
C-3	70.0	01:10:00	393.500	--	--	0.43	191	374	525	55	171		70	70	1.0	--	--	25.515	--	40.824
C-4	75.0	01:15:00	395.180	--	--	0.43	191	373	523	56	171		70	70	1.0	--	--	27.197	--	40.796
C-5	80.0	01:20:00	396.860	--	--	0.43	191	374	522	56	172		70	70	1.0	--	--	28.919	--	40.827
C-6	85.0	01:25:00	398.580	--	--	0.43	191	373	523	55	171		70	70	1.0	--	--	30.621	--	40.829
D-1	90.0	01:30:00	400.280	--	--	0.43	190	374	525	55	172		70	70	1.0	--	--	32.324	--	40.830
D-2	95.0	01:35:00	401.980	--	--	0.43	191	374	525	55	171		70	70	1.0	--	--	34.036	--	40.843
D-3	100.0	01:40:00	403.690	--	--	0.43	190	372	524	55	171		71	71	1.0	--	--	35.714	--	40.817
D-4	105.0	01:45:00	405.370	--	--	0.43	190	373	525	56	171		72	72	1.0	--	--	37.400	--	40.800
D-5	110.0	01:50:00	407.060	--	--	0.43	191	373	523	56	172		71	71	1.0	--	--	39.099	--	40.799
D-6	115.0	01:55:00	408.760	--	--	0.43	191	374	525	56	172		70	70	1.0	--	--	40.771	--	40.771
Last Pt	120.0	02:00:00	410.430																	
Final Val	120.0	02:00:00	410.430											**Max Vac**	1.0	**Final Values**		40.771		
Average Values						0.43	191	374	523	55	171		71	71						
													71							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-100 w/DB-SO3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	191.8	°F
Average Meter Temp	(t_m)	69.2	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	9.83	%
Stack Dry Molecular Weight	(M_d)	29.28	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.34	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	2		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0002		
Impinger Case Number	samp-bc-0025		

Pressures			
Barometric Pressure	(P_b)	30.42	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	30.36	in Hg
Absolute Meter Pressure	(P_m)	30.56	in Hg

Nozzle Measurements		**ID:**		
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	06:31	**End**	08:31

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	721.9	683.1	594.6	866.8				
Post	794.5	692.7	596.2	881.2				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			2	2	samp-bh-0002	samp-bc-0025	3102		samp-cp-0024		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	416.300	--	--	0.43	192	400	525	58	185		68	68	1.0	--	--	2.033	--	48.800
A-2	5.0	00:05:00	418.280	--	--	0.43	193	375	525	58	185		68	68	1.0	--	--	3.697	--	44.363
A-3	10.0	00:10:00	419.900	--	--	0.43	192	375	525	58	185		68	68	1.0	--	--	5.515	--	44.117
A-4	15.0	00:15:00	421.670	--	--	0.43	193	376	520	58	182		68	68	1.0	--	--	7.209	--	43.254
A-5	20.0	00:20:00	423.320	--	--	0.43	193	375	524	59	185		68	68	1.0	--	--	9.129	--	43.821
A-6	25.0	00:25:00	425.190	--	--	0.43	193	374	525	60	184		69	69	1.0	--	--	10.985	--	43.938
B-1	30.0	00:30:00	427.000	--	--	0.43	193	375	522	60	183		69	69	1.0	--	--	12.922	--	44.303
B-2	35.0	00:35:00	428.890	--	--	0.43	193	374	525	60	185		69	69	1.0	--	--	14.377	--	43.132
B-3	40.0	00:40:00	430.310	--	--	0.43	193	375	525	61	184		69	69	1.0	--	--	16.222	--	43.259
B-4	45.0	00:45:00	432.110	--	--	0.43	193	374	524	61	185		69	69	1.0	--	--	18.160	--	43.583
B-5	50.0	00:50:00	434.000	--	--	0.43	193	372	523	61	185		69	69	1.0	--	--	19.707	--	42.998
B-6	55.0	00:55:00	435.510	--	--	0.43	191	374	525	61	184		69	69	1.0	--	--	21.634	--	43.268
C-1	60.0	01:00:00	437.390	--	--	0.43	191	374	525	61	184		69	69	1.0	--	--	23.274	--	42.968
C-2	65.0	01:05:00	438.990	--	--	0.43	191	375	524	61	183		69	69	1.0	--	--	25.047	--	42.938
C-3	70.0	01:10:00	440.720	--	--	0.43	191	374	525	60	185		69	69	1.0	--	--	26.872	--	42.995
C-4	75.0	01:15:00	442.500	--	--	0.43	191	373	525	61	184		70	70	1.0	--	--	28.519	--	42.779
C-5	80.0	01:20:00	444.110	--	--	0.43	190	375	523	61	184		70	70	1.0	--	--	30.176	--	42.602
C-6	85.0	01:25:00	445.730	--	--	0.43	190	374	525	61	185		70	70	1.0	--	--	31.997	--	42.663
D-1	90.0	01:30:00	447.510	--	--	0.43	191	375	524	61	184		70	70	1.0	--	--	33.737	--	42.615
D-2	95.0	01:35:00	449.210	--	--	0.43	191	373	525	61	185		70	70	1.0	--	--	35.496	--	42.595
D-3	100.0	01:40:00	450.930	--	--	0.43	191	374	525	61	185		70	70	1.0	--	--	37.246	--	42.566
D-4	105.0	01:45:00	452.640	--	--	0.43	191	375	524	61	185		70	70	1.0	--	--	38.944	--	42.484
D-5	110.0	01:50:00	454.300	--	--	0.43	191	373	525	61	184		70	70	1.0	--	--	40.652	--	42.420
D-6	115.0	01:55:00	455.970	--	--	0.43	191	371	525	60	184		70	70	1.0	--	--	42.473	--	42.473
Last Pt	120.0	02:00:00	457.750																	
Final Val	120.0	02:00:00	457.750											**Max Vac**	1.0	**Final Values**		42.473		
Average Values						0.43	192	375	524	60	184		69	69						
													69							

Notes:

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
without Duct Burners Firing
NH_3 Data

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Run Start Time	15:54	17:13	18:44		hh:mm	
Run Stop Time	16:58	18:13	19:44		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	1.009	1.009	1.009			
Pitot Tube Coefficient	0.8042	0.8042	0.8042			
Stack Test Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Initial Meter Volume	596.040	639.370	683.120		ft^3	
Final Meter Volume	638.860	682.850	727.780		ft^3	
Total Meter Volume	42.820	43.480	44.660	43.653	ft^3	
Total Sampling Time	60.00	60.00	60.00	60.00	min	
Average Meter Temperature	71.75	77.13	77.08	75.32	°F	
Average Stack Temperature	205.58	205.83	204.85	205.42	°F	
Barometric Pressure	30.08	30.02	29.98	30.03	in Hg	
Stack Static Pressure	-0.87	-0.87	-0.87	-0.87	in H_2O	
Absolute Stack Pressure	30.02	29.96	29.92	29.96	in Hg	
Average Orifice Pressure Drop	1.86	1.86	1.90	1.87	in H_2O	
Absolute Meter Pressure	30.22	30.16	30.12	30.16	in Hg	
Avg Square Root Pitot Pressure	1.24	1.25	1.22	1.24	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	43.70	82.20	88.10	71.33	g	
Silica Gel Weight Gain	19.10	9.40	12.80	13.77	g	
Total Water Volume Collected	62.91	91.77	101.08	85.25	ml	
Standard Water Vapor Volume	2.96	4.32	4.76	4.01	scf	
Standard Meter Volume	43.3	43.5	44.6	43.8	dscf	
Standard Metric Meter Volume	1.2	1.2	1.3	1.2	dscm	
Calculated Stack Moisture	6.40	9.04	9.64	8.36	%	
Saturated Stack Moisture	87.58	88.20	86.56	87.45	%	
Reported Stack Moisture Content	6.40	9.04	9.64	8.36	%	
Gas Analysis Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.1	4.2	4.2	4.2	%	
Oxygen Content	13.6	13.5	13.5	13.5	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.3	82.3	82.4	82.3	%	
Stack Dry Molecular Weight	29.20	29.21	29.20	29.21	lb/lb-mole	
Stack Wet Molecular Weight	28.48	28.20	28.12	28.27	lb/lb-mole	
Calculated Fuel Factor	1.780	1.762	1.783	1.775		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	167.3	164.1	163.8	165.1	%	

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	75.31	76.60	74.85	75.58	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft^2	
Actual Stack Flow Rate	1,281,134	1,303,015	1,273,337	1,285,829	acfm	
Wet Standard Stack Flow Rate	61,174	62,071	60,667	61,304	wkscfh	
Dry Standard Stack Flow Rate	57,260,937	56,461,397	54,818,659	56,180,331	dscfh	
Ammonia Analysis (CTM-027)	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Front Half Results (C_f)	19.6946	24.2706	23.7322	22.5658	mg/l	
Back Half Results (C_b)	0.1936	0.2504	0.2036	0.2159	mg/l	
Practical Quantitation Limit	0.1000	0.1000	0.1000	0.1000	mg/l	
Blank Results	0.0460	0.0460	0.0460	0.0460	mg/l	
Front Half Sample Volume	211	179	195	195	ml	
Back Half Sample Volume	239	215	218	224	ml	
Volume of NH_3	0.00593	0.00621	0.00660	0.00625	L	
NH_3 Concentration	4.83	5.04	5.22	5.03	ppmvd	--
NH_3 Concentration	3.91	4.02	4.16	4.03	ppm@15%O_2	5.00

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		CG/MP	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		CTG-1	
Base Run Number		1-Base-NH3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0024	samp-cp-0024	samp-cp-0024	
Meter Calibration Factor	(Y)	1.009	1.009	1.009	
Orifice Meter Coefficient	($\Delta H_@$)	1.869	1.869	1.869	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	A3701	A3701	A3701	
Pitot Tube Coefficient	(C_p)	0.8042	0.8042	0.8042	
Probe Number	from ACS	samp-cp-0141	samp-cp-0141	samp-cp-0141	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-hb-0005	samp-hb-0005	samp-hb-0005	
Impinger Case Number	from ACS	samp-bc-0002	samp-bc-0002	samp-bc-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	
Sampling Location	CTG-1 Stack	**Operator**	CG/MP
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600 **Max. Fuel Factor** 1.836

Gas Analysis Data

Run Number	1-Base-NH3-1		**Date**	09/25/18	**Run Start Time**	15:54	**Run Stop Time**	16:58
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:04	4.1	13.6	0.0	82.3	29.20	1.780	167.3	YES

Gas Analysis Data

Run Number	1-Base-NH3-2		**Date**	09/25/18	**Run Start Time**	17:13	**Run Stop Time**	18:13
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.2	13.5	0.0	82.3	29.21	1.762	164.1	YES

Gas Analysis Data

Run Number	1-Base-NH3-3		**Date**	09/25/18	**Run Start Time**	18:44	**Run Stop Time**	19:44
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.2	13.5	0.0	82.4	29.20	1.783	163.8	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	
Sampling Location	CTG-1 Stack	**Operator**	CG/MP
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		1-Base-NH3-1		**Date**	09/25/18	**Start Time**	15:54	**Stop Time**	16:58
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	42.820	dcf		**Barometric Pressure**	(P_b)	30.08	in Hg
Average Stack Temp		$(t_s)_{avg}$	206	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	72	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.86	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	732.30	714.30	601.60	980.60				
Initial Value	(V_i),(W_i)	731.30	687.30	585.90	961.50				
Net Value	(V_n),(W_n)	1.0	27.0	15.7	19.1				
Results									
Total Weight		(W_t)	62.80	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.961	scf
Std Meter Volume		($V_{m(std)}$)	43.326	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	87.58	%
Calc Moisture Content		($B_{ws(calc)}$)	6.40	%		**Final Moisture Content**	(B_{ws})	6.40	%

Moisture Content Data									
Run Number		1-Base-NH3-2		**Date**	09/25/18	**Start Time**	17:13	**Stop Time**	18:13
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	43.480	dcf		**Barometric Pressure**	(P_b)	30.02	in Hg
Average Stack Temp		$(t_s)_{avg}$	206	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	77	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.86	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	751.90	709.80	594.40	921.20				
Initial Value	(V_i),(W_i)	707.10	682.00	584.80	911.80				
Net Value	(V_n),(W_n)	44.8	27.8	9.6	9.4				
Results									
Total Weight		(W_t)	91.60	g		**Water Vol Weighed**	($V_{wsg(std)}$)	4.319	scf
Std Meter Volume		($V_{m(std)}$)	43.467	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	88.20	%
Calc Moisture Content		($B_{ws(calc)}$)	9.04	%		**Final Moisture Content**	(B_{ws})	9.04	%

Moisture Content Data									
Run Number		1-Base-NH3-3		**Date**	09/25/18	**Start Time**	18:44	**Stop Time**	19:44
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	44.660	dcf		**Barometric Pressure**	(P_b)	29.98	in Hg
Average Stack Temp		$(t_s)_{avg}$	205	°F		**Stack Static Pressure**	(P_{static})	-0.87	in H_2O
Average Meter Temp		$(t_m)_{avg}$	77	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.90	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	765.10	728.20	590.70	914.60				
Initial Value	(V_i),(W_i)	704.10	706.80	585.00	901.80				
Net Value	(V_n),(W_n)	61.0	21.4	5.7	12.8				
Results									
Total Weight		(W_t)	100.90	g		**Water Vol Weighed**	($V_{wsg(std)}$)	4.757	scf
Std Meter Volume		($V_{m(std)}$)	44.596	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	86.56	%
Calc Moisture Content		($B_{ws(calc)}$)	9.64	%		**Final Moisture Content**	(B_{ws})	9.64	%

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	CG
Run Number	1-Base-NH3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8042	A3701
Average Stack Temp	(t_s)	205.6	°F
Average Meter Temp	(t_m)	71.8	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.24	in H_2O
Stack Moisture Content	(B_{ws})	6.40	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	20.0	in Hg
PASS	**Post**	0.000	ft³/min@	20.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2067	in
Probe Number	samp-cp-0141		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hb-0005		
Impinger Case Number	samp-bc-0002		

Pressures			
Barometric Pressure	(P_b)	30.08	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.22	in Hg

Nozzle Measurements		**ID:**		
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	15:54	**End**	16:58

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	731.3	687.3	585.9	961.5				
Post	732.3	714.3	601.6	980.6				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-cp-0141	samp-cp-0141	samp-hb-0005	samp-bc-0002			**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**			**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	596.040	1.50	--	1.86	205	253	261	64	--	--	70	70	2.5	1.22	74.26	3.756	--	45.073
A-2	5.0	00:05:00	599.740	1.50	--	1.86	205	255	264	64	--	--	70	70	2.5	1.22	74.26	7.390	--	44.342
A-3	10.0	00:10:00	603.320	1.50	--	1.86	206	255	265	64	--	--	70	70	2.5	1.22	74.32	11.055	--	44.220
B-1	15.0	00:15:00	606.930	1.50	--	1.86	206	254	263	64	--	--	70	70	2.5	1.22	74.32	14.700	--	44.099
B-2	20.0	00:20:00	610.520	1.50	--	1.86	206	253	264	64	--	--	71	71	2.5	1.22	74.32	18.550	--	44.520
B-3	25.0	00:25:00	614.320	1.50	--	1.86	206	255	264	63	--	--	71	71	2.5	1.22	74.32	22.056	--	44.112
C-1	30.0	00:30:00	617.780	1.50	--	1.86	206	254	264	63	--	--	71	71	2.5	1.22	74.32	25.501	--	43.716
C-2	35.0	00:35:00	621.180	1.60	--	1.86	206	254	265	64	--	--	73	73	2.5	1.26	76.75	29.084	--	43.627
C-3	40.0	00:40:00	624.730	1.60	--	1.86	205	254	264	64	--	--	73	73	2.5	1.26	76.70	33.152	--	44.203
D-1	45.0	00:45:00	628.760	1.60	--	1.86	204	254	264	64	--	--	74	74	2.5	1.26	76.64	36.487	--	43.785
D-2	50.0	00:50:00	632.070	1.60	--	1.86	206	254	264	64	--	--	74	74	2.5	1.26	76.75	39.651	--	43.256
D-3	55.0	00:55:00	635.210	1.60	--	1.86	206	255	264	65	--	--	74	74	2.5	1.26	76.75	43.329	--	43.329
Last Pt	60.0	01:00:00	638.860		#DIV/0!														--	
Final Val	60.0	01:00:00	638.860											**Max Vac**	2.5	**Final Values**		43.329		
Average Values				1.54		1.86	206	254	264	64			72	72		1.24	75.31			
													72							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	CG
Run Number	1-Base-NH3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8042	A3701
Average Stack Temp	(t_s)	205.8	°F
Average Meter Temp	(t_m)	77.1	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.25	in H_2O
Stack Moisture Content	(B_{ws})	9.04	%
Stack Dry Molecular Weight	(M_d)	29.21	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.72	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2007	in
Probe Number	samp-cp-0141		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hb-0005		
Impinger Case Number	samp-bc-0002		

Pressures			
Barometric Pressure	(P_b)	30.02	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.96	in Hg
Absolute Meter Pressure	(P_m)	30.16	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	17:13	**End**	18:13

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	707.1	682.0	584.8	911.8				
Post	751.9	709.8	594.4	921.2				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-cp-0141	samp-cp-0141	samp-hb-0005	samp-bc-0002			**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**			**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_i$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	639.370	1.60	--	1.86	206	256	264	62	--	--	75	75	2.5	1.26	77.22	3.643	--	43.720
A-2	5.0	00:05:00	643.000	1.60	--	1.86	206	255	266	62	--	--	75	75	2.5	1.26	77.22	7.768	--	46.611
A-3	10.0	00:10:00	647.110	1.60	--	1.86	207	254	264	62	--	--	77	77	2.5	1.26	77.28	11.448	--	45.793
B-1	15.0	00:15:00	650.790	1.50	--	1.86	207	254	264	58	--	--	77	77	2.5	1.22	74.82	14.778	--	44.334
B-2	20.0	00:20:00	654.120	1.50	--	1.86	207	254	264	57	--	--	77	77	2.5	1.22	74.82	18.568	--	44.563
B-3	25.0	00:25:00	657.910	1.50	--	1.86	207	254	264	56	--	--	77	77	2.5	1.22	74.82	22.068	--	44.135
C-1	30.0	00:30:00	661.410	1.60	--	1.86	207	254	264	56	--	--	78	78	2.5	1.26	77.28	25.780	--	44.195
C-2	35.0	00:35:00	665.130	1.60	--	1.86	205	254	265	58	--	--	78	78	2.5	1.26	77.16	29.873	--	44.809
C-3	40.0	00:40:00	669.230	1.60	--	1.86	205	251	264	58	--	--	77	78	2.5	1.26	77.16	33.059	--	44.079
D-1	45.0	00:45:00	672.420	1.60	--	1.86	205	252	263	58	--	--	78	78	2.5	1.26	77.16	37.192	--	44.630
D-2	50.0	00:50:00	676.560	1.60	--	1.86	204	248	264	54	--	--	78	78	2.5	1.26	77.10	40.296	--	43.959
D-3	55.0	00:55:00	679.670	1.60	--	1.86	204	250	263	54	--	--	78	78	2.5	1.26	77.10	43.469	--	43.469
Last Pt	60.0	01:00:00	682.850		--														--	
Final Val	60.0	01:00:00	682.850											**Max Vac**	2.5	**Final Values**		43.469		
Average Values				1.58		1.86	206	253	264	58			77	77		1.25	76.60			
													77							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	MP
Run Number	1-Base-NH3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8042	A3701
Average Stack Temp	(t_s)	204.8	°F
Average Meter Temp	(t_m)	77.1	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.22	in H_2O
Stack Moisture Content	(B_{ws})	9.64	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.72	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2020	in
Probe Number	samp-cp-0141		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hb-0005		
Impinger Case Number	samp-bc-0002		

Pressures			
Barometric Pressure	(P_b)	29.98	in Hg
Stack Static Pressure	(P_{static})	-0.87	in H_2O
Absolute Stack Pressure	(P_s)	29.92	in Hg
Absolute Meter Pressure	(P_m)	30.12	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	18:44	**End**	19:44

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	704.1	706.8	585.0	901.8				
Post	765.1	728.2	590.7	914.6				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-cp-0141	samp-cp-0141	samp-hb-0005	samp-bc-0002			**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**			**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	683.120	1.50	--	1.90	204	254	265	62	--	--	77	77	2.5	1.22	74.80	3.625	--	43.504
A-2	5.0	00:05:00	686.750	1.50	--	1.90	204	255	264	58	--	--	76	76	2.5	1.22	74.80	7.377	--	44.265
A-3	10.0	00:10:00	690.500	1.50	--	1.90	205	254	266	56	--	--	77	77	2.5	1.22	74.86	11.133	--	44.531
B-1	15.0	00:15:00	694.260	1.50	--	1.90	205	254	264	57	--	--	77	77	2.5	1.22	74.86	14.838	--	44.514
B-2	20.0	00:20:00	697.970	1.50	--	1.90	206	254	263	59	--	--	76	76	2.5	1.22	74.92	18.550	--	44.520
B-3	25.0	00:25:00	701.680	1.50	--	1.90	204	252	263	61	--	--	76	76	2.5	1.22	74.80	22.262	--	44.524
C-1	30.0	00:30:00	705.390	1.50	--	1.90	205	254	265	63	--	--	78	78	2.5	1.22	74.86	25.960	--	44.504
C-2	35.0	00:35:00	709.100	1.50	--	1.90	205	254	263	63	--	--	78	78	2.5	1.22	74.86	29.629	--	44.443
C-3	40.0	00:40:00	712.780	1.50	--	1.90	205	252	263	67	--	--	77	77	2.5	1.22	74.86	33.414	--	44.552
D-1	45.0	00:45:00	716.570	1.50	--	1.90	205	252	263	67	--	--	77	77	2.5	1.22	74.86	37.119	--	44.543
D-2	50.0	00:50:00	720.280	1.50	--	1.90	205	251	261	67	--	--	77	77	2.5	1.22	74.86	40.864	--	44.579
D-3	55.0	00:55:00	724.030	1.50	--	1.90	205	252	265	67	--	--	78	78	2.5	1.22	74.86	44.603	--	44.603
Last Pt	60.0	01:00:00	727.780	1.50	#DIV/0!	1.90	205	256	264	67			78	78	2.5	1.22	74.86		--	
Final Val	60.0	01:00:00	727.780											**Max Vac**	2.5	**Final Values**		44.603		
Average Values				1.50		1.90	205	253	264	63			77	77		1.22	74.85			
													77							

Notes:

EMISSION DATA RECORDS

Unit #CTG-1
Base Load
with Duct Burners Firing
NH_3 Data

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Run Start Time	09:21	10:45	12:10		hh:mm	
Run Stop Time	10:24	11:48	13:14		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	w/DB	w/DB	w/DB		% or w/DB	--
Meter Calibration Factor	1.009	1.009	1.009			
Pitot Tube Coefficient	0.8264	0.8264	0.8264			
Stack Test Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Initial Meter Volume	465.500	508.670	552.770		ft^3	
Final Meter Volume	508.800	551.900	595.600		ft^3	
Total Meter Volume	43.300	43.230	42.830	43.120	ft^3	
Total Sampling Time	60.00	60.00	60.00	60.00	min	
Average Meter Temperature	69.17	70.42	70.67	70.08	°F	
Average Stack Temperature	190.33	190.00	190.67	190.33	°F	
Barometric Pressure	30.39	30.36	30.32	30.36	in Hg	
Stack Static Pressure	-1.10	-1.10	-1.10	-1.10	in H_2O	
Absolute Stack Pressure	30.31	30.28	30.24	30.28	in Hg	
Average Orifice Pressure Drop	1.86	1.86	1.80	1.84	in H_2O	
Absolute Meter Pressure	30.53	30.50	30.46	30.49	in Hg	
Avg Square Root Pitot Pressure	1.24	1.25	1.25	1.25	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	88.10	133.90	99.60	107.20	g	
Silica Gel Weight Gain	18.20	12.50	9.60	13.43	g	
Total Water Volume Collected	106.49	146.66	109.40	120.85	ml	
Standard Water Vapor Volume	5.01	6.90	5.15	5.69	scf	
Standard Meter Volume	44.5	44.3	43.8	44.2	dscf	
Standard Metric Meter Volume	1.3	1.3	1.2	1.3	dscm	
Calculated Stack Moisture	10.13	13.49	10.53	11.38	%	
Saturated Stack Moisture	63.08	62.69	63.68	63.15	%	
Reported Stack Moisture Content	10.13	13.49	10.53	11.38	%	
Gas Analysis Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.7	4.8	4.8	4.8	%	
Oxygen Content	12.0	12.3	12.2	12.2	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	83.3	82.9	83.0	83.1	%	
Stack Dry Molecular Weight	29.23	29.26	29.25	29.25	lb/lb-mole	
Stack Wet Molecular Weight	28.09	27.74	28.07	27.97	lb/lb-mole	
Calculated Fuel Factor	1.894	1.795	1.820	1.836		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	120.1	128.3	125.5	124.6	%	

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	76.86	77.78	77.20	77.28	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft^2	
Actual Stack Flow Rate	1,307,477	1,323,215	1,313,354	1,314,682	acfm	
Wet Standard Stack Flow Rate	64,520	65,266	64,627	64,804	wkscfh	
Dry Standard Stack Flow Rate	57,985,824	56,459,578	57,824,230	57,423,211	dscfh	
Ammonia Analysis (CTM-027)	**Run - 1**	**Run - 2**	**Run - 3**	**Average**	**Units**	**Limits**
Front Half Results (C_f)	16.8241	15.9351	16.2136	16.3243	mg/l	
Back Half Results (C_b)	0.2499	1.0103	0.1947	0.4850	mg/l	
Practical Quantitation Limit	0.1000	0.1000	0.1000	0.1000	mg/l	
Blank Results	0.0460	0.0460	0.0460	0.0460	mg/l	
Front Half Sample Volume	247	243	233	241	ml	
Back Half Sample Volume	223	215	228	222	ml	
Volume of NH_3	0.00594	0.00577	0.00540	0.00570	L	
NH_3 Concentration	4.72	4.61	4.35	4.56	ppmvd	--
NH_3 Concentration	3.13	3.16	2.95	3.08	ppm@15%O_2	5.00

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	09/25/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		CTG-1	
Base Run Number		1-100 w/DB-NH3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		w/DB	w/DB	w/DB	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0024	samp-cp-0024	samp-cp-0024	
Meter Calibration Factor	(Y)	1.009	1.009	1.009	
Orifice Meter Coefficient	($\Delta H_@$)	1.869	1.869	1.869	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	A5702	A5702	A5702	
Pitot Tube Coefficient	(C_p)	0.8264	0.8264	0.8264	
Probe Number	from ACS	samp-hp-0141	samp-hp-0141	samp-hp-0141	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-hb-0005	samp-hb-0005	samp-hb-0005	
Impinger Case Number	from ACS	samp-bc-0002	samp-bc-0002	samp-bc-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18		
Sampling Location	CTG-1 Stack	**Operator**	CG		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	1-100 w/DB-NH3-1		**Date**	09/25/18	**Run Start Time**	09:21	**Run Stop Time**	10:24
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:03	4.7	12.0	0.0	83.3	29.23	1.894	120.1	NO

Gas Analysis Data

Run Number	1-100 w/DB-NH3-2		**Date**	09/25/18	**Run Start Time**	10:45	**Run Stop Time**	11:48
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:03	4.8	12.3	0.0	82.9	29.26	1.795	128.3	YES

Gas Analysis Data

Run Number	1-100 w/DB-NH3-3		**Date**	09/25/18	**Run Start Time**	12:10	**Run Stop Time**	13:14
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:04	4.8	12.2	0.0	83.0	29.25	1.820	125.5	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES			
Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18
Sampling Location	CTG-1 Stack	**Operator**	CG
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0022	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/25/18	500	499.9	-0.1	Pass
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		1-100 w/DB-NH3-1		**Date**	09/25/18	**Start Time**	09:21	**Stop Time**	10:24
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	43.300	dcf	**Barometric Pressure**		(P_b)	30.39	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	69	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	1.86	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	798.30	692.70	601.20	902.20				
Initial Value	$(V_i),(W_i)$	735.00	672.10	597.00	884.00				
Net Value	$(V_n),(W_n)$	63.3	20.6	4.2	18.2				
Results									
Total Weight		(W_t)	106.30	g	**Water Vol Weighed**		($V_{wsg(std)}$)	5.012	scf
Std Meter Volume		($V_{m(std)}$)	44.477	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	63.08	%
Calc Moisture Content		($B_{ws(calc)}$)	10.13	%	**Final Moisture Content**		(B_{ws})	10.13	%

Moisture Content Data									
Run Number		1-100 w/DB-NH3-2		**Date**	09/25/18	**Start Time**	10:45	**Stop Time**	11:48
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	43.230	dcf	**Barometric Pressure**		(P_b)	30.36	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	70	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	1.86	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	765.80	722.20	592.30	961.50				
Initial Value	$(V_i),(W_i)$	700.60	697.10	548.70	949.00				
Net Value	$(V_n),(W_n)$	65.2	25.1	43.6	12.5				
Results									
Total Weight		(W_t)	146.40	g	**Water Vol Weighed**		($V_{wsg(std)}$)	6.903	scf
Std Meter Volume		($V_{m(std)}$)	44.257	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	62.69	%
Calc Moisture Content		($B_{ws(calc)}$)	13.49	%	**Final Moisture Content**		(B_{ws})	13.49	%

Moisture Content Data									
Run Number		1-100 w/DB-NH3-3		**Date**	09/25/18	**Start Time**	12:10	**Stop Time**	13:14
Meter Box Number		samp-cp-0024				**Meter Cal Factor**	(Y)	1.009	
Total Meter Volume		(V_m)	42.830	dcf	**Barometric Pressure**		(P_b)	30.32	in Hg
Average Stack Temp		$(t_s)_{avg}$	191	°F	**Stack Static Pressure**		(P_{static})	-1.10	in H_2O
Average Meter Temp		$(t_m)_{avg}$	71	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	768.30	705.90	603.20	911.80				
Initial Value	$(V_i),(W_i)$	694.00	684.80	599.00	902.20				
Net Value	$(V_n),(W_n)$	74.3	21.1	4.2	9.6				
Results									
Total Weight		(W_t)	109.20	g	**Water Vol Weighed**		($V_{wsg(std)}$)	5.149	scf
Std Meter Volume		($V_{m(std)}$)	43.763	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	63.68	%
Calc Moisture Content		($B_{ws(calc)}$)	10.53	%	**Final Moisture Content**		(B_{ws})	10.53	%

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	CG
Run Number	1-100 w/DB-NH3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8264	A5702
Average Stack Temp	(t_s)	190.3	°F
Average Meter Temp	(t_m)	69.2	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.24	in H_2O
Stack Moisture Content	(B_{ws})	10.13	%
Stack Dry Molecular Weight	(M_d)	29.23	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	30.0	sec
	Pre (-)	5.0	in H_2O for	30.0	sec
PASS	**Post (+)**	5.1	in H_2O for	15.0	sec
	Post (-)	5.2	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2030	in
Probe Number	samp-hp-0141		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hb-0005		
Impinger Case Number	samp-bc-0002		

Pressures			
Barometric Pressure	(P_b)	30.39	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	30.31	in Hg
Absolute Meter Pressure	(P_m)	30.53	in Hg

Nozzle Measurements		**ID:**		
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	09:21	**End**	10:24

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	735.0	672.1	597.0	884.0				
Post	798.3	692.7	601.2	902.2				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-hp-0141	samp-hp-0141	samp-hb-0005	samp-bc-0002			**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	465.500	1.50	#DIV/0!	1.86	191	250	256	57			68	68	2.0	1.22	75.66	3.603	--	43.237
A-2	5.0	00:05:00	469.000	1.50	#DIV/0!	1.86	191	251	254	57			68	68	2.0	1.22	75.66	7.114	--	42.681
A-3	10.0	00:10:00	472.410	1.60	#DIV/0!	1.86	191	251	254	57			68	68	2.0	1.26	78.14	10.809	--	43.237
B-1	15.0	00:15:00	476.000	1.60	#DIV/0!	1.86	190	250	253	57			69	69	2.0	1.26	78.08	14.693	--	44.080
B-2	20.0	00:20:00	479.780	1.50	#DIV/0!	1.86	190	251	252	58			69	69	2.0	1.22	75.60	18.382	--	44.117
B-3	25.0	00:25:00	483.370	1.60	#DIV/0!	1.86	190	251	251	58			69	69	2.0	1.26	78.08	21.835	--	43.669
C-1	30.0	00:30:00	486.730	1.50	#DIV/0!	1.86	190	250	250	57			69	69	2.0	1.22	75.60	25.893	--	44.388
C-2	35.0	00:35:00	490.680	1.60	#DIV/0!	1.86	190	252	251	57			70	70	2.0	1.26	78.08	29.247	--	43.870
C-3	40.0	00:40:00	493.950	1.60	#DIV/0!	1.86	190	252	251	57			70	70	2.0	1.26	78.08	32.734	--	43.645
D-1	45.0	00:45:00	497.350	1.50	#DIV/0!	1.86	190	252	250	57			70	70	2.0	1.22	75.60	36.467	--	43.760
D-2	50.0	00:50:00	500.990	1.50	#DIV/0!	1.86	190	250	251	58			70	70	2.0	1.22	75.60	40.128	--	43.776
D-3	55.0	00:55:00	504.560	1.60	#DIV/0!	1.86	191	252	253	58			70	70	2.0	1.26	78.14	44.477	--	44.477
Last Pt	60.0	01:00:00	508.800		#DIV/0!														--	
Final Val	60.0	01:00:00	508.800											**Max Vac**	2.0	**Final Values**		44.477		
Average Values				1.55		1.86	190	251	252	57			69	69		1.24	76.86			
													69							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	CG
Run Number	1-100 w/DB-NH3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8264	A5702
Average Stack Temp	(t_s)	190.0	°F
Average Meter Temp	(t_m)	70.4	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.25	in H_2O
Stack Moisture Content	(B_{ws})	13.49	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	15.0	in Hg
Pitot	Pre (+)	5.0	in H_2O for	30.0	sec
	Pre (-)	5.0	in H_2O for	30.0	sec
PASS	Post (+)	5.1	in H_2O for	15.0	sec
	Post (-)	5.2	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0024		
Meter Cal Factor	(Y)	1.009	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2005	in
Probe Number	samp-hp-0141		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-hb-0005		
Impinger Case Number	samp-bc-0002		

Pressures			
Barometric Pressure	(P_b)	30.36	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	30.28	in Hg
Absolute Meter Pressure	(P_m)	30.50	in Hg

Nozzle Measurements			ID:	
Pre	--	--	--	PASS
Post	--	--	--	PASS

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	10:45	End	11:48

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	700.6	697.1	548.7	949.0				
Post	765.8	722.2	592.3	961.5				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-hp-0141	samp-hp-0141	samp-hb-0005	samp-bc-0002			samp-cp-0024		samp-cp-0024					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤--°F)	CPM Filter Temp (--±--°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity ($v_s)_i$	Cumul. Meter Volume ($V_m)_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume ($V_m)_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	508.670	1.60	#DIV/0!	1.86	190	246	261	63			69	69	2.0	1.26	78.61	4.044	--	48.533
A-2	5.0	00:05:00	512.610	1.60	#DIV/0!	1.86	190	246	260	63			69	69	2.0	1.26	78.61	7.381	--	44.283
A-3	10.0	00:10:00	515.860	1.60	#DIV/0!	1.86	190	247	261	63			69	69	2.0	1.26	78.61	11.220	--	44.879
B-1	15.0	00:15:00	519.600	1.60	#DIV/0!	1.86	190	251	264	63			70	70	2.0	1.26	78.61	14.703	--	44.110
B-2	20.0	00:20:00	523.000	1.50	#DIV/0!	1.86	190	250	263	62			71	71	2.0	1.22	76.12	18.190	--	43.657
B-3	25.0	00:25:00	526.410	1.60	#DIV/0!	1.86	190	252	262	62			71	71	2.0	1.26	78.61	21.862	--	43.723
C-1	30.0	00:30:00	530.000	1.50	#DIV/0!	1.86	190	253	260	60			71	71	2.0	1.22	76.12	25.625	--	43.929
C-2	35.0	00:35:00	533.680	1.50	#DIV/0!	1.86	190	253	264	60			71	71	2.0	1.22	76.12	29.409	--	44.113
C-3	40.0	00:40:00	537.380	1.50	#DIV/0!	1.86	189	249	255	61			71	71	2.0	1.22	76.06	33.111	--	44.148
D-1	45.0	00:45:00	541.000	1.60	#DIV/0!	1.86	190	252	262	60			71	71	2.0	1.26	78.61	36.864	--	44.237
D-2	50.0	00:50:00	544.670	1.60	#DIV/0!	1.86	190	254	263	60			71	71	2.0	1.26	78.61	40.699	--	44.399
D-3	55.0	00:55:00	548.420	1.60	#DIV/0!	1.86	191	252	263	60			71	71	2.0	1.26	78.67	44.258	--	44.258
Last Pt	60.0	01:00:00	551.900		#DIV/0!														--	
Final Val	60.0	01:00:00	551.900											Max Vac	2.0	Final Values		44.258		
Average Values				1.57		1.86	190	250	262	61			70	70		1.25	77.78			
													70							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	CG
Run Number	1-100 w/DB-NH3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8264	A5702
Average Stack Temp	(t_s)	190.7	°F
Average Meter Temp	(t_m)	70.7	
Orifice Meter Coefficient	($\Delta H@$)	1.869	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)	1.25	in H_2O
Stack Moisture Content	(B_{ws})	10.53	%
Stack Dry Molecular Weight	(M_d)	29.25	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	30.0	sec
	Pre (-)	5.0	in H_2O for	30.0	sec
PASS	**Post (+)**	5.1	in H_2O for	15.0	sec
	Post (-)	5.2	in H_2O for	15.0	sec

Sampling Equipment				
Meter Box Number	samp-cp-0024			
Meter Cal Factor	(Y)	1.009		
Nozzle Number				
Average Nozzle Diameter	(D_{na})	#DIV/0!	in	
Suggested Nozzle Diameter	(D_{ni})	0.2007	in	
Probe Number	samp-hp-0141		in	
Probe Length	108		in	
Liner Material	glass			
Sample Case / Oven Number	samp-hb-0005			
Impinger Case Number	samp-bc-0002			

Pressures			
Barometric Pressure	(P_b)	30.32	in Hg
Stack Static Pressure	(P_{static})	-1.10	in H_2O
Absolute Stack Pressure	(P_s)	30.24	in Hg
Absolute Meter Pressure	(P_m)	30.46	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	12:10	**End**	13:14

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	694.0	684.8	599.0	902.2				
Post	768.3	705.9	603.2	911.8				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0024	samp-cp-0024	samp-cp-0024			samp-hp-0141	samp-hp-0141	samp-hb-0005	samp-bc-0002			**samp-cp-0024**		samp-cp-0024					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	552.770	1.60	#DIV/0!	1.80	190	256	262	57			70	70	2.0	1.26	78.20	3.826	--	45.916
A-2	5.0	00:05:00	556.510	1.70	#DIV/0!	1.80	191	251	262	57			70	70	2.0	1.30	80.67	7.397	--	44.381
A-3	10.0	00:10:00	560.000	1.60	#DIV/0!	1.80	191	257	261	58			70	70	2.0	1.26	78.26	11.489	--	45.957
B-1	15.0	00:15:00	564.000	1.60	#DIV/0!	1.80	191	256	261	58			70	70	2.0	1.26	78.26	15.796	--	47.389
B-2	20.0	00:20:00	568.210	1.50	#DIV/0!	1.80	190	252	263	58			71	71	2.0	1.22	75.72	18.451	--	44.283
B-3	25.0	00:25:00	570.810	1.50	#DIV/0!	1.80	190	255	262	57			71	71	2.0	1.22	75.72	22.638	--	45.276
C-1	30.0	00:30:00	574.910	1.50	#DIV/0!	1.80	190	253	261	57			71	71	2.0	1.22	75.72	25.793	--	44.217
C-2	35.0	00:35:00	578.000	1.60	#DIV/0!	1.80	191	253	260	57			71	71	2.0	1.26	78.26	29.490	--	44.235
C-3	40.0	00:40:00	581.620	1.60	#DIV/0!	1.80	191	252	260	57			71	71	2.0	1.26	78.26	33.064	--	44.085
D-1	45.0	00:45:00	585.120	1.50	#DIV/0!	1.80	191	248	262	58			71	71	2.0	1.22	75.78	36.914	--	44.296
D-2	50.0	00:50:00	588.890	1.50	#DIV/0!	1.80	191	255	262	58			71	71	2.0	1.22	75.78	40.304	--	43.968
D-3	55.0	00:55:00	592.210	1.50	#DIV/0!	1.80	191	253	262	58			71	71	2.0	1.22	75.78	43.766	--	43.766
Last Pt	60.0	01:00:00	595.600		#DIV/0!														--	
Final Val	60.0	01:00:00	595.600											**Max Vac**	2.0	**Final Values**		43.766		
Average Values				1.56		1.80	191	253	262	58			71	71		1.25	77.20			
													71							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
Unit Operations Data

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	205.84	2095738.09	0.00	89.29
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 16:40:00:000	206.24767	2092360.5	0.0041098	89.39595
2018/09/25 16:41:00:000	205.89044	2097055.9	0.0041098	89.281235
2018/09/25 16:42:00:000	205.89044	2096817.4	0.0041098	89.281235
2018/09/25 16:43:00:000	205.58824	2095475.4	0.0041098	89.44122
2018/09/25 16:44:00:000	205.58824	2087808.6	0.0041098	89.36877
2018/09/25 16:45:00:000	205.58824	2097139	0.0041098	89.321304
2018/09/25 16:46:00:000	205.92259	2095921.5	0.0041098	89.321304
2018/09/25 16:47:00:000	205.92259	2092500.8	0.0041098	89.321304
2018/09/25 16:48:00:000	205.92259	2096901.5	0.0041098	89.321304
2018/09/25 16:49:00:000	205.92259	2097027.8	0.0041098	89.321304
2018/09/25 16:50:00:000	205.92259	2096290.2	0.0041098	89.321304
2018/09/25 16:51:00:000	205.92259	2096216.4	0.0041098	89.321304
2018/09/25 16:52:00:000	205.79712	2094155.1	0.0041098	89.321304
2018/09/25 16:53:00:000	205.79712	2097158.5	0.0041098	89.321304
2018/09/25 16:54:00:000	206.20648	2097495	0.0041098	89.321304
2018/09/25 16:55:00:000	206.20648	2101022.2	0.0041098	89.321304
2018/09/25 16:56:00:000	205.92049	2096747.6	0.0041098	89.321304
2018/09/25 16:57:00:000	205.92049	2099435.5	0.0041098	89.321304
2018/09/25 16:58:00:000	205.92049	2094469.8	0.0041098	89.14992
2018/09/25 16:59:00:000	205.59128	2095520.2	0.0041098	89.145966
2018/09/25 17:00:00:000	205.59128	2096506.9	0.0041098	89.17352
2018/09/25 17:01:00:000	205.59128	2097518.5	0.0041098	89.23345
2018/09/25 17:02:00:000	205.59128	2093175.6	0.0041098	89.23345
2018/09/25 17:03:00:000	205.59128	2094745.2	0.0041098	89.23345
2018/09/25 17:04:00:000	205.59128	2092879.2	0.0041098	89.37938
2018/09/25 17:05:00:000	205.71599	2093777.5	0.0041098	89.25867
2018/09/25 17:06:00:000	205.71599	2092927	0.0041098	89.29986
2018/09/25 17:07:00:000	205.71599	2096785	0.0041098	89.29986
2018/09/25 17:08:00:000	206.25748	2098095.5	0.0041098	89.29986
2018/09/25 17:09:00:000	205.96689	2097092	0.0041098	89.34638
2018/09/25 17:10:00:000	205.72404	2094739.2	0.0041098	89.16539
2018/09/25 17:11:00:000	205.72404	2094536.9	0.0041098	89.170845
2018/09/25 17:12:00:000	205.72404	2092397.6	0.0041098	89.2612
2018/09/25 17:13:00:000	205.72404	2094711	0.0041098	89.289154
2018/09/25 17:14:00:000	205.72404	2091382.8	0.0041098	89.289154
2018/09/25 17:15:00:000	205.91135	2099468.8	0.0041098	89.289154
2018/09/25 17:16:00:000	205.91135	2096881.2	0.0041098	89.44478
2018/09/25 17:17:00:000	205.91135	2099928	0.0041098	89.189896
2018/09/25 17:18:00:000	205.91135	2097904	0.0041098	89.40729
2018/09/25 17:19:00:000	205.91135	2094504.1	0.0041098	89.41495
2018/09/25 17:20:00:000	205.91135	2096218.5	0.0041098	89.24975
2018/09/25 17:21:00:000	205.91135	2094623	0.0041098	89.24975
2018/09/25 17:22:00:000	205.62871	2098321.2	0.0041098	89.24975
2018/09/25 17:23:00:000	205.62871	2093932	0.0041098	89.24975
2018/09/25 17:24:00:000	205.62871	2094893.8	0.0041098	89.24975
2018/09/25 17:25:00:000	205.62871	2097000	0.0041098	89.13966
2018/09/25 17:26:00:000	205.9282	2096152.8	0.0041098	89.2944
2018/09/25 17:27:00:000	205.9282	2096028.9	0.0041098	89.251144
2018/09/25 17:28:00:000	205.9282	2096364.5	0.0041098	89.251144
2018/09/25 17:29:00:000	205.61543	2095293.1	0.0041098	89.251144
2018/09/25 17:30:00:000	205.61543	2093440.4	0.0041098	89.31034
2018/09/25 17:31:00:000	205.61543	2091535.5	0.0041098	89.148315
2018/09/25 17:32:00:000	205.61543	2094595.2	0.0041098	89.148315
2018/09/25 17:33:00:000	205.96396	2095418.8	0.0041098	89.33375
2018/09/25 17:34:00:000	205.96396	2097395.8	0.0041098	89.33375
2018/09/25 17:35:00:000	205.96396	2098120.2	0.0041098	89.538025
2018/09/25 17:36:00:000	205.96396	2096602.5	0.0041098	89.36985
2018/09/25 17:37:00:000	205.96396	2097145.2	0.0041098	89.36985
2018/09/25 17:38:00:000	206.25716	2095303.8	0.0041098	89.36985
2018/09/25 17:39:00:000	206.25716	2098425.5	0.0041098	89.36985

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**205.41**	**2092599.98**	**0.00**	**89.17**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 18:15:00:000	205.4413	2091904.8	0.0041098	89.07527
2018/09/25 18:16:00:000	205.4413	2091499.2	0.0041098	89.18875
2018/09/25 18:17:00:000	205.4413	2091112.2	0.0041098	89.18875
2018/09/25 18:18:00:000	205.4413	2093115	0.0041098	89.18875
2018/09/25 18:19:00:000	205.4413	2091249.6	0.0041098	89.18875
2018/09/25 18:20:00:000	205.89514	2096088.6	0.0041098	89.18875
2018/09/25 18:21:00:000	205.89514	2088463.1	0.0041098	89.18875
2018/09/25 18:22:00:000	205.39189	2092288.2	0.0041098	88.925705
2018/09/25 18:23:00:000	205.39189	2092828.1	0.0041098	88.913864
2018/09/25 18:24:00:000	205.39189	2092524.2	0.0041098	89.020325
2018/09/25 18:25:00:000	204.96315	2092601.5	0.0041098	89.020325
2018/09/25 18:26:00:000	205.46487	2092903.5	0.0041098	89.06441
2018/09/25 18:27:00:000	204.96396	2091099.6	0.0041098	89.19478
2018/09/25 18:28:00:000	204.96396	2091180.1	0.0041098	89.02205
2018/09/25 18:29:00:000	204.96396	2087604.2	0.0041098	89.02205
2018/09/25 18:30:00:000	205.12129	2090385.5	0.0041098	89.00064
2018/09/25 18:31:00:000	205.12129	2089131.2	0.0041098	89.18449
2018/09/25 18:32:00:000	205.12129	2089119	0.0041098	89.02658
2018/09/25 18:33:00:000	205.12129	2091158	0.0041098	89.05295
2018/09/25 18:34:00:000	205.12129	2092068	0.0041098	89.05295
2018/09/25 18:35:00:000	205.12129	2087562.2	0.0041098	89.05295
2018/09/25 18:36:00:000	204.8098	2091909.4	0.0041098	89.06737
2018/09/25 18:37:00:000	204.8098	2089781.5	0.0041098	89.06737
2018/09/25 18:38:00:000	205.13947	2090985.4	0.0041098	89.15773
2018/09/25 18:39:00:000	205.13947	2092750.8	0.0041098	89.15773
2018/09/25 18:40:00:000	205.46861	2091557.4	0.0041098	89.13451
2018/09/25 18:41:00:000	205.46861	2092080.5	0.0041098	89.13451
2018/09/25 18:42:00:000	205.26425	2094432	0.0041098	89.222984
2018/09/25 18:43:00:000	205.89644	2082490.6	0.0041098	89.222984
2018/09/25 18:44:00:000	204.72989	2075935.5	0.0041098	88.802
2018/09/25 18:45:00:000	205.88464	2116316.5	0.0041098	89.36588
2018/09/25 18:46:00:000	205.20335	2077692.6	0.0041098	88.96338
2018/09/25 18:47:00:000	206.1434	2117176	0.0041098	89.55749
2018/09/25 18:48:00:000	205.12022	2084763.5	0.0041098	89.15283
2018/09/25 18:49:00:000	205.91751	2088809.6	0.0041098	89.41896
2018/09/25 18:50:00:000	205.91751	2097231.8	0.0041098	89.14046
2018/09/25 18:51:00:000	205.27219	2082792	0.0041098	89.14046
2018/09/25 18:52:00:000	205.92683	2108925	0.0041098	89.44506
2018/09/25 18:53:00:000	205.09525	2091936.5	0.0041098	89.21609
2018/09/25 18:54:00:000	205.69266	2093560.1	0.0041098	89.33626
2018/09/25 18:55:00:000	205.69266	2099124.2	0.0041098	89.38675
2018/09/25 18:56:00:000	205.05446	2096052	0.0041098	89.22578
2018/09/25 18:57:00:000	205.26917	2086630.9	0.0041098	89.11319
2018/09/25 18:58:00:000	205.93385	2090325.2	0.0041098	89.3324
2018/09/25 18:59:00:000	205.26181	2093564.2	0.0041098	89.22734
2018/09/25 19:00:00:000	205.70825	2100847	0.0041098	89.22734
2018/09/25 19:01:00:000	205.70825	2096705.2	0.0041098	89.22734
2018/09/25 19:02:00:000	205.70825	2086795.9	0.0041098	89.22734
2018/09/25 19:03:00:000	205.51692	2091601.4	0.0041098	89.22734
2018/09/25 19:04:00:000	205.73085	2093492	0.0041098	89.265396
2018/09/25 19:05:00:000	205.73085	2096500	0.0041098	89.265396
2018/09/25 19:06:00:000	205.48166	2094076.1	0.0041098	89.156296
2018/09/25 19:07:00:000	205.48166	2094829.2	0.0041098	89.11783
2018/09/25 19:08:00:000	205.48166	2093009	0.0041098	89.28023
2018/09/25 19:09:00:000	205.48166	2094781.2	0.0041098	89.09398
2018/09/25 19:10:00:000	205.45447	2095616.4	0.0041098	89.337296
2018/09/25 19:11:00:000	205.45447	2092575	0.0041098	89.22472
2018/09/25 19:12:00:000	205.45447	2095655.5	0.0041098	89.22472
2018/09/25 19:13:00:000	205.45447	2092569.1	0.0041098	89.22472
2018/09/25 19:14:00:000	205.45447	2094236.8	0.0041098	89.193016

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	205.33	2091966.10	0.00	89.15
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 19:44:00:000	205.62181	2098109.2	0.0041098	89.193726
2018/09/25 19:45:00:000	205.62181	2096270.2	0.0041098	89.250885
2018/09/25 19:46:00:000	205.30849	2093009.4	0.0041098	89.250885
2018/09/25 19:47:00:000	205.30849	2085952	0.0041098	89.242966
2018/09/25 19:48:00:000	205.30849	2091745.2	0.0041098	89.08577
2018/09/25 19:49:00:000	205.30849	2089296.1	0.0041098	89.168335
2018/09/25 19:50:00:000	205.12155	2080668.4	0.0041098	89.01399
2018/09/25 19:51:00:000	205.89581	2108461.2	0.0041098	89.245575
2018/09/25 19:52:00:000	204.73494	2070095.9	0.0041098	89.05318
2018/09/25 19:53:00:000	204.49315	2073805.6	0.0041098	88.9532
2018/09/25 19:54:00:000	205.4747	2085199.4	0.0041098	89.23692
2018/09/25 19:55:00:000	204.9842	2117542	0.0041098	89.194565
2018/09/25 19:56:00:000	205.29218	2082786.8	0.0041098	89.14554
2018/09/25 19:57:00:000	205.29218	2091502.1	0.0041098	89.02115
2018/09/25 19:58:00:000	205.29218	2089676.1	0.0041098	89.30353
2018/09/25 19:59:00:000	205.29218	2081525.8	0.0041098	88.996124
2018/09/25 20:00:00:000	205.29218	2100983.5	0.0041098	89.22641
2018/09/25 20:01:00:000	205.29218	2086681.5	0.0041098	88.93245
2018/09/25 20:02:00:000	205.73373	2089303.9	0.0041098	89.1837
2018/09/25 20:03:00:000	205.73373	2101691.8	0.0041098	89.10413
2018/09/25 20:04:00:000	205.48999	2089134.6	0.0041098	89.10413
2018/09/25 20:05:00:000	205.91316	2095190.4	0.0041098	89.30655
2018/09/25 20:06:00:000	205.91316	2110107	0.0041098	89.30655
2018/09/25 20:07:00:000	205.36569	2094138.9	0.0041098	89.13858
2018/09/25 20:08:00:000	205.84503	2092928.1	0.0041098	89.282394
2018/09/25 20:09:00:000	205.84503	2093474.4	0.0041098	89.282394
2018/09/25 20:10:00:000	205.44351	2092166.4	0.0041098	89.23071
2018/09/25 20:11:00:000	205.44351	2092197.6	0.0041098	88.95992
2018/09/25 20:12:00:000	204.90398	2091716.8	0.0041098	89.04744
2018/09/25 20:13:00:000	205.49847	2093352.4	0.0041098	89.239
2018/09/25 20:14:00:000	205.1521	2091044.9	0.0041098	89.20442
2018/09/25 20:15:00:000	205.1521	2097362	0.0041098	89.27843
2018/09/25 20:16:00:000	205.4455	2092194.9	0.0041098	89.14888
2018/09/25 20:17:00:000	205.17586	2091581.6	0.0041098	89.14888
2018/09/25 20:18:00:000	205.17586	2088924.6	0.0041098	89.08343
2018/09/25 20:19:00:000	205.17586	2091140.6	0.0041098	89.08343
2018/09/25 20:20:00:000	205.17586	2093178.8	0.0041098	89.08343
2018/09/25 20:21:00:000	205.17586	2089411.8	0.0041098	89.07748
2018/09/25 20:22:00:000	205.17586	2092928.1	0.0041098	88.930435
2018/09/25 20:23:00:000	205.17586	2092306.9	0.0041098	89.0553
2018/09/25 20:24:00:000	205.17586	2089203.1	0.0041098	89.10501
2018/09/25 20:25:00:000	205.17586	2087958.2	0.0041098	89.10501
2018/09/25 20:26:00:000	205.17586	2088378.9	0.0041098	89.10501
2018/09/25 20:27:00:000	205.17586	2090848.6	0.0041098	89.10501
2018/09/25 20:28:00:000	205.17586	2092712.5	0.0041098	89.10501
2018/09/25 20:29:00:000	205.17586	2094674.6	0.0041098	89.183334
2018/09/25 20:30:00:000	205.17586	2089681.5	0.0041098	89.024734
2018/09/25 20:31:00:000	205.17586	2095321.9	0.0041098	89.22619
2018/09/25 20:32:00:000	205.44022	2096172.2	0.0041098	89.04292
2018/09/25 20:33:00:000	205.44022	2094647.2	0.0041098	89.113815
2018/09/25 20:34:00:000	205.44022	2091948.2	0.0041098	89.243256
2018/09/25 20:35:00:000	205.44022	2093974.8	0.0041098	89.21405
2018/09/25 20:36:00:000	205.44022	2094365	0.0041098	89.277695
2018/09/25 20:37:00:000	205.44022	2093030.1	0.0041098	89.25983
2018/09/25 20:38:00:000	205.44022	2091508.8	0.0041098	89.20712
2018/09/25 20:39:00:000	205.13737	2092728.9	0.0041098	89.20968
2018/09/25 20:40:00:000	205.13737	2090295.2	0.0041098	89.02124
2018/09/25 20:41:00:000	205.13737	2090487.9	0.0041098	89.14995
2018/09/25 20:42:00:000	205.45293	2087114.2	0.0041098	89.14995
2018/09/25 20:43:00:000	205.45293	2094127.4	0.0041098	89.31183

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
Unit Operations Data

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	209.99	2129501.23	16.25	90.84
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 10:25:00:000	210.34167	2129650.5	16.255562	90.824875
2018/09/25 10:26:00:000	210.34167	2121710.5	16.255562	90.95378
2018/09/25 10:27:00:000	210.34167	2143790.2	16.255562	91.194664
2018/09/25 10:28:00:000	210.34167	2124144.5	16.255562	91.04726
2018/09/25 10:29:00:000	210.34167	2122236.2	16.255562	91.04726
2018/09/25 10:30:00:000	210.34167	2150243	16.255562	91.04726
2018/09/25 10:31:00:000	210.34167	2125659.8	16.255562	90.87898
2018/09/25 10:32:00:000	210.34167	2124597.8	16.255562	90.87898
2018/09/25 10:33:00:000	210.34167	2140539.8	16.255562	91.003784
2018/09/25 10:34:00:000	209.96764	2123398.8	16.255562	90.791985
2018/09/25 10:35:00:000	209.96764	2124818.8	16.255562	90.963936
2018/09/25 10:36:00:000	210.65047	2147515.8	16.255562	90.963936
2018/09/25 10:37:00:000	210.0563	2126500.8	16.255562	90.872604
2018/09/25 10:38:00:000	210.0563	2126224.5	16.255562	90.872604
2018/09/25 10:39:00:000	210.55162	2144717.8	16.255562	90.89636
2018/09/25 10:40:00:000	210.16628	2128050	16.255562	90.7135
2018/09/25 10:41:00:000	210.16628	2127245.2	16.255562	90.99036
2018/09/25 10:42:00:000	210.16628	2139348.8	16.255562	90.87698
2018/09/25 10:43:00:000	210.16628	2134826.2	16.255562	90.778366
2018/09/25 10:44:00:000	209.81244	2121190.5	16.255562	90.778366
2018/09/25 10:45:00:000	210.06734	2127073.2	16.255562	90.77782
2018/09/25 10:46:00:000	210.06734	2132372.8	16.255562	90.906006
2018/09/25 10:47:00:000	209.87819	2132164.8	16.255562	90.875595
2018/09/25 10:48:00:000	209.87819	2119877.2	16.255562	90.875595
2018/09/25 10:49:00:000	209.87819	2124049.2	16.255562	90.875595
2018/09/25 10:50:00:000	209.87819	2132403.2	16.255562	90.875595
2018/09/25 10:51:00:000	210.52708	2127674.8	16.255562	90.875595
2018/09/25 10:52:00:000	210.229	2133283.5	16.255562	90.81177
2018/09/25 10:53:00:000	209.88647	2129827.2	16.255562	90.81177
2018/09/25 10:54:00:000	209.88647	2130858.2	16.255562	90.81177
2018/09/25 10:55:00:000	209.88647	2131989.8	16.255562	90.81177
2018/09/25 10:56:00:000	210.19487	2130818.8	16.255562	90.86705
2018/09/25 10:57:00:000	209.55972	2125228.5	16.255562	90.78553
2018/09/25 10:58:00:000	209.55972	2127922.8	16.255562	90.78553
2018/09/25 10:59:00:000	210.0228	2126919	16.255562	90.9365
2018/09/25 11:00:00:000	210.0228	2127523.8	16.255562	90.80879
2018/09/25 11:01:00:000	210.0228	2132295	16.255562	90.918465
2018/09/25 11:02:00:000	210.0228	2130980.8	16.245287	90.71399
2018/09/25 11:03:00:000	210.0228	2131676.2	16.245287	90.86785
2018/09/25 11:04:00:000	210.0228	2134236	16.245287	90.65413
2018/09/25 11:05:00:000	210.0228	2131612	16.245287	90.7798
2018/09/25 11:06:00:000	209.55865	2131416	16.245287	90.92738
2018/09/25 11:07:00:000	209.92476	2128498.5	16.245287	90.797104
2018/09/25 11:08:00:000	209.92476	2123762.8	16.245287	90.875336
2018/09/25 11:09:00:000	209.92476	2131413.8	16.245287	90.875336
2018/09/25 11:10:00:000	209.92476	2128575.8	16.256245	90.824554
2018/09/25 11:11:00:000	209.92476	2128942.5	16.256245	90.67366
2018/09/25 11:12:00:000	209.58052	2128403	16.256245	90.67366
2018/09/25 11:13:00:000	209.58052	2128895	16.256245	90.754074
2018/09/25 11:14:00:000	209.96727	2131070	16.256245	90.754074
2018/09/25 11:15:00:000	209.96727	2130645.8	16.256245	90.711784
2018/09/25 11:16:00:000	209.36874	2129501.8	16.256245	90.711784
2018/09/25 11:17:00:000	209.61476	2127106.8	16.256245	90.711784
2018/09/25 11:18:00:000	209.61476	2119651.2	16.256245	90.711784
2018/09/25 11:19:00:000	209.61476	2126207	16.24597	90.711784
2018/09/25 11:20:00:000	209.61476	2121406.5	16.24597	90.88292
2018/09/25 11:21:00:000	209.96019	2127117.5	16.24597	90.781784
2018/09/25 11:22:00:000	209.68304	2127144.5	16.24597	90.781784
2018/09/25 11:23:00:000	209.68304	2127220.2	16.24597	90.618835
2018/09/25 11:24:00:000	209.68304	2125898.5	16.24597	90.854675

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	208.89	2119978.09	16.26	90.47
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 12:24:00:000	208.92174	2121056.8	16.25419	90.55608
2018/09/25 12:25:00:000	208.92174	2120376.8	16.25419	90.5323
2018/09/25 12:26:00:000	208.92174	2121865.2	16.25419	90.5323
2018/09/25 12:27:00:000	208.92174	2119209.2	16.25419	90.5323
2018/09/25 12:28:00:000	208.92174	2119988	16.25419	90.61719
2018/09/25 12:29:00:000	209.37889	2121904.5	16.25419	90.61719
2018/09/25 12:30:00:000	209.37889	2124121	16.272	90.61719
2018/09/25 12:31:00:000	209.10283	2127368	16.272	90.52468
2018/09/25 12:32:00:000	209.10283	2120561	16.272	90.52468
2018/09/25 12:33:00:000	209.10283	2122960.8	16.272	90.52468
2018/09/25 12:34:00:000	208.99284	2124505.8	16.272	90.43117
2018/09/25 12:35:00:000	208.99284	2123329	16.272	90.43117
2018/09/25 12:36:00:000	208.99284	2122994.2	16.263094	90.56219
2018/09/25 12:37:00:000	209.3272	2122991.8	16.263094	90.41248
2018/09/25 12:38:00:000	209.3272	2122479.8	16.263094	90.43365
2018/09/25 12:39:00:000	208.6839	2121392.8	16.263094	90.57236
2018/09/25 12:40:00:000	209.32439	2122519.8	16.263094	90.596375
2018/09/25 12:41:00:000	208.88614	2121176.5	16.263094	90.596954
2018/09/25 12:42:00:000	208.88614	2120491.8	16.263094	90.40294
2018/09/25 12:43:00:000	208.88614	2118828	16.263094	90.4937
2018/09/25 12:44:00:000	208.88614	2119872	16.263094	90.4937
2018/09/25 12:45:00:000	208.91225	2120845.8	16.263094	90.4937
2018/09/25 12:46:00:000	208.91225	2122788.8	16.263094	90.43784
2018/09/25 12:47:00:000	208.91225	2115861.8	16.263094	90.52432
2018/09/25 12:48:00:000	208.91225	2119957.2	16.263094	90.52432
2018/09/25 12:49:00:000	208.91225	2120038.2	16.263094	90.52432
2018/09/25 12:50:00:000	208.91225	2123920	16.263094	90.52432
2018/09/25 12:51:00:000	208.91225	2118409.2	16.263094	90.39606
2018/09/25 12:52:00:000	208.91225	2118540.8	16.263094	90.5195
2018/09/25 12:53:00:000	208.91225	2123854.5	16.263094	90.38455
2018/09/25 12:54:00:000	208.91225	2121080.8	16.263094	90.510666
2018/09/25 12:55:00:000	208.91225	2120025.8	16.263094	90.52342
2018/09/25 12:56:00:000	208.91225	2120026.2	16.263094	90.434
2018/09/25 12:57:00:000	208.91225	2121287.2	16.263094	90.2155
2018/09/25 12:58:00:000	208.69537	2119591	16.263094	90.40068
2018/09/25 12:59:00:000	208.69537	2118072	16.263094	90.54521
2018/09/25 13:00:00:000	208.96832	2119333.5	16.263094	90.5486
2018/09/25 13:01:00:000	208.96832	2120930.8	16.263094	90.488205
2018/09/25 13:02:00:000	208.96832	2119798.8	16.263094	90.488205
2018/09/25 13:03:00:000	208.96832	2120779	16.263094	90.488205
2018/09/25 13:04:00:000	208.96832	2118633	16.263094	90.41441
2018/09/25 13:05:00:000	208.96832	2120913.2	16.263094	90.41441
2018/09/25 13:06:00:000	208.69426	2121405.5	16.263094	90.47332
2018/09/25 13:07:00:000	208.69426	2121251.5	16.263094	90.47332
2018/09/25 13:08:00:000	208.69426	2119688.2	16.263094	90.47332
2018/09/25 13:09:00:000	208.69426	2117035.5	16.263094	90.52148
2018/09/25 13:10:00:000	208.69426	2117644.5	16.25145	90.52148
2018/09/25 13:11:00:000	208.81116	2117360.2	16.25145	90.3887
2018/09/25 13:12:00:000	208.81116	2115929	16.25145	90.60927
2018/09/25 13:13:00:000	208.81116	2116667	16.25145	90.4377
2018/09/25 13:14:00:000	208.81116	2118112.5	16.25145	90.37689
2018/09/25 13:15:00:000	208.81116	2115455.5	16.25145	90.37689
2018/09/25 13:16:00:000	208.81116	2120634.5	16.25145	90.44726
2018/09/25 13:17:00:000	208.81116	2118167.8	16.25145	90.44726
2018/09/25 13:18:00:000	208.81116	2116848	16.26926	90.15732
2018/09/25 13:19:00:000	208.40971	2115352.2	16.26926	90.3138
2018/09/25 13:20:00:000	208.65428	2116279.8	16.26926	90.379074
2018/09/25 13:21:00:000	208.65428	2116191.5	16.26926	90.241425
2018/09/25 13:22:00:000	208.2755	2116337.8	16.26926	90.39374
2018/09/25 13:23:00:000	208.2755	2113644.2	16.26926	90.39374

Site = SPPA-T3000-AGR
Time Range = 2018/09/25 00:00:00.000 to 2018/09/26 02:30:00.000

Average	**207.38**	**2109111.26**	**16.26**	**89.96**
Time	CT MEGAWATT SELECT	VOLUMETRIC TOTAL GAS FLOW	HRSG2 DB NG FLOW1	TOTAL GAS FUEL FLOW
	MW	SCFH	KPPH	KPPH
	12HAD00EU001	12HAD00EU001	12HHA10CF001	12MBP10CF910
Note: System time offset	XQ04	XQ27	XQ01	XQ07
one hour from run time	208.26256	2115494.5	9.717435	90.182365
2018/09/25 13:57:00:000	208.19147	2117667	16.26515	90.14734
2018/09/25 13:58:00:000	208.19147	2116003.8	16.26515	90.14734
2018/09/25 13:59:00:000	208.19147	2117245.8	16.278164	90.14734
2018/09/25 14:00:00:000	208.19147	2114076.5	16.278164	90.14734
2018/09/25 14:01:00:000	207.64957	2114965.5	16.278164	90.14734
2018/09/25 14:02:00:000	207.64957	2112196.5	16.278164	90.14734
2018/09/25 14:03:00:000	207.99226	2115050.5	16.278164	90.14734
2018/09/25 14:04:00:000	207.99226	2117863.8	16.278164	90.10892
2018/09/25 14:05:00:000	207.99226	2111761	16.278164	90.081924
2018/09/25 14:06:00:000	207.99226	2110094.5	16.26789	90.081924
2018/09/25 14:07:00:000	207.21968	2106861.2	16.26789	89.975876
2018/09/25 14:08:00:000	207.62433	2111290.5	16.26789	89.975876
2018/09/25 14:09:00:000	207.62433	2111040	16.26789	89.975876
2018/09/25 14:10:00:000	207.62433	2113115.5	16.26789	89.975876
2018/09/25 14:11:00:000	207.62433	2109242	16.26789	90.01497
2018/09/25 14:12:00:000	207.9451	2109394.2	16.26789	89.83426
2018/09/25 14:13:00:000	207.62628	2112109.5	16.26789	89.88118
2018/09/25 14:14:00:000	207.62628	2108533	16.26515	89.984314
2018/09/25 14:15:00:000	207.62628	2111503.5	16.26515	89.88199
2018/09/25 14:16:00:000	207.62628	2107465	16.26515	90.097145
2018/09/25 14:17:00:000	207.45758	2108195	16.26515	90.222855
2018/09/25 14:18:00:000	206.94484	2109492	16.26515	90.17563
2018/09/25 14:19:00:000	207.48169	2107944.2	16.26515	90.17563
2018/09/25 14:20:00:000	207.48169	2111260.5	16.26515	90.22912
2018/09/25 14:21:00:000	207.48169	2107660.2	16.26515	90.22912
2018/09/25 14:22:00:000	207.48169	2112153.2	16.26515	90.08103
2018/09/25 14:23:00:000	207.48169	2111580	16.26515	90.08103
2018/09/25 14:24:00:000	207.48169	2108598.8	16.26515	90.08103
2018/09/25 14:25:00:000	207.48169	2112037.2	16.26515	90.08103
2018/09/25 14:26:00:000	207.48169	2112848.8	16.26515	90.08103
2018/09/25 14:27:00:000	207.14697	2111635.2	16.26515	90.10779
2018/09/25 14:28:00:000	207.14697	2110195	16.26515	90.066734
2018/09/25 14:29:00:000	207.14697	2109638.8	16.26515	89.86426
2018/09/25 14:30:00:000	207.41396	2108641.5	16.26515	89.919495
2018/09/25 14:31:00:000	207.08165	2104592.5	16.26515	89.919495
2018/09/25 14:32:00:000	207.08165	2105553.5	16.26515	89.919495
2018/09/25 14:33:00:000	207.32797	2106854	16.26515	89.78245
2018/09/25 14:34:00:000	207.32797	2105265.5	16.26515	89.908035
2018/09/25 14:35:00:000	207.32797	2110946.2	16.26515	89.908035
2018/09/25 14:36:00:000	207.32797	2104469.5	16.26515	89.908035
2018/09/25 14:37:00:000	206.86316	2104943.5	16.26515	90.11373
2018/09/25 14:38:00:000	207.40622	2106212	16.26515	89.95135
2018/09/25 14:39:00:000	207.40622	2105572.8	16.26515	89.76143
2018/09/25 14:40:00:000	206.96724	2106232.5	16.26515	89.7835
2018/09/25 14:41:00:000	206.96724	2106515.8	16.26515	89.7835
2018/09/25 14:42:00:000	206.96724	2104227.5	16.26515	89.7835
2018/09/25 14:43:00:000	206.96724	2106178	16.256245	89.7835
2018/09/25 14:44:00:000	206.96724	2106418	16.256245	89.8311
2018/09/25 14:45:00:000	206.96724	2108859.8	16.256245	89.72662
2018/09/25 14:46:00:000	206.96724	2106648.8	16.256245	89.72662
2018/09/25 14:47:00:000	206.96724	2108530.2	16.256245	89.72662
2018/09/25 14:48:00:000	206.96724	2108473.8	16.256245	89.72662
2018/09/25 14:49:00:000	206.96724	2103707.2	16.256245	89.72662
2018/09/25 14:50:00:000	206.96724	2100713	16.256245	89.72662
2018/09/25 14:51:00:000	206.96724	2106668.8	16.256245	89.697174
2018/09/25 14:52:00:000	206.96724	2105491	16.256245	89.77079
2018/09/25 14:53:00:000	206.96724	2105233.5	16.256245	89.77079
2018/09/25 14:54:00:000	206.96724	2110372	16.256245	89.8561
2018/09/25 14:55:00:000	206.96724	2102559.5	16.256245	89.82621
2018/09/25 14:56:00:000	206.96724	2106077.2	16.256245	90.04213

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
NOx, CO, VOC, CO_2, and O_2 Data

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,095,738	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,095,738	SCFH

Weather Data

Barometric Pressure	29.69	in. Hg
Relative Humidity	96	%
Ambient Temperature	58	°F
Specific Humidity	0.009928	lb H_2O / lb air

Unit Data

Unit Load	204.1	megawatts
Meas. Stack Moisture	9.0	%
Stack Exhaust Flow (M19)	51,012,770	SCFH

Base Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 15:40:24	101220	13.42	2.11	0.61	2.16	4.05
09/25/18 15:41:24	101280	13.42	2.07	0.61	2.19	4.06
09/25/18 15:42:24	101340	13.42	2.06	0.59	2.10	4.06
09/25/18 15:43:24	101400	13.42	2.09	0.63	2.02	4.06
09/25/18 15:44:24	101460	13.42	2.06	0.65	2.06	4.06
09/25/18 15:45:24	101520	13.42	2.11	0.58	2.07	4.06
09/25/18 15:46:24	101580	13.43	2.09	0.62	2.02	4.06
09/25/18 15:47:24	101640	13.42	2.02	0.61	1.95	4.05
09/25/18 15:48:24	101700	13.41	2.05	0.60	1.93	4.06
09/25/18 15:49:24	101760	13.42	2.09	0.64	1.96	4.06
09/25/18 15:50:24	101820	13.42	2.09	0.60	1.98	4.06
09/25/18 15:51:24	101880	13.43	2.05	0.57	2.04	4.05
09/25/18 15:52:24	101940	13.43	2.03	0.58	2.09	4.06
09/25/18 15:53:24	102000	13.42	2.07	0.60	2.08	4.05
09/25/18 15:54:24	102060	13.42	2.09	0.56	2.20	4.05
09/25/18 15:55:24	102120	13.42	2.03	0.53	2.28	4.06
09/25/18 15:56:24	102180	13.41	2.03	0.60	2.35	4.06
09/25/18 15:57:24	102240	13.42	2.01	0.58	2.40	4.06
09/25/18 15:58:24	102300	13.42	2.06	0.59	2.48	4.05
09/25/18 15:59:24	102360	13.41	2.03	0.59	2.52	4.06
09/25/18 16:00:24	102420	13.41	2.14	0.58	2.52	4.06
09/25/18 16:01:24	102480	13.43	2.06	0.61	2.48	4.05
09/25/18 16:02:24	102540	13.43	2.11	0.62	2.46	4.05
09/25/18 16:03:24	102600	13.42	2.00	0.60	2.37	4.05
09/25/18 16:04:24	102660	13.43	1.96	0.63	2.35	4.06
09/25/18 16:05:24	102720	13.42	1.94	0.61	2.36	4.06
09/25/18 16:06:24	102780	13.43	2.03	0.59	2.39	4.06
09/25/18 16:07:24	102840	13.42	1.98	0.64	2.44	4.06
09/25/18 16:08:24	102900	13.41	1.99	0.65	2.52	4.06
09/25/18 16:09:24	102960	13.41	2.06	0.66	2.50	4.06
09/25/18 16:10:24	103020	13.43	1.99	0.62	2.52	4.06
09/25/18 16:11:24	103080	13.42	1.98	0.65	2.49	4.06
09/25/18 16:12:24	103140	13.41	2.03	0.59	2.36	4.06
09/25/18 16:13:24	103200	13.42	1.99	0.64	2.32	4.06
09/25/18 16:14:24	103260	13.42	1.94	0.63	2.18	4.05
09/25/18 16:15:24	103320	13.44	1.97	0.62	2.15	4.07
09/25/18 16:16:24	103380	13.42	1.97	0.64	2.18	4.05
09/25/18 16:17:24	103440	13.43	2.04	0.62	2.17	4.06
09/25/18 16:18:24	103500	13.42	2.04	0.61	2.15	4.06
09/25/18 16:19:24	103560	13.42	2.01	0.61	2.16	4.06
09/25/18 16:20:24	103620	13.41	1.97	0.65	2.12	4.06
09/25/18 16:21:24	103680	13.42	2.00	0.64	2.08	4.06
09/25/18 16:22:24	103740	13.41	2.07	0.65	2.16	4.06
09/25/18 16:23:24	103800	13.42	2.02	0.65	2.23	4.06
09/25/18 16:24:24	103860	13.42	2.01	0.62	2.24	4.06
09/25/18 16:25:24	103920	13.42	2.03	0.59	2.24	4.06
09/25/18 16:26:24	103980	13.42	1.98	0.65	2.17	4.05
09/25/18 16:27:24	104040	13.42	1.97	0.60	2.17	4.05
09/25/18 16:28:24	104100	13.41	2.05	0.61	2.16	4.06
09/25/18 16:29:24	104160	13.42	2.04	0.63	2.08	4.05
09/25/18 16:30:24	104220	13.41	1.98	0.62	2.09	4.06
09/25/18 16:31:24	104280	13.41	2.06	0.65	2.04	4.05
09/25/18 16:32:24	104340	13.42	2.12	0.64	2.03	4.06
09/25/18 16:33:24	104400	13.43	2.07	0.67	2.03	4.05
09/25/18 16:34:24	104460	13.42	1.96	0.64	2.00	4.06
09/25/18 16:35:24	104520	13.42	1.95	0.60	1.99	4.06
09/25/18 16:36:24	104580	13.42	2.01	0.59	1.95	4.06
09/25/18 16:37:24	104640	13.41	1.98	0.56	1.94	4.06
09/25/18 16:38:24	104700	13.42	2.10	0.58	1.89	4.05
09/25/18 16:39:24	104760	13.42	2.09	0.56	1.88	4.05
RAW AVERAGE		**13.42**	**2.03**	**0.61**	**2.19**	**4.06**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.05	-0.03	0.32	0.12	-0.04
Bias	**Final Zero**	0.09	-0.04	0.38	0.02	-0.04
Bias	**Avg. Zero**	0.07	-0.04	0.35	0.07	-0.04
Bias	**Initial UpScale**	11.96	5.51	5.81	2.89	8.80
Bias	**Final UpScale**	11.97	5.58	5.87	3.00	8.82
Bias	**Avg. UpScale**	11.97	5.55	5.84	2.95	8.81
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.44	2.05	0.27	2.41	4.13
Concentration (ppm@ 15%O_2)	N/A	1.62	0.22	1.91	N/A

Non-Bias Adjusted Averages Include: *

CH_4 (as CH_4)	C_2H_6 (as CH_4)	VOC (as CH_4)
2.00	0.10	0.31
N/A	N/A	0.24

Note: Reported at RDL

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,052,599	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,052,599	SCFH

Weather Data

Barometric Pressure	29.68	in. Hg
Relative Humidity	98	%
Ambient Temperature	58	°F
Specific Humidity	0.010141	lb H_2O / lb air

Unit Data

Unit Load	205.6	megawatts
Meas. Stack Moisture	8.7	%
Stack Exhaust Flow (M19)	49,960,821	SCFH

Base Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 17:15:24	106920	13.40	1.96	0.61	2.18	4.05
09/25/18 17:16:24	106980	13.40	1.97	0.61	2.01	4.05
09/25/18 17:17:24	107040	13.40	2.01	0.63	2.06	4.05
09/25/18 17:18:24	107100	13.40	2.03	0.63	2.43	4.05
09/25/18 17:19:24	107160	13.41	2.02	0.62	2.40	4.05
09/25/18 17:20:24	107220	13.40	2.05	0.62	2.47	4.05
09/25/18 17:21:24	107280	13.41	2.03	0.63	2.19	4.06
09/25/18 17:22:24	107340	13.40	1.99	0.59	2.16	4.06
09/25/18 17:23:24	107400	13.39	2.02	0.66	2.15	4.05
09/25/18 17:24:24	107460	13.40	2.02	0.65	2.01	4.05
09/25/18 17:25:24	107520	13.41	2.07	0.58	1.88	4.05
09/25/18 17:26:24	107580	13.40	2.01	0.64	1.85	4.05
09/25/18 17:27:24	107640	13.41	2.01	0.64	1.72	4.05
09/25/18 17:28:24	107700	13.41	2.00	0.58	1.76	4.05
09/25/18 17:29:24	107760	13.40	2.03	0.62	1.90	4.06
09/25/18 17:30:24	107820	13.40	2.05	0.63	1.91	4.05
09/25/18 17:31:24	107880	13.42	2.01	0.67	1.99	4.05
09/25/18 17:32:24	107940	13.41	2.03	0.60	1.93	4.06
09/25/18 17:33:24	108000	13.41	2.05	0.60	1.73	4.05
09/25/18 17:34:24	108060	13.41	2.01	0.61	1.62	4.05
09/25/18 17:35:24	108120	13.41	2.11	0.61	1.61	4.06
09/25/18 17:36:24	108180	13.41	2.20	0.58	1.57	4.05
09/25/18 17:37:24	108240	13.41	2.11	0.59	1.45	4.05
09/25/18 17:38:24	108300	13.41	2.08	0.64	1.40	4.06
09/25/18 17:39:24	108360	13.40	2.08	0.62	1.38	4.05
09/25/18 17:40:24	108420	13.41	2.10	0.59	1.27	4.05
09/25/18 17:41:24	108480	13.41	2.10	0.59	1.32	4.06
09/25/18 17:42:24	108540	13.41	2.07	0.61	1.29	4.05
09/25/18 17:43:24	108600	13.41	2.04	0.63	1.25	4.05
09/25/18 17:44:24	108660	13.41	2.00	0.62	1.22	4.05
09/25/18 17:45:24	108720	13.41	2.05	0.60	0.80	4.06
09/25/18 17:46:24	108780	13.42	1.99	0.61	0.90	4.04
09/25/18 17:47:24	108840	13.40	2.06	0.60	0.98	4.06
09/25/18 17:48:24	108900	13.41	1.98	0.61	1.02	4.05
09/25/18 17:49:24	108960	13.39	2.03	0.56	1.15	4.06
09/25/18 17:50:24	109020	13.40	1.99	0.59	1.23	4.05
09/25/18 17:51:24	109080	13.39	1.99	0.60	1.09	4.06
09/25/18 17:52:24	109140	13.43	2.03	0.58	0.96	4.05
09/25/18 17:53:24	109200	13.39	1.97	0.60	1.01	4.05
09/25/18 17:54:24	109260	13.40	2.04	0.58	1.13	4.05
09/25/18 17:55:24	109320	13.41	2.05	0.60	1.16	4.05
09/25/18 17:56:24	109380	13.41	2.03	0.62	1.27	4.06
09/25/18 17:57:24	109440	13.41	1.98	0.60	1.35	4.06
09/25/18 17:58:24	109500	13.42	1.97	0.63	1.28	4.05
09/25/18 17:59:24	109560	13.41	1.95	0.65	0.61	4.06
09/25/18 18:00:24	109620	13.41	1.99	0.65	0.80	4.05
09/25/18 18:01:24	109680	13.40	1.98	0.62	0.86	4.06
09/25/18 18:02:24	109740	13.40	1.97	0.63	0.28	4.05
09/25/18 18:03:24	109800	13.41	1.96	0.61	0.55	4.05
09/25/18 18:04:24	109860	13.40	1.99	0.60	0.29	4.06
09/25/18 18:05:24	109920	13.40	2.01	0.60	0.50	4.06
09/25/18 18:06:24	109980	13.40	2.01	0.59	0.53	4.06
09/25/18 18:07:24	110040	13.41	1.99	0.66	0.56	4.05
09/25/18 18:08:24	110100	13.39	2.02	0.61	0.62	4.06
09/25/18 18:09:24	110160	13.39	2.11	0.62	0.77	4.05
09/25/18 18:10:24	110220	13.40	2.07	0.61	0.81	4.05
09/25/18 18:11:24	110280	13.40	2.00	0.59	1.05	4.05
09/25/18 18:12:24	110340	13.39	1.99	0.58	0.88	4.06
09/25/18 18:13:24	110400	13.40	2.01	0.63	0.71	4.06
09/25/18 18:14:24	110460	13.41	1.99	0.62	0.66	4.06
RAW AVERAGE		**13.40**	**2.02**	**0.61**	**1.33**	**4.05**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.09	-0.04	0.38	0.02	-0.04
Bias	**Final Zero**	0.10	0.11	0.32	-0.11	-0.03
Bias	**Avg. Zero**	0.10	0.04	0.35	-0.05	-0.04
Bias	**Initial UpScale**	11.97	5.58	5.87	3.00	8.82
Bias	**Final UpScale**	11.94	5.48	5.80	3.09	8.78
Bias	**Avg. UpScale**	11.96	5.53	5.84	3.05	8.80
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.44	2.00	0.27	1.46	4.13
Concentration (ppm@ 15%O_2)	N/A	1.58	0.22	1.15	N/A
Non-Bias Adjusted Averages Include:				*	

CH_4 (as CH_4)	C_2H_6 (as CH_4)	VOC (as CH_4)
2.00	0.10	0.00
N/A	N/A	0.00

Note: Reported at RDL

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,091,966	SCFH
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,091,966	SCFH

Weather Data

Barometric Pressure	29.66	in. Hg
Relative Humidity	98	%
Ambient Temperature	58	°F
Specific Humidity	0.010148	lb H_2O / lb air

Unit Data

Unit Load	205.5	megawatts
Meas. Stack Moisture	9.4	%
Stack Exhaust Flow (M19)	50,933,540	SCFH

Base Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 18:44:24	112260	13.38	1.99	0.57	2.57	4.05
09/25/18 18:45:24	112320	13.38	2.02	0.58	2.53	4.05
09/25/18 18:46:24	112380	13.38	2.01	0.61	2.46	4.05
09/25/18 18:47:24	112440	13.38	1.99	0.60	2.45	4.06
09/25/18 18:48:24	112500	13.39	1.97	0.57	2.47	4.06
09/25/18 18:49:24	112560	13.39	2.00	0.59	2.40	4.05
09/25/18 18:50:24	112620	13.39	2.03	0.56	2.43	4.05
09/25/18 18:51:24	112680	13.39	2.00	0.56	2.50	4.05
09/25/18 18:52:24	112740	13.38	1.98	0.59	2.64	4.05
09/25/18 18:53:24	112800	13.41	2.05	0.59	2.61	4.05
09/25/18 18:54:24	112860	13.37	1.99	0.61	2.58	4.05
09/25/18 18:55:24	112920	13.38	2.00	0.65	2.62	4.06
09/25/18 18:56:24	112980	13.39	2.03	0.63	2.57	4.05
09/25/18 18:57:24	113040	13.40	2.05	0.62	2.45	4.05
09/25/18 18:58:24	113100	13.39	2.01	0.61	2.39	4.06
09/25/18 18:59:24	113160	13.40	2.00	0.59	2.45	4.05
09/25/18 19:00:24	113220	13.39	2.04	0.62	2.38	4.05
09/25/18 19:01:24	113280	13.39	2.01	0.60	2.46	4.05
09/25/18 19:02:24	113340	13.39	2.02	0.59	2.63	4.06
09/25/18 19:03:24	113400	13.39	2.01	0.58	2.73	4.05
09/25/18 19:04:24	113460	13.38	2.13	0.56	2.91	4.06
09/25/18 19:05:24	113520	13.39	2.32	0.53	2.90	4.04
09/25/18 19:06:24	113580	13.39	2.19	0.53	2.72	4.05
09/25/18 19:07:24	113640	13.38	2.10	0.52	2.63	4.06
09/25/18 19:08:24	113700	13.38	2.05	0.50	2.58	4.06
09/25/18 19:09:24	113760	13.39	1.99	0.52	2.49	4.06
09/25/18 19:10:24	113820	13.39	2.02	0.52	2.56	4.06
09/25/18 19:11:24	113880	13.38	1.96	0.53	2.51	4.06
09/25/18 19:12:24	113940	13.38	1.97	0.55	2.69	4.06
09/25/18 19:13:24	114000	13.38	1.95	0.53	2.53	4.06
09/25/18 19:14:24	114060	13.39	2.01	0.55	2.46	4.06
09/25/18 19:15:24	114120	13.39	2.07	0.57	2.57	4.06
09/25/18 19:16:24	114180	13.39	2.07	0.55	2.69	4.06
09/25/18 19:17:24	114240	13.38	2.06	0.57	2.84	4.06
09/25/18 19:18:24	114300	13.39	2.10	0.56	3.11	4.06
09/25/18 19:19:24	114360	13.39	2.13	0.56	3.10	4.06
09/25/18 19:20:24	114420	13.39	2.02	0.57	2.96	4.05
09/25/18 19:21:24	114480	13.38	2.05	0.58	2.67	4.06
09/25/18 19:22:24	114540	13.38	2.04	0.60	2.39	4.06
09/25/18 19:23:24	114600	13.39	2.01	0.59	2.30	4.06
09/25/18 19:24:24	114660	13.38	1.97	0.61	2.31	4.06
09/25/18 19:25:24	114720	13.39	2.08	0.59	2.30	4.06
09/25/18 19:26:24	114780	13.39	2.11	0.60	2.23	4.06
09/25/18 19:27:24	114840	13.39	2.07	0.60	2.17	4.05
09/25/18 19:28:24	114900	13.39	2.08	0.60	2.25	4.06
09/25/18 19:29:24	114960	13.39	2.19	0.63	2.19	4.05
09/25/18 19:30:24	115020	13.39	2.14	0.59	2.12	4.05
09/25/18 19:31:24	115080	13.39	2.02	0.59	2.27	4.05
09/25/18 19:32:24	115140	13.39	2.11	0.58	2.24	4.06
09/25/18 19:33:24	115200	13.39	2.11	0.54	2.40	4.05
09/25/18 19:34:24	115260	13.39	2.06	0.59	2.48	4.05
09/25/18 19:35:24	115320	13.40	2.05	0.58	2.47	4.06
09/25/18 19:36:24	115380	13.39	2.04	0.59	2.49	4.06
09/25/18 19:37:24	115440	13.40	2.03	0.58	2.35	4.05
09/25/18 19:38:24	115500	13.38	2.00	0.60	2.33	4.05
09/25/18 19:39:24	115560	13.40	2.04	0.58	2.32	4.06
09/25/18 19:40:24	115620	13.39	2.00	0.57	2.51	4.06
09/25/18 19:41:24	115680	13.39	1.99	0.59	2.29	4.06
09/25/18 19:42:24	115740	13.39	1.99	0.57	2.16	4.05
09/25/18 19:43:24	115800	13.39	2.05	0.58	2.23	4.06
RAW AVERAGE		**13.39**	**2.04**	**0.58**	**2.50**	**4.05**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.10	0.11	0.32	-0.11	-0.03
	Final Zero	0.12	0.06	0.34	0.18	-0.03
	Avg. Zero	0.11	0.09	0.33	0.04	-0.03
	Initial UpScale	11.94	5.48	5.80	3.09	8.78
	Final UpScale	11.94	5.56	5.83	3.06	8.78
	Avg. UpScale	11.94	5.52	5.82	3.08	8.78
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.45	1.99	0.26	2.76	4.14
Concentration (ppm@ 15%O_2)	N/A	1.58	0.21	2.18	N/A

Non-Bias Adjusted Averages Include: *

CH_4 (as CH_4)	C_2H_6 (as CH_4)	VOC (as CH_4)
2.00	0.10	0.66
N/A	N/A	0.52

Note: Reported at RDL

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
NOx, CO, VOC, CO_2, and O_2 Data

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,129,501	SCFH
Duct Burner Fuel Flow	271	lb/min
Total Fuel Flow	2,512,210	SCFH

Weather Data

Barometric Pressure	29.78	in. Hg
Relative Humidity	97	%
Ambient Temperature	52	°F
Specific Humidity	0.008014	lb H_2O / lb air

Unit Data

Unit Load	210.7	megawatts
Meas. Stack Moisture	10.2	%
Stack Exhaust Flow (M19)	50,847,815	SCFH

100% W/Db Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 09:25:24	78720	12.01	2.44	0.62	1.81	4.92
09/25/18 09:26:24	78780	12.02	2.46	0.61	1.75	4.91
09/25/18 09:27:24	78840	12.04	2.40	0.62	1.71	4.91
09/25/18 09:28:24	78900	12.01	2.41	0.61	1.69	4.91
09/25/18 09:29:24	78960	12.01	2.50	0.62	1.65	4.91
09/25/18 09:30:24	79020	12.03	2.48	0.63	1.46	4.91
09/25/18 09:31:24	79080	12.00	2.54	0.62	1.50	4.92
09/25/18 09:32:24	79140	12.01	2.60	0.64	1.47	4.92
09/25/18 09:33:24	79200	12.02	2.44	0.62	1.62	4.92
09/25/18 09:34:24	79260	12.00	2.46	0.61	1.81	4.92
09/25/18 09:35:24	79320	12.02	2.47	0.62	1.86	4.91
09/25/18 09:36:24	79380	12.02	2.47	0.64	1.63	4.91
09/25/18 09:37:24	79440	12.00	2.43	0.61	1.78	4.92
09/25/18 09:38:24	79500	12.02	2.46	0.63	1.60	4.92
09/25/18 09:39:24	79560	12.00	2.39	0.64	1.64	4.91
09/25/18 09:40:24	79620	12.00	2.48	0.61	1.37	4.92
09/25/18 09:41:24	79680	12.01	2.52	0.60	1.60	4.91
09/25/18 09:42:24	79740	12.02	2.37	0.64	1.71	4.91
09/25/18 09:43:24	79800	12.00	2.36	0.59	1.73	4.91
09/25/18 09:44:24	79860	12.01	2.39	0.59	1.62	4.91
09/25/18 09:45:24	79920	12.02	2.38	0.59	1.67	4.91
09/25/18 09:46:24	79980	12.00	2.35	0.62	1.53	4.91
09/25/18 09:47:24	80040	12.02	2.39	0.64	1.87	4.91
09/25/18 09:48:24	80100	12.02	2.37	0.61	1.98	4.91
09/25/18 09:49:24	80160	12.00	2.34	0.61	1.73	4.91
09/25/18 09:50:24	80220	12.00	2.38	0.60	1.75	4.91
09/25/18 09:51:24	80280	12.00	2.44	0.61	1.78	4.91
09/25/18 09:52:24	80340	12.01	2.46	0.59	1.57	4.92
09/25/18 09:53:24	80400	12.01	2.49	0.60	1.47	4.91
09/25/18 09:54:24	80460	12.01	2.43	0.64	1.69	4.91
09/25/18 09:55:24	80520	12.02	2.48	0.62	1.76	4.91
09/25/18 09:56:24	80580	12.02	2.37	0.61	1.66	4.91
09/25/18 09:57:24	80640	12.01	2.44	0.63	1.38	4.91
09/25/18 09:58:24	80700	12.01	2.48	0.62	1.51	4.91
09/25/18 09:59:24	80760	12.02	2.47	0.59	1.65	4.91
09/25/18 10:00:24	80820	12.01	2.41	0.61	1.43	4.91
09/25/18 10:01:24	80880	12.00	2.45	0.60	1.49	4.91
09/25/18 10:02:24	80940	12.00	2.42	0.62	1.47	4.91
09/25/18 10:03:24	81000	12.00	2.39	0.60	1.41	4.92
09/25/18 10:04:24	81060	12.01	2.43	0.59	1.51	4.91
09/25/18 10:05:24	81120	12.00	2.46	0.59	1.53	4.91
09/25/18 10:06:24	81180	12.01	2.43	0.60	1.45	4.91
09/25/18 10:07:24	81240	12.02	2.47	0.60	1.43	4.90
09/25/18 10:08:24	81300	11.99	2.42	0.59	1.80	4.91
09/25/18 10:09:24	81360	12.00	2.43	0.62	1.81	4.91
09/25/18 10:10:24	81420	12.01	2.44	0.59	1.35	4.91
09/25/18 10:11:24	81480	11.99	2.52	0.61	1.55	4.92
09/25/18 10:12:24	81540	12.00	2.48	0.64	1.61	4.92
09/25/18 10:13:24	81600	12.02	2.44	0.58	1.80	4.91
09/25/18 10:14:24	81660	12.01	2.45	0.61	1.64	4.91
09/25/18 10:15:24	81720	12.00	2.45	0.61	1.59	4.91
09/25/18 10:16:24	81780	12.00	2.42	0.60	1.50	4.91
09/25/18 10:17:24	81840	12.01	2.43	0.61	1.38	4.91
09/25/18 10:18:24	81900	12.00	2.47	0.64	1.37	4.91
09/25/18 10:19:24	81960	12.01	2.44	0.66	1.76	4.91
09/25/18 10:20:24	82020	12.00	2.41	0.61	1.78	4.90
09/25/18 10:21:24	82080	12.00	2.43	0.62	1.78	4.91
09/25/18 10:22:24	82140	12.01	2.42	0.62	1.56	4.91
09/25/18 10:23:24	82200	12.00	2.50	0.61	1.76	4.91
09/25/18 10:24:24	82260	12.01	2.46	0.61	2.08	4.91
RAW AVERAGE		**12.01**	**2.44**	**0.61**	**1.63**	**4.91**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.09	0.00	0.07	0.01	-0.02
Bias	**Final Zero**	0.09	0.01	0.33	0.11	0.03
Bias	**Avg. Zero**	0.09	0.01	0.20	0.06	0.01
Bias	**Initial UpScale**	12.07	5.58	5.74	2.94	8.99
Bias	**Final UpScale**	12.04	5.51	5.79	2.98	8.92
Bias	**Avg. UpScale**	12.06	5.55	5.77	2.96	8.96
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	11.93	2.43	0.42	1.81	4.89
Concentration (ppm@ 15%O_2)	N/A	1.60	0.28	1.19	N/A
Non-Bias Adjusted Averages Include:				*	

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,119,978	SCFH
Duct Burner Fuel Flow	271	lb/min
Total Fuel Flow	2,502,922	SCFH

Weather Data

Barometric Pressure	29.78	in. Hg
Relative Humidity	97	%
Ambient Temperature	53	°F
Specific Humidity	0.008318	lb H_2O / lb air

Unit Data

Unit Load	209.5	megawatts
Meas. Stack Moisture	11.0	%
Stack Exhaust Flow (M19)	50,755,979	SCFH

100% W/Db Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 11:24:24	85860	11.99	2.48	0.61	2.77	4.90
09/25/18 11:25:24	85920	11.98	2.50	0.59	2.45	4.90
09/25/18 11:26:24	85980	11.99	2.54	0.61	2.57	4.90
09/25/18 11:27:24	86040	12.00	2.52	0.61	2.63	4.89
09/25/18 11:28:24	86100	11.99	2.50	0.65	3.03	4.90
09/25/18 11:29:24	86160	11.99	2.47	0.63	3.15	4.90
09/25/18 11:30:24	86220	12.00	2.49	0.58	3.07	4.90
09/25/18 11:31:24	86280	11.97	2.48	0.62	3.17	4.91
09/25/18 11:32:24	86340	11.99	2.49	0.61	3.25	4.90
09/25/18 11:33:24	86400	11.99	2.51	0.62	3.14	4.91
09/25/18 11:34:24	86460	11.98	2.51	0.61	2.98	4.91
09/25/18 11:35:24	86520	11.98	2.49	0.60	2.91	4.90
09/25/18 11:36:24	86580	12.00	2.51	0.63	2.88	4.90
09/25/18 11:37:24	86640	11.99	2.48	0.65	2.67	4.90
09/25/18 11:38:24	86700	11.99	2.52	0.58	2.71	4.90
09/25/18 11:39:24	86760	11.99	2.47	0.63	2.74	4.90
09/25/18 11:40:24	86820	12.00	2.55	0.63	2.43	4.90
09/25/18 11:41:24	86880	11.99	2.46	0.59	2.07	4.89
09/25/18 11:42:24	86940	11.99	2.47	0.59	2.34	4.90
09/25/18 11:43:24	87000	12.00	2.44	0.58	2.51	4.90
09/25/18 11:44:24	87060	11.99	2.52	0.60	2.53	4.90
09/25/18 11:45:24	87120	11.99	2.45	0.61	2.80	4.90
09/25/18 11:46:24	87180	11.98	2.51	0.58	2.78	4.90
09/25/18 11:47:24	87240	12.00	2.42	0.60	2.72	4.89
09/25/18 11:48:24	87300	11.99	2.44	0.61	2.57	4.91
09/25/18 11:49:24	87360	11.99	2.44	0.58	2.47	4.90
09/25/18 11:50:24	87420	11.99	2.51	0.62	2.52	4.93
09/25/18 11:51:24	87480	11.98	2.46	0.60	2.41	4.90
09/25/18 11:52:24	87540	12.00	2.56	0.59	2.38	4.90
09/25/18 11:53:24	87600	11.99	2.49	0.61	2.27	4.90
09/25/18 11:54:24	87660	11.98	2.51	0.61	1.97	4.90
09/25/18 11:55:24	87720	11.99	2.48	0.60	1.95	4.90
09/25/18 11:56:24	87780	11.98	2.50	0.62	1.95	4.90
09/25/18 11:57:24	87840	12.00	2.48	0.62	1.98	4.90
09/25/18 11:58:24	87900	11.98	2.48	0.60	2.00	4.90
09/25/18 11:59:24	87960	11.99	2.42	0.59	2.01	4.89
09/25/18 12:00:24	88020	11.99	2.41	0.58	2.21	4.90
09/25/18 12:01:24	88080	11.99	2.44	0.58	2.03	4.89
09/25/18 12:02:24	88140	11.99	2.41	0.60	2.00	4.89
09/25/18 12:03:24	88200	11.98	2.48	0.58	2.04	4.90
09/25/18 12:04:24	88260	11.98	2.48	0.58	1.80	4.90
09/25/18 12:05:24	88320	11.98	2.50	0.57	1.96	4.90
09/25/18 12:06:24	88380	11.98	2.48	0.55	1.91	4.90
09/25/18 12:07:24	88440	11.98	2.48	0.60	1.65	4.90
09/25/18 12:08:24	88500	11.99	2.43	0.56	1.86	4.89
09/25/18 12:09:24	88560	11.99	2.42	0.57	1.83	4.89
09/25/18 12:10:24	88620	11.99	2.43	0.58	1.74	4.90
09/25/18 12:11:24	88680	11.98	2.50	0.59	1.60	4.90
09/25/18 12:12:24	88740	11.98	2.57	0.58	1.70	4.89
09/25/18 12:13:24	88800	11.98	2.64	0.58	1.75	4.89
09/25/18 12:14:24	88860	11.98	2.48	0.59	1.62	4.90
09/25/18 12:15:24	88920	11.98	2.51	0.58	1.90	4.90
09/25/18 12:16:24	88980	12.00	2.53	0.57	1.89	4.89
09/25/18 12:17:24	89040	11.98	2.56	0.58	1.52	4.89
09/25/18 12:18:24	89100	11.97	2.52	0.56	1.67	4.90
09/25/18 12:19:24	89160	11.98	2.57	0.54	1.79	4.89
09/25/18 12:20:24	89220	11.97	2.48	0.55	1.76	4.89
09/25/18 12:21:24	89280	11.97	2.46	0.56	1.63	4.90
09/25/18 12:22:24	89340	11.98	2.47	0.56	1.43	4.90
09/25/18 12:23:24	89400	11.98	2.44	0.58	1.51	4.89
RAW AVERAGE		**11.99**	**2.49**	**0.59**	**2.26**	**4.90**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.09	0.01	0.33	0.11	0.03
	Final Zero	0.08	0.01	0.35	0.28	-0.03
	Avg. Zero	0.09	0.01	0.34	0.20	0.00
	Initial UpScale	12.04	5.51	5.79	2.98	8.92
	Final UpScale	11.99	5.48	5.80	2.72	8.86
	Avg. UpScale	12.02	5.50	5.80	2.85	8.89
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	11.95	2.50	0.27	2.54	4.92
Concentration (ppm@ 15%O_2)	N/A	1.65	0.18	1.67	N/A
Non-Bias Adjusted Averages Include:				*	

CPV Valley, LLC
September 25, 2018
Siemens, SCC6-5000F, Unit #CTG-2
CPV Valley Energy Center

Fuel Data

Fuel Fd factor	8,632	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,006	Btu/SCF fuel
Turbine Fuel Flow	2,109,939	SCFH
Duct Burner Fuel Flow	271	lb/min
Total Fuel Flow	2,493,119	SCFH

Weather Data

Barometric Pressure	29.75	in. Hg
Relative Humidity	97	%
Ambient Temperature	54	°F
Specific Humidity	0.008642	lb H_2O / lb air

Unit Data

Unit Load	208.6	megawatts
Meas. Stack Moisture	11.3	%
Stack Exhaust Flow (M19)	50,611,217	SCFH

100% W/Db Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)
09/25/18 12:57:24	91440	11.97	2.59	0.57	1.97	4.89
09/25/18 12:58:24	91500	11.97	2.49	0.59	2.03	4.89
09/25/18 12:59:24	91560	11.96	2.48	0.53	2.03	4.89
09/25/18 13:00:24	91620	11.97	2.56	0.55	1.88	4.89
09/25/18 13:01:24	91680	11.96	2.45	0.54	1.97	4.90
09/25/18 13:02:24	91740	11.97	2.51	0.56	1.87	4.89
09/25/18 13:03:24	91800	11.97	2.46	0.58	1.74	4.89
09/25/18 13:04:24	91860	11.98	2.49	0.56	1.76	4.89
09/25/18 13:05:24	91920	11.97	2.49	0.58	1.46	4.89
09/25/18 13:06:24	91980	11.95	2.52	0.56	1.62	4.90
09/25/18 13:07:24	92040	11.96	2.53	0.58	1.62	4.89
09/25/18 13:08:24	92100	11.95	2.56	0.57	1.59	4.89
09/25/18 13:09:24	92160	11.97	2.50	0.56	1.49	4.89
09/25/18 13:10:24	92220	11.97	2.60	0.56	1.42	4.89
09/25/18 13:11:24	92280	11.96	2.51	0.56	1.55	4.89
09/25/18 13:12:24	92340	11.97	2.55	0.56	1.65	4.88
09/25/18 13:13:24	92400	11.96	2.53	0.62	1.40	4.89
09/25/18 13:14:24	92460	11.96	2.59	0.58	1.55	4.88
09/25/18 13:15:24	92520	11.96	2.52	0.56	1.65	4.89
09/25/18 13:16:24	92580	11.96	2.49	0.58	1.42	4.89
09/25/18 13:17:24	92640	11.97	2.50	0.55	1.50	4.89
09/25/18 13:18:24	92700	11.95	2.53	0.56	1.57	4.89
09/25/18 13:19:24	92760	11.97	2.43	0.57	1.68	4.88
09/25/18 13:20:24	92820	11.97	2.47	0.57	1.40	4.89
09/25/18 13:21:24	92880	11.96	2.51	0.57	1.45	4.89
09/25/18 13:22:24	92940	11.95	2.49	0.56	1.55	4.89
09/25/18 13:23:24	93000	11.96	2.53	0.59	1.54	4.89
09/25/18 13:24:24	93060	11.95	2.49	0.57	1.62	4.88
09/25/18 13:25:24	93120	11.96	2.49	0.56	1.58	4.88
09/25/18 13:26:24	93180	11.96	2.52	0.60	1.49	4.88
09/25/18 13:27:24	93240	11.93	2.55	0.58	1.65	4.89
09/25/18 13:28:24	93300	11.94	2.51	0.56	1.55	4.88
09/25/18 13:29:24	93360	11.94	2.47	0.58	1.58	4.89
09/25/18 13:30:24	93420	11.96	2.50	0.62	1.59	4.89
09/25/18 13:31:24	93480	11.95	2.47	0.58	1.19	4.89
09/25/18 13:32:24	93540	11.95	2.47	0.57	1.18	4.89
09/25/18 13:33:24	93600	11.95	2.50	0.57	1.41	4.89
09/25/18 13:34:24	93660	11.95	2.47	0.59	1.47	4.88
09/25/18 13:35:24	93720	11.96	2.57	0.57	1.44	4.89
09/25/18 13:36:24	93780	11.95	2.44	0.54	1.52	4.89
09/25/18 13:37:24	93840	11.95	2.47	0.57	1.71	4.88
09/25/18 13:38:24	93900	11.97	2.52	0.60	1.52	4.88
09/25/18 13:39:24	93960	11.95	2.48	0.56	1.39	4.88
09/25/18 13:40:24	94020	11.94	2.50	0.57	1.67	4.89
09/25/18 13:41:24	94080	11.94	2.51	0.58	1.77	4.88
09/25/18 13:42:24	94140	11.96	2.50	0.56	1.36	4.88
09/25/18 13:43:24	94200	11.95	2.50	0.59	1.66	4.88
09/25/18 13:44:24	94260	11.95	2.41	0.57	1.66	4.88
09/25/18 13:45:24	94320	11.95	2.47	0.58	1.35	4.88
09/25/18 13:46:24	94380	11.95	2.48	0.61	1.54	4.89
09/25/18 13:47:24	94440	11.93	2.53	0.55	1.56	4.89
09/25/18 13:48:24	94500	11.95	2.50	0.56	1.59	4.88
09/25/18 13:49:24	94560	11.95	2.47	0.55	1.57	4.89
09/25/18 13:50:24	94620	11.94	2.52	0.55	1.18	4.89
09/25/18 13:51:24	94680	11.96	2.48	0.63	1.06	4.88
09/25/18 13:52:24	94740	11.96	2.50	0.58	1.47	4.88
09/25/18 13:53:24	94800	11.96	2.47	0.60	1.62	4.87
09/25/18 13:54:24	94860	11.94	2.49	0.59	1.78	4.88
09/25/18 13:55:24	94920	11.96	2.51	0.56	1.69	4.88
09/25/18 13:56:24	94980	11.95	2.49	0.60	1.43	4.89
RAW AVERAGE		**11.96**	**2.50**	**0.57**	**1.57**	**4.89**

		O_2	NOx	CO	THC	CO_2
	Serial Number:	INST-O2-0017	INST-NX-0043	INST-CO-0018	INST-TH-0009	INST-C2-0018
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Bias	**Initial Zero**	0.08	0.01	0.35	0.28	-0.03
Bias	**Final Zero**	0.05	-0.03	0.32	0.12	-0.04
Bias	**Avg. Zero**	0.07	-0.01	0.34	0.20	-0.04
Bias	**Initial UpScale**	11.99	5.48	5.80	2.72	8.86
Bias	**Final UpScale**	11.96	5.51	5.81	2.89	8.80
Bias	**Avg. UpScale**	11.98	5.50	5.81	2.81	8.83
Upscale Cal Gas		11.98	5.53	5.73	3.08	8.92

EMISSIONS DATA	O_2	NOx	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	11.96	2.52	0.25	1.77	4.95
Concentration (ppm@ 15%O_2)	N/A	1.67	0.16	1.17	N/A
Non-Bias Adjusted Averages Include:				*	

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
Opacity Data

Method Used (Circle One)
Method 9 203A 203B Other: ______

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY Zip: 10940

Process	Unit # CTG-2	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

Describe Emissions Point

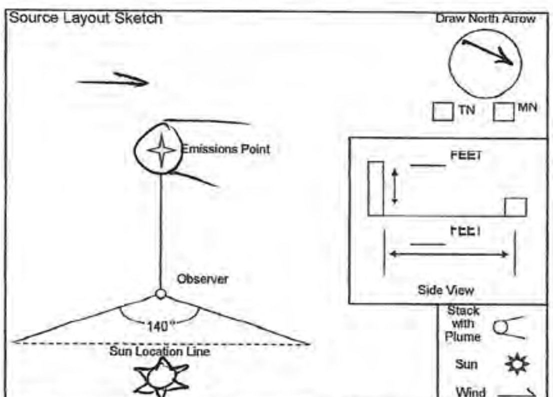
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start Clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start cloudy End cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 10mph End 12mph	Wind Direction Start ESE End E
Ambient Temp. Start 60°F End 61°F	Wet Bulb Temp. RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4161	-74.4362	

Additional Information

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 1 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/24/18		11:15am	12:15pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)			
Method 9	203A	203B	Other:

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 2 of 2
Continued on Form Number (AHI Project Code)	

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-2	Base Load
Control Equipment		Operating Mode: Base Load

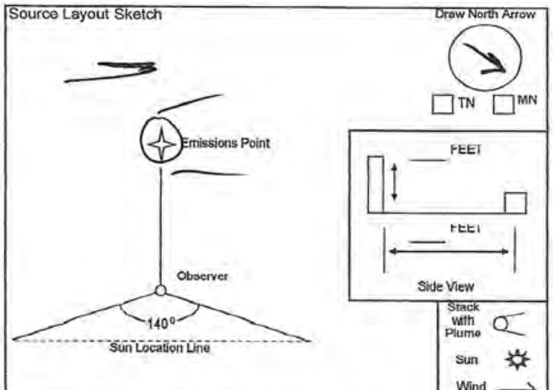
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start Cloudy End Cloudy		
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken	
Wind Speed Start End	Wind Direction Start ESE End E	
Ambient Temp. Start 60°F End 61°F	Wet Bulb Temp.	RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4161	-74.4362	

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/24/18		11:15am	12:15pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)
Method 9 | 203A | 203B | Other: ________

VISUAL EMISSIONS OBSERVATION FORM

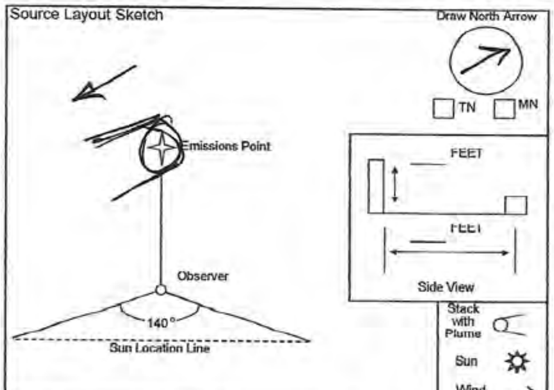
Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit # CTG-2	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End
Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none
Describe Plume Background Start cloudy End cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 11 mph	Wind Direction Start ENE End E
Ambient Temp. Start 61° F End 62° F	Wet Bulb Temp.	RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 1 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/24/18		12:30 pm	1:30 pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)
Method 9 203A 203B Other: ________

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

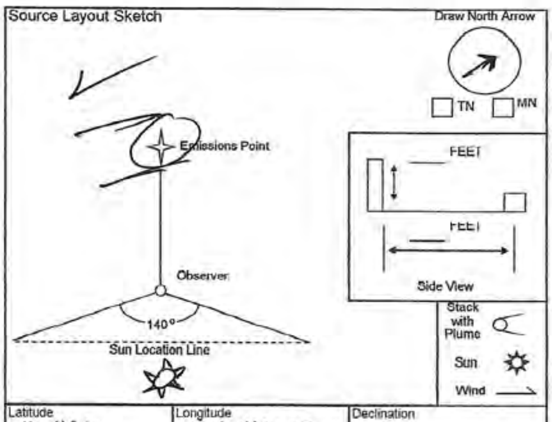
Process	Unit #: CTG-2	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

Describe Emissions Point

Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End
Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start Clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none
Describe Plume Background Start cloudy End Cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 11 mph	Wind Direction Start ENE End E
Ambient Temp. Start 61°F End 62°F	Wet Bulb Temp. RH Percent 72%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code) sie-18-middletown.ny-start#1 — Page 2 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
		12:30pm	1:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 09/24/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date 07/06/18

Method Used (Circle One)			
Method 9	203A	203B	Other:

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code)	Page 1 of 2
sie-18-middletown,ny-start#1	
Continued on Form Number (AHI Project Code)	

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY / Zip: 10940

Process	Unit #	Operating Mode
	CTG-2	Base Load
Control Equipment		Operating Mode: Base Load

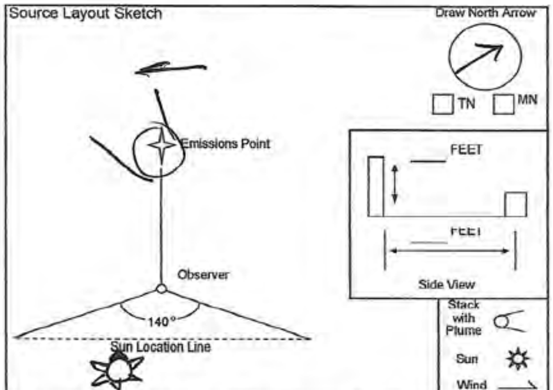
Describe Emissions Point	
Height of Emiss. Pt. Start / End	Height of Emiss. Pt. Rel. to Observer Start / End
Distance to Emiss. Pt. Start / End	Direction to Emiss. Pt. (Degrees) Start / End

Vetical Angle to Obs. Pt. Start / End	Direction to Obs. Pt. (Degrees) Start / End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start Clear	End Clear
Emission Color Start Clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start cloudy	End cloudy
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 10 mph	Wind Direction Start E End E
Ambient Temp. Start 61°F End 61°F	Wet Bulb Temp. / RH Percent 74%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/24/18		1:45pm	2:45pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)	Axel Garrido-Martinez
Observer's Signature	Date 9/24/18
Organization	Air Hygiene International, Inc.
Certified By: Compliance Assurance Associates, Inc.	Date 7/06/18

Method Used (Circle One)
Method 9 203A 203B Other: ____

Company Name	CPV Valley LLC	
Facility Name	CPV Valley Energy Center	
Street Address	3330 US Route 6	
City: Middletown	State: NY	Zip: 10940

Process	Unit # CTG-2	Operating Mode: Base Load
Control Equipment		Operating Mode: Base Load

Describe Emissions Point

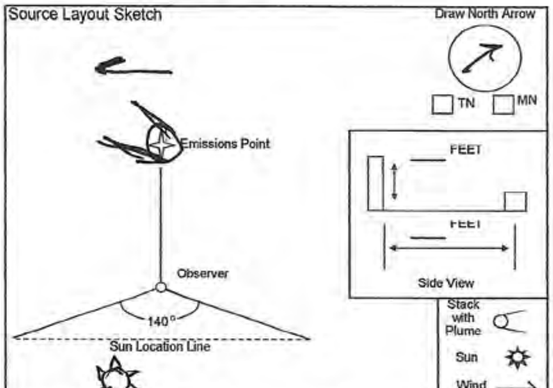
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start Clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start none End none

Describe Plume Background Start Cloudy End cloudy	
Background Color Start white/gray End white/gray	Sky Conditions Start Broken End Broken
Wind Speed Start 11 mph End 10mph	Wind Direction Start E End E
Ambient Temp. Start 61°F End 61°F	Wet Bulb Temp. RH Percent 74%

Source Layout Sketch



Latitude	Longitude	Declination
41.4068	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code)	Page 2 of 2
sie-18-middletown.ny-start#1	
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/24/18		1:45pm	2:45pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garridor Martinez	
Observer's Signature	Date 9/24/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 7/06/18

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
Opacity Data

Method Used (Circle One)
Method 9 | 203A | 203B | Other: ________

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 1 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/25/18		3:30pm	4:30pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6

City	State	Zip
Middletown	NY	10940

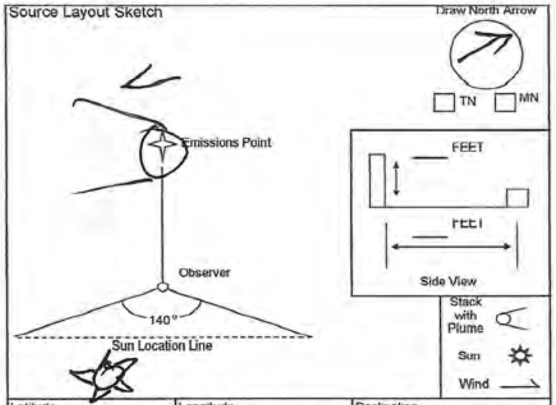
Process	Unit #	Operating Mode
	CTG-2	100% w/ DB
Control Equipment		Operating Mode 100% w/ DB

Describe Emissions Point

Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End
Vatical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached
Describe Plume Background Start gray clouds End gray clouds	
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 3 mph End 3 mph	Wind Direction Start NNE End NE
Ambient Temp. Start 58°F End 58°F	Wet Bulb Temp. RH Percent 97%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 9/25/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 7/6/18

Method Used (Circle One)
Method 9 203A 203B Other: ________

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1
Page 2 of 2

Continued on Form Number (AHI Project Code):

Observation Date	Time Zone	Start Time	End Time
9/25/18		3:30pm	4:30pm

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City	Middletown
State	NY
Zip	10940

Process	Unit #	Operating Mode
	CTG-2	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

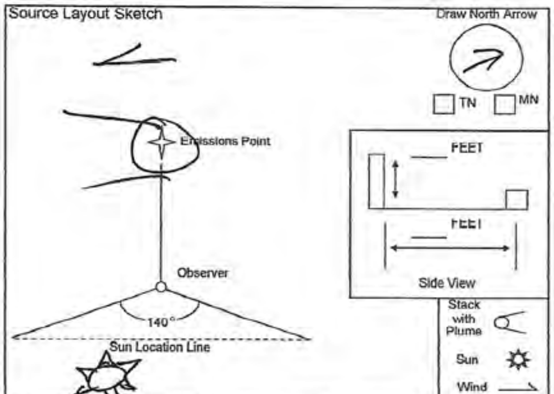
Describe Emissions Point:

Height of Emiss. Pt. Start End — Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End — Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End — Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start End

	Start	End
Describe Emissions	clear	clear
Emission Color	clear	clear
Water Droplet Plume	detached	detached
Describe Plume Background	gray clouds	gray clouds
Background Color	gray	gray
Sky Conditions	overcast	overcast
Wind Speed	3mph	3mph
Wind Direction	NNE	NE
Ambient Temp.	58°F	58°F
Wet Bulb Temp.		
RH Percent	97%	

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information:

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez
Observer's Signature: [signature] Date: 9/25/18
Organization: Air Hygiene International, Inc.
Certified By: Compliance Assurance Associates, Inc. Date: 7/6/18

Method Used (Circle One)
Method 9 | 203A | 203B | Other: ______

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY — Zip: 10940

Process	Unit # CTG-2	Operating Mode 100% w/ DB
Control Equipment		Operating Mode 100% w/ DB

Describe Emissions Point

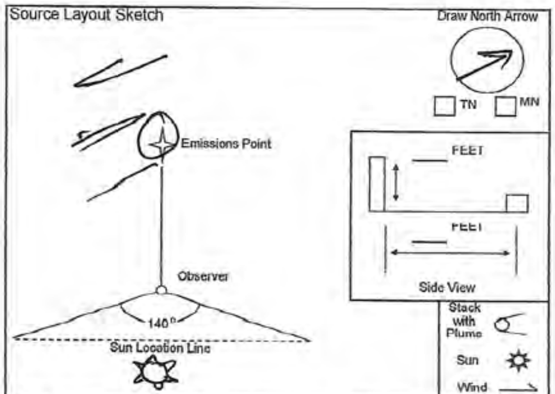
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start Clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds	
Background Color Start grey End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 4mph End 4mph	Wind Direction Start NNE End N
Ambient Temp. Start 56°F End 56°F	Wet Bulb Temp. — RH Percent 100%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 — Page 1 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		1:00pm	2:00pm

Min \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0		
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature	Date 9/25/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 7/6/18

Method Used (Circle One)			
Method 9	203A	203B	Other:

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code)	sie-18-middletown.ny-start#1
Page	2 of 2
Continued on Form Number (AHI Project Code)	

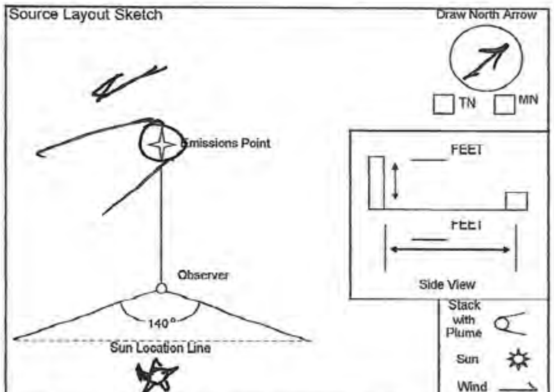
Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City	Middletown
State	NY
Zip	10940

Process	
Unit #	CTG-2
Operating Mode	100% w/ DB
Control Equipment	
Operating Mode	100% w/ DB

Describe Emissions Point	
Height of Emiss. Pt. Start	End
Height of Emiss. Pt. Rel. to Observer Start	End
Distance to Emiss. Pt. Start	End
Direction to Emiss. Pt. (Degrees) Start	End
Vetical Angle to Obs. Pt. Start	End
Direction to Obs. Pt. (Degrees) Start	End
Distance and Direction to Observation Point from Emission Point Start	End

	Start	End
Describe Emissions	clear	clear
Emission Color	clear	clear
Water Droplet Plume	detached	detached
Describe Plume Background	gray clouds	gray clouds
Background Color	gray	gray
Sky Conditions	overcast	overcast
Wind Speed	4mph	4mph
Wind Direction	NNE	N
Ambient Temp.	56°F	56°F
Wet Bulb Temp.		
RH Percent	100%	

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/25/18		1:00pm	2:00pm

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)	Axel Garrido-Martinez
Observer's Signature	[signature]
Date	9/25/18
Organization	Air Hygiene International, Inc.
Certified By	Compliance Assurance Associates, Inc.
Date	7/6/18

Method Used (Circle One)
Method 9 203A 203B Other: ________

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY	Zip: 10940

Process	Unit #	Operating Mode
	CTG-2	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

Describe Emissions Point

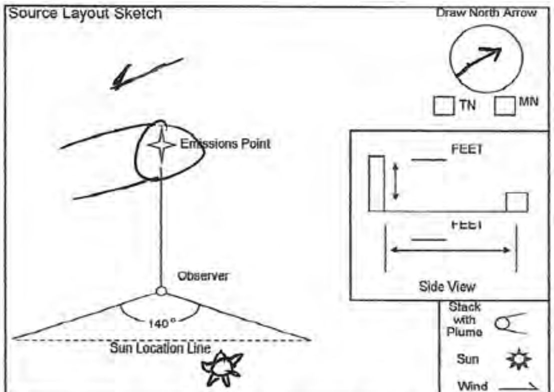
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start Clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds	End gray clouds
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 9 mph End 9 mh	Wind Direction Start NNE End NE
Ambient Temp. Start 51°F End 51°F	Wet Bulb Temp. RH Percent 95%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number (AHI Project Code): sie-18-middletown.ny-start#1 Page 1 of 2

Continued on Form Number (AHI Project Code)

Observation Date	Time Zone	Start Time	End Time
9/25/18		8:30am	9:30am

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Axel Garrido-Martinez	
Observer's Signature: [signature]	Date: 9/25/18
Organization: Air Hygiene International, Inc.	
Certified By: Compliance Assurance Associates, Inc.	Date: 7/06/18

Method Used (Circle One)
Method 9 203A 203B Other: ______

VISUAL EMISSIONS OBSERVATION FORM

Company Name	CPV Valley LLC
Facility Name	CPV Valley Energy Center
Street Address	3330 US Route 6
City: Middletown	State: NY Zip: 10940

Process	Unit #	Operating Mode
	CTG-2	100% w/ DB
Control Equipment		Operating Mode: 100% w/ DB

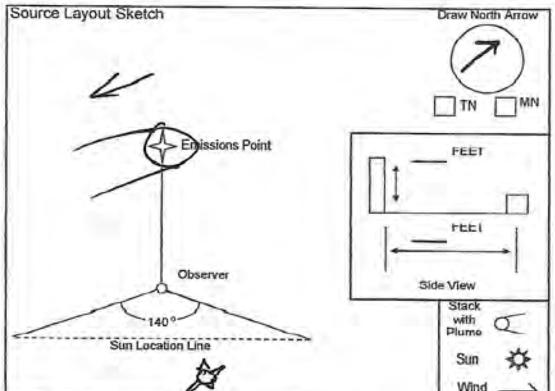
Describe Emissions Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vetical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start	End

Describe Emissions Start clear	End clear
Emission Color Start clear End clear	Water Droplet Plume Start detached End detached

Describe Plume Background Start gray clouds End gray clouds	
Background Color Start gray End gray	Sky Conditions Start overcast End overcast
Wind Speed Start 9mph End 9mph	Wind Direction Start NNE End NE
Ambient Temp. Start 51°F End 51°F	Wet Bulb Temp. RH Percent 95%

Source Layout Sketch



Latitude	Longitude	Declination
41.4069	-74.4305	

Additional Information

Form Number (AHI Project Code) sie-18-middletown.ny-start#1	Page 2 of 2
Continued on Form Number (AHI Project Code)	

Observation Date	Time Zone	Start Time	End Time
9/25/18		8:30am	9:30am

Min. \ Sec.	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) Axel Garrido-Martinez	
Observer's Signature [signature]	Date 9/25/18
Organization Air Hygiene International, Inc.	
Certified By Compliance Assurance Associates, Inc.	Date 7/6/18

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
PM Data

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Historical Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Run Start Time	19:14	23:30	04:17		hh:mm	
Run Stop Time	23:24	03:57	08:32		hh:mm	
Test Date	10/10/18	10/10/18	10/11/18		mm/dd/yy	
Meter Calibration Factor	0.984	0.995	0.984			
Pitot Tube Coefficient	0.7240	0.7720	0.7240			
Average Nozzle Diameter	0.156	0.156	0.156		in	
Stack Test Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	809.830	545.710	903.850		ft^3	
Final Meter Volume	896.960	641.330	995.000		ft^3	
Total Meter Volume	87.130	95.620	91.150	91.300	ft^3	
Total Sampling Time	237.75	258.00	241.25	245.67	min	
Average Meter Temperature	77.25	73.50	75.42	75.39	°F	
Average Stack Temperature	197.83	197.58	208.42	201.28	°F	
Barometric Pressure	29.40	29.39	29.40	29.40	in Hg	
Stack Static Pressure	-0.88	-0.88	-0.88	-0.88	in H_2O	
Absolute Stack Pressure	29.34	29.33	29.34	29.33	in Hg	
Average Orifice Pressure Drop	0.44	0.43	0.44	0.44	in H_2O	
Absolute Meter Pressure	29.53	29.52	29.53	29.53	in Hg	
Avg Square Root Pitot Pressure	1.13	1.12	1.14	1.13	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	172.40	191.30	180.40	181.37	g	
Silica Gel Weight Gain	18.10	23.20	21.60	20.97	g	
Total Water Volume Collected	190.84	214.89	202.36	202.70	ml	
Standard Water Vapor Volume	8.98	10.11	9.52	9.54	scf	
Standard Meter Volume	82.9	92.6	87.0	87.5	dscf	
Standard Metric Meter Volume	2.3	2.6	2.5	2.5	dscm	
Calculated Stack Moisture	9.78	9.85	9.87	9.83	%	
Saturated Stack Moisture	76.38	76.01	94.90	82.43	%	
Reported Stack Moisture Content	9.78	9.85	9.87	9.83	%	
Gas Analysis Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.5	4.5	4.5	4.5	%	
Oxygen Content	13.4	13.4	13.4	13.4	%	
Carbon Monoxide Content	0.0	0.0	0.0	0.0	ppm	
Nitrogen Content	82.1	82.1	82.1	82.1	%	
Stack Dry Molecular Weight	29.26	29.26	29.26	29.26	lb/lb-mole	
Stack Wet Molecular Weight	28.16	28.15	28.15	28.15	lb/lb-mole	
Calculated Fuel Factor	1.667	1.667	1.667	1.667		
Fuel F-Factor	8710.00	8710.00	8710.00	8710.00	dscf/MMBtu	
Percent Excess Air	161.9	161.9	161.9	161.9	%	

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Volumetric Flow Rate Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	62.49	65.80	63.26	63.85	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	
Actual Stack Flow Rate	1,063,069	1,119,451	1,076,097	1,086,205	acfm	
Wet Standard Stack Flow Rate	50,195	52,859	50,006	51,020	wkscfh	
Dry Standard Stack Flow Rate	45,287,271	47,654,049	45,071,742	46,004,354	dscfh	
Percent of Isokinetic Rate	98.8	96.7	102.7	99.4	%	
Emission Rate Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Total $PM_{10}/PM_{2.5}$ Mass	2.96	2.15	2.30	2.47	mg	--
Total $PM_{10}/PM_{2.5}$ Concentration	3.58E-05	2.32E-05	2.64E-05	2.85E-05	g/dscf	--
	5.52E-04	3.59E-04	4.08E-04	4.39E-04	gr/dscf	--
Total $PM_{10}/PM_{2.5}$ Emission Rate	1.62	1.11	1.19	1.31	kg/hr	--
	3.57	2.44	2.63	2.88	lb/hr	--
	15.63	10.69	11.50	12.61	tpy	--
	0.0019	0.0012	0.0014	0.0015	lb/MMBtu	0.0073
Filterable PM_{10} Mass	0.14	0.18	0.40	0.24	mg	--
Filterable PM_{10} Concentration	1.68E-06	1.93E-06	4.58E-06	2.73E-06	g/dscf	--
	2.59E-05	2.98E-05	7.07E-05	4.21E-05	gr/dscf	--
Filterable PM_{10} Emission Rate	0.08	0.09	0.21	0.12	kg/hr	--
	0.17	0.20	0.46	0.28	lb/hr	--
	0.73	0.89	1.99	1.21	tpy	--
	0.0001	0.0001	0.0002	0.0001	lb/MMBtu	--
Filterable $PM_{2.5}$ Mass	0.52	0.57	0.70	0.60	mg	--
Filterable $PM_{2.5}$ Concentration	6.33E-06	6.18E-06	8.06E-06	6.86E-06	g/dscf	--
	9.76E-05	9.54E-05	1.24E-04	1.06E-04	gr/dscf	--
Filterable $PM_{2.5}$ Emission Rate	0.29	0.29	0.36	0.31	kg/hr	--
	0.63	0.65	0.80	0.69	lb/hr	--
	2.77	2.85	3.51	3.04	tpy	--
	0.0003	0.0003	0.0004	0.0004	lb/MMBtu	--
Condensable $PM_{2.5}$ Mass	2.30	1.40	1.20	1.63	mg	--
Condensable $PM_{2.5}$ Concentration	2.77E-05	1.51E-05	1.38E-05	1.89E-05	g/dscf	--
	4.28E-04	2.33E-04	2.13E-04	2.91E-04	gr/dscf	--
Condensable $PM_{2.5}$ Emission Rate	1.26	0.72	0.62	0.87	kg/hr	--
	2.77	1.59	1.37	1.91	lb/hr	--
	12.13	6.96	6.00	8.36	tpy	--
	0.0015	0.0008	0.0007	0.0010	lb/MMBtu	--
RM 201A Quality Control	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Cyclone Flow Rate	0.49	0.51	0.52	0.50	ft³/min	
Stack Viscosity	202.69	202.56	205.11	203.45	μP	
Cunningham Correction Factor	1.08	1.08	1.08	1.08		
Recalculated D50-1 for CIV	2.43	2.35	2.35	2.38		
Recalculated Cunninham	1.08	1.08	1.08	1.08		
Lower Limit Cut Diameter, CI (NRE<3162), D50LL	2.43	2.35	2.35	2.38		
Reynolds Number	2628.00	2708.37	2688.24	2,674.87		
Z	1.00	1.00	1.00	1.00		
No. Sampling Pts. Outside Dp	0	0	0	0	points	

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#4	
Operator		MS	
Date for Preliminary Run	(mm/dd/yy)	10/10/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	50	scf
Run Duration	chk Subpart	240	minutes
Unit Number		CTG-2	
Base Run Number		2-Base-PM	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	10/10/18	10/10/18	10/11/18	
Fuel F-Factor		8710.00	8710.00	8710.00	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0030	samp-cp-0032	samp-cp-0030	
Meter Calibration Factor	(Y)	0.984	0.995	0.984	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.812	1.825	1.812	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	4187/10	P-980/10	4187/10	
Pitot Tube Coefficient	(C_p)	0.7240	0.7720	0.7240	
Nozzle Number	from ACS	3	3	3	must match cyc nozz tab (e.g. 3, 4, etc.)
Nozzle Diameter	(D_n)	0.156	0.156	0.156	in
Probe Number	from ACS	samp-hp-0155	samp-hp-0149	samp-hp-0155	
Probe Length		96.0	96.0	96.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-bh-0029	samp-bh-0029	samp-bh-0029	
Impinger Case Number	from ACS	samp-cc-0014	samp-cc-0014	samp-cc-0014	

Note: no fuel analysis available, utilizing EPA Method 19 F-Factor

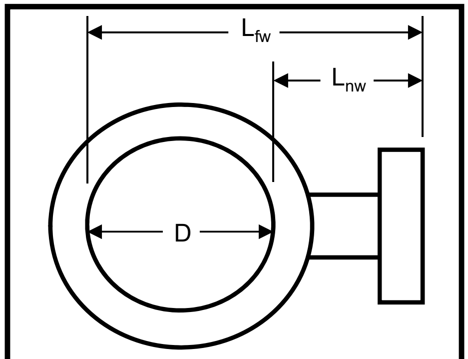
Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Michael Stockwell
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

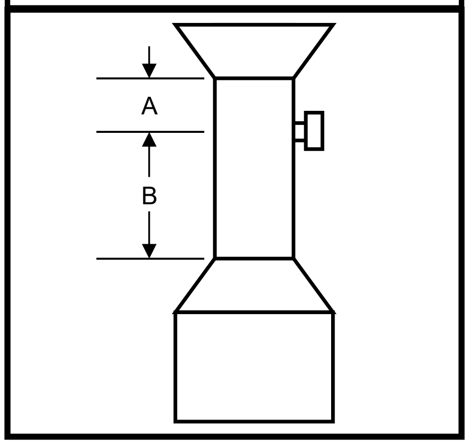
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	CPV Valley Energy Center	**Date**	10/10/18
Sampling Location	CTG-2 Stack	**Stack Type**	Circular
Operator	MS	**Ports Available**	4
Project #	sie-18-middletown.ny-start#4	**Ports Used**	4
Stack Size	Large (>24 inch diameter)	**Port ID (inches)**	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	235.25	in
Distance to Near Wall of Stack	(L_{nw})	7.25	in
Diameter of Stack	(D)	228.00	in
Area of Stack	(A_s)	283.53	ft²



Distance from Port to Disturbances			
Distance Upstream	(A)	1200.00	in
Diameters Upstream	(A_D)	5.26	diameters
Distance Downstream	(B)	1095.00	in
Diameters Downstream	(B_D)	4.80	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		**Minimum Number of Traverse Points**[1]	
Down Stream	**Up Stream**	**Particulate Points**	**Velocity Points**
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		12	12
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

○ Method 1 Trav
◉ 12 Point PM Trav
○ Velocity

Number of Traverse Points Used			
4	**Ports by**	3	**Across**
12	**Pts Used**	12	**Required**

Location of Traverse Points in Circular Stacks									
Traverse	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Point	Number of Traverse Points Across the Stack								
Number	2	4	6	8	10	12	14	16	18
1	.146	.067	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764

Traverse Point Locations			
Traverse Point Number	**Fraction of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
		in	in
1	0.044	10	17 2/8
2	0.146	33 2/8	40 4/8
3	0.296	67 4/8	74 6/8
4			
5			
6			
7			
8			
9			

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	CPV Valley Energy Center		
Sampling Location	CTG-2 Stack		
Operator	MS		
Project #	sie-18-middletown.ny-start#4		
Pitot Leak Check	x	**PreTest**	x	**PostTest**

Preliminary Run Date	10/10/18		
Stack Type	Circular		
Ports Available	4		
Thermocouple ID	samp-hp-0155		
Pitot Coefficient	0.7720	**Pitot Identification**	P-980/10

Stack Dimensions			
Area of Stack	(A_s)	283.53	ft²
Diameter of Stack	(D)	228.00	in

Pressures			
Barometric Pressure	(P_b)	29.45	in Hg
Static Pressure	(P_{static})	-0.88	in H_2O
Absolute Stack Pressure	(P_s)	29.39	in Hg

Stack Gas Composition			
Composition Data:	**Estimated Composition**		
Carbon Dioxide Concentration	(%CO_2)	4.50	%vd
Oxygen Concentration	(%O_2)	13.40	%vd
Carbon Monoxide Concentration	(ppmCO)	0.00	ppmvd
Nitrogen Concentration	(%N_2)	82.10	%vd
Stack Moisture Content	(B_{ws})	10.00	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Stack Wet Molecular Weight	(M_w)	28.13	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	60.20	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	43,901,743	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	731,696	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	1,024,153	acf/min
Avg Stack Wet Std Flow Rate	(Q_{sw})	48,779,714	ascf/hr

40 CFR 60, Method 2G, Section 8.11.1 (but applies to all Method 2 type static pressure measurements):
If a Type S probe is used for this measurement, position the probe at or between any traverse point(s) and rotate the probe until a null differential pressure reading is obtained. Disconnect the tubing from one of the pressure ports; read and record the ΔP. For pressure devices with one-directional scales, if a deflection in the positive direction is noted with the negative side disconnected, then the static pressure is positive. Likewise, if a deflection in the positive direction is noted with the positive side disconnected, then the static pressure is negative.

Stack Cross Section Schematic

Velocity Traverse Data					
Run Number	2-Base-PM-V1				
Run Time	18:00	**Start**	18:12	**End**	
Traverse Point	**Velocity Head** (Δp)	**Null Angle** (N_a)	**Zero Deg Pressure** ($0^o{}_a$)	**Stack Temp** (t_s)	**Local Velocity** ($v_{s(l)}$)
	in H_2O	deg	in H_2O	°F	ft/sec
A-1	1.40	0	0.00	193	69.41
A-2	1.30	0	0.00	194	66.93
A-3	1.20	0	0.00	194	64.31
B-1	1.20	5	0.05	191	64.16
B-2	1.20	0	0.00	193	64.26
B-3	1.20	0	0.00	193	64.26
C-1	1.00	0	0.00	194	58.70
C-2	1.00	5	-0.04	194	58.70
C-3	1.10	0	0.00	193	61.52
D-1	1.20	0	0.00	193	64.26
D-2	1.30	0	0.00	193	66.88
D-3	1.30	0	0.00	194	66.93
Average	1.20	1		193	
	1.09	= Square roots of Δp			
Standard deviation of null angles =				1.9	

METHOD 201A and OTM 27 - DETERMINATION OF NOZZLE SIZE AND POST RUN QUALITY CONTROL

Gas Analysis	Prelim	2-Base-PM-1	2-Base-PM-2	2-Base-PM-3	2-Base-PM-4	2-Base-PM-5	2-Base-PM-6	
Carbon Dioxide Content	4.5	4.5	4.5	4.5				%
Oxygen Content	13.4	13.4	13.4	13.4				%
Stack Moisture Content	10.0	9.8	9.8	9.9				%
Nitrogen plus CO Content	82.1	82.1	82.1	82.1				%

Corrected Velocity Head, $\Delta p_{2.5}$ (in H_2O)	Min.	1.14	Max.	1.59

Stack and Equipment Information	Prelim	2-Base-PM-1	2-Base-PM-2	2-Base-PM-3	2-Base-PM-4	2-Base-PM-5	2-Base-PM-6	
Barometric Pressure	29.45	29.40	29.39	29.40				in Hg
Stack Static Pressure	-0.88	-0.88	-0.88	-0.88				in H_2O
Absolute Stack Pressure	29.39	29.34	29.33	29.34				in Hg
Average Stack Temp	193	198	198	208				0.00
Average Stack Temp	653	658	658	668				°R
Average Meter Temp	85	77	74	75				0.00
Orifice Meter Coefficient	1.812	1.812	1.825	1.812				in H_2O
Pitot Coefficient	0.724	0.724	0.772	0.724				
Stack Dry Molecular Weight	29.26	29.26	29.26	29.26				lb/lb mole
Stack Wet Molecular Weight	28.13	28.16	28.15	28.15				lb/lb mole
Stack Viscosity	201.39	202.69	202.56	205.11				μP
Cunningham Correction Factor, for a 2.25 μm particle	1.08							
Cunningham Correction Factor, for a 2.5 μm particle		1.08	1.08	1.08				
Prelim Cut Dia., Cyclone I, D_{50LL}, N_{re}<3162	10.21	2.43	2.35	2.35				μm
Middle Zone Dia., Cyclone I, D_{50T}, N_{re}<3162	10.60							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.), N_{re}<3162	0.49							dscfm
Reynolds Number, Cyc I & IV, N_{re}<3162	2664.15	2628.00	2708.37	2688.24				
Dia. of 50% Prob. (D_{50}) Cyc IV (N_{re}<3162)	2.40	2.44	2.35	2.35				μm
Sampling Rate, Cyc IV, N_{re}<3,162	0.49							dscfm
Reynolds Number, Cyc IV, N_{re}<3162	2664.11	2628.00	2708.37	2688.24				
Prelim Cut Dia., Cyclone I, $D_{50LL\geq3162}$	10.61							μm
Middle Zone Dia., Cyclone I, $D_{50T\geq3162}$	10.80							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.)≥3162	0.48							dscfm
Reynolds Number, Cyc I & IV, N_{re}≥3162	2594.68							
Dia. of 50% Prob. (D_{50}) CIV (N_{re}≥3162)	2.30							μm
Sampling Rate, Cyc IV, N_{re}≥3,162	4.78							dscfm
Reynolds Number ≥ 3162	25946.95							
Cyclone Flow Rate	0.49	0.49	0.51	0.52				ft³/min
Recalculated D_{50-1} for C_{IV}		2.43	2.35	2.35				
Recalculated Cunninham		1.08	1.08	1.08				
Z		1.00	1.00	1.00				
Isokinetics		98.81	96.72	102.75				%
No. Sampling Pts. Outside Δp		0	0	0				
Sample Nozzle Diameter		0.156	0.156	0.156				in

Orifice Head and Nozzle Selection Calculation

Nozzle No.	0	1	2	3	4	5	6	7	8	9	10
Nozzle diameter, D_n, in.	0.113	0.128	0.134	0.156	0.175	0.193	0.209	0.229	0.264	0.296	0.339
Nozzle velocity, v_n, ft/sec	117.44	91.53	83.52	61.62	48.97	40.26	34.33	28.60	21.52	17.12	13.05
R_{min}	0.77	0.76	0.75	0.73	0.69	0.65	0.60	0.50	0.50	0.50	0.50
v_{min}, ft/sec	90.82	69.63	63.03	44.77	33.93	26.17	20.56	14.43	10.76	8.56	6.52
R_{max}	1.22	1.23	1.23	1.25	1.27	1.29	1.31	1.35	1.41	1.49	1.50
v_{max}, ft/sec	143.15	112.34	102.83	76.95	62.09	51.93	45.06	38.47	30.42	25.48	19.57
Δp_{min}, in. H_2O @ $t_{s-50}$$^oF$	2.95	1.73	1.42	0.72	0.41	0.24	0.15	0.07	0.04	0.03	0.02
Δp_{min}, in. H_2O @ t_s	2.72	1.60	1.31	0.66	0.38	0.23	0.14	0.07	0.04	0.02	0.01
Δp_{max}, in. H_2O @ t_s	6.77	4.17	3.49	1.96	1.27	0.89	0.67	0.49	0.31	0.21	0.13
Δp_{min}, in. H_2O @ $t_{s+50}$$^oF$	6.29	3.87	3.25	1.82	1.18	0.83	0.62	0.45	0.28	0.20	0.12
ΔH, in. H_2O @ t_s+50°F	0.362										
ΔH, in. H_2O @ t_s	**0.419**										
ΔH, in. H_2O @ t_s-50°F	0.492										

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	10/10/18		
Sampling Location	CTG-2 Stack	**Operator**	MS		
Project #	sie-18-middletown.ny-start#4	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	2-Base-PM-1		**Date**	10/10/18	**Run Start Time**	19:14	**Run Stop Time**	23:24
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:10	4.5	13.4	0.0	82.1	29.26	1.667	161.9	YES

Gas Analysis Data

Run Number	2-Base-PM-2		**Date**	10/10/18	**Run Start Time**	23:30	**Run Stop Time**	03:57
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:27	4.5	13.4	0.0	82.1	29.26	1.667	161.9	YES

Gas Analysis Data

Run Number	2-Base-PM-3		**Date**	10/11/18	**Run Start Time**	04:17	**Run Stop Time**	08:32
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:15	4.5	13.4	0.0	82.1	29.26	1.667	161.9	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	10/10/18
Sampling Location	CTG-2 Stack	**Operator**	MS
Project #	sie-18-middletown.ny-start#4	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0025	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	10/10/18	500	500.1	0.1	Pass
Test Day 1	10/10/18	500	500.1	0.1	Pass

Moisture Content Data									
Run Number		2-Base-PM-1		**Date**	10/10/18	**Start Time**	19:14	**Stop Time**	23:24
Meter Box Number		samp-cp-0030			**Meter Cal Factor**		(Y)	0.984	
Total Meter Volume		(V_m)	87.130	dcf	**Barometric Pressure**		(P_b)	29.40	in Hg
Average Stack Temp		$(t_s)_{avg}$	198	°F	**Stack Static Pressure**		(P_{static})	-0.88	in H_2O
Average Meter Temp		$(t_m)_{avg}$	77	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.44	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	507.60	613.10	707.60	860.30				
Initial Value	$(V_i),(W_i)$	350.60	611.60	693.70	842.20				
Net Value	$(V_n),(W_n)$	157.0	1.5	13.9	18.1				
Results									
Total Weight		(W_t)	190.50	g	**Water Vol Weighed**		$(V_{wsg(std)})$	8.982	scf
Std Meter Volume		$(V_{m(std)})$	82.886	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	76.38	%
Calc Moisture Content		$(B_{ws(calc)})$	9.78	%	**Final Moisture Content**		(B_{ws})	9.78	%

Moisture Content Data									
Run Number		2-Base-PM-2		**Date**	10/10/18	**Start Time**	23:30	**Stop Time**	03:57
Meter Box Number		samp-cp-0032			**Meter Cal Factor**		(Y)	0.995	
Total Meter Volume		(V_m)	95.620	dcf	**Barometric Pressure**		(P_b)	29.39	in Hg
Average Stack Temp		$(t_s)_{avg}$	198	°F	**Stack Static Pressure**		(P_{static})	-0.88	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	537.90	610.10	706.70	870.10				
Initial Value	$(V_i),(W_i)$	366.30	608.40	688.70	846.90				
Net Value	$(V_n),(W_n)$	171.6	1.7	18.0	23.2				
Results									
Total Weight		(W_t)	214.50	g	**Water Vol Weighed**		$(V_{wsg(std)})$	10.114	scf
Std Meter Volume		$(V_{m(std)})$	92.594	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	76.01	%
Calc Moisture Content		$(B_{ws(calc)})$	9.85	%	**Final Moisture Content**		(B_{ws})	9.85	%

Moisture Content Data									
Run Number		2-Base-PM-3		**Date**	10/11/18	**Start Time**	04:17	**Stop Time**	08:32
Meter Box Number		samp-cp-0030			**Meter Cal Factor**		(Y)	0.984	
Total Meter Volume		(V_m)	91.150	dcf	**Barometric Pressure**		(P_b)	29.40	in Hg
Average Stack Temp		$(t_s)_{avg}$	208	°F	**Stack Static Pressure**		(P_{static})	-0.88	in H_2O
Average Meter Temp		$(t_m)_{avg}$	75	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.44	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	512.50	572.70	726.70	858.00				
Initial Value	$(V_i),(W_i)$	352.40	571.50	707.60	836.40				
Net Value	$(V_n),(W_n)$	160.1	1.2	19.1	21.6				
Results									
Total Weight		(W_t)	202.00	g	**Water Vol Weighed**		$(V_{wsg(std)})$	9.524	scf
Std Meter Volume		$(V_{m(std)})$	87.008	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	94.90	%
Calc Moisture Content		$(B_{ws(calc)})$	9.87	%	**Final Moisture Content**		(B_{ws})	9.87	%

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Date	10/10/18
Operator	MS
Run Number	2-Base-PM-1

Filter #
05335/0418-026
1

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	197.8	°F
Average Meter Temp	(t_m)	77.3	
Orifice Meter Coefficient	($\Delta H@$)	1.812	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.13	in H_2O
Stack Moisture Content	(B_{ws})	9.78	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.33	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	15.0	sec
	Pre (-)	4.0	in H_2O for	15.0	sec
PASS	**Post (+)**	5.5	in H_2O for	15.0	sec
	Post (-)	6.0	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0030		
Meter Cal Factor	(Y)	0.984	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.2193	in
Probe Number	samp-hp-0155		in
Probe Length	96		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0029		
Impinger Case Number	samp-cc-0014		

Pressures			
Barometric Pressure	(P_b)	29.40	in Hg
Stack Static Pressure	(P_{static})	-0.88	in H_2O
Absolute Stack Pressure	(P_s)	29.34	in Hg
Absolute Meter Pressure	(P_m)	29.53	in Hg

Nozzle Measurements			ID: 3	
Pre	0.156	0.156	0.156	**PASS**
Post	0.156	0.156	0.156	**PASS**

Barometer ID
SAMP-WE-0032
Scale ID
SAMP-SC-0025

Run Time			
Start	19:14	**End**	23:24

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	350.6	611.6	693.7	842.2				
Post	507.6	613.1	707.6	860.3				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0030	samp-cp-0030	samp-cp-0030			samp-hp-0155	samp-hp-0155	samp-bh-0029	samp-cc-0014			**samp-cp-0030**		samp-cp-0030					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_i$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	809.830	1.50	0.419	0.40	199	256	251	66	75	83	74	74	3.0	1.22	67.71	7.206	87.7	79.687
A-2	21.5	00:21:30	817.360	1.50	0.419	0.42	198	258	250	64	38	75	76	76	3.0	1.22	67.66	14.758	89.9	81.596
A-3	43.0	00:43:00	825.280	1.20	0.419	0.45	198	256	249	57	40	71	77	77	3.0	1.10	60.52	21.587	94.3	82.445
B-1	62.3	01:02:15	832.455	1.30	0.419	0.45	198	249	246	64	51	79	77	77	3.0	1.14	62.99	28.596	95.3	82.660
B-2	82.3	01:22:15	839.820	1.30	0.419	0.45	198	259	251	56	55	78	78	78	3.0	1.14	62.99	35.593	95.9	82.760
B-3	102.3	01:42:15	847.185	1.30	0.419	0.45	199	257	249	56	59	79	78	78	3.0	1.14	63.04	42.637	96.4	82.920
C-1	122.3	02:02:15	854.600	1.10	0.419	0.45	197	255	250	57	63	74	78	78	3.0	1.05	57.90	49.088	97.9	83.065
C-2	140.5	02:20:30	861.390	1.10	0.419	0.44	198	255	249	55	61	68	78	78	3.0	1.05	57.94	55.452	98.9	83.048
C-3	158.8	02:38:45	868.090	1.10	0.419	0.44	197	257	251	54	55	69	78	78	3.0	1.05	57.90	61.827	99.7	83.047
D-1	177.0	02:57:00	874.800	1.30	0.419	0.43	197	257	247	58	60	71	77	77	3.0	1.14	62.94	68.784	99.5	83.012
D-2	197.0	03:17:00	882.110	1.30	0.419	0.43	198	258	252	56	56	76	78	78	3.0	1.14	62.99	75.718	99.3	82.959
D-3	217.0	03:37:00	889.410	1.40	0.419	0.43	197	255	247	57	73	76	78	78	3.0	1.18	65.32	82.890	98.8	82.890
Last Pt	237.8	03:57:45	896.960																	
Final Val	237.8	03:57:45	896.960											**Max Vac**	3.0	**Final Values**		82.890	98.8	
Average Values				1.28		0.44	198	256	249	58	57	75	77	77		1.13	62.49			
													77							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Date	10/10/18
Operator	MS
Run Number	2-Base-PM-2

Filter #
05334/0818-188
2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7720	P-980/10
Average Stack Temp	(t_s)	197.6	°F
Average Meter Temp	(t_m)	73.5	
Orifice Meter Coefficient	($\Delta H@$)	1.825	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.12	in H_2O
Stack Moisture Content	(B_{ws})	9.85	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.37	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	15.0	sec
	Pre (-)	5.3	in H_2O for	15.0	sec
PASS	**Post (+)**	5.9	in H_2O for	15.0	sec
	Post (-)	4.8	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0032		
Meter Cal Factor	(Y)	0.995	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.1457	in
Probe Number	samp-hp-0149		in
Probe Length	96		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0029		
Impinger Case Number	samp-cc-0014		

Pressures			
Barometric Pressure	(P_b)	29.39	in Hg
Stack Static Pressure	(P_{static})	-0.88	in H_2O
Absolute Stack Pressure	(P_s)	29.33	in Hg
Absolute Meter Pressure	(P_m)	29.52	in Hg

Nozzle Measurements		**ID: 3**		
Pre	0.156	0.156	0.156	**PASS**
Post	0.156	0.156	0.156	**PASS**

Barometer ID
SAMP-WE-0032
Scale ID
SAMP-SC-0025

Run Time			
Start	23:30	**End**	03:57

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	366.3	608.4	688.7	846.9				
Post	537.9	610.1	706.7	870.1				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0032	samp-cp-0032	samp-cp-0032			samp-hp-0149	samp-hp-0149	samp-bh-0029	samp-cc-0014			**samp-cp-0032**		samp-cp-0032					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_I$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	545.710	1.40	0.419	0.42	200	249	251	66	49	75	72	72	3.0	1.18	69.83	7.982	88.3	89.537
A-2	23.0	00:23:00	553.930	1.30	0.419	0.43	197	250	249	63	61	73	72	72	3.0	1.14	67.13	15.741	90.1	89.749
A-3	45.3	00:45:15	561.920	1.20	0.419	0.43	195	250	251	63	60	74	74	74	3.0	1.10	64.40	23.190	92.0	89.970
B-1	66.5	01:06:30	569.620	1.20	0.419	0.43	197	251	251	67	70	76	75	75	3.0	1.10	64.50	30.741	93.3	90.385
B-2	87.8	01:27:45	577.440	1.40	0.419	0.43	199	249	250	56	48	71	75	75	3.0	1.18	69.77	38.910	92.7	90.645
B-3	110.8	01:50:45	585.900	1.40	0.419	0.43	198	250	252	62	63	77	74	74	3.0	1.18	69.72	47.095	92.3	90.845
C-1	133.8	02:13:45	594.360	1.20	0.419	0.44	197	250	249	67	66	80	73	73	3.0	1.10	64.50	54.403	93.7	91.589
C-2	153.3	02:33:15	601.900	1.20	0.419	0.44	197	251	246	65	58	81	73	73	3.0	1.10	64.50	61.527	94.5	91.890
C-3	172.8	02:52:45	609.250	1.20	0.419	0.44	197	249	251	64	59	77	73	73	3.0	1.10	64.50	68.671	95.1	92.157
D-1	192.3	03:12:15	616.620	1.10	0.419	0.44	196	248	250	66	65	77	73	73	3.0	1.05	61.71	76.503	96.2	92.448
D-2	213.5	03:33:30	624.700	1.30	0.419	0.44	199	251	250	67	66	78	74	74	3.0	1.14	67.24	84.949	96.1	92.573
D-3	236.8	03:56:45	633.430	1.10	0.419	0.44	199	250	250	65	60	79	74	74	3.0	1.05	61.85	92.591	96.7	92.591
Last Pt	258.0	04:18:00	641.330																	
Final Val	258.0	04:18:00	641.330											**Max Vac**	3.0	**Final Values**		92.591	96.7	
Average Values				1.25		0.43	198	250	250	64	60	77	74	74		1.12	65.80			
													74							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Date	10/11/18
Operator	MS
Run Number	2-Base-PM-3

Filter #
05272/0818-188
3

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7240	4187/10
Average Stack Temp	(t_s)	208.4	°F
Average Meter Temp	(t_m)	75.4	
Orifice Meter Coefficient	($\Delta H@$)	1.812	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.14	in H_2O
Stack Moisture Content	(B_{ws})	9.87	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.36	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.32	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	4.7	in H_2O for	15.0	sec
	Pre (-)	5.0	in H_2O for	15.0	sec
PASS	**Post (+)**	5.0	in H_2O for	15.0	sec
	Post (-)	5.4	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0030		
Meter Cal Factor	(Y)	0.984	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.1524	in
Probe Number	samp-hp-0155		in
Probe Length	96		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0029		
Impinger Case Number	samp-cc-0014		

Pressures			
Barometric Pressure	(P_b)	29.40	in Hg
Stack Static Pressure	(P_{static})	-0.88	in H_2O
Absolute Stack Pressure	(P_s)	29.34	in Hg
Absolute Meter Pressure	(P_m)	29.53	in Hg

Nozzle Measurements		**ID: 3**		
Pre	0.156	0.156	0.156	**PASS**
Post	0.156	0.156	0.156	**PASS**

Barometer ID
SAMP-WE-0032
Scale ID
SAMP-SC-0025

Run Time			
Start	04:17	**End**	08:32

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	352.4	571.5	707.6	836.4				
Post	512.5	572.7	726.7	858.0				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0030	samp-cp-0030	samp-cp-0030			samp-hp-0155	samp-hp-0155	samp-bh-0029	samp-cc-0014			**samp-cp-0030**		samp-cp-0030					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	903.850	1.40	0.419	0.44	208	259	246	68	53	80	73	73	3.0	1.18	65.87	7.777	98.8	87.260
A-2	21.5	00:21:30	911.960	1.40	0.419	0.44	207	257	249	53	52	74	75	75	3.0	1.18	65.82	15.581	98.9	87.418
A-3	43.0	00:43:00	920.130	1.30	0.419	0.44	209	254	255	55	60	75	75	75	3.0	1.14	63.52	23.023	99.8	87.127
B-1	63.8	01:03:45	927.920	1.30	0.419	0.44	208	256	252	62	63	80	75	75	3.0	1.14	63.48	30.264	100.5	87.179
B-2	83.8	01:23:45	935.500	1.30	0.419	0.44	209	257	249	53	71	77	76	76	3.0	1.14	63.52	37.444	100.7	87.069
B-3	103.8	01:43:45	943.030	1.40	0.419	0.44	209	256	246	56	75	79	76	76	3.0	1.18	65.92	44.872	100.2	86.951
C-1	124.5	02:04:30	950.820	1.30	0.419	0.44	208	254	249	61	78	79	76	76	3.0	1.14	63.48	51.480	100.5	87.002
C-2	142.8	02:22:45	957.750	1.30	0.419	0.44	209	257	248	55	63	79	76	76	3.0	1.14	63.52	58.050	100.7	86.984
C-3	161.0	02:41:00	964.640	1.30	0.419	0.44	208	257	249	60	74	80	76	76	3.0	1.14	63.48	64.686	101.0	87.060
D-1	179.3	02:59:15	971.600	1.10	0.419	0.44	209	252	262	59	60	81	75	75	3.0	1.05	58.43	72.051	102.2	87.239
D-2	199.3	03:19:15	979.310	1.20	0.419	0.44	209	261	261	51	50	75	76	76	3.0	1.10	61.03	79.718	102.8	87.319
D-3	220.3	03:40:15	987.350	1.20	0.419	0.44	208	257	261	53	61	77	76	76	3.0	1.10	60.99	87.012	102.7	87.012
Last Pt	241.3	04:01:15	995.000																	
Final Val	241.3	04:01:15	995.000											**Max Vac**	3.0	**Final Values**		87.012	102.7	
Average Values				1.29		0.44	208	256	252	57	63	78	75	75		1.14	63.26			
													75							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
PM Data

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Run Start Time	23:36	05:03	10:20		hh:mm	
Run Stop Time	03:53	09:10	14:39		hh:mm	
Test Date	09/24/18	09/25/18	09/25/18		mm/dd/yy	
Load	w/DB	w/DB	w/DB		% or w/DB	--
Meter Calibration Factor	1.000	1.000	1.000			
Pitot Tube Coefficient	0.7420	0.7420	0.7420			
Average Nozzle Diameter	0.156	0.156	0.156		in	
Stack Test Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Initial Meter Volume	48.770	140.470	234.480		ft^3	
Final Meter Volume	140.060	234.920	340.710		ft^3	
Total Meter Volume	91.290	94.450	106.230	97.323	ft^3	
Total Sampling Time	246.75	246.75	247.75	247.08	min	
Average Meter Temperature	80.00	81.08	78.58	79.89	°F	
Average Stack Temperature	189.69	189.50	188.83	189.34	°F	
Barometric Pressure	29.98	29.91	29.78	29.89	in Hg	
Stack Static Pressure	0.55	0.55	0.55	0.55	in H_2O	
Absolute Stack Pressure	30.02	29.95	29.82	29.93	in Hg	
Average Orifice Pressure Drop	0.43	0.43	0.43	0.43	in H_2O	
Absolute Meter Pressure	30.11	30.04	29.91	30.02	in Hg	
Avg Square Root Pitot Pressure	1.15	1.16	1.18	1.16	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	306.20	129.40	226.90	220.83	g	
Silica Gel Weight Gain	37.10	16.50	47.10	33.57	g	
Total Water Volume Collected	343.92	146.16	274.49	254.86	ml	
Standard Water Vapor Volume	16.19	6.88	12.92	11.99	scf	
Standard Meter Volume	89.5	92.2	103.8	95.2	dscf	
Standard Metric Meter Volume	2.5	2.6	2.9	2.7	dscm	
Calculated Stack Moisture	15.31	6.94	11.07	11.11	%	
Saturated Stack Moisture	62.81	62.70	62.08	62.53	%	
Reported Stack Moisture Content	15.31	6.94	11.07	11.11	%	
Gas Analysis Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.9	4.9	4.9	4.9	%	
Oxygen Content	12.0	12.0	12.0	12.0	%	
Carbon Monoxide Content	0.4	0.5	0.5	0.5	ppm	
Nitrogen Content	83.1	83.1	83.1	83.1	%	
Stack Dry Molecular Weight	29.26	29.26	29.26	29.26	lb/lb-mole	
Stack Wet Molecular Weight	27.54	28.48	28.02	28.01	lb/lb-mole	
Calculated Fuel Factor	1.816	1.816	1.816	1.816		
Fuel F-Factor	8633.27	8632.22	8632.22	8632.57	dscf/MMBtu	
Percent Excess Air	120.7	120.7	120.7	120.7	%	

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	64.57	64.42	66.08	65.02	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	
Actual Stack Flow Rate	1,098,491	1,095,865	1,124,082	1,106,146	acfm	
Wet Standard Stack Flow Rate	53,744	53,506	54,702	53,984	wkscfh	
Dry Standard Stack Flow Rate	45,515,391	49,792,509	48,645,409	47,984,436	dscfh	
Percent of Isokinetic Rate	102.9	96.0	111.1	103.4	%	
Emission Rate Data	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Total $PM_{10}/PM_{2.5}$ Mass	5.35	26.09	14.84	15.43	mg	--
Total $PM_{10}/PM_{2.5}$ Concentration	5.97E-05	2.83E-04	1.43E-04	1.62E-04	g/dscf	--
	9.21E-04	4.37E-03	2.21E-03	2.50E-03	gr/dscf	--
Total $PM_{10}/PM_{2.5}$ Emission Rate	2.72	14.09	6.96	7.92	kg/hr	--
	5.99	31.06	15.34	17.46	lb/hr	--
	26.24	136.02	67.19	76.48	tpy	--
	0.0027	0.0126	0.0064	0.0072	lb/MMBtu	0.0073
Filterable PM_{10} Mass	0.24	0.11	0.45	0.27	mg	--
Filterable PM_{10} Concentration	2.66E-06	1.24E-06	4.33E-06	2.74E-06	g/dscf	--
	4.10E-05	1.91E-05	6.68E-05	4.23E-05	gr/dscf	--
Filterable PM_{10} Emission Rate	0.12	0.06	0.21	0.13	kg/hr	--
	0.27	0.14	0.46	0.29	lb/hr	--
	1.17	0.60	2.03	1.27	tpy	--
	0.0001	0.0001	0.0002	0.0001	lb/MMBtu	--
Filterable $PM_{2.5}$ Mass	3.61	0.98	1.99	2.19	mg	--
Filterable $PM_{2.5}$ Concentration	4.03E-05	1.06E-05	1.92E-05	2.34E-05	g/dscf	--
	6.22E-04	1.64E-04	2.96E-04	3.61E-04	gr/dscf	--
Filterable $PM_{2.5}$ Emission Rate	1.83	0.53	0.93	1.10	kg/hr	--
	4.04	1.16	2.06	2.42	lb/hr	--
	17.71	5.10	9.02	10.61	tpy	--
	0.0018	0.0005	0.0009	0.0010	lb/MMBtu	--
Condensable $PM_{2.5}$ Mass	1.50	25.00	12.40	12.97	mg	--
Condensable $PM_{2.5}$ Concentration	1.68E-05	2.71E-04	1.20E-04	1.36E-04	g/dscf	--
	2.59E-04	4.18E-03	1.84E-03	2.10E-03	gr/dscf	--
Condensable $PM_{2.5}$ Emission Rate	0.76	13.50	5.81	6.69	kg/hr	--
	1.68	29.75	12.82	14.75	lb/hr	--
	7.36	130.32	56.13	64.61	tpy	--
	0.0007	0.0121	0.0053	0.0061	lb/MMBtu	--
RM 201A Quality Control	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	**Average**	**Units**	**Limits**
Cyclone Flow Rate	0.53	0.49	0.58	0.53	ft³/min	
Stack Viscosity	194.88	202.59	198.60	198.69	μP	
Cunningham Correction Factor	1.08	1.08	1.09	1.09		
Recalculated D50-1 for CIV	2.12	2.34	1.92	2.13		
Recalculated Cunninham	1.08	1.08	1.09	1.09		
Lower Limit Cut Diameter, CI (NRE<3162), D50LL	2.12	2.34		2.23		
Dia. of 50% Prob. (D50) CIV (NRE>3162)			1.92	1.92		
Reynolds Number	2964.42	2764.85	3252.96	2,994.08		
Z	1.00	1.00	1.00	1.00		
No. Sampling Pts. Outside Dp	0	0	0	0	points	

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		SB	
Date for Preliminary Run	(mm/dd/yy)	09/24/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	50	scf
Run Duration	chk Subpart	240	minutes
Unit Number		CTG-1	
Base Run Number		2-100 w/DB-PM	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		1	2	3	
Test Date	(mm/dd/yy)	09/24/18	09/25/18	09/25/18	
Load		w/DB	w/DB	w/DB	% or w/DB
Fuel F-Factor		8633.27	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029	
Meter Calibration Factor	(Y)	1.000	1.000	1.000	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.824	1.824	1.824	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	5273/10	5273/10	5273/10	
Pitot Tube Coefficient	(C_p)	0.7420	0.7420	0.7420	
Nozzle Number	from ACS	3	3	3	must match cyc nozz tab (e.g. 3, 4, etc.)
Nozzle Diameter	(D_n)	0.156	0.156	0.156	in
Probe Number	from ACS	SAMP-HP-0140	SAMP-HP-0140	SAMP-HP-0140	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	5143	5143	5143	
Impinger Case Number	from ACS	SAMP-CC-0001	SAMP-CC-0001	SAMP-CC-0001	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Operator	SB
Project #	sie-18-middletown.ny-start#1
Pitot Leak Check	x **PreTest** x **PostTest**

Preliminary Run Date	09/24/18		
Stack Type	Circular		
Ports Available	4		
Thermocouple ID	SAMP-HP-0140		
Pitot Coefficient	0.7420	**Pitot Identification**	5273/10

Stack Dimensions			
Area of Stack	(A_s)	283.53	ft²
Diameter of Stack	(D)	228.00	in

Pressures			
Barometric Pressure	(P_b)	29.98	in Hg
Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg

Stack Gas Composition			
Composition Data:	**Estimated Composition**		
Carbon Dioxide Concentration	(%CO_2)	4.90	%vd
Oxygen Concentration	(%O_2)	12.00	%vd
Carbon Monoxide Concentration	(ppmCO)	0.40	ppmvd
Nitrogen Concentration	(%N_2)	83.10	%vd
Stack Moisture Content	(B_{ws})	9.50	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Stack Wet Molecular Weight	(M_w)	28.19	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	65.27	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	48,775,564	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	812,926	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	1,110,309	acf/min
Avg Stack Wet Std Flow Rate	(Q_{sw})	53,895,651	ascf/hr

40 CFR 60, Method 2G, Section 8.11.1 (but applies to all Method 2 type static pressure measurements):
If a Type S probe is used for this measurement, position the probe at or between any traverse point(s) and rotate the probe until a null differential pressure reading is obtained. Disconnect the tubing from one of the pressure ports; read and record the ∆P. For pressure devices with one-directional scales, if a deflection in the positive direction is noted with the negative side disconnected, then the static pressure is positive. Likewise, if a deflection in the positive direction is noted with the positive side disconnected, then the static pressure is negative.

Stack Cross Section Schematic

Velocity Traverse Data

Run Number	2-100 w/DB-PM-V1				
Run Time	10:57	**Start**	11:37	**End**	
Traverse Point	**Velocity Head** (Δp)	**Null Angle** (N_a)	**Zero Deg Pressure** ($0^o{}_a$)	**Stack Temp** (t_s)	**Local Velocity** ($v_{s(l)}$)
	in H_2O	deg	in H_2O	°F	ft/sec
A-1	1.40	-5	0.28	193	65.93
A-2	1.70	-3	0.15	192	72.59
A-3	1.30	-2	0.06	193	63.53
B-1	1.10	0	0.04	192	58.39
B-2	1.20	2	0.00	193	61.04
B-3	1.20	2	0.00	192	60.99
C-1	1.60	5	0.00	198	70.75
C-2	1.50	-5	0.40	198	68.50
C-3	1.20	-2	0.05	196	61.18
D-1	1.60	5	0.00	197	70.69
D-2	1.50	2	0.00	197	68.45
D-3	1.20	0	0.03	197	61.22
Average	1.38	3		195	
	1.17	**= Square roots of ∆p**			
Standard deviation of null angles =				1.9	

QA/QC Check: *- Page 1 of 1 -* **Data Collector**

Completeness *sign* ________

Legibility *date* ________

Accuracy (here or report title) **QA Reviewer**

Specifications *sign* ________

Reasonableness *date* ________

METHOD 201A and OTM 27 - DETERMINATION OF NOZZLE SIZE AND POST RUN QUALITY CONTROL

Gas Analysis	Prelim	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	2-100 w/DB-PM-4	2-100 w/DB-PM-5	2-100 w/DB-PM-6	
Carbon Dioxide Content	4.9	4.9	4.9	4.9				%
Oxygen Content	12.0	12.0	12.0	12.0				%
Stack Moisture Content	9.5	15.3	6.9	11.1				%
Nitrogen plus CO Content	83.1	83.1	83.1	83.1				%

Corrected Velocity Head, $\Delta p_{2.5}$ (in H_2O)	Min.	1.10	Max.	1.70

Stack and Equipment Information	Prelim	2-100 w/DB-PM-1	2-100 w/DB-PM-2	2-100 w/DB-PM-3	2-100 w/DB-PM-4	2-100 w/DB-PM-5	2-100 w/DB-PM-6	
Barometric Pressure	29.98	29.98	29.91	29.78				in Hg
Stack Static Pressure	0.55	0.55	0.55	0.55				in H_2O
Absolute Stack Pressure	30.02	30.02	29.95	29.82				in Hg
Average Stack Temp	195	190	190	189				0.00
Average Stack Temp	655	650	650	649				°R
Average Meter Temp	85	80	81	79				0.00
Orifice Meter Coefficient	1.824	1.824	1.824	1.824				in H_2O
Pitot Coefficient	0.742	0.742	0.742	0.742				
Stack Dry Molecular Weight	29.26	29.26	29.26	29.26				lb/lb mole
Stack Wet Molecular Weight	28.19	27.54	28.48	28.02				lb/lb mole
Stack Viscosity	201.48	194.88	202.59	198.60				μP
Cunningham Correction Factor, for a 2.25 μm particle	1.08							
Cunningham Correction Factor, for a 2.5 μm particle		1.07	1.07	1.07				
Prelim Cut Dia., Cyclone I, D_{50LL}, N_{re}<3162	10.25	2.12	2.34					μm
Middle Zone Dia., Cyclone I, D_{50T}, N_{re}<3162	10.62							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.), N_{re}<3162	0.49							dscfm
Reynolds Number, Cyc I & IV, N_{re}<3162	2697.43	2964.42	2764.85	3252.96				
Dia. of 50% Prob. (D_{50}) Cyc IV (N_{re}<3162)	2.39	2.13	2.35					μm
Sampling Rate, Cyc IV, N_{re}<3,162	0.49							dscfm
Reynolds Number, Cyc IV, N_{re}<3162	2697.39	2964.42	2764.85	3252.96				
Prelim Cut Dia., Cyclone I, $D_{50LL\geq3162}$	10.62							μm
Middle Zone Dia., Cyclone I, $D_{50T\geq3162}$	10.81							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.)≥3162	0.47							dscfm
Reynolds Number, Cyc I & IV, N_{re}≥3162	2632.75							
Dia. of 50% Prob. (D_{50}) CIV (N_{re}≥3162)	2.30			1.94				μm
Sampling Rate, Cyc IV, N_{re}≥3,162	4.75							dscfm
Reynolds Number ≥ 3162	26327.67							
Cyclone Flow Rate	0.49	0.53	0.49	0.58				ft³/min
Recalculated D_{50-1} for C_{IV}		2.12	2.34	1.92				
Recalculated Cunninham		1.08	1.08	1.09				
Z		1.00	1.00	1.00				
Isokinetics		102.94	96.01	111.12				%
No. Sampling Pts. Outside Δp		0	0	0				
Sample Nozzle Diameter		0.156	0.156	0.156				in

Orifice Head and Nozzle Selection Calculation

Nozzle No.	1	2	3	4	5	6	7	8	9	10	11
Nozzle diameter, D_n, in.	0.125	0.138	0.156	0.172	0.188	0.200	0.216	0.234	0.253	0.274	0.296
Nozzle velocity, v_n, ft/sec	95.18	78.09	61.11	50.27	42.08	37.18	31.87	27.16	23.23	19.81	16.97
R_{min}	0.76	0.75	0.73	0.70	0.66	0.63	0.57	0.50	0.50	0.50	0.50
v_{min}, ft/sec	72.64	58.56	44.36	35.09	27.85	23.33	18.11	13.58	11.62	9.90	8.49
R_{max}	1.23	1.23	1.25	1.27	1.28	1.30	1.32	1.36	1.39	1.44	1.49
v_{max}, ft/sec	116.66	96.39	76.34	63.60	54.03	48.34	42.22	36.81	32.34	28.48	25.30
Δp_{min}, in. H_2O @ $t_{s-50}$$^oF$	1.84	1.19	0.68	0.43	0.27	0.19	0.11	0.06	0.05	0.03	0.03
Δp_{min}, in. H_2O @ t_s	1.70	1.10	0.63	0.40	0.25	0.17	0.11	0.06	0.04	0.03	0.02
Δp_{max}, in. H_2O @ t_s	4.37	2.99	1.87	1.30	0.94	0.75	0.57	0.44	0.34	0.26	0.21
Δp_{min}, in. H_2O @ $t_{s+50}$$^oF$	4.06	2.77	1.74	1.21	0.87	0.70	0.53	0.40	0.31	0.24	0.19
ΔH, in. H_2O @ t_s+50^{o}F	0.370										
ΔH, in. H_2O @ t_s	**0.428**										
ΔH, in. H_2O @ t_s-50^{o}F	0.502										

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18		
Sampling Location	CTG-2 Stack	**Operator**	SB		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	2-100 w/DB-PM-1		**Date**	09/24/18	**Run Start Time**	23:36	**Run Stop Time**	03:53
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:17	4.9	12.0	0.4	83.1	29.26	1.816	120.7	YES

Gas Analysis Data

Run Number	2-100 w/DB-PM-2		**Date**	09/25/18	**Run Start Time**	05:03	**Run Stop Time**	09:10
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:07	4.9	12.0	0.5	83.1	29.26	1.816	120.7	YES

Gas Analysis Data

Run Number	2-100 w/DB-PM-3		**Date**	09/25/18	**Run Start Time**	10:20	**Run Stop Time**	14:39
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:19	4.9	12.0	0.5	83.1	29.26	1.816	120.7	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	SB
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0022	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/24/18	500	499.9	-0.1	Pass
Test Day 1	09/24/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		2-100 w/DB-PM-1		**Date**	09/24/18	**Start Time**	23:36	**Stop Time**	03:53
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	91.290	dcf	**Barometric Pressure**		(P_b)	29.98	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	80	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	638.60	611.00	654.10	857.50				
Initial Value	$(V_i),(W_i)$	362.00	598.90	636.60	820.40				
Net Value	$(V_n),(W_n)$	276.6	12.1	17.5	37.1				
Results									
Total Weight		(W_t)	343.30	g	**Water Vol Weighed**		($V_{wsg(std)}$)	16.187	scf
Std Meter Volume		($V_{m(std)}$)	89.535	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	62.81	%
Calc Moisture Content		($B_{ws(calc)}$)	15.31	%	**Final Moisture Content**		(B_{ws})	15.31	%

Moisture Content Data									
Run Number		2-100 w/DB-PM-2		**Date**	09/25/18	**Start Time**	05:03	**Stop Time**	09:10
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	94.450	dcf	**Barometric Pressure**		(P_b)	29.91	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	81	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	484.50	597.60	757.10	898.30				
Initial Value	$(V_i),(W_i)$	357.00	597.00	755.80	881.80				
Net Value	$(V_n),(W_n)$	127.5	0.6	1.3	16.5				
Results									
Total Weight		(W_t)	145.90	g	**Water Vol Weighed**		($V_{wsg(std)}$)	6.879	scf
Std Meter Volume		($V_{m(std)}$)	92.233	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	62.70	%
Calc Moisture Content		($B_{ws(calc)}$)	6.94	%	**Final Moisture Content**		(B_{ws})	6.94	%

Moisture Content Data									
Run Number		2-100 w/DB-PM-3		**Date**	09/25/18	**Start Time**	10:20	**Stop Time**	14:39
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	106.230	dcf	**Barometric Pressure**		(P_b)	29.78	in Hg
Average Stack Temp		$(t_s)_{avg}$	189	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	79	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	566.50	608.50	668.50	895.10				
Initial Value	$(V_i),(W_i)$	361.80	600.80	654.00	848.00				
Net Value	$(V_n),(W_n)$	204.7	7.7	14.5	47.1				
Results									
Total Weight		(W_t)	274.00	g	**Water Vol Weighed**		($V_{wsg(std)}$)	12.919	scf
Std Meter Volume		($V_{m(std)}$)	103.765	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	62.08	%
Calc Moisture Content		($B_{ws(calc)}$)	11.07	%	**Final Moisture Content**		(B_{ws})	11.07	%

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	SB
Run Number	2-100 w/DB-PM-1

Filter #
000009
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	189.7	°F
Average Meter Temp	(t_m)	80.0	
Orifice Meter Coefficient	($\Delta H@$)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)	1.15	in H_2O
Stack Moisture Content	(B_{ws})	15.31	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.32	

Leak Checks					
Train	Pre	0.001	ft³/min@	16.0	in Hg
PASS	Post	0.000	ft³/min@	10.0	in Hg
Pitot	Pre (+)	4.6	in H_2O for	15.0	sec
	Pre (-)	4.1	in H_2O for	15.0	sec
PASS	Post (+)	5.3	in H_2O for	15.0	sec
	Post (-)	6.2	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.2143	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0001		

Nozzle Measurements		ID: 3		
Pre	0.156	0.156	0.156	PASS
Post	0.156	0.156	0.156	PASS

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Pressures			
Barometric Pressure	(P_b)	29.98	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.11	in Hg

Run Time			
Start	23:36	End	03:53

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	362.0	598.9	636.6	820.4				
Post	638.6	611.0	654.1	857.5				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0001			SAMP-CP-0029		SAMP-CP-0029					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤85°F)	CPM Filter Temp (76.5±8.5°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity (v_s)$_l$	Cumul. Meter Volume (V_m)$_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V_m)$_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	48.770	1.40	0.428	0.43	191	233	265	47	74	74	74	74	5.0	1.18	66.60	7.240	97.9	88.222
A-2	20.3	00:20:15	56.070	1.50	0.428	0.43	190	244	261	48	59	54	76	76	5.0	1.22	68.89	14.611	95.3	87.402
A-3	41.3	00:41:15	63.530	1.50	0.428	0.43	190	242	261	50	65	60	78	78	5.0	1.22	68.89	22.014	94.6	87.261
B-1	62.3	01:02:15	71.050	1.10	0.428	0.43	189	250	265	53	68	61	80	80	5.0	1.05	58.95	28.458	98.1	87.501
B-2	80.3	01:20:15	77.620	1.10	0.428	0.43	190	268	264	51	71	61	80	80	5.0	1.05	58.99	35.009	100.8	87.924
B-3	98.3	01:38:15	84.300	1.20	0.428	0.43	190	267	257	53	75	63	81	81	5.0	1.10	61.61	41.833	101.9	88.224
C-1	117.0	01:57:00	91.270	1.20	0.428	0.43	188	267	263	53	74	61	81	81	5.0	1.10	61.52	49.508	102.4	88.202
C-2	138.5	02:18:30	99.110	1.20	0.428	0.43	190	268	266	54	76	62	81	81	5.0	1.10	61.61	57.330	103.1	88.413
C-3	160.0	02:40:00	107.100	1.20	0.428	0.43	190	267	261	53	76	61	81	81	5.0	1.10	61.61	65.220	103.8	88.667
D-1	181.5	03:01:30	115.160	1.40	0.428	0.43	190	227	253	52	74	58	82	82	5.0	1.18	66.55	73.154	103.4	88.920
D-2	203.0	03:23:00	123.280	1.40	0.428	0.43	190	229	257	53	72	57	82	82	5.0	1.18	66.55	81.206	103.3	89.254
D-3	224.5	03:44:30	131.520	1.50	0.428	0.43	189	237	250	56	73	59	82	82	5.0	1.22	68.83	89.551	102.9	89.551
Last Pt	246.8	04:06:45	140.060	1.50	0.428	0.43	189	235	254	58	72	60	82	82	5.0	1.22	68.83			
Final Val	246.8	04:06:45	140.060											Max Vac	5.0	Final Values		89.551	102.9	
Average Values				1.32		0.43	190	249	260	52	71	61	80	80		1.15	64.57			
													80							

Notes:

CPM filter temp out of specification due to: Ambient conditions

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	SB
Run Number	2-100 w/DB-PM-2

Filter #
05305
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	189.5	°F
Average Meter Temp	(t_m)	81.1	
Orifice Meter Coefficient	(ΔH@)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.16	in H_2O
Stack Moisture Content	(B_{ws})	6.94	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.36	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.37	

Leak Checks				
Train	**Pre**	0.000	ft³/min@	17.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	4.5	in H_2O for	15.0	sec
	Pre (-)	5.7	in H_2O for	15.0	sec
PASS	**Post (+)**	3.6	in H_2O for	15.0	sec
	Post (-)	5.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.1495	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0001		

Pressures			
Barometric Pressure	(P_b)	29.91	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.95	in Hg
Absolute Meter Pressure	(P_m)	30.04	in Hg

Nozzle Measurements		**ID: 3**	
Pre	0.156	0.156	0.156	**PASS**
Post	0.156	0.156	0.156	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	05:03	**End**	09:10

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	357.0	597.0	755.8	881.8				
Post	484.5	597.6	757.1	898.3				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0001			**SAMP-CP-0029**		SAMP-CP-0029					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($(v_s)_i$)**	**Cumul. Meter Volume ($(V_m)_{std}$)**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($(V_m)_{std}$)**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	140.470	1.30	0.428	0.43	189	250	268	55	54	53	77	77	3.0	1.14	63.08	7.517	97.6	91.601
A-2	20.3	00:20:15	148.110	1.30	0.428	0.43	188	270	265	54	54	53	79	79	3.0	1.14	63.04	15.301	99.3	93.223
A-3	40.5	00:40:30	156.050	1.30	0.428	0.43	190	270	259	54	55	52	82	82	3.0	1.14	63.13	22.603	97.8	91.806
B-1	60.8	01:00:45	163.540	1.20	0.428	0.43	190	246	260	52	55	55	80	80	3.0	1.10	60.66	29.609	99.9	92.774
B-2	78.8	01:18:45	170.700	1.20	0.428	0.43	189	255	261	52	56	55	81	81	3.0	1.10	60.61	36.348	100.4	92.701
B-3	96.8	01:36:45	177.600	1.10	0.428	0.43	189	266	261	53	56	59	82	82	3.0	1.05	58.03	41.905	99.3	90.701
C-1	114.0	01:54:00	183.300	1.40	0.428	0.43	190	243	258	55	57	60	82	82	3.0	1.18	65.52	49.899	98.5	90.867
C-2	135.5	02:15:30	191.500	1.50	0.428	0.43	190	245	248	61	65	65	81	81	3.0	1.22	67.82	58.259	97.5	91.128
C-3	157.8	02:37:45	200.060	1.60	0.428	0.43	189	250	238	55	67	65	82	82	3.0	1.26	69.99	67.257	96.9	91.815
D-1	180.8	03:00:45	209.290	1.40	0.428	0.43	190	255	255	56	70	66	82	82	3.0	1.18	65.52	75.212	96.5	91.760
D-2	202.3	03:22:15	217.450	1.50	0.428	0.43	190	250	252	55	71	67	82	82	3.0	1.22	67.82	83.840	96.4	92.149
D-3	224.5	03:44:30	226.300	1.50	0.428	0.43	190	255	250	55	71	69	83	83	3.0	1.22	67.82	92.227	96.0	92.227
Last Pt	246.8	04:06:45	234.920																	
Final Val	246.8	04:06:45	234.920											**Max Vac**	3.0	**Final Values**		92.227	96.0	
Average Values				1.36		0.43	190	255	256	55	61	60	81	81		1.16	64.42			
													81							

Notes:

CPM filter temp out of specification due to: Ambient conditions

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	SB
Run Number	2-100 w/DB-PM-3

Filter #
05290
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	188.8	°F
Average Meter Temp	(t_m)	78.6	
Orifice Meter Coefficient	($\Delta H@$)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.18	in H_2O
Stack Moisture Content	(B_{ws})	11.07	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.37	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.35	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	3.6	in H_2O for	15.0	sec
	Pre (-)	4.5	in H_2O for	15.0	sec
PASS	**Post (+)**	5.8	in H_2O for	15.0	sec
	Post (-)	6.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	3		
Average Nozzle Diameter	(D_{na})	0.1560	in
Suggested Nozzle Diameter	(D_{ni})	0.1507	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0001		

Pressures			
Barometric Pressure	(P_b)	29.78	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.82	in Hg
Absolute Meter Pressure	(P_m)	29.91	in Hg

Nozzle Measurements		**ID: 3**	
Pre 0.156	0.156	0.156	**PASS**
Post 0.156	0.156	0.156	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	10:20	**End**	14:39

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	361.8	600.8	654.0	848.0				
Post	566.5	608.5	668.5	895.1				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0001			**SAMP-CP-0029**		SAMP-CP-0029					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	234.480	1.40	0.428	0.43	190	254	245	58	62	68	78	78	5.0	1.18	66.20	7.353	95.7	89.967
A-2	20.3	00:20:15	242.000	1.50	0.428	0.43	190	253	254	58	65	68	78	78	5.0	1.22	68.53	16.545	104.5	99.372
A-3	41.3	00:41:15	251.400	1.50	0.428	0.43	188	256	250	58	65	70	78	78	5.0	1.22	68.42	25.102	104.2	99.902
B-1	62.3	01:02:15	260.150	1.40	0.428	0.43	183	259	253	65	71	70	78	78	5.0	1.18	65.84	31.604	102.2	97.570
B-2	80.3	01:20:15	266.800	1.50	0.428	0.43	190	251	253	65	71	70	78	78	5.0	1.22	68.53	39.779	104.3	99.801
B-3	98.8	01:38:45	275.160	1.50	0.428	0.43	190	258	260	58	75	80	79	79	5.0	1.22	68.53	48.202	106.4	101.852
C-1	117.3	01:57:15	283.790	1.20	0.428	0.43	190	256	257	52	70	75	79	79	5.0	1.10	61.29	57.582	109.3	102.818
C-2	138.8	02:18:45	293.400	1.20	0.428	0.43	189	257	264	55	70	78	79	79	5.0	1.10	61.24	66.611	110.7	102.982
C-3	160.3	02:40:15	302.650	1.20	0.428	0.43	189	244	257	55	75	78	79	79	5.0	1.10	61.24	75.454	111.4	102.854
D-1	181.8	03:01:45	311.710	1.40	0.428	0.43	189	246	259	56	79	78	79	79	5.0	1.18	66.15	84.619	111.5	103.145
D-2	203.3	03:23:15	321.100	1.50	0.428	0.43	189	250	263	60	81	80	79	79	5.0	1.22	68.47	94.233	111.3	103.531
D-3	225.5	03:45:30	330.950	1.50	0.428	0.43	189	260	263	60	81	80	79	79	5.0	1.22	68.47	103.759	111.1	103.759
Last Pt	247.8	04:07:45	340.710																	
Final Val	247.8	04:07:45	340.710											**Max Vac**	5.0	**Final Values**		103.759	111.1	
Average Values				1.40		0.43	189	254	257	58	72	75	79	79		1.18	66.08			
													79							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
Sulfuric Acid Mist Data

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**2-Base-SO3-1**	**2-Base-SO3-2**	**2-Base-SO3-3**	**Average**	**Units**	**Limits**
Run Start Time	12:22	20:29	23:10		hh:mm	
Run Stop Time	14:22	22:29	01:10		hh:mm	
Test Date	09/24/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	1.017	1.017	1.017			
Stack Test Data	**2-Base-SO3-1**	**2-Base-SO3-2**	**2-Base-SO3-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	0.133	88.713	135.626		ft³	
Final Meter Volume	41.206	129.911	176.778		ft³	
Total Meter Volume	41.073	41.198	41.152	41.141	ft³	
Total Sampling Time	120.00	120.00	120.00	120.00	min	
Average Meter Temperature	76.50	72.67	74.04	74.40	°F	
Average Stack Temperature	220.13	203.83	205.04	209.67	°F	
Barometric Pressure	29.97	29.65	29.61	29.74	in Hg	
Stack Static Pressure	-0.89	-0.89	-0.89	-0.89	in H_2O	
Absolute Stack Pressure	29.90	29.58	29.54	29.68	in Hg	
Average Orifice Pressure Drop	0.44	0.42	0.42	0.43	in H_2O	
Absolute Meter Pressure	30.10	29.78	29.74	29.88	in Hg	
Avg Square Root Pitot Pressure					$\sqrt{(in\ H_2O)}$	
Moisture Content Data	**2-Base-SO3-1**	**2-Base-SO3-2**	**2-Base-SO3-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	82.30	95.20	82.00	86.50	g	
Silica Gel Weight Gain	8.90	10.50	7.30	8.90	g	
Total Water Volume Collected	91.36	105.89	89.46	95.57	ml	
Standard Water Vapor Volume	4.30	4.98	4.21	4.50	scf	
Standard Meter Volume	41.2	41.2	41.0	41.1	dscf	
Standard Metric Meter Volume	1.2	1.2	1.2	1.2	dscm	
Calculated Stack Moisture	9.45	10.79	9.31	9.85	%	
Saturated Stack Moisture	100.00	85.74	88.00	91.25	%	
Reported Stack Moisture Content	9.45	10.79	9.31	9.85	%	
Gas Analysis Data	**2-Base-SO3-1**	**2-Base-SO3-2**	**2-Base-SO3-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.1	4.1	4.1	4.1	%	
Oxygen Content	13.5	13.5	13.5	13.5	%	
Carbon Monoxide Content	0.7	0.6	0.6	0.6	ppm	
Nitrogen Content	82.4	82.4	82.4	82.4	%	
Stack Dry Molecular Weight	29.20	29.20	29.20	29.20	lb/lb-mole	
Stack Wet Molecular Weight	28.14	27.99	28.15	28.09	lb/lb-mole	
Calculated Fuel Factor	1.805	1.805	1.805	1.805		
Fuel F-Factor	8633.27	8632.22	8632.22	8632.57	dscf/MMBtu	
Percent Excess Air	163.6	163.6	163.6	163.6	%	
Volumetric Flow Rate Data	**2-Base-SO3-1**	**2-Base-SO3-2**	**2-Base-SO3-3**	**Average**	**Units**	**Limits**
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Sulfuric Acid Mist IC Analysis	2-Base-SO3-1	2-Base-SO3-2	2-Base-SO3-3	Average	Units	Limits
H_2SO_4 (IC) Sample Volume - Front Half Rinse	121.0	100.0	121.0	114.00	ml	--
H_2SO_4 (IC) Sample - Mass Per Volume	0.099	0.100	0.116	0.10	mg/L	--
H_2SO_4 (IC) Mass	0.01	0.01	0.01	0.01	mg	--
H_2SO_4 (IC) Concentration	2.91E-07	2.43E-07	3.42E-07	2.92E-07	g/dscf	--
	4.49E-06	3.75E-06	5.27E-06	4.50E-06	gr/dscf	--
	1.03E-08	8.57E-09	1.21E-08	1.03E-08	g/L	--
	0.00	0.00	0.00	0.00	ppmvd	--
H_2SO_4 (IC) Emission Rate	0.000016	0.000013	0.000018	0.000016	lb/MMBtu	0.0007

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		PM/BL/SB	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	8a, 2.4.1.3	10.6	scf
Run Duration	10 L/min	120	minutes
Unit Number		CTG-2	
Base Run Number		2-Base-SO3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/24/18	09/25/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8633.27	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025	
Meter Calibration Factor	(Y)	1.017	1.017	1.017	
Orifice Meter Coefficient	($\Delta H_@$)	1.820	1.820	1.820	in H_2O
Non-Console Manometer Used		No	No	No	
Probe Number	from ACS	SAMP-S3-0005	SAMP-S3-0005	SAMP-S3-0005	
Probe Length		72.0	72.0	72.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	SAMP-MBH-0009	SAMP-MBH-0009	SAMP-MBH-0009	
Impinger Case Number	from ACS	5410	SAMP-BC-0009	5410	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/06/18		
Sampling Location	CTG-2 Stack	**Operator**	PM/BL/SB		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data								
Run Number	2-Base-SO3-1		**Date**	09/24/18	**Run Start Time**	12:22	**Run Stop Time**	14:22
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.1	13.5	0.7	82.4	29.20	1.805	163.6	YES

Gas Analysis Data								
Run Number	2-Base-SO3-2		**Date**	09/25/18	**Run Start Time**	20:29	**Run Stop Time**	22:29
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.1	13.5	0.6	82.4	29.20	1.805	163.6	YES

Gas Analysis Data								
Run Number	2-Base-SO3-3		**Date**	09/25/18	**Run Start Time**	23:10	**Run Stop Time**	01:10
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.1	13.5	0.6	82.4	29.20	1.805	163.6	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/06/18
Sampling Location	CTG-2 Stack	**Operator**	PM/BL/SB
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/06/18	500	499.9	-0.1	Pass
Test Day 1	09/24/18	500	500.0	0.0	Pass

Moisture Content Data									
Run Number		2-Base-SO3-1		**Date**	09/24/18	**Start Time**	12:22	**Stop Time**	14:22
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	41.073	dcf	**Barometric Pressure**		(P_b)	29.97	in Hg
Average Stack Temp		$(t_s)_{avg}$	220	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	77	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.44	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	806.20	656.50	597.50	869.10				
Initial Value	$(V_i),(W_i)$	736.20	646.20	595.50	860.20				
Net Value	$(V_n),(W_n)$	70.0	10.3	2.0	8.9				
Results									
Total Weight		(W_t)	91.20	g	**Water Vol Weighed**		$(V_{wsg(std)})$	4.300	scf
Std Meter Volume		$(V_{m(std)})$	41.223	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	100.00	%
Calc Moisture Content		$(B_{ws(calc)})$	9.45	%	**Final Moisture Content**		(B_{ws})	9.45	%

Moisture Content Data									
Run Number		2-Base-SO3-2		**Date**	09/25/18	**Start Time**	20:29	**Stop Time**	22:29
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	41.198	dcf	**Barometric Pressure**		(P_b)	29.65	in Hg
Average Stack Temp		$(t_s)_{avg}$	204	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	73	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	767.30	718.60	588.70	888.30				
Initial Value	$(V_i),(W_i)$	685.30	707.50	586.60	877.80				
Net Value	$(V_n),(W_n)$	82.0	11.1	2.1	10.5				
Results									
Total Weight		(W_t)	105.70	g	**Water Vol Weighed**		$(V_{wsg(std)})$	4.984	scf
Std Meter Volume		$(V_{m(std)})$	41.199	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	85.74	%
Calc Moisture Content		$(B_{ws(calc)})$	10.79	%	**Final Moisture Content**		(B_{ws})	10.79	%

Moisture Content Data									
Run Number		2-Base-SO3-3		**Date**	09/25/18	**Start Time**	23:10	**Stop Time**	01:10
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	41.152	dcf	**Barometric Pressure**		(P_b)	29.61	in Hg
Average Stack Temp		$(t_s)_{avg}$	205	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	735.70	706.90	615.20	867.10				
Initial Value	$(V_i),(W_i)$	658.70	701.50	615.60	859.80				
Net Value	$(V_n),(W_n)$	77.0	5.4	-0.4	7.3				
Results									
Total Weight		(W_t)	89.30	g	**Water Vol Weighed**		$(V_{wsg(std)})$	4.210	scf
Std Meter Volume		$(V_{m(std)})$	40.992	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	88.00	%
Calc Moisture Content		$(B_{ws(calc)})$	9.31	%	**Final Moisture Content**		(B_{ws})	9.31	%

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	PM/BL/SB
Run Number	2-Base-SO3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	220.1	°F
Average Meter Temp	(t_m)	76.5	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	9.45	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	SAMP-S3-0005		in
Probe Length	72		in
Liner Material	glass		
Sample Case / Oven Number	SAMP-MBH-0009		
Impinger Case Number	5410		

Pressures			
Barometric Pressure	(P_b)	29.97	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.90	in Hg
Absolute Meter Pressure	(P_m)	30.10	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	12:22	**End**	14:22

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	736.2	646.2	595.5	860.2				
Post	806.2	656.5	597.5	869.1				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-S3-0005	SAMP-S3-0005	SAMP-MBH-0009	**5410**			**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.133	--	--	0.44	221	352	506	68	175	--	73	73	2.0	--	--	1.861	--	44.660
A-1	5.0	00:05:00	1.975	--	--	0.44	221	362	520	68	185	--	73	73	2.0	--	--	3.588	--	43.060
A-1	10.0	00:10:00	3.685	--	--	0.44	221	368	513	68	172	--	73	73	2.0	--	--	5.336	--	42.688
A-1	15.0	00:15:00	5.415	--	--	0.44	221	373	512	62	174	--	74	74	2.0	--	--	7.141	--	42.846
A-1	20.0	00:20:00	7.205	--	--	0.44	221	374	512	63	177	--	75	75	2.0	--	--	8.973	--	43.069
A-1	25.0	00:25:00	9.025	--	--	0.44	218	375	515	64	176	--	75	75	2.0	--	--	10.874	--	43.496
A-1	30.0	00:30:00	10.914	--	--	0.44	218	373	513	61	176	--	76	76	2.0	--	--	12.823	--	43.964
A-1	35.0	00:35:00	12.854	--	--	0.44	217	374	512	60	176	--	76	76	2.0	--	--	14.456	--	43.369
A-1	40.0	00:40:00	14.480	--	--	0.44	218	374	513	68	176	--	76	76	2.0	--	--	16.435	--	43.827
A-1	45.0	00:45:00	16.450	--	--	0.44	221	374	508	64	176	--	76	76	2.0	--	--	18.053	--	43.326
A-1	50.0	00:50:00	18.060	--	--	0.44	221	375	515	63	175	--	76	76	2.0	--	--	20.077	--	43.804
A-1	55.0	00:55:00	20.075	--	--	0.44	222	373	511	63	176	--	77	77	2.0	--	--	21.606	--	43.212
A-1	60.0	01:00:00	21.600	--	--	0.44	221	373	510	63	176	--	78	78	2.0	--	--	23.247	--	42.918
A-1	65.0	01:05:00	23.240	--	--	0.44	222	374	513	64	176	--	78	78	2.0	--	--	25.129	--	43.078
A-1	70.0	01:10:00	25.120	--	--	0.44	221	374	513	64	175	--	78	78	2.0	--	--	26.961	--	43.137
A-1	75.0	01:15:00	26.950	--	--	0.44	221	373	515	64	176	--	78	78	2.0	--	--	28.192	--	42.287
A-1	80.0	01:20:00	28.180	--	--	0.44	221	374	514	65	176	--	78	78	2.0	--	--	29.743	--	41.990
A-1	85.0	01:25:00	29.730	--	--	0.44	219	373	515	66	175	--	78	78	2.0	--	--	31.524	--	42.032
A-1	90.0	01:30:00	31.510	--	--	0.44	219	374	511	66	175	--	78	78	2.0	--	--	33.096	--	41.805
A-1	95.0	01:35:00	33.080	--	--	0.44	220	373	512	66	173	--	78	78	2.0	--	--	34.717	--	41.660
A-1	100.0	01:40:00	34.700	--	--	0.44	220	372	514	65	169	--	78	78	2.0	--	--	36.318	--	41.507
A-1	105.0	01:45:00	36.300	--	--	0.44	220	371	516	65	164	--	78	78	2.0	--	--	37.970	--	41.422
A-1	110.0	01:50:00	37.950	--	--	0.44	220	371	512	65	162	--	78	78	2.0	--	--	39.841	--	41.574
A-1	115.0	01:55:00	39.820	--	--	0.44	219	371	514	66	182	--	78	78	2.0	--	--	41.229	--	41.229
Last Pt	120.0	02:00:00	41.206	--	--											--	--		--	
Final Val	120.0	02:00:00	41.206											**Max Vac**	2.0	**Final Values**		41.229		
Average Values						0.44	220	372	513	65	175		77	77						
													77							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	PM/BL/SB
Run Number	2-Base-SO3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	203.8	°F
Average Meter Temp	(t_m)	72.7	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	10.79	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.34	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	9.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	SAMP-S3-0005		in
Probe Length	72		in
Liner Material	glass		
Sample Case / Oven Number	SAMP-MBH-0009		
Impinger Case Number	SAMP-BC-0009		

Pressures			
Barometric Pressure	(P_b)	29.65	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.58	in Hg
Absolute Meter Pressure	(P_m)	29.78	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	20:29	**End**	22:29

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	685.3	707.5	586.6	877.8				
Post	767.3	718.6	588.7	888.3				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-S3-0005	SAMP-S3-0005	SAMP-MBH-0009	SAMP-BC-0009			**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_i$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	88.713	--	--	0.42	206	375	512	65	185	--	70	70	2.0	--	--	1.772	#DIV/0!	42.526
A-2	5.0	00:05:00	90.476	--	--	0.42	202	374	515	60	184	--	71	71	2.0	--	--	3.567	#DIV/0!	42.799
A-3	10.0	00:10:00	92.265	--	--	0.42	202	372	515	60	179	--	71	71	2.0	--	--	5.274	#DIV/0!	42.192
A-4	15.0	00:15:00	93.967	--	--	0.42	203	372	515	61	179	--	71	71	2.0	--	--	6.986	#DIV/0!	41.919
A-5	20.0	00:20:00	95.674	--	--	0.42	203	375	523	62	173	--	71	71	2.0	--	--	8.715	#DIV/0!	41.831
A-6	25.0	00:25:00	97.397	--	--	0.42	203	374	516	62	170	--	71	71	2.0	--	--	10.437	#DIV/0!	41.749
B-1	30.0	00:30:00	99.114	--	--	0.42	203	373	522	63	169	--	71	71	2.0	--	--	12.154	#DIV/0!	41.670
B-2	35.0	00:35:00	100.825	--	--	0.42	203	375	522	63	167	--	71	71	2.0	--	--	13.876	#DIV/0!	41.629
B-3	40.0	00:40:00	102.542	--	--	0.42	203	375	523	64	165	--	71	71	2.0	--	--	15.592	#DIV/0!	41.578
B-4	45.0	00:45:00	104.252	--	--	0.42	203	375	517	63	161	--	71	71	2.0	--	--	17.305	#DIV/0!	41.532
B-5	50.0	00:50:00	105.960	--	--	0.42	203	374	517	63	157	--	71	71	2.0	--	--	19.013	#DIV/0!	41.484
B-6	55.0	00:55:00	107.663	--	--	0.42	204	373	517	63	154	--	72	72	2.0	--	--	20.720	#DIV/0!	41.439
C-1	60.0	01:00:00	109.367	--	--	0.42	203	374	511	63	153	--	72	72	2.0	--	--	22.430	#DIV/0!	41.409
C-2	65.0	01:05:00	111.075	--	--	0.42	204	374	514	64	149	--	73	73	2.0	--	--	24.156	#DIV/0!	41.410
C-3	70.0	01:10:00	112.802	--	--	0.42	203	374	520	64	147	--	73	73	2.0	--	--	25.820	#DIV/0!	41.312
C-4	75.0	01:15:00	114.467	--	--	0.42	203	373	515	64	148	--	74	74	2.0	--	--	27.530	#DIV/0!	41.294
C-5	80.0	01:20:00	116.181	--	--	0.42	203	375	515	65	149	--	74	74	2.0	--	--	29.238	#DIV/0!	41.278
C-6	85.0	01:25:00	117.894	--	--	0.42	203	375	514	66	151	--	75	75	2.0	--	--	30.935	#DIV/0!	41.247
D-1	90.0	01:30:00	119.598	--	--	0.42	205	374	523	65	149	--	75	75	2.0	--	--	32.625	#DIV/0!	41.210
D-2	95.0	01:35:00	121.295	--	--	0.42	206	374	518	56	138	--	75	75	2.0	--	--	34.348	#DIV/0!	41.218
D-3	100.0	01:40:00	123.026	--	--	0.42	206	374	515	54	137	--	75	75	2.0	--	--	36.062	#DIV/0!	41.213
D-4	105.0	01:45:00	124.747	--	--	0.42	206	374	508	53	131	--	75	75	2.0	--	--	37.780	#DIV/0!	41.215
D-5	110.0	01:50:00	126.473	--	--	0.42	206	375	510	52	126	--	75	75	2.0	--	--	39.499	#DIV/0!	41.216
D-6	115.0	01:55:00	128.199	--	--	0.42	206	375	519	53	130	--	76	76	2.0	--	--	41.200	#DIV/0!	41.200
Last Pt	120.0	02:00:00	129.911		--											--	--		#DIV/0!	
Final Val	120.0	02:00:00	129.911											**Max Vac**	2.0	**Final Values**		41.200		
Average Values						0.42	204	374	517	61	156		73	73						
													73							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	PM/BL/SB
Run Number	2-Base-SO3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	205.0	°F
Average Meter Temp	(t_m)	74.0	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	9.31	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.34	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	17.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	SAMP-S3-0005		in
Probe Length	72		in
Liner Material	glass		
Sample Case / Oven Number	SAMP-MBH-0009		
Impinger Case Number	5410		

Pressures			
Barometric Pressure	(P_b)	29.61	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.54	in Hg
Absolute Meter Pressure	(P_m)	29.74	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	23:10	**End**	01:10

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	658.7	701.5	615.6	859.8				
Post	735.7	706.9	615.2	867.1				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-S3-0005	SAMP-S3-0005	SAMP-MBH-0009	**5410**			**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_I$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	135.626	--	--	0.42	205	377	510	57	64	--	74	74	2.0	--	--	1.792	#DIV/0!	43.012
A-2	5.0	00:05:00	137.425	--	--	0.42	205	377	521	54	67	--	74	74	2.0	--	--	3.471	#DIV/0!	41.649
A-3	10.0	00:10:00	139.110	--	--	0.42	205	375	517	53	69	--	74	74	2.0	--	--	5.149	#DIV/0!	41.195
A-4	15.0	00:15:00	140.795	--	--	0.42	205	375	511	55	74	--	74	74	2.0	--	--	6.830	#DIV/0!	40.979
A-5	20.0	00:20:00	142.482	--	--	0.42	205	375	520	56	73	--	74	74	2.0	--	--	8.507	#DIV/0!	40.836
A-6	25.0	00:25:00	144.166	--	--	0.42	205	375	521	56	77	--	74	74	2.0	--	--	10.208	#DIV/0!	40.832
B-1	30.0	00:30:00	145.873	--	--	0.42	205	375	512	57	75	--	75	75	2.0	--	--	11.910	#DIV/0!	40.835
B-2	35.0	00:35:00	147.585	--	--	0.42	206	375	515	57	77	--	74	74	2.0	--	--	13.609	#DIV/0!	40.826
B-3	40.0	00:40:00	149.290	--	--	0.42	205	375	518	58	80	--	74	74	2.0	--	--	15.308	#DIV/0!	40.822
B-4	45.0	00:45:00	150.996	--	--	0.42	205	375	518	60	81	--	74	74	2.0	--	--	17.002	#DIV/0!	40.804
B-5	50.0	00:50:00	152.696	--	--	0.42	205	375	522	60	76	--	74	74	2.0	--	--	18.694	#DIV/0!	40.788
B-6	55.0	00:55:00	154.395	--	--	0.42	205	375	519	59	81	--	74	74	2.0	--	--	20.381	#DIV/0!	40.762
C-1	60.0	01:00:00	156.088	--	--	0.42	204	375	516	59	76	--	74	74	2.0	--	--	22.068	#DIV/0!	40.742
C-2	65.0	01:05:00	157.782	--	--	0.42	205	375	515	59	77	--	74	74	2.0	--	--	23.745	#DIV/0!	40.706
C-3	70.0	01:10:00	159.465	--	--	0.42	205	375	518	58	77	--	74	74	2.0	--	--	25.426	#DIV/0!	40.681
C-4	75.0	01:15:00	161.152	--	--	0.42	205	375	516	60	80	--	74	74	2.0	--	--	27.100	#DIV/0!	40.650
C-5	80.0	01:20:00	162.833	--	--	0.42	204	376	515	62	83	--	74	74	2.0	--	--	28.772	#DIV/0!	40.619
C-6	85.0	01:25:00	164.511	--	--	0.42	204	376	514	63	82	--	74	74	2.0	--	--	30.526	#DIV/0!	40.701
D-1	90.0	01:30:00	166.272	--	--	0.42	204	375	518	63	82	--	74	74	2.0	--	--	32.277	#DIV/0!	40.771
D-2	95.0	01:35:00	168.030	--	--	0.42	204	375	513	63	86	--	74	74	2.0	--	--	34.033	#DIV/0!	40.839
D-3	100.0	01:40:00	169.792	--	--	0.42	204	375	520	64	85	--	74	74	2.0	--	--	35.775	#DIV/0!	40.886
D-4	105.0	01:45:00	171.541	--	--	0.42	208	375	522	65	84	--	74	74	2.0	--	--	37.516	#DIV/0!	40.927
D-5	110.0	01:50:00	173.289	--	--	0.42	205	375	522	63	73	--	74	74	2.0	--	--	39.266	#DIV/0!	40.973
D-6	115.0	01:55:00	175.045	--	--	0.42	208	375	516	64	85	--	74	74	2.0	--	--	40.992	#DIV/0!	40.992
Last Pt	120.0	02:00:00	176.778		--											--	--		#DIV/0!	
Final Val	120.0	02:00:00	176.778											**Max Vac**	2.0	**Final Values**		40.992		
Average Values						0.42	205	375	517	59	78		74	74						
													74							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
Sulfuric Acid Mist Data

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	2-100 w/DB-SO3-1	2-100 w/DB-SO3-2	2-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Run Start Time	12:31	03:47	06:29		hh:mm	
Run Stop Time	14:31	05:47	08:29		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	w/DB	w/DB	w/DB		% or w/DB	--
Meter Calibration Factor	1.017	1.017	1.017			
Stack Test Data	2-100 w/DB-SO3-1	2-100 w/DB-SO3-2	2-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Initial Meter Volume	0.265	47.005	0.000		ft^3	
Final Meter Volume	41.132	88.117	41.760		ft^3	
Total Meter Volume	40.867	41.112	41.760	41.246	ft^3	
Total Sampling Time	120.00	120.00	120.00	120.00	min	
Average Meter Temperature	70.24	71.92	73.75	71.97	°F	
Average Stack Temperature	189.92	188.68	190.00	189.53	°F	
Barometric Pressure	29.98	29.91	29.91	29.93	in Hg	
Stack Static Pressure	0.55	0.55	0.55	0.55	in H_2O	
Absolute Stack Pressure	30.02	29.95	29.95	29.97	in Hg	
Average Orifice Pressure Drop	0.42	0.42	0.42	0.42	in H_2O	
Absolute Meter Pressure	30.11	30.04	30.04	30.07	in Hg	
Moisture Content Data	2-100 w/DB-SO3-1	2-100 w/DB-SO3-2	2-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	99.30	36.60	92.50	76.13	g	
Silica Gel Weight Gain	10.70	8.70	14.00	11.13	g	
Total Water Volume Collected	110.20	45.38	106.69	87.42	ml	
Standard Water Vapor Volume	5.19	2.14	5.02	4.11	scf	
Standard Meter Volume	41.5	41.5	42.0	41.7	dscf	
Standard Metric Meter Volume	1.2	1.2	1.2	1.2	dscm	
Calculated Stack Moisture	11.11	4.89	10.67	8.89	%	
Saturated Stack Moisture	63.12	61.60	63.38	62.70	%	
Reported Stack Moisture Content	11.11	4.89	10.67	8.89	%	
Gas Analysis Data	2-100 w/DB-SO3-1	2-100 w/DB-SO3-2	2-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.9	4.9	5.0	4.9	%	
Oxygen Content	12.0	12.0	12.0	12.0	%	
Carbon Monoxide Content	0.3	0.2	0.2	0.2	ppm	
Nitrogen Content	83.1	83.1	83.0	83.1	%	
Stack Dry Molecular Weight	29.26	29.27	29.27	29.27	lb/lb-mole	
Stack Wet Molecular Weight	28.01	28.72	28.07	28.27	lb/lb-mole	
Calculated Fuel Factor	1.824	1.809	1.796	1.810		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	120.2	120.8	121.2	120.7	%	
Volumetric Flow Rate Data	2-100 w/DB-SO3-1	2-100 w/DB-SO3-2	2-100 w/DB-SO3-3	**Average**	**Units**	**Limits**
Stack Cross-Sectional Area	285.40	285.40	285.40	285.40	ft^2	

METHOD 8A (CONTROLLED CONDENSATE) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Sulfuric Acid Mist IC Analysis	**2-100 w/DB-SO3-1**	**2-100 w/DB-SO3-2**	**2-100 w/DB-SO3-3**	**Average**	**Units**	**Limits**
H_2SO_4 (IC) Sample Volume - Front Half Rinse	76.0	105.0	114.0	98.33	ml	--
H_2SO_4 (IC) Sample - Mass Per Volume	0.105	0.105	0.105	0.11	mg/L	--
H_2SO_4 (IC) Mass	0.01	0.01	0.01	0.01	mg	--
H_2SO_4 (IC) Concentration	1.93E-07	2.65E-07	2.85E-07	2.48E-07	g/dscf	--
	2.97E-06	4.09E-06	4.40E-06	3.82E-06	gr/dscf	--
	6.81E-09	9.35E-09	1.01E-08	8.75E-09	g/L	--
	0.0017	0.0023	0.0025	0.0021	ppmvd	--
H_2SO_4 (IC) Emission Rate	0.000009	0.000012	0.000013	0.000011	lb/MMBtu	0.0007

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		SB	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	8a, 2.4.1.3	10.6	scf
Run Duration	10 L/min	120	minutes
Unit Number		CTG-2	
Base Run Number		2-100 w/DB-SO3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		w/DB	w/DB	w/DB	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025	
Meter Calibration Factor	(Y)	1.017	1.017	1.017	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.820	1.820	1.820	in H_2O
Non-Console Manometer Used		No	No	No	
Probe Number	from ACS	SAMP-S3-0005	SAMP-S3-0005	SAMP-S3-0005	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	samp-bh-0009	samp-bh-0009	samp-bh-0009	
Impinger Case Number	from ACS	samp-bc-0029	samp-bc-0029	samp-bc-0029	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	SB
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600 **Max. Fuel Factor** 1.836

Gas Analysis Data

Run Number	2-100 w/DB-SO3-1		**Date**	09/25/18	**Run Start Time**	12:31	**Run Stop Time**	14:31
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.9	12.0	0.3	83.1	29.26	1.824	120.2	YES

Gas Analysis Data

Run Number	2-100 w/DB-SO3-2		**Date**	09/25/18	**Run Start Time**	03:47	**Run Stop Time**	05:47
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	4.9	12.0	0.2	83.1	29.27	1.809	120.8	YES

Gas Analysis Data

Run Number	2-100 w/DB-SO3-3		**Date**	09/25/18	**Run Start Time**	06:29	**Run Stop Time**	08:29
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
02:00	5.0	12.0	0.2	83.0	29.27	1.796	121.2	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	SB
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0022	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		2-100 w/DB-SO3-1		**Date**	09/25/18	**Start Time**	12:31	**Stop Time**	14:31
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	40.867	dcf	**Barometric Pressure**		(P_b)	29.98	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	70	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	799.30	736.80	614.50	961.90				
Initial Value	$(V_i),(W_i)$	710.00	729.30	612.00	951.20				
Net Value	$(V_n),(W_n)$	89.3	7.5	2.5	10.7				
Results									
Total Weight		(W_t)	110.00	g	**Water Vol Weighed**		($V_{wsg(std)}$)	5.186	scf
Std Meter Volume		($V_{m(std)}$)	41.512	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	63.12	%
Calc Moisture Content		($B_{ws(calc)}$)	11.11	%	**Final Moisture Content**		(B_{ws})	11.11	%

Moisture Content Data									
Run Number		2-100 w/DB-SO3-2		**Date**	09/25/18	**Start Time**	03:47	**Stop Time**	05:47
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	41.112	dcf	**Barometric Pressure**		(P_b)	29.91	in Hg
Average Stack Temp		$(t_s)_{avg}$	189	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	72	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	714.90	686.90	586.60	877.80				
Initial Value	$(V_i),(W_i)$	688.30	678.20	585.30	869.10				
Net Value	$(V_n),(W_n)$	26.6	8.7	1.3	8.7				
Results									
Total Weight		(W_t)	45.30	g	**Water Vol Weighed**		($V_{wsg(std)}$)	2.136	scf
Std Meter Volume		($V_{m(std)}$)	41.532	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	61.60	%
Calc Moisture Content		($B_{ws(calc)}$)	4.89	%	**Final Moisture Content**		(B_{ws})	4.89	%

Moisture Content Data									
Run Number		2-100 w/DB-SO3-3		**Date**	09/25/18	**Start Time**	06:29	**Stop Time**	08:29
Meter Box Number		SAMP-CP-0025			**Meter Cal Factor**		(Y)	1.017	
Total Meter Volume		(V_m)	41.760	dcf	**Barometric Pressure**		(P_b)	29.91	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F	**Stack Static Pressure**		(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.42	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O_2	H_2O_2	DI Water	Sil Gel				
Final Value	$(V_f),(W_f)$	771.10	718.80	615.60	859.80				
Initial Value	$(V_i),(W_i)$	685.90	713.00	614.10	845.80				
Net Value	$(V_n),(W_n)$	85.2	5.8	1.5	14.0				
Results									
Total Weight		(W_t)	106.50	g	**Water Vol Weighed**		($V_{wsg(std)}$)	5.021	scf
Std Meter Volume		($V_{m(std)}$)	42.042	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	63.38	%
Calc Moisture Content		($B_{ws(calc)}$)	10.67	%	**Final Moisture Content**		(B_{ws})	10.67	%

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	SB
Run Number	2-100 w/DB-SO3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	189.9	°F
Average Meter Temp	(t_m)	70.2	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	11.11	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	17.0	in Hg
PASS	**Post**	0.000	ft³/min@	10.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})		in
Probe Number	SAMP-S3-0005		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	samp-bh-0009		
Impinger Case Number	samp-bc-0029		

Pressures			
Barometric Pressure	(P_b)	29.98	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.11	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	12:31	**End**	14:31

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	710.0	729.3	612.0	951.2				
Post	799.3	736.8	614.5	961.9				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-S3-0005	SAMP-S3-0005	samp-bh-0009	samp-bc-0029	1015		**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_I$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.265	--	--	0.42	191	371	501	56	77	--	67	67	1.0	--	--	1.715	--	41.159
A-1	5.0	00:05:00	1.943	--	--	0.42	191	359	512	50	108	--	67	67	1.0	--	--	3.430	--	41.159
A-1	10.0	00:10:00	3.621	--	--	0.42	190	363	514	50	111	--	67	67	1.0	--	--	5.176	--	41.404
A-1	15.0	00:15:00	5.329	--	--	0.42	190	371	515	50	124	--	68	68	1.0	--	--	6.860	--	41.158
A-1	20.0	00:20:00	6.980	--	--	0.42	191	373	518	50	133	--	68	68	1.0	--	--	8.568	--	41.128
A-1	25.0	00:25:00	8.655	--	--	0.42	190	372	507	51	147	--	69	69	1.0	--	--	10.268	--	41.071
A-1	30.0	00:30:00	10.324	--	--	0.42	190	368	519	51	159	--	69	69	1.0	--	--	11.964	--	41.019
A-1	35.0	00:35:00	11.990	--	--	0.42	190	364	512	51	162	--	69	69	1.0	--	--	13.659	--	40.977
A-1	40.0	00:40:00	13.655	--	--	0.42	190	366	515	52	165	--	70	70	1.0	--	--	15.910	--	42.427
A-1	45.0	00:45:00	15.870	--	--	0.42	190	369	516	51	170	--	70	70	1.0	--	--	17.170	--	41.209
A-1	50.0	00:50:00	17.110	--	--	0.42	189	373	515	52	182	--	70	70	1.0	--	--	18.954	--	41.354
A-1	55.0	00:55:00	18.865	--	--	0.42	189	369	511	52	179	--	70	70	1.0	--	--	20.686	--	41.373
A-1	60.0	01:00:00	20.570	--	--	0.42	189	364	514	52	166	--	71	71	1.0	--	--	22.446	--	41.439
A-1	65.0	01:05:00	22.305	--	--	0.42	189	368	511	52	170	--	71	71	2.0	--	--	24.198	--	41.482
A-1	70.0	01:10:00	24.032	--	--	0.42	190	370	514	53	153	--	71	71	2.0	--	--	25.935	--	41.495
A-1	75.0	01:15:00	25.744	--	--	0.42	190	372	513	53	157	--	73	73	2.0	--	--	27.663	--	41.494
A-1	80.0	01:20:00	27.454	--	--	0.42	190	369	513	53	156	--	71	71	2.0	--	--	29.418	--	41.532
A-1	85.0	01:25:00	29.185	--	--	0.42	190	366	512	53	153	--	72	72	2.0	--	--	31.173	--	41.564
A-1	90.0	01:30:00	30.918	--	--	0.42	190	368	512	53	150	--	71	71	2.0	--	--	32.918	--	41.580
A-1	95.0	01:35:00	32.638	--	--	0.42	190	371	512	53	149	--	72	72	2.0	--	--	34.622	--	41.547
A-1	100.0	01:40:00	34.322	--	--	0.42	190	373	510	54	148	--	72	72	2.0	--	--	36.341	--	41.532
A-1	105.0	01:45:00	36.019	--	--	0.42	190	372	514	54	147	--	72	72	2.0	--	--	38.047	--	41.506
A-1	110.0	01:50:00	37.705	--	--	0.42	190	369	517	54	149	--	72	72	2.0	--	--	39.782	--	41.511
A-1	115.0	01:55:00	39.418	--	--	0.42	189	366	515	53	151	--	72	72	2.0	--	--	41.517	--	41.517
Last Pt	120.0	02:00:00	41.132	--	--	0.42	190	364	517	53	150		72	72	2.0	--	--		--	
Final Val	120.0	02:00:00	41.132											**Max Vac**	2.0	**Final Values**		41.517		
Average Values						0.42	190	368	513	52	149		70	70						
													70							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	SB
Run Number	2-100 w/DB-SO3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	188.7	°F
Average Meter Temp	(t_m)	71.9	
Orifice Meter Coefficient	$(\Delta H@)$	1.820	in H_2O
Square Root ΔP	$(\Delta p^{1/2}{}_{avg})$		in H_2O
Stack Moisture Content	(B_{ws})	4.89	%
Stack Dry Molecular Weight	(M_d)	29.27	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	17.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment				
Meter Box Number	SAMP-CP-0025			
Meter Cal Factor	(Y)	1.017		
Nozzle Number				
Average Nozzle Diameter	(D_{na})	--		in
Suggested Nozzle Diameter	(D_{ni})			in
Probe Number	SAMP-S3-0005			in
Probe Length	108			in
Liner Material	glass			
Sample Case / Oven Number	samp-bh-0009			
Impinger Case Number	samp-bc-0029			

Pressures			
Barometric Pressure	(P_b)	29.91	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.95	in Hg
Absolute Meter Pressure	(P_m)	30.04	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	03:47	**End**	05:47

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	688.3	678.2	585.3	869.1				
Post	714.9	686.9	586.6	877.8				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-S3-0005	SAMP-S3-0005	samp-bh-0009	samp-bc-0029	**1015**		**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP $(\Delta p^{1/2})$**	**Local Stack Velocity $(v_s)_l$**	**Cumul. Meter Volume $(V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume $(V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	47.005	--	--	0.42	189	387	506	55	169	--	69	69	1.0			1.744		41.859
A-2	5.0	00:05:00	48.722	--	--	0.42	189	384	514	52	167	--	70	70	2.0			3.497		41.965
A-3	10.0	00:10:00	50.451	--	--	0.42	189	381	516	52	163	--	70	70	2.0			5.270		42.163
A-4	15.0	00:15:00	52.200	--	--	0.42	189	376	511	54	167	--	70	70	2.0			7.045		42.268
A-5	20.0	00:20:00	53.950	--	--	0.42	189	376	516	52	167	--	71	71	2.0			8.707		41.795
A-6	25.0	00:25:00	55.593	--	--	0.42	188	375	514	53	163	--	71	71	2.0			10.444		41.775
B-1	30.0	00:30:00	57.309	--	--	0.42	188	376	511	54	165	--	72	72	2.0			12.178		41.753
B-2	35.0	00:35:00	59.026	--	--	0.42	189	374	519	54	164	--	72	72	2.0			13.912		41.737
B-3	40.0	00:40:00	60.743	--	--	0.42	189	376	514	54	163	--	72	72	2.0			15.647		41.724
B-4	45.0	00:45:00	62.460	--	--	0.42	189	375	519	54	164	--	72	72	2.0			17.363		41.670
B-5	50.0	00:50:00	64.159	--	--	0.42	189	374	518	54	165	--	73	73	2.0			19.076		41.619
B-6	55.0	00:55:00	65.858	--	--	0.42	189	375	516	54	162	--	73	73	2.0			20.787		41.575
C-1	60.0	01:00:00	67.556	--	--	0.42	188	376	516	53	164	--	73	73	2.0			22.522		41.580
C-2	65.0	01:05:00	69.277	--	--	0.42	188	368	513	54	169	--	73	73	2.0			24.271		41.607
C-3	70.0	01:10:00	71.011	--	--	0.42	189	372	511	55	165	--	73	73	2.0			25.962		41.540
C-4	75.0	01:15:00	72.689	--	--	0.42	188	374	519	54	165	--	73	73	2.0			27.672		41.508
C-5	80.0	01:20:00	74.385	--	--	0.42	188	369	516	54	166	--	73	73	2.0			29.386		41.486
C-6	85.0	01:25:00	76.085	--	--	0.42	188	372	514	54	164	--	73	73	2.0			30.800		41.067
D-1	90.0	01:30:00	77.488	--	--	0.42	189	376	518	54	165	--	73	73	2.0			32.865		41.514
D-2	95.0	01:35:00	79.536	--	--	0.42	189	375	519	54	166	--	72	72	2.0			34.617		41.540
D-3	100.0	01:40:00	81.270	--	--	0.42	188	376	516	54	167	--	72	72	2.0			36.337		41.528
D-4	105.0	01:45:00	82.973	--	--	0.42	189	371	511	54	168	--	72	72	2.0			38.070		41.531
D-5	110.0	01:50:00	84.689	--	--	0.42	189	375	513	54	168	--	72	72	2.0			39.803		41.534
D-6	115.0	01:55:00	86.405	--	--	0.42	189	372	511	54	165	--	72	72	2.0			41.533		41.533
Last Pt	120.0	02:00:00	88.117	--	--	0.42	189	371	515	54	167		72	72	2.0					
Final Val	120.0	02:00:00	88.117											**Max Vac**	2.0	**Final Values**		41.533		
Average Values						0.42	189	375	515	54	166		72	72						
													72							

Notes:

METHOD 8A (CONTROLLED CONDENSATE) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	SB
Run Number	2-100 w/DB-SO3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)		
Average Stack Temp	(t_s)	190.0	°F
Average Meter Temp	(t_m)	73.8	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)		in H_2O
Stack Moisture Content	(B_{ws})	10.67	%
Stack Dry Molecular Weight	(M_d)	29.27	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	--	in H_2O for	--	sec
	Pre (-)	--	in H_2O for	--	sec
PASS	**Post (+)**	--	in H_2O for	--	sec
	Post (-)	--	in H_2O for	--	sec

Sampling Equipment				
Meter Box Number	SAMP-CP-0025			
Meter Cal Factor	(Y)	1.017		
Nozzle Number				
Average Nozzle Diameter	(D_{na})	--		in
Suggested Nozzle Diameter	(D_{ni})			in
Probe Number	SAMP-S3-0005			in
Probe Length	108			in
Liner Material	glass			
Sample Case / Oven Number	samp-bh-0009			
Impinger Case Number	samp-bc-0029			

Pressures			
Barometric Pressure	(P_b)	29.91	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.95	in Hg
Absolute Meter Pressure	(P_m)	30.04	in Hg

Nozzle Measurements		**ID:**		
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0022

Run Time			
Start	06:29	**End**	08:29

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	685.9	713.0	614.1	845.8				
Post	771.1	718.8	615.6	859.8				

Wash Volumes						ml
						ml

Identification Nos.	SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025				SAMP-S3-0005	SAMP-S3-0005	samp-bh-0009	samp-bc-0029	**1015**		**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (375±25°F)**	**Filter Temp (525±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤185°F)**		**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F		°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	--		0.42	190	375	519	56	180		74	74	2.0			1.738		41.708
A-2	5.0	00:05:00	1.727	--		0.42	190	374	518	53	176		74	74	2.0			3.498		41.974
A-3	10.0	00:10:00	3.476	--		0.42	190	375	517	54	185		74	74	2.0			5.255		42.038
A-4	15.0	00:15:00	5.222	--		0.42	190	373	514	54	185		75	75	2.0			7.011		42.069
A-5	20.0	00:20:00	6.971	--		0.42	190	370	511	54	185		75	75	2.0			8.765		42.073
A-6	25.0	00:25:00	8.717	--		0.42	190	375	511	56	179		75	75	2.0			10.511		42.043
B-1	30.0	00:30:00	10.455	--		0.42	190	375	514	56	175		75	75	2.0			12.247		41.991
B-2	35.0	00:35:00	12.184	--		0.42	190	375	511	56	168		74	74	2.0			14.024		42.073
B-3	40.0	00:40:00	13.950	--		0.42	190	375	513	56	167		73	73	2.0			15.740		41.974
B-4	45.0	00:45:00	15.652	--		0.42	190	374	513	57	165		73	73	2.0			17.511		42.026
B-5	50.0	00:50:00	17.408	--		0.42	190	375	512	57	163		73	73	2.0			19.270		42.043
B-6	55.0	00:55:00	19.153	--		0.42	190	374	519	57	165		73	73	2.0			21.031		42.062
C-1	60.0	01:00:00	20.900	--		0.42	190	375	518	58	163		73	73	2.0			22.793		42.080
C-2	65.0	01:05:00	22.648	--		0.42	190	375	518	58	164		73	73	2.0			24.545		42.076
C-3	70.0	01:10:00	24.385	--		0.42	190	373	516	60	164		73	73	2.0			26.296		42.073
C-4	75.0	01:15:00	26.122	--		0.42	190	375	517	60	164		73	73	2.0			28.064		42.096
C-5	80.0	01:20:00	27.876	--		0.42	190	375	512	61	164		73	73	2.0			29.811		42.086
C-6	85.0	01:25:00	29.609	--		0.42	190	374	514	61	162		73	73	2.0			31.561		42.082
D-1	90.0	01:30:00	31.345	--		0.42	190	376	514	60	162		74	74	2.0			33.306		42.071
D-2	95.0	01:35:00	33.079	--		0.42	190	377	516	61	164		74	74	2.0			35.063		42.076
D-3	100.0	01:40:00	34.825	--		0.42	190	377	516	61	163		74	74	2.0			36.809		42.068
D-4	105.0	01:45:00	36.560	--		0.42	190	376	518	62	162		74	74	2.0			38.560		42.066
D-5	110.0	01:50:00	38.300	--		0.42	190	375	518	63	163		74	74	2.0			40.306		42.058
D-6	115.0	01:55:00	40.035	--		0.42	190	375	518	63	163		74	74	2.0			42.042		42.042
Last Pt	120.0	02:00:00	41.760	--																
Final Val	120.0	02:00:00	41.760											**Max Vac**	2.0	**Final Values**		42.042		
Average Values						0.42	190	375	515	58	169		74	74						
													74							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
without Duct Burners Firing
NH_3 Data

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	2-Base-NH3-1	2-Base-NH3-2	2-Base-NH3-3	Average	Units	Limits
Run Start Time	15:40	17:15	18:44		hh:mm	
Run Stop Time	16:40	18:15	19:44		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	1.017	1.017	1.017			
Pitot Tube Coefficient	0.8390	0.8390	0.8390			
Stack Test Data	**2-Base-NH3-1**	**2-Base-NH3-2**	**2-Base-NH3-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	0.000	0.000	44.281		ft^3	
Final Meter Volume	43.346	43.950	88.300		ft^3	
Total Meter Volume	43.346	43.950	44.019	43.772	ft^3	
Total Sampling Time	60.00	60.00	60.00	60.00	min	
Average Meter Temperature	70.58	73.75	77.08	73.81	°F	
Average Stack Temperature	203.67	205.08	204.08	204.28	°F	
Barometric Pressure	29.69	29.68	29.67	29.68	in Hg	
Stack Static Pressure	-0.89	-0.89	-0.89	-0.89	in H_2O	
Absolute Stack Pressure	29.62	29.61	29.60	29.61	in Hg	
Average Orifice Pressure Drop	1.82	1.82	1.80	1.81	in H_2O	
Absolute Meter Pressure	29.82	29.81	29.80	29.81	in Hg	
Avg Square Root Pitot Pressure	1.19	1.20	1.27	1.22	$\sqrt{(\text{in } H_2O)}$	
Moisture Content Data	**2-Base-NH3-1**	**2-Base-NH3-2**	**2-Base-NH3-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	77.80	71.10	87.70	78.87	g	
Silica Gel Weight Gain	14.10	17.60	8.60	13.43	g	
Total Water Volume Collected	92.07	88.86	96.47	92.47	ml	
Standard Water Vapor Volume	4.33	4.18	4.54	4.35	scf	
Standard Meter Volume	43.7	44.1	43.8	43.9	dscf	
Standard Metric Meter Volume	1.2	1.2	1.2	1.2	dscm	
Calculated Stack Moisture	9.02	8.67	9.39	9.02	%	
Saturated Stack Moisture	85.33	87.87	86.12	86.44	%	
Reported Stack Moisture Content	9.02	8.67	9.39	9.02	%	
Gas Analysis Data	**2-Base-NH3-1**	**2-Base-NH3-2**	**2-Base-NH3-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.1	4.1	4.1	4.1	%	
Oxygen Content	13.5	13.5	13.5	13.5	%	
Carbon Monoxide Content	0.6	0.6	0.6	0.6	ppm	
Nitrogen Content	82.4	82.4	82.4	82.4	%	
Stack Dry Molecular Weight	29.20	29.20	29.20	29.20	lb/lb-mole	
Stack Wet Molecular Weight	28.19	28.23	28.15	28.19	lb/lb-mole	
Calculated Fuel Factor	1.792	1.792	1.787	1.790		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	163.7	163.7	163.8	163.7	%	

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	**2-Base-NH3-1**	**2-Base-NH3-2**	**2-Base-NH3-3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	75.86	76.58	81.59	78.01	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft^2	
Actual Stack Flow Rate	1,290,513	1,302,779	1,387,914	1,327,068	acfm	
Wet Standard Stack Flow Rate	60,994	61,422	65,512	62,643	wkscfh	
Dry Standard Stack Flow Rate	55,494,901	56,097,006	59,363,478	56,985,128	dscfh	
Ammonia Analysis (CTM-027)	**2-Base-NH3-1**	**2-Base-NH3-2**	**2-Base-NH3-3**	**Average**	**Units**	**Limits**
Front Half Results (C_f)	19.7674	28.2182	22.4031	23.4629	mg/l	
Back Half Results (C_b)	0.2588	0.1448	0.0566	0.1534	mg/l	
Practical Quantitation Limit	0.1000	0.1000	0.1000	0.1000	mg/l	
Blank Results	0.0460	0.0460	0.0460	0.0460	mg/l	
Front Half Sample Volume	215	164	215	198	ml	
Back Half Sample Volume	281	274	217	257	ml	
Volume of NH_3	0.00610	0.00659	0.00682	0.00650	L	
NH_3 Concentration	4.93	5.28	5.49	5.23	ppmvd	--
NH_3 Concentration	3.93	4.21	4.38	4.17	ppm@15%O_2	5.00

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		BL/SB	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		CTG-2	
Base Run Number		2-Base-NH3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025	
Meter Calibration Factor	(Y)	1.017	1.017	1.017	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.820	1.820	1.820	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	A8169	A8169	A8169	
Pitot Tube Coefficient	(C_p)	0.8390	0.8390	0.8390	
Probe Number	from ACS	SAMP-HP-0152	SAMP-HP-0152	SAMP-HP-0152	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	5238	5238	5238	
Impinger Case Number	from ACS	SAMP-BC-0017	SAMP-BC-0022	SAMP-BC-0017	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	BL/SB
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600 **Max. Fuel Factor** 1.836

Gas Analysis Data

Run Number	2-Base-NH3-1		**Date**	09/25/18	**Run Start Time**	15:40	**Run Stop Time**	16:40
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.1	13.5	0.6	82.4	29.20	1.792	163.7	YES

Gas Analysis Data

Run Number	2-Base-NH3-2		**Date**	09/25/18	**Run Start Time**	17:15	**Run Stop Time**	18:15
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.1	13.5	0.6	82.4	29.20	1.792	163.7	YES

Gas Analysis Data

Run Number	2-Base-NH3-3		**Date**	09/25/18	**Run Start Time**	18:44	**Run Stop Time**	19:44
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.1	13.5	0.6	82.4	29.20	1.787	163.8	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	BL/SB
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/24/18	500	499.9	-0.1	Pass
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		2-Base-NH3-1		**Date**	09/25/18	**Start Time**	15:40	**Stop Time**	16:40
Meter Box Number		SAMP-CP-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	43.346	dcf		**Barometric Pressure**	(P_b)	29.69	in Hg
Average Stack Temp		$(t_s)_{avg}$	204	°F		**Stack Static Pressure**	(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	71	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.82	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	651.50	707.60	690.30	880.30				
Initial Value	(V_i),(W_i)	652.60	696.40	622.60	866.20				
Net Value	(V_n),(W_n)	-1.1	11.2	67.7	14.1				
Results									
Total Weight		(W_t)	91.90	g		**Water Vol Weighed**	($V_{wsg(std)}$)	4.333	scf
Std Meter Volume		($V_{m(std)}$)	43.727	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	85.33	%
Calc Moisture Content		($B_{ws(calc)}$)	9.02	%		**Final Moisture Content**	(B_{ws})	9.02	%

Moisture Content Data									
Run Number		2-Base-NH3-2		**Date**	09/25/18	**Start Time**	17:15	**Stop Time**	18:15
Meter Box Number		SAMP-CP-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	43.950	dcf		**Barometric Pressure**	(P_b)	29.68	in Hg
Average Stack Temp		$(t_s)_{avg}$	205	°F		**Stack Static Pressure**	(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	74	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.82	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	682.30	765.90	642.30	946.20				
Initial Value	(V_i),(W_i)	659.30	732.80	627.30	928.60				
Net Value	(V_n),(W_n)	23.0	33.1	15.0	17.6				
Results									
Total Weight		(W_t)	88.70	g		**Water Vol Weighed**	($V_{wsg(std)}$)	4.182	scf
Std Meter Volume		($V_{m(std)}$)	44.059	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	87.87	%
Calc Moisture Content		($B_{ws(calc)}$)	8.67	%		**Final Moisture Content**	(B_{ws})	8.67	%

Moisture Content Data									
Run Number		2-Base-NH3-3		**Date**	09/25/18	**Start Time**	18:44	**Stop Time**	19:44
Meter Box Number		SAMP-CP-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	44.019	dcf		**Barometric Pressure**	(P_b)	29.67	in Hg
Average Stack Temp		$(t_s)_{avg}$	204	°F		**Stack Static Pressure**	(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	77	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	(V_f),(W_f)	736.50	712.70	628.70	888.90				
Initial Value	(V_i),(W_i)	670.90	695.90	623.40	880.30				
Net Value	(V_n),(W_n)	65.6	16.8	5.3	8.6				
Results									
Total Weight		(W_t)	96.30	g		**Water Vol Weighed**	($V_{wsg(std)}$)	4.541	scf
Std Meter Volume		($V_{m(std)}$)	43.837	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	86.12	%
Calc Moisture Content		($B_{ws(calc)}$)	9.39	%		**Final Moisture Content**	(B_{ws})	9.39	%

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL/SB
Run Number	2-Base-NH3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	203.7	°F
Average Meter Temp	(t_m)	70.6	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.19	in H_2O
Stack Moisture Content	(B_{ws})	9.02	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	--	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	20.0	in Hg
PASS	**Post**	0.000	ft³/min@	20.0	in Hg
Pitot	**Pre (+)**	5.0	in H_2O for	15.0	sec
	Pre (-)	5.0	in H_2O for	15.0	sec
PASS	**Post (+)**	5.0	in H_2O for	15.0	sec
	Post (-)	5.0	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})	0.2036	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0017		

Pressures			
Barometric Pressure	(P_b)	29.69	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.62	in Hg
Absolute Meter Pressure	(P_m)	29.82	in Hg

Nozzle Measurements			**ID:**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	15:40	**End**	16:40

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	652.6	696.4	622.6	866.2				
Post	651.5	707.6	690.3	880.3				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-HP-0152	SAMP-HP-0152	**5238**	SAMP-BC-0017			**SAMP-CP-0025**		SAMP-CP-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**			**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_i$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	1.50		1.82	203	256	256	58			68	68	4.0	1.22	78.27	3.526	--	42.309
A-2	5.0	00:05:00	3.478	1.40		1.82	203	256	256	58			68	68	4.0	1.18	75.62	7.066	--	42.394
A-3	10.0	00:10:00	6.970	1.40		1.82	204	256	258	61			68	68	4.0	1.18	75.67	10.543	--	42.171
A-1	15.0	00:15:00	10.400	1.50		1.82	205	255	259	66			68	68	4.0	1.22	78.39	14.042	--	42.127
A-2	20.0	00:20:00	13.852	1.40		1.82	205	255	256	68			70	70	4.0	1.18	75.73	17.642	--	42.340
A-3	25.0	00:25:00	17.416	1.30		1.82	203	256	255	68			71	71	4.0	1.14	72.87	21.338	--	42.676
A-1	30.0	00:30:00	21.083	1.50		1.82	204	255	260	68			71	71	4.0	1.22	78.33	25.069	--	42.976
A-2	35.0	00:35:00	24.785	1.40		1.82	202	257	260	68			72	72	4.0	1.18	75.56	28.795	--	43.193
A-3	40.0	00:40:00	28.488	1.30		1.82	203	255	257	67			72	72	4.0	1.14	72.87	32.515	--	43.353
A-1	45.0	00:45:00	32.185	1.40		1.82	204	255	257	67			73	73	4.0	1.18	75.67	36.243	--	43.492
A-2	50.0	00:50:00	35.898	1.40		1.82	204	255	257	66			73	73	4.0	1.18	75.67	40.122	--	43.769
A-3	55.0	00:55:00	39.760	1.40		1.82	204	255	257	66			73	73	4.0	1.18	75.67	43.723	--	43.723
Last Pt	60.0	01:00:00	43.346																--	
Final Val	60.0	01:00:00	43.346											**Max Vac**	4.0	**Final Values**		43.723		
Average Values				1.41		1.82	204	256	257	65			71	71		1.19	75.86			
													71							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL/SB
Run Number	2-Base-NH3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	205.1	°F
Average Meter Temp	(t_m)	73.8	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.20	in H_2O
Stack Moisture Content	(B_{ws})	8.67	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.73	acfm
ΔP to ΔH Isokinetic Factor	(K)	--	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	16.0	in Hg
Pitot	Pre (+)	3.5	in H_2O for	15.0	sec
	Pre (-)	6.2	in H_2O for	15.0	sec
PASS	Post (+)	5.5	in H_2O for	15.0	sec
	Post (-)	6.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})	0.1998	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0022		

Pressures			
Barometric Pressure	(P_b)	29.68	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.61	in Hg
Absolute Meter Pressure	(P_m)	29.81	in Hg

Nozzle Measurements			ID:	
Pre	--	--	--	PASS
Post	--	--	--	PASS

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	17:15	End	18:15

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	659.3	732.8	627.3	928.6				
Post	682.3	765.9	642.3	946.2				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-HP-0152	SAMP-HP-0152	5238	SAMP-BC-0022			SAMP-CP-0025		SAMP-CP-0025					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)			Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity ($v_s)_i$	Cumul. Meter Volume ($V_m)_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume ($V_m)_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	1.50		1.82	203	256	259	62			72	72	4.0	1.22	78.23	3.691	--	44.294
A-2	5.0	00:05:00	3.670	1.40		1.82	204	256	259	62			72	72	4.0	1.18	75.63	7.292	--	43.751
A-3	10.0	00:10:00	7.250	1.40		1.82	204	256	256	64			72	72	4.0	1.18	75.63	10.980	--	43.920
A-1	15.0	00:15:00	10.917	1.50		1.82	205	256	260	68			73	73	4.0	1.22	78.35	14.758	--	44.273
A-2	20.0	00:20:00	14.680	1.40		1.82	206	257	257	68			73	73	4.0	1.18	75.75	19.195	--	46.068
A-3	25.0	00:25:00	19.100	1.40		1.82	206	256	257	68			73	73	4.0	1.18	75.75	22.041	--	44.082
A-1	30.0	00:30:00	21.935	1.50		1.82	206	256	257	68			73	73	4.0	1.22	78.41	25.740	--	44.126
A-2	35.0	00:35:00	25.620	1.40		1.82	206	255	258	66			75	75	4.0	1.18	75.75	29.391	--	44.086
A-3	40.0	00:40:00	29.270	1.40		1.82	205	256	259	66			75	75	4.0	1.18	75.69	33.211	--	44.281
A-1	45.0	00:45:00	33.090	1.50		1.82	204	256	258	66			75	75	4.0	1.22	78.29	36.737	--	44.084
A-2	50.0	00:50:00	36.615	1.40		1.82	206	256	259	68			76	76	4.0	1.18	75.75	40.495	--	44.176
A-3	55.0	00:55:00	40.380	1.40		1.82	206	256	259	68			76	76	4.0	1.18	75.75	44.059	--	44.059
Last Pt	60.0	01:00:00	43.950																--	
Final Val	60.0	01:00:00	43.950											Max Vac	4.0	Final Values		44.059		
Average Values				1.43		1.82	205	256	258	66			74	74		1.20	76.58			
													74							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL/SB
Run Number	2-Base-NH3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	204.1	°F
Average Meter Temp	(t_m)	77.1	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.27	in H_2O
Stack Moisture Content	(B_{ws})	9.39	%
Stack Dry Molecular Weight	(M_d)	29.20	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.73	acfm
ΔP to ΔH Isokinetic Factor	(K)	--	

Leak Checks					
Train	Pre	0.001	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	15.0	in Hg
Pitot	Pre (+)	5.0	in H_2O for	15.0	sec
	Pre (-)	5.2	in H_2O for	15.0	sec
PASS	Post (+)	5.4	in H_2O for	15.0	sec
	Post (-)	6.0	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number			
Average Nozzle Diameter	(D_{na})	--	in
Suggested Nozzle Diameter	(D_{ni})	0.1966	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0017		

Pressures			
Barometric Pressure	(P_b)	29.67	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.60	in Hg
Absolute Meter Pressure	(P_m)	29.80	in Hg

Nozzle Measurements			ID:	
Pre	--	--	--	PASS
Post	--	--	--	PASS

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0031

Run Time			
Start	18:44	End	19:44

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	670.9	695.9	623.4	880.3				
Post	736.5	712.7	628.7	888.9				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0025	SAMP-CP-0025	SAMP-CP-0025			SAMP-HP-0152	SAMP-HP-0152	5238	SAMP-BC-0017			SAMP-CP-0025		SAMP-CP-0025					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)			Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity (v_s)$_i$	Cumul. Meter Volume (V_m)$_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V_m)$_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F			°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	44.281	1.70		1.80	206	259	262	56			75	75	4.0	1.30	83.60	3.563	--	42.757
A-2	5.0	00:05:00	47.845	1.70		1.80	205	259	262	52			76	76	4.0	1.30	83.54	7.242	--	43.454
A-3	10.0	00:10:00	51.532	1.50		1.80	204	259	261	53			76	76	4.0	1.22	78.41	10.911	--	43.642
A-1	15.0	00:15:00	55.208	1.50		1.80	204	258	261	54			77	77	4.0	1.22	78.41	14.584	--	43.752
A-2	20.0	00:20:00	58.896	1.50		1.80	204	259	264	55			77	77	4.0	1.22	78.41	18.262	--	43.829
A-3	25.0	00:25:00	62.589	1.70		1.80	202	259	263	55			77	77	4.0	1.30	83.35	21.914	--	43.827
A-1	30.0	00:30:00	66.255	1.70		1.80	204	258	260	55			78	78	4.0	1.30	83.48	25.574	--	43.841
A-2	35.0	00:35:00	69.937	1.60		1.80	204	258	258	57			78	78	4.0	1.26	80.98	29.250	--	43.874
A-3	40.0	00:40:00	73.634	1.80		1.80	204	258	257	57			78	78	4.0	1.34	85.90	32.888	--	43.851
A-1	45.0	00:45:00	77.294	1.60		1.80	203	258	259	58			78	78	4.0	1.26	80.92	36.540	--	43.848
A-2	50.0	00:50:00	80.967	1.60		1.80	204	258	260	57			77	77	4.0	1.26	80.98	40.190	--	43.844
A-3	55.0	00:55:00	84.632	1.60		1.80	205	258	259	57			78	78	4.0	1.26	81.04	43.837	--	43.837
Last Pt	60.0	01:00:00	88.300																--	
Final Val	60.0	01:00:00	88.300											Max Vac	4.0	Final Values		43.837		
Average Values				1.63		1.80	204	258	261	56			77	77		1.27	81.59			
													77							

Notes:

EMISSION DATA RECORDS

Unit #CTG-2
Base Load
with Duct Burners Firing
NH_3 Data

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Run Start Time	09:25	11:24	12:57		hh:mm	
Run Stop Time	10:26	12:24	13:57		hh:mm	
Test Date	09/25/18	09/25/18	09/25/18		mm/dd/yy	
Load	w/DB	w/DB	w/DB		% or w/DB	--
Meter Calibration Factor	1.017	1.017	1.017			
Pitot Tube Coefficient	0.8390	0.8390	0.8390			
Stack Test Data	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Initial Meter Volume	0.000	0.000	0.000		ft^3	
Final Meter Volume	44.206	44.444	43.675		ft^3	
Total Meter Volume	44.206	44.444	43.675	44.108	ft^3	
Total Sampling Time	60.00	60.00	60.00	60.00	min	
Average Meter Temperature	74.77	68.23	70.08	71.03	°F	
Average Stack Temperature	191.08	190.00	190.00	190.36	°F	
Barometric Pressure	29.78	29.78	29.75	29.77	in Hg	
Stack Static Pressure	0.55	0.55	0.55	0.55	in H_2O	
Absolute Stack Pressure	29.82	29.82	29.79	29.81	in Hg	
Average Orifice Pressure Drop	1.82	1.82	1.82	1.82	in H_2O	
Absolute Meter Pressure	29.91	29.91	29.88	29.90	in Hg	
Moisture Content Data	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	68.50	93.40	96.00	85.97	g	
Silica Gel Weight Gain	13.30	19.10	18.10	16.83	g	
Total Water Volume Collected	81.95	112.70	114.31	102.99	ml	
Standard Water Vapor Volume	3.86	5.30	5.38	4.85	scf	
Standard Meter Volume	44.4	45.2	44.2	44.6	dscf	
Standard Metric Meter Volume	1.3	1.3	1.3	1.3	dscm	
Calculated Stack Moisture	8.00	10.51	10.85	9.79	%	
Saturated Stack Moisture	65.14	63.65	63.72	64.17	%	
Reported Stack Moisture Content	8.00	10.51	10.85	9.79	%	
Gas Analysis Data	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.9	4.9	5.0	4.9	%	
Oxygen Content	12.0	12.0	12.0	12.0	%	
Carbon Monoxide Content	0.4	0.3	0.3	0.3	ppm	
Nitrogen Content	83.1	83.1	83.0	83.1	%	
Stack Dry Molecular Weight	29.26	29.27	29.27	29.27	lb/lb-mole	
Stack Wet Molecular Weight	28.36	28.08	28.05	28.16	lb/lb-mole	
Calculated Fuel Factor	1.824	1.809	1.796	1.810		
Fuel F-Factor	8632.22	8632.22	8632.22	8632.22	dscf/MMBtu	
Percent Excess Air	120.2	120.8	121.2	120.7	%	

CTM 027 (AMMONIA) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	74.20	73.86	71.42	73.16	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft^2	
Actual Stack Flow Rate	1,262,325	1,256,517	1,215,000	1,244,614	acfm	
Wet Standard Stack Flow Rate	61,218	61,037	58,961	60,405	wkscfh	
Dry Standard Stack Flow Rate	56,322,805	54,622,585	52,561,784	54,502,391	dscfh	
Ammonia Analysis (CTM-027)	2-100 w/DB-NH3-1	2-100 w/DB-NH3-2	2-100 w/DB-NH3-3	**Average**	**Units**	**Limits**
Front Half Results (C_f)	7.8704	24.4697	22.4464	18.2622	mg/l	
Back Half Results (C_b)	0.1293	0.1294	0.1082	0.1223	mg/l	
Practical Quantitation Limit	0.1000	0.1000	0.1000	0.1000	mg/l	
Blank Results	0.0460	0.0460	0.0460	0.0460	mg/l	
Front Half Sample Volume	168	220	223	204	ml	
Back Half Sample Volume	263	219	288	257	ml	
Volume of NH_3	0.00191	0.00764	0.00711	0.00555	L	
NH_3 Concentration	1.52	5.97	5.68	4.39	ppmvd	--
NH_3 Concentration	1.01	3.96	3.77	2.91	ppm@15%O_2	5.00

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		BL	
Date for Preliminary Run	(mm/dd/yy)	09/25/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		CTG-2	
Base Run Number		2-100 w/DB-NH3	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/25/18	09/25/18	09/25/18	
Load		w/DB	w/DB	w/DB	% or w/DB
Fuel F-Factor		8632.22	8632.22	8632.22	dscf/MMBtu
Meter Box Number	from ACS	samp-cp-0025	samp-cp-0025	samp-cp-0025	
Meter Calibration Factor	(Y)	1.017	1.017	1.017	
Orifice Meter Coefficient	($\Delta H_@$)	1.820	1.820	1.820	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	A8169	A8169	A8169	
Pitot Tube Coefficient	(C_p)	0.8390	0.8390	0.8390	
Probe Number	from ACS	SAMP-HP-0152	SAMP-HP-0152	SAMP-HP-0152	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	5238	5238	5238	
Impinger Case Number	from ACS	SAMP-BC-0017	SAMP-BC-0017	SAMP-BC-0017	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18		
Sampling Location	CTG-2 Stack	**Operator**	BL		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	2-100 w/DB-NH3-1		**Date**	09/25/18	**Run Start Time**	09:25	**Run Stop Time**	10:26
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:01	4.9	12.0	0.4	83.1	29.26	1.824	120.2	YES

Gas Analysis Data

Run Number	2-100 w/DB-NH3-2		**Date**	09/25/18	**Run Start Time**	11:24	**Run Stop Time**	12:24
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	4.9	12.0	0.3	83.1	29.27	1.809	120.8	YES

Gas Analysis Data

Run Number	2-100 w/DB-NH3-3		**Date**	09/25/18	**Run Start Time**	12:57	**Run Stop Time**	13:57
Sample Analysis Time	**CO_2 Conc.** ($\%CO_2$)	**O_2 Conc.** ($\%O_2$)	**CO Conc.** (ppmCO)	**N_2 Conc.** ($\%N_2$)	**Dry Molecular Weight** (M_d)	**Calculated Fuel Factor** $(F_o)_{avg}$	**Excess Air** $(\%EA)_{avg}$	**Fuel Factor in Range**
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	5.0	12.0	0.3	83.0	29.27	1.796	121.2	YES

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES			
Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/25/18
Sampling Location	CTG-2 Stack	**Operator**	BL
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0031	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Preliminary Date	09/25/18	500	499.9	-0.1	Pass
Test Day 1	09/25/18	500	499.9	-0.1	Pass

Moisture Content Data									
Run Number		2-100 w/DB-NH3-1		**Date**	09/25/18	**Start Time**	09:25	**Stop Time**	10:26
Meter Box Number		samp-cp-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	44.206	dcf		**Barometric Pressure**	(P_b)	29.78	in Hg
Average Stack Temp		$(t_s)_{avg}$	191	°F		**Stack Static Pressure**	(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	75	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.82	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	744.30	741.90	632.10	916.90				
Initial Value	$(V_i),(W_i)$	692.00	725.70	632.10	903.60				
Net Value	$(V_n),(W_n)$	52.3	16.2	0.0	13.3				
Results									
Total Weight		(W_t)	81.80	g		**Water Vol Weighed**	$(V_{wsg(std)})$	3.857	scf
Std Meter Volume		$(V_{m(std)})$	44.379	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	65.14	%
Calc Moisture Content		$(B_{ws(calc)})$	8.00	%		**Final Moisture Content**	(B_{ws})	8.00	%

Moisture Content Data									
Run Number		2-100 w/DB-NH3-2		**Date**	09/25/18	**Start Time**	11:24	**Stop Time**	12:24
Meter Box Number		samp-cp-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	44.444	dcf		**Barometric Pressure**	(P_b)	29.78	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F		**Stack Static Pressure**	(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	68	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.82	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	731.70	711.60	633.30	866.20				
Initial Value	$(V_i),(W_i)$	687.60	675.30	620.30	847.10				
Net Value	$(V_n),(W_n)$	44.1	36.3	13.0	19.1				
Results									
Total Weight		(W_t)	112.50	g		**Water Vol Weighed**	$(V_{wsg(std)})$	5.304	scf
Std Meter Volume		$(V_{m(std)})$	45.170	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	63.65	%
Calc Moisture Content		$(B_{ws(calc)})$	10.51	%		**Final Moisture Content**	(B_{ws})	10.51	%

Moisture Content Data									
Run Number		2-100 w/DB-NH3-3		**Date**	09/25/18	**Start Time**	12:57	**Stop Time**	13:57
Meter Box Number		samp-cp-0025				**Meter Cal Factor**	(Y)	1.017	
Total Meter Volume		(V_m)	43.675	dcf		**Barometric Pressure**	(P_b)	29.75	in Hg
Average Stack Temp		$(t_s)_{avg}$	190	°F		**Stack Static Pressure**	(P_{static})	0.55	in H_2O
Average Meter Temp		$(t_m)_{avg}$	70	°F		**Avg Orifice Pressure**	$(\Delta H)_{avg}$	1.82	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2SO_4	H_2SO_4	-	Sil Gel				
Final Value	$(V_f),(W_f)$	720.30	774.80	637.00	928.60				
Initial Value	$(V_i),(W_i)$	665.30	742.80	628.00	910.50				
Net Value	$(V_n),(W_n)$	55.0	32.0	9.0	18.1				
Results									
Total Weight		(W_t)	114.10	g		**Water Vol Weighed**	$(V_{wsg(std)})$	5.380	scf
Std Meter Volume		$(V_{m(std)})$	44.190	dscf		**Sat. Moisture Content**	$(B_{ws(svp)})$	63.72	%
Calc Moisture Content		$(B_{ws(calc)})$	10.85	%		**Final Moisture Content**	(B_{ws})	10.85	%

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL
Run Number	2-100 w/DB-NH3-1

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	191.1	°F
Average Meter Temp	(t_m)	74.8	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.18	in H_2O
Stack Moisture Content	(B_{ws})	8.00	%
Stack Dry Molecular Weight	(M_d)	29.26	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.004	ft³/min@	15.0	in Hg
Pitot	Pre (+)	3.5	in H_2O for	15.0	sec
	Pre (-)	3.1	in H_2O for	15.0	sec
PASS	Post (+)	6.8	in H_2O for	15.0	sec
	Post (-)	5.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number	na		
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2024	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0017		

Pressures			
Barometric Pressure	(P_b)	29.78	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.82	in Hg
Absolute Meter Pressure	(P_m)	29.91	in Hg

Nozzle Measurements			ID: na	
Pre	--	--	--	PASS
Post	--	--	--	PASS

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	09:25	End	10:26

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	692.0	725.7	632.1	903.6				
Post	744.3	741.9	632.1	916.9				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0025	samp-cp-0025	samp-cp-0025			SAMP-HP-0152	SAMP-HP-0152	5238	SAMP-BC-0017			samp-cp-0025		samp-cp-0025					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤--°F)	CPM Filter Temp (--±--°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity (v_s)$_i$	Cumul. Meter Volume (V_m)$_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V_m)$_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	1.40	#DIV/0!	1.82	192	254	258	60			73	73	4.0	1.18	74.52	3.702	--	44.420
A-2	5.0	00:05:00	3.675	1.50	#DIV/0!	1.82	192	255	256	63			74	74	4.0	1.22	77.13	7.406	--	44.439
A-3	10.0	00:10:00	7.360	1.50	#DIV/0!	1.82	192	255	255	67			75	75	4.0	1.22	77.13	11.019	--	44.076
B-1	15.0	00:15:00	10.960	1.50	#DIV/0!	1.82	192	255	255	68			75	75	4.0	1.22	77.13	14.660	--	43.979
B-2	20.0	00:20:00	14.588	1.50	#DIV/0!	1.82	192	255	260	68			75	75	4.0	1.22	77.13	18.184	--	43.641
B-3	25.0	00:25:00	18.100	1.30	#DIV/0!	1.82	192	255	258	66			75	75	4.0	1.14	71.80	22.050	--	44.101
C-1	30.0	00:30:00	21.953	1.30	#DIV/0!	1.82	192	255	255	65			75	75	4.0	1.14	71.80	25.798	--	44.226
C-2	35.0	00:35:00	25.688	1.30	#DIV/0!	1.82	192	255	256	64			75	75	4.0	1.14	71.80	29.512	--	44.268
C-3	40.0	00:40:00	29.389	1.30	#DIV/0!	1.82	188	255	259	64			75	75	4.0	1.14	71.58	33.256	--	44.342
D-1	45.0	00:45:00	33.120	1.30	#DIV/0!	1.82	190	256	259	63			75	75	4.0	1.14	71.69	36.970	--	44.364
D-2	50.0	00:50:00	36.821	1.30	#DIV/0!	1.82	190	254	258	65			75	75	4.0	1.14	71.69	40.692	--	44.391
D-3	55.0	00:55:00	40.530	1.50	#DIV/0!	1.82	190	254	258	65			75	75	4.0	1.22	77.01	44.381	--	44.381
Last Pt	60.0	01:00:00	44.206		#DIV/0!	1.82	190	254	258	65			75	75	4.0				--	
Final Val	60.0	01:00:00	44.206											Max Vac	4.0	Final Values		44.381		
Average Values				1.39		1.82	191	255	257	65			75	75		1.18	74.20			
													75							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL
Run Number	2-100 w/DB-NH3-2

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	190.0	°F
Average Meter Temp	(t_m)	68.2	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.17	in H_2O
Stack Moisture Content	(B_{ws})	10.51	%
Stack Dry Molecular Weight	(M_d)	29.27	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	15.0	in Hg
Pitot	Pre (+)	3.5	in H_2O for	15.0	sec
	Pre (-)	3.1	in H_2O for	15.0	sec
PASS	Post (+)	6.8	in H_2O for	15.0	sec
	Post (-)	5.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number	na		
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2021	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0017		

Pressures			
Barometric Pressure	(P_b)	29.78	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.82	in Hg
Absolute Meter Pressure	(P_m)	29.91	in Hg

Nozzle Measurements			ID: na	
Pre	--	--	--	PASS
Post	--	--	--	PASS

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	11:24	End	12:24

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	687.6	675.3	620.3	847.1				
Post	731.7	711.6	633.3	866.2				

Wash Volumes					
					ml
					ml

Identification Nos.		samp-cp-0025	samp-cp-0025	samp-cp-0025			SAMP-HP-0152	SAMP-HP-0152	5238	SAMP-BC-0017			samp-cp-0025		samp-cp-0025					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤--°F)	CPM Filter Temp (--±--°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity ($v_s)_i$	Cumul. Meter Volume ($V_m)_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume ($V_m)_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	1.40	#DIV/0!	1.82	190	256	260	59			65	65	4.0	1.18	74.77	3.740	--	44.876
A-2	5.0	00:05:00	3.657	1.40	#DIV/0!	1.82	190	256	257	59			66	66	4.0	1.18	74.77	7.459	--	44.754
A-3	10.0	00:10:00	7.301	1.40	#DIV/0!	1.82	190	255	255	63			66	66	4.0	1.18	74.77	11.171	--	44.684
B-1	15.0	00:15:00	10.938	1.40	#DIV/0!	1.82	190	256	257	68			68	68	4.0	1.18	74.77	14.884	--	44.653
B-2	20.0	00:20:00	14.590	1.30	#DIV/0!	1.82	190	256	260	68			68	68	4.0	1.14	72.05	18.608	--	44.659
B-3	25.0	00:25:00	18.252	1.30	#DIV/0!	1.82	190	255	257	68			68	68	4.0	1.14	72.05	22.346	--	44.691
C-1	30.0	00:30:00	21.928	1.30	#DIV/0!	1.82	190	256	256	68			69	69	4.0	1.14	72.05	26.046	--	44.650
C-2	35.0	00:35:00	25.574	1.30	#DIV/0!	1.82	190	255	259	68			69	69	4.0	1.14	72.05	29.751	--	44.627
C-3	40.0	00:40:00	29.225	1.40	#DIV/0!	1.82	190	255	256	68			69	69	4.0	1.18	74.77	33.511	--	44.682
D-1	45.0	00:45:00	32.930	1.40	#DIV/0!	1.82	190	255	257	68			69	69	4.0	1.18	74.77	37.190	--	44.628
D-2	50.0	00:50:00	36.555	1.40	#DIV/0!	1.82	190	251	255	68			70	70	4.0	1.18	74.77	40.910	--	44.629
D-3	55.0	00:55:00	40.227	1.40	#DIV/0!	1.82	190	256	258	66			70	70	4.0	1.18	74.77	45.181	--	45.181
Last Pt	60.0	01:00:00	44.444		#DIV/0!	1.82	190	256	258	66			70	70	4.0				--	
Final Val	60.0	01:00:00	44.444											Max Vac	4.0	Final Values		45.181		
Average Values				1.37		1.82	190	255	257	66			68	68		1.17	73.86			
													68							

Notes:

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	BL
Run Number	2-100 w/DB-NH3-3

Filter #
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.8390	A8169
Average Stack Temp	(t_s)	190.0	°F
Average Meter Temp	(t_m)	70.1	
Orifice Meter Coefficient	($\Delta H@$)	1.820	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.13	in H_2O
Stack Moisture Content	(B_{ws})	10.85	%
Stack Dry Molecular Weight	(M_d)	29.27	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	#DIV/0!	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	3.5	in H_2O for	15.0	sec
	Pre (-)	3.1	in H_2O for	15.0	sec
PASS	**Post (+)**	6.8	in H_2O for	15.0	sec
	Post (-)	5.1	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	samp-cp-0025		
Meter Cal Factor	(Y)	1.017	
Nozzle Number	na		
Average Nozzle Diameter	(D_{na})	#DIV/0!	in
Suggested Nozzle Diameter	(D_{ni})	0.2052	in
Probe Number	SAMP-HP-0152		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5238		
Impinger Case Number	SAMP-BC-0017		

Pressures			
Barometric Pressure	(P_b)	29.75	in Hg
Stack Static Pressure	(P_{static})	0.55	in H_2O
Absolute Stack Pressure	(P_s)	29.79	in Hg
Absolute Meter Pressure	(P_m)	29.88	in Hg

Nozzle Measurements			**ID: na**	
Pre	--	--	--	**PASS**
Post	--	--	--	**PASS**

Barometer ID
SAMP-WE-0041
Scale ID
SAMP-SC-0031

Run Time			
Start	12:57	**End**	13:57

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	665.3	742.8	628.0	910.5				
Post	720.3	774.8	637.0	928.6				

Wash						ml
Volumes						ml

Identification Nos.		samp-cp-0025	samp-cp-0025	samp-cp-0025			SAMP-HP-0152	SAMP-HP-0152	5238	SAMP-BC-0017			samp-cp-0025		samp-cp-0025					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)ᵢ**	**Cumul. Meter Volume (V_m)std**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)std**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	0.000	1.30	#DIV/0!	1.82	190	246	255	59			68	68	4.0	1.14	72.13	3.612	--	43.345
A-2	5.0	00:05:00	3.556	1.30	#DIV/0!	1.82	190	246	255	59			68	68	4.0	1.14	72.13	7.306	--	43.839
A-3	10.0	00:10:00	7.193	1.20	#DIV/0!	1.82	190	256	258	60			69	69	4.0	1.10	69.30	10.969	--	43.878
B-1	15.0	00:15:00	10.806	1.20	#DIV/0!	1.82	190	256	260	62			69	69	4.0	1.10	69.30	14.725	--	44.174
B-2	20.0	00:20:00	14.510	1.20	#DIV/0!	1.82	190	255	257	66			70	70	4.0	1.10	69.30	18.418	--	44.204
B-3	25.0	00:25:00	18.160	1.30	#DIV/0!	1.82	190	255	261	68			70	70	4.0	1.14	72.13	22.127	--	44.254
C-1	30.0	00:30:00	21.825	1.30	#DIV/0!	1.82	190	255	257	68			71	71	4.0	1.14	72.13	26.031	--	44.624
C-2	35.0	00:35:00	25.690	1.30	#DIV/0!	1.82	190	255	255	68			71	71	4.0	1.14	72.13	29.483	--	44.225
C-3	40.0	00:40:00	29.108	1.30	#DIV/0!	1.82	190	256	258	68			71	71	4.0	1.14	72.13	33.172	--	44.229
D-1	45.0	00:45:00	32.760	1.30	#DIV/0!	1.82	190	256	258	67			71	71	4.0	1.14	72.13	36.858	--	44.230
D-2	50.0	00:50:00	36.410	1.30	#DIV/0!	1.82	190	255	260	66			71	71	4.0	1.14	72.13	40.747	--	44.451
D-3	55.0	00:55:00	40.260	1.30	#DIV/0!	1.82	190	256	258	68			71	71	4.0	1.14	72.13	44.196	--	44.196
Last Pt	60.0	01:00:00	43.675		#DIV/0!	1.82	190	256	258	68			71	71	4.0				--	
Final Val	60.0	01:00:00	43.675											**Max Vac**	4.0	**Final Values**		44.196		
Average Values				1.28		1.82	190	254	258	65			70	70		1.13	71.42			
													70							

Notes:

APPENDIX C

CALIBRATION GAS CERTIFICATIONS

CALIBRATION GAS CERTIFICATIONS

Unit #CTG-1
Cylinder Certifications

RED BALL TECHNICAL GAS SERVICES

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

CERTIFICATE OF ANALYSIS
(Zero Ambient Nitrogen)

Cylinder Number:	EB0072319	**Certification Date:**	08/17/2018
Product ID Number:	121026	**Expiration Date:**	08/15/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0072319.20180817-0	**Lot Number:**	EB0072319.20180817
Customer PO. NO.:		**Tracking Number:**	084249645
Customer:		**Previous Certification Dates:**	

This mixture is for laboratory use only, not for drug, household or other use.
This mixture is certified in Mole % to be within ±2% of the actual number reported with a confidence of 95%.
This mixture was manufactured by scale; weights traceable to N.I.S.T. Certificate #822/266926-02.
Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Composing Material: Zero Ambient Nitrogen, Cert., Sz152

Component	Specification	Concentration
Nitrogen	Balance	Balance
Oxygen as Impurity	<1.0 PPM	<1.0 PPM
Carbon Dioxide as Impurity	<0.5 PPM	<0.5 PPM
Carbon Monoxide as Impurity	<0.5 PPM	<0.5 PPM
Total Oxides of Nitrogen as Impurity	<0.1 PPM	<0.1 PPM
Sulfur Dioxide as Impurity	<0.1 PPM	<0.1 PPM
Total Hydrocarbons as Impurity	<0.1 PPM	<0.1 PPM

Red Ball Technical Gas Service
PGVP Vendor ID # G12018
Information and Ordering
800-551-8150
Fax (318-425-6309)

ilac-MRA PJLA Calibration and Testing
Accreditation #62754

Amisha Jewitt
Analytical Chemist

Version 02-B, Revised on 2015-05-27

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0101662	**Certification Date:**	11/15/2017
Product ID Number:	124605	**Expiration Date:**	11/13/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0101662.20171106-0	**Lot Number:**	EB0101662.20171106
Customer PO. NO.:		**Tracking Number:**	095706076
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**18.7 %**	±0.16 %	NDIR	11/15/2017
Oxygen	**21.0 %**	±0.11 %	MPA	11/10/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0060638	EB0060638.20170112-0	10/23/2025	GMIS	N2	CO2	19.5 %	0.724	C1309410.01
EB0060740	EB0060740.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0064384	EB0064384.20170112	08/13/2025	GMIS	N2	CO2	19.6 %	0.761	101001

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	10/16/2017
CO2	NDIR	Thermo	410i	1162980025	10/23/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0032368	**Certification Date:**	06/05/2018
Product ID Number:	124606	**Expiration Date:**	06/03/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0032368.20180530-0	**Lot Number:**	EB0032368.20180530
Customer PO. NO.:		**Tracking Number:**	056559239
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**8.92 %**	±0.08 %	NDIR	06/05/2018
Oxygen	**12.05 %**	±0.06 %	MPA	06/05/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC237204	CC237204.071001a	04/05/2023	NTRM	N2	O2	24.31 %	0.49	071001
EB0032313	EB0032313.20170112	05/22/2025	GMIS	N2	O2	9.34 %	0.235	2658a
EB0072967	EB0072967.20170424	11/25/2025	GMIS	N2	CO2	9.52 %	0.753	C1309410.01
EB0097755	EB0097755.20171018-0	12/26/2025	GMIS	N2	CO2	24.86 %	0.212	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	05/11/2018
CO2	NDIR	Thermo	410i	1162980025	05/11/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0027601	**Certification Date:**	08/28/2018
Product ID Number:	124737	**Expiration Date:**	08/27/2021
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0027601.20180724-0	**Lot Number:**	EB0027601.20180724
Customer PO. NO.:		**Tracking Number:**	048406543
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**9.2 PPM**	±0.12 PPM	FTIR	08/21/2018
Nitric Oxide	**8.8 PPM**	±0.10 PPM	Chemiluminescence	08/02/2018, 08/16/2018, 08/28/2018
Total Oxides of Nitrogen	8.9 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC202290	CC202290.20160721	01/11/2025	GMIS	N2	CO	12.14 PPM	1.033	091002
CC238257	CC238257.20171116	07/25/2022	GMIS	N2	NO	9.9 PPM	1.107	12100115
EB0005969	EB0005969.20171228	07/17/2026	GMIS	N2	NO	62.3 PPM	1.065	12100115
EB0010962	EB0010962.20171116	05/31/2021	GMIS	N2	NO	15.1 PPM	1.085	12100115

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	07/25/2018
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	08/20/2018
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	08/28/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Laboratory Supervisor
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0004881	**Certification Date:**	08/24/2018
Product ID Number:	125564	**Expiration Date:**	08/23/2021
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0004881.20180720-0	**Lot Number:**	EB0004881.20180720
Customer PO. NO.:		**Tracking Number:**	5945179
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**5.13 PPM**	±0.06 PPM	FTIR	07/25/2018
Nitric Oxide	**4.85 PPM**	±0.07 PPM	Chemiluminescence	08/17/2018, 08/24/2018
Total Oxides of Nitrogen	4.92 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC238257	CC238257.20171116	07/25/2022	GMIS	N2	NO	9.9 PPM	1.107	12100115
EB0004076	EB0004076.20160721	08/05/2025	GMIS	N2	CO	12.2 PPM	1.046	091002
EB0012241	EB0012241.20151012	07/25/2021	GMIS	N2	NO	3.05 PPM	1.062	12100115
EB0032297	EB0032297.20160725	09/06/2025	GMIS	N2	CO	6.15 PPM	1.067	091002

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	07/09/2018
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	08/10/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Laboratory Supervisor
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0045218	**Certification Date:**	07/17/2017
Product ID Number:	126123	**Expiration Date:**	07/15/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0045218.20170713-0	**Lot Number:**	EB0045218.20170713
Customer PO. NO.:		**Tracking Number:**	065086081
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**8.29 PPM**	±0.03 PPM	FTIR	07/17/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0058163	EB0058163.201411231g	03/17/2023	GMIS	N2	CH4	30.38 PPM	0.277	2751

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	06/30/2017

Red Ball Technical Gas Service
PGVP Vendor ID # G12017
Information and Ordering
800-551-8150
Fax (318-425-6309)

PJLA Calibration and Testing
Accreditation #62754

Anthony Cyr
Analytical Chemist

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Version 02-E, Revised on 2016-04-27

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0099513	**Certification Date:**	01/05/2018
Product ID Number:	124609	**Expiration Date:**	01/03/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0099513.20171227-0	**Lot Number:**	EB0099513.20171227
Customer PO. NO.:		**Tracking Number:**	095685612
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**5.11 PPM**	±0.03 PPM	FTIR	01/05/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0058163	EB0058163.201411231g	03/17/2023	GMIS	N2	CH4	30.38 PPM	0.277	2751

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	01/05/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	CC719271	**Certification Date:**	08/14/2018
Product ID Number:	125892	**Expiration Date:**	08/12/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	CC719271.20180806-0	**Lot Number:**	CC719271.20180806
Customer PO. NO.:		**Tracking Number:**	098505502
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**3.22 PPM**	±0.02 PPM	FTIR	08/14/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0042063	EB0042063.20171231	03/17/2023	GMIS	N2	CH4	30.37 PPM	0.277	2751

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	08/14/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Laboratory Supervisor
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0049796	**Certification Date:**	11/14/2017
Product ID Number:	124731	**Expiration Date:**	11/13/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0049796.20171101-0	**Lot Number:**	EB0049796.20171101
Customer PO. NO.:		**Tracking Number:**	073562832
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Nitrogen Dioxide	**50.8 PPM**	±0.6 PPM	FTIR	11/07/2017, 11/14/2017
Air	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0085284	EB0085284.20161201	11/02/2020	GMIS	AIR	NO2	97 PPM	1.027	5605008

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/06/2017
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/14/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

CALIBRATION GAS CERTIFICATIONS

Unit #CTG-2
Cylinder Certifications

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0101677	**Certification Date:**	11/15/2017
Product ID Number:	124605	**Expiration Date:**	11/13/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0101677.20171106-0	**Lot Number:**	EB0101677.20171106
Customer PO. NO.:		**Tracking Number:**	095706155
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**18.7 %**	±0.16 %	NDIR	11/15/2017
Oxygen	**21.0 %**	±0.11 %	MPA	11/10/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0060638	EB0060638.20170112-0	10/23/2025	GMIS	N2	CO2	19.5 %	0.724	C1309410.01
EB0060740	EB0060740.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0064384	EB0064384.20170112	08/13/2025	GMIS	N2	CO2	19.6 %	0.761	101001

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	10/16/2017
CO2	NDIR	Thermo	410i	1162980025	10/23/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	CC719163	**Certification Date:**	08/24/2018
Product ID Number:	124606	**Expiration Date:**	08/22/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	CC719163.20180814-0	**Lot Number:**	CC719163.20180814
Customer PO. NO.:		**Tracking Number:**	098490486
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**8.92 %**	±0.08 %	NDIR	08/24/2018
Oxygen	**11.98 %**	±0.07 %	MPA	08/24/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0032246	EB0032246.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0034340	EB0034340.20170209	05/09/2026	GMIS	N2	O2	20 %	0.5	071001
EB0087453	EB0087453.20170424	11/25/2025	GMIS	N2	CO2	9.51 %	0.724	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	07/27/2018
CO2	NDIR	Thermo	410i	1162980025	07/30/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Amisha Jewitt
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0052316	**Certification Date:**	07/03/2017
Product ID Number:	124604	**Expiration Date:**	07/02/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0052316.20170621-0	**Lot Number:**	EB0052316.20170621
Customer PO. NO.:		**Tracking Number:**	074202432
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**11.18 PPM**	±0.05 PPM	FTIR	07/03/2017
Nitric Oxide	**11.12 PPM**	±0.03 PPM	Chemiluminescence	06/26/2017, 07/03/2017
Total Oxides of Nitrogen	11.32 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC-349582	12100115CC-349582	07/22/2019	NTRM	N2	NO	95.2 PPM	1.05	12100115
EB0003194	EB0003194.20160721	01/11/2025	GMIS	N2	CO	12.16 PPM	1.033	091002
EB0005492	EB0005492.20160721	01/10/2025	GMIS	N2	CO	18.63 PPM	1.014	091002
EB0064245	EB0064245.20150713	11/29/2019	GMIS	N2	NO	9.86 PPM	1.16	121001

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	06/05/2017
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	06/06/2017

Red Ball Technical Gas Service
PGVP Vendor ID # G12017
Information and Ordering
800-551-8150
Fax (318-425-6309)

PJLA Calibration and Testing
Accreditation #62754

Anthony Cyr
Analytical Chemist

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Version 02-E, Revised on 2016-04-27

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0078112	**Certification Date:**	05/14/2018
Product ID Number:	124744	**Expiration Date:**	05/13/2021
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0078112.20180502-0	**Lot Number:**	EB0078112.20180502
Customer PO. NO.:		**Tracking Number:**	084266785
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**5.73 PPM**	±0.06 PPM	FTIR	05/09/2018
Nitric Oxide	**5.44 PPM**	±0.06 PPM	Chemiluminescence	05/07/2018, 05/14/2018
Total Oxides of Nitrogen	5.53 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0004076	EB0004076.20160721	08/05/2025	GMIS	N2	CO	12.2 PPM	1.046	091002
EB0027596	EB0027596.20151012g	12/20/2018	GMIS	N2	NO	5.802 PPM	1.01	2628a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	04/30/2018
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	05/09/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0100138	**Certification Date:**	01/05/2018
Product ID Number:	126123	**Expiration Date:**	01/03/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0100138.20171227-0	**Lot Number:**	EB0100138.20171227
Customer PO. NO.:		**Tracking Number:**	095685603
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**8.61 PPM**	±0.03 PPM	FTIR	01/05/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0058163	EB0058163.201411231g	03/17/2023	GMIS	N2	CH4	30.38 PPM	0.277	2751

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	01/05/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0072999	**Certification Date:**	04/24/2017
Product ID Number:	124609	**Expiration Date:**	04/22/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0072999.20170420-0	**Lot Number:**	EB0072999.20170420
Customer PO. NO.:		**Tracking Number:**	084252065
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**5.05 PPM**	±0.019 PPM	FTIR	04/24/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0058163	EB0058163.201411231g	03/17/2023	GMIS	N2	CH4	30.38 PPM	0.277	2751

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	04/24/2017

Red Ball Technical Gas Service
PGVP Vendor ID # G12017
Information and Ordering
800-551-8150
Fax (318-425-6309)

ilac-MRA PJLA Calibration and Testing
Accreditation #62754

Brandon Theus
Analytical Chemist

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Version 02-E, Revised on 2016-04-27

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0079029	**Certification Date:**	01/05/2018
Product ID Number:	125892	**Expiration Date:**	01/03/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0079029.20171226-0	**Lot Number:**	EB0079029.20171226
Customer PO. NO.:		**Tracking Number:**	084090535
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Methane	**3.08 PPM**	±0.02 PPM	FTIR	01/05/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0058163	EB0058163.201411231g	03/17/2023	GMIS	N2	CH4	30.38 PPM	0.277	2751

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CH4	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	01/05/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0051214	**Certification Date:**	06/15/2018
Product ID Number:	124731	**Expiration Date:**	06/14/2021
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0051214.20180529-0	**Lot Number:**	EB0051214.20180529
Customer PO. NO.:		**Tracking Number:**	073563585
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Nitrogen Dioxide	**49.1 PPM**	±0.5 PPM	FTIR	06/08/2018, 06/15/2018
Air	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0085284	EB0085284.20161201	11/02/2020	GMIS	AIR	NO2	97 PPM	1.027	5605008

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	06/07/2018
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	06/14/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Anthony Cyr
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0087648	**Certification Date:**	03/15/2018
Product ID Number:	124605	**Expiration Date:**	03/13/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0087648.20180306-0	**Lot Number:**	EB0087648.20180306
Customer PO. NO.:		**Tracking Number:**	095285944
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**19.0 %**	±0.18 %	NDIR	03/15/2018
Oxygen	**21.0 %**	±0.11 %	MPA	03/12/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0019964	EB0019964.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0045483	EB0045483.20170424	11/25/2025	GMIS	N2	CO2	9.53 %	0.724	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	02/23/2018
CO2	NDIR	Thermo	410i	1162980025	03/14/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

B Theus

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	CC719798	**Certification Date:**	09/06/2018
Product ID Number:	124606	**Expiration Date:**	09/04/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	CC719798.20180823-0	**Lot Number:**	CC719798.20180823
Customer PO. NO.:		**Tracking Number:**	098506981
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**8.92 %**	±0.08 %	NDIR	09/06/2018
Oxygen	**12.07 %**	±0.06 %	MPA	08/30/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0034340	EB0034340.20170209	05/09/2026	GMIS	N2	O2	20 %	0.5	071001
EB0087453	EB0087453.20170424	11/25/2025	GMIS	N2	CO2	9.51 %	0.724	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	08/30/2018
CO2	NDIR	Thermo	410i	1162980025	08/31/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Amisha Jewitt
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

AIR HYGIENE ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses six major areas:

1. Field Qualifications
2. QA reviews of reports, laboratory work, and field testing;
3. Equipment calibration and maintenance;
4. Chain-of-custody;
5. Training; and
6. Knowledge of current test methods

Field Qualifications

Air Hygiene personnel are required to gain and maintain competence with testing methods and techniques according to their job titles and the roles they play during field testing events. Qualifications for each job description include:

Staff Technician - An entry level position with responsibility to test on the stack by performing duties that include: keep trucks and trailers stocked and clean, travel to and from job site, be the "hands of the test" on the stack; stay on a stack during the sample test, set up and tear down equipment on-site, perform maintenance on equipment in the shop and on-site.

Test Technician or Specialist - Acts as the "hands of the test" on the stack by performing duties that include: stay on a stack during the sample test, migrate to the testing trailer and learn the different analyzers and testing methods used on site, set up and tear down testing equipment on site, learn the system for testing from Testing Managers and Project Managers, travel to and from job site; including driving responsibilities under DOT requirements, follow directions of Testing Managers and Project Managers, learn the proper way to conduct on-site test of stationary stacks

Test Manager or Engineer - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Test Managers must hold as least one QSTI certificate.

Project Manager - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Project Managers typically hold QSTI certificates in Groups 1 through 4.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program. In conformance with ASTM D7036 Section 15.3.15, all metering and monitoring equipment meets or exceeds the uncertainty criteria contained in the method language that pertains to that equipment.

Chain-of-Custody

Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples are stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training

Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3 A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods

With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

Reproduction and Distribution Policy

Reproducing portions of this test report may omit critical or substantial documentation or be taken out of context and due care must be exercised in this regard. Furthermore, this test report and its associated data shall not be reproduced in full or in part without the written consent of the customer.

COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

In conformance with ASTM D7036 Section 15.3.11 and 13, all testing was performed without any real or apparent errors, with the exception of those that would be listed in Section 2.0 of this report. In addition, all testing was conducted according to the approved testing protocol, test methods, Air Hygiene Quality Manual, or ASTM D7036, with the exception of specifics noted in Section 2.0 of this report. A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values. NO_2 to NO conversion was checked via direct connect with an EPA Protocol certified concentration of NO_2 in a balance of air or nitrogen. Conversion was verified to be between 90 and 110 percent.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS
QUALITY ASSURANCE DATA

Date: September 24-25, 2018
Company: CPV Valley, LLC
Location: Middletown, New York
Techs: AR/TP/DA

Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
September 24-25, 2018	1 and 2	0

Accredited Laboratory

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

Broken Arrow, OK

for technical competence in the field of

Environmental Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the R219 – Specific Requirements – TNI Field Sampling and Measurement Organization Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION
CORPORATE SEAL 1978
DISTRICT OF COLUMBIA
A2LA

Presented this 10th day of October 2017

President and CEO
For the Accreditation Council
Certificate Number 3796.01
Valid to August 31, 2019

For the types of tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA

American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION CORPORATE SEAL 1978 DISTRICT OF COLUMBIA A2LA

Presented this 10th day of October 2017

President and CEO
For the Accreditation Council
Certificate Number 3796.02
Valid to August 31, 2019

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

PATRICK K. McGOVERN

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 25TH DAY OF SEPEMBER 2015 AND EFFECTIVE UNTIL SEPTEMBER 25TH, 2020

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Theresa Lowe, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

CERTIFICATE NO. 2008-133

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

PATRICK K. McGOVERN, Jr.

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 10TH DAY OF NOVEMBER 2017 AND EFFECTIVE UNTIL NOVEMBER 9TH, 2022

Peter R. Westlin, QSTI/QSTO Review Board

J. Wade Bice, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Theresa Lowe, QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2008-133

COMPLIANCE ASSURANCE ASSOCIATES INC.

Helping Industry Comply with Environmental Regulations

This is to acknowledge that

Axel Garrido Martinez

BRO180706-16529

Certificate verification is available at www.Compliance.Assurance.com/certs.php using the last name and 16529

successfully participated in Visible Emissions Evaluation field training and certification and pursuant to US EPA 40 CFR 60 Appendix A, Reference Method 9, as amended, is certified to evaluate Visible Emissions for a period of six (6) months from the date of this certification.

	Broken Arrow, OK	07/06/2018
Anthony Ferro - Field Manager	Location	Date

Compliance Assurance Associates, Inc. 682 Orvil Smith Rd, Harvest, AL, 35749. 901-381-9960. compliance-assurance.com

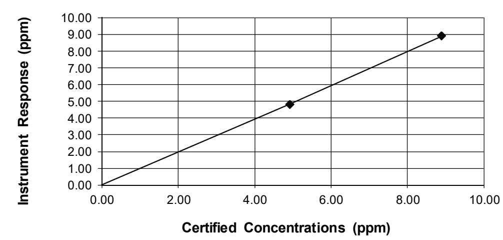
QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-1
Daily Analyzer Calibrations

Calibration Date: September 25, 2018 **Location:** CPV Valley Energy Center - Unit CTG-1
Client: CPV Valley, LLC

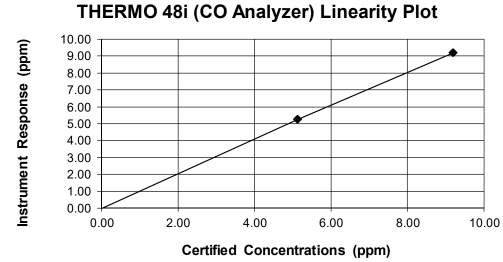
NOx Span (ppm) = 8.90

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.00	-0.02	0.00	YES (%)
4.92	4.83	-1.01	0.09	YES (%)
8.90	8.91	0.11	0.01	YES (%)
Linearity = 0.999				



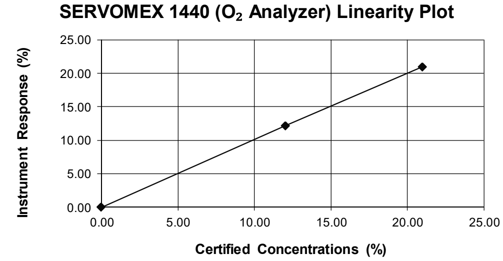
CO Span (ppm) = 9.20

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	-0.03	-0.33	0.03	YES (%)
5.13	5.26	1.41	0.13	YES (%)
9.20	9.19	-0.11	0.01	YES (%)
Linearity = 0.996				



O_2 Span (%) = 21.00

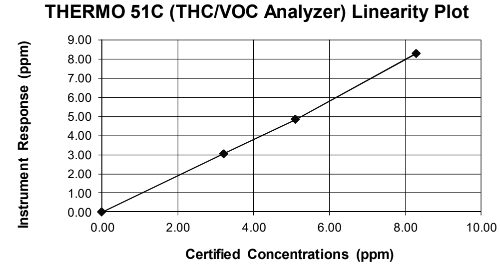
SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.00	0.01	0.00	YES (%)
12.05	12.19	0.66	0.14	YES (%)
21.00	20.99	-0.04	0.01	YES (%)
Linearity = 1.000				



VOC Range (ppm) = 10

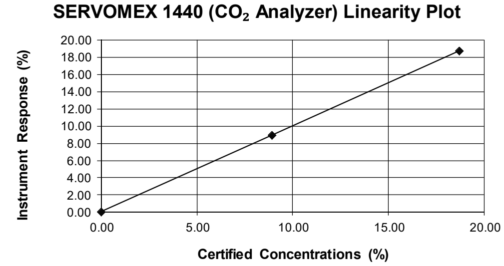
THERMO 51C (THC/VOC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2,5%)[1]
0.00	0.00	0.01	N/A	YES
3.22	3.07	-4.61	3.22	YES
5.11	4.85	-4.97	5.10	YES
8.29	8.28	-0.10	N/A	YES
Linearity = 0.967				

[1]-zero/high based on 2% of span, low/mid based on 5% of concentration



CO_2 Span (%) = 18.70

SERVOMEX 1440 (CO_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.06	0.31	0.06	YES (%)
8.92	8.94	0.11	0.02	YES (%)
18.70	18.74	0.23	0.04	YES (%)
Linearity = 1.001				



NOx Converter Efficiency

Date: September 25, 2018

Analyzer: INST-NX-0043

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**50.80**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**2.40**
	Analyzer Reading, NOx Channel, ppmvd	**48.39**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**45.99**
	Converter Efficiency, %	**90.53**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_v}\right) \times 100$$

Eq. 7E-7 = $\dfrac{45.99 \text{ ppmvd}}{50.80 \text{ ppmvd}}$ x 100 = 90.53%

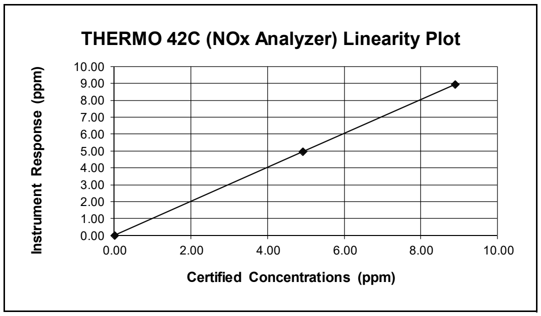
Date/Time mm/dd/yy hh:mm:ss	Elapsed Time Seconds	NOx ppmvd	NO ppmvd
09/25/18 06:28:26	68080	46.69	2.49
09/25/18 06:28:36	68090	46.98	2.49
09/25/18 06:28:46	68100	47.26	2.49
09/25/18 06:28:56	68110	47.48	2.43
09/25/18 06:29:06	68120	47.75	2.39
09/25/18 06:29:16	68130	47.99	2.41
09/25/18 06:29:26	68140	48.19	2.39
09/25/18 06:29:36	***68150***	***48.39***	***2.40***
09/25/18 06:29:46	68160	48.50	2.33
09/25/18 06:29:56	68170	48.67	2.32
09/25/18 06:30:06	68180	48.81	2.32

Calibration Date: **September 26, 2018** **Location:** **CPV Valley Energy Center - Unit CTG-1**
Client: **CPV Valley, LLC**

NOx Span (ppm) = 8.90

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.00	0.00	0.00	YES (%)
4.92	4.96	0.48	0.04	YES (%)
8.90	8.95	0.60	0.05	YES (%)

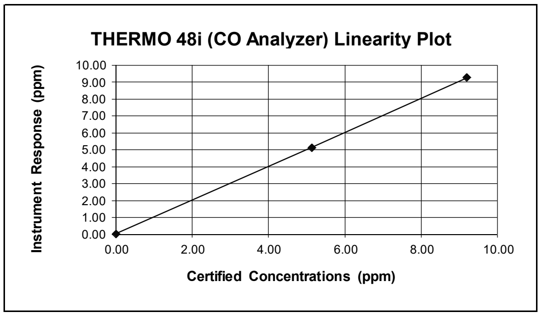
Linearity = 0.994



CO Span (ppm) = 9.20

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.04	0.43	0.04	YES (%)
5.13	5.14	0.10	0.01	YES (%)
9.20	9.28	0.87	0.08	YES (%)

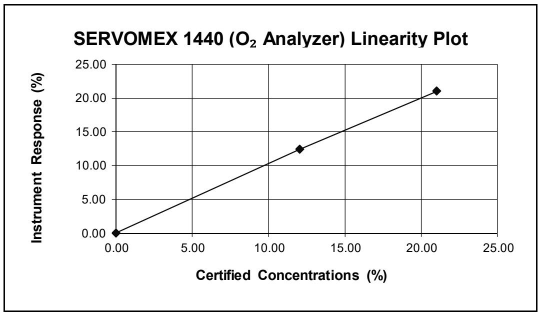
Linearity = 0.996



O2 Span (%) = 21.00

SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.03	0.12	0.03	YES (%)
12.05	12.43	1.81	0.38	YES (%)
21.00	20.98	-0.12	0.02	YES (%)

Linearity = 1.000

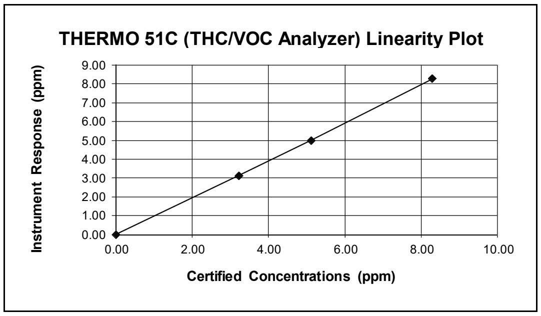


THC Range (ppm) = 10

THERMO 51C (THC/VOC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2,5%)[1]
0.00	0.00	0.00	N/A	YES
3.22	3.13	-2.58	3.21	YES
5.11	4.99	-2.11	5.10	YES
8.29	8.27	-0.20	N/A	YES

Linearity = 0.984

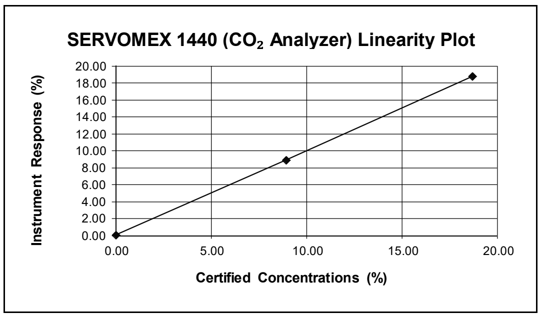
[1]-zero/high based on 2% of span,low/mid based on 5% of concentration



CO2 Span (%) = 18.70

SERVOMEX 1440 (CO_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.05	0.28	0.05	YES (%)
8.92	8.92	-0.02	0.00	YES (%)
18.70	18.80	0.55	0.10	YES (%)

Linearity = 0.997



NOx Converter Efficiency

Date: September 26, 2018

Analyzer: INST-NX-0043

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**50.80**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**1.78**
	Analyzer Reading, NOx Channel, ppmvd	**51.89**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**50.11**
	Converter Efficiency, %	**98.64**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_v}\right) \times 100 \qquad \text{Eq. 7E-7} = \frac{50.11 \text{ ppmvd}}{50.80 \text{ ppmvd}} \times 100 = 98.64\%$$

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
09/27/18 03:23:56	229810	51.08	9.32
09/27/18 03:24:06	229820	51.21	9.27
09/27/18 03:24:16	229830	51.29	9.31
09/27/18 03:24:26	229840	51.39	9.31
09/27/18 03:24:36	229850	51.56	9.37
09/27/18 03:24:46	229860	51.62	3.48
09/27/18 03:24:56	229870	51.73	1.89
09/27/18 03:25:06	229880	51.82	1.82
09/27/18 03:25:16	***229890***	***51.89***	***1.78***
09/27/18 03:25:26	229900	51.94	1.80

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	**O2**	**NOx**
Initial Zero	0.04	-0.06
Final Zero	0.02	0.00
Avg. Zero	0.03	-0.03
Initial UpScale	12.23	4.82
Final UpScale	12.01	4.97
Avg. UpScale	12.12	4.90
Sys Resp (Zero)	0.04	-0.06
Sys Resp (Upscale)	12.23	4.82
Upscale Cal Gas	12.05	4.92
Initial Zero Bias	0.00%	0.00%
Final Zero Bias	-0.10%	0.67%
Zero Drift	0.10%	0.67%
Initial Upscale Bias	0.00%	0.00%
Final Upscale Bias	-1.05%	1.69%
Upscale Drift	1.05%	1.69%
Alternative Specification Abs Diff **Initial Zero**	0.00	0.00
Final Zero	0.02	0.06
Initial Upscale	0.00	0.00
Final Upscale	0.22	0.15
Calibration Span	21.00	8.90
3% of Range (drift)	0.63	0.27
5% of Range (bias)	1.05	0.45

Respone Time (min)	0.7	2.0
Sys. Response (min)	2.0	

Date/Time mm/dd/yy hh:mm:ss	z	O_2 %	s	z	NOx ppm	s	**INJECTIONS**
09/24/18 06:43:27		**0.10**			0.74		x
09/24/18 06:43:37		**0.06**			1.84		
09/24/18 06:43:47		**0.05**			3.35		
09/24/18 06:43:57		**0.04**			3.89		
09/24/18 06:44:07	x	**0.04**			3.99		
09/24/18 06:44:17		**0.03**			4.04		
09/24/18 06:44:27		**0.02**			4.04		
09/24/18 06:44:37		**0.02**			4.05		
09/24/18 06:44:47		**0.02**			4.07		
09/24/18 06:44:57		**0.01**			4.08		
09/24/18 06:45:07		**0.01**			4.08		
09/24/18 06:45:17		**0.01**			4.07		
09/24/18 06:45:27		**0.01**			**4.96**	x	
09/24/18 06:45:37		**0.02**			**4.93**		
09/24/18 06:45:47		**0.01**			**4.98**		
09/24/18 06:45:57		**0.03**			**4.96**		
09/24/18 07:30:57		13.53			2.32		x
09/24/18 07:31:07		13.55			2.29		
09/24/18 07:31:17		**12.65**			2.29		
09/24/18 07:31:27		9.45			2.27		
09/24/18 07:31:37		**11.94**	x		1.83		
09/24/18 07:31:47		**12.09**			1.50		
09/24/18 07:31:57		**12.10**			0.89		
09/24/18 07:32:07		**12.10**		x	**0.11**		
09/24/18 07:32:17		**12.11**			**-0.03**		
09/24/18 07:32:27		**12.10**			**-0.07**		
09/24/18 07:32:37		**12.11**			**-0.09**		
09/24/18 07:32:47		**12.11**			**-0.09**		

DRIFT AND BIAS CHECK					
Base Load, Run - 1	O_2	NOx	CO	VOC	CO_2
Raw Average	13.51	2.08	-0.39	0.51	4.12
Corrected Average	13.59	2.11	0.00	0.54	4.14
Initial Zero	0.03	0.00	0.06	0.01	0.08
Final Zero	0.03	-0.02	-0.07	0.01	0.08
Avg. Zero	0.03	-0.01	-0.01	0.01	0.08
Initial UpScale	12.00	4.85	5.09	3.07	8.79
Final UpScale	11.98	4.91	4.97	3.13	8.75
Avg. UpScale	11.99	4.88	5.03	3.10	8.77
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	0.13%	0.00%	0.98%	0.08%	0.12%
Final Zero Bias	0.12%	-0.15%	-0.48%	0.09%	0.12%
Zero Drift	0.01%	0.16%	1.46%	0.01%	0.01%
Initial Upscale Bias	-0.90%	0.22%	-1.87%	0.04%	-0.82%
Final Upscale Bias	-1.01%	0.94%	-3.21%	0.66%	-1.02%
Upscale Drift	0.11%	0.72%	1.34%	0.62%	0.20%
Alternative Specification Abs Diff — Initial Zero	0.03	0.00	0.09	--	0.02
Final Zero	0.03	0.01	0.04	--	0.02
Initial Upscale	0.19	0.02	0.17	--	0.15
Final Upscale	0.21	0.08	0.30	--	0.19
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

DRIFT AND BIAS CHECK					
Base Load, Run - 2	O_2	NOx	CO	VOC	CO_2
Raw Average	13.40	1.68	-0.45	0.17	4.16
Corrected Average	13.53	1.75	0.00	0.19	4.17
Initial Zero	0.03	-0.02	-0.07	0.01	0.08
Final Zero	0.02	0.05	-0.14	0.08	0.06
Avg. Zero	0.02	0.02	-0.11	0.05	0.07
Initial UpScale	11.98	4.91	4.97	3.13	8.75
Final UpScale	11.91	4.45	5.05	3.24	8.89
Avg. UpScale	11.94	4.68	5.01	3.19	8.82
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	0.12%	-0.15%	-0.48%	0.09%	0.12%
Final Zero Bias	0.08%	0.62%	-1.19%	0.79%	0.01%
Zero Drift	0.05%	0.77%	0.71%	0.70%	0.11%
Initial Upscale Bias	-1.01%	0.94%	-3.21%	0.66%	-1.02%
Final Upscale Bias	-1.32%	-4.27%	-2.26%	1.72%	-0.27%
Upscale Drift	0.31%	5.21%	0.95%	1.06%	0.75%
Alternative Specification Abs Diff — Initial Zero	0.03	0.01	0.04	--	0.02
Final Zero	0.02	0.06	0.11	--	0.00
Initial Upscale	0.21	0.08	0.30	--	0.19
Final Upscale	0.28	0.38	0.21	--	0.05
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

DRIFT AND BIAS CHECK					
Base Load, Run - 3	O_2	NOx	CO	VOC	CO_2
Raw Average	13.39	1.54	-0.46	0.44	4.15
Corrected Average	13.59	1.65	0.00	0.49	4.16
Initial Zero	0.02	0.05	-0.14	0.08	0.06
Final Zero	0.02	-0.02	-0.03	0.05	0.05
Avg. Zero	0.02	0.02	-0.08	0.07	0.06
Initial UpScale	11.91	4.45	5.05	3.24	8.89
Final UpScale	11.85	4.68	5.16	3.04	8.80
Avg. UpScale	11.88	4.57	5.11	3.14	8.85
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	0.08%	0.62%	-1.19%	0.79%	0.01%
Final Zero Bias	0.10%	-0.20%	0.02%	0.53%	-0.02%
Zero Drift	0.02%	0.82%	1.21%	0.27%	0.03%
Initial Upscale Bias	-1.32%	-4.27%	-2.26%	1.72%	-0.27%
Final Upscale Bias	-1.61%	-1.69%	-1.09%	-0.28%	-0.75%
Upscale Drift	0.29%	2.58%	1.17%	2.00%	0.48%
Alternative Specification Abs Diff: Initial Zero	0.02	0.06	0.11	--	0.00
Final Zero	0.02	0.02	0.00	--	0.00
Initial Upscale	0.28	0.38	0.21	--	0.05
Final Upscale	0.34	0.15	0.10	--	0.14
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

DRIFT AND BIAS CHECK					
100% W/Db Load, Run - 1	O_2	NOx	CO	VOC	CO_2
Raw Average	12.14	2.58	-0.30	0.07	4.78
Corrected Average	12.11	2.61	0.00	0.08	4.80
Initial Zero	0.00	-0.02	0.05	0.00	0.07
Final Zero	0.05	-0.05	-0.01	0.00	0.08
Avg. Zero	0.02	-0.03	0.02	0.00	0.07
Initial UpScale	11.85	4.90	5.15	3.13	8.86
Final UpScale	11.86	4.89	5.11	3.07	8.79
Avg. UpScale	11.86	4.89	5.13	3.10	8.82
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	-0.01%	-0.20%	0.89%	0.01%	0.04%
Final Zero Bias	0.20%	-0.55%	0.22%	-0.02%	0.12%
Zero Drift	0.21%	0.35%	0.67%	0.03%	0.08%
Initial Upscale Bias	-1.61%	0.77%	-1.20%	0.62%	-0.43%
Final Upscale Bias	-1.56%	0.67%	-1.65%	0.01%	-0.82%
Upscale Drift	0.05%	0.10%	0.46%	0.61%	0.39%
Alternative Specification Abs Diff: Initial Zero	0.00	0.02	0.08	--	0.01
Final Zero	0.04	0.05	0.02	--	0.02
Initial Upscale	0.34	0.07	0.11	--	0.08
Final Upscale	0.33	0.06	0.15	--	0.15
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

DRIFT AND BIAS CHECK					
100% W/Db Load, Run - 2	O_2	NOx	CO	VOC	CO_2
Raw Average	12.28	2.71	-0.31	0.00	4.79
Corrected Average	12.40	2.75	0.00	0.00	4.82
Initial Zero	0.05	-0.05	-0.01	0.00	0.08
Final Zero	0.03	-0.06	0.09	0.00	0.08
Avg. Zero	0.04	-0.06	0.04	0.00	0.08
Initial UpScale	11.86	4.89	5.11	3.07	8.79
Final UpScale	12.00	4.90	5.12	3.12	8.79
Avg. UpScale	11.93	4.90	5.11	3.10	8.79
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	0.20%	-0.55%	0.22%	-0.02%	0.12%
Final Zero Bias	0.15%	-0.70%	1.25%	-0.01%	0.13%
Zero Drift	0.05%	0.16%	1.03%	0.01%	0.02%
Initial Upscale Bias	-1.56%	0.67%	-1.65%	0.01%	-0.82%
Final Upscale Bias	-0.90%	0.79%	-1.54%	0.56%	-0.82%
Upscale Drift	0.67%	0.11%	0.11%	0.55%	0.00%
Alternative Specification Abs Diff: Initial Zero	0.04	0.05	0.02	--	0.02
Final Zero	0.03	0.06	0.11	--	0.02
Initial Upscale	0.33	0.06	0.15	--	0.15
Final Upscale	0.19	0.07	0.14	--	0.15
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

DRIFT AND BIAS CHECK					
100% W/Db Load, Run - 3	O_2	NOx	CO	VOC	CO_2
Raw Average	12.20	2.73	-0.26	0.13	4.78
Corrected Average	12.25	2.77	0.00	0.14	4.82
Initial Zero	0.03	-0.06	0.09	0.00	0.08
Final Zero	0.03	0.00	0.06	0.01	0.08
Avg. Zero	0.03	-0.03	0.07	0.00	0.08
Initial UpScale	12.00	4.90	5.12	3.12	8.79
Final UpScale	12.00	4.85	5.09	3.07	8.79
Avg. UpScale	12.00	4.88	5.10	3.10	8.79
Sys Resp (Zero)	0.00	0.00	-0.03	0.00	0.06
Sys Resp (Upscale)	12.19	4.83	5.26	3.07	8.94
Upscale Cal Gas	12.05	4.92	5.13	3.22	8.92
Initial Zero Bias	0.15%	-0.70%	1.25%	-0.01%	0.13%
Final Zero Bias	0.13%	0.00%	0.98%	0.08%	0.12%
Zero Drift	0.02%	0.71%	0.27%	0.09%	0.01%
Initial Upscale Bias	-0.90%	0.79%	-1.54%	0.56%	-0.82%
Final Upscale Bias	-0.90%	0.22%	-1.87%	0.04%	-0.82%
Upscale Drift	0.00%	0.56%	0.33%	0.52%	0.00%
Alternative Specification Abs Diff: Initial Zero	0.03	0.06	0.11	--	0.02
Final Zero	0.03	0.00	0.09	--	0.02
Initial Upscale	0.19	0.07	0.14	--	0.15
Final Upscale	0.19	0.02	0.17	--	0.15
Calibration Span	21.00	8.90	9.20	10.00	18.70
3% of Cal. Span (drift)	0.63	0.27	0.28	0.30	0.56
5% of Cal. Span (bias)	1.05	0.45	0.46	0.50	0.94

AIR HYGIENE

MULTI LOAD TEST - FIELD DATA SHEET

Company:	Siemens
Location:	Middletown, Ny
Date:	Project Code: sie-18-middletown.ny-start#1
Unit Make and Model:	Siemens NG fired combined cycle turbine
Unit Number:	CT-1
Serial Number:	
Data Recorded By:	Andrew McMahan
Tested With AHI Unit(s):	Truck(s): 149 Trailer(s): 217
LDEQ Warmup/Cal Req:	On (Day/Time): 09/25/18 Cal (Day/Time):

CYLINDER SERIAL NUMBERS		O_2	NOx	CO	THC	CO_2	SO_2
	Low	EB0072319	EB0072319	EB0072319	CC719271	EB0072319	--
	Mid	EB0032368	EB0004881	EB0004881	EB0099513	EB0032368	--
	High	EB0101662	EB0027801	EB0027801	EB0045218	EB0101662	--

NO_2 CONVERSION			
NO_2 Gas (ppm)	50.8	NOx Reading (ppm)	48.49
NO Reading (ppm)	2.40	Cylinder Num	EB0049796

Stack Dia. = ______
Measured By: ______
Measured With: ______

RUN INFORMATION	Base Load with out Duct Burners			Base Load with Duct Burners			60%					
	____% #1	____% #2	____% #3	____% #1	____% #2	____% #3	____% #1	____% #2	____% #3	____% #1	____% #2	____% #3
Time Start (hh:mm:ss)	15:52:48	17:13:46	18:51:46	09:20:46	10:44:46	12:10:46	-	-	-	-	-	-
Time Stop (hh:mm:ss)	16:52:18	18:13:16	19:51:16	10:20:16	11:44:16	13:10:16	-	-	-	-	-	-
Rated MegaWatts (MW or hp)							-	-	-	-	-	-
Actual MegaWatts (MW or hp)							-	-	-	-	-	-
Barometric Pressure (in. Hg)	30.28	30.22	29.98	30.36	30.36	29.49	-	-	-	-	-	-
Ambient Temperature (°F)	58	60	59	53	58	58	-	-	-	-	-	-
Relative Humidity (%)	96	93	99	95	94	96	-	-	-	-	-	-
Fuel Flow (lb/min)							-	-	-	-	-	-
Fuel Flow (SCF/hr)=(lb/min)*21.7							-	-	-	-	-	-
Specific Humidity (gr/lb)	-	-	-	-	-	-	-	-	-	-	-	-
Specific Humidity (lb H_2O/lb air)=(gr/lb)/7000	0.009731	0.010153	0.010519	0.009718	0.008509	0.009718	-	-	-	-	-	-
PSD (psi)	-	-	-	-	-	-	-	-	-	-	-	-
PSD (mm Hg)=(psi+14.24)*51.71493	-	-	-	-	-	-	-	-	-	-	-	-
NOx Water Injection (gpm)	-	-	-	-	-	-	-	-	-	-	-	-

CALIBRATION	O_2		NOx		CO		THC		CO_2		SO_2	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.00	0	0.00	0	-0.03	0	0.00	0	0.06	--	--
Low Gas	--	--	--	--	--	--	3.22	3.07	--	--	--	--
Mid Gas	12.05	12.19	4.92	4.83	5.13	5.26	5.11	4.85	8.92	8.94	--	--
High Gas	21	20.99	8.9	8.91	9.2	9.19	~~8.92~~ 8.27	8.28	18.7	18.74	--	--

BIAS	O_2		NOx		CO		THC		CO_2		SO_2	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Low Load Run #1	0.03	12.00	0.00	4.85	0.06	5.09	0.01	3.07	0.08	8.79	-	-
Load 1 Run #1 / Load 1 Run #2	0.03	11.98	-0.02	4.91	-0.07	4.97	0.01	3.13	0.08	8.75	-	-
Load 1 Run #2 / Load 1 Run #3	0.02	11.91	0.05	4.45	-0.14	5.05	0.08	3.24	0.06	8.89	-	-
Load 1 Run #3 / Load 2 Run #1	0.02	11.85	-0.02	4.68	-0.03	5.16	0.05	3.04	0.05	8.80	-	-
Load 2 Run #1 / Load 2 Run #2	0.05	11.86	-0.05	4.89	-0.01	5.11	0.00	3.07	0.08	8.79	-	-
Load 2 Run #2 / Load 2 Run #3	0.03	12.00	-0.06	4.90	0.09	5.12	0.00	3.18	0.08	8.79	-	-
Load 2 Run #3 / Load 3 Run #1	0.03	12.00	0.00	4.85	0.06	5.09	0.01	3.07	0.08	8.79	-	-
Load 3 Run #1 / Load 3 Run #2	-	-	-	-	-	-	-	-	-	-	-	-
Load 3 Run #2 / Load 3 Run #3	-	-	-	-	-	-	-	-	-	-	-	-
Load 3 Run #3 / Load 4 Run #1	-	-	-	-	-	-	-	-	-	-	-	-
Load 4 Run #1 / Load 4 Run #2	-	-	-	-	-	-	-	-	-	-	-	-
Load 4 Run #2 / Load 4 Run #3	-	-	-	-	-	-	-	-	-	-	-	-
Load 4 Run #3 Final	-	-	-	-	-	-	-	-	-	-	-	-
Bias Gas Actual Conc.		12.05		4.92		5.13		3.22		8.92		-

Signature Andrew McMahan

MULTI LOAD TEST - FIELD DATA SHEET

AIR HYGIENE

Company:	Siemens
Location:	Middletown, Ny
Date:	Project Code: sie-18-middletown.ny-start#1
Unit Make and Model:	Siemens NG fired combined cycle turbine
Unit Number:	CT-1
Serial Number:	
Data Recorded By:	Andrew McMahan
Tested With AHI Unit(s):	Truck(s): 149 Trailer(s): 217
LDEQ Warmup/Cal Req:	On (Day/Time): 09/27/18 Cal (Day/Time):

CYLINDER SERIAL NUMBERS		O_2	NOx	CO	THC	CO_2	SO_2
	Low	EB0072319	EB0072319	EB0072319	CC719271	EB0072319	--
	Mid	EB0032368	EB0004881	EB0004681	EB0099513	EB0032368	--
	High	EB0101662	EB0027801	EB0027801	EB0045218	EB0101662	--

NO_2 CONVERSION			
NO_2 Gas (ppm)	50.8	NOx Reading (ppm)	48.69
NO Reading (ppm)	2.20	Cylinder Num	EB0049796

Stack Dia. = ________
Measured By: ________
Measured With: ________

RUN INFORMATION	Base Load with out Duct Burners			Base Load with Duct Burners			60%					
	___% #1	___% #2	___% #3	___% #1	___% #2	___% #3	___% #1	___% #2	___% #3	___% #1	___% #2	___% #3
Time Start (hh:mm:ss)	—	—	—	—	—	—	23:32:46	00:55:46	02:15:46	—	—	—
Time Stop (hh:mm:ss)	—	—	—	—	—	—	00:31:16	01:55:16	03:15:16	—	—	—
Rated MegaWatts (MW or hp)	—	—	—	—	—	—				—	—	—
Actual MegaWatts (MW or hp)	—	—	—	—	—	—				—	—	—
Barometric Pressure (in. Hg)	—	—	—	—	—	—	29.49	29.53	29.54	—	—	—
Ambient Temperature (°F)	—	—	—	—	—	—	63	63	58	—	—	—
Relative Humidity (%)	—	—	—	—	—	—	79	78	74	—	—	—
Fuel Flow (lb/min)	—	—	—	—	—	—				—	—	—
Fuel Flow (SCF/hr)=(lb/min)*21.7	—	—	—	—	—	—			—	—	—	—
Specific Humidity (gr/lb)	—	—	—	—	—	—	—	—	—	—	—	—
Specific Humidity (lb H_2O/lb air)=(gr/lb)/7000	—	—	—	—	—	—	0.009823	0.009684	0.007664	—	—	—
PSD (psi)	—	—	—	—	—	—	—	—	—	—	—	—
PSD (mm Hg)=(psi+14.24)*51.71493	—	—	—	—	—	—	—	—	—	—	—	—
NOx Water Injection (gpm)	—	—	—	—	—	—	—	—	—	—	—	—

CALIBRATION	O_2		NOx		CO		THC		CO_2		SO_2	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.00	0	0.06	0	0.04	0	0.00	0	0.05	--	--
Low Gas	--	--	--	--	--	--	3.22	3.12	--	--	--	--
Mid Gas	12.05	12.43	4.92	4.98	5.13	5.14	5.11	4.99	8.92	8.92	--	--
High Gas	21	20.98	8.9	8.95	9.2	9.28	~~8.92~~ 8.29	8.27	18.7	18.80	--	--

BIAS	O_2		NOx		CO		THC		CO_2		SO_2	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Low Load Run #1	0.03	12.00	0.00	4.85	0.06	5.09	0.01	3.07	0.08	8.79	—	—
Load 1 Run #1 / Load 1 Run #2	0.03	11.98	-0.02	4.91	-0.07	4.97	0.01	3.13	0.05	8.75	—	—
Load 1 Run #2 / Load 1 Run #3	—	—	—	—	—	—	—	—	—	—	—	—
Load 1 Run #3 / Load 2 Run #1	—	—	—	—	—	—	—	—	—	—	—	—
Load 2 Run #1 / Load 2 Run #2	—	—	—	—	—	—	—	—	—	—	—	—
Load 2 Run #2 / Load 2 Run #3	—	—	—	—	—	—	—	—	—	—	—	—
Load 2 Run #3 / Load 3 Run #1	-0.02	12.01	0.04	4.91	-0.02	5.13	0.06	3.13	0.05	8.92	—	—
Load 3 Run #1 / Load 3 Run #2	0.00	12.00	0.02	4.78	0.00	5.19	0.00	2.78	0.08	8.90	—	—
Load 3 Run #2 / Load 3 Run #3	0.01	12.05	-0.15	4.95	-0.30	4.95	0.00	2.58	0.08	8.89	—	—
Load 3 Run #3 / Load 4 Run #1	0.00	12.05	0.05	4.72	0.17	5.24	0.04	~~0.69~~ 2.96	0.11	9.02	—	—
Load 4 Run #1 / Load 4 Run #2	—	—	—	—	—	—	—	—	—	—	—	—
Load 4 Run #2 / Load 4 Run #3	—	—	—	—	—	—	—	—	—	—	—	—
Load 4 Run #3 Final	—	—	—	—	—	—	—	—	—	—	—	—
Bias Gas Actual Conc.		12.05		4.92		5.13		3.22		8.92		

Signature Andrew McMahan

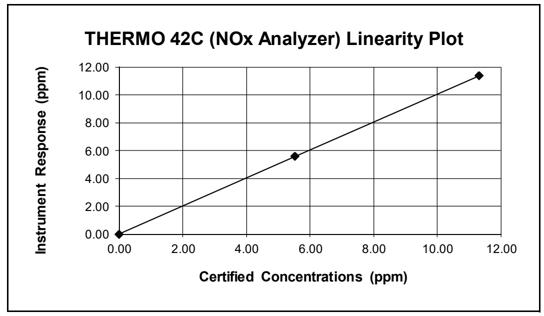
QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-2
Daily Analyzer Calibrations

Calibration Date: September 25, 2018 **Location:** CPV Valley Energy Center - Unit CTG-2
Client: CPV Valley, LLC

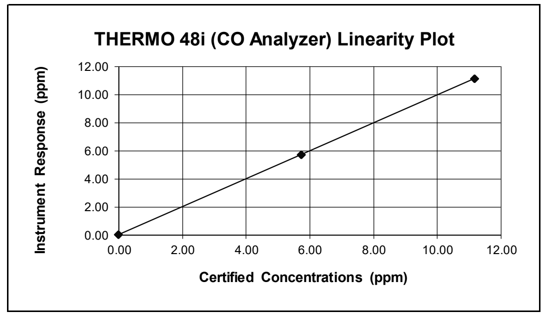
NOx Span (ppm) = 11.32

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.00	0.00	0.00	YES (%)
5.53	5.58	0.44	0.05	YES (%)
11.32	11.38	0.53	0.06	YES (%)
Linearity = 0.995				



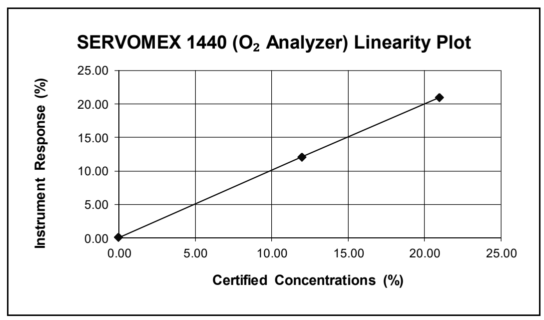
CO Span (ppm) = 11.18

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.07	0.63	0.07	YES (%)
5.73	5.74	0.09	0.01	YES (%)
11.18	11.15	-0.27	0.03	YES (%)
Linearity = 1.009				



O_2 Span (%) = 21.00

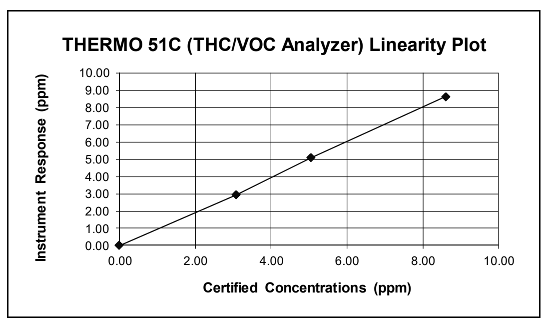
SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	0.09	0.43	0.09	YES (%)
11.98	12.07	0.43	0.09	YES (%)
21.00	21.01	0.05	0.01	YES (%)
Linearity = 1.004				



THC Range (ppm) = 10

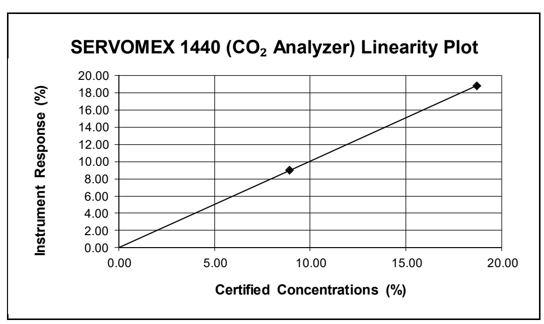
THERMO 51C (THC/VOC Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Estimated Point (ppm)**	**Pass or Fail (±2,5%)[1]**
0.00	0.01	0.10	N/A	YES
3.08	2.94	-4.99	3.09	YES
5.05	5.09	0.48	5.07	YES
8.61	8.63	0.20	N/A	YES
Linearity = 0.975				

[1]-zero/high based on 2% of span, low/mid based on 5% of concentration



CO_2 Span (%) = 18.70

SERVOMEX 1440 (CO_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	-0.02	-0.11	0.02	YES (%)
8.92	8.99	0.37	0.07	YES (%)
18.70	18.83	0.70	0.13	YES (%)
Linearity = 0.992				



NOx Converter Efficiency

Date: September 25, 2018

Analyzer: INST-NX-0043

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**49.10**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**0.70**
	Analyzer Reading, NOx Channel, ppmvd	**46.05**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**45.35**
	Converter Efficiency, %	**92.36**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_V}\right) \times 100$$

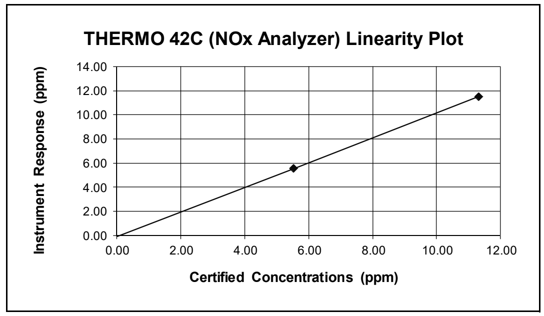
Eq. 7E-7 = $\frac{45.35 \text{ ppmvd}}{49.10 \text{ ppmvd}}$ x 100 = 92.36%

Date/Time mm/dd/yy hh:mm:ss	Elapsed Time Seconds	NOx ppmvd	NO ppmvd
09/25/18 07:08:24	70500	-0.07	-0.11
09/25/18 07:09:24	70560	-0.09	-0.12
09/25/18 07:10:24	70620	-0.09	-0.12
09/25/18 07:11:24	70680	17.71	0.39
09/25/18 07:12:24	70740	40.12	2.01
09/25/18 07:13:24	70800	43.48	1.64
09/25/18 07:14:24	70860	44.75	1.23
09/25/18 07:15:24	70920	45.43	0.99
09/25/18 07:16:24	70980	45.88	0.83
09/25/18 07:17:24	***71040***	***46.05***	***0.70***

Calibration Date: **September 26, 2018** **Location:** **CPV Valley Energy Center - Unit CTG-2**
Client: **CPV Valley, LLC**

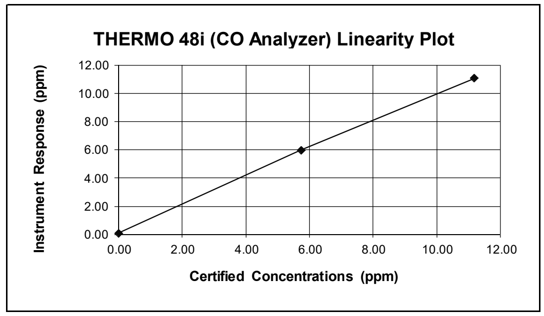
NOx Span (ppm) = 11.32

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	-0.11	-0.97	0.11	YES (%)
5.53	5.56	0.27	0.03	YES (%)
11.32	11.51	1.68	0.19	YES (%)
Linearity = 0.974				



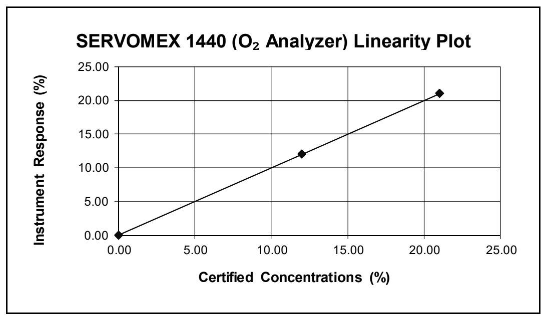
CO Span (ppm) = 11.18

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.08	0.72	0.08	YES (%)
5.73	5.97	2.15	0.24	YES (abs)
11.18	11.07	-0.98	0.11	YES (%)
Linearity = 1.016				



O2 Span (%) = 21.00

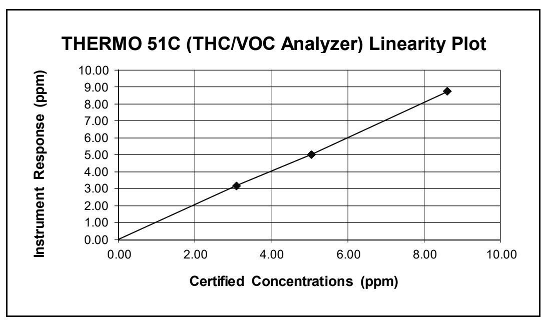
SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	0.02	0.10	0.02	YES (%)
11.98	12.01	0.14	0.03	YES (%)
21.00	21.01	0.05	0.01	YES (%)
Linearity = 1.000				



THC Range (ppm) = 10

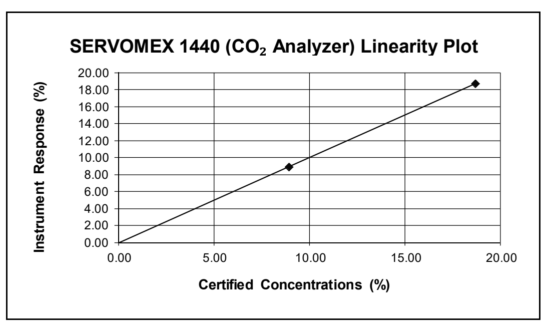
THERMO 51C (THC/VOC Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Estimated Point (ppm)**	**Pass or Fail (±2,5%)[1]**
0.00	-0.01	-0.10	N/A	YES
3.08	3.18	1.83	3.12	YES
5.05	5.02	-2.14	5.13	YES
8.61	8.75	1.40	N/A	YES
Linearity = 0.987				

[1]-zero/high based on 2% of span,low/mid based on 5% of concentration



CO2 Span (%) = 18.70

SERVOMEX 1440 (CO_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	-0.05	-0.27	0.05	YES (%)
8.92	8.92	0.00	0.00	YES (%)
18.70	18.73	0.16	0.03	YES (%)
Linearity = 0.996				



NOx Converter Efficiency

Date: September 26, 2018

Analyzer: INST-NX-0043

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**49.10**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**0.48**
	Analyzer Reading, NOx Channel, ppmvd	**45.83**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**45.35**
	Converter Efficiency, %	**92.36**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_V}\right) \times 100$$

Eq. 7E-7 = $\frac{45.35 \text{ ppmvd}}{49.10 \text{ ppmvd}}$ x 100 = 92.36%

Date/Time mm/dd/yy hh:mm:ss	Elapsed Time Seconds	NOx ppmvd	NO ppmvd
09/26/18 22:41:34	212890	45.77	0.54
09/26/18 22:41:44	212900	45.75	0.53
09/26/18 22:41:54	212910	45.77	0.54
09/26/18 22:42:04	212920	45.76	0.53
09/26/18 22:42:14	212930	45.81	0.54
09/26/18 22:42:24	212940	45.82	0.54
09/26/18 22:42:34	212950	45.79	0.53
09/26/18 22:42:44	212960	45.79	0.53
09/26/18 22:42:54	***212970***	***45.83***	***0.48***
09/26/18 22:43:04	212980	45.82	0.48
09/26/18 22:43:14	***212990***	***45.83***	***0.48***
09/26/18 22:43:24	213000	45.83	0.49

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	**O2**	**NOx**
Initial Zero	0.06	0.21
Final Zero	0.09	0.11
Avg. Zero	0.08	0.16
Initial UpScale	11.83	5.87
Final UpScale	12.15	5.48
Avg. UpScale	11.99	5.68
Sys Resp (Zero)	-0.01	0.02
Sys Resp (Upscale)	12.03	5.80
Upscale Cal Gas	11.98	5.53
Initial Zero Bias	0.33%	1.68%
Final Zero Bias	0.48%	0.80%
Zero Drift	0.14%	0.88%
Initial Upscale Bias	-0.95%	0.62%
Final Upscale Bias	0.57%	-2.83%
Upscale Drift	1.52%	3.45%
Alternative Specification Abs Diff **Initial Zero**	0.07	0.19
Final Zero	0.10	0.09
Initial Upscale	0.20	0.07
Final Upscale	0.12	0.32
Calibration Span	21.00	11.32
3% of Range (drift)	0.63	0.34
5% of Range (bias)	1.05	0.57

Respone Time (min)	0.8	1.8
Sys. Response (min)	1.8	

Date/Time mm/dd/yy hh:mm:ss	z	O_2 %	s	z	NOx ppm	s	**INJECTIONS**
09/24/18 14:16:54		13.32			2.76		x
09/24/18 14:17:04		13.11			2.80		
09/24/18 14:17:14		7.89			2.81		
09/24/18 14:17:24		1.83			2.78		
09/24/18 14:17:34	x	**0.44**			2.63		
09/24/18 14:17:44		**0.23**			2.78		
09/24/18 14:17:54		**0.19**			4.10		
09/24/18 14:18:04		**0.17**			5.22		
09/24/18 14:18:14		**0.15**			5.42		
09/24/18 14:18:24		**0.14**			5.57		
09/24/18 14:18:34		**0.12**			**5.59**	x	
09/24/18 14:23:04		**0.06**			**5.90**		x
09/24/18 14:23:14		**0.06**			**5.86**		
09/24/18 14:23:24		1.51			**5.86**		
09/24/18 14:23:34		5.07			**5.81**		
09/24/18 14:23:44		9.77			**5.74**		
09/24/18 14:23:54		**11.44**	x		5.51		
09/24/18 14:24:04		**11.73**			4.77		
09/24/18 14:24:14		**11.79**			2.60		
09/24/18 14:24:24		**11.81**			1.00		
09/24/18 14:24:34		**11.81**			0.79		
09/24/18 14:24:44		**11.82**			0.57		
09/24/18 14:24:54		**11.83**		x	**0.43**		
09/24/18 14:25:04		**11.83**			**0.36**		

DRIFT AND BIAS CHECK						
100% W/Db Load, Run - 1		O_2	NOx	CO	THC	CO_2
	Raw Average	12.01	2.44	0.61	1.63	4.91
	Corrected Average	11.93	2.43	0.42	1.81	4.89
	Initial Zero	0.09	0.00	0.07	0.01	-0.02
	Final Zero	0.09	0.01	0.33	0.11	0.03
	Avg. Zero	0.09	0.01	0.20	0.06	0.01
	Initial UpScale	12.07	5.58	5.74	2.94	8.99
	Final UpScale	12.04	5.51	5.79	2.98	8.92
	Avg. UpScale	12.06	5.55	5.77	2.96	8.96
	Sys Resp (Zero)	0.09	0.00	0.07	0.01	-0.02
	Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
	Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
	Initial Zero Bias	0.00%	0.00%	0.00%	0.00%	0.00%
	Final Zero Bias	0.00%	0.09%	2.33%	1.00%	0.27%
	Zero Drift	0.00%	0.09%	2.33%	1.00%	0.27%
	Initial Upscale Bias	0.00%	0.00%	0.00%	0.00%	0.00%
	Final Upscale Bias	-0.14%	-0.62%	0.45%	0.40%	-0.37%
	Upscale Drift	0.14%	0.62%	0.45%	0.40%	0.37%
Alternative Specification Abs Diff	Initial Zero	0.00	0.00	0.00	--	0.00
	Final Zero	0.00	0.01	0.26	--	0.05
	Initial Upscale	0.00	0.00	0.00	--	0.00
	Final Upscale	0.03	0.07	0.05	--	0.07
	Calibration Span	21.00	11.32	11.18	10.00	18.70
	3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
	5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

DRIFT AND BIAS CHECK						
100% W/Db Load, Run - 2		O_2	NOx	CO	THC	CO_2
	Raw Average	11.99	2.49	0.59	2.26	4.90
	Corrected Average	11.95	2.50	0.27	2.54	4.92
	Initial Zero	0.09	0.01	0.33	0.11	0.03
	Final Zero	0.08	0.01	0.35	0.28	-0.03
	Avg. Zero	0.09	0.01	0.34	0.20	0.00
	Initial UpScale	12.04	5.51	5.79	2.98	8.92
	Final UpScale	11.99	5.48	5.80	2.72	8.86
	Avg. UpScale	12.02	5.50	5.80	2.85	8.89
	Sys Resp (Zero)	0.09	0.00	0.07	0.01	-0.02
	Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
	Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
	Initial Zero Bias	0.00%	0.09%	2.33%	1.00%	0.27%
	Final Zero Bias	-0.05%	0.09%	2.50%	2.70%	-0.05%
	Zero Drift	0.05%	0.00%	0.18%	1.70%	0.32%
	Initial Upscale Bias	-0.14%	-0.62%	0.45%	0.40%	-0.37%
	Final Upscale Bias	-0.38%	-0.88%	0.54%	-2.20%	-0.70%
	Upscale Drift	0.24%	0.27%	0.09%	2.60%	0.32%
Alternative Specification Abs Diff	Initial Zero	0.00	0.01	0.26	--	0.05
	Final Zero	0.01	0.01	0.28	--	0.01
	Initial Upscale	0.03	0.07	0.05	--	0.07
	Final Upscale	0.08	0.10	0.06	--	0.13
	Calibration Span	21.00	11.32	11.18	10.00	18.70
	3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
	5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

DRIFT AND BIAS CHECK					
100% W/Db Load, Run - 3	O_2	NOx	CO	THC	CO_2
Raw Average	11.96	2.50	0.57	1.57	4.89
Corrected Average	11.96	2.52	0.25	1.77	4.95
Initial Zero	0.08	0.01	0.35	0.28	-0.03
Final Zero	0.05	-0.03	0.32	0.12	-0.04
Avg. Zero	0.07	-0.01	0.34	0.20	-0.04
Initial UpScale	11.99	5.48	5.80	2.72	8.86
Final UpScale	11.96	5.51	5.81	2.89	8.80
Avg. UpScale	11.98	5.50	5.81	2.81	8.83
Sys Resp (Zero)	0.09	0.00	0.07	0.01	-0.02
Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
Initial Zero Bias	-0.05%	0.09%	2.50%	2.70%	-0.05%
Final Zero Bias	-0.19%	-0.27%	2.24%	1.10%	-0.11%
Zero Drift	0.14%	0.35%	0.27%	1.60%	0.05%
Initial Upscale Bias	-0.38%	-0.88%	0.54%	-2.20%	-0.70%
Final Upscale Bias	-0.52%	-0.62%	0.63%	-0.50%	-1.02%
Upscale Drift	0.14%	0.27%	0.09%	1.70%	0.32%
Alternative Specification Abs Diff — Initial Zero	0.01	0.01	0.28	--	0.01
Final Zero	0.04	0.03	0.25	--	0.02
Initial Upscale	0.08	0.10	0.06	--	0.13
Final Upscale	0.11	0.07	0.07	--	0.19
Calibration Span	21.00	11.32	11.18	10.00	18.70
3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

DRIFT AND BIAS CHECK					
Base Load, Run - 1	O_2	NOx	CO	THC	CO_2
Raw Average	13.42	2.03	0.61	2.19	4.06
Corrected Average	13.44	2.05	0.27	2.41	4.13
Initial Zero	0.05	-0.03	0.32	0.12	-0.04
Final Zero	0.09	-0.04	0.38	0.02	-0.04
Avg. Zero	0.07	-0.04	0.35	0.07	-0.04
Initial UpScale	11.96	5.51	5.81	2.89	8.80
Final UpScale	11.97	5.58	5.87	3.00	8.82
Avg. UpScale	11.97	5.55	5.84	2.95	8.81
Sys Resp (Zero)	0.02	-0.11	0.08	-0.01	-0.05
Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
Initial Zero Bias	0.14%	0.71%	2.15%	1.30%	0.05%
Final Zero Bias	0.33%	0.62%	2.68%	0.30%	0.05%
Zero Drift	0.19%	0.09%	0.54%	1.00%	0.00%
Initial Upscale Bias	-0.52%	-0.62%	0.63%	-0.50%	-1.02%
Final Upscale Bias	-0.48%	0.00%	1.16%	0.60%	-0.91%
Upscale Drift	0.05%	0.62%	0.54%	1.10%	0.11%
Alternative Specification Abs Diff — Initial Zero	0.03	0.08	0.24	--	0.01
Final Zero	0.07	0.07	0.30	--	0.01
Initial Upscale	0.11	0.07	0.07	--	0.19
Final Upscale	0.10	0.00	0.13	--	0.17
Calibration Span	21.00	11.32	11.18	10.00	18.70
3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

DRIFT AND BIAS CHECK					
Base Load, Run - 2	O_2	NOx	CO	THC	CO_2
Raw Average	13.40	2.02	0.61	1.33	4.05
Corrected Average	13.44	2.00	0.27	1.46	4.13
Initial Zero	0.09	-0.04	0.38	0.02	-0.04
Final Zero	0.10	0.11	0.32	-0.11	-0.03
Avg. Zero	0.10	0.04	0.35	-0.05	-0.04
Initial UpScale	11.97	5.58	5.87	3.00	8.82
Final UpScale	11.94	5.48	5.80	3.09	8.78
Avg. UpScale	11.96	5.53	5.84	3.05	8.80
Sys Resp (Zero)	0.09	0.00	0.07	0.01	-0.02
Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
Initial Zero Bias	0.00%	-0.35%	2.77%	0.10%	-0.11%
Final Zero Bias	0.05%	0.97%	2.24%	-1.20%	-0.05%
Zero Drift	0.05%	1.33%	0.54%	1.30%	0.05%
Initial Upscale Bias	-0.48%	0.00%	1.16%	0.60%	-0.91%
Final Upscale Bias	-0.62%	-0.88%	0.54%	1.50%	-1.12%
Upscale Drift	0.14%	0.88%	0.63%	0.90%	0.21%
Alternative Specification Abs Diff — Initial Zero	0.00	0.04	0.31	--	0.02
Final Zero	0.01	0.11	0.25	--	0.01
Initial Upscale	0.10	0.00	0.13	--	0.17
Final Upscale	0.13	0.10	0.06	--	0.21
Calibration Span	21.00	11.32	11.18	10.00	18.70
3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

DRIFT AND BIAS CHECK					
Base Load, Run - 3	O_2	NOx	CO	THC	CO_2
Raw Average	13.39	2.04	0.58	2.50	4.05
Corrected Average	13.45	1.99	0.26	2.76	4.14
Initial Zero	0.10	0.11	0.32	-0.11	-0.03
Final Zero	0.12	0.06	0.34	0.18	-0.03
Avg. Zero	0.11	0.09	0.33	0.04	-0.03
Initial UpScale	11.94	5.48	5.80	3.09	8.78
Final UpScale	11.94	5.56	5.83	3.06	8.78
Avg. UpScale	11.94	5.52	5.82	3.08	8.78
Sys Resp (Zero)	0.09	0.00	0.07	0.01	-0.02
Sys Resp (Upscale)	12.07	5.58	5.74	2.94	8.99
Upscale Cal Gas	11.98	5.53	5.73	3.08	8.92
Initial Zero Bias	0.05%	0.97%	2.24%	-1.20%	-0.05%
Final Zero Bias	0.14%	0.53%	2.42%	1.70%	-0.05%
Zero Drift	0.10%	0.44%	0.18%	2.90%	0.00%
Initial Upscale Bias	-0.62%	-0.88%	0.54%	1.50%	-1.12%
Final Upscale Bias	-0.62%	-0.18%	0.81%	1.20%	-1.12%
Upscale Drift	0.00%	0.71%	0.27%	0.30%	0.00%
Alternative Specification Abs Diff — Initial Zero	0.01	0.11	0.25	--	0.01
Final Zero	0.03	0.06	0.27	--	0.01
Initial Upscale	0.13	0.10	0.06	--	0.21
Final Upscale	0.13	0.02	0.09	--	0.21
Calibration Span	21.00	11.32	11.18	10.00	18.70
3% of Cal. Span (drift)	0.63	0.34	0.34	0.30	0.56
5% of Cal. Span (bias)	1.05	0.57	0.56	0.50	0.94

MULTI LOAD TEST - FIELD DATA SHEET

AIR HYGIENE

Company:	CPV Valley, LLC		
Location:	CPV Valley Energy Center		
Date:	Monday, September 24, 2018	Project Code:	sie-18-middletown.ny-start#1
Unit Make and Model:	Siemens SGT6-8000H		
Unit Number:	CTG-2		
Serial Number:			
Data Recorded By:	PKM		
Tested With AHI Unit(s):	Truck(s): 165	Trailer(s):	215

CYLINDER SERIAL NUMBERS		O_2	NOx	CO		CO_2	THC
	Low	EB0078112	CC719163	CC719163		EB0078112	CC719163
	Mid	CC719163	EB0078112	EB0078112		CC719163	EB0072999
	High	EB00101677	EB0052316	EB0052316		EB00101677	EB0100138

NO_2 CONVERSION			
NO_2 Gas (ppm)	49.1	NOx Reading (ppm)	
NO Reading (ppm)		Cylinder Num	EB0051214

Stack Dia. = ______
Measured By: ______
Measured With: ______

RUN INFORMATION	Max Load					Low Load						
	____% #1	____% #2	____% #3	____% #4	____% #5	____% #1	____% #2	____% #3	____% #4	____% #5		
Time Start (hh:mm:ss)												
Time Stop (hh:mm:ss)												
Rated MegaWatts (MW or hp)												
Actual MegaWatts (MW or hp)												
Barometric Pressure (in. Hg)												
Ambient Temperature (°F)												
Relative Humidity (%)												
Fuel Flow (lb/min)												
Fuel Flow (SCF/hr)=(lb/min)*21.7												
Specific Humidity (gr/lb)												
Specific Humidity (lb H_2O/lb air)=(gr/lb)/7000												
PCD (psi)												
PCD (mm Hg)=(psi+14.24)*51.71493												
NOx Water Injection (gpm)												

CALIBRATION	O_2		NOx		CO		THC		CO_2		SO_2	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	-0.01	0	0.02	0	-0.02	0	-0.11	0	-0.03		
Low Gas			5.53	5.80	5.73	5.86	3.08	2.91				
Mid Gas	11.98	12.03	11.32	11.56	11.18	11.11	5.05	4.75	8.92	9.03		
High Gas	21	21.04					8.61	8.54	18.7	18.94		

BIAS	O_2		NOx		CO		THC		CO_2		SO_2	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Low Load Run #1	0.09	12.15	0.11	5.48	0.36	5.77						
Load 1 Run #1 / Load 1 Run #2												
Load 1 Run #2 / Load 1 Run #3												
Load 1 Run #3 / Load 1 Run #4												
Load 1 Run #4 / Load 1 Run #5												
Load 1 Run #5 / END												
Initial / Load 2 Run #1												
Load 2 Run #1 / Load 2 Run #2												
Load 2 Run #2 / Load 2 Run #3												
Load 2 Run #3 / Load 2 Run #4												
Load 2 Run #4 / Load 2 Run #5												
Load 2 Run #5 / Final												
Bias Gas Actual Conc.		11.98		5.53		5.73		3.08		8.92		

Signature ______

MULTI LOAD TEST - FIELD DATA SHEET

AIR HYGIENE

Company:	CPV Valley, LLC
Location:	CPV Valley Energy Center
Date:	Tuesday, September 25, 2018 — Project Code: sie-18-middletown.ny-start#1
Unit Make and Model:	Siemens SGT6-8000H
Unit Number:	CTG-2
Serial Number:	
Data Recorded By:	PKM
Tested With AHI Unit(s):	Truck(s): 165 — Trailer(s): 215

CYLINDER SERIAL NUMBERS	O_2	NOx	CO		CO_2	THC
Low	EB0078112	CC719163	CC719163		EB0078112	CC719163
Mid	CC719163	EB0078112	EB0078112		CC719163	EB0072999
High	EB00101677	EB0052316	EB0052316		EB00101677	EB0100138

NO_2 CONVERSION			
NO_2 Gas (ppm)	49.1	NOx Reading (ppm)	
NO Reading (ppm)		Cylinder Num	EB0051214

Stack Dia. = ______
Measured By: ______
Measured With: ______

RUN INFORMATION	← 100% w/DB — Max Load → ____% #1	____% #2	____% #3	← BASE LOAD ____% #4	____% #5	→ Low Load ____% #1	____% #2	____% #3	____% #4	____% #5		
Time Start (hh:mm:ss)	9:25:24	11:24:24	12:57:24	15:40:24	17:15:24	18:44:24						
Time Stop (hh:mm:ss)	10:24:24	12:23:24	13:56:24	16:39:24	18:14:24	19:43:24						
Rated MegaWatts (MW or hp)												
Actual MegaWatts (MW or hp)												
Barometric Pressure (in. Hg)	29.78	29.78	29.75	29.69	29.68	29.66						
Ambient Temperature (°F)	52	53	54	58	58	58						
Relative Humidity (%)	97	97	97	96	98	98						
Fuel Flow (lb/min)												
Fuel Flow (SCF/hr)=(lb/min)*21.7												
Specific Humidity (gr/lb)												
Specific Humidity (lb H_2O/lb air)=(gr/lb)/7000												
PCD (psi)												
PCD (mm Hg)=(psi+14.24)*51.71493												
NOx Water Injection (gpm)												

CALIBRATION	O_2 Conc.	O_2 Actual	NOx Conc.	NOx Actual	CO Conc.	CO Actual	THC Conc.	THC Actual	CO_2 Conc.	CO_2 Actual	SO_2 Conc.	SO_2 Actual
Zero Gas	0	0.09	0	0.00	0	0.07	0	0.01	0	-0.02		
Low Gas			5.53	5.58	5.73	5.74	3.08	2.94				
Mid Gas	11.98	12.07	11.32	11.38	11.18	11.15	5.05	5.09	8.92	8.99		
High Gas	21	21.01					8.61	8.63	18.7	18.83		

BIAS	O_2 Zero	O_2 Mid	NOx Zero	NOx Mid	CO Zero	CO Mid	THC Zero	THC Mid	CO_2 Zero	CO_2 Mid	SO_2 Zero	SO_2 Mid
Initial Low Load Run #1	0.09	12.07	0.00	5.58	0.07	5.74	0.01	2.94	-0.02	8.99		
Load 1 Run #1 / Load 1 Run #2	0.09	12.04	0.01	5.51	0.33	5.79	0.11	2.98	0.03	8.92		
Load 1 Run #2 / Load 1 Run #3	0.08	11.99	0.01	5.48	0.35	5.80	0.28	2.72	-0.03	8.86		
Load 1 Run #3 / Load 1 Run #4	0.05	11.96	-0.03	5.51	0.32	5.81	0.12	2.89	-0.04	8.80		
Load 1 Run #4 / Load 1 Run #5	0.09	11.97	-0.04	5.58	0.38	5.87	0.02	3.00	-0.04	8.82		
Load 1 Run #5 / END	0.10	11.94	0.11	5.48	0.32	5.80	-0.11	3.09	-0.03	8.78		
Initial / Load 2 Run #1	0.12	11.94	0.06	5.56	0.34	5.83	0.36	3.06	-0.03	8.78		
Load 2 Run #1 / Load 2 Run #2												
Load 2 Run #2 / Load 2 Run #3												
Load 2 Run #3 / Load 2 Run #4												
Load 2 Run #4 / Load 2 Run #5												
Load 2 Run #5 / Final												
Bias Gas Actual Conc.		11.98		5.53		5.73		3.08		8.92		

Signature Pat McA

AIR HYGIENE

MULTI LOAD TEST - FIELD DATA SHEET

Company:	CPV Valley, LLC
Location:	CPV Valley Energy Center
Date:	Wednesday, September 26, 2018 — Project Code: sie-18-middletown.ny-start#1
Unit Make and Model:	Siemens SGT6-8000H
Unit Number:	CTG-2
Serial Number:	
Data Recorded By:	PKM
Tested With AHI Unit(s):	Truck(s): 165 — Trailer(s): 215

CYLINDER SERIAL NUMBERS	O_2	NOx	CO		CO_2	THC
Low	EB0078112	CC719163	CC719163		EB0078112	CC719163
Mid	CC719163	EB0078112	EB0078112		CC719163	EB0072999
High	EB00101677	EB0052316	EB0052316		EB00101677	EB0100138

NO_2 CONVERSION			
NO_2 Gas (ppm)	49.1	NOx Reading (ppm)	
NO Reading (ppm)		Cylinder Num	EB0051214

Stack Dia. = ______
Measured By: ______
Measured With: ______

RUN INFORMATION	Max Load ____% #1	____% #2	____% #3	____% #4	____% #5	Low Load ____% #1	____% #2	____% #3	____% #4	____% #5		
Time Start (hh:mm:ss)	23:41:24	00:57:24	02:13:24									
Time Stop (hh:mm:ss)	00:40:24	01:56:24	03:12:24									
Rated MegaWatts (MW or hp)												
Actual MegaWatts (MW or hp)												
Barometric Pressure (in. Hg)	29.49	29.53	29.54									
Ambient Temperature (°F)	60	60	58									
Relative Humidity (%)	83	79	76									
Fuel Flow (lb/min)												
Fuel Flow (SCF/hr)=(lb/min)*21.7												
Specific Humidity (gr/lb)												
Specific Humidity (lb H_2O/lb air)=(gr/lb)/7000												
CD (psi)												
CD (mm Hg)=(psi+14.24)*51.71493												
NOx Water Injection (gpm)												

CALIBRATION	O_2 Conc.	O_2 Actual	NOx Conc.	NOx Actual	CO Conc.	CO Actual	THC Conc.	THC Actual	CO_2 Conc.	CO_2 Actual	SO_2 Conc.	SO_2 Actual
Zero Gas	0	0.02	0	-0.11	0	0.08	0	-0.01	0	-0.05		
Low Gas			5.53	5.56	5.73	5.97	3.08	3.18				
Mid Gas	11.98	12.01	11.32	11.51	11.18	11.07	5.05	5.02	8.92	8.92		
High Gas	21	21.01					8.61	8.75	18.7	18.73		

BIAS	O_2 Zero	O_2 Mid	NOx Zero	NOx Mid	CO Zero	CO Mid	THC Zero	THC Mid	CO_2 Zero	CO_2 Mid	SO_2 Zero	SO_2 Mid
Initial Low Load Run #1	0.02	12.01	-0.11	5.56	0.08	5.97	-0.01	3.18	-0.05	8.92		
Load 1 Run #1 / Load 1 Run #2	0.11	11.91	0.12	5.53	0.42	6.08	-0.12	3.08	-0.04	8.81		
Load 1 Run #2 / Load 1 Run #3	0.09	11.92	0.07	5.47	0.50	6.05	-0.05	3.12	-0.05	8.79		
Load 1 Run #3 / Load 1 Run #4	0.10	11.92	0.01	5.43	0.51	6.05	0.10	3.22	-0.05	8.84		
Load 1 Run #4 / Load 1 Run #5												
Load 1 Run #5 / END												
Initial / Load 2 Run #1												
Load 2 Run #1 / Load 2 Run #2												
Load 2 Run #2 / Load 2 Run #3												
Load 2 Run #3 / Load 2 Run #4												
Load 2 Run #4 / Load 2 Run #5												
Load 2 Run #5 / Final												
Bias Gas Actual Conc.	11.98		5.53		5.73		3.08		8.92			

Signature Patrick McH[illegible]

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-1
Equipment Certifications and Calibrations

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0024

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]Original (5 point)

Make: Apex
Model #: XC-522
Serial #: 1308035

Date: 05/07/18
Barometric Pressure: 29.25 (in. Hg)
Theoretical Critical Vacuum: 13.80 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.32	17.00	78.000	83.170	5.170	73.0	73.0
0.63	12.00	83.170	88.410	5.240	74.0	74.0
1.10	10.00	88.410	94.350	5.940	75.0	75.0
2.00	10.00	94.350	102.120	7.770	76.0	76.0
3.60	10.00	102.120	112.690	10.570	77.0	77.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
73.0	73.0	140	0.2353	16.0	71.2	71.4	71.3
75.0	75.0	148	0.3368	16.0	71.3	71.4	71.4
76.0	76.0	155	0.4555	16.0	71.4	71.6	71.5
77.0	77.0	163	0.5955	16.0	71.6	71.7	71.7
77.0	77.0	173	0.8121	16.0	71.6	71.7	71.7

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
5.009	141.85	5.076	143.8	5.227
5.066	143.48	5.128	145.2	5.281
5.739	162.53	5.779	163.7	5.953
7.510	212.69	7.554	213.9	7.784
10.248	290.22	10.302	291.8	10.615

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.005	1.013	1.955	49.66	0.086
0.004	1.012	1.874	47.59	0.005
-0.002	1.007	1.786	45.36	-0.083
-0.003	1.006	1.897	48.17	0.028
-0.003	1.005	1.834	46.58	-0.035
AVERAGE:	**1.009**	**1.869**	47.47	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 05/07/18 05/07/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0024

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]Original (5 point)

Make: Apex
Model #: XC-522
Serial #: 1308035

Date: 05/07/18
Barometric Pressure: 29.25 (in. Hg)
Temperature (ASTM cal): 70.90 (°F)

Thermocouple	**100 (°F)**		**600 (°F)**		**1200 (°F)**	
	Reading	**% Error**	**Reading**	**% Error**	**Reading**	**% Error**
Stack	100.00	0.00	602.00	0.33	1203.00	0.25
Probe	99.00	0.50	600.00	0.00	1201.00	0.08
Filter	100.00	0.00	600.00	0.00	1200.00	0.00
Dryer	100.00	0.00	602.00	0.33	1203.00	0.25
Aux.	101.00	0.50	602.00	0.33	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	**70.90 (°F)**		**Responded to heating/cooling with the anticipated outcome?**
	Reading	**(±°F)**	
DGM In	71.0	0.10	yes
DGM Out	71.0	0.10	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 05/07/18 05/07/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]Original (5 point)

Barometric Pressure: 29.25

Thermo-couples		Temps (°F)	Signature		Date	
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
Stack	Read	71.00				
	±°F	0.10				
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
Probe	Read	71.00				
	±°F	0.10				
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
Filter	Read	71.00				
	±°F	0.10				
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
Cond.	Read	71.00				
	±°F	0.10				
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
CPM	Read	71.00				
	±°F	0.10				
	Ref	70.90	Craig McCarty		05/07/18	05/07/18
Exit	Read	71.00				
	±°F	0.10				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0024

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]10-10-18 (3 point)

Make: Apex | Date: 10/10/18
Model #: XC-522 | Barometric Pressure: 29.10 (in. Hg)
Serial #: 1308035 | Theoretical Critical Vacuum: 13.73 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H2O)	Time (min)	Volume Initial (ft³)	Volume Final (ft³)	Volume Total (ft³)	Initial Temperature Inlet (°F)	Initial Temperature Outlet (°F)
1.90	10.00	94.110	101.700	7.590	70.0	70.0
1.90	10.00	101.700	109.290	7.590	71.0	71.0
1.90	10.00	109.290	116.880	7.590	73.0	73.0

Final Temperature Inlet (°F)	Final Temperature Outlet (°F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature Initial (°F)	Ambient Temperature Final (°F)	Ambient Temperature Average (°F)
71.0	71.0	163	0.5955	16.0	71.2	71.3	71.3
73.0	73.0	163	0.5955	16.0	71.3	71.2	71.3
74.0	74.0	163	0.5955	16.0	71.2	71.3	71.3

RESULTS

DRY GAS METER VOLUME CORRECTED Vm(std) (ft³)	DRY GAS METER VOLUME CORRECTED Vm(std) (liters)	ORIFICE VOLUME CORRECTED Vcr(std) (ft³)	ORIFICE VOLUME CORRECTED Vcr(std) (liters)	ORIFICE VOLUME NOMINAL Vcr (ft³)
7.380	208.99	7.518	212.9	7.781
7.359	208.40	7.518	212.9	7.781
7.338	207.81	7.518	212.9	7.781

DRY GAS METER CALIBRATION FACTOR Y Variation (number)	DRY GAS METER CALIBRATION FACTOR Y Value (number)	ORIFICE CALIBRATION FACTOR ΔH@ Value (in. H2O)	ORIFICE CALIBRATION FACTOR ΔH@ Value (mm H2O)	ORIFICE CALIBRATION FACTOR ΔH@ Variation (in. H2O)
-0.003	1.019	1.830	46.49	0.005
0.000	1.022	1.825	46.36	0.000
0.003	1.025	1.820	46.23	-0.005
AVERAGE:	**1.022**	**1.825**	46.36	**PASSED**
LAST 5-PT:	**1.009**	**1.869**	**PASSED**	5-PT Date:
% DIFF:	**1.3%**	**2.4%**		05/07/18

40 CFR - CHAPTER I - PART 60
Appendix A, Method 5
10.3.2 Calibration After Use
After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)....Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration
If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty | DATE: 10/10/18 10/10/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0024

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]10-10-18 (3 point)

Make: Apex
Model #: XC-522
Serial #: 1308035

Date: 10/10/18
Barometric Pressure: 29.10 (in. Hg)
Temperature (ASTM cal): 71.30 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	101.00	0.50	602.00	0.33	1204.00	0.33
Probe	101.00	0.50	602.00	0.33	1204.00	0.33
Filter	101.00	0.50	602.00	0.33	1204.00	0.33
Dryer	101.00	0.50	602.00	0.33	1204.00	0.33
Aux.	101.00	0.50	602.00	0.33	1204.00	0.33

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	71.30 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	71.0	0.30	yes
DGM Out	71.0	0.30	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 10/10/18 10/10/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0024 Calibration 5-7-18.xls]10-10-18 (3 point)

Barometric Pressure: 29.10

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.30				
Probe	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	72.00				
	±°F	0.70				
Filter	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.30				
Cond.	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.30				
CPM	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.30				
Exit	Ref	71.30	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.30				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]Original (5 point)

Make: apex — Date: 11/27/17
Model #: 522 — Barometric Pressure: 29.26 (in. Hg)
Serial #: 1705007 — Theoretical Critical Vacuum: 13.80 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.31	17.00	175.600	180.970	5.370	74.0	74.0
0.63	12.00	180.970	186.430	5.460	74.0	74.0
1.10	10.00	186.430	192.620	6.190	74.0	74.0
1.90	10.00	192.620	200.780	8.160	74.0	74.0
3.50	10.00	200.780	211.880	11.100	75.0	75.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
74.0	75.0	140	0.2345	16.0	69.6	69.7	69.7
74.0	74.0	148	0.3355	16.0	69.6	69.6	69.6
74.0	74.0	155	0.4539	16.0	69.6	69.4	69.5
75.0	75.0	163	0.5911	16.0	69.5	69.4	69.5
76.0	76.0	173	0.8106	16.0	69.4	69.1	69.3

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
5.192	147.04	5.068	143.5	5.201
5.286	149.69	5.119	145.0	5.252
6.000	169.91	5.772	163.5	5.921
7.917	224.22	7.517	212.9	7.710
10.793	305.66	10.310	292.0	10.572

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.014	0.976	1.895	48.14	0.058
0.006	0.968	1.883	47.83	0.046
0.000	0.962	1.796	45.62	-0.041
-0.013	0.949	1.827	46.41	-0.010
-0.007	0.955	1.786	45.36	-0.052
AVERAGE:	**0.962**	**1.838**	46.67	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 11/27/17 11/27/17

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]Original (5 point)

Make: apex
Model #: 522
Serial #: 1705007

Date: 11/27/17
Barometric Pressure: 29.25 (in. Hg)
Temperature (ASTM cal): 68.00 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	101.00	0.50	601.00	0.17	1201.00	0.08
Probe	101.00	0.50	601.00	0.17	1201.00	0.08
Filter	101.00	0.50	601.00	0.17	1201.00	0.08
Dryer	101.00	0.50	601.00	0.17	1201.00	0.08
Aux.	101.00	0.50	601.00	0.17	1201.00	0.08

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003

Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	68.00 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	68.0	0.00	yes
DGM Out	68.0	0.00	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 11/27/17 11/27/17

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]Original (5 point)

Barometric Pressure: 29.26

Thermo-couples		Temps (°F)	Signature		Date	
Stack	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	68.00				
	±°F	0.60				
Probe	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	69.00				
	±°F	0.40				
Filter	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	69.00				
	±°F	0.40				
Cond.	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	68.00				
	±°F	0.60				
CPM	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	68.00				
	±°F	0.60				
Exit	**Ref**	68.60	Craig McCarty		11/27/17	11/27/17
	Read	68.00				
	±°F	0.60				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]10-9-18 (3 point)

Make: apex
Model #: 522
Serial #: 1705007

Date: 10/09/18
Barometric Pressure: 28.88 (in. Hg)
Theoretical Critical Vacuum: 13.62 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
1.90	10.00	292.400	300.610	8.210	73.0	73.0
1.90	10.00	300.610	308.820	8.210	75.0	75.0
1.90	10.00	308.820	317.090	8.270	78.0	78.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
75.0	75.0	163	0.5955	16.0	71.0	71.0	71.0
77.0	77.0	163	0.5955	16.0	71.0	70.8	70.9
79.0	79.0	163	0.5955	16.0	70.8	71.0	70.9

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
7.870	222.89	7.463	211.4	7.779
7.841	222.06	7.464	211.4	7.778
7.862	222.64	7.464	211.4	7.778

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
-0.002	0.948	1.831	46.51	0.008
0.002	0.952	1.824	46.33	0.000
0.000	0.949	1.816	46.11	-0.008
AVERAGE:	**0.950**	**1.824**	46.32	**PASSED**
LAST 5-PT:	**0.962**	**1.838**	**PASSED**	5-PT Date:
% DIFF:	**1.3%**	**0.8%**		11/27/17

40 CFR - CHAPTER I - PART 60
Appendix A, Method 5
10.3.2 Calibration After Use
After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)....Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration
If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 10/09/18 10/09/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]10-9-18 (3 point)

Make: apex
Model #: 522
Serial #: 1705007

Date: 10/09/18
Barometric Pressure: 28.88 (in. Hg)
Temperature (ASTM cal): 71.00 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	600.00	0.00	1200.00	0.00
Probe	100.00	0.00	600.00	0.00	1200.00	0.00
Filter	100.00	0.00	600.00	0.00	1200.00	0.00
Dryer	100.00	0.00	600.00	0.00	1200.00	0.00
Aux.	100.00	0.00	600.00	0.00	1200.00	0.00

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	71.00 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	71.0	0.00	yes
DGM Out	71.0	0.00	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 10/09/18 10/09/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-d-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0028 Calibration 11-27-17.xls]10-9-18 (3 point)

Barometric Pressure: 28.88

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	70.70	Craig McCarty		10/09/18	10/09/18
	Read	71.00				
	±°F	0.30				
Probe	Ref	70.80	Craig McCarty		10/09/18	10/09/18
	Read	71.00				
	±°F	0.20				
Filter	Ref	70.70	Craig McCarty		10/09/18	10/09/18
	Read	70.00				
	±°F	0.70				
Cond.	Ref	70.80	Craig McCarty		10/09/18	10/09/18
	Read	71.00				
	±°F	0.20				
CPM	Ref	70.70	Craig McCarty		10/09/18	10/09/18
	Read	71.00				
	±°F	0.30				
Exit	Ref	70.70	Craig McCarty		10/09/18	10/09/18
	Read	71.00				
	±°F	0.30				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

Environmental Supply Company, Inc.

Quality Source Sampling Systems & Accessories

Wind Tunnel Pitot Calibration

S-type Pitot ID:	**A4187**	Date:	**2-Mar-15**
Standard Pitot ID:	**001**	Personnel:	**KMR MF**
Cp(std):	**0.99**	Cp(actual):	**0.724**
Part Number:		P_{bar}(in Hg):	**29.71**
Test Velocity (fps):	**50**	T(°F):	**55**
Wind Tunnel Location:	**Calera, AL**	Tunnel Size:	**20" x 40"**
Customer:	**Air Hygiene**		

A-SIDE

ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	Cp(s)	Deviation*
0.563	**1.053**	**0.723**	0.002
0.561	**1.048**	**0.724**	-0.001
0.561	**1.050**	**0.724**	0.000
	AVERAGE	**0.724**	0.001
		Std deviation	0.002

NOTES:

1. **Pitot calibrated with an Environmental Supply Co. PM10 cyclone.**
2. **C_p is only valid when used with PM10 cyclone.**
3. **C_p is only valid with 1" spacing from PM10 cyclone.**

$$Cp(s) = Cp(std)\sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

*Deviation = {Cp(s) - *AVG* Cp(s)} {must be <0.010}

Standard deviation of the deviations must be less than 0.02 for both sides.

Pitot tube S/N A4187 was calibrated in accordance with the CFR 40, Part 60 Appendix A, Method 2, Section 10.

[signature]
Signature

3/2/15
Date

708 E. Club Blvd., Durham, North Carolina 27704 www.environsupply.com 919-956-9688 FAX: 919-682-0333

APEX SOURCE TESTING EQUIPMENT INSTRUMENTS

Apex Instruments, Inc.
204 Technology Park Lane
Fuquay-Varina, NC 27526

S-TYPE PITOT TUBE CALIBRATION SHEET

Reference USEPA Reference Method 2 (40CFR60, App. A, Meth. 2)

PITOT SERIAL#	A5702	**CALIBRATION DATE:**	17-Nov-14
PITOT TYPE:	S	**BAROMETRIC PRESSURE:**	29.40 in Hg
STD. PITOT TYPE:	HEMISPHERICAL	**STATIC PRESSURE**	-0.6 in H_20
Cp(std):	0.990	**BLOCKAGE %:**	<2%
PROBE SERIAL#	N/A	**CORRECTION FACTOR:**	1.00

SIDE "A" CALIBRATION

RUN NO.	Δ Pstd in H_2O	Δ Ps in H_2O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.565	0.814	0.825	0.000
2	0.564	0.809	0.827	0.002
3	0.561	0.810	0.824	-0.001
		"A" AVERAGE	0.825	0.0014 (must be ≤ 0.01)

SIDE "B" CALIBRATION

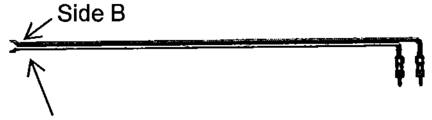
RUN NO.	Δ Pstd in H_2O	Δ Ps in H_2O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.561	0.804	0.827	-0.001
2	0.564	0.804	0.829	0.001
3	0.561	0.804	0.827	-0.001
		"B" AVERAGE	0.828	0.0013 (must be ≤ 0.01)

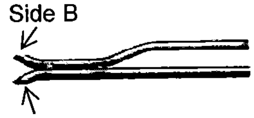
ACCEPTANCE CRITERIA

AVERAGE **-0.0026** AVG. Cp (A) - AVG. Cp (B) must be ≤ 0.01

If the Average and both Deviation Averages "A" & "B" are ≤ 0.01, then the OVERALL AVERAGE below may be used.
*** If NOT, use the "A" Average OR "B" Average.**

OVERALL AVERAGE **0.8264**





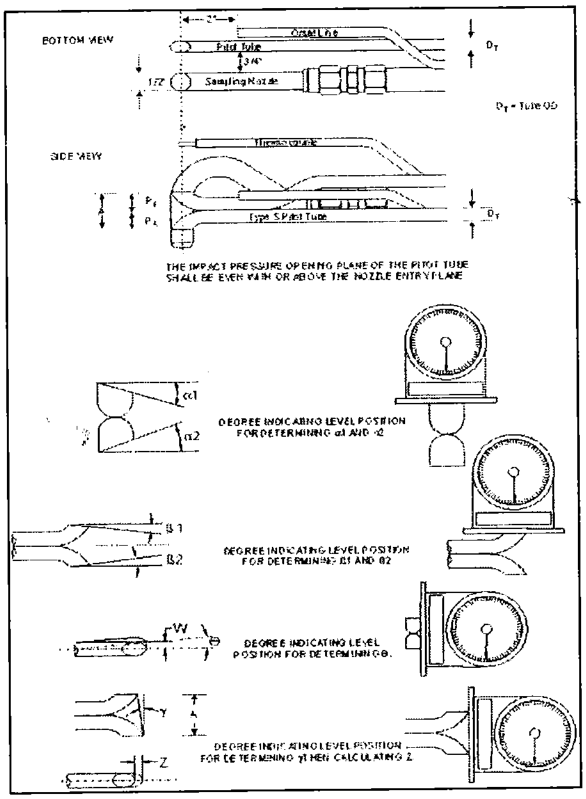
I certify that the above pitot tube was tested in accordance with the US EPA Method 2 standards.
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.

Print Name: BO PRITCHARD Date 11/17/2014

Signature: Bo P

APEX SOURCE TESTING EQUIPMENT
INSTRUMENTS

Type S Pitot Tube Inspection Form



PITOT TUBE/PROBE # 5702

Parameter	Value	Allowable Range	Check
Assembly Level?	yes	Yes	OK
Ports Damaged?	no	No	OK
α1	0	-10° < α1 < +10°	OK
α2	1	-10° < α2 < +10°	OK
1	0	-5° < b1 < +5°	OK
1	1	-5° < β2 < +5°	OK
γ	1		
θ	0		
Z = A tan γ	0.000	Z ≤ .125"	OK
W = A tan θ	0.000	W ≤ .031"	OK
Dt	0.375	.188" to .375"	OK
A/2Dt	1.105333	$1.05 \le P_A/D_t \le 1.5$	OK
A	0.829	$2.1D_t \le A \le 3D_t$	OK

Certification

I certify that pitot tube/probe number 5702 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.84. See 40 CFR Pt. 60, App. A, EPA Method 2.

Certified by: Bob Christ 11-12-14
Personnel (Signature/Date)

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Certificate of Calibration

S-Type Pitot Tube Calibration

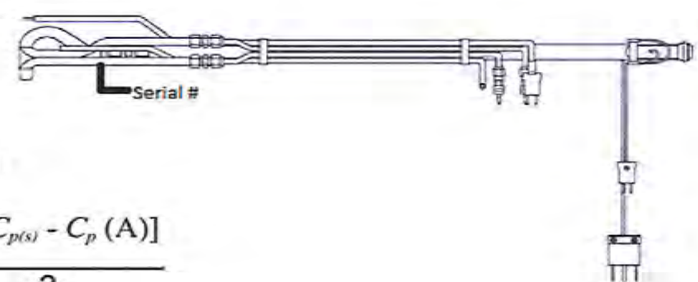
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.

Pitot Information		Calibration Conditions		Reference Pitot Information	
Pitot Type:	S	Bar. Pressure (in Hg):	30.00	Std. Pitot Type	Ellipsoidal
Pitot Serial #:	8162	Elevation (ft):	407	Cp(std):	0.990
Probe Serial #:	WT-CAL-PROBE	Adj. Bar. Pressure (in Hg):	29.59	Serial #:	APEX-RP1
		Static Pressure (in H20):	-0.6		
		Blockage %:	< 2		
		Correction Factor:	1.00		

	Side "A" Calibration			
Run No.	Δ Pstd in H20	Δ Ps in H20	Cp(s)	Deviation Cp(s) - avg.Cp(s)
1	0.558	0.817	0.818	-0.002
2	0.557	0.810	0.821	0.001
3	0.557	0.812	0.820	0.000
		"A" Average	0.820	0.001

(must be ≤ 0.01)

$$C_{p(s)} = C_{p(std)} \sqrt{\frac{\Delta p_{std}}{\Delta p_s}}$$



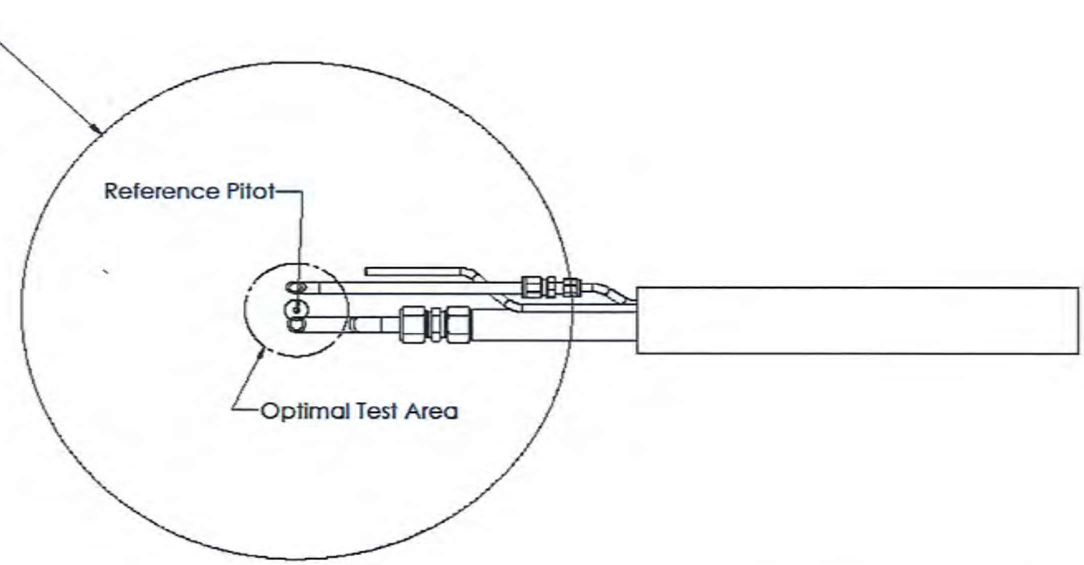
$$\text{Deviation} = C_{p(s)} - \overline{C_p}(\text{A})$$

$$\text{Avg Dev} = \sigma(\text{A}) = \frac{\sum_{1}^{3} [C_{p(s)} - C_p(\text{A})]}{3}$$

Method 2 Section 10.1.4.3 For a probe assembly constructed such that its pitot tube is always used in the same orientation, only one side of the pitot tube need be calibrated (the side which will face the flow). The pitot tube must still meet the alignment specifications of Figure 2-2 or 2-3, however, and must have an average deviation (σ) value of 0.01 or less (see section 10.1.4.4).

Technician: Chris Harris **Signature:** [signature] **Date:** 5/18/2018

I certify that the above pitot tube was tested in accordance with the US EPA Method 2 standards.



Reference pitot is lowered in from the top of the wind tunnel and removed during testing.

P:\Archives-documentation\Justin - Master CAD Files\P-## [PROBES]\Method 5 Probe\

DRAWN	CNH 4/19/2018
TITLE:	M5 Probe in Tunnel
SIZE	B
SCALE: 1:3	SHEET 1 OF 1

APEX INSTRUMENTS

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-2
Equipment Certifications and Calibrations

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0025

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]Original (5 point)

Make:	apex	Date:	06/06/18
Model #:	XC-522D	Barometric Pressure:	29.23 (in. Hg)
Serial #:	1604005	Theoretical Critical Vacuum:	13.79 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.31	17.00	0.001	5.141	5.140	72.0	72.0
0.61	12.00	5.141	10.330	5.189	72.0	72.0
1.10	10.00	10.330	16.222	5.892	74.0	74.0
1.90	10.00	16.222	23.904	7.682	77.0	77.0
3.50	10.00	23.904	34.397	10.493	78.0	78.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
72.0	72.0	140	0.2353	16.0	71.8	71.8	71.8
74.0	74.0	148	0.3368	16.0	71.8	72.1	72.0
76.0	76.0	155	0.4555	16.0	72.1	72.5	72.3
78.0	78.0	163	0.5955	16.0	72.5	73.3	72.9
80.0	80.0	173	0.8121	16.0	73.3	73.4	73.4

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
4.986	141.19	5.070	143.6	5.229
5.027	142.38	5.122	145.1	5.284
5.694	161.26	5.771	163.4	5.958
7.404	209.69	7.540	213.5	7.793
10.126	286.77	10.279	291.1	10.632

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.000	1.017	1.901	48.28	0.080
0.002	1.019	1.823	46.29	0.002
-0.003	1.013	1.791	45.50	-0.029
0.002	1.018	1.804	45.82	-0.016
-0.001	1.015	1.783	45.30	-0.037
AVERAGE:	**1.017**	**1.820**	46.24	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 06/06/18 06/06/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0025

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]Original (5 point)

Make: apex
Model #: XC-522D
Serial #: 1604005

Date: 06/06/18
Barometric Pressure: 29.23 (in. Hg)
Temperature (ASTM cal): 72.00 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	601.00	0.17	1202.00	0.17
Probe	100.00	0.00	601.00	0.17	1202.00	0.17
Filter	100.00	0.00	601.00	0.17	1202.00	0.17
Dryer	100.00	0.00	601.00	0.17	1202.00	0.17
Aux.	100.00	0.00	601.00	0.17	1202.00	0.17

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	72.00 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	72.0	0.00	yes
DGM Out	72.0	0.00	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 06/06/18 06/06/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]Original (5 point)

Barometric Pressure: 29.21

Thermo-couples		Temps (°F)	Signature		Date	
	Ref	72.00				
Stack	**Read**	72.00	Craig McCarty		06/06/18	06/06/18
	±°F	0.00				
	Ref	72.00				
Probe	**Read**	71.00	Craig McCarty		06/06/18	06/06/18
	±°F	1.00				
	Ref	72.00				
Filter	**Read**	72.00	Craig McCarty		06/06/18	06/06/18
	±°F	0.00				
	Ref	72.00				
Cond.	**Read**	71.00	Craig McCarty		06/06/18	06/06/18
	±°F	1.00				
	Ref	72.00				
CPM	**Read**	71.00	Craig McCarty		06/06/18	06/06/18
	±°F	1.00				
	Ref	72.00				
Exit	**Read**	72.00	Craig McCarty		06/06/18	06/06/18
	±°F	0.00				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0025

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]10-5-18 (3 point)

Make: apex
Model #: XC-522D
Serial #: 1604005

Date: 10/05/18
Barometric Pressure: 29.12 (in. Hg)
Theoretical Critical Vacuum: 13.74 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
1.90	10.00	0.001	7.610	7.609	75.0	75.0
1.90	10.00	7.610	15.210	7.600	75.0	75.0
1.90	10.00	15.210	22.829	7.619	76.0	76.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
75.0	75.0	163	0.5955	16.0	71.0	71.2	71.1
76.0	76.0	163	0.5955	16.0	71.2	71.4	71.3
77.0	77.0	163	0.5955	16.0	71.4	71.5	71.5

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
7.341	207.89	7.525	213.1	7.780
7.325	207.45	7.523	213.1	7.781
7.330	207.58	7.522	213.0	7.782

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
-0.001	1.025	1.813	46.05	0.002
0.001	1.027	1.812	46.03	0.001
0.000	1.026	1.809	45.95	-0.002
AVERAGE:	**1.026**	**1.811**	46.01	**PASSED**
LAST 5-PT:	**1.017**	**1.820**	**PASSED**	5-PT Date:
% DIFF:	**0.9%**	**0.5%**		06/06/18

40 CFR - CHAPTER I - PART 60
Appendix A, Method 5
10.3.2 Calibration After Use
After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)....Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration
If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 10/05/18 10/05/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0025

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]10-5-18 (3 point)

Make:	apex	Date:	10/05/18
Model #:	XC-522D	Barometric Pressure:	29.12 (in. Hg)
Serial #:	1604005	Temperature (ASTM cal):	71.30 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	101.00	0.50	602.00	0.33	1203.00	0.25
Probe	101.00	0.50	602.00	0.33	1203.00	0.25
Filter	101.00	0.50	602.00	0.33	1203.00	0.25
Dryer	101.00	0.50	602.00	0.33	1203.00	0.25
Aux.	101.00	0.50	602.00	0.33	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	71.30 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	72.0	0.70	yes
DGM Out	72.0	0.70	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 10/05/18 10/05/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0025 Calibration 6-6-18.xls]10-5-18 (3 point)

Barometric Pressure: 29.12

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	72.00				
	±°F	0.50				
Probe	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	73.00				
	±°F	1.50				
Filter	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	72.00				
	±°F	0.50				
Cond.	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	72.00				
	±°F	0.50				
CPM	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	72.00				
	±°F	0.50				
Exit	Ref	71.50	Craig McCarty		10/05/18	10/05/18
	Read	72.00				
	±°F	0.50				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0029

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]Original (5 point)

Make: apex
Model #: 522
Serial #: 1706009

Date: 08/09/18
Barometric Pressure: 29.19 (in. Hg)
Theoretical Critical Vacuum: 13.77 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.31	17.00	862.100	867.330	5.230	73.0	73.0
0.63	12.00	867.330	872.630	5.300	75.0	75.0
1.10	10.00	872.630	878.640	6.010	77.0	77.0
1.90	10.00	878.640	886.490	7.850	78.0	78.0
3.50	10.00	886.490	897.290	10.800	80.0	80.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
75.0	75.0	140	0.2353	16.0	70.9	71.3	71.1
77.0	77.0	148	0.3368	16.0	71.3	71.4	71.4
78.0	78.0	155	0.4555	16.0	71.4	71.5	71.5
80.0	80.0	163	0.5955	16.0	71.6	71.8	71.7
82.0	82.0	173	0.8121	16.0	71.8	71.9	71.9

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
5.047	142.93	5.067	143.5	5.226
5.100	144.42	5.118	144.9	5.281
5.773	163.50	5.768	163.3	5.953
7.535	213.39	7.538	213.5	7.784
10.370	293.67	10.279	291.1	10.617

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.004	1.004	1.894	48.10	0.070
0.004	1.004	1.872	47.56	0.048
-0.001	0.999	1.783	45.28	-0.041
0.001	1.000	1.797	45.65	-0.027
-0.008	0.991	1.774	45.06	-0.050
AVERAGE:	**1.000**	**1.824**	46.33	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 08/09/18 08/09/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0029

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]Original (5 point)

Make: apex
Model #: 522
Serial #: 1706009

Date: 08/09/18
Barometric Pressure: 29.19 (in. Hg)
Temperature (ASTM cal): 70.30 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	601.00	0.17	1203.00	0.25
Probe	100.00	0.00	601.00	0.17	1203.00	0.25
Filter	100.00	0.00	601.00	0.17	1203.00	0.25
Dryer	100.00	0.00	601.00	0.17	1203.00	0.25
Aux.	100.00	0.00	601.00	0.17	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	70.30 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	70.0	0.30	yes
DGM Out	70.0	0.30	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 08/09/18 08/09/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]Original (5 point)

Barometric Pressure: 29.19

Thermo-couples		Temps (°F)	Signature		Date	
	Ref	70.30				
Stack	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				
	Ref	70.30				
Probe	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				
	Ref	70.30				
Filter	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				
	Ref	70.30				
Cond.	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				
	Ref	70.30				
CPM	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				
	Ref	70.30				
Exit	**Read**	71.00	Craig McCarty		08/09/18	08/09/18
	±°F	0.70				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0029

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]10-10-18 (3 point)

Make: apex
Model #: 522
Serial #: 1706009

Date: 10/10/18
Barometric Pressure: 29.06 (in. Hg)
Theoretical Critical Vacuum: 13.71 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
1.90	10.00	648.900	656.730	7.830	71.0	71.0
1.90	10.00	656.730	664.570	7.840	72.0	72.0
1.90	10.00	664.570	672.420	7.850	75.0	75.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
72.0	72.0	163	0.5955	16.0	70.8	70.9	70.9
75.0	75.0	163	0.5955	16.0	70.9	71.0	71.0
76.0	76.0	163	0.5955	16.0	71.0	71.2	71.1

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft³)
7.588	214.90	7.511	212.7	7.778
7.569	214.36	7.510	212.7	7.779
7.551	213.84	7.509	212.7	7.780

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
-0.002	0.990	1.828	46.43	0.006
0.000	0.992	1.821	46.26	0.000
0.002	0.994	1.815	46.10	-0.006
AVERAGE:	**0.992**	**1.821**	46.27	**PASSED**

LAST 5-PT:	**1.000**	**1.824**	**PASSED**	5-PT Date:
% DIFF:	**0.8%**	**0.1%**		08/09/18

40 CFR - CHAPTER I - PART 60
Appendix A, Method 5
10.3.2 Calibration After Use
After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)....Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration
If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 10/10/18 10/10/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0029

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]10-10-18 (3 point)

Make: apex
Model #: 522
Serial #: 1706009

Date: 10/10/18
Barometric Pressure: 29.06 (in. Hg)
Temperature (ASTM cal): 70.80 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	601.00	0.17	1203.00	0.25
Probe	100.00	0.00	601.00	0.17	1203.00	0.25
Filter	100.00	0.00	601.00	0.17	1203.00	0.25
Dryer	100.00	0.00	601.00	0.17	1203.00	0.25
Aux.	100.00	0.00	601.00	0.17	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	70.80 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	70.0	0.80	yes
DGM Out	70.0	0.80	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 10/10/18 10/10/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0029 Calibration 8-9-18.xls]10-10-18 (3 point)

Barometric Pressure: 29.06

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				
Probe	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				
Filter	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				
Cond.	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				
CPM	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				
Exit	Ref	70.80	Craig McCarty		10/10/18	10/10/18
	Read	71.00				
	±°F	0.20				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0030

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0030 Calibration 7-9-18.xls]Original (5 point)

Make:	apex	Date:	07/09/18	
Model #:	522	Barometric Pressure:	29.36	(in. Hg)
Serial #:	1706010	Theoretical Critical Vacuum:	13.85	(in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.31	17.00	523.220	528.570	5.350	79.0	79.0
0.63	12.00	528.570	533.970	5.400	79.0	79.0
1.10	10.00	533.970	540.100	6.130	80.0	80.0
1.90	10.00	540.100	548.090	7.990	81.0	81.0
3.50	10.00	548.090	559.080	10.990	82.0	82.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
79.0	79.0	140	0.2353	16.0	74.1	74.1	74.1
80.0	80.0	148	0.3368	16.0	74.1	74.2	74.2
81.0	81.0	155	0.4555	16.0	74.2	74.3	74.3
82.0	82.0	163	0.5955	16.0	74.3	74.4	74.4
84.0	84.0	173	0.8121	16.0	74.4	74.5	74.5

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL
Vm(std)	Vm(std)	Vcr(std)	Vcr(std)	Vcr
(ft³)	(liters)	(ft³)	(liters)	(ft³)
5.145	145.70	5.082	143.9	5.241
5.192	147.04	5.134	145.4	5.295
5.890	166.80	5.786	163.9	5.968
7.678	217.45	7.564	214.2	7.804
10.574	299.46	10.314	292.1	10.643

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation	Value	Value	Value	Variation
(number)	(number)	(in. H2O)	(mm H2O)	(in. H2O)
0.004	0.988	1.876	47.64	0.064
0.005	0.989	1.859	47.22	0.047
-0.002	0.982	1.772	45.00	-0.040
0.001	0.985	1.788	45.40	-0.025
-0.009	0.975	1.766	44.86	-0.046
AVERAGE:	**0.984**	**1.812**	46.03	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 07/09/18 07/09/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0030

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0030 Calibration 7-9-18.xls]Original (5 point)

Make: apex
Model #: 522
Serial #: 1706010

Date: 07/09/18
Barometric Pressure: 29.36 (in. Hg)
Temperature (ASTM cal): 74.30 (°F)

Thermocouple	**100 (°F)**		**600 (°F)**		**1200 (°F)**	
	Reading	**% Error**	**Reading**	**% Error**	**Reading**	**% Error**
Stack	100.00	0.00	602.00	0.33	1205.00	0.42
Probe	100.00	0.00	602.00	0.33	1205.00	0.42
Filter	100.00	0.00	602.00	0.33	1205.00	0.42
Dryer	100.00	0.00	602.00	0.33	1205.00	0.42
Aux.	100.00	0.00	602.00	0.33	1205.00	0.42

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003
Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	**74.30 (°F)**		**Responded to heating/cooling with the anticipated outcome?**
	Reading	**(±°F)**	
DGM In	74.0	0.30	yes
DGM Out	74.0	0.30	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty

DATE: 07/09/18 07/09/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0030 Calibration 7-9-18.xls]Original (5 point)

Barometric Pressure: 29.36

Thermo-couples		Temps (°F)	Signature		Date	
Stack	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				
Probe	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				
Filter	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				
Cond.	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				
CPM	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				
Exit	**Ref**	74.20	Craig McCarty		07/09/18	07/09/18
	Read	74.00				
	±°F	0.20				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0032

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0032 Calibration 6-26-18.xls]Original (5 point)

Make: apex
Model #: 522
Serial #: 1804004

Date: 06/26/18
Barometric Pressure: 29.13 (in. Hg)
Theoretical Critical Vacuum: 13.74 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft³)	(ft³)	(ft³)	(°F)	(°F)
0.31	17.00	27.050	32.310	5.260	73.0	73.0
0.62	12.00	32.310	37.620	5.310	74.0	74.0
1.10	10.00	37.620	43.650	6.030	76.0	76.0
1.90	10.00	43.650	51.540	7.890	79.0	79.0
3.50	10.00	51.540	62.360	10.820	80.0	80.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
74.0	74.0	140	0.2353	16.0	71.5	71.6	71.6
75.0	75.0	148	0.3368	16.0	71.6	71.8	71.7
78.0	78.0	155	0.4555	16.0	71.8	72.4	72.1
80.0	80.0	163	0.5955	16.0	72.4	72.4	72.4
82.0	82.0	173	0.8121	16.0	72.4	72.4	72.4

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL
Vm(std)	Vm(std)	Vcr(std)	Vcr(std)	Vcr
(ft³)	(liters)	(ft³)	(liters)	(ft³)
5.070	143.59	5.054	143.1	5.228
5.113	144.80	5.106	144.6	5.283
5.786	163.86	5.752	162.9	5.956
7.551	213.84	7.518	212.9	7.789
10.368	293.62	10.253	290.4	10.623

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.002	0.997	1.901	48.28	0.076
0.004	0.999	1.853	47.06	0.028
-0.001	0.994	1.790	45.47	-0.035
0.001	0.996	1.802	45.76	-0.023
-0.006	0.989	1.780	45.20	-0.045
AVERAGE:	**0.995**	**1.825**	46.36	**PASSED**

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 that equates to 0.75 cfm of air at 68 ^oF and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 06/26/18 06/26/18

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0032

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0032 Calibration 6-26-18.xls]Original (5 point)

Make:	apex	Date:	06/26/18	
Model #:	522	Barometric Pressure:		(in. Hg)
Serial #:	1804004	Temperature (ASTM cal):		(°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	600.00	0.00	1200.00	0.00
Probe	100.00	0.00	601.00	0.17	1201.00	0.08
Filter	101.00	0.50	600.00	0.00	1201.00	0.08
Dryer	100.00	0.00	600.00	0.00	1200.00	0.00
Aux.	100.00	0.00	600.00	0.00	1200.00	0.00

Note: Calibrated against an ALTEK Thermocouple Source Series 22, ID: samp-tc-0003

Direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	72.00 (°F)		Responded to heating/cooling with the anticipated outcome?
	Reading	(±°F)	
DGM In	72.0	0.00	yes
DGM Out	72.0	0.00	yes

Note: Calibrated against Reference Thermometer ID: a070717

SIGNATURE: Craig McCarty DATE: 06/26/18 06/26/18

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60
Appendix A, Method 5
10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0086 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0028

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0032 Calibration 6-26-18.xls]Original (5 point)

Barometric Pressure: 29.14

Thermocouples		Temps (°F)	Signature		Date	
Stack	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	72.00				
	±°F	0.00				
Probe	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	73.00				
	±°F	1.00				
Filter	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	72.00				
	±°F	0.00				
Cond.	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	72.00				
	±°F	0.00				
CPM	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	72.00				
	±°F	0.00				
Exit	Ref	72.00	Craig McCarty		06/26/18	06/26/18
	Read	72.00				
	±°F	0.00				

Note: Calibrated against Reference Thermometer ID: a070717

Thermocouple	Responded to heating/cooling with the anticipated outcome?
Stack	yes
Probe	yes
Filter	yes
Cond.	yes
CPM	yes
Exit	yes

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

Environmental Supply Company, Inc.
Quality Source Sampling Systems & Accessories

Wind Tunnel Pitot Calibration

S-type Pitot ID:	A4187	Date:	2-Mar-15
Standard Pitot ID:	001	Personnel:	KMR MF
Cp(std):	0.99	Cp(actual):	0.724
Part Number:		P_{bar}(in Hg):	29.71
Test Velocity (fps):	50	T(°F):	55
Wind Tunnel Location:	Calera, AL	Tunnel Size:	20" x 40"
Customer:	Air Hygiene		

A-SIDE

ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	Cp(s)	Deviation*
0.563	1.053	0.723	0.002
0.561	1.048	0.724	-0.001
0.561	1.050	0.724	0.000
	AVERAGE	0.724	0.001
		Std deviation	0.002

NOTES:

1. **Pitot calibrated with an Environmental Supply Co. PM10 cyclone.**
2. **C_p is only valid when used with PM10 cyclone.**
3. **C_p is only valid with 1" spacing from PM10 cyclone.**

$$Cp(s) = Cp(std)\sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

*Deviation = {Cp(s) - *AVG* Cp(s)} {must be <0.010}

Standard deviation of the deviations must be less than 0.02 for both sides.

Pitot tube S/N A4187 was calibrated in accordance with the CFR 40, Part 60 Appendix A, Method 2, Section 10.

Signature

3/2/15
Date

Environmental Supply Company, Inc.
Quality Source Sampling Systems & Accessories

Wind Tunnel Pitot Calibration

S-type Pitot ID:	A5273	Date:	2-Mar-15
Standard Pitot ID:	001	Personnel:	KMR MF
Cp(std):	0.99	Cp(actual):	0.742
Part Number:		P_{bar}(in Hg):	29.71
Test Velocity (fps):	50	T(°F):	55
Wind Tunnel Location:	Calera, AL	Tunnel Size:	20" x 40"
Customer:	Air Hygiene		

A-SIDE

ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	Cp(s)	Deviation*
0.5596	0.9948	0.743	0.002
0.5608	0.9981	0.742	-0.001
0.5615	0.9984	0.742	0.000
	AVERAGE	0.742	0.001
		Std deviation	0.002

NOTES:

1. **Pitot calibrated with an Environmental Supply Co. PM10 cyclone.**
2. **C_p is only valid when used with PM10 cyclone.**
3. **C_p is only valid with 1" spacing from PM10 cyclone.**

$$Cp(s) = Cp(std)\sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

*Deviation = {Cp(s) - *AVG* Cp(s)} {must be <0.010}

Standard deviation of the deviations must be less than 0.02 for both sides.

Pitot tube S/N A5273 was calibrated in accordance with the CFR 40, Part 60 Appendix A, Method 2, Section 10.

Signature

3/2/15
Date

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Certificate of Calibration

S-Type Pitot Tube Calibration

See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.

Pitot Information

Pitot Type:	S
Pitot Serial #:	8169
Probe Serial #:	WT-CAL-PROBE

Calibration Conditions

Bar. Pressure (in Hg):	30.00
Elevation (ft):	407
Adj. Bar. Pressure (in Hg):	29.59
Static Pressure (in H20):	-0.6
Blockage %:	< 2
Correction Factor:	1.00

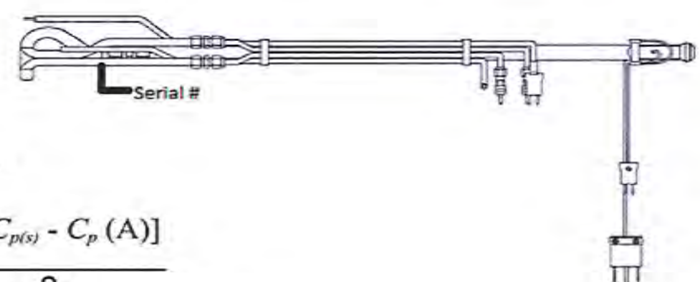
Reference Pitot Information

Std. Pitot Type	Ellipsoidal
Cp(std):	0.990
Serial #:	APEX-RP1

	Side "A" Calibration			
Run No.	Δ Pstd in H20	Δ Ps in H20	Cp(s)	Deviation Cp(s) - avg.Cp(s)
1	0.558	0.776	0.840	0.001
2	0.556	0.776	0.838	-0.001
3	0.557	0.777	0.838	0.000
		"A" Average	0.839	0.001

(must be ≤ 0.01)

$$C_{p(s)} = C_{p(std)} \sqrt{\frac{\Delta p_{std}}{\Delta p_s}}$$



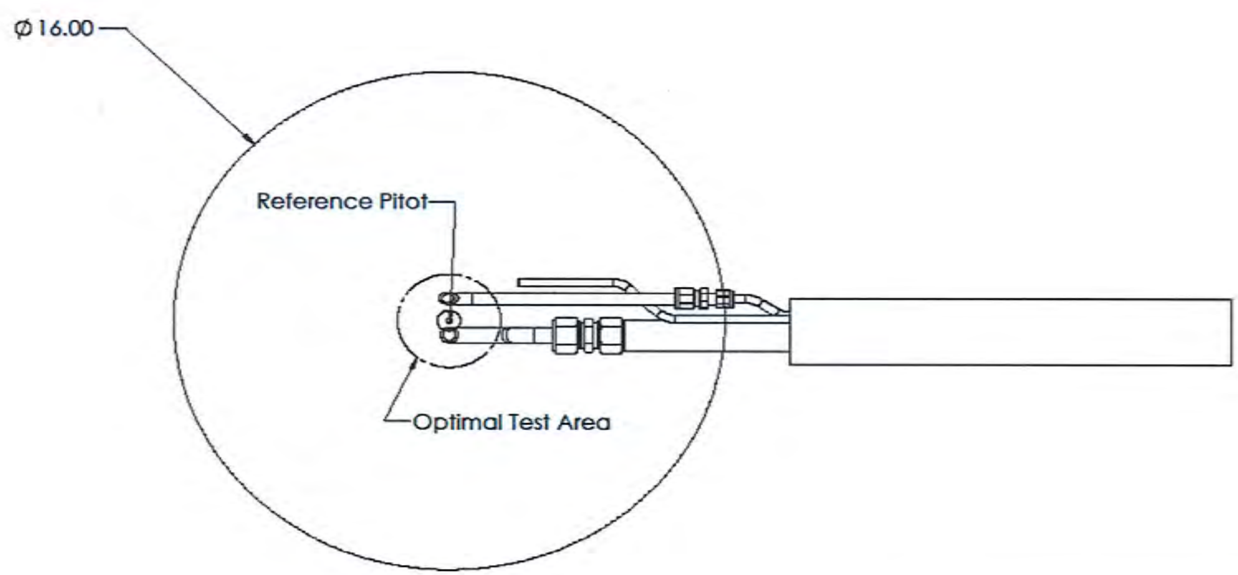
$$\text{Deviation} = C_{p(s)} - \overline{C_p}(\text{A})$$

$$\text{Avg Dev} = \sigma\,(\text{A}) = \frac{\sum_{1}^{3} [C_{p(s)} - C_p\,(\text{A})]}{3}$$

Method 2 Section 10.1.4.3 For a probe assembly constructed such that its pitot tube is always used in the same orientation, only one side of the pitot tube need be calibrated (the side which will face the flow). The pitot tube must still meet the alignment specifications of Figure 2-2 or 2-3, however, and must have an average deviation (σ) value of 0.01 or less (see section 10.1.4.4).

Technician: Chris Harris **Signature:** [signature] **Date:** 5/18/2018

I certify that the above pitot tube was tested in accordance with the US EPA Method 2 standards.



Reference pilot is lowered in from the top of the wind tunnel and removed during testing.

P:\Archives-documentation\Justin - Master CAD Files\P-## [PROBES]\Method 5 Probe\

PROPRIETARY AND CONFIDENTIAL

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL± ANGULAR: MACH± BEND ± TWO PLACE DECIMAL ±.010 THREE PLACE DECIMAL ±.005	DRAWN	CNH	4/19/2018
	CHECKED		
	ENG APPR.		
	MFG APPR.		
INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
MATERIAL	COMMENTS:		
FINISH			
DO NOT SCALE DRAWING			

APEX INSTRUMENTS

TITLE:

SIZE	DWG. NO.	REV
B	M5 Probe in Tunnel	
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

Wind Tunnel Pitot Calibration

S-type Pitot ID:	**P-980**	Date:	**2-Nov-15**
Standard Pitot ID:	**001**	Personnel:	**KMR**
Cp(std):	**0.99**	Cp(actual):	**0.772**
Part Number:		P_{bar}(in Hg):	**29.31**
Test Velocity (fps):	**50**	T(°F):	**67**
Wind Tunnel Location:	**Calera, AL**	Tunnel Size:	**20" x 40"**
Customer:	**Air Hygiene**		

A-SIDE

ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	Cp(s)	Deviation*
0.563	**0.925**	**0.772**	0.002
0.563	**0.925**	**0.772**	-0.001
0.563	**0.926**	**0.772**	0.000
	AVERAGE	**0.772**	0.001
		Std deviation	0.002

NOTES:

1. **Pitot calibrated with an Apex Instruments PM10 cyclone.**
2. **C_p is only valid when used with PM10 cyclone.**
3. **C_p is only valid with 1" spacing from PM10 cyclone.**

$$Cp(s) = Cp(std)\sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

*Deviation = {Cp(s) - *AVG* Cp(s)} {must be <0.010}

Standard deviation of the deviations must be less than 0.02 for both sides.

Pitot tube S/N P-980 was calibrated in accordance with the CFR 40, Part 60 Appendix A, Method 2, Section 10.

David Hem[illegible]
Signature

11/2/15
Date

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Common
Equipment Certifications and Calibrations

Field Balance Weight Verfication
Annual 500g Field Balance Stock Weight vs. 500g ISO 17025 Traceable Weight
Air Hygiene Asset ID: samp-sc-0022

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\Field Balance Weights\2018\[samp-sc-0022_215.xlsm]Balance

Make:	Ohaus	ISO 17025 Weight ID	LABS-WT-0005
Model #:	Scout Pro SP2001-US	ISO S/N	1000128090
Serial #:	7130410811	ISO Cal Due	8/16/2018
Field Weight #:	sc-0022		
Trailer #:	215		

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.60	0.40
		must be <0.5

Sean Barnes (signature) 07/06/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.80	0.20
		must be <0.5

Sean Barnes (signature) 07/06/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	500.10	0.10
		must be <0.5

Sean Barnes (signature) 07/06/18 (date)

Note: Calibrated against ISO 17025 Certified weight LABS-WT-0005

EPA Method 4 - Section 10.3, EPA Method 5 - Section 10.7, EPA Method 202 - Section 10.3: Field Balance Calibration Check. Check the calibration of the balance used to weigh impingers with a weight that is at least 500g or within 50g of a loaded impinger. The weight must be ASTM E617-13 "Standard Specification for Laboratory Weights and Precision Mass Standards" Class 6 (or better). Daily before used, the field balance must meausure within ±0.5g of the certified mass. If the daily balance calibration check fails, perform corrective measures and repeat the check before using balance.

ISO 17025 Certified 500g Weight is certified annually. Certified weight is used to verify Class 6 or better weight that accompanies each field balance on the balance it will be used. Acceptance critieria is certified weight must be within ±0.5g of Class 6 or better weight.

Field Balance Weight Verfication
Annual 500g Field Balance Stock Weight vs. 500g ISO 17025 Traceable Weight
Air Hygiene Asset ID: samp-sc-0025

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\Field Balance Weights\2018\[samp-sc-0025_209.xlsm]Balance
Make: Ohaus
Model #: Scout Pro SP2001-US
Serial #: 7130410278
Field Weight #: sc-0025
Trailer #: 209

ISO 17025 Weight ID LABS-WT-0005
ISO S/N 1000128090
ISO Cal Due 8/2/2019

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.70	0.30
		must be <0.5

Sean Barnes (signature) 08/16/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.80	0.20
		must be <0.5

Sean Barnes (signature) 08/16/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.90	0.10
		must be <0.5

Sean Barnes (signature) 08/16/18 (date)

Note: Calibrated against ISO 17025 Certified weight LABS-WT-0005

EPA Method 4 - Section 10.3, EPA Method 5 - Section 10.7, EPA Method 202 - Section 10.3: Field Balance Calibration Check. Check the calibration of the balance used to weigh impingers with a weight that is at least 500g or within 50g of a loaded impinger. The weight must be ASTM E617-13 "Standard Specification for Laboratory Weights and Precision Mass Standards" Class 6 (or better). Daily before used, the field balance must meausure within ±0.5g of the certified mass. If the daily balance calibration check fails, perform corrective measures and repeat the check before using balance.

ISO 17025 Certified 500g Weight is certified annually. Certified weight is used to verify Class 6 or better weight that accompanies each field balance on the balance it will be used. Acceptance critieria is certified weight must be within ±0.5g of Class 6 or better weight.

Field Balance Weight Verfication
Annual 500g Field Balance Stock Weight vs. 500g ISO 17025 Traceable Weight
Air Hygiene Asset ID: samp-sc-0031

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\Field Balance Weights\2018\[samp-sc-0031_211.xlsm]Balance
Make: Ohaus
Model #: Scout Pro SP2001
Serial #: B346992366
Field Weight #: sc-0031
Trailer #: 211

ISO 17025 Weight ID LABS-WT-0005
ISO S/N 1000128090
ISO Cal Due 8/2/2019

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	500.00	0.00
Sean Barnes (signature)		must be within ±0.5g 10/15/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	499.80	0.20
Sean Barnes (signature)		must be within ±0.5g 10/15/18 (date)

ISO 17025 Certfified Weight (g)	Field Balance Weight (g)	± g
500.00	500.10	0.10
Sean Barnes (signature)		must be within ±0.5g 10/15/18 (date)

Note: Calibrated against ISO 17025 Certified weight LABS-WT-0005

EPA Method 4 - Section 10.3, EPA Method 5 - Section 10.7, EPA Method 202 - Section 10.3: Field Balance Calibration Check. Check the calibration of the balance used to weigh impingers with a weight that is at least 500g or within 50g of a loaded impinger. The weight must be ASTM E617-13 "Standard Specification for Laboratory Weights and Precision Mass Standards" Class 6 (or better). Daily before used, the field balance must meausure within ±0.5g of the certified mass. If the daily balance calibration check fails, perform corrective measures and repeat the check before using balance.

ISO 17025 Certified 500g Weight is certified annually. Certified weight is used to verify Class 6 or better weight that accompanies each field balance on the balance it will be used. Acceptance critieria is certified weight must be within ±0.5g of Class 6 or better weight.

WEATHER STATION CALIBRATION SHEET
Temperature, Barometric Pressure, and Relative Humidity Periodic Calibration
Air Hygiene Asset ID: samp-we-0032

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\Weather Stations\2018\[SAMP-WE-0032_AHU.xlsm]112013
Make: Kestrel
Model #: 4000
Serial #: 724648

ISO 17025 Weather Station ID SAMP-WE-0033
ISO 17025 S/N A026334
ISO 17025 Cal Due 8/22/2018

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
69.40	70.60	1.20	29.19	29.19	0.00	08:20

Sean Barnes (signature) 05/10/18 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
69.60	70.60	1.00	29.17	29.17	0.00	08:44

Sean Barnes (signature) 05/10/18 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
69.60	70.40	0.80	29.16	29.17	0.01	09:00

Sean Barnes (signature) 05/10/18 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
69.60	70.60	1.00	29.22	29.25	0.03	11:06

Sean Barnes (signature) 05/10/18 (date)

Note: Verified against ISO 17025 Traceable Barometer and Thermometer (SAMP-WE-0033).

WEATHER STATION CALIBRATION SHEET
Temperature, Barometric Pressure, and Relative Humidity Periodic Calibration
Air Hygiene Asset ID: samp-we-0041

Filename: \\AHI-FILESVR\public\Shared\QAQC\Calibrations\Weather Stations\2017\[Weather Station Calibration_samp-we-0041_215.xlsm]112013
Make: Kestrel
Model #: 2500
Serial #: 2195814

ISO 17025 Weather Station ID SAMP-WE-0033
ISO 17025 S/N A026334
ISO 17025 Cal Due 8/22/2018

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
68.10	69.10	1.00	29.31	29.32	0.01	13:18

Sean Barnes (signature) 10/27/17 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
68.10	68.60	0.50	29.31	29.33	0.02	13:35

Sean Barnes (signature) 10/27/17 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
68.10	68.10	0.00	29.30	29.31	0.01	13:53

Sean Barnes (signature) 10/27/17 (date)

ASTM Temp (deg F) (±1.5°)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg) (±0.1 in Hg)	Barometric (in. Hg)	± in. Hg	Time
68.50	69.10	0.60	29.28	29.32	0.04	14:30

Sean Barnes (signature) 10/27/17 (date)

Note: Verified against ISO 17025 Traceable Barometer and Thermometer (SAMP-WE-0033).

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-1
Laboratory Analysis
PM

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		Run	1-Base-PM-1		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			Run	1	Start Time	09:52
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.6000	--	--	0.6000
Filter Beaker				--	--	
Nozzle Wash PM>10			1.3	70	0.3461	0.9539
Cyclone Wash 2.5<PM<10			1.5	61	0.3016	1.1984
Cyclone Exit to Front Half of Filter Wash (<2.5)			1.0	64	0.3164	0.6836
Inorganic Impinger Contents			3.0	310.9328	1.2857	1.7143
Organic Impinger Contents			2.6	100.3009	0.7143	1.8857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-Base-PM-2	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	2	**Start Time**	15:02
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			1.1	47	0.2324	0.8676
Cyclone Wash 2.5<PM<10			0.6	56	0.2769	0.3232
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.9	47	0.2324	0.6676
Inorganic Impinger Contents			1.4	230.6921	1.2857	0.1143
Organic Impinger Contents			1.4	79.2377	0.7143	0.6857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-Base-PM-3	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	3	**Start Time**	15:36
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.8000	--	--	0.8000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.5	63	0.3115	0.1885
Cyclone Wash 2.5<PM<10			0.5000	60	0.2966	0.2034
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.9	44	0.2175	0.6825
Inorganic Impinger Contents			2.1	280.8425	1.2857	0.8143
Organic Impinger Contents			1.1	83.2497	0.7143	0.3857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-100 w/DB-PM-1	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	1	**Start Time**	23:32
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.7	58	0.2867	0.4133
Cyclone Wash 2.5<PM<10			0.5000	57	0.2818	0.2182
Cyclone Exit to Front Half of Filter Wash (<2.5)			1.2	37	0.1829	1.0171
Inorganic Impinger Contents			3.9	270.8124	1.2857	2.6143
Organic Impinger Contents			1.6	89.2678	0.7143	0.8857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-100 w/DB-PM-2	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**		2	**Start Time**	04:11
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)	
Filter			1.0000	--	--	1.0000	
Filter Beaker				--	--		
Nozzle Wash PM>10			0.5	58	0.2867	0.2133	
Cyclone Wash 2.5<PM<10			0.5	64	0.3164	0.1836	
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.7	58	0.2867	0.4133	
Inorganic Impinger Contents			1.2	300.9027	1.2857	0.0000	
Organic Impinger Contents			1.1	110.3310	0.7143	0.3857	

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-100 w/DB-PM-3	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	3	**Start Time**	09:20
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.9000	--	--	0.9000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.5000	83	0.4103	0.0897
Cyclone Wash 2.5<PM<10			0.5	70	0.3461	0.1539
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.5000	60	0.2966	0.2034
Inorganic Impinger Contents			2.4	381.1434	1.2857	1.1143
Organic Impinger Contents			1.0	87.2618	0.7143	0.2857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-1 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	1-100 w/DB-PM-FB		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	Sample Number	Date	Time
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Gravimetric Concentrations					**Actual Gain**
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)		(mg)
Inorganic Impinger Contents	0.0018	0.0000	1.2857	max 2 mg total blank adjustment, proportioned	1.8000
Organic Impinger Contents	0.0010	0.0000	0.7143		1.0000

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Unit #CTG-2
Laboratory Analysis
PM

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Analytical Data		**Run**	2-Base-PM-1		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	1	**Start Time**	19:14
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.9000	70.0000	0.3461	0.5539
Cyclone Wash 2.5<PM<10			0.5000	73.0000	0.3609	0.1391
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.6000	76.0000	0.3757	0.2243
Inorganic Impinger Contents			3.1000	360.0000	1.3103	1.7897
Organic Impinger Contents			1.2000	91.0000	0.6897	0.5103

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Analytical Data		**Run**	2-Base-PM-2	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	2	**Start Time**	23:30
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.8000	64.0000	0.3164	0.4836
Cyclone Wash 2.5<PM<10			0.5000	65.0000	0.3213	0.1787
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.5	46.0000	0.2274	0.2726
Inorganic Impinger Contents			2.3000	370.0000	1.3103	0.9897
Organic Impinger Contents			1.1000	88.0000	0.6897	0.4103

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Analytical Data		**Run**	2-Base-PM-3		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0005	340.0000	0.0015	--
DI Water Blank Weight of Solids	0.0005	370.0000	0.0014	--
Hexane Blank Weight of Solids	0.0082	250.0000	0.0328	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	3	**Start Time**	04:17
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.5000	66.0000	0.0971	0.4029
Cyclone Wash 2.5<PM<10			0.5000	69.0000	0.1015	0.3985
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.5000	67.0000	0.0985	0.4015
Inorganic Impinger Contents			2.2000	320.0000	1.3103	0.8897
Organic Impinger Contents			1.0000	95.0000	0.6897	0.3103

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#4

Analytical Data		**Run**	2-Base-PM-FB	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Gravimetric Concentrations					**Actual Gain**
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)		(mg)
Inorganic Impinger Contents	0.0019	0.0000	1.3103	max 2 mg total blank adjustment, proportioned	1.9000
Organic Impinger Contents	0.0010	0.0000	0.6897		1.0000

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-100 w/DB-PM-1	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	1	**Start Time**	23:36
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			1.5000	--	--	1.5000
Filter Beaker				--	--	
Nozzle Wash PM>10			1.1	72	0.3560	0.7441
Cyclone Wash 2.5<PM<10			0.5000	53	0.2620	0.2380
Cyclone Exit to Front Half of Filter Wash (<2.5)			2.3	39	0.1928	2.1072
Inorganic Impinger Contents			2.2	361.0832	1.2857	0.9143
Organic Impinger Contents			1.3	70.2106	0.7143	0.5857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-100 w/DB-PM-2	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	2	**Start Time**	05:03
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.8000	--	--	0.8000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.6	68	0.3362	0.2638
Cyclone Wash 2.5<PM<10			0.5000	78	0.3856	0.1144
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.5	65	0.3213	0.1787
Inorganic Impinger Contents			10	260.7823	1.2857	8.7143
Organic Impinger Contents			17	100.3009	0.7143	16.2857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-100 w/DB-PM-3		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	3	**Start Time**	10:20
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			1.0000	--	--	1.0000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.8	84	0.4153	0.3847
Cyclone Wash 2.5<PM<10			0.8	71	0.3510	0.4490
Cyclone Exit to Front Half of Filter Wash (<2.5)			1.3	62	0.3065	0.9935
Inorganic Impinger Contents			7.0	410	1.2857	5.7143
Organic Impinger Contents			7.4	91	0.7143	6.6857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-100 w/DB-PM-FB	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Gravimetric Concentrations					**Actual Gain**
Sample Portion	**Final**	**Tare**	**Gain**		
	(g)	(g)	(mg)		(mg)
Inorganic Impinger Contents	0.0018	0.0000	1.2857	max 2 mg total blank adjustment, proportioned	1.8000
Organic Impinger Contents	0.0010	0.0000	0.7143		1.0000

QUALITY ASSURANCE AND QUALITY CONTROL DATA

Laboratory Analysis
Maxxam

Your Project #: SIE-18-MIDDLETOWN.NY-START#1

Attention: Data Reports

Air Hygiene International Inc
1600 West Tacoma Street
Broken Arrow, OK
USA 74012

Report Date: 2018/10/03
Report #: R5426001
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8P3474
Received: 2018/09/26, 20:30

Sample Matrix: Stack Sampling Train
Samples Received: 76

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Extractable Condensables (M202)	12	2018/09/27	2018/10/02	BRL SOP-00118	EPA 202 m
Non Extractable Condensibles (M202)	12	2018/09/27	2018/10/02	BRL SOP-00118 / BRL SOP-00109	EPA 202 m
Ammonium in H2SO4 Impingers (CTM-027)	26	2018/09/27	2018/09/27	BRL SOP-00107	EPA CTM-027 m
>10um Particulates in Rinse	12	2018/09/27	2018/10/03	BRL SOP-00109	EPA M201A
2.5-10um Particulates in Rinse	12	2018/09/27	2018/10/03	BRL SOP-00109	EPA M201A
2.5 um Particulates on Filter	12	N/A	2018/09/28	BRL SOP-00109	EPA M201A
<2.5um Particulates in Rinse	12	2018/09/27	2018/10/03	BRL SOP-00109	EPA M201A
Sulphuric Acid Mist by IC	12	2018/09/27	2018/09/27	BRL SOP-00105	EPA CTM013/13A/13B m
Sulphuric Acid Mist by IC	1	2018/10/01	N/A	BRL SOP-00105	EPA CTM013/13A/13B m
Sulphur Dioxide (CTM-013B)	12	2018/09/27	2018/09/27	BRL SOP-00105	EPA CTM-013B m
Sulphur Dioxide (CTM-013B)	1	2018/10/01	N/A	BRL SOP-00105	EPA CTM-013B m
Final Volume of Acetone Probe Rinse	12	N/A	2018/10/03	BRL SOP-00109	
Volume of Sulfuric Acid Impinger	26	N/A	2018/09/27		
Volume of Hydrogen Peroxide Impinger	13	N/A	2018/10/01		
Final Volume of Impinger	13	N/A	2018/10/01		
Weight of Solvent from Impingers	12	N/A	2018/09/27		
Weight of Water from Impingers	12	N/A	2018/09/27		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their

Maxxam
A Bureau Veritas Group Company

Your Project #: SIE-18-MIDDLETOWN.NY-START#1

Attention: Data Reports

Air Hygiene International Inc
1600 West Tacoma Street
Broken Arrow, OK
USA 74012

Report Date: 2018/10/03
Report #: R5426001
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8P3474
Received: 2018/09/26, 20:30
agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Clayton Johnson, Project Manager - Air Toxics, Source Evaluation
Email: CJohnson@maxxam.ca
Phone# (905)817-5769
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

EPA M201A - PARTICULATES (STACK SAMPLING TRAIN)

Maxxam ID		HWD060	HWD095			
Sampling Date		2018/09/24	2018/09/24			
	UNITS	**M201A- UNIT 1 BASE-R1**	**M201A- UNIT 1 BASE-R2**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	1.3	1.1	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	1.0	0.9	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	1.5	0.6	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	0.60	0.30	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	70	47	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	61	56	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	64	47	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD096	HWD097			
Sampling Date		2018/09/25	2018/09/24			
	UNITS	**M201A- UNIT 1 BASE-R3**	**M201A- UNIT 1 W/DB-R1**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	0.5	0.7	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	0.9	1.2	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	0.80	<0.30	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	63	58	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	60	57	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	44	37	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

EPA M201A - PARTICULATES (STACK SAMPLING TRAIN)

Maxxam ID		HWD098	HWD099			
Sampling Date		2018/09/24	2018/09/25			
	UNITS	**M201A- UNIT 1 W/DB-R2**	**M201A- UNIT 1 W/DB-R3**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	0.5	<0.5	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	0.7	<0.5	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	0.5	0.5	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	1.00	0.90	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	58	83	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	64	70	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	58	60	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD100	HWD101			
Sampling Date		2018/09/24	2018/09/24			
	UNITS	**M201A- UNIT 2 BASE-R1**	**M201A- UNIT 2 BASE-R2**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	1.3	0.6	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	0.7	0.8	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	0.8	0.6	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	<0.30	<0.30	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	71	45	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	68	50	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	65	48	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA M201A - PARTICULATES (STACK SAMPLING TRAIN)

Maxxam ID		HWD102	HWD103			
Sampling Date		2018/09/25	2018/09/24			
	UNITS	**M201A- UNIT 2 BASE-R3**	**M201A- UNIT 2 W/DB-R1**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	1.2	1.1	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	1.0	2.3	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	<0.30	1.50	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	60	72	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	72	53	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	48	39	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD104	HWD105			
Sampling Date		2018/09/24	2018/09/25			
	UNITS	**M201A- UNIT 2 W/DB-R2**	**M201A- UNIT 2 W/DB-R3**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	0.6	0.8	0.5	0.1	5755422
< 2.5 Particulate Weight in Acetone Rinse	mg	0.5	1.3	0.5	0.5	5755420
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	0.8	0.5	0.5	5755421
< 2.5 Particulate Weight on Filter	mg	0.80	1.00	0.30	0.30	5757073
Acetone Rinse Volume (10)	ml	68	84	1	N/A	5755423
Acetone Rinse Volume (2.5 - 10)	ml	78	71	1	N/A	5755423
Acetone Rinse Volume (2.5)	ml	65	62	1	N/A	5755423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA M202 CONDENSIBLE PM (STACK SAMPLING TRAIN)

Maxxam ID		HWC952	HWC953	HWC954			
Sampling Date		2018/09/24	2018/09/24	2018/09/25			
	UNITS	**M202- UNIT 1 BASE-R1**	**M202- UNIT 1 BASE-R2**	**M202- UNIT 1 BASE-R3**	**RDL**	**MDL**	**QC Batch**
Weight	g	310	230	280	0.1	0.1	5754784
Weight of Solvent	g	100	79	83	0.1	N/A	5754782
Miscellaneous Parameters							
Inorganic Condensibles	mg	3.0	1.4	2.1	0.5	0.1	5754787
Organic Condensibles	mg	2.6	1.4	1.1	1.0	0.20	5754779

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWC955	HWC956	HWC957			
Sampling Date		2018/09/24	2018/09/24	2018/09/25			
	UNITS	**M202- UNIT 1 W/DB-R1**	**M202- UNIT 1 W/DB-R2**	**M202- UNIT 1 W/DB-R3**	**RDL**	**MDL**	**QC Batch**
Weight	g	270	300	380	0.1	0.1	5754784
Weight of Solvent	g	89	110	87	0.1	N/A	5754782
Miscellaneous Parameters							
Inorganic Condensibles	mg	3.9	1.2	2.4	0.5	0.1	5754787
Organic Condensibles	mg	1.6	1.1	1.0	1.0	0.20	5754779

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWC958	HWD055	HWD056			
Sampling Date		2018/09/24	2018/09/24	2018/09/25			
	UNITS	**M202- UNIT 2 BASE-R1**	**M202- UNIT 2 BASE-R2**	**M202- UNIT 2 BASE-R3**	**RDL**	**MDL**	**QC Batch**
Weight	g	300	350	280	0.1	0.1	5754784
Weight of Solvent	g	100	79	91	0.1	N/A	5754782
Miscellaneous Parameters							
Inorganic Condensibles	mg	61	2.0	16	0.5	0.1	5754787
Organic Condensibles	mg	88	1.9	13	1.0	0.20	5754779

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA M202 CONDENSIBLE PM (STACK SAMPLING TRAIN)

Maxxam ID		HWD057	HWD058	HWD059			
Sampling Date		2018/09/24	2018/09/24	2018/09/25			
	UNITS	**M202- UNIT 2 W/DB-R1**	**M202- UNIT 2 W/DB-R2**	**M202- UNIT 2 W/DB-R3**	**RDL**	**MDL**	**QC Batch**
Weight	g	360	260	410	0.1	0.1	5754784
Weight of Solvent	g	70	100	91	0.1	N/A	5754782
Miscellaneous Parameters							
Inorganic Condensibles	mg	2.2	10	7.0	0.5	0.1	5754787
Organic Condensibles	mg	1.3	17	7.4	1.0	0.20	5754779

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

EPA CTM 027 AMMONIA (STACK SAMPLING TRAIN)

Maxxam ID		HWD114			HWD115			HWD116			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT1 BASE- R1 FH	RDL	MDL	CTM027- UNIT1 BASE- R1 BH	RDL	MDL	CTM027- UNIT1 BASE- R2 FH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	211	1	1	239	1	1	179	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	4400	250	48	49	13	2.5	4600	250	48	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HWD116			HWD117			HWD118			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT1 BASE- R2 FH Lab-Dup	RDL	MDL	CTM027- UNIT1 BASE- R2 BH	RDL	MDL	CTM027- UNIT1 BASE- R3 FH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	N/A	1	1	215	1	1	195	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	4600	250	48	57	13	2.5	4900	250	48	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		HWD119			HWD120			HWD121			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT1 BASE- R3 BH	RDL	MDL	CTM027- UNIT1 W/DB- R1 FH	RDL	MDL	CTM027- UNIT1 W/DB- R1 BH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	218	1	1	247	1	1	223	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	47	13	2.5	4400	250	48	59	13	2.5	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA CTM 027 AMMONIA (STACK SAMPLING TRAIN)

Maxxam ID		HWD122			HWD123			HWD124			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT1 W/DB- R2 FH	RDL	MDL	CTM027- UNIT1 W/DB- R2 BH	RDL	MDL	CTM027- UNIT1 W/DB- R3 FH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	243	1	1	215	1	1	233	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	4100	250	48	230	13	2.5	4000	250	48	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HWD125			HWD126			HWD127			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT1 W/DB- R3 BH	RDL	MDL	CTM027- UNIT2 BASE- R1 FH	RDL	MDL	CTM027- UNIT2 BASE- R1 BH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	228	1	1	215	1	1	281	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	47	13	2.5	4500	250	48	77	14	2.7	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HWD128			HWD129			HWD130			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	CTM027- UNIT2 BASE- R2 FH	RDL	MDL	CTM027- UNIT2 BASE- R2 BH	RDL	MDL	CTM027- UNIT2 BASE- R3 FH	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	164	1	1	274	1	1	215	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	4900	250	48	42	14	2.7	5100	250	48	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA CTM 027 AMMONIA (STACK SAMPLING TRAIN)

Maxxam ID		HWD131			HWD132			HWD133			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	**CTM027- UNIT2 BASE- R3 BH**	**RDL**	**MDL**	**CTM027- UNIT2 W/DB- R1 FH**	**RDL**	**MDL**	**CTM027- UNIT2 W/DB- R1 BH**	**RDL**	**MDL**	**QC Batch**
Sulfuric Acid Volume	ml	217	1	1	168	1	1	263	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	<13	13	2.5	1400	25	4.8	36	13	2.5	5756997

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HWD134			HWD135			HWD136			
Sampling Date		2018/09/25			2018/09/25			2018/09/25			
	UNITS	**CTM027- UNIT2 W/DB- R2 FH**	**RDL**	**MDL**	**CTM027- UNIT2 W/DB- R2 BH**	**RDL**	**MDL**	**CTM027- UNIT2 W/DB- R3 FH**	**RDL**	**MDL**	**QC Batch**
Sulfuric Acid Volume	ml	220	1	1	219	1	1	223	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	5700	63	12	30	13	2.5	5300	130	25	5757006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HWD136			HWD137			HWY651			
Sampling Date		2018/09/25			2018/09/25			2018/09/07			
	UNITS	**CTM027- UNIT2 W/DB- R3 FH Lab-Dup**	**RDL**	**MDL**	**CTM027- UNIT2 W/DB- R3 BH**	**RDL**	**MDL**	**CTM027 - DI BLANK**	**RDL**	**MDL**	**QC Batch**
Sulfuric Acid Volume	ml	N/A	1	1	288	1	1	241	1	1	5756985
Inorganics											
Ammonium (NH4)	ug	5300	130	25	33	14	2.7	<13	13	2.5	5757006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

EPA CTM 027 AMMONIA (STACK SAMPLING TRAIN)

Maxxam ID		HWY652			
Sampling Date		2018/09/07			
	UNITS	**CTM027 - H2SO4 BLANK**	**RDL**	**MDL**	**QC Batch**
Sulfuric Acid Volume	ml	267	1	1	5756985
Inorganics					
Ammonium (NH4)	ug	<13	13	2.5	5757006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		HWD138	HWD139			HWD140			
Sampling Date		2018/09/24	2018/09/24			2018/09/25			
	UNITS	**CTM13- UNIT1 BASE- R1 CW**	**CTM13- UNIT1 BASE- R1 IC**	**RDL**	**MDL**	**CTM13- UNIT1 BASE- R2 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	N/A	204	1	1	N/A	1	1	5760404
Impinger Volume	ml	107	N/A	1	1	85	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	N/A	<0.068	0.068	N/A	N/A	0.068	N/A	5755885
Sulphuric Acid Mist	mg	<0.011	N/A	0.011	0.011	<0.009	0.009	0.009	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD140	HWD141	HWD141			
Sampling Date		2018/09/25	2018/09/25	2018/09/25			
	UNITS	**CTM13- UNIT1 BASE- R2 CW Lab-Dup**	**CTM13- UNIT1 BASE- R2 IC**	**CTM13- UNIT1 BASE- R2 IC Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	N/A	204	N/A	1	1	5760404
Miscellaneous Parameters							
Sulphur dioxide	mg	N/A	<0.068	<0.068	0.068	N/A	5755885
Sulphuric Acid Mist	mg	<0.009	N/A	N/A	0.009	0.009	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		HWD142		HWD143		HWD144			
Sampling Date		2018/09/25		2018/09/25		2018/09/24			
	UNITS	**CTM13- UNIT1 BASE- R3 CW**	**RDL**	**CTM13- UNIT1 BASE- R3 IC**	**MDL**	**CTM13- UNIT1 W/DB- R1 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	N/A	1	223	1	N/A	1	1	5760404
Impinger Volume	ml	90	1	N/A	1	124	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	N/A	0.068	0.097	N/A	N/A	0.074	N/A	5755885
Sulphuric Acid Mist	mg	<0.009	0.009	N/A	0.009	<0.013	0.013	0.013	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		HWD145		HWD146		HWD147			
Sampling Date		2018/09/24		2018/09/25		2018/09/25			
	UNITS	**CTM13- UNIT1 W/DB- R1 IC**	**MDL**	**CTM13- UNIT1 W/DB- R2 CW**	**RDL**	**CTM13- UNIT1 W/DB- R2 IC**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	324	1	N/A	1	224	1	1	5760404
Impinger Volume	ml	N/A	1	106	1	N/A	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	<0.11	N/A	N/A	0.11	<0.075	0.075	N/A	5755885
Sulphuric Acid Mist	mg	N/A	0.013	<0.011	0.011	N/A	0.01	0.011	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD148		HWD149		HWD150			
Sampling Date		2018/09/25		2018/09/25		2018/09/24			
	UNITS	**CTM13- UNIT1 W/DB- R3 CW**	**RDL**	**CTM13- UNIT1 W/DB- R3 IC**	**MDL**	**CTM13- UNIT2 BASE- R1 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	N/A	1	282	1	N/A	1	1	5760404
Impinger Volume	ml	100	1	N/A	1	121	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	N/A	0.075	<0.094	N/A	N/A	0.094	N/A	5755885
Sulphuric Acid Mist	mg	<0.01	0.01	N/A	0.01	<0.012	0.012	0.012	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD151			HWD152			
Sampling Date		2018/09/24			2018/09/25			
	UNITS	**CTM13- UNIT2 BASE- R1 IC**	**RDL**	**MDL**	**CTM13- UNIT2 BASE- R2 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	281	1	1	N/A	1	1	5760404
Impinger Volume	ml	N/A	1	1	100	1	1	5760373
Miscellaneous Parameters								
Sulphur dioxide	mg	<0.094	0.094	N/A	N/A	0.094	N/A	5755885
Sulphuric Acid Mist	mg	N/A	0.012	0.012	<0.01	0.01	0.01	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam

A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		HWD153		HWD154			
Sampling Date		2018/09/25		2018/09/25			
	UNITS	**CTM13- UNIT2 BASE- R2 IC**	**MDL**	**CTM13- UNIT2 BASE- R3 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	277	1	N/A	1	1	5760404
Impinger Volume	ml	N/A	1	121	1	1	5760373
Miscellaneous Parameters							
Sulphur dioxide	mg	<0.092	N/A	N/A	0.092	N/A	5755885
Sulphuric Acid Mist	mg	N/A	0.01	0.014	0.012	0.012	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD155		HWD156		HWD157			
Sampling Date		2018/09/25		2018/09/24		2018/09/24			
	UNITS	**CTM13- UNIT2 BASE- R3 IC**	**MDL**	**CTM13- UNIT2 W/DB- R1 CW**	**RDL**	**CTM13- UNIT2 W/DB- R1 IC**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	250	1	N/A	1	342	1	1	5760404
Impinger Volume	ml	N/A	1	76	1	N/A	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	0.084	N/A	N/A	0.083	<0.11	0.11	N/A	5755885
Sulphuric Acid Mist	mg	N/A	0.012	<0.008	0.008	N/A	0.011	0.008	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		HWD158		HWD159		HWD160			
Sampling Date		2018/09/25		2018/09/25		2018/09/25			
	UNITS	**CTM13- UNIT2 W/DB- R2 CW**	**RDL**	**CTM13- UNIT2 W/DB- R2 IC**	**MDL**	**CTM13- UNIT2 W/DB- R3 CW**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	N/A	1	298	1	N/A	1	1	5760404
Impinger Volume	ml	105	1	N/A	1	114	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	N/A	0.11	0.11	N/A	N/A	0.099	N/A	5755885
Sulphuric Acid Mist	mg	<0.011	0.011	N/A	0.011	<0.012	0.012	0.012	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		HWD161		HWY653		HWY654			
Sampling Date		2018/09/25		2018/09/07		2018/09/07			
	UNITS	**CTM13- UNIT2 W/DB- R3 IC**	**MDL**	**CTM13 - DI BLANK**	**RDL**	**CTM13 - H2O2 BLANK**	**RDL**	**MDL**	**QC Batch**
Hydrogen Peroxide Volume	ml	295	1	N/A	1	267	1	1	5760404
Impinger Volume	ml	N/A	1	170	1	N/A	1	1	5760373
Miscellaneous Parameters									
Sulphur dioxide	mg	<0.098	N/A	N/A	0.098	<0.089	0.089	N/A	5755885
Sulphuric Acid Mist	mg	N/A	0.012	<0.017	0.017	N/A	N/A	0.017	5755858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWC952
Sample ID: M202- UNIT 1 BASE- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWC953
Sample ID: M202- UNIT 1 BASE- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWC954
Sample ID: M202- UNIT 1 BASE- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWC955
Sample ID: M202- UNIT 1 W/DB- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWC956
Sample ID: M202- UNIT 1 W/DB- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWC957
Sample ID: M202- UNIT 1 W/DB- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWC958
Sample ID: M202- UNIT 2 BASE- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWD055
Sample ID: M202- UNIT 2 BASE- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWD056
Sample ID: M202- UNIT 2 BASE- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWD057
Sample ID: M202- UNIT 2 W/DB- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD058
Sample ID: M202- UNIT 2 W/DB- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWD059
Sample ID: M202- UNIT 2 W/DB- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5754779	2018/09/27	2018/10/02	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5754787	2018/09/27	2018/10/02	Muhammad M Rahman
Weight of Solvent from Impingers		5754782	N/A	2018/09/27	Muhammad M Rahman
Weight of Water from Impingers		5754784	N/A	2018/09/27	Muhammad M Rahman

Maxxam ID: HWD060
Sample ID: M201A- UNIT 1 BASE- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD095
Sample ID: M201A- UNIT 1 BASE- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD096
Sample ID: M201A- UNIT 1 BASE- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD097
Sample ID: M201A- UNIT 1 W/DB- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD098
Sample ID: M201A- UNIT 1 W/DB- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD099
Sample ID: M201A- UNIT 1 W/DB- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD100
Sample ID: M201A- UNIT 2 BASE- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD101
Sample ID: M201A- UNIT 2 BASE- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD101
Sample ID: M201A- UNIT 2 BASE- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD102
Sample ID: M201A- UNIT 2 BASE- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD103
Sample ID: M201A- UNIT 2 W/DB- R1
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD104
Sample ID: M201A- UNIT 2 W/DB- R2
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam ID: HWD105
Sample ID: M201A- UNIT 2 W/DB- R3
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5755422	2018/09/27	2018/10/03	Farag Farag
2.5-10um Particulates in Rinse	BAL	5755421	2018/09/27	2018/10/03	Farag Farag
2.5 um Particulates on Filter	BAL	5757073	N/A	2018/09/28	Brenda Moore
<2.5um Particulates in Rinse	BAL	5755420	2018/09/27	2018/10/03	Farag Farag
Final Volume of Acetone Probe Rinse		5755423	N/A	2018/10/03	Farag Farag

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD114
Sample ID: CTM027- UNIT1 BASE- R1 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD115
Sample ID: CTM027- UNIT1 BASE- R1 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD116
Sample ID: CTM027- UNIT1 BASE- R2 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD116 Dup
Sample ID: CTM027- UNIT1 BASE- R2 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern

Maxxam ID: HWD117
Sample ID: CTM027- UNIT1 BASE- R2 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD118
Sample ID: CTM027- UNIT1 BASE- R3 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD119 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 BASE- R3 BH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD120 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 W/DB- R1 FH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD121 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 W/DB- R1 BH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD122 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 W/DB- R2 FH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD123 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 W/DB- R2 BH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD124 **Collected:** 2018/09/25
Sample ID: CTM027- UNIT1 W/DB- R3 FH **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD125
Sample ID: CTM027- UNIT1 W/DB- R3 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD126
Sample ID: CTM027- UNIT2 BASE- R1 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD127
Sample ID: CTM027- UNIT2 BASE- R1 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD128
Sample ID: CTM027- UNIT2 BASE- R2 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD129
Sample ID: CTM027- UNIT2 BASE- R2 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD130
Sample ID: CTM027- UNIT2 BASE- R3 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD131
Sample ID: CTM027- UNIT2 BASE- R3 BH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD132
Sample ID: CTM027- UNIT2 W/DB- R1 FH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD133
Sample ID: CTM027- UNIT2 W/DB- R1 BH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5756997	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD134
Sample ID: CTM027- UNIT2 W/DB- R2 FH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD135
Sample ID: CTM027- UNIT2 W/DB- R2 BH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD136
Sample ID: CTM027- UNIT2 W/DB- R3 FH
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD136 Dup
Sample ID: CTM027- UNIT2 W/DB- R3 FH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern

Maxxam ID: HWD137
Sample ID: CTM027- UNIT2 W/DB- R3 BH
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWD138
Sample ID: CTM13- UNIT1 BASE- R1 CW
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD139
Sample ID: CTM13- UNIT1 BASE- R1 IC
Matrix: Stack Sampling Train

Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD140
Sample ID: CTM13- UNIT1 BASE- R2 CW
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD140 Dup
Sample ID: CTM13- UNIT1 BASE- R2 CW
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le

Maxxam ID: HWD141
Sample ID: CTM13- UNIT1 BASE- R2 IC
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

TEST SUMMARY

Maxxam ID: HWD141
Sample ID: CTM13- UNIT1 BASE- R2 IC
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD141 Dup
Sample ID: CTM13- UNIT1 BASE- R2 IC
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le

Maxxam ID: HWD142
Sample ID: CTM13- UNIT1 BASE- R3 CW
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD143
Sample ID: CTM13- UNIT1 BASE- R3 IC
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD144
Sample ID: CTM13- UNIT1 W/DB- R1 CW
Matrix: Stack Sampling Train
Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD145
Sample ID: CTM13- UNIT1 W/DB- R1 IC
Matrix: Stack Sampling Train
Collected: 2018/09/24
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD146
Sample ID: CTM13- UNIT1 W/DB- R2 CW
Matrix: Stack Sampling Train
Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD146 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT1 W/DB- R2 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD147 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT1 W/DB- R2 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD148 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT1 W/DB- R3 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD149 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT1 W/DB- R3 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD150 **Collected:** 2018/09/24
Sample ID: CTM13- UNIT2 BASE- R1 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD151 **Collected:** 2018/09/24
Sample ID: CTM13- UNIT2 BASE- R1 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD152 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT2 BASE- R2 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD153 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT2 BASE- R2 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD154 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT2 BASE- R3 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD155 **Collected:** 2018/09/25
Sample ID: CTM13- UNIT2 BASE- R3 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD156 **Collected:** 2018/09/24
Sample ID: CTM13- UNIT2 W/DB- R1 CW **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD157 **Collected:** 2018/09/24
Sample ID: CTM13- UNIT2 W/DB- R1 IC **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD158
Sample ID: CTM13- UNIT2 W/DB- R2 CW
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD159
Sample ID: CTM13- UNIT2 W/DB- R2 IC
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD160
Sample ID: CTM13- UNIT2 W/DB- R3 CW
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/09/27	2018/09/27	Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWD161
Sample ID: CTM13- UNIT2 W/DB- R3 IC
Matrix: Stack Sampling Train

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/09/27	2018/09/27	Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam ID: HWY651
Sample ID: CTM027 - DI BLANK
Matrix: Stack Sampling Train

Collected: 2018/09/07
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam ID: HWY652
Sample ID: CTM027 - H2SO4 BLANK
Matrix: Stack Sampling Train

Collected: 2018/09/07
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	5757006	2018/09/27	2018/09/27	Ann-Marie Stern
Volume of Sulfuric Acid Impinger		5756985	N/A	2018/09/27	Walt Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWY653
Sample ID: CTM13 - DI BLANK
Matrix: Stack Sampling Train

Collected: 2018/09/07
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphuric Acid Mist by IC	IC/SPEC	5755858	2018/10/01		Lang Le
Final Volume of Impinger		5760373	N/A	2018/10/01	Walt Wang

Maxxam ID: HWY654
Sample ID: CTM13 - H2O2 BLANK
Matrix: Stack Sampling Train

Collected: 2018/09/07
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphur Dioxide (CTM-013B)	IC/SPEC	5755885	2018/10/01		Lang Le
Volume of Hydrogen Peroxide Impinger		5760404	N/A	2018/10/01	Walt Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

Sample HWC952 [M202- UNIT 1 BASE- R1] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC953 [M202- UNIT 1 BASE- R2] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC954 [M202- UNIT 1 BASE- R3] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC955 [M202- UNIT 1 W/DB- R1] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC956 [M202- UNIT 1 W/DB- R2] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC957 [M202- UNIT 1 W/DB- R3] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWC958 [M202- UNIT 2 BASE- R1] : ORGANIC EXTRACTION : Visual oily extract residue found in vial.
INORGANIC EXTRACTION : Blackish oily residue found in Teflon dish.

Sample HWD055 [M202- UNIT 2 BASE- R2] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWD056 [M202- UNIT 2 BASE- R3] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Blackish oily residue found in Teflon dish.

Sample HWD057 [M202- UNIT 2 W/DB- R1] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample HWD058 [M202- UNIT 2 W/DB- R2] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Brownish residue found in Teflon dish.

Sample HWD059 [M202- UNIT 2 W/DB- R3] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Brownish residue found in Teflon dish.

Sample HWD060 [M201A- UNIT 1 BASE- R1] : DE Edge of the filter frayed
LFT Loose filter material

Sample HWD097 [M201A- UNIT 1 W/DB- R1] : Negative weight observed

Sample HWD100 [M201A- UNIT 2 BASE- R1] : Negative weight observed

DE Edge of the filter frayed
LFT Loose filter material

Sample HWD101 [M201A- UNIT 2 BASE- R2] : Negative weight observed

Sample HWY651 [CTM027 - DI BLANK] : blank results reported from worksheet #5723151
, job#B8N3906 as per client request

Sample HWY652 [CTM027 - H2SO4 BLANK] : blank results reported from worksheet #5723151, job#B8N3906 as per client request

Sample HWY653 [CTM13 - DI BLANK] : Blank Sample was previously analyzed on 2018-09-11 (see ws #5722951)

Sample HWY654 [CTM13 - H2O2 BLANK] : Blank sample was previously analyzed on 2018-09-11 (see ws#5722965)

Results relate only to the items tested.

Maxxam Job #: B8P3474
Report Date: 2018/10/03

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5754779	MOR	Spiked Blank	Organic Condensibles	2018/10/02		96	%	70 - 130
5754779	MOR	Method Blank	Organic Condensibles	2018/10/02	<1.0		mg	
5754787	MOR	Method Blank	Inorganic Condensibles	2018/10/02	<0.5		mg	
5755420	FF	Method Blank	< 2.5 Particulate Weight in Acetone Rinse	2018/10/03	<0.5		mg	
5755421	FF	Method Blank	2.5 - 10 Particulate Weight in Acetone Rinse	2018/10/03	<0.5		mg	
5755422	FF	Method Blank	> 10 Particulate Weight in Acetone Rinse	2018/10/03	<0.5		mg	
5755858	LLE	Matrix Spike(HWD140)	Sulphuric Acid Mist	2018/09/27		97	%	80 - 120
5755858	LLE	Spiked Blank	Sulphuric Acid Mist	2018/09/27		100	%	90 - 110
5755858	LLE	Method Blank	Sulphuric Acid Mist	2018/09/27	<0.01		mg	
5755858	LLE	RPD - Sample/Sample Dup	Sulphuric Acid Mist	2018/09/27	NC		%	20
5755885	LLE	Matrix Spike(HWD141)	Sulphur dioxide	2018/09/27		100	%	80 - 120
5755885	LLE	Spiked Blank	Sulphur dioxide	2018/09/27		102	%	90 - 110
5755885	LLE	Method Blank	Sulphur dioxide	2018/09/27	<0.013		mg	
5755885	LLE	RPD - Sample/Sample Dup	Sulphur dioxide	2018/09/27	NC		%	20
5756997	A_S	Matrix Spike(HWD116)	Ammonium (NH4)	2018/09/27		98	%	75 - 125
5756997	A_S	Spiked Blank	Ammonium (NH4)	2018/09/27		99	%	90 - 110
5756997	A_S	Method Blank	Ammonium (NH4)	2018/09/27	<13		ug	
5756997	A_S	RPD - Sample/Sample Dup	Ammonium (NH4)	2018/09/27	0.31		%	20
5757006	A_S	Matrix Spike(HWD136)	Ammonium (NH4)	2018/09/27		104	%	75 - 125
5757006	A_S	Spiked Blank	Ammonium (NH4)	2018/09/27		100	%	90 - 110
5757006	A_S	Method Blank	Ammonium (NH4)	2018/09/27	<13		ug	
5757006	A_S	RPD - Sample/Sample Dup	Ammonium (NH4)	2018/09/27	0.0075		%	20

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brenda Moore, Team Lead

Frank Mo, B.Sc., Inorganic Lab. Manager

Walt Wang, Supervisor, Inorganics

Your Project #: SIE-18-MIDDLETOWN.NY-START#1
Your C.O.C. #: na

Attention: Data Reports

Air Hygiene International Inc
1600 West Tacoma Street
Broken Arrow, OK
USA 74012

Report Date: 2018/09/27
Report #: R5417818
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8P3503
Received: 2018/09/26, 20:30

Sample Matrix: Tedlar Bag
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Light Hydrocarbons	3	N/A	2018/09/27	CAM SOP-00204	GC/FID

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Clayton Johnson, Project Manager - Air Toxics, Source Evaluation
Email: CJohnson@maxxam.ca
Phone# (905)817-5769
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8P3503
Report Date: 2018/09/27

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

RESULTS OF ANALYSES OF TEDLAR BAG

Maxxam ID		HWD195	HWD195	HWD196	HWD197			
Sampling Date		2018/09/25	2018/09/25	2018/09/25	2018/09/25			
COC Number		na	na	na	na			
	UNITS	**U2-R1**	**U2-R1 Lab-Dup**	**U2-R2**	**U2-R3**	**RDL**	**MDL**	**QC Batch**
Gas								
Ethane	ppm	<0.1	<0.1	<0.1	<0.1	0.1	0.02	5755395
Methane	ppm	<2	<2	<2	<2	2	0.4	5755395

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8P3503
Report Date: 2018/09/27

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

TEST SUMMARY

Maxxam ID: HWD195
Sample ID: U2-R1
Matrix: Tedlar Bag

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Light Hydrocarbons	GC/FID	5755395	N/A	2018/09/27	Iqbal Hasan

Maxxam ID: HWD195 Dup
Sample ID: U2-R1
Matrix: Tedlar Bag

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Light Hydrocarbons	GC/FID	5755395	N/A	2018/09/27	Iqbal Hasan

Maxxam ID: HWD196
Sample ID: U2-R2
Matrix: Tedlar Bag

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Light Hydrocarbons	GC/FID	5755395	N/A	2018/09/27	Iqbal Hasan

Maxxam ID: HWD197
Sample ID: U2-R3
Matrix: Tedlar Bag

Collected: 2018/09/25
Shipped:
Received: 2018/09/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Light Hydrocarbons	GC/FID	5755395	N/A	2018/09/27	Iqbal Hasan

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B8P3503
Report Date: 2018/09/27

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5755395	IH0	Method Blank	Ethane		<0.1		ppm	
			Methane		<2		ppm	
5755395	IH0	RPD - Sample/Sample Dup	Ethane	2018/09/27	NC		%	30
			Methane	2018/09/27	NC		%	30

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8P3503
Report Date: 2018/09/27

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#1

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam
A Bureau Veritas Group Company

Your Project #: SIE-18-MIDDLETOWN.NY-START#4

Attention: Data Reports

Air Hygiene International Inc
1600 West Tacoma Street
Broken Arrow, OK
USA 74012

Report Date: 2018/10/18
Report #: R5447062
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R1187
Received: 2018/10/12, 23:55

Sample Matrix: Stack Sampling Train
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Extractable Condensables (M202)	5	2018/10/15	2018/10/17	BRL SOP-00118	EPA 202 m
Non Extractable Condensibles (M202)	5	2018/10/15	2018/10/16	BRL SOP-00118 / BRL SOP-00109	EPA 202 m
>10um Particulates in Rinse	3	2018/10/15	2018/10/18	BRL SOP-00109	EPA M201A
2.5-10um Particulates in Rinse	3	2018/10/15	2018/10/18	BRL SOP-00109	EPA M201A
2.5 um Particulates on Filter	3	N/A	2018/10/16	BRL SOP-00109	EPA M201A
<2.5um Particulates in Rinse	3	2018/10/15	2018/10/18	BRL SOP-00109	EPA M201A
Particulates/Acetone Rinse (M5/315/M201)	1	2018/10/15	2018/10/18	BRL SOP-00109	EPA 5/315 m
Final Volume of Acetone Probe Rinse	4	N/A	2018/10/18	BRL SOP-00109	
Weight of Solvent from Impingers	5	N/A	2018/10/15		
Weight of Water from Impingers	5	N/A	2018/10/15		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: SIE-18-MIDDLETOWN.NY-START#4

Attention: Data Reports

Air Hygiene International Inc
1600 West Tacoma Street
Broken Arrow, OK
USA 74012

Report Date: 2018/10/18
Report #: R5447062
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R1187
Received: 2018/10/12, 23:55

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Clayton Johnson, Project Manager - Air Toxics, Source Evaluation
Email: CJohnson@maxxam.ca
Phone# (905)817-5769
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

EPA M201A - PARTICULATES (STACK SAMPLING TRAIN)

Maxxam ID		IAC047	IAC048	IAC049			
Sampling Date		2018/10/10	2018/10/10	2018/10/11			
	UNITS	**M201A- UNIT 2-R1**	**M201A- UNIT 2-R2**	**M201A- UNIT 2-R3**	**RDL**	**MDL**	**QC Batch**
> 10 Particulate Weight in Acetone Rinse	mg	0.9	0.8	0.5	0.5	0.1	5783286
< 2.5 Particulate Weight in Acetone Rinse	mg	0.6	<0.5	<0.5	0.5	0.5	5783283
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	<0.5	0.5	0.5	5783285
< 2.5 Particulate Weight on Filter	mg	<0.30	0.30	<0.30	0.30	0.30	5786521
Acetone Rinse Volume (10)	ml	70	64	66	1	N/A	5783287
Acetone Rinse Volume (2.5 - 10)	ml	73	65	69	1	N/A	5783287
Acetone Rinse Volume (2.5)	ml	76	46	67	1	N/A	5783287

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

EPA M202 CONDENSIBLE PM (STACK SAMPLING TRAIN)

Maxxam ID		IAC037	IAC038	IAC039	IAC040			
Sampling Date					2018/10/10			
	UNITS	**M202- DI WATER BLANK**	**M202- HEXANE BLANK**	**M202- UNIT 2-FB**	**M202- UNIT 2-R1**	**RDL**	**MDL**	**QC Batch**
Weight	g	370	N/A	280	360	0.1	0.1	5783592
Weight of Solvent	g	N/A	250	66	91	0.1	N/A	5783588
Miscellaneous Parameters								
Inorganic Condensibles	mg	<0.5	N/A	1.9	3.1	0.5	0.1	5783596
Organic Condensibles	mg	N/A	8.2	<1.0	1.2	1.0	0.20	5783580

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		IAC041	IAC042			
Sampling Date		2018/10/10	2018/10/11			
	UNITS	**M202- UNIT 2-R2**	**M202- UNIT 2-R3**	**RDL**	**MDL**	**QC Batch**
Weight	g	370	320	0.1	0.1	5783592
Weight of Solvent	g	88	95	0.1	N/A	5783588
Miscellaneous Parameters						
Inorganic Condensibles	mg	2.3	2.2	0.5	0.1	5783596
Organic Condensibles	mg	1.1	<1.0	1.0	0.20	5783580

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		IAC046			
Sampling Date					
	UNITS	**M201A- ACETONE BLANK**	**RDL**	**MDL**	**QC Batch**
Acetone Rinse Particulate Weight in Acetone Rinse	mg	<0.5	0.5	0.1	5783282
Acetone Rinse Volume	ml	340	1	1	5783287

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

TEST SUMMARY

Maxxam ID: IAC037 **Collected:**
Sample ID: M202- DI WATER BLANK **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Non Extractable Condensibles (M202)	BAL	5783596	2018/10/15	2018/10/16	Muhammad M Rahman
Weight of Water from Impingers		5783592	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC038 **Collected:**
Sample ID: M202- HEXANE BLANK **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5783580	2018/10/15	2018/10/17	Muhammad M Rahman
Weight of Solvent from Impingers		5783588	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC039 **Collected:**
Sample ID: M202- UNIT 2- FB **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5783580	2018/10/15	2018/10/17	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5783596	2018/10/15	2018/10/16	Muhammad M Rahman
Weight of Solvent from Impingers		5783588	N/A	2018/10/15	Muhammad M Rahman
Weight of Water from Impingers		5783592	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC040 **Collected:** 2018/10/10
Sample ID: M202- UNIT 2- R1 **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5783580	2018/10/15	2018/10/17	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5783596	2018/10/15	2018/10/16	Muhammad M Rahman
Weight of Solvent from Impingers		5783588	N/A	2018/10/15	Muhammad M Rahman
Weight of Water from Impingers		5783592	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC041 **Collected:** 2018/10/10
Sample ID: M202- UNIT 2- R2 **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5783580	2018/10/15	2018/10/17	Muhammad M Rahman
Non Extractable Condensibles (M202)	BAL	5783596	2018/10/15	2018/10/16	Muhammad M Rahman
Weight of Solvent from Impingers		5783588	N/A	2018/10/15	Muhammad M Rahman
Weight of Water from Impingers		5783592	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC042 **Collected:** 2018/10/11
Sample ID: M202- UNIT 2- R3 **Shipped:**
Matrix: Stack Sampling Train **Received:** 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	5783580	2018/10/15	2018/10/17	Muhammad M Rahman

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

TEST SUMMARY

Maxxam ID: IAC042
Sample ID: M202- UNIT 2- R3
Matrix: Stack Sampling Train

Collected: 2018/10/11
Shipped:
Received: 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Non Extractable Condensibles (M202)	BAL	5783596	2018/10/15	2018/10/16	Muhammad M Rahman
Weight of Solvent from Impingers		5783588	N/A	2018/10/15	Muhammad M Rahman
Weight of Water from Impingers		5783592	N/A	2018/10/15	Muhammad M Rahman

Maxxam ID: IAC046
Sample ID: M201A- ACETONE BLANK
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Particulates/Acetone Rinse (M5/315/M201)	BAL	5783282	2018/10/15	2018/10/18	Farag Farag
Final Volume of Acetone Probe Rinse		5783287	N/A	2018/10/18	Farag Farag

Maxxam ID: IAC047
Sample ID: M201A- UNIT 2- R1
Matrix: Stack Sampling Train

Collected: 2018/10/10
Shipped:
Received: 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5783286	2018/10/15	2018/10/18	Farag Farag
2.5-10um Particulates in Rinse	BAL	5783285	2018/10/15	2018/10/18	Farag Farag
2.5 um Particulates on Filter	BAL	5786521	N/A	2018/10/16	Brenda Moore
<2.5um Particulates in Rinse	BAL	5783283	2018/10/15	2018/10/18	Farag Farag
Final Volume of Acetone Probe Rinse		5783287	N/A	2018/10/18	Farag Farag

Maxxam ID: IAC048
Sample ID: M201A- UNIT 2- R2
Matrix: Stack Sampling Train

Collected: 2018/10/10
Shipped:
Received: 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5783286	2018/10/15	2018/10/18	Farag Farag
2.5-10um Particulates in Rinse	BAL	5783285	2018/10/15	2018/10/18	Farag Farag
2.5 um Particulates on Filter	BAL	5786521	N/A	2018/10/16	Brenda Moore
<2.5um Particulates in Rinse	BAL	5783283	2018/10/15	2018/10/18	Farag Farag
Final Volume of Acetone Probe Rinse		5783287	N/A	2018/10/18	Farag Farag

Maxxam ID: IAC049
Sample ID: M201A- UNIT 2- R3
Matrix: Stack Sampling Train

Collected: 2018/10/11
Shipped:
Received: 2018/10/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	5783286	2018/10/15	2018/10/18	Farag Farag
2.5-10um Particulates in Rinse	BAL	5783285	2018/10/15	2018/10/18	Farag Farag
2.5 um Particulates on Filter	BAL	5786521	N/A	2018/10/16	Brenda Moore
<2.5um Particulates in Rinse	BAL	5783283	2018/10/15	2018/10/18	Farag Farag
Final Volume of Acetone Probe Rinse		5783287	N/A	2018/10/18	Farag Farag

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

Sample IAC037 [M202- DI WATER BLANK] : INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample IAC038 [M202- HEXANE BLANK] : ORGANIC EXTRACTION : Oily material found in vial.

Sample IAC039 [M202- UNIT 2- FB] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample IAC040 [M202- UNIT 2- R1] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample IAC041 [M202- UNIT 2- R2] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Sample IAC042 [M202- UNIT 2- R3] : ORGANIC EXTRACTION : Oily material found in vial.
INORGANIC EXTRACTION : Whitish residue found in Teflon dish.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5783282	FF	Method Blank	Acetone Rinse Particulate Weight in Acetone Ri	2018/10/18	<0.5		mg	
5783283	FF	Method Blank	< 2.5 Particulate Weight in Acetone Rinse	2018/10/18	<0.5		mg	
5783285	FF	Method Blank	2.5 - 10 Particulate Weight in Acetone Rinse	2018/10/18	<0.5		mg	
5783286	FF	Method Blank	> 10 Particulate Weight in Acetone Rinse	2018/10/18	<0.5		mg	
5783580	MOR	Spiked Blank	Organic Condensibles	2018/10/17		96	%	70 - 130
5783580	MOR	Method Blank	Organic Condensibles	2018/10/17	<1.0		mg	
5783596	MOR	Method Blank	Inorganic Condensibles	2018/10/18	<0.5		mg	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8R1187
Report Date: 2018/10/18

Air Hygiene International Inc
Client Project #: SIE-18-MIDDLETOWN.NY-START#4

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brenda Moore

Brenda Moore, Team Lead

Frank Mo, B.Sc., Inorganic Lab. Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

38R 1187

Requested Standard Analysis - 5-10 business days after receipt at lab

SAMPLE DESCRIPTION AND LABELING RECORD

Contact Information (deliver results to)
Name: Michael Stockwell
Phone: (918) 307-8865
Email:

Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

Project Number:	sie-18-middletown.ny-start#4				Laboratory Analysis Requested:			
Person Taking Samples:	MS				Gravimetric			
Sample Number	Location	Date	Volume		Analysis Method			
					RM 201A	RM 202	--	--
2-Base-PM-1-F	Unit 2-Base-PM - Run 1 - Filter	10/10/18	N/A		X			
2-Base-PM-1-C2	Unit 2-Base-PM - Run 1 - Nozzle Wash PM>10	10/10/18			X			
2-Base-PM-1-C3	Unit 2-Base-PM - Run 1 - Cyclone Wash 2.5<PM<10	10/10/18			X			
2-Base-PM-1-C4	Unit 2-Base-PM - Run 1 - Cyclone Exit to Front Half of Filter Wash (<2.5)	10/10/18	N/A		X			
2-Base-PM-1-C5	Unit 2-Base-PM - Run 1 - Inorganic Impinger Contents	10/10/18				X		
2-Base-PM-1-C6	Unit 2-Base-PM - Run 1 - Organic Impinger Contents	10/10/18				X		
2-Base-PM-1-CPM	Unit 2-Base-PM - Run 1 - CPM Filter	10/10/18	N/A			X		
2-Base-PM-2-F	Unit 2-Base-PM - Run 2 - Filter	10/10/18	N/A		X			
2-Base-PM-2-C2	Unit 2-Base-PM - Run 2 - Nozzle Wash PM>10	10/10/18			X			
2-Base-PM-2-C3	Unit 2-Base-PM - Run 2 - Cyclone Wash 2.5<PM<10	10/10/18			X			
2-Base-PM-2-C4	Unit 2-Base-PM - Run 2 - Cyclone Exit to Front Half of Filter Wash (<2.5)	10/10/18	N/A		X			
2-Base-PM-2-C5	Unit 2-Base-PM - Run 2 - Inorganic Impinger Contents	10/10/18				X		
2-Base-PM-2-C6	Unit 2-Base-PM - Run 2 - Organic Impinger Contents	10/10/18				X		
2-Base-PM-2-CPM	Unit 2-Base-PM - Run 2 - CPM Filter	10/10/18	N/A			X		
2-Base-PM-3-F	Unit 2-Base-PM - Run 3 - Filter	10/11/18	N/A		X			
2-Base-PM-3-C2	Unit 2-Base-PM - Run 3 - Nozzle Wash PM>10	10/11/18			X			
2-Base-PM-3-C3	Unit 2-Base-PM - Run 3 - Cyclone Wash 2.5<PM<10	10/11/18			X			
2-Base-PM-3-C4	Unit 2-Base-PM - Run 3 - Cyclone Exit to Front Half of Filter Wash (<2.5)	10/11/18	N/A		X			
2-Base-PM-3-C5	Unit 2-Base-PM - Run 3 - Inorganic Impinger Contents	10/11/18				X		
2-Base-PM-3-C6	Unit 2-Base-PM - Run 3 - Organic Impinger Contents	10/11/18				X		
2-Base-PM-3-CPM	Unit 2-Base-PM - Run 3 - CPM Filter	10/11/18	N/A			X		
2-Base-PM-FB-C3	Unit 2-Base-PM - Run FB - ~~Cyclone Wash 2.5<PM<10~~ CPM Filter	FB			X			
2-Base-PM-FB-C4	Unit 2-Base-PM - Run FB - ~~Cyclone Exit to Front Half of Filter Wash (<2.5)~~ Organic Impinger Contents	FB	N/A		X			
2-Base-PM-FB-C5	Unit 2-Base-PM - Run FB - Inorganic Impinger Contents	FB				X		
2-Base-PM-B1-Acetone	Unit 2-Base-PM - Blank - Acetone		200			X		
2-Base-PM-B2-DI Water	Unit 2-Base-PM - Blank - DI Water		200		X			
2-Base-PM-B3-Hexane	Unit 2-Base-PM - Blank - Hexane		200			X		

Signature 10/11/18 10:00
Date Time

Signature 10/11/18 10:00
Date Time

Signature JUAN Tong 2018/10/12 23:55
Date Time

Signature Date Time

APPENDIX E

FUEL ANALYSIS RECORDS

Client: CPV Valley, LLC
Location: CPV Valley Energy Center
Date: September 24, 2018
Project #: sie-18-middletown.ny-start#1

Natural Gas - Fuel Analysis

Standardized to 68 deg F and 14.696 psia - EPA Standards

Gas Component		Mole (%)	Molecular[1] Weight (lb/lb-mole)	Lbs Component per Lb-Mole of Gas	Wt. % of Component	Ideal Gross[1,3] Heating Value (Btu/ft^3)	Fuel Heat Value [HHV] (Btu/SCF)	Ideal Net[1,3] Heating Value (Btu/ft^3)	Fuel Heat Value [LHV] (Btu/SCF)
Methane	CH_4	97.684	16.0430	15.67	95.71	994.85	971.80	895.75	875.01
Ethane	C_2H_6	1.835	30.0700	0.55	3.37	1,743.15	31.99	1,594.41	29.26
Propane	C_3H_8	0.047	44.0970	0.02	0.13	2,478.35	1.16	2,280.17	1.07
iso-Butane	iC_4H_{10}	0.000	58.1230	0.00	0.00	3,203.11	0.00	2,955.38	0.00
n-Butane	nC_4H_{10}	0.000	58.1230	0.00	0.00	3,213.35	0.00	2,965.62	0.00
Iso-Pentane	iC_5H_{12}	0.000	72.1500	0.00	0.00	3,940.87	0.00	3,643.50	0.00
n-Pentane	nC_5H_{12}	0.000	72.1500	0.00	0.00	3,948.75	0.00	3,648.32	0.00
Hexanes	C_6H_{14}	0.000	86.1770	0.00	0.00	4,684.54	0.00	4,337.82	0.00
Heptanes	C_7H_{16}	0.000	100.2040	0.00	0.00	5,419.94	0.00	5,023.77	0.00
Octanes	C_8H_{18}	0.000	114.2310	0.00	0.00	6,155.14	0.00	5,709.23	0.00
Carbon Dioxide	CO_2	0.052	44.0100	0.02	0.14	0.00	0.00	0.00	0.00
Nitrogen	N_2	0.382	28.0134	0.11	0.65	0.00	0.00	0.00	0.00
Hydrogen Sulfide	H_2S	0.000	34.0800	0.00	0.00	627.54	0.00	578.00	0.00
Oxygen	O_2	0.000	31.9988	0.00	0.00	0.00	0.00	0.00	0.00
Helium	He	0.000	4.0026	0.00	0.00	0.00	0.00	0.00	0.00
Hydrogen	H_2	0.000	2.0159	0.00	0.00	319.34	0.00	269.82	0.00
Totals		**100.000**		**16.37**	**100.00**	**dry**	**1,004.96**	**dry**	**905.34**
						wet[2,5]	**981.79**	**wet[2,5]**	**884.46**

Characteristics of Fuel Gas		
Molecular Weight of gas =	16.374	lb/lb-mole
Btu per lb. of gas[4] =	23,643.747	gross (HHV)
Btu per lb. of gas[4] =	21,300.020	net (LHV)
Density of fuel gas[2] =	0.0425	lb/cu. ft
Wt % VOC in fuel gas =	0.13	%
Specific Gravity[1] =	0.5653	

Component	Wt%
carbon	74.49
oxygen	0.10
hydrogen	24.76
nitrogen	0.65
helium	0.00
sulfur	0.00
Total	**100.00**

F-Factor (SCF dry exhaust per MMBtu [HHV]) = 8,633.27
(Based on EPA RM-19) at 68 deg F and 14.696 psia

F-Factor Calculation:

F-Factor = 1,000,000*((3.64*%H)+(1.53*%C)+(0.57*%S)+(0.14*%N)-(0.46*%O))/GCV

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of natural gas based on specific gravity multiplied by density of air at 68 deg F and 14.696 psia.

References:

[1] ASTM D 3588
[2] Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg
[3] Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III
[4] Introduction to Fluid Mechanics, 3rd ed. - William S. Janna
[5] GPA Reference Bulletin 181-86, revised 1986, reprinted 1995

Client: CPV Valley, LLC
Location: CPV Valley Energy Center
Date: September 25, 2018
Project #: sie-18-middletown.ny-start#1

Natural Gas - Fuel Analysis

Standardized to 68 deg F and 14.696 psia - EPA Standards

Gas Component		Mole (%)	Molecular[1] Weight (lb/lb-mole)	Lbs Component per Lb-Mole of Gas	Wt. % of Component	Ideal Gross[1,3] Heating Value (Btu/ft^3)	Fuel Heat Value [HHV] (Btu/SCF)	Ideal Net[1,3] Heating Value (Btu/ft^3)	Fuel Heat Value [LHV] (Btu/SCF)
Methane	CH_4	97.795	16.0430	15.69	95.92	994.85	972.91	895.75	876.00
Ethane	C_2H_6	1.828	30.0700	0.55	3.36	1,743.15	31.86	1,594.41	29.15
Propane	C_3H_8	0.044	44.0970	0.02	0.12	2,478.35	1.09	2,280.17	1.00
iso-Butane	iC_4H_{10}	0.000	58.1230	0.00	0.00	3,203.11	0.00	2,955.38	0.00
n-Butane	nC_4H_{10}	0.000	58.1230	0.00	0.00	3,213.35	0.00	2,965.62	0.00
Iso-Pentane	iC_5H_{12}	0.000	72.1500	0.00	0.00	3,940.87	0.00	3,643.50	0.00
n-Pentane	nC_5H_{12}	0.000	72.1500	0.00	0.00	3,948.75	0.00	3,648.32	0.00
Hexanes	C_6H_{14}	0.000	86.1770	0.00	0.00	4,684.54	0.00	4,337.82	0.00
Heptanes	C_7H_{16}	0.000	100.2040	0.00	0.00	5,419.94	0.00	5,023.77	0.00
Octanes	C_8H_{18}	0.000	114.2310	0.00	0.00	6,155.14	0.00	5,709.23	0.00
Carbon Dioxide	CO_2	0.034	44.0100	0.01	0.09	0.00	0.00	0.00	0.00
Nitrogen	N_2	0.299	28.0134	0.08	0.51	0.00	0.00	0.00	0.00
Hydrogen Sulfide	H_2S	0.000	34.0800	0.00	0.00	627.54	0.00	578.00	0.00
Oxygen	O_2	0.000	31.9988	0.00	0.00	0.00	0.00	0.00	0.00
Helium	He	0.000	4.0026	0.00	0.00	0.00	0.00	0.00	0.00
Hydrogen	H_2	0.000	2.0159	0.00	0.00	319.34	0.00	269.82	0.00
Totals		**100.000**		**16.36**	**100.00**	**dry**	**1,005.86**	**dry**	**906.15**
						wet[2,5]	**982.67**	**wet[2,5]**	**885.26**

Characteristics of Fuel Gas		
Molecular Weight of gas =	16.357	lb/lb-mole
Btu per lb. of gas[4] =	23,689.403	gross (HHV)
Btu per lb. of gas[4] =	21,341.065	net (LHV)
Density of fuel gas[2] =	0.0425	lb/cu. ft
Wt % VOC in fuel gas =	0.12	%
Specific Gravity[1] =	0.5648	

Component	Wt%
carbon	74.62
oxygen	0.07
hydrogen	24.80
nitrogen	0.51
helium	0.00
sulfur	0.00
Total	**100.00**

F-Factor (SCF dry exhaust per MMBtu [HHV]) =	**8,632.22**
(Based on EPA RM-19) at 68 deg F and 14.696 psia	

F-Factor Calculation:

F-Factor = 1,000,000*((3.64*%H)+(1.53*%C)+(0.57*%S)+(0.14*%N)-(0.46*%O))/GCV

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of natural gas based on specific gravity multiplied by density of air at 68 deg F and 14.696 psia.

References:

[1] ASTM D 3588
[2] Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg
[3] Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III
[4] Introduction to Fluid Mechanics, 3rd ed. - William S. Janna
[5] GPA Reference Bulletin 181-86, revised 1986, reprinted 1995

SPL

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-18100260-001A

Air Hygiene International, Inc.
1600 West Tacoma Street
Broken Arrow, OK 74012

Oct. 05, 2018

Station Name: SMR Feed Line
Station Number: sie-18-middletown.ny-start#1
Cylinder No: 1030-06464
Analyzed: 10/04/2018 05:02:00 by JD

Sampled By: PM
Sample Of: Gas Spot
Sample Date: 09/24/2018
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	0.382	0.654	
Methane	97.684	95.709	
Carbon Dioxide	0.052	0.140	
Ethane	1.835	3.370	0.490
Propane	0.047	0.127	0.013
Iso-butane	NIL	NIL	NIL
n-Butane	NIL	NIL	NIL
Iso-pentane	NIL	NIL	NIL
n-Pentane	NIL	NIL	NIL
Hexanes Plus	NIL	NIL	NIL
	100.000	100.000	0.503

GPM TOTAL C2+	0.503
GPM TOTAL C3+	0.013
GPM TOTAL iC5+	0.000

Calculated Physical Properties	**Total**
Relative Density Real Gas	0.5663
Calculated Molecular Weight	16.37
Compressibility Factor	0.9979
GPA 2172 Calculation:	
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F	
Real Gas Dry BTU	1022
Water Sat. Gas Base BTU	1005

Comments: Gross Dry BTU at 29.92 "Hg and 68 °F = 1005 per cubic foot (ASTM D1826). Gross Saturated BTU at 29.92 "Hg and 68 °F = 982 per cubic foot (ASTM D1826).

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-18100260-001A

Air Hygiene International, Inc.
1600 West Tacoma Street
Broken Arrow, OK 74012

Oct. 05, 2018

Station Name: SMR Feed Line
Station Number: sie-18-middletown.ny-start#1
Cylinder No: 1030-06464
Analyzed: 10/04/2018 by TB

Sampled By: PM
Sample Of: Gas Spot
Sample Date: 09/24/2018
Sample Conditions:
Method: ASTM D-5504

Sulfur Analysis

SULFIDES	ppmw	MERCAPTANS	ppmw	DISULFIDES	ppmw
Hydrogen	ND	Methyl	ND	Carbon	ND
Carbonyl	ND	Ethyl	ND	Dimethyl	ND
Dimethyl	ND	Isopropyl	ND	Methyl Ethyl	ND
Methyl Ethyl	ND	n-Propyl	ND	Diethyl	ND
Diethyl	ND	Isobutyl	ND	Di-iso-Propyl	0.5
Di-iso-Propyl	ND	sec-Butyl	ND	Di-n-Propyl	0.5
Di-n-Propyl	ND	tert-Butyl	1.4	Di-iso-Butyl	ND
Di-iso-Butyl	ND	n-Butyl	ND	Di-sec-Butyl	ND
Di-sec-Butyl	ND	Isoamyl	ND	Di-tert-Butyl	ND
Di-tert-Butyl	ND	pri-Amyl	ND	Di-n-Butyl	ND
Di-n-Butyl	ND	n-Amyl	ND		
OTHER	**ppmw**	**OTHER**	**ppmw**	**OTHER**	**ppmw**
Misc. Sulfurs	ND	Thiophene	ND	Thiophane	ND
Sulfur Dioxide	ND				

Comments: Additional 0.2 ppmw Sulfur detected as unidentified compounds
Detection limit = 0.1 ppmw
Total Sulfur detected = 0.034 grains/100 std. cubic ft. at 68 °F.
ND = Not Detected

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 1030-18100260-002A

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Air Hygiene International, Inc.
1600 West Tacoma Street
Broken Arrow, OK 74012

Oct. 05, 2018

Station Name: SMR Feed Line
Station Number: sie-18-middletown.ny-start#1
Cylinder No: 1030-01476
Analyzed: 10/04/2018 05:20:00 by JD

Sampled By: PM
Sample Of: Gas Spot
Sample Date: 09/25/2018
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	0.299	0.512	
Methane	97.795	95.918	
Carbon Dioxide	0.034	0.091	
Ethane	1.828	3.360	0.489
Propane	0.044	0.119	0.012
Iso-butane	NIL	NIL	NIL
n-Butane	NIL	NIL	NIL
Iso-pentane	NIL	NIL	NIL
n-Pentane	NIL	NIL	NIL
Hexanes Plus	NIL	NIL	NIL
	100.000	100.000	0.501

GPM TOTAL C2+	0.501
GPM TOTAL C3+	0.012
GPM TOTAL iC5+	0.000

Calculated Physical Properties	**Total**
Relative Density Real Gas	0.5657
Calculated Molecular Weight	16.36
Compressibility Factor	0.9979
GPA 2172 Calculation:	
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F	
Real Gas Dry BTU	1023
Water Sat. Gas Base BTU	1006

Comments: Gross Dry BTU at 29.92 "Hg and 68 °F = 1006 per cubic foot (ASTM D1826). Gross Saturated BTU at 29.92 "Hg and 68 °F = 983 per cubic foot (ASTM D1826).

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis
Number: 1030-18100260-002A

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Air Hygiene International, Inc.
1600 West Tacoma Street
Broken Arrow, OK 74012

Oct. 05, 2018

Station Name:	SMR Feed Line	Sampled By:	PM
Station Number:	sie-18-middletown.ny-start#1	Sample Of:	Gas Spot
Cylinder No:	1030-01476	Sample Date:	09/25/2018
Analyzed:	10/04/2018 by TB	Sample Conditions:	
		Method:	ASTM D-5504

Sulfur Analysis

SULFIDES	ppmw	MERCAPTANS	ppmw	DISULFIDES	ppmw
Hydrogen	ND	Methyl	ND	Carbon	ND
Carbonyl	ND	Ethyl	ND	Dimethyl	ND
Dimethyl	ND	Isopropyl	ND	Methyl Ethyl	ND
Methyl Ethyl	ND	n-Propyl	ND	Diethyl	ND
Diethyl	ND	Isobutyl	ND	Di-iso-Propyl	0.2
Di-iso-Propyl	ND	sec-Butyl	ND	Di-n-Propyl	2.9
Di-n-Propyl	ND	tert-Butyl	ND	Di-iso-Butyl	ND
Di-iso-Butyl	ND	n-Butyl	ND	Di-sec-Butyl	ND
Di-sec-Butyl	ND	Isoamyl	ND	Di-tert-Butyl	ND
Di-tert-Butyl	ND	pri-Amyl	ND	Di-n-Butyl	ND
Di-n-Butyl	ND	n-Amyl	ND		
OTHER	**ppmw**	**OTHER**	**ppmw**	**OTHER**	**ppmw**
Misc. Sulfurs	ND	Thiophene	ND	Thiophane	ND
Sulfur Dioxide	ND				

Comments: Detection limit = 0.1 ppmw
Total Sulfur detected = 0.039 grains/100 std. cubic ft. at 68 °F.
ND = Not Detected

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

please do 48hr analysis

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD

Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

Project Number:	sie-18-middletown.ny-start#1	Laboratory Analysis Requested:	
Person Taking Samples:	Pat McGovern, Jr.	ASTM 5504, ASTM D 1945	

Sample Number	Location	Date	Volume	Analysis Method				
				5504	1945			
1030-06464	SMR feed line	9/24/2018		X	X			
1030-04658	SMR feed line (BACKUP)	9/24/2018		X	X			
1030-01476	SMR feed line	9/25/2018		X	X			
1030-05208	SMR feed line (BACKUP)	9/25/2018		X	X			
	1030-04658 &1030-05208 are BACKUP ONLY							
	Only Analyze Backup if necessary							

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	10/2/18	14:17	[signature]	10/3	14:02

y of Chain of Custody-AHI #1 Ninemile

APPENDIX F

STRATIFICATION TEST DATA

STRATIFICATION TEST DATA

Unit #CTG-1
Stratification Results

Source Information	
Company	CPV Valley, LLC
Plant Name	CPV Valley Energy Center
Equipment	Siemens SCC6-5000F, Unit #CTG-1
Location	Middletown, New York

Test Information	
Date	09/24/18
Project #	sie-18-middletown.ny-start#1
Unit Number	CTG-1
Load	Base
Number of Ports Available	4
Number of Ports Used	4

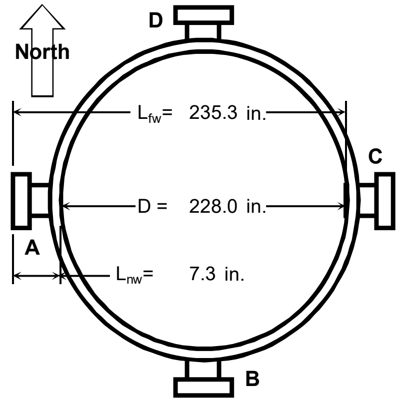
Stack and Test Type			
○	Isokinetic Traverse (Wet Chemistry Testing)		**Circular Stack**
○	Velocity Traverse (Flow and Flow RATA Test)		
○	Stratification Traverse (Compliance Test)	☐ RM 20	
◉	**Stratification Traverse (RATA)**	☐ Part 60 ☑ Part 75	

sie-18-middletown.ny-start#1-CTG1-Strat

METHOD 1 - STRATIFICATION TEST FOR A CIRCULAR SOURCE

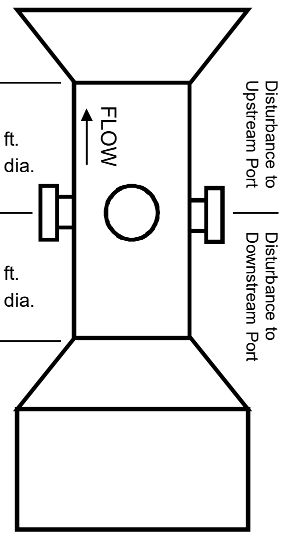
Company	CPV Valley, LLC	**Date**	09/24/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-18-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, Unit #CTG-1	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	235.25	in.
Distance to Near Wall of Stack	(L_{nw})	7.25	in.
Diameter of Stack	(D)	228.00	in.
Area of Stack	(A_s)	283.53	ft^2



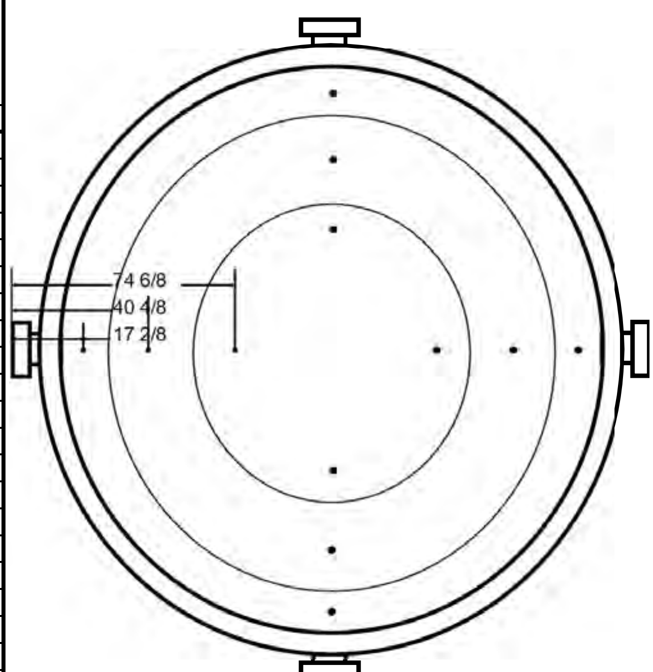
Distance from Disturbances to Port			
Distance Upstream	(A)	1200.00	in.
Diameters Upstream	(A_D)	5.26	diameters
Distance Downstream	(B)	1095.00	in.
Diameters Downstream	(B_D)	4.80	diameters

Number of Traverse Points Required					
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points		Minimum Number of Traverse Points	
Down (B_D) Stream	Up (A_D) Stream	Particulate Points	Velocity Points	Comp Stratification Criteria	Points
2.00-4.99	0.50-1.24	24	16	O RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	O Alt 7E 8.1.2	3 points
6.00-6.99	1.50-1.74	16	12		
7.00-7.99	1.75-1.99	12	12		
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]	**Minimum Number of**	
Upstream Spec		12	12	**Traverse Points**	
Downstream Spec		24	16	**RATA Stratification**	
Traverse Pts Required		24	16	**Criteria**	**Points**
[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.				● Part75/60	12 RM1 pts
				O 75 abrv (a)	3 points
[2] 8 for Circular Stacks 12 to 24 inches				O 75 abrv (b)	6 points
12 for Circular Stacks over 24 inches				12 points	



Number of Traverse Points Used				
4	**Ports by**	3	**Pts / port**	**Stratification Traverse (RATA)**
12	**Pts Used**	12	**Required**	

Traverse Point Locations			
Traverse Point Number	**Percent of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
	%	in.	in.
1	4.4%	10	17 2/8
2	14.6%	33 2/8	40 4/8
3	29.6%	67 4/8	74 6/8
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



STRATIFICATION TRAVERSE (RATA) RESULTS

Company	CPV Valley, LLC	**Date**	09/24/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-18-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, Unit #CTG-1	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	228.00	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	283.53	ft^2	**Run Start**	16:03:46	**Run End**	16:55:46

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O_2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%
D-3	4.00	16:03:46	16:07:46	13.55	0.11%	2.57	7.32%
D-2	4.00	16:07:46	16:11:46	13.51	**0.16%**	2.51	4.64%
D-1	4.00	16:11:46	16:15:46	13.52	0.12%	2.44	1.89%
C-3	4.00	16:15:46	16:19:46	13.54	0.05%	2.45	2.25%
C-2	4.00	16:19:46	16:23:46	13.54	0.05%	2.53	5.54%
C-1	4.00	16:23:46	16:27:46	13.53	0.01%	2.47	3.21%
B-3	4.00	16:27:46	16:31:46	13.53	0.04%	2.44	1.98%
B-2	4.00	16:31:46	16:35:46	13.54	0.01%	2.42	1.18%
B-1	4.00	16:35:46	16:39:46	13.54	0.03%	2.25	6.04%
A-3	4.00	16:43:46	16:47:46	13.55	0.10%	2.25	6.04%
A-2	4.00	16:47:46	16:51:46	13.52	0.11%	2.20	**8.21%**
A-1	4.00	16:51:46	16:55:46	13.55	0.09%	2.21	7.71%
Average				13.54		2.39	

RATA SAMPLE POINTS FOR CIRCULAR STACK

Company	CPV Valley, LLC	**Date**	09/24/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-18-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, Unit #CTG-1	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

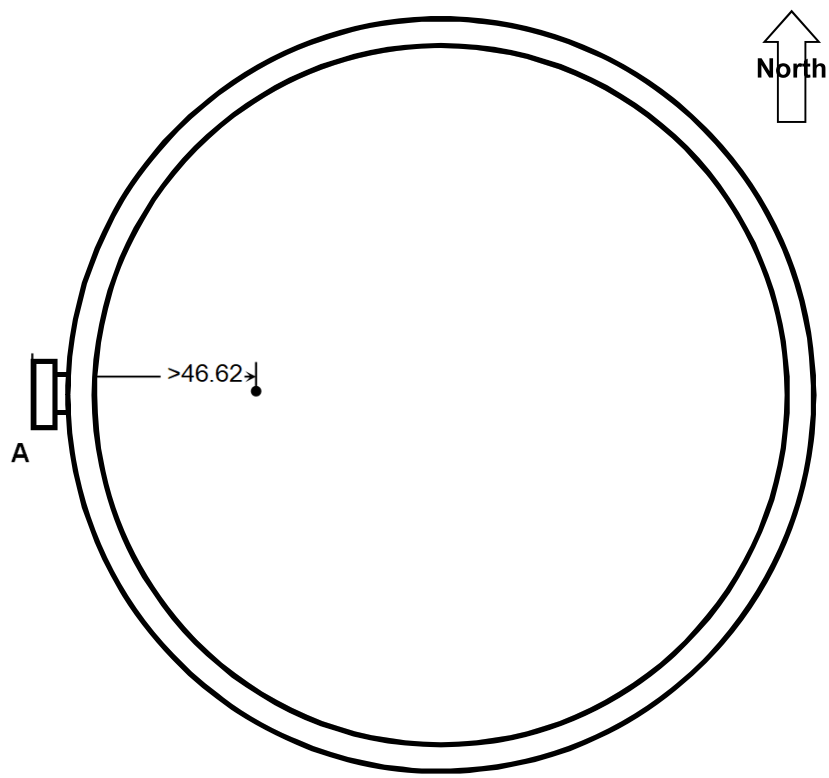
Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	228.00	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	283.53	ft^2	**Run Start**	16:03:46	**Run End**	16:55:46

40 CFR 75 Criteria

Stratification Results			Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
Maximum Percent Difference	8.21	% for NOx				
Maximum Pollutant Conc. Diff.	0.20	ppm for NOx				
Maximum Diluent Conc. Diff.	0.02	% for O2				
Stack Diameter	228.00	in.		%	in.	in.
Stratification Conclusions			**1**	>17.27%	>39.37	>46.62
Maximum % Diff.	Percent Diff. ≤10% Passed 6.5.6.3(a) Criteria		**2**			
Maximum Conc. Diff.	Conc. Diff. ≤ 0.3% Passed 6.5.6.3(b) Criteria		**3**			
Stack Diameter	D > 93.6 in.					

Passed Strat. Test Under 6.5.6.3(b) Criteria

Test Type		
	☐ Moisture, for MW	☐ Use 6.5.6.3(a) points?
	☐ Moisture, for wet-to-dry	☐ 6.5.6(b)(2) alt. points could apply
	☑ Gas	



STRATIFICATION TEST DATA

Unit #CTG-2
Stratification Results

Source Information	
Company	CPV Valley, LLC
Plant Name	CPV Valley Energy Center
Equipment	Siemens SCC6-5000F, Unit #CTG-2
Location	Middletown, New York

Test Information	
Date	09/24/18
Project #	sie-18-middletown.ny-start#1
Unit Number	CTG-2
Load	100% w/DB
Number of Ports Available	4
Number of Ports Used	4

Stack and Test Type			
○	Isokinetic Traverse (Wet Chemistry Testing)		**Circular Stack**
○	Velocity Traverse (Flow and Flow RATA Test)		
○	Stratification Traverse (Compliance Test)	☐ RM 20	
◉	**Stratification Traverse (RATA)**	☐ Part 60 ☑ Part 75	

STRATIFICATION TRAVERSE (RATA) RESULTS

Company	CPV Valley, LLC	**Date**	09/24/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-18-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, Unit #CTG-2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	228.00	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	283.53	ft^2	**Run Start**	16:45:24	**Run End**	17:38:24

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O_2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%
D-3	4.00	16:45:24	16:49:24	13.59	0.27%	2.34	2.27%
D-2	4.00	16:49:24	16:53:24	13.65	0.18%	2.40	0.42%
D-1	4.00	16:53:24	16:57:24	13.66	0.24%	2.44	1.78%
C-3	5.00	16:57:24	17:02:24	13.64	0.12%	2.60	**8.68%**
C-2	4.00	17:02:24	17:06:24	13.61	0.10%	2.53	5.54%
C-1	4.00	17:06:24	17:10:24	13.62	0.08%	2.42	1.07%
B-3	5.00	17:10:24	17:15:24	13.60	0.22%	2.39	0.32%
B-2	4.00	17:15:24	17:19:24	13.59	**0.27%**	2.43	1.69%
B-1	4.00	17:19:24	17:23:24	13.63	0.02%	2.39	0.03%
A-3	7.00	17:23:24	17:30:24	13.64	0.10%	2.24	6.51%
A-2	4.00	17:30:24	17:34:24	13.64	0.05%	2.31	3.35%
A-1	4.00	17:34:24	17:38:24	13.66	0.26%	2.23	6.70%
Average				13.63		2.39	

RATA SAMPLE POINTS FOR CIRCULAR STACK

Company	CPV Valley, LLC	**Date**	09/24/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-18-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, Unit #CTG-2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	228.00	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	283.53	ft^2	**Run Start**	16:45:24	**Run End**	17:38:24

40 CFR 75 Criteria

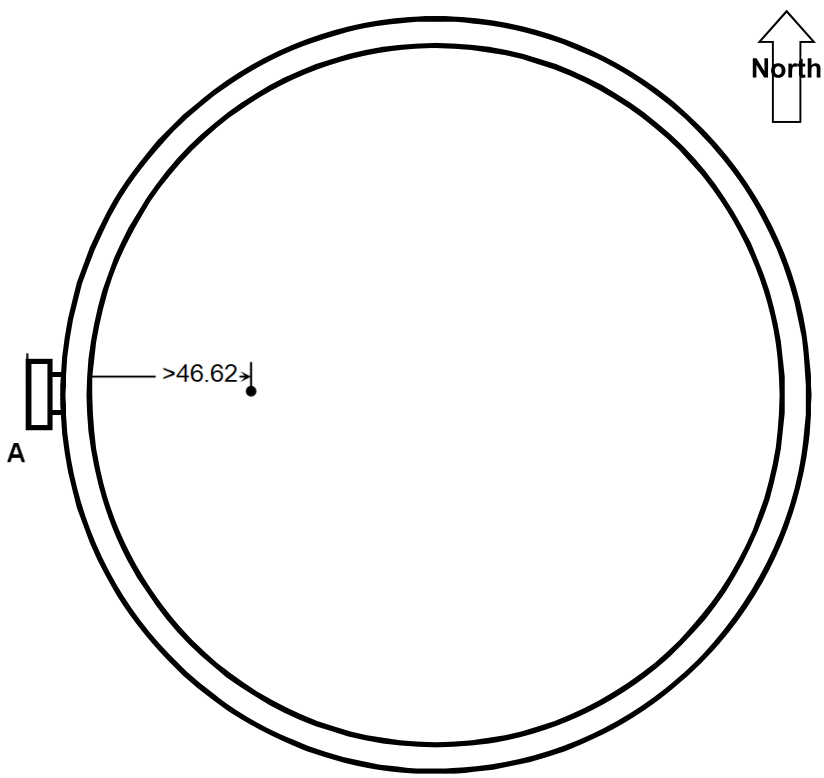
Stratification Results	
Maximum Percent Difference	8.68 % for NOx
Maximum Pollutant Conc. Diff.	0.21 ppm for NOx
Maximum Diluent Conc. Diff.	0.04 % for O2
Stack Diameter	228.00 in.

Stratification Conclusions	
Maximum % Diff.	Percent Diff. ≤10% Passed 6.5.6.3(a) Criteria
Maximum Conc. Diff.	Conc. Diff. ≤ 0.3% Passed 6.5.6.3(b) Criteria
Stack Diameter	D > 93.6 in.

Passed Strat. Test Under 6.5.6.3(b) Criteria

Traverse Point Number	**Percent of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
	%	in.	in.
1	>17.27%	>39.37	>46.62
2			
3			

Test Type
- ☐ Moisture, for MW
- ☐ Moisture, for wet-to-dry
- ☑ Gas
- ☐ Use 6.5.6.3(a) points?
- ☐ 6.5.6(b)(2) alt. points could apply



APPENDIX G

SEPTEMBER 25-27
PM TEST DATA
CTG-2 BASE LOAD
[EXCEEDED PERMIT LIMITS]

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Historical Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Run Start Time	09:52	15:12	15:39		hh:mm	
Run Stop Time	14:08	19:25	19:51		hh:mm	
Test Date	09/24/18	09/24/18	09/25/18		mm/dd/yy	
Load	Base	Base	Base		% or w/DB	--
Meter Calibration Factor	1.000	1.000	1.000			
Pitot Tube Coefficient	0.7420	0.7420	0.7420			
Average Nozzle Diameter	0.140	0.141	0.140		in	
Stack Test Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Initial Meter Volume	886.110	962.300	342.830		ft^3	
Final Meter Volume	962.005	1048.720	427.220		ft^3	
Total Meter Volume	75.895	86.420	84.390	82.235	ft^3	
Total Sampling Time	241.50	241.75	241.25	241.50	min	
Average Meter Temperature	79.50	79.92	78.25	79.22	°F	
Average Stack Temperature	218.00	216.50	203.33	212.61	°F	
Barometric Pressure	29.97	29.96	29.69	29.87	in Hg	
Stack Static Pressure	-0.89	-0.89	-0.89	-0.89	in H_2O	
Absolute Stack Pressure	29.90	29.89	29.62	29.81	in Hg	
Average Orifice Pressure Drop	0.39	0.43	0.43	0.42	in H_2O	
Absolute Meter Pressure	30.10	30.09	29.82	30.01	in Hg	
Avg Square Root Pitot Pressure	1.16	1.19	1.18	1.18	$\sqrt{(in\ H_2O)}$	
Moisture Content Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Impinger Water Weight Gain	134.00	249.40	199.10	194.17	g	
Silica Gel Weight Gain	23.20	33.30	31.60	29.37	g	
Total Water Volume Collected	157.48	283.21	231.12	223.94	ml	
Standard Water Vapor Volume	7.41	13.33	10.88	10.54	scf	
Standard Meter Volume	74.5	84.7	82.2	80.5	dscf	
Standard Metric Meter Volume	2.1	2.4	2.3	2.3	dscm	
Calculated Stack Moisture	9.05	13.60	11.68	11.44	%	
Saturated Stack Moisture	100.00	100.00	84.75	94.92	%	
Reported Stack Moisture Content	9.05	13.60	11.68	11.44	%	
Gas Analysis Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Carbon Dioxide Content	4.0	4.0	4.0	4.0	%	
Oxygen Content	13.4	13.4	13.4	13.4	%	
Carbon Monoxide Content	0.6	0.6	0.6	0.6	ppm	
Nitrogen Content	82.6	82.6	82.6	82.6	%	
Stack Dry Molecular Weight	29.18	29.18	29.18	29.18	lb/lb-mole	
Stack Wet Molecular Weight	28.16	27.66	27.87	27.90	lb/lb-mole	
Calculated Fuel Factor	1.875	1.875	1.875	1.875		
Fuel F-Factor	8632.80	8632.80	8632.80	8632.80	dscf/MMBtu	
Percent Excess Air	159.4	159.4	159.4	159.4	%	

METHOD 201A (FRONT) AND 202 (BACK) - RESULTS

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Volumetric Flow Rate Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Average Stack Gas Velocity	66.07	68.01	67.24	67.11	ft/sec	
Stack Cross-Sectional Area	283.53	283.53	283.53	283.53	ft²	
Actual Stack Flow Rate	1,124,032	1,157,038	1,143,870	1,141,647	acfm	
Wet Standard Stack Flow Rate	52,494	54,137	54,090	53,574	wkscfh	
Dry Standard Stack Flow Rate	47,742,394	46,777,098	47,771,465	47,430,319	dscfh	
Percent of Isokinetic Rate	104.1	118.3	116.8	113.0	%	
Emission Rate Data	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Total $PM_{10}/PM_{2.5}$ Mass	148.14	3.12	28.21	59.82	mg	--
Total $PM_{10}/PM_{2.5}$ Concentration	1.99E-03	3.68E-05	3.43E-04	7.90E-04	g/dscf	--
	3.07E-02	5.68E-04	5.29E-03	1.22E-02	gr/dscf	--
Total $PM_{10}/PM_{2.5}$ Emission Rate	94.97	1.72	16.39	37.69	kg/hr	--
	209.37	3.79	36.12	83.10	lb/hr	--
	917.06	16.61	158.23	363.97	tpy	--
	0.1055	0.0020	0.0182	0.0419	lb/MMBtu	0.0073
Filterable PM_{10} Mass	0.46	0.35	0.14	0.32	mg	--
Filterable PM_{10} Concentration	6.23E-06	4.16E-06	1.75E-06	4.05E-06	g/dscf	--
	9.61E-05	6.43E-05	2.70E-05	6.25E-05	gr/dscf	--
Filterable PM_{10} Emission Rate	0.30	0.19	0.08	0.19	kg/hr	--
	0.66	0.43	0.18	0.42	lb/hr	--
	2.87	1.88	0.81	1.85	tpy	--
	0.0003	0.0002	0.0001	0.0002	lb/MMBtu	--
Filterable $PM_{2.5}$ Mass	0.68	0.86	1.06	0.87	mg	--
Filterable $PM_{2.5}$ Concentration	9.11E-06	1.02E-05	1.29E-05	1.07E-05	g/dscf	--
	1.41E-04	1.57E-04	1.99E-04	1.66E-04	gr/dscf	--
Filterable $PM_{2.5}$ Emission Rate	0.44	0.48	0.62	0.51	kg/hr	--
	0.96	1.05	1.36	1.12	lb/hr	--
	4.20	4.60	5.96	4.92	tpy	--
	0.0005	0.0005	0.0007	0.0006	lb/MMBtu	--
Condensable $PM_{2.5}$ Mass	147.00	1.90	27.00	58.63	mg	--
Condensable $PM_{2.5}$ Concentration	1.97E-03	2.24E-05	3.28E-04	7.75E-04	g/dscf	--
	3.05E-02	3.46E-04	5.07E-03	1.20E-02	gr/dscf	--
Condensable $PM_{2.5}$ Emission Rate	94.24	1.05	15.68	36.99	kg/hr	--
	207.76	2.31	34.58	81.55	lb/hr	--
	909.98	10.13	151.46	357.19	tpy	--
	0.1047	0.0012	0.0174	0.0411	lb/MMBtu	--
RM 201A Quality Control	**2-Base-PM-1**	**2-Base-PM-2**	**2-Base-PM-3**	**Average**	**Units**	**Limits**
Cyclone Flow Rate	0.44	0.52	0.49	0.48	ft³/min	
Stack Viscosity	208.13	203.55	202.21	204.63	μP	
Cunningham Correction Factor	1.08	1.09	1.10	1.09		
Recalculated D50-1 for CIV	2.93	2.32	2.45	2.57		
Recalculated Cunninham	1.07	1.08	1.08	1.08		
Lower Limit Cut Diameter, CI (NRE<3162), D50LL	2.91	2.32	2.43	2.55		

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Fuel Type	Gas, Natural

Test Information			
Project #		sie-18-middletown.ny-start#1	
Operator		PM / BL	
Date for Preliminary Run	(mm/dd/yy)	09/24/18	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	indust. spec.	50	scf
Run Duration	chk Subpart	240	minutes
Unit Number		CTG-2	
Base Run Number		2-Base-PM	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		**1**	**2**	**3**	
Test Date	(mm/dd/yy)	09/24/18	09/24/18	09/25/18	
Load		Base	Base	Base	% or w/DB
Fuel F-Factor		8632.80	8632.80	8632.80	dscf/MMBtu
Meter Box Number	from ACS	SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029	
Meter Calibration Factor	(Y)	1.000	1.000	1.000	
Orifice Meter Coefficient	($\Delta H_@$)	1.824	1.824	1.824	in H_2O
Non-Console Manometer Used		No	No	No	
Pitot Identification	from ACS	5273/10	5273/10	5273/10	
Pitot Tube Coefficient	(C_p)	0.7420	0.7420	0.7420	
Nozzle Number	from ACS	2	2	2	must match cyc nozz tab (e.g. 3, 4, etc.)
Nozzle Diameter	(D_n)	0.140	0.141	0.140	in
Probe Number	from ACS	SAMP-HP-0140	SAMP-HP-0140	SAMP-HP-0140	
Probe Length		108.0	108.0	108.0	in
(SS, Glass ….) Liner Material	from list	glass	glass	glass	
Sample Case / Oven Number	from ACS	5143	5143	5143	
Impinger Case Number	from ACS	SAMP-CC-0001	SAMP-CC-0022	SAMP-CC-0001	

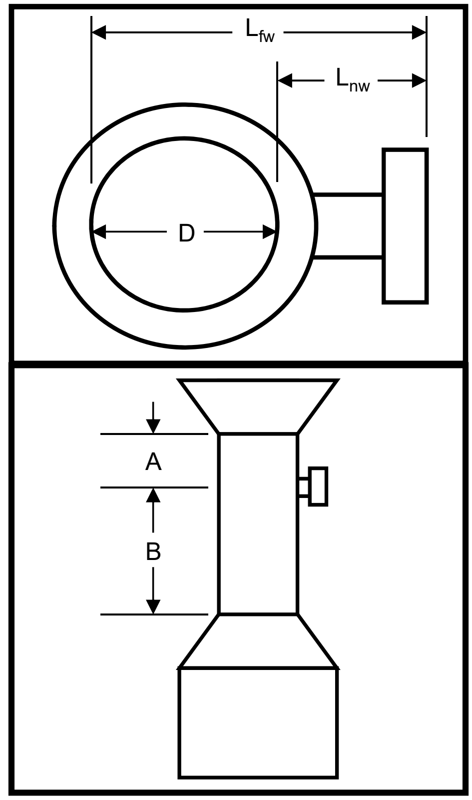
Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Pat McGovern, Jr.
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

Created with Isocalc-AHI v20180830

METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	CPV Valley Energy Center	**Date**	09/24/18
Sampling Location	CTG-2 Stack	**Stack Type**	Circular
Operator	PM / BL	**Ports Available**	4
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4
Stack Size	Large (>24 inch diameter)	**Port ID (inches)**	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	235.25	in
Distance to Near Wall of Stack	(L_{nw})	7.25	in
Diameter of Stack	(D)	228.00	in
Area of Stack	(A_s)	283.53	ft²



Distance from Port to Disturbances			
Distance Upstream	(A)	1200.00	in
Diameters Upstream	(A_D)	5.26	diameters
Distance Downstream	(B)	1095.00	in
Diameters Downstream	(B_D)	4.80	diameters

Number of Traverse Points Required			
Diameters to Flow Disturbance		**Minimum Number of[1] Traverse Points**	
Down Stream	**Up Stream**	**Particulate Points**	**Velocity Points**
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		12	12
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

○ Method 1 Trav

◉ 12 Point PM Trav

○ Velocity

Number of Traverse Points Used			
4	**Ports by**	3	**Across**
12	**Pts Used**	12	**Required**

Location of Traverse Points in Circular Stacks									
Traverse	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Point	Number of Traverse Points Across the Stack								
Number	2	4	6	8	10	12	14	16	18
1	.146	.067	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764

Traverse Point Locations			
Traverse Point Number	**Fraction of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
		in	in
1	0.044	10	17 2/8
2	0.146	33 2/8	40 4/8
3	0.296	67 4/8	74 6/8
4			
5			
6			
7			
8			
9			

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	CPV Valley Energy Center		
Sampling Location	CTG-2 Stack		
Operator	PM / BL		
Project #	sie-18-middletown.ny-start#1		
Pitot Leak Check	x	**PreTest**	x **PostTest**

Preliminary Run Date	09/24/18		
Stack Type	Circular		
Ports Available	4		
Thermocouple ID	SAMP-HP-0140		
Pitot Coefficient	0.8250	**Pitot Identification**	A8166

Stack Dimensions			
Area of Stack	(A_s)	283.53	ft²
Diameter of Stack	(D)	228.00	in

Pressures			
Barometric Pressure	(P_b)	29.82	in Hg
Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.75	in Hg

Stack Gas Composition			
Composition Data:	**Estimated Composition**		
Carbon Dioxide Concentration	(%CO_2)	4.00	%vd
Oxygen Concentration	(%O_2)	13.30	%vd
Carbon Monoxide Concentration	(ppmCO)	0.32	ppmvd
Nitrogen Concentration	(%N_2)	82.70	%vd
Stack Moisture Content	(B_{ws})	9.00	%
Stack Dry Molecular Weight	(M_d)	29.17	lb/lb-mole
Stack Wet Molecular Weight	(M_w)	28.17	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	70.40	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	51,216,624	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	853,610	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	1,197,670	acf/min
Avg Stack Wet Std Flow Rate	(Q_{sw})	56,282,005	ascf/hr

40 CFR 60, Method 2G, Section 8.11.1 (but applies to all Method 2 type static pressure measurements):
If a Type S probe is used for this measurement, position the probe at or between any traverse point(s) and rotate the probe until a null differential pressure reading is obtained. Disconnect the tubing from one of the pressure ports; read and record the ΔP. For pressure devices with one-directional scales, if a deflection in the positive direction is noted with the negative side disconnected, then the static pressure is positive. Likewise, if a deflection in the positive direction is noted with the positive side disconnected, then the static pressure is negative.

Stack Cross Section Schematic

Velocity Traverse Data					
Run Number	2-Base-PM-V1				
Run Time	07:44	**Start**	07:57	**End**	
Traverse Point	**Velocity Head** (Δp)	**Null Angle** (N_a)	**Zero Deg Pressure** ($0^o{}_a$)	**Stack Temp** (t_s)	**Local Velocity** ($v_{s(l)}$)
	in H_2O	deg	in H_2O	°F	ft/sec
A-1	1.30	10	-0.04	210	71.90
A-2	1.40	0	0.00	210	74.62
A-3	1.50	0	0.00	210	77.23
B-1	1.60	0	0.00	212	79.89
B-2	1.60	5	-0.05	212	79.89
B-3	1.50	0	0.00	211	77.29
C-1	1.60	0	0.00	206	79.53
C-2	1.60	0	0.00	210	79.77
C-3	1.50	0	0.00	211	77.29
D-1	1.60	10	-0.04	210	79.77
D-2	1.70	0	0.00	211	82.28
D-3	1.60	0	0.00	212	79.89
Average	1.54	2		210	
	1.24	**= Square roots of Δp**			
Standard deviation of null angles =				4.0	

METHOD 201A and OTM 27 - DETERMINATION OF NOZZLE SIZE AND POST RUN QUALITY CONTROL

Gas Analysis	Prelim	2-Base-PM-1	2-Base-PM-2	2-Base-PM-3	2-Base-PM-4	2-Base-PM-5	2-Base-PM-6	
Carbon Dioxide Content	4.0	4.0	4.0	4.0				%
Oxygen Content	13.3	13.4	13.4	13.4				%
Stack Moisture Content	9.0	9.1	13.6	11.7				%
Nitrogen plus CO Content	82.7	82.6	82.6	82.6				%

Corrected Velocity Head, $\Delta p_{2.5}$ (in H_2O)	Min.	1.61	Max.	2.10

Stack and Equipment Information	Prelim	2-Base-PM-1	2-Base-PM-2	2-Base-PM-3	2-Base-PM-4	2-Base-PM-5	2-Base-PM-6	
Barometric Pressure	29.82	29.97	29.96	29.69				in Hg
Stack Static Pressure	-0.89	-0.89	-0.89	-0.89				in H_2O
Absolute Stack Pressure	29.75	29.90	29.89	29.62				in Hg
Average Stack Temp	210	218	217	203				0.00
Average Stack Temp	670	678	677	663				°R
Average Meter Temp	85	80	80	78				0.00
Orifice Meter Coefficient	1.824	1.824	1.824	1.824				in H_2O
Pitot Coefficient	0.742	0.742	0.742	0.742				
Stack Dry Molecular Weight	29.17	29.18	29.18	29.18				lb/lb mole
Stack Wet Molecular Weight	28.17	28.16	27.66	27.87				lb/lb mole
Stack Viscosity	206.33	208.13	203.55	202.21				μP
Cunningham Correction Factor, for a 2.25 μm particle	1.09							
Cunningham Correction Factor, for a 2.5 μm particle		1.08	1.08	1.08				
Prelim Cut Dia., Cyclone I, D_{50LL}, N_{re}<3162	10.19	2.91	2.32	2.43				μm
Middle Zone Dia., Cyclone I, D_{50T}, N_{re}<3162	10.59							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.), N_{re}<3162	0.51							dscfm
Reynolds Number, Cyc I & IV, N_{re}<3162	2644.72	2246.43	2697.86	2604.42				
Dia. of 50% Prob. (D_{50}) Cyc IV (N_{re}<3162)	2.40	2.91	2.33	2.45				μm
Sampling Rate, Cyc IV, N_{re}<3,162	0.51							dscfm
Reynolds Number, Cyc IV, N_{re}<3162	2644.68	2246.43	2697.86	2604.42				
Prelim Cut Dia., Cyclone I, $D_{50LL\geq3162}$	10.61							μm
Middle Zone Dia., Cyclone I, $D_{50T\geq3162}$	10.81							μm
Sampling Rate (PM_{10} & $PM_{2.5}$ Cyc.)≥3162	0.49							dscfm
Reynolds Number, Cyc I & IV, N_{re}≥3162	2572.33							
Dia. of 50% Prob. (D_{50}) CIV (N_{re}≥3162)	2.30							μm
Sampling Rate, Cyc IV, N_{re}≥3,162	4.91							dscfm
Reynolds Number ≥ 3162	25723.49							
Cyclone Flow Rate	0.51	0.44	0.52	0.49				ft³/min
Recalculated D_{50-1} for C_{IV}		2.93	2.32	2.45				
Recalculated Cunninham		1.07	1.08	1.08				
Z		1.01	1.00	1.01				
Isokinetics		104.05	118.31	116.77				%
No. Sampling Pts. Outside Δp		0	0	0				
Sample Nozzle Diameter		0.140	0.141	0.140				in

Orifice Head and Nozzle Selection Calculation											
Nozzle No.	1	2	3	4	5	6	7	8	9	10	11
Nozzle diameter, D_n, in.	0.125	0.140	0.156	0.172	0.188	0.200	0.216	0.234	0.253	0.274	0.296
Nozzle velocity, v_n, ft/sec	98.81	78.77	63.20	52.19	43.68	38.60	33.09	28.20	24.12	20.56	17.62
R_{min}	0.76	0.75	0.73	0.70	0.66	0.63	0.57	0.50	0.50	0.50	0.50
v_{min}, ft/sec	75.46	58.94	45.92	36.50	29.00	24.33	18.94	14.10	12.06	10.28	8.81
R_{max}	1.23	1.24	1.25	1.26	1.28	1.30	1.32	1.35	1.39	1.43	1.49
v_{max}, ft/sec	121.08	97.31	78.92	65.98	56.05	50.14	43.78	38.16	33.52	29.51	26.21
Δp_{min}, in. H_2O @ $t_{s-50} o_F$	1.91	1.17	0.71	0.45	0.28	0.20	0.12	0.07	0.05	0.04	0.03
Δp_{min}, in. H_2O @ t_s	1.77	1.08	0.66	0.41	0.26	0.18	0.11	0.06	0.05	0.03	0.02
Δp_{max}, in. H_2O @ t_s	4.56	2.94	1.94	1.35	0.98	0.78	0.60	0.45	0.35	0.27	0.21
Δp_{min}, in. H_2O @ $t_{s+50} o_F$	4.24	2.74	1.80	1.26	0.91	0.73	0.55	0.42	0.32	0.25	0.20
ΔH, in. H_2O @ t_s+50°F	0.380										
ΔH, in. H_2O @ t_s	**0.439**										
ΔH, in. H_2O @ t_s-50°F	0.512										

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18		
Sampling Location	CTG-2 Stack	**Operator**	PM / BL		
Project #	sie-18-middletown.ny-start#1	**# of Ports Used**	1 (gas probe)		
Fuel Type	Gas, Natural	**Min. Fuel Factor**	1.600	**Max. Fuel Factor**	1.836

Gas Analysis Data

Run Number	2-Base-PM-1		**Date**	09/24/18	**Run Start Time**	09:52	**Run Stop Time**	14:08
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:16	4.0	13.4	0.6	82.6	29.18	1.875	159.4	NO

Gas Analysis Data

Run Number	2-Base-PM-2		**Date**	09/24/18	**Run Start Time**	15:12	**Run Stop Time**	19:25
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:13	4.0	13.4	0.6	82.6	29.18	1.875	159.4	NO

Gas Analysis Data

Run Number	2-Base-PM-3		**Date**	09/25/18	**Run Start Time**	15:39	**Run Stop Time**	19:51
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**CO Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
04:12	4.0	13.4	0.6	82.6	29.18	1.875	159.4	NO

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	CPV Valley Energy Center	**Preliminary Run Date**	09/24/18
Sampling Location	CTG-2 Stack	**Operator**	PM / BL
Project #	sie-18-middletown.ny-start#1	**Ports Used**	4

Scale Daily Calibration					
Scale Number	SAMP-SC-0032	**Standard**	**Result**	**Difference**	**Pass/Fail**
Date		(g)	(g)	(g)	(± 0.5 g)
Test Day 1	09/24/18	500	499.9	-0.1	Pass
Test Day 2	09/25/18	500	500.0	0.0	Pass

Moisture Content Data									
Run Number		2-Base-PM-1		**Date**	09/24/18	**Start Time**	09:52	**Stop Time**	14:08
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	75.895	dcf	**Barometric Pressure**		(P_b)	29.97	in Hg
Average Stack Temp		$(t_s)_{avg}$	218	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	80	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.39	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	490.80	598.80	767.10	897.80				
Initial Value	(V_i),(W_i)	362.10	596.80	763.80	874.60				
Net Value	(V_n),(W_n)	128.7	2.0	3.3	23.2				
Results									
Total Weight		(W_t)	157.20	g	**Water Vol Weighed**		($V_{wsg(std)}$)	7.412	scf
Std Meter Volume		($V_{m(std)}$)	74.473	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	100.00	%
Calc Moisture Content		($B_{ws(calc)}$)	9.05	%	**Final Moisture Content**		(B_{ws})	9.05	%

Moisture Content Data									
Run Number		2-Base-PM-2		**Date**	09/24/18	**Start Time**	15:12	**Stop Time**	19:25
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	86.420	dcf	**Barometric Pressure**		(P_b)	29.96	in Hg
Average Stack Temp		$(t_s)_{avg}$	217	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	80	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	579.00	604.20	755.50	956.20				
Initial Value	(V_i),(W_i)	357.10	593.20	739.00	922.90				
Net Value	(V_n),(W_n)	221.9	11.0	16.5	33.3				
Results									
Total Weight		(W_t)	282.70	g	**Water Vol Weighed**		($V_{wsg(std)}$)	13.329	scf
Std Meter Volume		($V_{m(std)}$)	84.715	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	100.00	%
Calc Moisture Content		($B_{ws(calc)}$)	13.60	%	**Final Moisture Content**		(B_{ws})	13.60	%

Moisture Content Data									
Run Number		2-Base-PM-3		**Date**	09/25/18	**Start Time**	15:39	**Stop Time**	19:51
Meter Box Number		SAMP-CP-0029			**Meter Cal Factor**		(Y)	1.000	
Total Meter Volume		(V_m)	84.390	dcf	**Barometric Pressure**		(P_b)	29.69	in Hg
Average Stack Temp		$(t_s)_{avg}$	203	°F	**Stack Static Pressure**		(P_{static})	-0.89	in H_2O
Average Meter Temp		$(t_m)_{avg}$	78	°F	**Avg Orifice Pressure**		$(\Delta H)_{avg}$	0.43	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		Dry	Dry	DI Water	Sil Gel				
Final Value	(V_f),(W_f)	523.40	602.60	784.80	929.90				
Initial Value	(V_i),(W_i)	357.40	597.20	757.10	898.30				
Net Value	(V_n),(W_n)	166.0	5.4	27.7	31.6				
Results									
Total Weight		(W_t)	230.70	g	**Water Vol Weighed**		($V_{wsg(std)}$)	10.878	scf
Std Meter Volume		($V_{m(std)}$)	82.234	dscf	**Sat. Moisture Content**		($B_{ws(svp)}$)	84.75	%
Calc Moisture Content		($B_{ws(calc)}$)	11.68	%	**Final Moisture Content**		(B_{ws})	11.68	%

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	PM / BL
Run Number	2-Base-PM-1

Filter #
000015
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	218.0	°F
Average Meter Temp	(t_m)	79.5	
Orifice Meter Coefficient	($\Delta H@$)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.16	in H_2O
Stack Moisture Content	(B_{ws})	9.05	%
Stack Dry Molecular Weight	(M_d)	29.18	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.22	

Leak Checks					
Train	**Pre**	0.001	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	5.6	in H_2O for	15.0	sec
	Pre (-)	5.1	in H_2O for	15.0	sec
PASS	**Post (+)**	5.8	in H_2O for	15.0	sec
	Post (-)	5.5	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	2		
Average Nozzle Diameter	(D_{na})	0.1400	in
Suggested Nozzle Diameter	(D_{ni})	0.2175	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0001		

Pressures			
Barometric Pressure	(P_b)	29.97	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.90	in Hg
Absolute Meter Pressure	(P_m)	30.10	in Hg

Nozzle Measurements		**ID: 2**		
Pre	0.140	0.140	0.140	**PASS**
Post	0.140	0.140	0.140	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0032

Run Time			
Start	09:52	**End**	14:08

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	362.1	596.8	763.8	874.6				
Post	490.8	598.8	767.1	897.8				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0001	1035	6692	SAMP-CP-0029		SAMP-CP-0029					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity ($v_s)_i$**	**Cumul. Meter Volume ($V_m)_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume ($V_m)_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	886.110	1.40	0.439	0.39	211	225	253	63	50	79	75	75	3.0	1.18	66.99	6.283	112.1	83.147
A-2	18.3	00:18:15	892.460	1.50	0.439	0.39	211	237	256	53	45	69	78	78	3.0	1.22	69.34	12.330	106.2	79.938
A-3	37.3	00:37:15	898.605	1.50	0.439	0.39	213	257	253	55	48	70	80	80	3.0	1.22	69.45	18.556	105.2	79.668
B-1	56.3	00:56:15	904.956	1.20	0.439	0.39	218	259	253	58	44	68	82	82	3.0	1.10	62.35	25.597	109.7	80.545
B-2	76.8	01:16:45	912.165	1.20	0.439	0.39	219	255	272	56	48	68	83	83	3.0	1.10	62.39	31.691	108.8	78.698
B-3	97.3	01:37:15	918.415	1.20	0.439	0.39	220	267	263	56	54	68	82	82	3.0	1.10	62.44	37.687	108.0	77.294
C-1	117.8	01:57:45	924.554	1.30	0.439	0.39	221	231	263	57	55	68	79	79	3.0	1.14	65.03	44.858	109.7	78.359
C-2	138.3	02:18:15	931.855	1.30	0.439	0.39	221	229	273	59	66	68	79	79	3.0	1.14	65.03	51.419	109.6	78.221
C-3	158.8	02:38:45	938.535	1.40	0.439	0.39	218	232	262	63	70	71	79	79	3.0	1.18	67.34	57.862	108.5	77.631
D-1	180.0	03:00:00	945.095	1.40	0.439	0.39	221	234	259	64	72	68	79	79	3.0	1.18	67.49	63.593	107.0	76.597
D-2	200.5	03:20:30	950.930	1.40	0.439	0.39	222	226	272	66	73	69	79	79	3.0	1.18	67.54	69.176	105.5	75.593
D-3	221.0	03:41:00	956.615	1.40	0.439	0.39	221	230	264	67	74	71	79	79	3.0	1.18	67.49	74.470	104.1	74.470
Last Pt	241.5	04:01:30	962.005																	
Final Val	241.5	04:01:30	962.005											**Max Vac**	3.0	**Final Values**		74.470	104.1	
Average Values				1.35		0.39	218	240	262	60	58	70	80	80		1.16	66.07			
													80							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/24/18
Operator	PM / BL
Run Number	2-Base-PM-2

Filter #
000020
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	216.5	°F
Average Meter Temp	(t_m)	79.9	
Orifice Meter Coefficient	($\Delta H@$)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)	1.19	in H_2O
Stack Moisture Content	(B_{ws})	13.60	%
Stack Dry Molecular Weight	(M_d)	29.18	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.31	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.21	

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	3.6	in H_2O for	15.0	sec
	Pre (-)	3.3	in H_2O for	15.0	sec
PASS	**Post (+)**	5.0	in H_2O for	15.0	sec
	Post (-)	5.4	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	2		
Average Nozzle Diameter	(D_{na})	0.1407	in
Suggested Nozzle Diameter	(D_{ni})	0.1379	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0022		

Pressures			
Barometric Pressure	(P_b)	29.96	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.89	in Hg
Absolute Meter Pressure	(P_m)	30.09	in Hg

Nozzle Measurements		**ID: 2**		
Pre	0.141	0.140	0.141	**PASS**
Post	0.141	0.140	0.141	**PASS**

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0032

Run Time			
Start	15:12	**End**	19:25

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	357.1	593.2	739.0	922.9				
Post	579.0	604.2	755.5	956.2				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0022	1035	6692	SAMP-CP-0029		SAMP-CP-0029					
Traverse Point #	**Sampling Time (Θ)**	**Timer Time**	**Dry Gas Meter Reading (V_m)**	**Velocity Head (Δp)**	**Desired Orifice ΔH (ΔH_d)**	**Actual Orifice ΔH (ΔH_a)**	**Stack Temp (t_s)**	**Probe Temp (248±25°F)**	**Filter Temp (248±25°F)**	**Impinger Exit Temp (≤68°F)**	**Cond. Temp (≤85°F)**	**CPM Filter Temp (76.5±8.5°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	962.300	1.40	0.439	0.43	223	253	251	65	56	70	74	74	4.0	1.18	68.22	6.145	114.3	81.400
A-2	18.3	00:18:15	968.500	1.50	0.439	0.43	221	240	248	65	59	71	75	75	4.0	1.22	70.51	12.625	112.9	81.934
A-3	37.3	00:37:15	975.050	1.40	0.439	0.43	218	248	259	65	61	70	77	77	4.0	1.18	67.97	19.209	116.0	83.670
B-1	55.5	00:55:30	981.730	1.20	0.439	0.43	218	242	249	65	68	70	78	78	4.0	1.10	62.93	26.360	119.1	83.851
B-2	76.0	01:16:00	989.000	1.20	0.439	0.43	218	252	261	65	78	70	79	79	4.0	1.10	62.93	33.008	119.0	82.692
B-3	96.5	01:36:30	995.770	1.20	0.439	0.43	217	265	261	65	80	70	81	81	4.0	1.10	62.88	40.257	120.8	83.182
C-1	117.0	01:57:00	1003.180	1.50	0.439	0.43	214	261	254	56	85	70	81	81	4.0	1.22	70.15	47.321	119.5	83.199
C-2	137.5	02:17:30	1010.400	1.50	0.439	0.43	214	261	259	55	70	70	82	82	4.0	1.22	70.15	54.547	118.9	83.460
C-3	158.0	02:38:00	1017.800	1.50	0.439	0.43	214	266	267	57	70	70	83	83	4.0	1.22	70.15	61.867	118.6	83.789
D-1	178.5	02:58:30	1025.310	1.40	0.439	0.43	214	262	253	60	75	71	83	83	4.0	1.18	67.77	69.206	118.8	84.074
D-2	199.0	03:19:00	1032.840	1.60	0.439	0.43	215	264	259	59	80	70	83	83	4.0	1.26	72.50	77.033	118.3	84.362
D-3	220.8	03:40:45	1040.870	1.50	0.439	0.43	212	264	257	60	81	75	83	83	4.0	1.22	70.04	84.685	118.3	84.685
Last Pt	241.8	04:01:45	1048.720																	
Final Val	241.8	04:01:45	1048.720											**Max Vac**	4.0	**Final Values**		84.685	118.3	
Average Values				1.41		0.43	217	257	257	61	72	71	80	80		1.19	68.01			
													80							

Notes:

METHOD 201A (FRONT) AND 202 (BACK) SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Date	09/25/18
Operator	PM / BL
Run Number	2-Base-PM-3

Filter #
18081505
--

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient / ID	(C_p)	0.7420	5273/10
Average Stack Temp	(t_s)	203.3	°F
Average Meter Temp	(t_m)	78.3	
Orifice Meter Coefficient	($\Delta H@$)	1.824	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	1.18	in H_2O
Stack Moisture Content	(B_{ws})	11.68	%
Stack Dry Molecular Weight	(M_d)	29.18	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.35	acfm
ΔP to ΔH Isokinetic Factor	(K)	0.22	

Leak Checks					
Train	Pre	0.000	ft³/min@	15.0	in Hg
PASS	Post	0.000	ft³/min@	17.0	in Hg
Pitot	Pre (+)	5.1	in H_2O for	15.0	sec
	Pre (-)	5.2	in H_2O for	15.0	sec
PASS	Post (+)	5.6	in H_2O for	15.0	sec
	Post (-)	5.2	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0029		
Meter Cal Factor	(Y)	1.000	
Nozzle Number	2		
Average Nozzle Diameter	(D_{na})	0.1400	in
Suggested Nozzle Diameter	(D_{ni})	0.1466	in
Probe Number	SAMP-HP-0140		in
Probe Length	108		in
Liner Material	glass		
Sample Case / Oven Number	5143		
Impinger Case Number	SAMP-CC-0001		

Pressures			
Barometric Pressure	(P_b)	29.69	in Hg
Stack Static Pressure	(P_{static})	-0.89	in H_2O
Absolute Stack Pressure	(P_s)	29.62	in Hg
Absolute Meter Pressure	(P_m)	29.82	in Hg

Nozzle Measurements			ID: 2	
Pre	0.140	0.140	0.140	PASS
Post	0.140	0.140	0.140	PASS

Barometer ID
SAMP-WE-0014
Scale ID
SAMP-SC-0032

Run Time			
Start	15:39	End	19:51

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	357.4	597.2	757.1	898.3				
Post	523.4	602.6	784.8	929.9				

Wash Volumes					
					ml
					ml

Identification Nos.		SAMP-CP-0029	SAMP-CP-0029	SAMP-CP-0029			SAMP-HP-0140	SAMP-HP-0140	5143	SAMP-CC-0001	1035	6692	SAMP-CP-0029		SAMP-CP-0029					
Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH_d)	Actual Orifice ΔH (ΔH_a)	Stack Temp (t_s)	Probe Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤85°F)	CPM Filter Temp (76.5±8.5°F)	Meter Inlet Temp (t_{mi})	Meter Outlet Temp (t_{mo})	Pump Vacuum	Square Root ΔP ($\Delta p^{1/2}$)	Local Stack Velocity (v_s)$_i$	Cumul. Meter Volume (V_m)$_{std}$	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V_m)$_{std}$
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	342.830	1.30	0.439	0.43	203	264	260	56	55	66	75	75	5.0	1.14	64.81	5.069	96.0	67.002
A-2	18.3	00:18:15	348.000	1.30	0.439	0.43	205	266	259	60	71	71	76	76	5.0	1.14	64.91	11.869	114.9	78.452
A-3	36.5	00:36:30	354.950	1.40	0.439	0.43	202	266	258	61	71	72	77	77	5.0	1.18	67.21	18.492	115.3	80.380
B-1	55.5	00:55:30	361.730	1.30	0.439	0.43	202	269	262	62	78	70	78	78	5.0	1.14	64.76	26.018	118.6	82.590
B-2	76.0	01:16:00	369.450	1.40	0.439	0.43	203	267	263	60	75	72	78	78	5.0	1.18	67.26	32.823	116.1	81.424
B-3	97.3	01:37:15	376.430	1.40	0.439	0.43	204	268	261	57	66	68	78	78	5.0	1.18	67.31	41.402	120.0	84.289
C-1	118.5	01:58:30	385.230	1.50	0.439	0.43	203	268	263	62	68	69	79	79	5.0	1.22	69.62	48.768	119.3	84.643
C-2	139.0	02:19:00	392.800	1.50	0.439	0.43	205	267	261	58	69	69	79	79	5.0	1.22	69.72	56.465	119.5	85.406
C-3	159.5	02:39:30	400.710	1.60	0.439	0.43	205	261	268	60	80	68	79	79	5.0	1.26	72.01	64.396	119.3	86.070
D-1	180.5	03:00:30	408.860	1.40	0.439	0.43	200	273	261	61	82	69	80	80	5.0	1.18	67.11	71.895	119.6	86.291
D-2	201.0	03:21:00	416.580	1.40	0.439	0.43	204	270	266	60	84	72	80	80	5.0	1.18	67.31	79.024	119.2	86.070
D-3	221.5	03:41:30	423.920	1.30	0.439	0.43	204	222	256	63	85	73	80	80	5.0	1.14	64.86	82.229	116.8	82.229
Last Pt	241.3	04:01:15	427.220																	
Final Val	241.3	04:01:15	427.220											Max Vac	5.0	Final Values		82.229	116.8	
Average Values				1.40		0.43	203	263	262	60	74	70	78	78		1.18	67.24			
													78							

Notes:

Probe temp out of specification due to:

CPM filter temp out of specification due to:

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-Base-PM-1		
Sample Leakage Evident	NO	**Estimated Leak Volume**		0.00	(mg)

Sample Type	**Sample Number**	**Date**	**Time**
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	1	**Start Time**	09:52
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			1.3	71	0.3510	0.9490
Cyclone Wash 2.5<PM<10			0.8	68	0.3362	0.4638
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.7	65	0.3213	0.3787
Inorganic Impinger Contents			61	300.9027	1.2857	59.7143
Organic Impinger Contents			88	100.3009	0.7143	87.2857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-Base-PM-2	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	2	**Start Time**	15:12
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			0.6	45	0.2225	0.3775
Cyclone Wash 2.5<PM<10			0.6	50	0.2472	0.3528
Cyclone Exit to Front Half of Filter Wash (<2.5)			0.8	48	0.2373	0.5627
Inorganic Impinger Contents			2.0	351.0532	1.2857	0.7143
Organic Impinger Contents			1.9	79.2377	0.7143	1.1857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-Base-PM-3	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Filter	Maxxam		
Nozzle Wash PM>10	Maxxam		
Cyclone Wash 2.5<PM<10	Maxxam		
Cyclone Exit to Front Half of Filter Wash (<2.5)	Maxxam		
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Blank and Titration Concentrations				
Blank Type	**Weight** (g)	**Volume** (ml)	**Concentration** (mg/ml)	**Mass** (mg)
Acetone Blank Weight of Solids	0.0010	202.2756	0.0049	--
DI Water Blank Weight of Solids	0.0005	230.6921	0.0022	--
Hexane Blank Weight of Solids	0.0010	257.9666	0.0039	--
0.1N NH_4OH Correction	--		--	0.0000

Gravimetric Concentrations			**Run**	3	**Start Time**	15:39
Sample Portion	**Final** (g)	**Tare** (g)	**Gain** (mg)	**Volume** (ml)	**Blank Adjustment** (mg)	**Adjusted Gain** (mg)
Filter			0.3000	--	--	0.3000
Filter Beaker				--	--	
Nozzle Wash PM>10			1.2	60	0.2966	0.9034
Cyclone Wash 2.5<PM<10			0.5000	72	0.3560	0.1441
Cyclone Exit to Front Half of Filter Wash (<2.5)			1.0	48	0.2373	0.7627
Inorganic Impinger Contents			16	280.8425	1.2857	14.7143
Organic Impinger Contents			13	91.2738	0.7143	12.2857

SAMPLE ANALYTICAL DATA SHEET

Plant Name	CPV Valley Energy Center
Sampling Location	CTG-2 Stack
Project #	sie-18-middletown.ny-start#1

Analytical Data		**Run**	2-Base-PM-FB	
Sample Leakage Evident	NO	**Estimated Leak Volume**	0.00	(mg)

Sample Type	Sample Number	Date	Time
Inorganic Impinger Contents	Maxxam		
Organic Impinger Contents	Maxxam		

Gravimetric Concentrations					Actual Gain
Sample Portion	Final	Tare	Gain		
	(g)	(g)	(mg)		(mg)
Inorganic Impinger Contents	0.0018	0.0000	1.2857	max 2 mg total blank adjustment, proportioned	1.8000
Organic Impinger Contents	0.0010	0.0000	0.7143		1.0000

this page intentionally left blank
end of report

ATTACHMENT 4

Continuous Emissions Monitoring Plan

Valley Energy Center
3330 Route 6
Middletown, NY 10940

June 12, 2017

Regional Air Pollution Control Engineer
NYSDEC – Region 3
21 South Putt Corners Road
New Paltz, NY 12561
Certified Mail: 7016 0600 0000 8503 7094

Division of Air Resources
NYSDEC - Bureau of Quality Assurance
625 Broadway
Albany, New York 12233-3258
Certified Mail: 7016 0600 0000 8503 7087

USEPA Clean Air Markets Division
1200 Pennsylvania Avenue, NW
Mail Code 6204M
Washington, DC 20460
Certified Mail: 7016 0600 0000 8503 7070

USEPA Region II
Air Compliance Branch
290 Broadway
New York, NY 10007-1866
Certified Mail: 7016 0600 0000 8503 7063

Re: CPV Valley Energy Center
ORIS Code – 56940
NYSDEC Title V Permit ID: 3-3356-00136/00001
CEMS Plan

Dear Sir / Madam:

In accordance with 6 CRR-NY 227-2.6 (b), CPV Valley Energy Center is submitting the attached CEMS Plan for the new Combined Cycle Combustion Turbines Unit No. 1 ("CTG1") and 2 ("CTG2"). Previously the facility submitted the Hardcopy Monitoring Plan on March 31, 2017 to the Department in accordance with 40 CFR §75.53 and 40 CFR §75.62(a)(2). CPV Valley Energy Center believed the Hardcopy Monitoring Plan fulfilled the specific requirements identified in 6 CRR-NY 227-2.6 (b) for the CEMS Plan.

If there are any questions regarding this submittal, please contact Benjamin Stanley at (845) 649-8300.

Sincerely,

Benjamin Stanley

CC:
Jack Breen - CPV
Chris Allgeier – CPV
Jonathan Moore

CEMS PLAN
6 CRR-NY 227-2.6 (b)

Continuous Emissions Monitoring System (CEMS)

40 CFR 75 Monitoring Plan Submittal Package

Document Date: March 2017
Revision No.: 0
CEMTEK Project No.: 50478
Siemens Document No.: CN50478_MONPLAN
Siemens Document Control No.: UNID498367531 rev04

Prepared for:

CPV Valley Energy Center
CTG Units 1 and 2
Middletown, NY

Facility ORISPL ID: 56940

Prepared by:

CEMTEK Environmental, Inc.
3041 S. Orange Ave
Santa Ana, CA 92707-4247
Phone: 714-437-7100
Fax: 714-437-7177
www.cemteks.com

Contents

1 Facility Information

The Valley Energy Center facility is located in Wawayanda, NY and consists of one combined cycle power plant operating on dual-fuel (natural gas and fuel oil) with duct burning.

The Facility consists of: two (2) Siemens SGT6-5000F(4) gas turbines with Dry Low NO_X (DLN) Combustion Systems, operating in 2x1 combined cycle configuration, firing natural gas and ultra-low sulfur diesel (ULSD) fuel oil; two (2) 3-drum HRSG's equipped with SCR systems for NO_X control and oxidation catalysts for CO and VOC control; and one (1) Siemens SST6-5000 steam turbine generator (STG).

2 CEMS Overview

The Acid Rain Program (40 CFR 75 and related Parts) requires monitoring and reporting of NO_X emission rate in lb/mmBtu, which is calculated using a NO_X and O_2 CEMS.

The Acid Rain Program also requires monitoring and reporting of heat input, SO_2, and CO_2. This is accomplished by following the alternate procedures in 40 CFR 75 Appendixes D and G. Appendix D defines how heat input is calculated from certified fuel flow meters. The heat input and fuel factors are then used to calculate the mass emissions of SO_2.

Each CEMS is a dry extractive system, which monitors NO_X, NH_3, CO, and O_2. Programmable Logic Controllers (PLCs) allows each system to automatically operate and perform daily, unattended calibrations. Complete system operation and sequencing is automatic. Operator attention is necessary for periodic system verification of accuracy, manual calibrations, and normal maintenance.

Each CTG CEMS is divided into two primary subassemblies. The Stack subassembly consists of a dual-bench NO_X/O_2 analyzer, a dual bench CO/CO_2 analyzer, and associated sample-conditioning system components. The NH_3 subassembly consists of a NO_X analyzer referenced as the NO_X/NH_3 analyzer and associated sample-conditioning system components. The NH_3 subassembly works with the Stack subassembly to calculate ammonia slip.

2.1 CEMS Analyzers

The following table provides information on the monitors that were subject to this test program.

CTG CEMS Unit 1

Analyzer	Manufacturer/Model	Range(s)	Serial Number
NO_X	Teledyne API T200M	0-10 ppm/0-100 ppm	645
O_2		0-25%	
NO_X/NH_3	Teledyne API T200M	0-10 ppm/0-100 ppm	644
CO	Teledyne API T300M	0-10 ppm/0-5000 ppm	355
CO_2		0-10%	

CTG CEMS Unit 2

Analyzer	Manufacturer/Model	Range(s)	Serial Number
NO_X	Teledyne API T200M	0-10 ppm/0-100 ppm	646
O_2		0-25%	
NO_X/NH_3	Teledyne API T200M	0-10 ppm/0-100 ppm	643
CO	Teledyne API T300M	0-10 ppm/0-5000 ppm	354
CO_2		0-10%	

The CO_2 analyzers and the NO_X/NH_3 analyzers are used for process monitoring and control.

2.1.1 TAPI 200M NO_X/O_2 Analyzer

The Model T200M uses the chemiluminescence measurement principal. The T200M is a microprocessor controlled instrument that measures the concentration of nitric oxide (NO), total nitrogen oxides (NO_X, the sum of NO and NO_2) and nitrogen dioxide (NO_2) in a sample gas drawn through the instrument. Sample and calibration gases are supplied at ambient atmospheric pressure in order to establish a constant flow through the reaction cell where the sample gas is exposed to ozone (O_3), initiating a chemical reaction that gives off light (chemiluminescence). The instrument measures the amount of chemiluminescence to determine the amount of NO in the sample gas. A catalytic-reactive converter converts any NO_2 in the sample gas to NO, which is then (including the NO in the sample gas) reported ad NO_X. NO_2 is calculated as the difference between NO_X and NO.

The analyzer includes an oxygen sensor which utilizes the fact that oxygen is attracted into a strong magnetic field to obtain fast, accurate oxygen measurements.

The sensors core is made up of two nitrogen filled glass spheres, which are mounted on a rotating suspension within a magnetic field. A mirror is mounted centrally on the suspension and light is shone onto the mirror, which reflects the light onto a pair of photocells that then generate a signal.

Oxygen from the sample stream is attracted into the magnetic field displacing the nitrogen filled spheres and causing the suspended mirror to rotate. This changes the amount of light reflected onto the photocells and therefore the output levels of the photocells. A feedback loop increases the amount of current fed into the wire winding in order to move the mirror back into its original position. The more O2 present, the more the mirror moves and the more current is fed into the wire winding by the feedback control loop. A sensor measures the amount of current generated by the feedback control loop which is directly proportional to the concentration of oxygen within the sample gas mixture.

2.1.2 TAPI 200M NO_X/NH_3 Analyzer

Ammonia slip is measured at the stack through use of the two TAPI 200M NO_X analyzers. An NH_3 converter is located at the probe interface box. Stack sample gas from the probe is split into two transport paths. One path transports sample gas to the primary sample conditioning system and outlet analyzers. The second path transports sample gas to the NH_3 converter (NH_3 to NO). After passing through the converter the sample is transported to the secondary sample conditioning system and the secondary NO_X/NH_3 analyzer. Ammonia slip is calculated as the difference between converted and unconverted NO_X ppm.

2.1.3 TAPI T300M CO/CO_2 Analyzer

The T300M is a Gas Filter Correlation carbon monoxide analyzer. The microprocessor-controlled analyzer determines the concentration of carbon monoxide (CO) in a sample gas drawn through the instrument. It uses a method based on the Beer-Lambert law, an empirical relationship that relates the absorption of light to the properties of the material through which the light is traveling over a defined distance. In this case the light is infrared (IR) traveling through a sample chamber filled with a gas bearing a varying concentration of CO.

The analyzer passes the IR beam through a spinning wheel made up of two separate chambers: once containing a high concentration of CO known as the reference, and the other containing a neutral gas known as the measure. The concentration of CO in the sample chamber is computed by taking the ratio of the instantaneous measure and the reference values and then compensating the ratio for the sample temperature and pressure.

The GMM221 CO_2 transmitter, included with the CO analyzer is silicon based. Its operation is based on the NDIR Single-Beam Dual Wavelength principle. The module consists of a component board, cable and a CO_2 probe.

2.2 Data Acquisition System

The CEMS system includes an Allen Bradley Control Logix Programmable Logic Controller (PLC). The PLC consists of a series of input and output modules. PLCs are designed for industrial applications and are more tolerant of humidity, temperature, and vibration than a desktop computer would be. The Allen Bradley Control Logix Programmable Logic Controller communicates information from the analyzers and sensors to the DAHS and/or the plant's Distributed Control System (DCS). For ease of connection and added protection, the PLC is mounted in the instrument rack inside of the shelter.

The Programmable Logic Controller (PLC) has a range of functions in a typical system. The PLC is programmed to automatically perform a system calibration at predetermined intervals. It can also receive a manual input to perform calibrations on an as-needed basis. Analog -to-digital converters take 4-20 mA signals received directly from the analyzers and convert those signals into digital values that are then scaled into the appropriate engineering units. There are also digital input points, used to monitor conditions such as *process-on, in calibration*, or *analyzer fault*. Signals from the analyzers and DCS are processed and then forwarded to the DAHS server, either in the form of raw data or averages, depending on the source.

The PLC has an RJ-45 jack, allowing it to be networked with the DAHS using cat5e patch cable. The PLC is typically connected to an Ethernet switch on the same network as the DAHS server. Some analyzers will also be patched into the local switch. This configuration allows the PLC to communicate with more than one device on a local area network, and allows the DAHS to accept data from multiple PLCs. In this type of situation, there will also be a client computer, or a dedicated OIT, located with each PLC to function as a local interface.

The PLC will run in a stand-alone mode (that is not connected to the DAHS or DCS), if necessary. It will continue to calibrate all analyzers in cases where the DAHS is temporarily offline. In addition, the controller has battery backup (non-volatile) memory. Data for each channel can be stored in memory on a "first in first out" (FIFO) basis until the memory is full. This helps prevent data loss if the DAHS goes offline. The amount of time the DAHS can be offline before the PLC memory is full (and subsequently over-written with new data) varies by system. Typically the PLC memory will hold approximately seven days of data. When the DAHS returns to service, available data from the controller can be retrieved and stored by the DAHS.

The PLC automatically performs a system calibration at predetermined intervals to ensure accurate measurements.

The Data Acquisition and Handling System (DAHS) provides automated data monitoring and management capabilities to the CEMS. The DAHS server is located in the plant's control room with remote work stations located in each CEMS shelter.

The hardware for the DAHS includes a Dell desktop computer with an Intel Core 2 Duo 3.2 GHz CPU, 4 GB RAM, 500 GB hard disk, 16xDVD +/- RW drive, USB enhanced keyboard and optical mouse, 19" flat panel LCD monitor, 2 Ethernet interface cards, and Windows 7 operating system. Removable hard drives are included for data backup and archiving. The DAHS is backed up to a disk on a monthly basis for data archiving.

The software by VIM technologies is specifically designed for CEMS and regulatory compliance. The DAHS provides an interface to the PLC, collects and stores data, performs calculations, and generates reports specific to each customer's regulatory requirements. There is a user manual for the VIM software in pdf format located on the hard drive of the DAHS server.

The DAHS server receives data from the PLC over a switched Ethernet and fiber optic network. Data is written and stored to hard disk on the DAHS server. Depending on the data, the DAHS will process values received from the PLC into averages or rolling averages, as necessary. In addition to gas measurements from the analyzers, a number of process-operating parameters are monitored by the PLC and logged by the DAHS. These include calibration control, alarms, analyzer status, and process status.

2.3 Appendix D Reporting System

The alternate monitoring methodology found in Part 75, Appendix D requires continuous monitoring of fuel flow rate and periodic sampling of the fuel characteristics, such as sulfur content, gross calorific value (GCV), and density. The measured fuel flow rates are used with the results from the fuel sampling and analysis to determine the SO_2 mass emissions rate and the unit heat input rate.

2.3.1 Fuel Flow Monitoring

The Acid Rain Program requires monitoring and reporting of heat input, SO_2 and CO_2. This is accomplished by following the alternate procedures in Part 75 Appendixes D and G. Part 75 Appendixes D and F define how heat input is calculated from fuel flow meters. The heat input and fuel factors are then used to calculate the mass emissions of SO_2 and CO_2. The appropriate gas heating value (GCV) is manually entered into the DAHS. The appropriate quarterly average gas heating value (GCV) is manually entered into the DAHS.

Fuel flow is monitored by certified fuel flowmeters in order to report heat input to the unit in accordance with Part 75, Appendix D. For each hour when the unit is combusting fuel, the facility is required to measure and record the flow of fuel combusted by the unit with an in-line fuel flowmeter and automatically record the data.

Signals from each flowmeter are sent to the CEM's DAHS via the PLC control unit for required recording and emission reporting. Data is reduced to hourly averages.

The fuel flowmeters are certified, in accordance with Part 75, Appendix D, section 2.1.5.1. Manufacturer, model number and serial number of each fuel flowmeter and accompanying converter are noted in the facility's Part 75 monitoring plan records located in Appendix A.

Documentation is provided in the appendix section of this document demonstrating that the natural gas supply qualified as pipeline quality natural gas per the definition located in 40 CFR72, section 72.2.

2.3.2 SO_2/CO_2 Monitoring

When natural gas (NNG) is burned SO_2 is calculated using fuel analysis values for sulfur content and GCV, and the calculated heat input result. These values can be adjusted in the DAHS based on quarterly fuel analysis reports, as required by Permit Condition 22.2.

SO_2 from fuel oil is calculated from oil flow rate, mass of oil, and %sulfur content of the fuel (from fuel analysis). Analytical content and related required constants can be entered and adjusted in the DAHS as needed.

CO_2 is calculated using the heat input and the dry carbon fuel factors (F factors) for natural gas and oil. The factors can be adjusted in the DAHS.

2.3.3 Fuel Sampling

Fuel sampling for SO_2 and GCV content for natural gas will be done in accordance with methods outlined by Permit Condition 22.2 and 40 CFR 75 Appendix D section 2.3 and Table D-5.

Oil fuel sampling for SO_2 and GCV content will be performed in accordance with Permit Condition 22.2 and 40 CFR 75 Appendix D section 2.2 and Table D-4.

3 NO_X Analyzer Range and MER Determination

The maximum NO_X expected concentration (MEC) value and maximum NO_X potential concentration (MPC) value were chosen based on manufacturer's guarantee levels and on air permit limits (cross reference specification from 40 CFR 75 §75.53(e)(2)(i)).

MPC = 100 ppm NO_X (manufacturer's expected concentrations)
MEC = 6 ppm NO_X (from facility's permit limit, oil-fueled based)

Low range: MEC x (1.0 up to 1.25), rounded up to nearest 10 =10 ppm
High range: MPC x (1.0 up to 1.25), rounded up to nearest 10 = 100 ppm

In addition, a NO_X maximum emission rate (MER) was calculated per the following equation. The MER is used as a maximum cap value for missing data substitution.

$$E = K \times Cd \times Fd \times (20.9 / (20.9 - \%O_2d)) = 1.144 \text{ lb/mmBtu}$$

E	=	Pollutant emissions, lb/mmBtu
K	=	1.194×10^{-7} (lb/dscf)/ppm NO_X
Cd	=	Hourly average NO_X concentration, ppm dry. The NOX MPC value of 100 ppm was utilized as the Cd value in the equation
$\%O_2$	=	Oxygen concentration, % volume. The allowed default of 19% O_2 for turbines was utilized in the equation.

Fd = Fuel-based factor representing a ratio of the volume of dry flue gases generated to the caloric value of the fuel combusted. A default factor of 8710 for natural gas (as the primary fuel source) was utilized in the equation.

4 F-Factor Determination

An F factor for dual fuels (oil and natural gas) is determined using EPA Part 75, Appendix F, Equation F-8 (cross reference specification from 40 CFR 75 §75.53(e)(2)(i)).

*Fd = (X_oil * 9190) + (X_gas * 8710)*

Fd	=	Fuel factor from oil and gas
9190	=	Fc factor for oil, O_2 basis, dscf/10^6 Btu
8710	=	Fc factor for natural gas, O_2 basis, dscf/10^6 Btu
X	=	Fraction of total heat input derived from each fuel type (oil and gas)

*X, natural gas = (HHV_gas * natural gas flow) / Total heat input*
*X, oil = (HHV_oil * oil fuel flow) / Total heat input*

HHV = Higher heating value, natural gas or oil, Btu/scf
Natural gas fuel flow, kscfh
Oil fuel flow, lb/hr
Total heat input is derived from EPA Part 75, Appendix D, Equation D-15A.

5 Certification Summary

Certification testing of the CEMS will be done in accordance with 40 CFR 75, Appendix A and 40 CFR 60, Appendix B Performance Specifications as required by the applicable regulations and air permit requirements (cross reference specification from 40 CFR 75 §75.53(e)(2)(i)). The source tester contracted to perform the Relative Accuracy Test Audit will provide a RATA test protocol under separate cover for Agency review.

A hard copy of all test results will be made available and forwarded to the EPA Regional Office and State Agency after completion of all testing.

The DAHS formulae listed in the Monitoring Plan record fields will be testing during or immediately after completion of the primary certification program. The DAHS uses standardized missing data substitution procedure. A statement from the DAHS supplier certifying that the missing data substitution routines meets Part 75 specifications will be provided with the certification report.

After certification, facility technicians will maintain and operate the CEMS in accordance with the Quality Control/Quality Assurance procedures outlined in the CEMS Quality Assurance Plan (QAP) developed for the CEMS components.

The final certification report will contain a summary of all test results, description of the tests performed, and supporting documentation including:

DAHS report printouts
Spreadsheet calculation cross-checks
Calibration gas certificates
Technician's field notes, as applicable

The certification report will also include copies of the DAHS Verification printouts and fuel flowmeter accuracy test results.

A QA_Cert EDR will be prepared shortly after finalization of the certification report for submittal to the EPA's ECMPS/Client Tool host server.

5.1 7-Day Calibration Error Test – Part 75

An on-site calibration error test (7-day drift test) will be performed for each O_2 and NO_X monitoring system in accordance with 40 CFR 75, Appendix A, Section 6.3. The tests are performed while the unit was combusting fuel at stabilized stack temperature and pressure conditions.

The calibration error test consists of measuring the calibration error of each monitor scale once each day for seven (7) consecutive unit operating (process on line) days. The calibration error tests are conducted at two EPA Traceability Protocol calibration gas concentrations: zero-level (0-20%) and high-level (80-100%) as specified in 40 CFR 75, Appendix A, Section 6.3.1. Alternately, a mid-level calibration gas (50-60% of span) may be used in place of the high-level gas as the mid-level gas is more representative of actual stack gas concentrations.

During calibration, the system controller flows calibration gases to the probe. The analyzers are challenged once with each of the two calibration gases. Each gas flows for approximately 10 minutes. The monitor response is recorded by the DAHS.

Any required routine manual adjustments to the monitor settings are not made until after taking measurements at both zero and high concentration levels for that day (reference Part 75, Appendix A, section 6.3.1). A failed calibration or taking an analyzer out-of-service during the drift period will result in a re-start of the drift period once the analyzer is placed back into service.

The DAHS compares the actual analyzer reading with the expected value of the calibration gas. The calibration error for the NO_X monitor is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Pollutants 40 CFR 75, Appendix A Equation A-5	
$$CE = \frac{\lvert R - A \rvert}{S} \times 100$$	CE = Calibration error as a percentage of instrument span R = Zero or high-level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The calibration error for diluent (O_2) monitors is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Diluents 40 CFR 75, Appendix A, Equation A-5	
$$CE = \lvert R - A \rvert$$	CE = Calibration error as a percentage of O_2 R = Zero or high-level calibration gas value in percent (%). A = Actual monitor response to calibration gas in percent (%)

In accordance with 40 CFR 75, Appendix A, Section 3.1, results of the 7-day calibration error test is acceptable if the daily calibration error does not exceed: 2.5% for NO_X and 0.5% for O_2. Alternatively, if the pollutant monitor's span value is equal to or less than 200 ppm, then calibration error shall not exceed 5.0 ppm difference.

5.2 7-Day Calibration Drift Test – Part 60

Calibrations are performed on each CO analyzer automatically at approximately 24-hour intervals by the DAHS for seven consecutive unit operating (process on-line) days. The calibration drift tests are conducted at two calibration gas concentrations: zero-level (0-20%) and high-level (50-100%) as specified in 40 CFR 60 Appendix B Performance Specifications. The low and high span (zero and span gas) readings for each analyzer are taken from the DAHS at the completion of the calibration routine. (40 CFR 60, Appendix B, PS-2, Section 4.1).

The 24-hour calibration drifts are calculated and reported by the following method (40 CFR 60, Appendix B, PS-2). For pollutant analyzers, the raw zero reading is subtracted from the zero gas bottle value, the difference is then divided by the analyzer’s span and the resultant value is multiplied by 100 to give the percent calibration drift. The preceding procedure is repeated with the span gas to give the span drift.

Daily Drift for CO 40 CFR 60, Appendix B, PS-2 and PS-4	
$$CD = \frac{R - A}{S} \times 100$$	CD = Calibration error as a percentage of instrument span R = Zero or high level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The 24-hour calibration drift must not exceed ±5% for CO (6 out of 7 days).

5.3 Linearity Error Check – Part 75

An on-site linearity check test will be conducted in accordance with the 40 CFR 75, Appendix A, for each O_2 and NO_X monitoring system. The test is performed while the unit is combusting primary fuel at stabilized stack temperature and pressure conditions. The test is performed on both ranges of dual-ranged analyzers. If a NO_X analyzer range is ≤30 ppm that range is exempt from the linearity requirement.

EPA Protocol certified calibration gases are used to conduct the linearity checks of the analyzers. Three points (concentrations) of calibration gases, low (20-30%), mid (50-60%) and high (80-100%) are introduced at the probe (40 CFR 75, Appendix A, Section 5.2). Each monitor is challenged three times with the appropriate reference gas, without using the same gas twice in succession. The monitors' response for each concentration is recorded by the DAHS. The average of the three responses is used to calculate the linearity error (40 CFR 75, Appendix A, Section 6.2). A copy of the DAHS linearity report will be included in the certification report.

Linearity error is calculated using the following equation.

Linearity Error Equation A-4, 40 CFR 75, Appendix A	
$$LE = \frac{\lvert R - A \rvert}{R} \times 100$$	LE = Percent Linearity Error R = Calibration gas reference value A = Average of monitor response

Linearity Check: Alternate Criteria 40 CFR 75, Appendix A, Section 3		
$LE = \| R - A \|$	LE =	Percent linearity error
	R =	Calibration gas reference value
	A =	Average of monitor response

Linearity checks are acceptable for monitor certification if none of the test results exceed the applicable performance specification of 40 CFR 75, Appendix A, Section 3.2. The results of the NO_X and O_2 shall be less than 5.0% as calculated by the above equation or the alternative criteria of ≤0.5% O_2 or ≤5 ppm difference for NO_X.

5.4 Cycle/Response Time Check – Part 75

The cycle time test measures the monitor's reaction time to a change in gas concentration (40 CFR 75, Appendix A, Section 6.4). The system measures stack concentrations until a stable response is observed (normal sampling mode). The stable stack response value is recorded. A low-level (zero) calibration gas will be injected at the probe sample interface. Gas injection at the probe continues until a stable monitor response is reached. Next the monitor is switched back to monitor stack gas until a stable reading is achieved and the time recorded. A span-level (80-100% of span) calibration gas is then injected at the probe until a stable response is reached. The amount of time required for the system to respond to 95% of the final stable calibration gas response value is noted from the DAHS 1-minute data report. The time is recorded for the upscale test and the downscale test for each analyzer. The response time for NO_X and O_2 will be ≤15 minutes.

The test is performed on both ranges of dual-ranged analyzers.

5.5 CO Response Time Check – Part 60

An on-site response time test for the CO monitoring system is performed in accordance with Performance Specification 4A, section 8.3. The response time test measures the monitor’s reaction time to a change in gas concentration.

The daily zero and span calibration gases are utilized for response time testing. A zero-level calibration gas is direct injected into the analyzer. Gas injection continues until a stable monitor response is reached. A high span gas is then introduced to the analyzer until a stable value is observed. The upscale response time required is the amount of time to reach 95% of the final stable end value. The zero gas is re-introduced to the analyzer until a stable reading is reached. The downscale response time required is the amount of time to reach 95% of the final stable end value.

The response times for 3 repetitions of upscale and downscale runs are recorded. An average of the 3 upscale and 3 downscale runs is determined. The response time of the longer (slower) of the two means must be ≤1.5 minutes.

The DAHS cannot generate reports for less than 1-minute averages making it difficult to “find” the step change point for a 90 second pass/fail criteria. The technician performing the test will use a stopwatch type device and will note monitor response values in 10-second intervals for each test run. Monitor values are taken directly from the monitor display panel.

5.6 Relative Accuracy Test Audit

A Relative Accuracy Test Audit (RATA) will be performed on-site for each O_2 and NO_X monitoring system in accordance with 40 CFR 75, Appendix A, Section 6.5. A full RATA test protocol, written by the source tester contracted to perform the test, will be provided as a separate document.

Appendix A Monitoring Plan Records

The attached file of monitoring plan records was configured and downloaded from the EPA's ECMPS/Client Tool software program.

Coding note on the gas fuel flowmeters:
GAS component ID represents the turbine natural gas fuel flowmeter
GAB component ID represents the natural gas duct burner fuel flowmeter

ECMPS Client Tool
Version 1.0 2016 Q4

Monitoring Plan Printout Report
January 24, 2017 01:34 PM

Facility Name: CPV Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
Monitoring Plan Location IDs:	0001
State:	NY
County:	Orange
Latitude:	41.4130
Longitude:	74.4350

Reporting Frequency

Monitoring Plan Location IDs	Reporting Frequency	Begin Quarter	End Quarter
0001	Q - Quarterly	2017 QTR 3	

Monitoring Location Attributes

Unit/Stack/Pipe Identifier	Duct Indicator	Ground Elevation	Stack Height	Cross Area Exit	Cross Area Flow	Material Code	Shape Code	Begin Date	End Date
0001		464	275	284		OTHER	ROUND	08/18/2017	

Unit Operation Information

Unit Identifier	Non-Load Based Ind	Commence Commercial Operation Date	Commence Operation Date	Boiler/Turbine Type			Max Heat Input		
				Code	Begin Date	End Date	Value (mmBtu)	Begin Date	End Date
0001	0	01/01/2018	01/01/2018	CC	01/01/2018		2734.0	01/01/2018	

Unit Type Codes: CC - Combined cycle

Unit Program Information

Unit Identifier	Program Code	Unit Class	Unit Monitor Certification Begin Date	Unit Monitor Certification Deadline
0001	ARP	P2	01/01/2018	
	CSNOX	A	01/01/2018	
	CSNOXOS	A	01/01/2018	
	CSOSG2	A	01/01/2018	
	CSSO2G1	A	01/01/2018	

Unit Fuel

Unit Identifier	Fuel Type	Fuel Indicator	Demonstration Method for GCV	Demonstration Method for Daily Sulfur	Ozone Season Indicator	Begin Date	End Date
0001	DSL	S				01/01/2018	
	NNG	P				01/01/2018	

Fuel Type Codes: NNG - Natural Gas
DSL - Diesel Oil

Fuel Indicator Codes: S - Secondary
P - Primary

Unit Controls

Unit Identifier	Parameter	Control Equipment	Original Ind	Seasonal Ind	Installation Date	Optimization Date	Retirement Date
0001	NOX	SCR	Y				

Control Equipment Descriptions: SCR - Selective Catalytic Reduction

Monitoring Method

Unit/Stack/Pipe Identifier	Parameter	Methodology	Substitute Data Approach	Bypass Approach Code	Begin Date/Hour	End Date/Hour
0001	CO2	AD	SPTS		08/18/2017 00	
	HI	AD	SPTS		08/18/2017 00	
	NOXR	CEM	SPTS		08/18/2017 00	
	OP	EXP			08/18/2017 00	
	SO2	AD	SPTS		08/18/2017 00	

Parameter Codes: SO2 - SO2 Hourly Mass Rate (lb/hr)
OP - Opacity
NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)

Methodology Codes: EXP - Exempt
CEM - Continuous Emission Monitor
AD - Appendix D

Substitute Data Codes: SPTS - Standard Part 75 for Missing Data

Facility Name: **CPV Valley Energy Center**

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

January 24, 2017 01:34 PM

Monitoring System / Analytical Components

Unit/Stack /Pipe Identifier	System					Component									
	ID	Type	Des	Begin Date/Hour	End Date/Hour	ID	Type	SAM	BAS	Manufacturer	Model or Version	Serial Number	Begin Date/Hour	End Date/Hour	Hg Converter Indicator
0001	GAS	GAS	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						GAB	GFFM	ORF		FLUIDIC TECHNOLOGIES	FAB3110	FAB3110-1A	08/18/2017 00		
						GAS	GFFM	ORF		GTE	3044SS PADDLE	3033514	08/18/2017 00		
	NOX	NOX	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						NOX	NOX	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						O2D	O2	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						PRB	PRB	EXT		UNIVERSAL	270SF	TBD	08/18/2017 00		
	OIL	OILM	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						OIL	OFFM	TUR		FTI	FT-40C4U3-LEA-3	160405M51314	08/18/2017 00		

System Types Descriptions: GAS - Gas Fuel Flow
NOX - NOx Emission Rate
OILM - Mass of Oil Fuel Flow

System Designations Descriptions: P - Primary

Sample Acquisition Method (SAM): TUR - Turbine
ORF - Orifice
EXT - Dry Extractive

Component Types Descriptions: DAHS - Data Acquisition and Handling System
GFFM - Gas Fuel Flowmeter
NOX - NOx Concentration
O2 - O2 Concentration
PRB - Probe
OFFM - Oil Fuel Flowmeter

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): 56940

Monitoring System Fuel Flow

Unit/Stack/Pipe Identifier	System ID	Fuel Code	Max Fuel Flow Rate	Units of Measure	Source Code	Begin Date/Hour	End Date/Hour
0001	GAS	NNG	28000.0	HSCF	URV	08/18/2017 00	
	OIL	DSL	120000.0	LBHR	URV	08/18/2017 00	

System Fuel Codes Descriptions: NNG - Natural Gas

DSL - Diesel Oil

Units of Measure Descriptions: LBHR - Pounds / Hour

HSCF - Hundred Standard Cubic Feet / Hour

Source Codes Descriptions: URV - Upper Range Value

Analyzer Range Data

Unit/Stack/Pipe Identifier	Component Type	Component ID	Range Code	Dual Range Indicator	Begin Date/Hour	End Date/Hour
0001	NOX	NOX	Auto Ranging	Y	08/18/2017 00	
	O2	O2D	High Range		08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration

O2 - O2 Concentration

Emissions Formulas

Unit/Stack/Pipe Identifier	Parameter	Formula ID	Formula Code	Formula	Begin Date/Hour	End Date/Hour
0001	NOXR	100	F-5	NOx_lb/mmBtu = S#(NOX-NOX) * (1.194*10**-7) * F#(107) * (20.9 / (20.9 - S#(O2D-NOX))	08/18/2017 00	
	HI	101	F-20	HI_gas = (F#(112) * GCV_gas) / 10**6	08/18/2017 00	
	SO2	102	D-5	M_SO2_gas = F#(111) * F#(101)	08/18/2017 00	
	CO2	103	G-4	W_CO2_gas = (1040 * F#(101) * 1/385 * 44.0) / 2000	08/18/2017 00	
	HI	104	D-8	HI_oil = S#(OIL-OIL)_oilrate * (GCV_oil / 10**6)	08/18/2017 00	
	SO2	105	D-2	M_SO2_oil = 2.0 * S#(OIL-OIL)_oilrate * (%S_oil / 100)	08/18/2017 00	
	CO2	106	G-4	W_CO2_oil = (1420 * F#(104) * 1/385 * 44.0) / 2000	08/18/2017 00	
	FD	107	F-8	Fd = (X_oil * 9190) + (X_gas * 8710)	08/18/2017 00	
	HI	108	D-15A	HI_total = (F#(101) * T_gas + F#(104) * T_oil) / T_unit	08/18/2017 00	
	CO2	109	G-4A	CO2_total = (F#(103) * T_gas + F#(106) * T_oil) / T_unit	08/18/2017 00	
	SO2	110	D-12	SO2_total = (F#(102) * T_gas + F#(105) * T_oil) / T_unit	08/18/2017 00	
	SO2R	111	D-1H	ER_SO2_gas = (2.0 / 7000) * (10**6) * S_NNG/GCV_NNG)	08/18/2017 00	
	FGAS	112	N-GAS	N_gas = S#(GAS-GAS) + S#(GAB-GAS)	08/18/2017 00	

Parameter Codes Descriptions:

NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
SO2 - SO2 Hourly Mass Rate (lb/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)
FD - F-Factor Dry-basis
SO2R - SO2 Hourly Emission Rate (lb/mmBtu)
FGAS - Gas Hourly Flow Rate (hscf)

Formula Codes Descriptions:

N-GAS - FGAS (net gas flow rate)
G-4A - CO2 (from CO2 rate for multiple fuels)
G-4 - CO2 (from HI, Fc)
F-8 - FD/FC/FW (from multiple fuels)
F-5 - NOXR/SO2R (from NOX or SO2 dry, O2 dry, Fd)
F-20 - HI (same as D-6)
D-8 - HI (from oil flow rate, GCV)
D-5 - SO2 (from gas SO2 emission rate, HI)
D-2 - SO2 (from OILM, oil sulfur content)
D-1H - SO2R (from gas sulfur content, GCV)
D-15A - HI (from HI rate for multiple fuels)
D-12 - SO2 (from SO2 rate for multiple fuels)

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): 56940

Span Values

Unit/Stack /Pipe Identifier	Comp Type	Scale	Method	MPC/ MPF	MEC	Span Value	Full-Scale Range	Units of Measure	Scale Transition Point	Def. High Range Value	Flow Full Range (SCFH)	Flow Span Value (SCFH)	Begin Date/Hour	End Date/Hour
0001	NOX	H	ME	100.0	6.0	100.000	100.000	PPM	9.5				08/18/2017 00	
	NOX	L	PL		6.0	10.000	10.000	PPM	9.5				08/18/2017 00	
	O2	H				25.000	25.000	PCT					08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration
O2 - O2 Concentration

Span Method Codes Descriptions: PL - Permit Limit for NOX MEC
ME - Manufacturer's Estimate for NOX MPC

Units of Measure Descriptions: PPM - Parts per Million
PCT - Percentage

Unit/Stack/Pipe Load or Operating Level Information

Unit/Stack/Pipe Identifier	Maximum Hourly Load	Units of Measure	Upper Bound of Range of Operation	Lower Bound of Range of Operation	Designated Normal Op. Level	Second Most Frequently Used Op. Level	Second Normal Indicator	Load Analysis Date	Begin Date/Hour	End Date/Hour
0001	400	MW	400	100	High	Mid	Yes	12/31/2017	12/31/2017 00	

Units of Measure Descriptions: MW - Megawatt

Monitoring Defaults

Unit/Stack/Pipe Identifier	Parameter	Value	Units of Measure	Purpose Code	Fuel Type	Operating Condition	Source of Value	Begin Date/Hour	End Date/Hour
0001	NORX	1.1440	LBMMBTU	MD	NFS	A	DEF	08/18/2017 00	
	O2X	19.0000	PCT	DC	NFS	A	DEF	08/18/2017 00	

Parameter Codes Descriptions: O2X - Maximum O2 Concentration (pct)
NORX - Maximum NOx Emission Rate (lb/mmBtu)

Units of Measure Descriptions: PCT - Percentage
LBMMBTU - Pounds / mmBtu

Purpose Codes Descriptions: MD - Missing Data (or Unmonitored Bypass Stack or Emergency Fuel) Default
DC - Diluent Cap

Fuel Type Codes Descriptions: NFS - Non-Fuel Specific

Operating Conditions Descriptions: A - Any Hour

Source Codes Descriptions: DEF - Default Value from Part 75

Facility Name: CPV Valley Energy Center

Facility Details

Facility ID (ORISPL):	56940
Monitoring Plan Location IDs:	0002
State:	NY
County:	Orange
Latitude:	41.4130
Longitude:	74.4350

Reporting Frequency

Monitoring Plan Location IDs	Reporting Frequency	Begin Quarter	End Quarter
0002	Q - Quarterly	2017 QTR 3	

Monitoring Location Attributes

Unit/Stack/Pipe Identifier	Duct Indicator	Ground Elevation	Stack Height	Cross Area Exit	Cross Area Flow	Material Code	Shape Code	Begin Date	End Date
0002		464	275	284		OTHER	ROUND	08/18/2017	

Unit Operation Information

Unit Identifier	Non-Load Based Ind	Commence Commercial Operation Date	Commence Operation Date	Boiler/Turbine Type			Max Heat Input		
				Code	Begin Date	End Date	Value (mmBtu)	Begin Date	End Date
0002	0	01/01/2018	01/01/2018	CC	01/01/2018		2734.0	01/01/2018	

Unit Type Codes: CC - Combined cycle

Unit Program Information

Unit Identifier	Program Code	Unit Class	Unit Monitor Certification Begin Date	Unit Monitor Certification Deadline
0002	ARP	P2	01/01/2018	
	CSNOX	A	01/01/2018	
	CSNOXOS	A	01/01/2018	
	CSOSG2	A	01/01/2018	
	CSSO2G1	A	01/01/2018	

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

January 24, 2017 01:35 PM

Unit Fuel

Unit Identifier	Fuel Type	Fuel Indicator	Demonstration Method for GCV	Demonstration Method for Daily Sulfur	Ozone Season Indicator	Begin Date	End Date
0002	DSL	S				01/01/2018	
	NNG	P				01/01/2018	

Fuel Type Codes: NNG - Natural Gas
DSL - Diesel Oil

Fuel Indicator Codes: S - Secondary
P - Primary

Unit Controls

Unit Identifier	Parameter	Control Equipment	Original Ind	Seasonal Ind	Installation Date	Optimization Date	Retirement Date
0002	NOX	SCR	Y				

Control Equipment Descriptions: SCR - Selective Catalytic Reduction

Monitoring Method

Unit/Stack/Pipe Identifier	Parameter	Methodology	Substitute Data Approach	Bypass Approach Code	Begin Date/Hour	End Date/Hour
0002	CO2	AD	SPTS		08/18/2017 00	
	HI	AD	SPTS		08/18/2017 00	
	NOXR	CEM	SPTS		08/18/2017 00	
	OP	EXP			08/18/2017 00	
	SO2	AD	SPTS		08/18/2017 00	

Parameter Codes: SO2 - SO2 Hourly Mass Rate (lb/hr)
OP - Opacity
NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)

Methodology Codes: EXP - Exempt
CEM - Continuous Emission Monitor
AD - Appendix D

Substitute Data Codes: SPTS - Standard Part 75 for Missing Data

Facility Name: **CPV Valley Energy Center**

Facility ID (ORISPL): **56940**

Monitoring Plan Printout Report

January 24, 2017 01:35 PM

Monitoring System / Analytical Components

Unit/Stack /Pipe Identifier	System					Component									
	ID	Type	Des	Begin Date/Hour	End Date/Hour	ID	Type	SAM	BAS	Manufacturer	Model or Version	Serial Number	Begin Date/Hour	End Date/Hour	Hg Converter Indicator
0002	GAS	GAS	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						GAB	GFFM	ORF		FLUIDIC TECHNOLOGIES	FAB3110	FAB3110-1B	08/18/2017 00		
						GAS	GFFM	ORF		GTE	3044SS PADDLE	3033515	08/18/2017 00		
	NOX	NOX	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						NOX	NOX	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						O2D	O2	EXT	D	TAPI	T200M	TBD	08/18/2017 00		
						PRB	PRB	EXT		UNIVERSAL	270SF	TBD	08/18/2017 00		
	OIL	OILM	P	08/18/2017 00		DAS	DAHS			VIM TECHNOLOGIES	CEMLINK6		08/18/2017 00		
						OIL	OFFM	TUR		FTI	FT-40C4U3-LEA-3	160405M51315	08/18/2017 00		

System Types Descriptions:
GAS - Gas Fuel Flow
NOX - NOx Emission Rate
OILM - Mass of Oil Fuel Flow

System Designations Descriptions:
P - Primary

Sample Acquisition Method (SAM):
TUR - Turbine
ORF - Orifice
EXT - Dry Extractive

Component Types Descriptions:
DAHS - Data Acquisition and Handling System
GFFM - Gas Fuel Flowmeter
NOX - NOx Concentration
O2 - O2 Concentration
PRB - Probe
OFFM - Oil Fuel Flowmeter

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): **56940**

Monitoring System Fuel Flow

Unit/Stack/Pipe Identifier	System ID	Fuel Code	Max Fuel Flow Rate	Units of Measure	Source Code	Begin Date/Hour	End Date/Hour
0002	GAS	NNG	28000.0	HSCF	URV	08/18/2017 00	
	OIL	DSL	120000.0	LBHR	URV	08/18/2017 00	

System Fuel Codes Descriptions: NNG - Natural Gas
DSL - Diesel Oil

Units of Measure Descriptions: LBHR - Pounds / Hour
HSCF - Hundred Standard Cubic Feet / Hour

Source Codes Descriptions: URV - Upper Range Value

Analyzer Range Data

Unit/Stack/Pipe Identifier	Component Type	Component ID	Range Code	Dual Range Indicator	Begin Date/Hour	End Date/Hour
0002	NOX	NOX	Auto Ranging	Y	08/18/2017 00	
	O2	O2D	High Range		08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration
O2 - O2 Concentration

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): 56940

Emissions Formulas

Unit/Stack/Pipe Identifier	Parameter	Formula ID	Formula Code	Formula	Begin Date/Hour	End Date/Hour
0002	NOXR	100	F-5	NOx_lb/mmBtu = S#(NOX-NOX) * (1.194*10**-7) * F#(107) * (20.9 / (20.9 - S#(O2D-NOX))	08/18/2017 00	
	HI	101	F-20	HI_gas = (F#(112) * GCV_gas) / 10**6	08/18/2017 00	
	SO2	102	D-5	M_SO2_gas = F#(111) * F#(101)	08/18/2017 00	
	CO2	103	G-4	W_CO2_gas = (1040 * F#(101) * 1/385 * 44.0) / 2000	08/18/2017 00	
	HI	104	D-8	HI_oil = S#(OIL-OIL)_oilrate * (GCV_oil) / 10**6)	08/18/2017 00	
	SO2	105	D-2	M_SO2_oil = 2.0 * S#(OIL-OIL)_oilrate * (%S_oil) / 100)	08/18/2017 00	
	CO2	106	G-4	W_CO2_oil = (1420 * F#(104) * 1/385 * 44.0) / 2000	08/18/2017 00	
	FD	107	F-8	Fd = (X_oil * 9190) + (X_gas * 8710)	08/18/2017 00	
	HI	108	D-15A	HI_total = F#(101) * T_gas + F#(104) * T_oil) / T_unit	08/18/2017 00	
	CO2	109	G-4A	CO2_total = (F#(103) * T_gas + F#(106) * T_oil) / T_unit	08/18/2017 00	
	SO2	110	D-12	SO2_total = (#(102) * T_gas + F#(105) * T_oil) / T_unit	08/18/2017 00	
	SO2R	111	D-1H	ER_SO2_gas = (2.0 / 7000) * (10**6) * S_NNG/GCV_NNG)	08/18/2017 00	
	FGAS	112	N-GAS	N_gas = S#(GAS-GAS) + S#(GAB-GAS)	08/18/2017 00	

Parameter Codes Descriptions:
NOXR - NOx Emission Rate (lb/mmBtu)
HI - Heat Input Rate (mmBtu/hr)
SO2 - SO2 Hourly Mass Rate (lb/hr)
CO2 - CO2 Hourly Mass Rate (ton/hr)
FD - F-Factor Dry-basis
SO2R - SO2 Hourly Emission Rate (lb/mmBtu)
FGAS - Gas Hourly Flow Rate (hscf)

Formula Codes Descriptions:
N-GAS - FGAS (net gas flow rate)
G-4A - CO2 (from CO2 rate for multiple fuels)
G-4 - CO2 (from HI, Fc)
F-8 - FD/FC/FW (from multiple fuels)
F-5 - NOXR/SO2R (from NOX or SO2 dry, O2 dry, Fd)
F-20 - HI (same as D-6)
D-8 - HI (from oil flow rate, GCV)
D-5 - SO2 (from gas SO2 emission rate, HI)
D-2 - SO2 (from OILM, oil sulfur content)
D-1H - SO2R (from gas sulfur content, GCV)
D-15A - HI (from HI rate for multiple fuels)
D-12 - SO2 (from SO2 rate for multiple fuels)

Facility Name: CPV Valley Energy Center

Facility ID (ORISPL): 56940

Span Values

Unit/Stack /Pipe Identifier	Comp Type	Scale	Method	MPC/ MPF	MEC	Span Value	Full-Scale Range	Units of Measure	Scale Transition Point	Def. High Range Value	Flow Full Range (SCFH)	Flow Span Value (SCFH)	Begin Date/Hour	End Date/Hour
0002	NOX	H	ME	100.0	6.0	100.000	100.000	PPM	9.5				08/18/2017 00	
	NOX	L	PL		6.0	10.000	10.000	PPM	9.5				08/18/2017 00	
	O2	H				25.000	26.000	PCT					08/18/2017 00	

Component Types Descriptions: NOX - NOx Concentration
O2 - O2 Concentration

Span Method Codes Descriptions: PL - Permit Limit for NOX MEC
ME - Manufacturer's Estimate for NOX MPC

Units of Measure Descriptions: PPM - Parts per Million
PCT - Percentage

Unit/Stack/Pipe Load or Operating Level Information

Unit/Stack/Pipe Identifier	Maximum Hourly Load	Units of Measure	Upper Bound of Range of Operation	Lower Bound of Range of Operation	Designated Normal Op. Level	Second Most Frequently Used Op. Level	Second Normal Indicator	Load Analysis Date	Begin Date/Hour	End Date/Hour
0002	400	MW	400	100	High	Mid	Yes	12/31/2017	12/31/2017 00	

Units of Measure Descriptions: MW - Megawatt

Monitoring Defaults

Unit/Stack/Pipe Identifier	Parameter	Value	Units of Measure	Purpose Code	Fuel Type	Operating Condition	Source of Value	Begin Date/Hour	End Date/Hour
0002	NORX	1.1440	LBMMBTU	MD	NFS	A	DEF	08/18/2017 00	
	O2X	19.0000	PCT	DC	NFS	A	DEF	08/18/2017 00	

Parameter Codes Descriptions: O2X - Maximum O2 Concentration (pct)
NORX - Maximum NOx Emission Rate (lb/mmBtu)

Units of Measure Descriptions: PCT - Percentage
LBMMBTU - Pounds / mmBtu

Purpose Codes Descriptions: MD - Missing Data (or Unmonitored Bypass Stack or Emergency Fuel) Default
DC - Diluent Cap

Fuel Type Codes Descriptions: NFS - Non-Fuel Specific

Operating Conditions Descriptions: A - Any Hour

Source Codes Descriptions: DEF - Default Value from Part 75

Appendix B CEMS Drawings

The following CEMS Engineering drawings are attached.

Sample system flow diagram(s)
Drawing number 50478A02

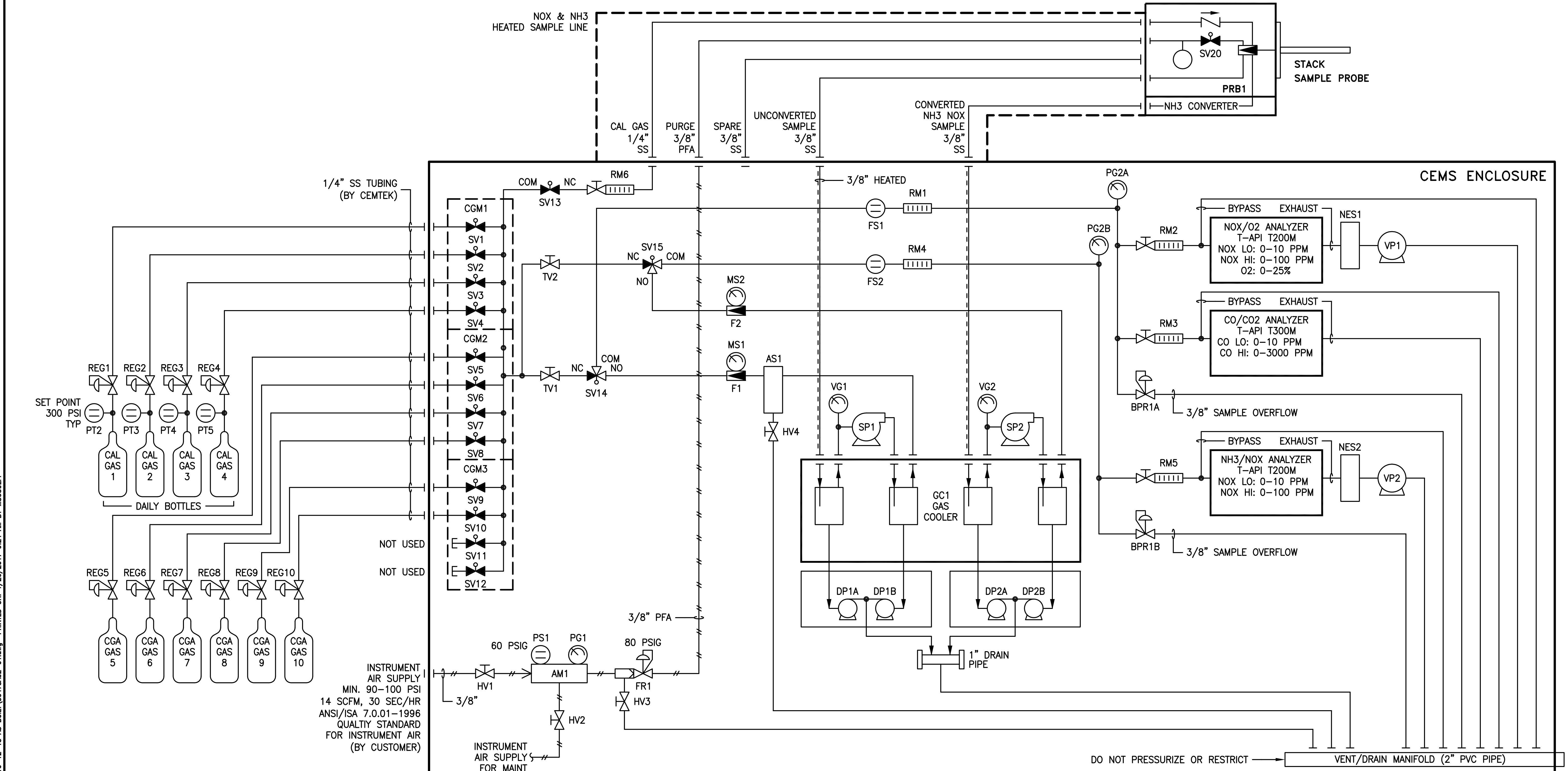
The sample system flow diagram(s) illustrates major CEMS components in the gas sample flow path (cross reference 40 CFR 75 §75.53(e)(2)(iv)).

System block diagram (data flow)
Drawing number 50478A07

The system block diagram is an overview on CEMS sampling pathways and data pathways (cross reference 40 CFR 75 §75.53(e)(2)(iii)).

Major components are identified on the sample system flow diagram(s) by tag names. The following is an identification key for the tags.

AMx	Instrument air manifold
ASx	Ammonia scrubber
BPRx	Back pressure regulator
CGMx	Calibration gas manifold
DMAx	Drain manifold
DPx	Peristaltic drain pump
FRx	Filter regulator
FSx	Flow switch
Fx	Sample system particulate filter
GCx	Sample gas cooler
HVx	Hand valves
MSx	Moisture sensor
PGx	Pressure gauge
PSx	Pressure switch/pressure transducer
REGx	Calibration gas regulator
RMx	Rotameter (flow meters)
SPx	Sample pump
SVx	Solenoid valves
TVx	Trim valve
VGx	Vacuum gauge



TYPICAL FOR UNITS 1 & 2

1. ALL TUBING SHALL BE 1/4" O.D. TEFLON.

NOTES: UNLESS OTHERWISE SPECIFIED.

HEATED LINE

INSTRUMENT AIR

CEMTEK Environmental

CEMTEK Environmental, Inc.

3041 S. Orange Ave., Santa Ana, CA. 92707

Phone: 714-437-7100. CEMS Parts: 888-400-0200

NO.	REVISION	DATE	APPR.
A	CUSTOMER COMMENTS	09/15/15	PT
B	AS BUILT	12/13/16	PT

NO.	REVISION	DATE	APPR.

ELECTRICAL SPECIFICATION

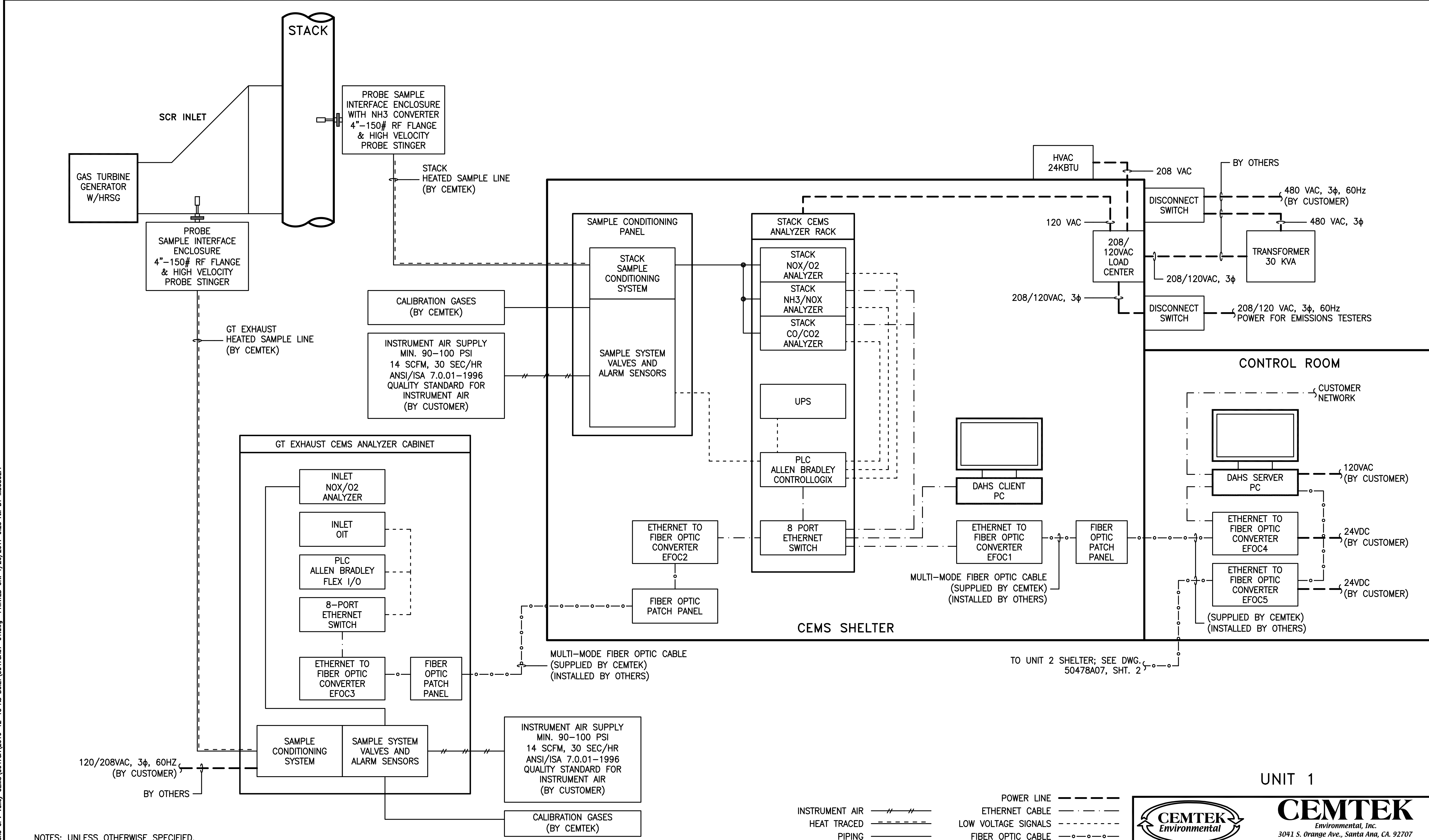
	INS	SIZE	LUGS	MISC
CONTROL WIRE	PVC	18 AWG MIN	NONE	–
SIGNAL WIRE	TEFLON	18 AWG MIN	NONE	–
POWER WIRE	THHN	14 AWG MIN	NONE	–

SIEMENS ENERGY
CPV VALLEY ENERGY CENTER
WAWAYANDA, NY
CONTINUOUS EMISSIONS MONITORING SYSTEM
P.O. NO. 4500715162
CEMTEK PROJECT NO. CN50478

STACK
SAMPLE SYSTEM FLOW

PROJECT: SIEMENS-CPV VALLEY				SCALE: N/A	SHT: 1 OF 1
DWN:	M. SUSOEFF	DATE	07/16/15	50478A02	
CKD:	P. TRAN	DATE	07/16/15		
APP:	D. OQUENDO	DATE	07/16/15		

Z:\CAD_Projects\50478 Siemens CPV Valley CEMS\50478A\2016-12-13 AS BUILT\50478A02-01.dwg PRINTED ON: 1/26/2017 9:24 AM BY MSUSOEFF



NOTES: UNLESS OTHERWISE SPECIFIED.

BOTH THIS DRAWING AND THE INFORMATION IN IT ARE PROPRIETARY, ARE THE PROPERTY OF CEMTEK ENVIRONMENTAL, INC. AND MAY NOT BE USED FOR THE DESIGN, PRODUCTION, INSTALLATION OR OPERATION OF APPARATUS OR PROCESSES EXCEPT UNDER CONTRACT WITH IT.

CEMTEK ENVIRONMENTAL, INC.

NO.	REVISION	DATE	APPR.
A	CUSTOMER COMMENTS	09/15/15	PT
B	CUSTOMER COMMENTS 3	09/14/16	PT
C	AS BUILT	12/13/16	PT

ELECTRICAL SPECIFICATION

	INS	SIZE	LUGS	MISC
CONTROL WIRE	PVC	18 AWG MIN	NONE	–
SIGNAL WIRE	TEFLON	18 AWG MIN	NONE	–
POWER WIRE	THHN	14 AWG MIN	NONE	–

SIEMENS ENERGY
CPV VALLEY ENERGY CENTER
WAWAYANDA, NY
CONTINUOUS EMISSIONS MONITORING SYSTEM
P.O. NO. 4500715162
CEMTEK PROJECT NO. CN50478

CEMTEK Environmental
CEMTEK Environmental, Inc.
3041 S. Orange Ave., Santa Ana, CA. 92707
Phone: 714-437-7100. CEMS Parts: 888-400-0200

SYSTEM BLOCK

PROJECT: SIEMENS-CPV VALLEY | SCALE: N/A | SHT: 1 OF 2

DWN:	M. SUSOEFF	DATE	07/16/15
CKD:	P. TRAN	DATE	07/16/15
APP:	D. OQUENDO	DATE	07/16/15

50478A07

Z:\CAD_Projects\50478 Siemens CPV Valley CEMS\50478A\2016-12-13 AS BUILT\50478A07-01.dwg PRINTED ON: 1/26/2017 9:25 AM BY MSUSOEFF

Appendix C Stack Drawings

Dimensioned stack drawings are attached depicted location of the CEMS probe and EPA test ports (cross reference 40 CFR 75 §75.53(e)(2)(ii) and (iv)).

Engineering Design Report

Stack Arrangement

Prepared For:

Project Name: Valley Energy Center Project
Location: Wawayanda, NY
CMI Customer: Siemens Energy, Inc., Orlando, FL
Customer Name: CPV Valley, LLC

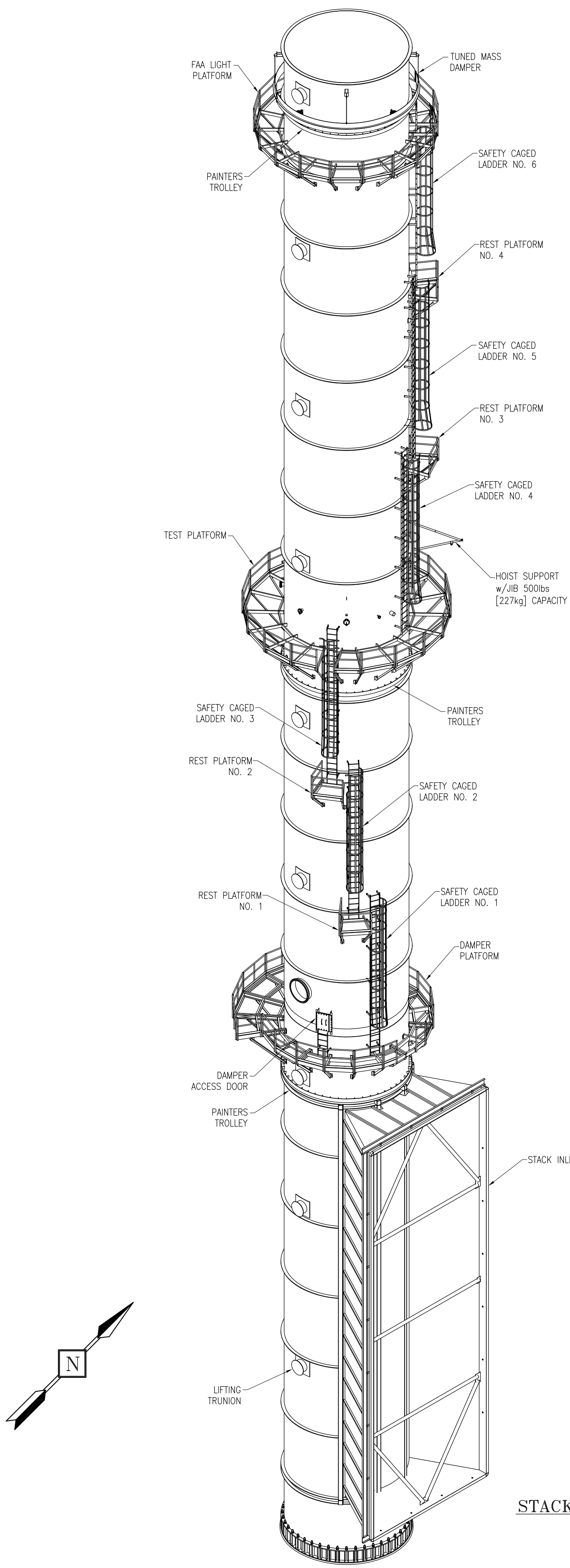
		UNID No.:	497460516
Prepared By:	K. Taylor	**Document No.:**	2068-001.01-SGA
Reviewed By:	K. Taylor	**Contract No.:**	2068
Approved By:	K. Taylor	**Revision No.:**	2

REVISION LOG

Rev. No.	Date	Summary of Revisions	Page No.
1	01-Nov-15	Initial issue.	ALL
2	18 Feb 16	Revised per Customer comments on IRL 0288	ALL

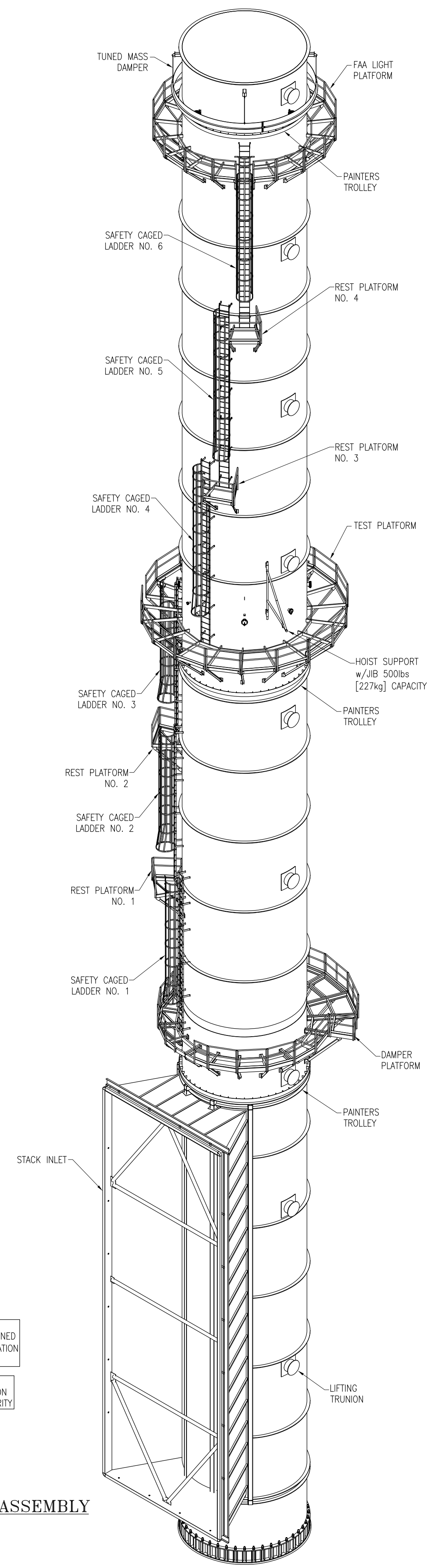
DRAWING INDEX

Drawing File No.	Drawing Name	Drawing Revision
Q42-GA-01	Stack General Assembly	0
G42-GA-02	Stack Elevations and Sections	0
Q42-GA-03	Stack Sections and Details	1
Q42-GA-04	Stack Sections and Details	0
Q42-GA-05	Stack Sections	0



NOTE:
STACK HAS BEEN DESIGNED FOR 2" OF 8pcf INSULATION UP TO EL. 100'-0"

NOTE:
PERSONNEL PROTECTION NOT SHOWN FOR CLARITY



STACK GENERAL ASSEMBLY
(SCALE: N.T.S.)

MATERIALS
1. ALL PLATES, BARS AND STRUCTURAL SHAPES SHALL CONFORM TO CHINESE CARBON STEEL Q235B UNLESS NOTED OTHERWISE.
2. PLATFORMS AND LADDERS TO BE CONSTRUCTED OF CHINESE CARBON STEEL Q235B.
3. ALL REINFORCING TO BE CHINESE CARBON STEEL Q235B.
4. NO METRIC BOLTS ARE PERMITTED. ALL BOLTS SHALL BE IMPERIAL SIZE AND ASTM A325 OR A490 U.N.O.

TOLERANCES
1. STACK SHALL BE FABRICATED SUCH THAT IT CAN BE ERECTED PLUMB AT THE VERTICAL CENTERLINE TO WITHIN 1" [25] PER 50' [15240] OF STACK HEIGHT.
2. DIAMETER OUT-OF-ROUNDNESS SHALL BE LIMITED TO 1% OF THE STACK DIAMETER.
3. LOCAL DENTS IN THE PLATE WALL SHALL HAVE A DEPTH LESS THAN ONE HALF THE NOMINAL PLATE THICKNESS.
4. VERTICAL SEAMS SHALL BE STAGGERED 90° (20° MINIMUM).
5. PEAKING OF JOINTS AS MEASURED BY A TEMPLATE CUT TO THE PRESCRIBED RADIUS AND HAVING A MINIMUM CHORD LENGTH OF 18" [457] SHALL NOT EXCEED 1/4" [6].
6. TEST PORT FLANGES SHALL BE PERPENDICULAR TO THE CENTERLINE TO WITHIN $\frac{1}{2}$" [12] AND LOCATED WITHIN $\frac{1}{2}$" [12] OF LOCATION SHOWN.
7. MAXIMUM MISALIGNMENT OF PLATE SHALL NOT EXCEED 25% OF NOMINAL THICKNESS OR 1/8" [3], WHICHEVER IS LESS.

FABRICATION
1. ALL WORK SHALL BE FABRICATED IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", 13TH EDITION.
2. ALL WELDING IS TO BE PERFORMED USING A.W.S PROCEDURES (CODE D1.1). ALL WELDING SHALL BE BY A.W.S. CERTIFIED WELDERS USING E-70XX ELECTRODES. ALL FULL PENETRATION WELDS ARE TO BE INSPECTED PER ASME STS-1 2011, PART 8.4.1 (C). WELD INSPECTION SHALL BE RADIOGRAPHY.
3. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH WRITTEN WELDING PROCEDURE SPECIFICATIONS. EXCEPT AS OTHERWISE SPECIFIED, WELDING SHALL BE PERFORMED USING ONLY THOSE JOINT DETAILS AND WELDING PROCEDURES WHICH ARE QUALIFIED OR PRE-QUALIFIED IN ACCORDANCE WITH REFERENCED AWS OR ASME.
4. ALL BUTT WELDS SHALL BE PRE-QUALIFIED, FULL PENETRATION WELDS AND SHALL DEVELOP THE PENETRATION BUTT GROOVE WELDS.
5. ALL EXTERIOR WELDS SHALL BE SEAL WELDS.
6. ALL WELDING ELECTRODES AND FLUX SHALL CONFORM TO THE AWS CODE AND BE EQUIVALENT TO THE BASE METAL IN STRENGTH.
7. DEFECTIVE AREAS SHALL BE REPAIRED IN SUCH A MANNER AS NOT TO GOUGE, GROOVE OR REDUCE THE BASE METAL THICKNESS.
8. ALL EXTERNAL WELDS SHALL BE CONTINUOUS, STICH WELDING IS NOT PERMITTED.
9. REMOVE ALL WELD RUN-OUT TABS.
10. HANDRAILS ARE TO BE TWO RAIL DESIGN.

MATERIAL CERTIFICATIONS
1. MATERIAL TEST REPORTS FOR ALL MATERIAL UTILIZED ARE TO BE REQUESTED WHEN MATERIAL IS ORDERED. TEST REPORTS SHALL BE SUBMITTED TO IES, INC. UPON RECEIPT.
2. MSDS SHEETS FOR ALL TOUCH-UP PAINTS, THINNERS AND ANY OTHER HAZARDOUS MATERIAL IS TO BE INCLUDED WITH THE SHIPMENT OF THE ITEMS.

PERSONNEL PROTECTION
1. PERSONNEL PROTECTION TO BE SHIPPED LOOSE FOR FIELD INSTALLATION.
2. PERSONNEL PROTECTION TO BE FABRICATED FROM 1/2 - 16 GALVANIZED FLATTENED EXPANDED METAL.
3. PERSONNEL PROTECTION SHALL HAVE ITS EDGES BANDED IN THE SHOP TO CREATE A SMOOTH EDGE.
4. CONNECTION CLIPS TO BE GALVANIZED Q235B CARBON STEEL.
5. PERSONNEL PROTECTION TO BE PROVIDED AT EACH PLATFORM, LADDER AND FROM GRADE UP TO 8'-0" [2.5m] HEIGHT. LADDER LOCATION TO PROVIDE $7\frac{7}{8}$" [200] MIN. TOE CLEARANCE FROM PERSONNEL PROTECTION.
6. TWO RAIL HANDRAIL DESIGN PER OSHA 29 CFR 1910 & CMI STD. DWG. #007.

SURFACE PREPARATION
1. ALL SHARP PROJECTIONS SHALL BE GROUND SMOOTH.
2. ALL WELD FLUX AND SPATTER SHALL BE REMOVED BY POWER TOOL CLEANING.
3. PROTECT FLANGED AND THREADED CONNECTIONS WITH WOODEN OR PLASTIC COVERS FOR SANDBLAST, PAINTING AND SHIPMENT.
4. SANDBLAST PER SSPC-SP-10 EXTERNALLY AND INTERNALLY.
5. PLATFORMS & LADDERS TO BE HOT-DIPPED GALVANIZED PER ASTM A-123.
6. ALL FIELD WELD JOINTS SHALL HAVE INTERNAL AND EXTERNAL COATINGS HALTED 4" [100] FROM WELD JOINT, COATED WITH A WELDABLE PRIMER SUCH AS CAROWELD 11WB AND COVERED WITH A NO RESIDUE STRONG ADHESIVE TAPE. THE TAPE SHALL REMAIN ON FOR SHIPPING.
7. CORROSION ALLOWANCE = 0.0625" [1.6].
8. ALL NUTS, BOLTS, WASHERS, STUDS AND FASTENERS TO BE MECHANICALLY GALVANIZED. SUPPLIER SHALL PROVIDE 10% EXTRA SHIPPED LOOSE TO THE FIELD.

COATING
1. EXTERNAL COATING: PREP SSPC-SP-10/NACE NO. 2 - NEAR WHITE BLAST CLEANING.
EXTERNAL SURFACES (WITH INSULATION) SHOP APPLY PRIMER: P1-INORGANIC ZINC ETHYL SILICONE OR P3-WELDABLE INORGANIC ZINC SILICATE PER SIEMENS APPENDIX 13: COATINGS. 20% EXTRA COATING BY SUPPLIER (SHIPPED LOOSE).
INTERNAL COATING: PREP SSPC-SP-10/NACE NO. 2 - NEAR WHITE BLAST CLEANING.
INTERNAL SURFACES SHOP APPLY PRIMER: P1-INORGANIC ZINC ETHYL SILICATE, AMERON=DIMECOTE9 (HS), INTERNATIONAL=INTERZINC 22 (HS), SHERWIN WILLIAMS=ZINC CLAD II (HS), CARBOLINE=CARBOZINC 11 (HS OR VOC) PER SIEMENS APPENDIX 13: COATINGS. 20% EXTRA COATING BY SUPPLIER (SHIPPED LOOSE).
2. PLATFORMS, LADDERS, HANDRAILS, GRATING AND PERSONNEL PROTECTION TO SHALL BE HOT-DIPPED GALVANIZED PER ASTM A385.

SHIPPING
1. PIECES ARE TO BE LOADED SUCH THAT NO COMPONENT IS COMPROMISED, INCLUDING THE PAINT SYSTEM.
2. POINT LOADS ON SHELL PLATES ARE TO BE AVOIDED. 15PM-15 TIMBERS USED FOR SHIPPING SHALL BE PLACED SPANNING A MINIMUM OF TWO STIFFENERS.
3. ANY TEMPORARY SHIPPING BRACES WHICH ARE WELDED TO THE STACK SHALL BE PAINTED YELLOW. ERECTOR SHALL REMOVE TEMPORARY BRACES PRIOR TO ERECTION.
4. BOLTS, NUTS, WASHERS, GASKETS AND ANY OTHER SHIPPED LOOSE ITEMS SHALL BE PACKED IN CONTAINERS. A PACKING LIST SHALL BE ATTACHED TO CONTAINER IDENTIFYING ALL ITEMS CONTAINED INSIDE.

FIT-UP
1. MODERATE AMOUNTS OF STRAIGHTENING, SHIMMING, REAMING, CUTTING AND GRINDING ARE REQUIRED FOR NORMAL ERECTION PROCEDURES FOR PROPER FIT UP.
2. MISFITS WHICH CANNOT BE CORRECTED BY THESE MEANS ARE TO BE REPORTED TO CMI ENERGY IMMEDIATELY.
3. THE ERECTOR SHALL PROVIDE INFORMATION TO CORRECT THE FIT UP AND SHALL WORK WITH CMI ENERGY TO DETERMINE THE MOST ECONOMICAL SOLUTION TO CORRECT THE FIT UP PROBLEM.

ERECTION
1. THE STACK WILL ARRIVE IN 90° PANELS.
2. STACK PANELS SHALL BE LIFTED TO THE VERTICAL POSITION WITH NECESSARY MEANS TO NOT DAMAGE ANY COMPONENTS, INCLUDING THE PAINT SYSTEM.
3. STACK PANELS TO BE WELDED VERTICALLY TOGETHER AND THEN LIFTED AS ONE CAN SECTION WITH THE PROVIDED LIFTING TRUNIONS.
4. A TAILING CRANE SHOULD BE ATTACHED TO THE BASE CHAIR OR TAILING LUGS DURING THE LIFT.
5. ALL ANCHOR BOLTS ARE TIGHTENED USING THE AISC "TURN-OF-THE-NUT" METHOD.

MATCH MARK ALL FIELD JOINTS.

LOAD TABLE

	WIND	SEISMIC
CODE	ASCE 7-05 ASME-STS	IBC
SPEED/CLASS	100 MPH	0.273-0.066/D
EXP/GROUP	C	III
IMPORTANCE	1.15	1.25
BASE SHEAR	185 KIPS	35 KIPS
BASE MOMENT	27,000 KIP-FT	6,000 KIP-FT

LIVE LOAD	140 KIPS
APPROX. DEAD LOAD	615 KIPS
PLAT/LADDERS	47 KIPS

NOZZLE TABLE

Fx	-3,983 LBF
Fy	-6,820 LBF
Fz	2,420 LBF
Mx	30,332 FT-LBF
My	-41,711 FT-LBF
Mz	-33,566 FT-LBF

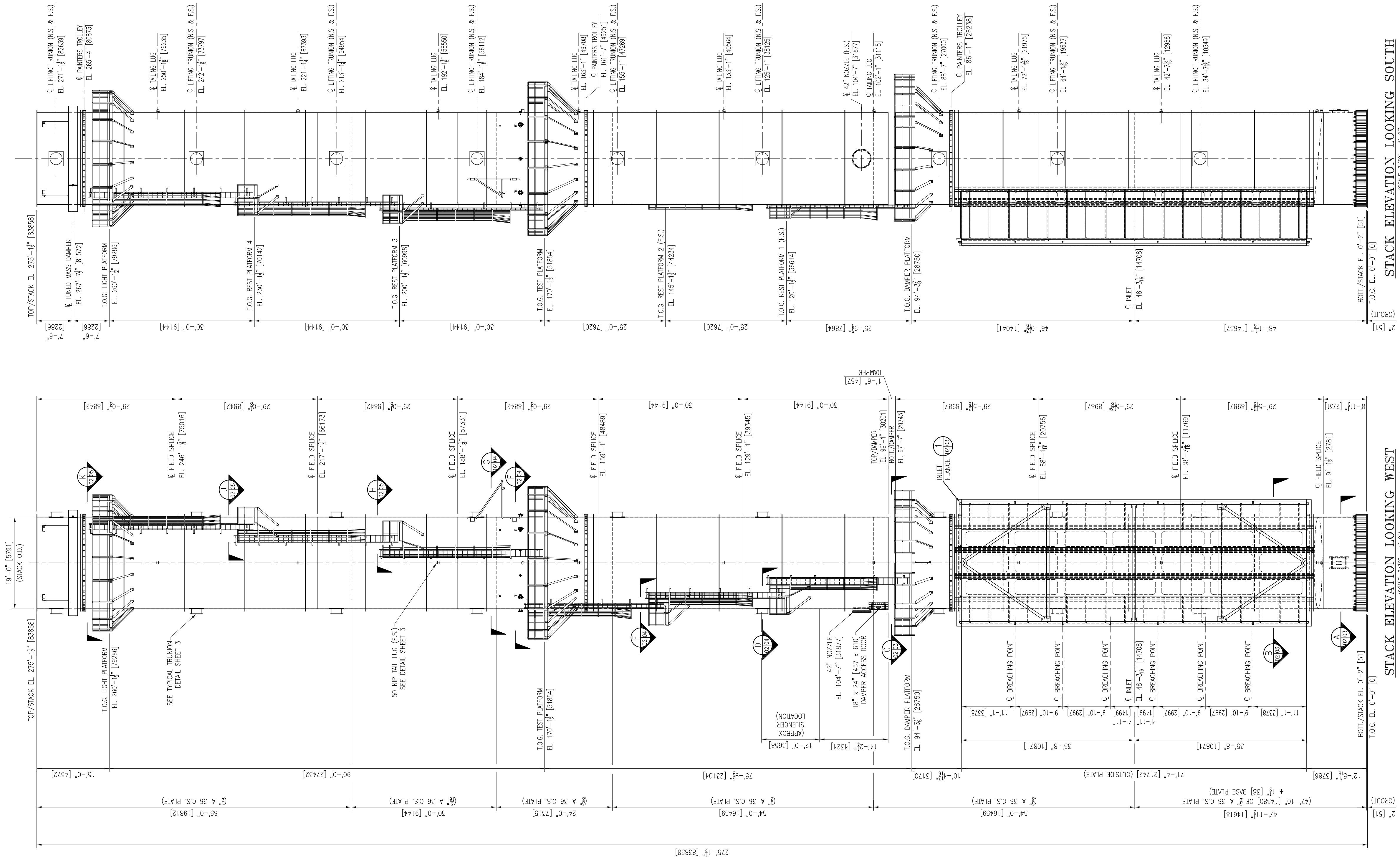
CERTIFIED FOR CONSTRUCTION

THIS DRAWING FOR APPROVAL ONLY. DETAILED CONSTRUCTION DRAWINGS TO BE SUBMITTED AFTER APPROVAL OF GENERAL ARRANGMENT

NO.	DATE	REVISION	BY	CHECKED
0	01/10/16	CERTFIED FOR CONSTRUCTION	J.R.	C.R.
B	01/04/16	GENERAL REVISION	CMY	J.R.
A	07/23/15	ISSUED FOR REVIEW	CMY	J.R.

INDUSTRIAL ENVIRONMENTAL SYSTEMS, INC.
Stacks, Ducts, Dampers & Silencers
SALES: (770) 645-1421 ENGINEERING: (334) 321-7039

PROJECT	VALLEY ENERGY CENTER PROJECT
CITY	WAWAYANDA
STATE	NEW YORK
CLIENT	CMI ENERGY
CLIENT DRAWING NO.	
DESCRIPTION	2068 STACK GENERAL ASSEMBLY
IES DRAWING NO.	Q42-GA-01
SHEET	1 OF 5
DRAWN BY	C. YOUNG
DATE	07/20/15
CHECKED BY	J. REID
DATE	07/23/15
APPROVED BY	
DATE	



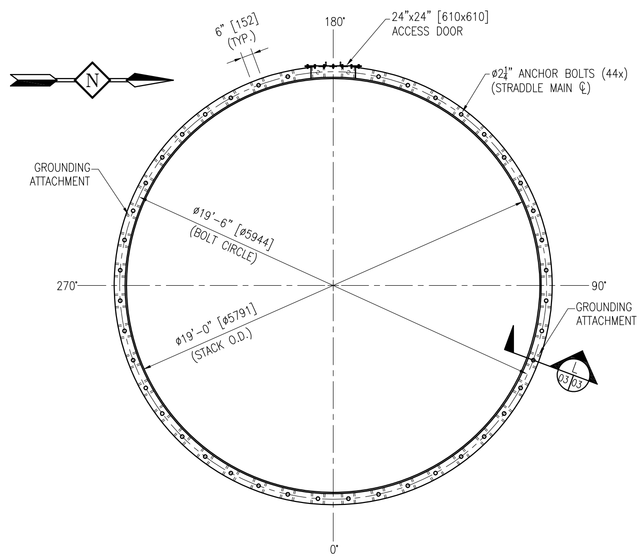
CERTIFIED FOR CONSTRUCTION

THIS DRAWING FOR APPROVAL ONLY.
DETAILED CONSTRUCTION DRAWINGS TO
BE SUBMITTED AFTER APPROVAL OF
GENERAL ARRANGMENT

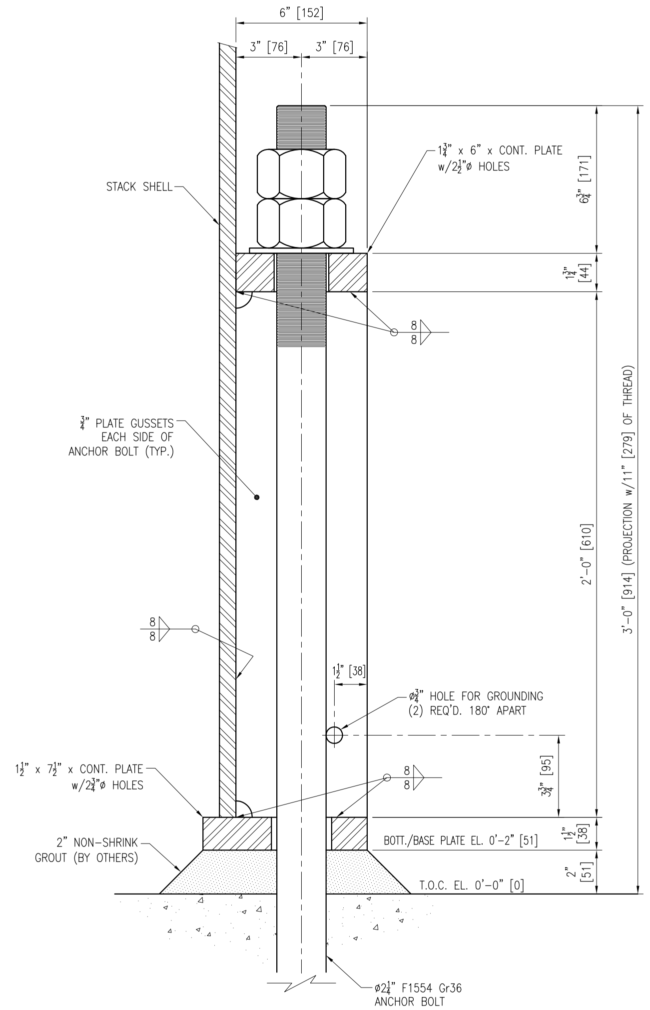
NO.	DATE	REVISION	BY	CHECKED
0	01/10/16	CERTIFIED FOR CONSTRUCTION	J.R.	C.R.
B	01/04/16	GENERAL REVISION	CMY	J.R.
A	07/23/15	ISSUED FOR REVIEW	CMY	J.R.

IES INDUSTRIAL ENVIRONMENTAL SYSTEMS, INC.
Stacks, Ducts, Dampers & Silencers
SALES: (770) 645-1421 ENGINEERING: (334) 321-7039

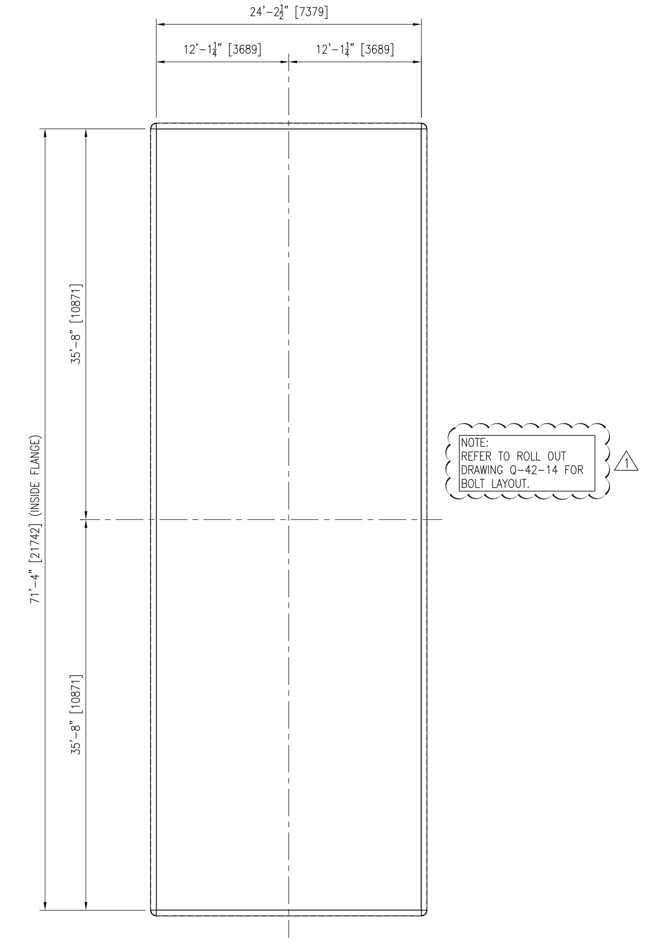
PROJECT	VALLEY ENERGY CENTER PROJECT
CITY	WAWAYANDA
STATE	NEW YORK
CLIENT	CMI ENERGY
CLIENT DRAWING NO.	
DESCRIPTION	2068 STACK ELEVATIONS & SECTIONS
IES DRAWING NO.	Q42-GA-02
SHEET	2 OF 5
DRAWN BY	C. YOUNG
DATE	07/20/15
CHECKED BY	J. REID
DATE	07/23/15
APPROVED BY	
DATE	



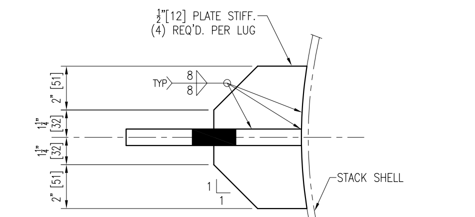
A 02 03 SECTION (SCALE: 1/4"=1'-0")



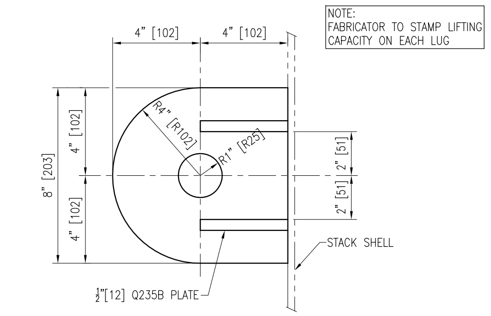
L 03 03 SECTION (SCALE: 3" = 1'-0")



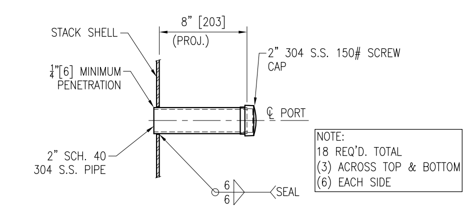
1 02 03 DETAIL (SCALE: 1/8"=1'-0")



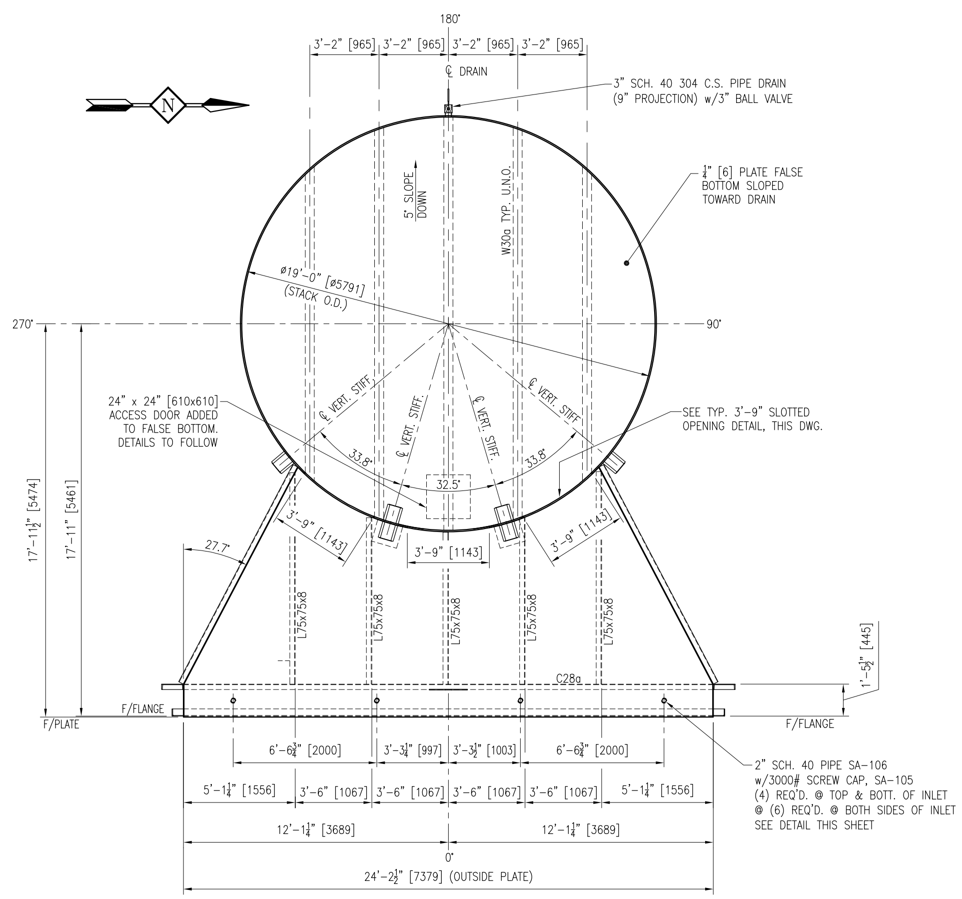
PLAN



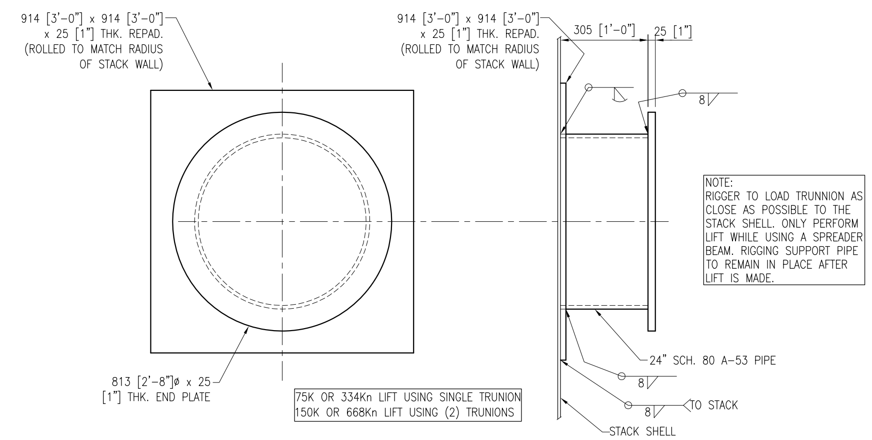
TYPICAL TAILING LUG DETAIL (SCALE: 3" = 1'-0")
50 KIP CAPACITY FOR TOTAL LIFT
IMPACT FACTOR = 2.0
(2) REQ'D PER STACK SECTIONS U.N.O.



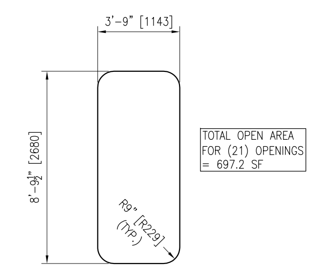
BREACHING TEST PORT DETAIL (SCALE: 1 1/2" = 1'-0")



B 02 03 SECTION (SCALE: 1/4"=1'-0")



TYPICAL TRUNION DETAIL (SCALE: 1" = 1'-0")



TYP. 3'-9" SLOTTED OPENING DETAIL (SCALE: 1/4" = 1'-0")

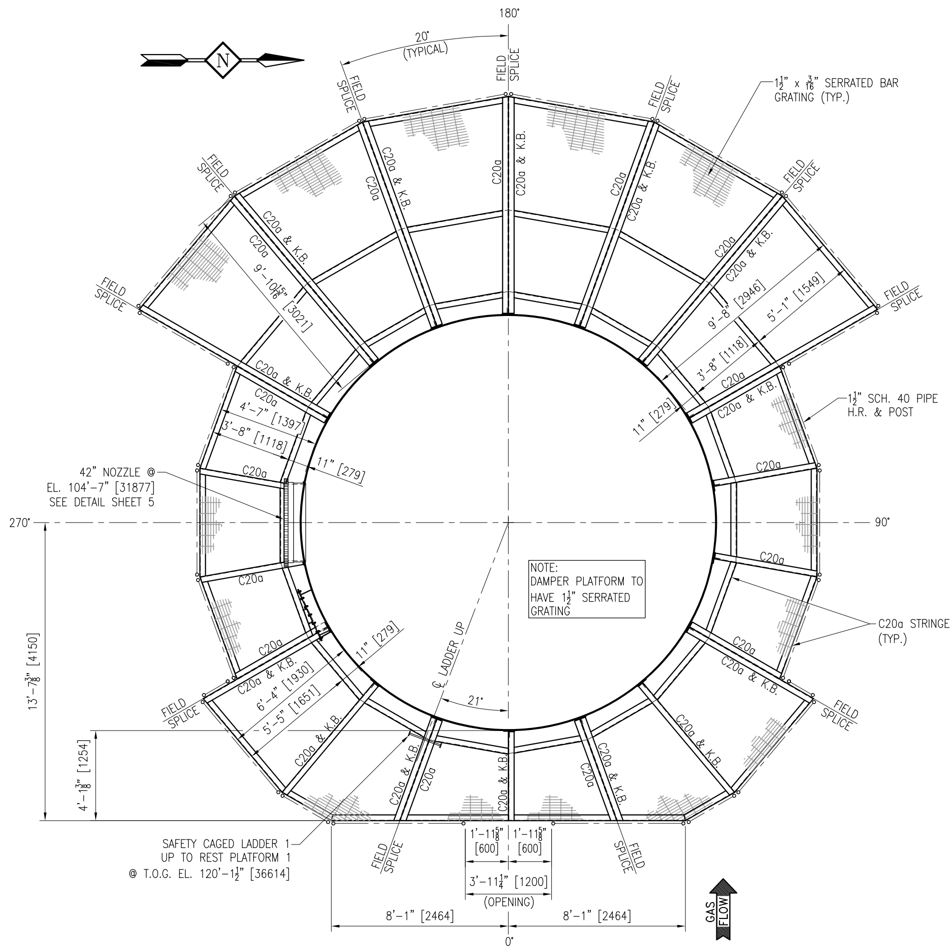
CERTIFIED FOR CONSTRUCTION

THIS DRAWING FOR APPROVAL ONLY. DETAILED CONSTRUCTION DRAWINGS TO BE SUBMITTED AFTER APPROVAL OF GENERAL ARRANGMENT

NO.	DATE	REVISION	BY	CHECKED
1	02/11/16	REVISED AS NOTED	J.R.	C.R.
0	01/10/16	CERTIFIED FOR CONSTRUCTION	J.R.	C.R.
B	01/04/16	GENERAL REVISION	CMY	J.R.
A	07/23/15	ISSUED FOR REVIEW	CMY	J.R.

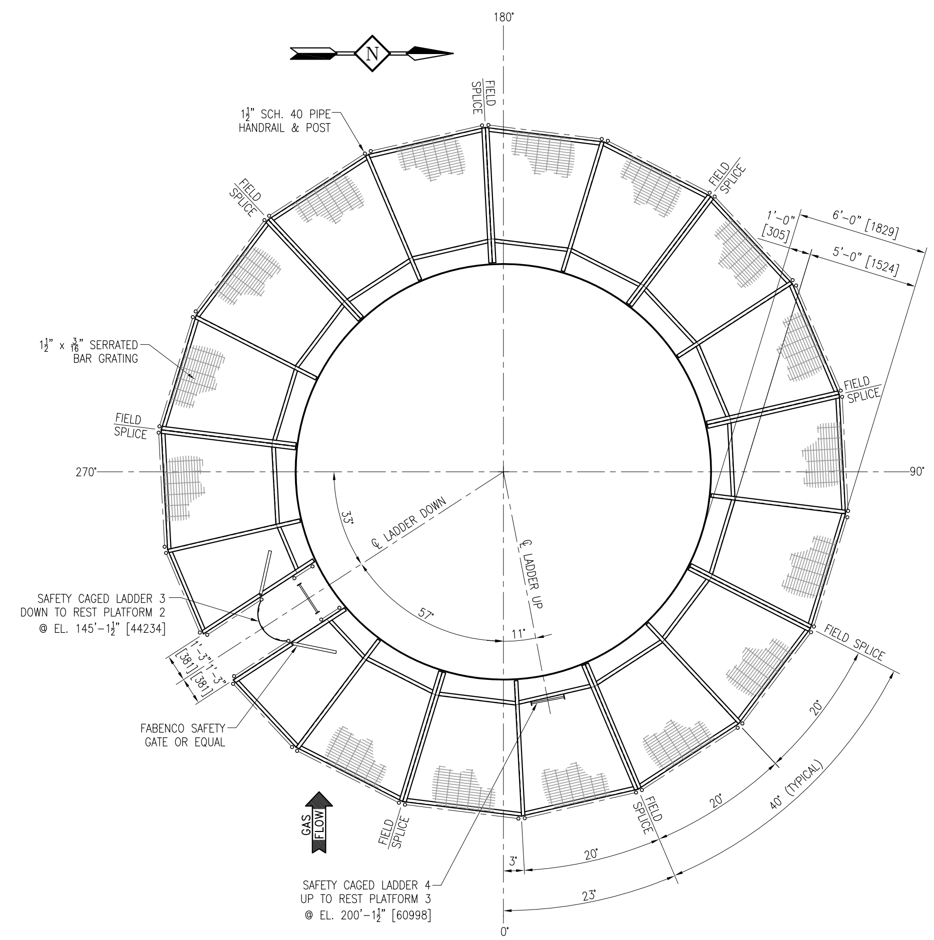
IES Industrial Environmental Systems, Inc.
Stacks, Ducts, Dampers & Silencers
SALES: (770) 645-1421 ENGINEERING: (334) 321-7039

PROJECT	VALLEY ENERGY CENTER PROJECT
CITY	WAWAYANDA
STATE	NEW YORK
CLIENT	CMI ENERGY
CLIENT DRAWING NO.	
DESCRIPTION	2068 STACK SECTIONS & DETAILS
IES DRAWING NO.	Q42-GA-03
SHEET	3 OF 5
DRAWN BY	C. YOUNG
DATE	07/20/15
CHECKED BY	J. REID
DATE	07/23/15
APPROVED BY	
DATE	



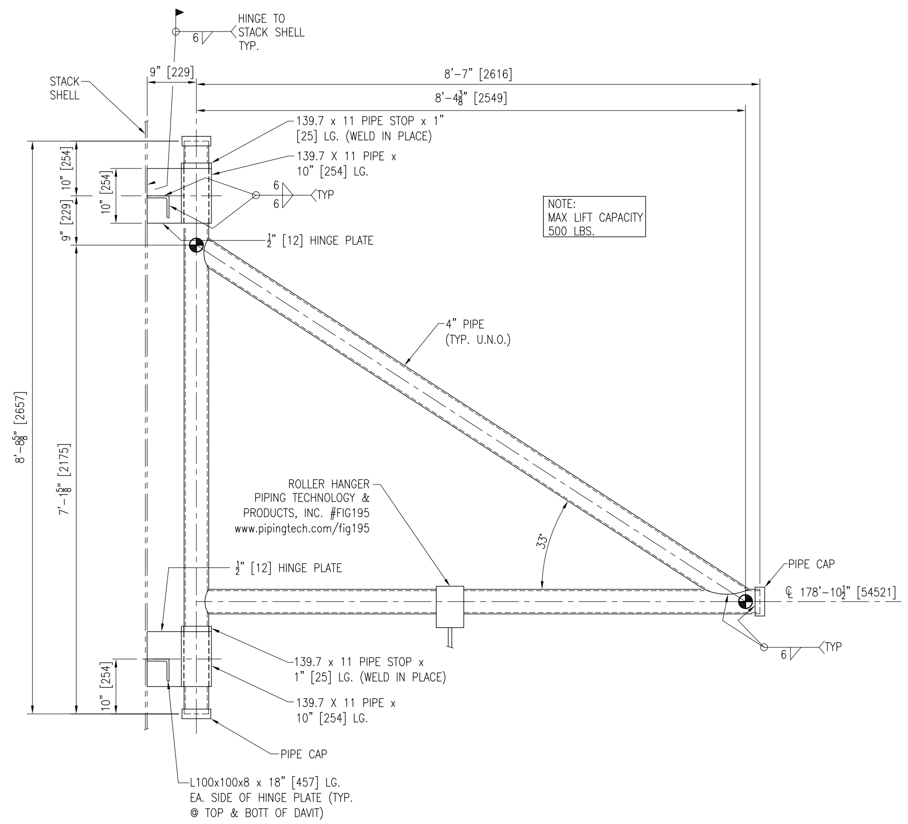
SECTION C 02/04 (SCALE: 1/4"=1'-0")

T.O.G. DAMPER PLATFORM EL. 94'-3⅜" [28750]



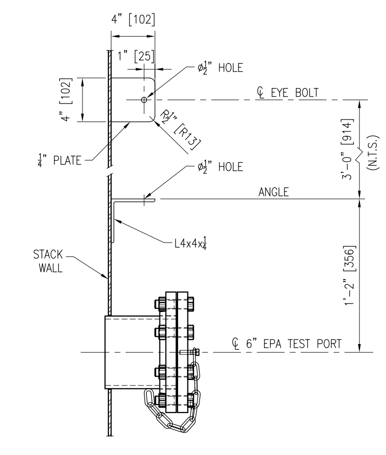
SECTION F 02/04 (SCALE: 1/4"=1'-0")

T.O.G. TEST PLATFORM EL. 170'-1½" [51854]



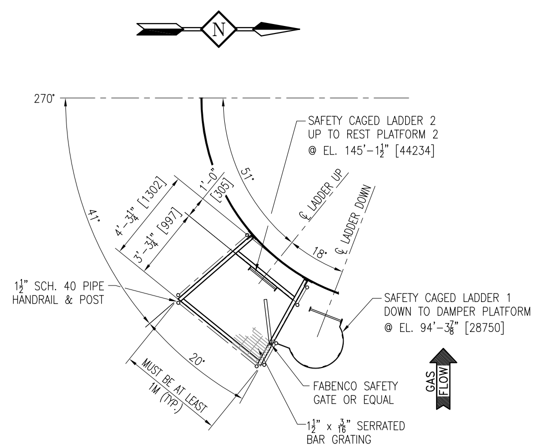
DAVIT HOIST DETAIL

(SCALE: 3/4 = 1'-0")



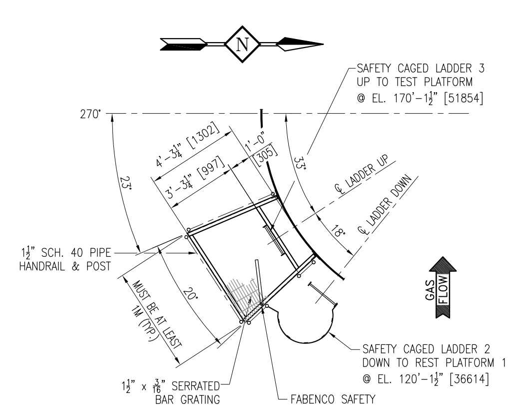
Ⓐ EMISSION TEST PORT DETAIL

(SCALE: 1 1/2" = 1'-0")



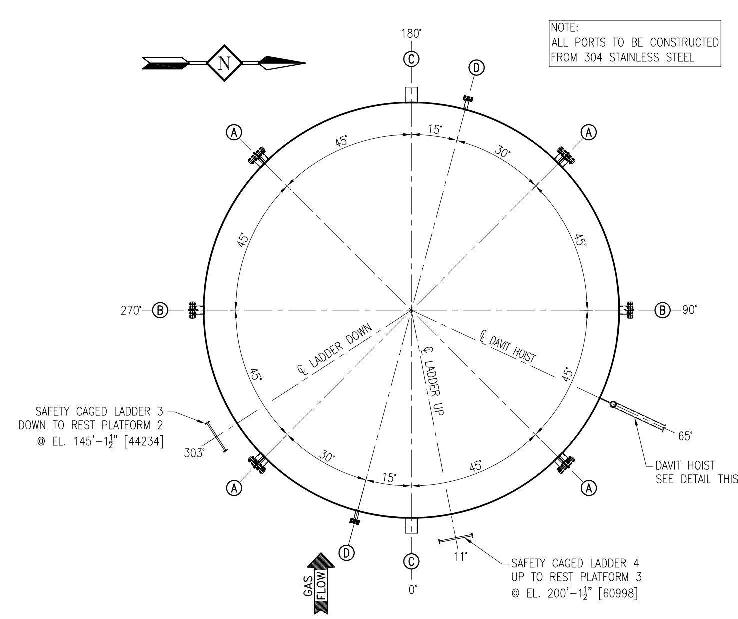
SECTION D 02/04 (SCALE: 1/4"=1'-0")

T.O.G. REST PLATFORM 1 EL. 120'-1½" [36614]



SECTION E 02/04 (SCALE: 1/4"=1'-0")

T.O.G. REST PLATFORM 2 EL. 145'-1½" [44234]



SECTION G 02/04 (SCALE: 1/4"=1'-0")

TEST PORT LAYOUT @ EPA TEST PLATFORM

NOTE: LUG AND CLIP DETAILS TO BE DESIGNED PER GE SPEC B29

Ⓐ (4) EPA TEST PORTS EQUALLY SPACED 90° APART
6" SCH. 40 PIPE w/150# R.F. FLANGE, w/BLIND FLANGE, w/CHAIN.
MOUNT (1) 100x100x6 L-BRACKET 14" ABOVE EACH PORT
MOUNT (1) 6MM EYE BOLT 36" ABOVE EACH L-BRACKET
PROJECTION = 6"[152] FROM STACK O.D.
@ EL. 175'-1½" [53379]

Ⓑ (2) CEM PORTS 180° APART. 4" SCH. 40 PIPE
w/150# R.F. FLANGE, w/BLIND FLANGE, w/CHAIN.
PROJECTION = 6"[152] FROM STACK O.D.
@ EL. 175'-1½" [53379]

Ⓒ (2) OPACITY PORTS 180° APART. 6" SCH. 10 PIPE.
PROJECTION = 8½"[215] FROM STACK I.D.
@ EL. 174'-7½" [53226]

Ⓓ (2) TEMPERATURE TEST PORTS
1½" SCH. 40 PIPE w/150# R.F. FLANGE w/BLIND FLANGE, w/CHAIN.
PROJECTION = 6"[152] FROM STACK O.D.
@ EL. 175'-1½" [53379]

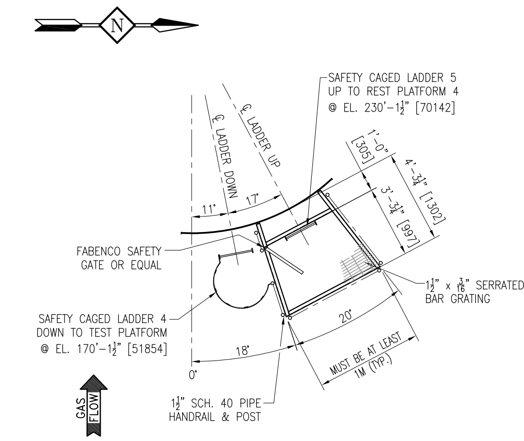
CERTIFIED FOR CONSTRUCTION

THIS DRAWING FOR APPROVAL ONLY. DETAILED CONSTRUCTION DRAWINGS TO BE SUBMITTED AFTER APPROVAL OF GENERAL ARRANGMENT

NO.	DATE	REVISION	BY	CHECKED
0	01/10/16	CERTIFIED FOR CONSTRUCTION	J.R.	C.R.
B	01/04/16	GENERAL REVISION	CMY	J.R.
A	07/23/15	ISSUED FOR REVIEW	CMY	J.R.

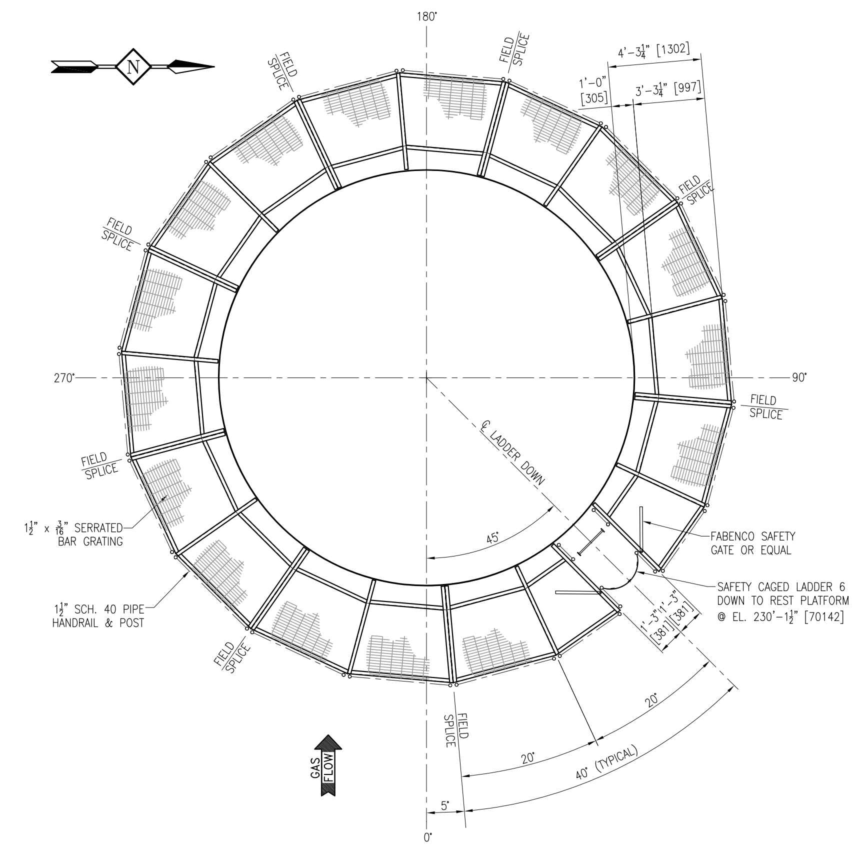
ies INDUSTRIAL ENVIRONMENTAL SYSTEMS, INC.
Stacks, Ducts, Dampers & Silencers
SALES: (770) 645-1421 ENGINEERING: (334) 321-7039

PROJECT	VALLEY ENERGY CENTER PROJECT
CITY	WAWAYANDA — STATE NEW YORK
CLIENT	CMI ENERGY
CLIENT DRAWING NO.	
DESCRIPTION	2068 STACK SECTIONS & DETAILS
IES DRAWING NO.	Q42-GA-04 — SHEET 4 OF 5
DRAWN BY	C. YOUNG — DATE 07/20/15
CHECKED BY	J. REID — DATE 07/23/15
APPROVED BY	— DATE



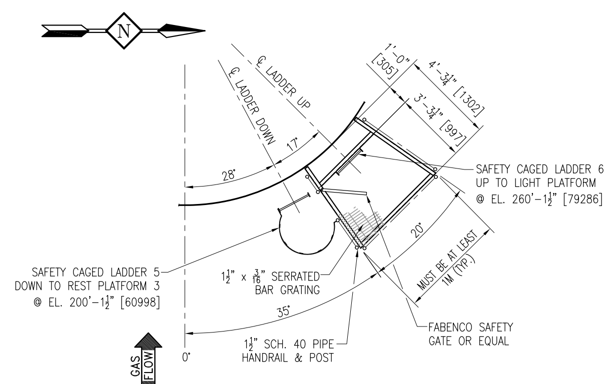
H 02|05 SECTION (SCALE: 1/4"=1'-0")

T.O.G. REST PLATFORM 3 EL. 200'-1½" [60998]



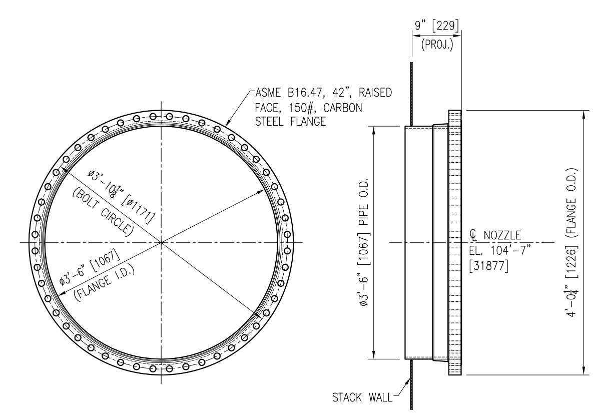
K 02|05 SECTION (SCALE: 1/4"=1'-0")

T.O.G. FAA LIGHT PLATFORM EL. 260'-1½" [79286]



J 02|05 SECTION (SCALE: 1/4"=1'-0")

T.O.G. REST PLATFORM 4 EL. 230'-1½" [70142]



42" NOZZLE DETAIL (SCALE: 3/4" = 1'-0")

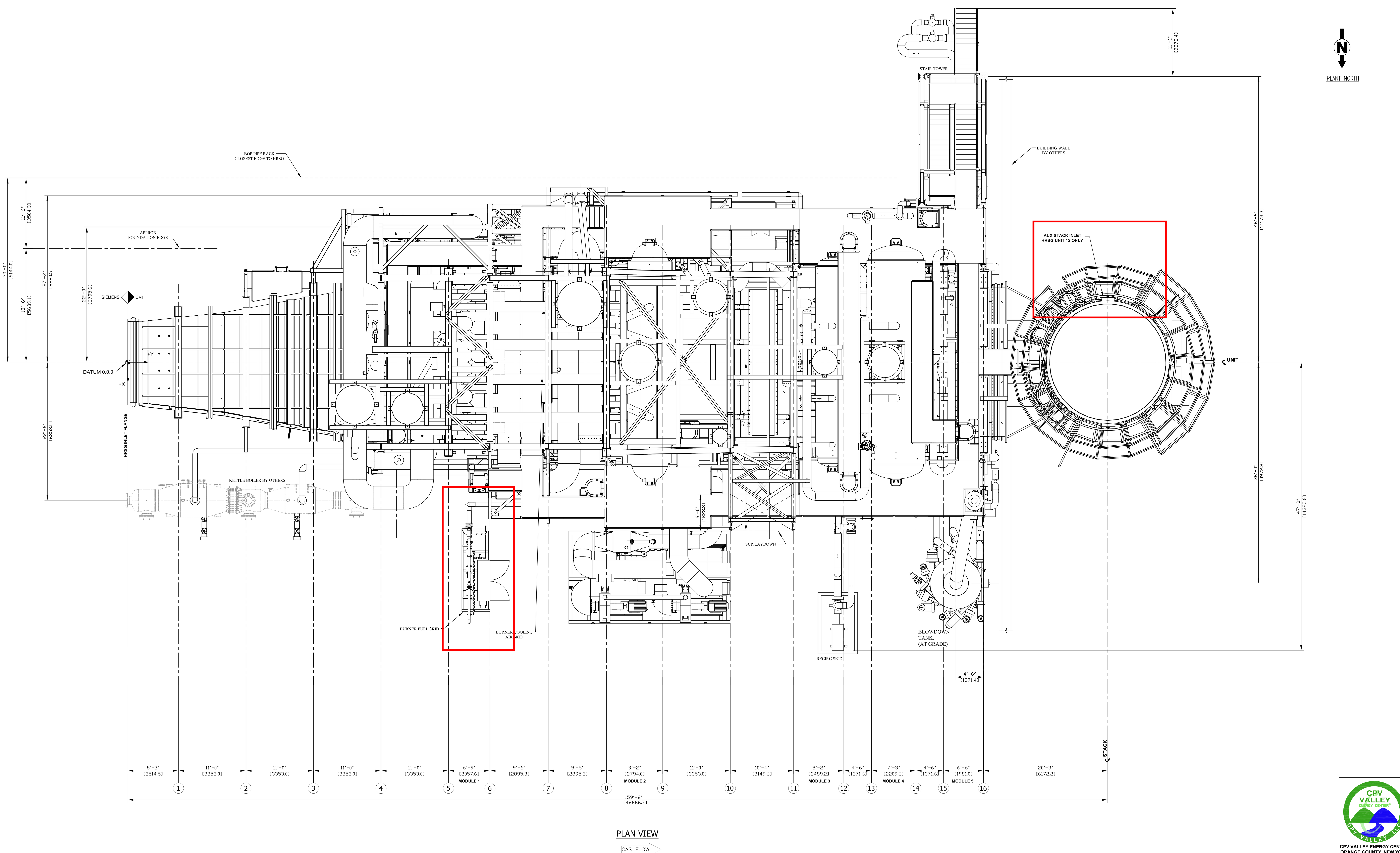
CERTIFIED FOR CONSTRUCTION

THIS DRAWING FOR APPROVAL ONLY.
DETAILED CONSTRUCTION DRAWINGS TO BE SUBMITTED AFTER APPROVAL OF GENERAL ARRANGMENT

NO.	DATE	REVISION	BY	CHECKED
0	01/10/16	CERTIFIED FOR CONSTRUCTION	J.R.	C.R.
B	01/04/16	GENERAL REVISION	CMY	J.R.
A	07/23/15	ISSUED FOR REVIEW	CMY	J.R.

ies Industrial Environmental Systems, Inc.
Stacks, Ducts, Dampers & Silencers
SALES: (770) 645-1421 ENGINEERING: (334) 321-7039

PROJECT	CPV VALLEY #2068
CITY	NEW YORK
STATE	NEW YORK
CLIENT	CMI ENERGY
CLIENT DRAWING NO.	
DESCRIPTION	STACK SECTIONS
IES DRAWING NO.	Q42-GA-05
SHEET	5 OF 5
DRAWN BY	C. YOUNG — DATE 07/20/15
CHECKED BY	J. REID — DATE 07/23/15
APPROVED BY	— DATE



PLAN VIEW

GAS FLOW

CPV VALLEY ENERGY CENTER
ORANGE COUNTY, NEW YORK

Revision Description	Drafter	Checker	Approved	Date	Rev.
FINAL KETTLE BOILER BY OTHERS (SHOWN PHANTOM)	MDS	JRS	KJT	04/25/16	8
FINAL	MDS	JRS	KJT	03/24/16	7
FINAL	MDS	JRS	KJT	11/02/15	6
FINAL	MDS	JRS	KJT	10/09/15	5
FOR REVIEW, REVISED COORDINATE SYSTEM, MOVED SCR LAYDOWN AREA, BLOWDOWN TANK, AND SCR SKID	MDS	JRS	KJT	09/24/15	4

SIEMENS

This Drawing and Design shown herein, is the property of CMI Energy, LLC and shall not be used or reproduced by a third party without written approval from CMI Energy, LLC

Drawing Status: **FINAL**

Revision Status: 8

THIRD ANGLE PROJECTION

DRAWING FORMAT IS IMPERIAL

	METRIC	IMPERIAL
DRAWING UNITS	MM	Ft' - In"
DIM. TOLERANCE	±2MM	±1/16"
DEC. TOLERANCE	0.254	0.01

SUPPLIER: CMI ENERGY

Project Name: CPV VALLEY ENERGY CENTER

Proprietary Information:

Service Company Name: -

Cad File No. 2068-099-G10102

Title: GENERAL ARRANGEMENT TOP VIEW

UNIT ID. NO. 497456892 | Size XX | Scale NTS | Drawing No. 2068-099-G10102 | Sheet 1 of 1

Appendix D Fuel Flowmeter Locations

The attached P&ID drawings detail location of the certified fuel flowmeters and fuel analysis tap points (cross reference 40 CFR 75 §75.53(f)(1)(ii)(A)).

NOTES:

1. ORIFICE PLATE REQUIRES 12 STRAIGHT PIPE DIAMETERS BETWEEN STRAIGHTENER AND ORIFICE PLATE AND 18 STRAIGHT PIPE DIAMETERS FROM ORIFICE PLATE TO FITTING UPSTREAM STRAIGHTENER. ORIFICE PLATE REQUIRES 4 STRAIGHT PIPE DIAMETERS DOWNSTREAM ORIFICE PLATE.
2. PROVIDE TEMPORARY SPOOL FOR AIR BLOW
3. LOCATE TAP 4 STRAIGHT PIPE DIAMETER MIN FROM FLANGE
4. LOCATE TAP 10 STRAIGHT PIPE DIAMETER MIN FROM FLANGE
5. FLOW ORIFICE REQUIRES STARIGHT RUN OF 30 STRAIGHT PIPE DIAMETER MIN UPSTEAM AND 7 STRAIGHT PIPE DIAMETER MIN DOWNSTREAM
6. LOCATE TAPS 10 STRAIGHT PIPE DIAMETERS DOWNSTREAM FROM VALVES.

IT IS A VIOLATION OF SECTION 7209-2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER ANY DOCUMENT THAT BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THE PERSON IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

FOR CONSTRUCTION

no.	date	by	ckd	description
3	03/01/17	BAN	CRF	REVISED AS SHOWN
2	10/07/16	RMS	BAN	REVISED AS SHOWN
1	06/30/16	RMS	DSH	ISSUED FOR CONSTRUCTION
0	01/15/16	RMS	DSH	ISSUED FOR BELOW GRADE ROUTING

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. 0011996
designed R. SUTHERLIN
detailed R. CHANDLER

CPV Valley Energy Center
ORANGE COUNTY, NEW YORK

Piping & Instrumentation Diagram
FUEL GAS

project 84595
contract
drawing MM0FGS-001 – rev. 3
sheet of sheets
file 84595MM0FGS001.pid

\Energy Center\Common\84595MM0FGS001.pid

NOTES:

1. REFER TO SIEMENS DRAWING 499244497
2. METER SECTION REQUIRES ADDITIONAL PIPE STRAIGHT RUN OF 20 PIPE DIAMETERS UPSTREAM. REFER TO SIEMENS DRAWING DP2IT-00000113
3. REFER TO SIEMENS DRAWING TCVGC55D2680
4. REFER TO SIEMENS DRAWING TCVGC55D2681
5. REFER TO SIEMENS DRAWING S16-11602-2-1
6. REFER TO SIEMENS DRAWING 70B7119-V
7. REFER TO SIEMENS DRAWING 2068-000-G30801
8. REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 21 & 70B6674
9. REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 22
10. PROVIDE SPOOL FOR AIR BLOW
11. PROVIDE SPOOL FOR AIR BLOW
12. COMMON TEMPORARY HOSE FOR NITROGEN PURGE CONNECTION. HOSE SHALL BE DISCONNECTED DURING NORMAL OPERATION.
13. REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 49

IT IS A VIOLATION OF SECTION 7209-2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER ANY DOCUMENT THAT BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THE PERSON IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

FOR CONSTRUCTION

no.	date	by	ckd	description
1	10/07/16	RMS	BAN	REVISED AS SHOWN
0	06/30/16	RMS	DSH	ISSUED FOR CONSTRUCTION-WORKING

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. 0011996

designed: R. SUTHERLIN
detailed: R. CHANDLER

CPV Valley Energy Center
ORANGE COUNTY, NEW YORK

Piping & Instrumentation Diagram
FUEL GAS

project: 84595
contract:
drawing: MM1FGS-001 — rev. 1
sheet of sheets
file 84595MM1FGS001.pid

\Energy Center\Unit 1\84595MM1FGS001.pid

NOTES:
1. PIPE SIZE SHOWN IS CARRIER PIPE SIZE. SEE PIPE SPEC 00CSJ01 FOR CONTAINMENT PIPE SIZE. CONTAINMENT PIPE LINE NUMBER INCLUDES SUFFIX J.

2. INSTRUMENT IS CONNECTED TO STRAINER.

3. MINIMUM STRAIGHT PIPE RUN DISTANCE UPSTREAM OF FLOW ELEMENT IS 10 FT AND DOWNSTREAM IS 4 FT.

4. ALLOW OPERATIONS TO RECIRCULATE STAGNANT OIL FROM GAS TURBINE.

5. VERAC TANK GAUGING SYSTEM SUPPLIED WITH TANK.

6. NOT USED.

7. LEAK SENSORS CONNECT TO CASING INSPECTION PORTS.

8. SEE TANK DATASHEET 48 56 60, 0FOL-TNK-0001 FOR DETAIL.

9. ROUTE OUTSIDE CONTAINMENT WALL. PROVIDE FFFE CONNECTION. HOSE CONNECTION BY 5.8360.

IT IS A VIOLATION OF SECTION 7209-2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER ANY DOCUMENT THAT BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THE PERSON IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

FOR CONSTRUCTION

no.	date	by	ckd	description
3	03/01/17	BEB	BAN	REVISED AS SHOWN
2	10/07/16	BEB	BAN	REVISED AS SHOWN
1	06/30/16	BEB	BAN	ISSUED FOR CONSTRUCTION
0	01/15/16	BEB	DSH	ISSUED FOR BELOW GRADE ROUTING

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. 0011996

designed: B. BOWMAN | detailed: B. BOWMAN

CPV Valley Energy Center
ORANGE COUNTY, NEW YORK

Piping & Instrumentation Diagram
FUEL OIL

project: 84595 | contract:
drawing: MM0FOL-001 | rev. – 3
sheet | of | sheets
file 84595MM0FOL001.pid

\Energy Center\Common\84595MM0FOL001.pid

NOTES:

1. REFER TO SIEMENS DRAWING 499244497
2. METER SECTION REQUIRES ADDITIONAL PIPE STRAIGHT RUN OF 20 PIPE DIAMETERS UPSTREAM. REFER TO SIEMENS DRAWING DP2IT-00000113
3. REFER TO SIEMENS DRAWING TCVGC55D2680
4. REFER TO SIEMENS DRAWING TCVGC55D2681
5. REFER TO SIEMENS DRAWING S16-11602-2-1
6. REFER TO SIEMENS DRAWING 70B7119-V
7. REFER TO SIEMENS DRAWING 2068-000-G30801
8. REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 21 & 70B6674
9. REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 22
10. PROVIDE SPOOL FOR AIR BLOW
11. PROVIDE SPOOL FOR AIR BLOW
12. ~~COMMON TEMPORARY HOSE FOR NITROGEN PURGE CONNECTION~~
13. ~~REFER TO SIEMENS DRAWING US1177-MB-MFB030-011200 PAGE 49~~

IT IS A VIOLATION OF SECTION 7209-2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER ANY DOCUMENT THAT BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THE PERSON IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

FOR CONSTRUCTION

no.	date	by	ckd	description
1	10/07/16	RMS	BAN	REVISED AS SHOWN
0	06/30/16	RMS	DSH	ISSUED FOR CONSTRUCTION-WORKING

no.	date	by	ckd	description

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. 0011996

designed: R. SUTHERLIN
detailed: R. CHANDLER

CPV Valley Energy Center
ORANGE COUNTY, NEW YORK

Piping & Instrumentation Diagram
FUEL GAS

project: 84595
contract:
drawing: MM2FGS-001 – rev. 1
sheet of sheets
file 84595MM2FGS001.pid

\Energy Center\Unit 2\84595MM2FGS001.pid

NOTES:
1. PIPE SIZE SHOWN IS CARRIER PIPE SIZE. SEE PIPE SPEC 00CSJ01 FOR CONTAINMENT PIPE SIZE. CONTAINMENT PIPE LINE NUMBER INCLUDES SUFFIX J.

2. INSTRUMENT CONNECTED TO STRAINER.

3. LEAK SENSORS CONNECT TO CASING INSPECTION PORT.

IT IS A VIOLATION OF SECTION 7209-2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER ANY DOCUMENT THAT BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THE PERSON IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

FOR CONSTRUCTION

no.	date	by	ckd	description	no.	date	by	ckd	description
2	10/07/16	BEB	BAN	REVISED AS SHOWN					
1	06/30/16	BEB	BAN	ISSUED FOR CONSTRUCTION					
0	01/15/16	BEB	DSH	ISSUED FOR BELOW GRADE ROUTING					

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. 0011996

designed: B. BOWMAN
detailed: B. BOWMAN

CPV Valley Energy Center
ORANGE COUNTY, NEW YORK

Piping & Instrumentation Diagram
FUEL OIL

project: 84595
contract:
drawing: MM0FOL-002 — rev. 2
sheet of sheets
file 84595MM0FOL002.pid

\Energy Center\Common\84595MM0FOL002.pid

7016 0600 0000 8503 7063

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

NEW YORK, NY 10007

OFFICIAL USE

Certified Mail Fee $	$3.35
	$2.75
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy) $	$0.00
☐ Return Receipt (electronic) $	$0.00
☐ Certified Mail Restricted Delivery $	$0.00
☐ Adult Signature Required $	$0.00
☐ Adult Signature Restricted Delivery $	
Postage $	$1.82
Total Postage and Fees $	$7.92

0060
05

Postmark Here

06/14/2017

Sent To
USEPA REGION II AIR COMP BRANCH
Street and Apt. No., or PO Box No.
290 BROADWAY
City, State, ZIP+4®
NEW YORK, NY 10007-1866

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0600 0000 8503 7070

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

WASHINGTON, DC 20460

OFFICIAL USE

Certified Mail Fee $	$3.35
	$2.75
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy) $	$0.00
☐ Return Receipt (electronic) $	$0.00
☐ Certified Mail Restricted Delivery $	$0.00
☐ Adult Signature Required $	$0.00
☐ Adult Signature Restricted Delivery $	
Postage $	$2.03
Total Postage and Fees $	$8.13

0060
05

Postmark Here

06/14/2017

Sent To
USEPA CLEAN AIR MARKETS DIVISION
Street and Apt. No., or PO Box No.
1200 PENNSYLVANIA AVE, NW
City, State, ZIP+4®
WASHINGTON, DC 20460

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0600 0000 8503 7094

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

NEW PALTZ, NY 12561

OFFICIAL USE

Certified Mail Fee $	$3.35
	$2.75
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy) $	$0.00
☐ Return Receipt (electronic) $	$0.00
☐ Certified Mail Restricted Delivery $	$0.00
☐ Adult Signature Required $	$0.00
☐ Adult Signature Restricted Delivery $	
Postage $	$2.03
Total Postage and Fees $	$8.13

0060
05

Postmark Here

06/14/2017

Sent To
REGIONAL AIR POLLUTION CONTROL ENG. NYSDEC REGION 3
Street and Apt. No., or PO Box No.
21 SOUTH PUTT CORNERS RD
City, State, ZIP+4®
NEW PALTZ, NY 12561

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0600 0000 8503 7087

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

ALBANY, NY 12233

OFFICIAL USE

Certified Mail Fee $	$3.35
	$2.75
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy) $	$0.00
☐ Return Receipt (electronic) $	$0.00
☐ Certified Mail Restricted Delivery $	$0.00
☐ Adult Signature Required $	$0.00
☐ Adult Signature Restricted Delivery $	
Postage $	$1.82
Total Postage and Fees $	$7.92

0060
05

Postmark Here

06/14/2017

Sent To
Division of Air Resources NYSDEC - Bureau of QA
Street and Apt. No., or PO Box No.
625 BROADWAY
City, State, ZIP+4®
ALBANY, NEW YORK 12233-3258

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

USEPA REGION II
AIR COMPLIANCE BRANCH
290 BROADWAY
NEW YORK, NY 10007-1866

9590 9402 2493 6306 1515 43

2. Article Number (Transfer from service label)

7016 0600 0000 8503 7063

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Chris Maloney
☐ Agent ☐ Addressee

B. Received by (Printed Name): Chris Maloney
C. Date of Delivery: 6-19-17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
ail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

REGIONAL AIR POLLUTION CONTROL ENGINEER
NYSDEC - REGION #3
SOUTH PUTT CORNERS RD
NEW PALTZ, NY 12561

9590 9402 2493 6306 1515 12

Article Number (Transfer from service label)

7016 0600 0000 8503 7094

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jen Cutter
☑ Agent ☐ Addressee

B. Received by (Printed Name): Jen Cutter
C. Date of Delivery: 6/16/17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
Mail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

DIVISION OF AIR RESOURCES
NYSDEC - BUREAU OF QA
625 BROADWAY
ALBANY, NY 12233-3258

9590 9402 2493 6306 1515 29

2. Article Number (Transfer from service label)

7016 0600 0000 8503 7087

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X RECEIVED
☐ Agent ☐ Addressee

B. Received by (Printed Name): JUN 16 2017
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No
MAILROOM

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
ail Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

USEPA CLEAN AIR MARKETS DIV.
200 PENNSYLVANIA AVE, NW
MAIL CODE 6204M
WASHINGTON, DC 20460

9590 9402 2493 6306 1515 36

Article Number (Transfer from service label)

7016 0600 0000 8503 7070

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Mail Management
☐ Agent ☐ Addressee

B. Received by (Printed Name)
C. Date of Delivery: JUN 19 2017

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☑ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Continuous Emissions Monitoring System (CEMS)

40 CFR 75 and 40 CFR 60 Certification Test Report

Report Date: June 2018
Revision: A
CEMTEK Project No.: 50478A
Siemens UNID No.: 498368484

Prepared for:

CPV Valley Energy Center
CTG Unit 2 Stack CEMS
Middletown, NY

Prepared by:
CEMTEK KVB-Enertec
3041 S. Orange Ave
Santa Ana, CA 92707-4247
Phone: 714-437-7100
Fax: 714-437-7177
www.cemteks.com

Contents

1 Introduction

This document is intended to satisfy the CEMS certification requirements of the USEPA as required by the Code of Federal Regulations, Title 40, Part 75 (40 CFR 75 or Part 75), Appendix A and 40 CFR 60 (Part 60) Appendix B Performance Specifications. This document summarizes the test program and test results.

Data from the various tests performed under this program provides resources for evaluating the acceptability of the operation of the facility's continuous emissions monitoring system (CEMS).

Tests were performed by personnel from CEMTEK Environmental Inc. with assistance from facility technicians.

The performance tests completed in this certification test program include:

- Part 75 Linearity Check – NO_X, O_2
- Part 75/Part 60 Cycle/Response Time Check – NO_X, O_2, CO
- Part 75/Part 60 Calibration Drift Check (7-day drift test) – NO_X, O_2, CO, CO_2
- Part 60 CGA – CO
- Relative Accuracy Test Audit (RATA)

1.1 Facility Description

The Valley Energy Center facility is located in Wawayanda, NY and consists of one combined cycle power plant operating on dual-fuel (natural gas and fuel oil) with duct burning.

The Facility consists of: two (2) Siemens SGT6-5000F (4) gas turbines with Dry Low NO_X (DLN) Combustion Systems, operating in 2x1 combined cycle configuration, firing natural gas and ultra-low sulfur diesel (ULSD) fuel oil; two (2) 3-drum HRSG's equipped with SCR systems for NO_X control and oxidation catalysts for CO and VOC control; and one (1) Siemens SST6-5000 steam turbine generator (STG).

This report summarizes test results for Unit 2.

1.2 CEMS Overview

The CEMS measures concentrations of carbon monoxide (CO), oxides of nitrogen (NO_X), and oxygen (O_2) from the turbine exhaust stack. All measurements are done on a real time basis. Contact closures are provided for alarms and system status.

All flue gas pollutant and diluent measurements are made on a dry basis. Effluent gas from the sampling location is filtered and transported through heated sample lines to the sample conditioning system in the main analyzer equipment rack. The sample conditioning system again filters the effluent gas. A sample gas cooler removes moisture. The dry, particulate-free effluent gas sample is supplied to each analyzer within the equipment rack. The analog outputs of each analyzer and certain plant signal inputs are transmitted to a system controller located with the analyzer components.

The system operates automatically so operator attention is necessary only for manual verification and accuracy and normal maintenance. Automatic zero and span calibrations are performed on the CEMS monitors every 24 hours. Certified EPA Protocol calibration gases are injected at a valve box in the back of the probe.

1.2.1 CEMS Analyzers

The following table summarizes the analyzer components of the CEMS.

CTG CEMS Unit 2

Analyzer	Manufacturer/Model	Range(s)	Serial Number
NO_X	Teledyne API T200M	0-10 ppm/0-100 ppm	646
O_2		0-25%	
CO	Teledyne API T300M	0-10 ppm/0-3000 ppm	354
CO_2		0-10%	

1.2.2 Data Acquisition System

The CEMS Data Acquisition and Reporting is controlled by the DAHS. The DAHS is a PC-based, multi-user, multi-tasking system. The DAHS provides automated data monitoring and management capabilities to the CEMS. The DAHS is utilized for operator interface, data storage, report generation, and data display.

The PLC transmits data from the analyzers to the DAHS. The DAHS polls the PLC for data to generate and store one (1) minute averages. The DAHS will indicate any occurrence of specification limit exceedances or CEM operational problems. In the DAHS, necessary reports are generated in the required format for submittal to the applicable regulatory agencies. These reports may be produced in either hard copy or electronic format and can be made available to state and local agencies.

All required reporting parameters follow the equations in 40 CFR Part 75 Appendices D, F, and G and facility operating permit as applicable.

2 Summary of Results

The results of all tests performed are summarized in the following tables. Procedural test descriptions are located in Section 3. DAHS printouts and supporting documentation for all tests are located within Section 4 of this document.

2.1 Results Summary Tables

Table 1: NO_X Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 75 RATA	7.01% lb/mmBtu by RM	≤10% semi-annual, ≤7.5% annual (by RM) or alternately ≤0.02 lb/mmBtu difference semi-annual, ≤0.015 lb/mmBtu difference annual (40 CFR 75, Appendix A and B)	5/11/18
Part 75 BAF	1.052	|d| > |cc|, the monitoring system has failed to meet bias test criteria, data to be adjusted to calculated BAF. If passed, BAF = 1.000	
Part 60 RATA	5.0% ppm @15% O_2 4.6% ppm 5.4% lb/hr	≤20% or ≤10% applicable standard (40 CFR 60, Appendix B, PS-2)	
Low Range Results			
Linearity Check	Low = 3.58% Mid = 4.13% High = 2.07%	≤5% of reference or ≤5 ppm absolute difference (40 CFR 75, Appendix A)	5/11/18
Cycle Time	Zero run = 2 min Span run = 3 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 0.00% span = 1.80%	≤2.5% of span or for ranges ≤200 ppm, then ≤5 ppm absolute difference (40 CFR 75, Appendix A)	4/24/18 thru 5/2/18
High Range Results			
Linearity Check	Low = 3.39% Mid = 2.12% High = 1.86%	≤5% of reference or ≤5 ppm absolute difference (40 CFR 75, Appendix A)	5/10/18
Cycle Time	Zero run = 3 min Span run = 3 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 0.10% span = 0.85%	≤2.5% of span or for ranges ≤200 ppm, then ≤5 ppm absolute difference (40 CFR 75, Appendix A)	4/24/18 thru 5/2/18

Table 2: O_2 Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 75 RATA	0.5% by RM	≤10% semi-annual, ≤7.5% annual (by RM) or alternately ≤1.0% difference semi-annual, ≤0.7% difference annual (40 CFR 75, Appendix A and B)	5/11/18
Linearity Check	Low = 2.52% Mid = 0.14% High = 0.05%	≤5% of reference or ≤0.5% difference (40 CFR 75, Appendix A)	5/11/18
Cycle Time	Zero run = 2 min Span run = 1 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 0.00% span = 0.01%	≤0.5% difference (40 CFR 75, Appendix A)	4/25/18 thru 5/3/18

Table 3: CO Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 60 RATA	0.6 ppm diff @ 15% O_2 0.6 ppm diff 0.6 lb/hr diff	≤10% by RM or ≤5% of applicable standard or difference + CC ≤5 ppm (40 CFR 60, Appendix B, PS-4/4A)	5/11/18
Low Range Results			
Response Time	2 min 40 sec	≤240 seconds (4 minutes) (40 CFR 60, PS-4A eCFR)	5/8/18
7-Day Drift, Highest Reading	zero = 2.00% span = 3.60%	≤5.0% of full span 6 out of 7 days (40 CFR 60, Appendix B, PS-4)	4/24/18 thru 5/2/18
CGA	Low = -11.36% Mid = -4.59%	≤15.0% of reference value or ≤5.0 ppm difference (40 CFR 60 Appendix F Procedure 1)	5/11/18
High Range Results			
Response Time	2 min 40 sec	≤240 seconds (4 minutes) (40 CFR 60, PS-4A eCFR)	5/8/18
7-Day Drift, Highest Reading	zero = 0.06% span = 0.68%	≤5.0% of full span 6 out of 7 days (40 CFR 60, Appendix B, PS-4)	4/24/18 thru 5/2/18
CGA	Low = 3.04% Mid = 1.71%	≤15.0% of reference value or ≤5.0 ppm difference (40 CFR 60 Appendix F Procedure 1)	5/11/18

Table 4: CO_2 Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
7-Day Drift, Highest Reading	zero = 0.00% span = 0.30%	≤0.5% difference (40 CFR 60, Appendix B, PS-3)	4/24/18 thru 5/2/18

3 Test Procedures

The test procedures used in this certification program were done in accordance with the methods outlined in 40 CFR 75 Appendix A and 40 CFR 60 Appendix B Performance Specifications. The following provides a brief overview on individual test procedures.

Test description for the RATA portion of the test program is attached as Section 5.

3.1 7-Day Calibration Error Test – NO_X, O_2

An on-site calibration error test (7-day drift test) was performed for each NO_X and O_2 monitoring system in accordance with 40 CFR 75, Appendix A, Section 6.3. The tests were performed while the unit was combusting fuel at stabilized stack temperature and pressure conditions.

The calibration error test consists of measuring the calibration error of each monitor scale once each day for seven (7) consecutive unit operating (process on line) days. The calibration error tests were conducted at two EPA Traceability Protocol 1 calibration gas concentrations: zero-level (0-20%) and high-level (80-100%) as specified in 40 CFR 75, Appendix A, Section 6.3.1.

In accordance with 40 CFR 75, Appendix A, Section 3.1, results of the 7-day calibration error test are acceptable if the daily calibration error does not exceed: 2.5% for NO_X and 0.5% for O_2. Alternatively, if the pollutant monitor's span value is equal to or less than 200 ppm, then calibration error shall not exceed 5.0 ppm difference.

Calibrations were performed automatically at approximately 24-hour intervals by the system controller during the drift test period. The readings for each analyzer were taken from the DAHS at the completion of the calibration routine. Copies of the DAHS reports are included with this test report. Manual or automatic adjustments were not made to the monitors until after the zero and high drift responses had been taken for that day during the 7-day test.

The percent calibration error is determined using the following equation:

Daily Drift for Pollutants 40 CFR 75, Appendix A Equation A-5	
$$CE = \frac{\lvert R - A \rvert}{S} \times 100$$	CE = Calibration error as a percentage of instrument span R = Zero or high-level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The calibration error for diluent (O_2) monitors is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Diluents **40 CFR 75, Appendix A, Equation A-5**	
$$CE = \mid R - A \mid$$	CE = Calibration error as a percentage of O_2 R = Zero or high-level calibration gas value in percent (%). A = Actual monitor response to calibration gas in percent (%)

3.2 7-Day Calibration Drift Test CO and CO_2 Monitors

The CO_2 analyzer is used for process monitoring and control (non-compliance). A 7-day calibration drift check was performed as a demonstration of analyzer accuracy with results reported in this report.

Calibrations were performed on the CO and CO_2 analyzer(s) automatically at approximately 24-hour intervals by the DAHS for seven consecutive unit operating (process on-line) days. The calibration drift tests were conducted at two calibration gas concentrations: zero-level (0-20%) and high-level (50-100%) as specified in 40 CFR 60 Appendix B Performance Specifications. The low and high span (zero and span gas) readings for each analyzer were taken from the DAHS at the completion of the calibration routine (40 CFR 60, Appendix B, PS-2, Section 4.1).

The 24-hour calibration drifts were calculated and reported by the following method (40 CFR 60, Appendix B, PS-2). For CO analyzers, the raw zero reading is subtracted from the zero-gas bottle value, the difference is then divided by the analyzer's span and the resultant value is multiplied by 100 to give the percent calibration drift. The preceding procedure is repeated with the span gas to give the span drift.

Daily Drift for CO **40 CFR 60, Appendix B, PS-2 and PS-4**	
$$CD = \frac{R - A}{S} \times 100$$	CD = Calibration error as a percentage of instrument span R = Zero or high-level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The calibration error for the CO_2 monitor is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Diluents ***40 CFR 60, Appendix B, PS-3 for CO_2***	
$$\mathbf{CD = R - A}$$	CD = Calibration drift as a percentage of CO_2 R = Zero or high level calibration gas value in percent (%) A = Actual monitor response to calibration gas in percent (%)

The 24-hour calibration drift must not exceed ±5% for CO (6 out of 7 days) and ±0.5% difference for CO_2.

3.3 Linearity Error Check – NO_X, O_2

An on-site linearity check test was conducted in accordance with the 40 CFR 75, Appendix A, for each NO_X and O_2 monitoring system. The test was performed while the unit was combusting primary fuel at stabilized stack temperature and pressure conditions.

EPA Protocol certified calibration gases were used to conduct the linearity checks of the analyzers. Three points (concentrations) of calibration gases, low (20-30%), mid (50-60%) and high (80-100%) were introduced at the probe (40 CFR 75, Appendix A, Section 5.2). Each monitor was challenged three times with the appropriate reference gas, without using the same gas twice in succession. The monitors' response for each concentration was recorded. The average of the three responses will be used to calculate the linearity error (40 CFR 75, Appendix A, Section 6.2).

Linearity error was calculated using the following equation.

Linearity Error **Equation A-4, 40 CFR 75, Appendix A**	
$$\mathbf{LE = \frac{\lvert R - A \rvert}{R} \times 100}$$	LE = Percent Linearity Error R = Calibration gas reference value A = Average of monitor response

Linearity Check: Alternate Criteria **40 CFR 75, Appendix A, Section 3**	
$$\mathbf{LE = \lvert R - A \rvert}$$	LE = Percent linearity error R = Calibration gas reference value A = Average of monitor response

Linearity checks are acceptable for monitor certification if none of the test results exceed the applicable performance specification of 40 CFR 75, Appendix A, Section 3.2. The results of the NO_X and O_2 shall be less than 5.0% as calculated by the above equation or the alternative criteria of ≤0.5% O_2 or ≤5 ppm difference for NO_X.

Note: If the NO_X span value is ≤30 ppm, that range of the analyzer is exempt from the linearity test requirements per 40 CFR 75, Appendix A, Section 6.2.

3.4 CO Analyzer Cylinder Gas Audit

Although not required for certification compliance (per Part 60 PS-4A) a Cylinder Gas Audit (CGA) was performed on the CO analyzer utilizing procedures from 40 CFR 60 Appendix F Procedure 1. The CGA was conducted as a demonstration check with results included in the CO analyzer summary table.

Separate calibration gas cylinders are used for the two required concentration levels during the audit. Three non-consecutive runs at each concentration level are performed. The calibration gases are introduced at the probe interface box and transported through the CEMS sampling system (normal sampling flow path).

The accuracy values for each concentration should not exceed 15% as calculated in the following equation or 5 ppm difference:

Cylinder Gas Audit Accuracy ***40 CFR 60, Appendix F, Section 6.3***	
$$A = \frac{C_m - C_a}{C_a} x\,100$$	A = Percent accuracy of the CEM C_m = The average monitor response to the specific audit gas (high or low) in units of concentration C_a = Certified value of audit gas (value according to EPA Protocol certification) in units of concentration

3.5 Cycle/Response Time Check – NO_X, O_2

The cycle time test measures the monitor's reaction time to a change in gas concentration (40 CFR 75, Appendix A, Section 6.4). The system measured stack concentrations until a stable response was observed. The stable stack value was recorded. A low-level (zero) calibration gas was injected at the probe sample interface. Gas injection at the probe continued until a stable monitor response was reached. Next the monitor was switched back to monitor stack gas until a stable reading was achieved and the time recorded. A span-level (80-100% of span) calibration gas was then injected at the probe until a stable response was reached. The amount of time required for the system to respond to 95% of the final stable calibration gas response value was recorded. The time was recorded for the upscale test and the downscale test for each analyzer. The response time for NO_X and O_2 will be ≤15 minutes.

The two cycle times for the upscale and downscale tests were compared. The longer of these two times was recorded as the cycle time for the analyzer.

For monitors with dual ranges, the test results from the range giving the longer cycle time was reported.

3.6 CO Analyzer Response Time Check

An on-site response time test for the CO monitoring system was performed in accordance with Performance Specification 4A, section 8.3 (as specified in recent eCFR posting). The response time test measures the monitor's reaction time to a change in gas concentration. A zero-level calibration gas was injected at the probe interface valve box such that the entire sampling system is included in the test. Gas injection continued until a stable monitor response was reached. A high span gas was then introduced to probe valve box until a stable value was observed. The upscale response time required is the amount of time to reach 95% of the final stable end value. The zero gas was re-introduced until a stable reading was reached. The downscale response time required is the amount of time to reach 95% of the final stable end value. The response times for 3 repetitions of upscale and downscale runs were recorded. An average of the 3 upscale and 3 downscale runs was determined. The response time of the longer (slower) of the two means must be ≤240 seconds (4 minutes).

The daily zero and span calibration gases were utilized for response time testing.

4 Test Data and Supporting Documentation

This section contains DAHS printouts and supporting documentation for tests performed in this certification test program.

4.1 7-Day Calibration Drift Data

The following pages contain DAHS printouts and supporting documentation for the drift tests performed on the gas analyzers and flow monitors. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A and 40 CFR 60 Appendix B Performance Specifications (as applicable).

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - NOx Low Range

40 CFR 75

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **646**
Measurement Span (ppm): **10**

Span Gas Option
High 80-100%

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.68**	86.80	OK	CC280797	12/06/20	OK

			Zero Reading					
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Difference |R-A|	Alt. Criteria (5 ppm diff)	Zero Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	24-Apr-18	9:53	0.00	**0.00**	0.00	PASS	0.00	PASS
2	25-Apr-18	11:33	0.00	**0.00**	0.00	PASS	0.00	PASS
3	28-Apr-18	15:08	0.00	**0.00**	0.00	PASS	0.00	PASS
4	29-Apr-18	14:57	0.00	**0.00**	0.00	PASS	0.00	PASS
5	30-Apr-18	1:29	0.00	**0.00**	0.00	PASS	0.00	PASS
6	1-May-18	18:09	0.00	**0.00**	0.00	PASS	0.00	PASS
7	2-May-18	12:09	0.00	**0.00**	0.00	PASS	0.00	PASS

Highest Zero Difference **0.00** **Highest Zero Drift** **0.00**

			Span Reading					
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Difference |R-A|	Alt. Criteria (5 ppm diff)	Span Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	24-Apr-18	9:56	8.68	**8.70**	0.02	PASS	0.20	PASS
2	25-Apr-18	11:36	8.68	**8.60**	0.08	PASS	0.80	PASS
3	28-Apr-18	15:11	8.68	**8.60**	0.08	PASS	0.80	PASS
4	29-Apr-18	15:00	8.68	**8.50**	0.18	PASS	1.80	PASS
5	30-Apr-18	1:32	8.68	**8.50**	0.18	PASS	1.80	PASS
6	1-May-18	18:12	8.68	**8.50**	0.18	PASS	1.80	PASS
7	2-May-18	12:12	8.68	**8.50**	0.18	PASS	1.80	PASS

Highest Span Difference **0.18** **Highest Span Drift** **1.80**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Alternately a 40-60% of span may be used.
Change the Span Gas Option cell if a mid-level gas is used.

Pass/Fail Criteria: 2.5% of span each day of drift period
or if the span is 200 ppm or less, then 5 ppm difference
(40 CFR 75, Appendix A, Section 3.1)

*Only use alternate criteria when span is less than 200 ppm

Equation (40 CFR 75, Appendix A, Eq. A-5):

CE = (|R - A| / R) x 100
or alternate for span ranges less than or equal to 200 ppm
CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - NOx High Range

40 CFR 75

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **646**
Measurement Span (ppm): **100**

Span Gas Option
High 80-100%

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**88.75**	88.75	OK	CC477949	09/25/25	OK

Day	Date	Cal Time	Zero Reading Cal Gas (R)	Zero Reading Response (A)	Zero Reading Difference |R-A|	Alt. Criteria (5 ppm diff)	Zero Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	24-Apr-18	9:53	0.00	**0.10**	0.10	PASS	0.10	PASS
2	25-Apr-18	11:33	0.00	**0.00**	0.00	PASS	0.00	PASS
3	28-Apr-18	15:08	0.00	**0.00**	0.00	PASS	0.00	PASS
4	29-Apr-18	14:57	0.00	**0.00**	0.00	PASS	0.00	PASS
5	30-Apr-18	1:29	0.00	**0.00**	0.00	PASS	0.00	PASS
6	1-May-18	18:09	0.00	**0.00**	0.00	PASS	0.00	PASS
7	2-May-18	12:09	0.00	**0.00**	0.00	PASS	0.00	PASS

Highest Zero Difference **0.10** **Highest Zero Drift** **0.10**

Day	Date	Cal Time	Span Reading Cal Gas (R)	Span Reading Response (A)	Span Reading Difference |R-A|	Alt. Criteria (5 ppm diff)	Span Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	24-Apr-18	9:59	88.75	**89.10**	0.35	PASS	0.35	PASS
2	25-Apr-18	11:39	88.75	**89.40**	0.65	PASS	0.65	PASS
3	28-Apr-18	15:14	88.75	**88.50**	0.25	PASS	0.25	PASS
4	29-Apr-18	15:03	88.75	**88.20**	0.55	PASS	0.55	PASS
5	30-Apr-18	1:35	88.75	**88.10**	0.65	PASS	0.65	PASS
6	1-May-18	18:15	88.75	**88.10**	0.65	PASS	0.65	PASS
7	2-May-18	12:15	88.75	**87.90**	0.85	PASS	0.85	PASS

Highest Span Difference **0.85** **Highest Span Drift** **0.85**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Alternately a 40-60% of span may be used.
Change the Span Gas Option cell if a mid-level gas is used.

Pass/Fail Criteria: 2.5% of span each day of drift period
or if the span is 200 ppm or less, then 5 ppm difference
(40 CFR 75, Appendix A, Section 3.1)

*Only use alternate criteria when span is less than 200 ppm

Equation (40 CFR 75, Appendix A, Eq. A-5):

CE = (|R - A| / R) x 100
or alternate for span ranges less than or equal to 200 ppm
CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **PASS**

7-Day Calibration Error (Drift) - CO Low Range

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **354**
Measurement Span (ppm): **10**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.94**	89.40	OK	CC280797	12/06/20	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Zero Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	24-Apr-18	9:53	0.00	**0.00**	0.00	PASS
2	25-Apr-18	11:33	0.00	**-0.10**	1.00	PASS
3	28-Apr-18	15:08	0.00	**0.10**	1.00	PASS
4	29-Apr-18	14:57	0.00	**0.00**	0.00	PASS
5	30-Apr-18	1:29	0.00	**0.20**	2.00	PASS
6	1-May-18	18:09	0.00	**0.10**	1.00	PASS
7	2-May-18	12:09	0.00	**0.10**	1.00	PASS

Highest Zero Drift **2.00**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Span Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	24-Apr-18	9:56	8.94	**8.90**	0.40	PASS
2	25-Apr-18	11:36	8.94	**9.10**	1.60	PASS
3	28-Apr-18	15:11	8.94	**9.30**	3.60	PASS
4	29-Apr-18	15:00	8.94	**9.10**	1.60	PASS
5	30-Apr-18	1:32	8.94	**9.00**	0.60	PASS
6	1-May-18	18:12	8.94	**8.90**	0.40	PASS
7	2-May-18	12:12	8.94	**8.80**	1.40	PASS

Highest Span Drift **3.60**

Notes:
Allowed calibration gas ranges (40 CFR 60)
0-20% of span
50-100% of span

Pass/Fail Criteria: 5.0% of span for 6 out of 7 days

Equation (40 CFR 60, Appendix B, PS-4):
CD = (R - A / S) x 100
CD = Calibration Drift, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **PASS**

7-Day Calibration Error (Drift) - CO High Range

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **354**
Measurement Span (ppm): **3000**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**2591.00**	86.37	OK	EB0095371	09/19/25	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Zero Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	24-Apr-18	9:53	0.00	**0.80**	0.03	PASS
2	25-Apr-18	11:33	0.00	**-0.90**	0.03	PASS
3	28-Apr-18	15:08	0.00	**-1.90**	0.06	PASS
4	29-Apr-18	14:57	0.00	**-0.40**	0.01	PASS
5	30-Apr-18	1:29	0.00	**-0.60**	0.02	PASS
6	1-May-18	18:09	0.00	**-0.80**	0.03	PASS
7	2-May-18	12:09	0.00	**-0.90**	0.03	PASS

Highest Zero Drift **0.06**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Span Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	24-Apr-18	10:02	2591.00	**2578.10**	0.43	PASS
2	25-Apr-18	11:42	2591.00	**2601.40**	0.35	PASS
3	28-Apr-18	15:17	2591.00	**2604.40**	0.45	PASS
4	29-Apr-18	15:06	2591.00	**2611.30**	0.68	PASS
5	30-Apr-18	1:38	2591.00	**2608.90**	0.60	PASS
6	1-May-18	18:18	2591.00	**2599.90**	0.30	PASS
7	2-May-18	12:18	2591.00	**2598.00**	0.23	PASS

Highest Span Drift **0.68**

Notes:
Allowed calibration gas ranges (40 CFR 60)
0-20% of span
50-100% of span

Pass/Fail Criteria: 5.0% of span for 6 out of 7 days

Equation (40 CFR 60, Appendix B, PS-4):
CD = (R - A / S) x 100
CD = Calibration Drift, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - O2

40 CFR 75, Appendix A, Section 3.1

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **646**
Analyzer Range (%): **25**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**20.89**	83.56	OK	EB0095371	09/19/25	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift |R-A|**	**Criteria (% diff)**
1	25-Apr-18	11:33	0.00	**0.00**	0.00	PASS
2	28-Apr-18	15:08	0.00	**0.00**	0.00	PASS
3	29-Apr-18	14:57	0.00	**0.00**	0.00	PASS
4	30-Apr-18	1:29	0.00	**0.00**	0.00	PASS
5	1-May-18	18:09	0.00	**0.00**	0.00	PASS
6	2-May-18	12:09	0.00	**0.00**	0.00	PASS
7	3-May-18	14:08	0.00	**0.00**	0.00	PASS

Highest Zero Drift **0.00**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift |R-A|**	**Criteria (% diff)**
1	25-Apr-18	11:42	20.89	**20.90**	0.01	PASS
2	28-Apr-18	15:17	20.89	**20.90**	0.01	PASS
3	29-Apr-18	15:06	20.89	**20.90**	0.01	PASS
4	30-Apr-18	1:38	20.89	**20.90**	0.01	PASS
5	1-May-18	18:18	20.89	**20.90**	0.01	PASS
6	2-May-18	12:18	20.89	**20.90**	0.01	PASS
7	3-May-18	14:17	20.89	**20.90**	0.01	PASS

Highest Span Drift **0.01**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Pass/Fail Criteria: 0.5% difference for each day of the drift period
(40 CFR 75, Appendix A, Section 3.1)

Equation (40 CFR 75, Appendix A, Section 3.1):

CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, %O2
A = Monitor Response, %O2

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - CO2

40 CFR 60, PS-3

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **354**
Analyzer Range (%): **10**

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.90**	89.00	OK	EB0095371	09/19/25	OK

			Zero Reading			
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Drift |R-A|	Criteria (% diff)
1	24-Apr-18	9:53	0.00	**0.00**	0.00	PASS
2	25-Apr-18	11:33	0.00	**0.00**	0.00	PASS
3	28-Apr-18	15:08	0.00	**0.00**	0.00	PASS
4	29-Apr-18	14:57	0.00	**0.00**	0.00	PASS
5	30-Apr-18	1:29	0.00	**0.00**	0.00	PASS
6	1-May-18	18:09	0.00	**0.00**	0.00	PASS
7	2-May-18	12:09	0.00	**0.00**	0.00	PASS

Highest Zero Drift **0.00**

			Span Reading			
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Drift (CD) |R-A|	Criteria (% diff)
1	24-Apr-18	10:02	8.90	**8.70**	0.20	PASS
2	25-Apr-18	11:42	8.90	**8.60**	0.30	PASS
3	28-Apr-18	15:17	8.90	**8.70**	0.20	PASS
4	29-Apr-18	15:06	8.90	**8.70**	0.20	PASS
5	30-Apr-18	1:38	8.90	**8.70**	0.20	PASS
6	1-May-18	18:18	8.90	**8.70**	0.20	PASS
7	2-May-18	12:18	8.90	**8.70**	0.20	PASS

Highest Span Drift **0.30**

Notes:
Allowed calibration gas ranges (40 CFR 60, PS-3)
0-20% of span
50-100% of span

Pass/Fail Criteria: 0.5% difference for each day of the drift period

Equation (40 CFR 60, Appendix B):
CD = R - A

CD = Calibration Drift, %
R = Calibration Gas Value, %CO2
A = Monitor Response, %CO2

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

	Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
1	04/24/2018 09:53	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/24/2018 09:56	CTG2 NOx Low P75	Upscale	8.70	8.70	0.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
2	04/25/2018 11:33	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/25/2018 11:36	CTG2 NOx Low P75	Upscale	8.70	8.60	1.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
3	04/28/2018 15:08	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/28/2018 15:11	CTG2 NOx Low P75	Upscale	8.70	8.60	1.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
4	04/29/2018 14:57	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/29/2018 15:00	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
5	04/30/2018 01:29	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/30/2018 01:32	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
	04/30/2018 05:36	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	04/30/2018 05:39	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
6	05/01/2018 18:09	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	05/01/2018 18:12	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
7	05/02/2018 12:09	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	05/02/2018 12:12	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
	05/03/2018 14:08	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
	05/03/2018 14:11	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC280797	12/06/20
	05/07/2018 17:15	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/07/2018 17:18	CTG2 NOx Low P75	Upscale	8.70	8.50	2.00	2.50	10.00		0	Pass			ON	CC2807 97	12/06/20
05/08/2018 15:32	CTG2 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/08/2018 15:35	CTG2 NOx Low P75	Upscale	8.70	8.70	0.00	2.50	10.00		0	Pass			ON	CC2807 97	12/06/20

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

7 certified NOx from cal gas cert

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/24/2018 09:53	CTG2 NOx High P75	Zero	0.00	0.10	-0.10	2.50	100.00	1	0	Pass			ON		
04/24/2018 09:59	CTG2 NOx High P75	Upscale	~~88.60~~ 88.75	89.10	-0.50	2.50	100.00		0	Pass			ON	CC477949	09/25/25
04/25/2018 11:33	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	2	0	Pass			ON		
04/25/2018 11:39	CTG2 NOx High P75	Upscale	88.60	89.40	-0.80	2.50	100.00		0	Pass			ON	CC477949	09/25/25
04/28/2018 15:08	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	3	0	Pass			ON		
04/28/2018 15:14	CTG2 NOx High P75	Upscale	88.60	88.50	0.10	2.50	100.00		0	Pass			ON	CC477949	09/25/25
04/29/2018 14:57	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	4	0	Pass			ON		
04/29/2018 15:03	CTG2 NOx High P75	Upscale	88.60	88.20	0.40	2.50	100.00		0	Pass			ON	CC477949	09/25/25
04/30/2018 01:29	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	5	0	Pass			ON		
04/30/2018 01:35	CTG2 NOx High P75	Upscale	88.60	88.10	0.50	2.50	100.00		0	Pass			ON	CC477949	09/25/25
04/30/2018 05:36	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
04/30/2018 05:42	CTG2 NOx High P75	Upscale	88.60	88.30	0.30	2.50	100.00		0	Pass			ON	CC477949	09/25/25
05/01/2018 18:09	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	6	0	Pass			ON		
05/01/2018 18:15	CTG2 NOx High P75	Upscale	88.60	88.10	0.50	2.50	100.00		0	Pass			ON	CC477949	09/25/25
05/02/2018 12:09	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00	7	0	Pass			ON		
05/02/2018 12:15	CTG2 NOx High P75	Upscale	88.60	87.90	0.70	2.50	100.00		0	Pass			ON	CC477949	09/25/25
05/03/2018 14:08	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
05/03/2018 14:14	CTG2 NOx High P75	Upscale	88.60	87.80	0.80	2.50	100.00		0	Pass			ON	CC477949	09/25/25
05/07/2018 17:15	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00		0	Pass			ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/07/2018 17:21	CTG2 NOx High P75	Upscale	88.60	87.20	1.40	2.50	100.00		0	Pass			ON	CC477949	09/25/25
05/08/2018 15:32	CTG2 NOx High P75	Zero	0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
05/08/2018 15:38	CTG2 NOx High P75	Upscale	88.60	87.20	1.40	2.50	100.00		0	Pass			ON	CC477949	09/25/25

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

	Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
1	04/25/2018 11:33	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	04/25/2018 11:42	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	04/28/2018 15:08	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
2	04/28/2018 15:17	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	04/29/2018 14:57	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
3	04/29/2018 15:06	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
4	04/30/2018 01:29	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	04/30/2018 01:38	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	04/30/2018 05:36	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	04/30/2018 05:45	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
5	05/01/2018 18:09	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	05/01/2018 18:18	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	05/02/2018 12:09	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
6	05/02/2018 12:18	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
7	05/03/2018 14:08	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	05/03/2018 14:17	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	05/07/2018 17:15	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
	05/07/2018 17:24	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25
	05/08/2018 15:32	CTG2 O2 P75	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/08/2018 15:41	CTG2 O2 P75	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 371	09/25/25

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/24/2018 09:53	CTG2 CO Low	Zero	0.00	0.00	0.00	5.00	10.00	Pass	0	1			ON		
04/24/2018 09:56	CTG2 CO Low	Upscale	9.00	8.90	1.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
04/25/2018 11:33	CTG2 CO Low	Zero	0.00	-0.10	1.00	5.00	10.00	Pass	0	2			ON		
04/25/2018 11:36	CTG2 CO Low	Upscale	9.00	9.10	-1.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
04/28/2018 15:08	CTG2 CO Low	Zero	0.00	0.10	-1.00	5.00	10.00	Pass	0	3			ON		
04/28/2018 15:11	CTG2 CO Low	Upscale	9.00	9.30	-3.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
04/29/2018 14:57	CTG2 CO Low	Zero	0.00	0.00	0.00	5.00	10.00	Pass	0	4			ON		
04/29/2018 15:00	CTG2 CO Low	Upscale	9.00	9.10	-1.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
04/30/2018 01:29	CTG2 CO Low	Zero	0.00	0.20	-2.00	5.00	10.00	Pass	0	5			ON		
04/30/2018 01:32	CTG2 CO Low	Upscale	9.00	9.00	0.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
04/30/2018 05:36	CTG2 CO Low	Zero	0.00	0.30	-3.00	5.00	10.00	Pass	0				ON		
04/30/2018 05:39	CTG2 CO Low	Upscale	9.00	8.90	1.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
05/01/2018 18:09	CTG2 CO Low	Zero	0.00	0.10	-1.00	5.00	10.00	Pass	0	6			ON		
05/01/2018 18:12	CTG2 CO Low	Upscale	9.00	8.90	1.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
05/02/2018 12:09	CTG2 CO Low	Zero	0.00	0.10	-1.00	5.00	10.00	Pass	0	7			ON		
05/02/2018 12:12	CTG2 CO Low	Upscale	9.00	8.80	2.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
05/03/2018 14:08	CTG2 CO Low	Zero	0.00	0.20	-2.00	5.00	10.00	Pass	0				ON		
05/03/2018 14:11	CTG2 CO Low	Upscale	9.00	9.20	-2.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
05/07/2018 17:15	CTG2 CO Low	Zero	0.00	0.20	-2.00	5.00	10.00	Pass	0				ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/24/2018 09:53	CTG2 CO High	Zero	0.00	0.80	-0.03	5.00	3,000.00	Pass	0	1			ON		
04/24/2018 10:02	CTG2 CO High	Upscale	2591.00	2578.10	0.43	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
04/25/2018 11:33	CTG2 CO High	Zero	0.00	-0.90	0.03	5.00	3,000.00	Pass	0	2			ON		
04/25/2018 11:42	CTG2 CO High	Upscale	2591.00	2601.40	-0.35	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
04/28/2018 15:08	CTG2 CO High	Zero	0.00	-1.90	0.06	5.00	3,000.00	Pass	0	3			ON		
04/28/2018 15:17	CTG2 CO High	Upscale	2591.00	2604.40	-0.45	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
04/29/2018 14:57	CTG2 CO High	Zero	0.00	-0.40	0.01	5.00	3,000.00	Pass	0	4			ON		
04/29/2018 15:06	CTG2 CO High	Upscale	2591.00	2611.30	-0.68	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
04/30/2018 01:29	CTG2 CO High	Zero	0.00	-0.60	0.02	5.00	3,000.00	Pass	0	5			ON		
04/30/2018 01:38	CTG2 CO High	Upscale	2591.00	2608.90	-0.60	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
04/30/2018 05:36	CTG2 CO High	Zero	0.00	-0.60	0.02	5.00	3,000.00	Pass	0	~~6~~			ON		
04/30/2018 05:45	CTG2 CO High	Upscale	2591.00	2600.10	-0.30	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
05/01/2018 18:09	CTG2 CO High	Zero	0.00	-0.80	0.03	5.00	3,000.00	Pass	0	6			ON		
05/01/2018 18:18	CTG2 CO High	Upscale	2591.00	2599.90	-0.30	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
05/02/2018 12:09	CTG2 CO High	Zero	0.00	-0.90	0.03	5.00	3,000.00	Pass	0	7			ON		
05/02/2018 12:18	CTG2 CO High	Upscale	2591.00	2598.00	-0.23	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
05/03/2018 14:08	CTG2 CO High	Zero	0.00	-0.90	0.03	5.00	3,000.00	Pass	0				ON		
05/03/2018 14:17	CTG2 CO High	Upscale	2591.00	2603.20	-0.41	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
05/07/2018 17:15	CTG2 CO High	Zero	0.00	0.60	-0.02	5.00	3,000.00	Pass	0				ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/07/2018 17:24	CTG2 CO High	Upscale	2591.00	2607.90	-0.56	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25
05/08/2018 15:32	CTG2 CO High	Zero	0.00	-1.90	0.06	5.00	3,000.00	Pass	0				ON		
05/08/2018 15:41	CTG2 CO High	Upscale	2591.00	2595.20	-0.14	5.00	3,000.00	Pass	0				ON	EB0095 371	09/25/25

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/07/2018 17:18	CTG2 CO Low	Upscale	9.00	9.00	0.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20
05/08/2018 15:32	CTG2 CO Low	Zero	0.00	0.00	0.00	5.00	10.00	Pass	0				ON		
05/08/2018 15:35	CTG2 CO Low	Upscale	8.80	9.10	-3.00	5.00	10.00	Pass	0				ON	CC280797	12/06/20

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/24/2018 09:53	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/24/2018 10:02	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
04/25/2018 11:33	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/25/2018 11:42	CTG2 CO2 P60	Upscale	8.90	8.60	0.30	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
04/28/2018 15:08	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/28/2018 15:17	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
04/29/2018 14:57	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/29/2018 15:06	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
04/30/2018 01:29	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/30/2018 01:38	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
04/30/2018 05:36	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/30/2018 05:45	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
05/01/2018 18:09	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/01/2018 18:18	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
05/02/2018 12:09	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/02/2018 12:18	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
05/03/2018 14:08	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/03/2018 14:17	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
05/07/2018 17:15	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/07/2018 17:24	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25
05/08/2018 15:32	CTG2 CO2 P60	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/08/2018 15:41	CTG2 CO2 P60	Upscale	8.90	8.70	0.20	0.50	10.00	Pass	0				ON	EB0095 371	09/25/25

4.2 Linearity and CGA Data

The following pages contain DAHS printouts and supporting documentation for the linearity and CGA checks performed on the gas analyzers. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A, section 6.2 and 40 CFR 60 Appendix F (as applicable).

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Linearity Test - NOx Low Range

40 CFR 75, Appendix A, Section 3.2

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**646**
Analyzer Range:	**10** ppm
Test Date:	**11-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	2.42	24.20	OK	EB0072315	07/04/20	OK
Mid	5.09	50.90	OK	EB0101725	12/03/20	OK
High	8.68	86.80	OK	CC280797	12/06/20	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A) Low	Mid	High
1	Low	2.42	**8:48**	**2.40**	0.02	-0.21	0.18
2	Mid	5.09	**8:52**	**5.30**			
3	High	8.68	**8:56**	**8.50**			
4	Low	2.42	**9:00**	**2.30**	0.12	-0.21	0.18
5	Mid	5.09	**9:04**	**5.30**			
6	High	8.68	**9:08**	**8.50**			
7	Low	2.42	**9:12**	**2.30**	0.12	-0.21	0.18
8	Mid	5.09	**9:16**	**5.30**			
9	High	8.68	**9:20**	**8.50**			
				Average Response	2.33	5.30	8.50
				Absolute Difference of Average	0.09	0.21	0.18
				Status (for alternate criteria of 5 ppm difference)	PASS	PASS	PASS
				Linearity Error, %	**3.58**	**4.13**	**2.07**
				Status	PASS	PASS	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 5 ppm or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances (40 CFR 75)
Low = 20-30% of span
Mid = 50-60% of span
High = 80-100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by: Justin Saporito
Company: Cemtek KVB-Enertec
Project # CN50478

Linearity Test - NOx High Range

40 CFR 75, Appendix A, Section 3.2

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **646**
Analyzer Range: **100** *ppm*
Test Date: **10-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	24.60	24.60	OK	EB0073000	03/19/21	OK
Mid	50.89	50.89	OK	CC503502	11/01/25	OK
High	88.75	88.75	OK	CC477949	09/25/25	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A)		
					Low	Mid	High
1	Low	24.60	**16:48**	**25.40**	-0.80	-1.11	1.55
2	Mid	50.89	**16:52**	**52.00**			
3	High	88.75	**16:56**	**87.20**			
4	Low	24.60	**17:00**	**25.50**	-0.90	-1.01	1.55
5	Mid	50.89	**17:04**	**51.90**			
6	High	88.75	**17:08**	**87.20**			
7	Low	24.60	**17:13**	**25.40**	-0.80	-1.11	1.85
8	Mid	50.89	**17:17**	**52.00**			
9	High	88.75	**17:20**	**86.90**			
				Average Response	25.43	51.97	87.10
				Absolute Difference of Average	0.83	1.08	1.65
				Status (for alternate criteria of 5 ppm difference)	PASS	PASS	PASS
				Linearity Error, %	**3.39**	**2.12**	**1.86**
				Status	PASS	PASS	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 5 ppm or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances (40 CFR 75)
Low = 20-30% of span
Mid = 50-60% of span
High = 80-100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by: Justin Saporito
Company: Cemtek KVB-Enertec
Project # CN50478

Linearity Test - O2

40 CFR 75, Appendix A, Section 3.2

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **646**
Analyzer Range: **25** %
Test Date: **11-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	6.36	25.44	OK	EB0049201	08/13/21	OK
Mid	13.82	55.28	OK	EB0060674	04/01/26	OK
High	20.89	83.56	OK	EB0095371	09/19/25	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A) Low	Mid	High
1	Low	6.36	**10:23**	**6.20**	0.16	0.02	-0.01
2	Mid	13.82	**10:27**	**13.80**			
3	High	20.89	**10:32**	**20.90**			
4	Low	6.36	**10:36**	**6.20**	0.16	0.02	-0.01
5	Mid	13.82	**10:40**	**13.80**			
6	High	20.89	**10:44**	**20.90**			
7	Low	6.36	**10:48**	**6.20**	0.16	0.02	-0.01
8	Mid	13.82	**10:52**	**13.80**			
9	High	20.89	**10:56**	**20.90**			
				Average Response	6.20	13.80	20.90
				Absolute Difference of Average	0.16	0.02	0.01
				Status (for alternate criteria of .5% difference)	PASS	PASS	PASS
				Linearity Error, %	**2.52**	**0.14**	**0.05**
				Status	PASS	PASS	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 0.5% or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances
Low = 20-30% of span
Mid = 50-60% of span
High = 80 100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

CPV Valley Energy Center
CTG 2
Middletown NY

Project# 50478

Cylinder Gas Audit - CO Low Range

Manufacturer:	TAPI
Model:	T300M
Serial Number:	354
Analyzer Range:	10
Test Date:	05/11/18

Reference Gas Value (Ca)		**% of Span**	**Status**	**Bottle #**	**Exp. Date**	**Exp. Date Status**
Low	2.67	26.70	OK	EB0072315	07/04/20	OK
Mid	5.66	56.60	OK	EB0101725	12/30/20	OK

Note: Cal gas values must be between 20-30% of span value for low and 50-60% of span value for mid

Run Number	**Run Time**	**Low Response**	**Run Time**	**Mid Response**
1	**8:48**	**2.30**	**8:52**	**5.50**
2	**8:59**	**2.50**	**9:03**	**5.40**
3	**9:12**	**2.30**	**9:16**	**5.30**
Average Response (Cm)		2.37		5.40
Difference (Cm-Ca)		-0.30		-0.26
Status (for alternate criteria of 5 ppm difference)		PASS		PASS
Accuracy %, ((Cm-Ca)/Ca) * 100		**-11.36**		**-4.59**
Status (for primary criteria of 15%)		PASS		PASS

Cylinder Gas Audit - CO High Range

Analyzer Range:	3000
Test Date:	05/10/18

Reference Gas Value (Ca)		**% of Span**	**Status**	**Bottle #**	**Exp. Date**	**Exp. Date Status**
Low	753.00	25.10	OK	EB0040994	04/04/26	OK
Mid	1670.00	55.67	OK	EB0072144	04/04/26	OK

Note: Cal gas values must be between 20-30% of span value for low and 50-60% of span value for mid

Run Number	**Run Time**	**Low Response**	**Run Time**	**Mid Response**
1	**17:39**	**777.10**	**17:43**	**1698.80**
2	**17:47**	**775.00**	**17:51**	**1699.30**
3	**17:55**	**775.50**	**18:00**	**1697.40**
Average Response (Cm)		775.87		1698.50
Difference (Cm-Ca)		22.87		28.50
Status (for alternate criteria of 5 ppm difference)		**FAIL**		**FAIL**
Accuracy %, ((Cm-Ca)/Ca) * 100		**3.04**		**1.71**
Status (for primary criteria of 15%)		PASS		PASS

Notes:
Pass/Fail Criteria: +/- 15% or 5.0 ppm difference for pollutants
(40 CFR 60, Appendix F)

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 NOX_LOW_P75			
	MMBTUHR	OS	MS	PPMD	OS	MS	
05/11/2018 08:45	1488.9	ON	GD	2.5	ON	QA	
05/11/2018 08:46	1528.1	ON	GD	3.2	ON	QA	
05/11/2018 08:47	1567.3	ON	GD	2.5	ON	QA	
05/11/2018 08:48	1606.5	ON	GD	2.4	ON	QA	1
05/11/2018 08:49	1665.2	ON	GD	2.4	ON	QA	
05/11/2018 08:50	1704.4	ON	GD	4.4	ON	QA	
05/11/2018 08:51	1743.6	ON	GD	5.3	ON	QA	
05/11/2018 08:52	1782.8	ON	GD	5.3	ON	QA	2
05/11/2018 08:53	1822.0	ON	GD	5.3	ON	QA	
05/11/2018 08:54	1861.1	ON	GD	7.9	ON	QA	
05/11/2018 08:55	1919.9	ON	GD	8.6	ON	QA	
05/11/2018 08:56	1959.1	ON	GD	8.5	ON	QA	3
05/11/2018 08:57	1978.7	ON	GD	8.5	ON	QA	
05/11/2018 08:58	1978.7	ON	GD	3.9	ON	QA	
05/11/2018 08:59	1978.7	ON	GD	2.4	ON	QA	
05/11/2018 09:00	1978.7	ON	GD	2.3	ON	QA	1
05/11/2018 09:01	1978.7	ON	GD	2.3	ON	QA	
05/11/2018 09:02	1959.1	ON	GD	4.1	ON	QA	
05/11/2018 09:03	1959.1	ON	GD	5.4	ON	QA	
05/11/2018 09:04	1959.1	ON	GD	5.3	ON	QA	2
05/11/2018 09:05	1959.1	ON	GD	5.3	ON	QA	
05/11/2018 09:06	1959.1	ON	GD	7.8	ON	QA	
05/11/2018 09:07	1959.1	ON	GD	8.6	ON	QA	
05/11/2018 09:08	1959.1	ON	GD	8.5	ON	QA	3
05/11/2018 09:09	1959.1	ON	GD	8.5	ON	QA	
05/11/2018 09:10	1959.1	ON	GD	4.0	ON	QA	
05/11/2018 09:11	1959.1	ON	GD	2.4	ON	QA	
05/11/2018 09:12	1959.1	ON	GD	2.3	ON	QA	1

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/11/2018 09:24   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 NOX_LOW_P75			
	MMBTUHR	OS	MS	PPMD	OS	MS	
05/11/2018 09:13	1959.1	ON	GD	2.3	ON	QA	
05/11/2018 09:14	1959.1	ON	GD	4.5	ON	QA	
05/11/2018 09:15	1959.1	ON	GD	5.3	ON	QA	
05/11/2018 09:16	1959.1	ON	GD	5.3	ON	QA	2
05/11/2018 09:17	1959.1	ON	GD	5.3	ON	QA	
05/11/2018 09:18	1959.1	ON	GD	7.7	ON	QA	
05/11/2018 09:19	1959.1	ON	GD	8.5	ON	QA	3
05/11/2018 09:20	1959.1	ON	GD	8.5	ON	QA	
05/11/2018 09:21	1959.1	ON	GD	8.5	ON	QA	
05/11/2018 09:22	1959.1	ON	GD	9.9	ON	GD	
05/11/2018 09:23	1959.1	ON	GD	10.6	ON	GD	
05/11/2018 09:24	1959.1	ON	GD	10.6	ON	GD	
05/11/2018 09:25				10.6	ON	GD	
Average	1890.0			10.4			
Maximum	1978.7			10.6			
Minimum	1488.9			9.9			
Total	75601.7			41.7			

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 NOX_HIGH_P75			
	MMBTUHR	OS	MS	PPMD	OS	MS	
05/10/2018 16:44	1880.7	SU	GD	3.9	SU	QA	
05/10/2018 16:45	1880.7	SU	GD	5.7	SU	QA	
05/10/2018 16:46	1880.7	SU	GD	19.7	SU	QA	
05/10/2018 16:47	1880.7	SU	GD	25.4	SU	QA	
05/10/2018 16:48	1880.7	SU	GD	25.4	SU	QA	1
05/10/2018 16:49	1880.7	SU	GD	25.4	SU	QA	
05/10/2018 16:50	1880.7	SU	GD	44.7	SU	QA	
05/10/2018 16:51	1880.7	SU	GD	52.0	SU	QA	
05/10/2018 16:52	1880.7	SU	GD	52.0	SU	QA	2
05/10/2018 16:53	1880.7	SU	GD	51.9	SU	QA	
05/10/2018 16:54	1880.7	SU	GD	72.0	SU	QA	
05/10/2018 16:55	1880.7	SU	GD	87.2	SU	QA	
05/10/2018 16:56	1880.7	SU	GD	87.2	SU	QA	3
05/10/2018 16:57	1880.7	SU	GD	87.3	SU	QA	
05/10/2018 16:58	1880.7	SU	GD	61.6	SU	QA	
05/10/2018 16:59	1880.7	SU	GD	25.5	SU	QA	
05/10/2018 17:00	1880.7	SU	GD	25.5	SU	QA	1
05/10/2018 17:01	1880.7	SU	GD	25.5	SU	QA	
05/10/2018 17:02	1880.7	SU	GD	31.7	SU	QA	
05/10/2018 17:03	1880.7	SU	GD	52.0	SU	QA	2
05/10/2018 17:04	1880.7	SU	GD	51.9	SU	QA	
05/10/2018 17:05	1880.7	SU	GD	51.9	SU	QA	
05/10/2018 17:06	1880.7	SU	GD	54.8	SU	QA	
05/10/2018 17:07	1880.7	SU	GD	87.0	SU	QA	
05/10/2018 17:08	1880.7	SU	GD	87.2	SU	QA	3
05/10/2018 17:09	1880.7	SU	GD	87.2	SU	QA	
05/10/2018 17:10	1880.7	SU	GD	82.2	SU	QA	
05/10/2018 17:11	1880.7	SU	GD	30.6	SU	QA	

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/10/2018 17:20   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 NOX_HIGH_P75			
	MMBTUHR	OS	MS	PPMD	OS	MS	
05/10/2018 17:12	1880.7	SU	GD	25.5	SU	QA	1
05/10/2018 17:13	1880.7	SU	GD	25.4	SU	QA	
05/10/2018 17:14	1880.7	SU	GD	25.4	SU	QA	
05/10/2018 17:15	1880.7	SU	GD	45.3	SU	QA	
05/10/2018 17:16	1880.7	SU	GD	52.0	SU	QA	2
05/10/2018 17:17	1880.7	SU	GD	52.0	SU	QA	
05/10/2018 17:18	1880.7	SU	GD	51.9	SU	QA	
05/10/2018 17:19	1880.7	SU	GD	72.4	SU	QA	3
05/10/2018 17:20	1880.7	SU	GD	86.9	SU	QA	
Average	1880.7						
Maximum	1880.7						
Minimum	1880.7						
Total	69585.9						

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75		
	MMBTUHR	OS	MS	PCT	OS	MS
05/11/2018 10:15	1939.5	ON	GD	13.8	ON	GD
05/11/2018 10:16	1939.5	ON	GD	13.8	ON	GD
05/11/2018 10:17	1939.5	ON	GD	13.8	ON	GD
05/11/2018 10:18	1939.5	ON	GD	13.8	ON	GD
05/11/2018 10:19	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:20	1939.5	ON	GD	13.6	ON	QA
05/11/2018 10:21	1939.5	ON	GD	9.8	ON	QA
05/11/2018 10:22	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:23	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:24	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:25	1939.5	ON	GD	7.9	ON	QA
05/11/2018 10:26	1939.5	ON	GD	13.7	ON	QA
05/11/2018 10:27	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:28	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:29	1939.5	ON	GD	14.0	ON	QA
05/11/2018 10:30	1939.5	ON	GD	20.7	ON	QA
05/11/2018 10:31	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:32	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:33	1939.5	ON	GD	20.8	ON	QA
05/11/2018 10:34	1939.5	ON	GD	6.9	ON	QA
05/11/2018 10:35	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:36	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:37	1939.5	ON	GD	6.3	ON	QA
05/11/2018 10:38	1939.5	ON	GD	13.3	ON	QA
05/11/2018 10:39	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:40	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:41	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:42	1939.5	ON	GD	19.0	ON	QA

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/11/2018 12:46   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75		
	MMBTUHR	OS	MS	PCT	OS	MS
05/11/2018 10:43	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:44	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:45	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:46	1939.5	ON	GD	11.4	ON	QA
05/11/2018 10:47	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:48	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:49	1939.5	ON	GD	6.2	ON	QA
05/11/2018 10:50	1939.5	ON	GD	9.9	ON	QA
05/11/2018 10:51	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:52	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:53	1939.5	ON	GD	13.8	ON	QA
05/11/2018 10:54	1939.5	ON	GD	17.2	ON	QA
05/11/2018 10:55	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:56	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:57	1939.5	ON	GD	20.9	ON	QA
05/11/2018 10:58	1939.5	ON	GD	14.4	ON	QA
05/11/2018 10:59	1939.5	ON	GD	0.1	ON	QA
05/11/2018 11:00	1939.5	ON	GD	0.0	ON	QA
Average	1939.5			13.8		
Maximum	1939.5			13.8		
Minimum	1939.5			13.8		
Total	89217.0			55.2		

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 CO			CTG2 HTIP_OIL_P75		
	PPMD	OS	MS	MMBTUHR	OS	MS
05/11/2018 08:45	2.6	ON	QA	1488.9	ON	GD
05/11/2018 08:46	3.1	ON	QA	1528.1	ON	GD
05/11/2018 08:47	2.4	ON	QA	1567.3	ON	GD
05/11/2018 08:48	2.3	ON	QA	1606.5	ON	GD
05/11/2018 08:49	2.3	ON	QA	1665.2	ON	GD
05/11/2018 08:50	4.0	ON	QA	1704.4	ON	GD
05/11/2018 08:51	5.5	ON	QA	1743.6	ON	GD
05/11/2018 08:52	5.5	ON	QA	1782.8	ON	GD
05/11/2018 08:53	5.3	ON	QA	1822.0	ON	GD
05/11/2018 08:54	7.1	ON	QA	1861.1	ON	GD
05/11/2018 08:55	8.7	ON	QA	1919.9	ON	GD
05/11/2018 08:56	8.7	ON	QA	1959.1	ON	GD
05/11/2018 08:57	8.6	ON	QA	1978.7	ON	GD
05/11/2018 08:58	5.5	ON	QA	1978.7	ON	GD
05/11/2018 08:59	2.5	ON	QA	1978.7	ON	GD
05/11/2018 09:00	2.4	ON	QA	1978.7	ON	GD
05/11/2018 09:01	2.5	ON	QA	1978.7	ON	GD
05/11/2018 09:02	4.0	ON	QA	1959.1	ON	GD
05/11/2018 09:03	5.4	ON	QA	1959.1	ON	GD
05/11/2018 09:04	5.3	ON	QA	1959.1	ON	GD
05/11/2018 09:05	5.4	ON	QA	1959.1	ON	GD
05/11/2018 09:06	6.9	ON	QA	1959.1	ON	GD
05/11/2018 09:07	8.5	ON	QA	1959.1	ON	GD
05/11/2018 09:08	8.6	ON	QA	1959.1	ON	GD
05/11/2018 09:09	8.5	ON	QA	1959.1	ON	GD
05/11/2018 09:10	5.5	ON	QA	1959.1	ON	GD
05/11/2018 09:11	2.4	ON	QA	1959.1	ON	GD
05/11/2018 09:12	2.3	ON	QA	1959.1	ON	GD

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/11/2018 09:25   Data is expressed in Standard Time

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 CO			CTG2 HTIP_OIL_P75		
	PPMD	OS	MS	MMBTUHR	OS	MS
05/11/2018 09:13	2.4	ON	QA	1959.1	ON	GD
05/11/2018 09:14	3.8	ON	QA	1959.1	ON	GD
05/11/2018 09:15	5.1	ON	QA	1959.1	ON	GD
05/11/2018 09:16	5.3	ON	QA	1959.1	ON	GD
05/11/2018 09:17	5.3	ON	QA	1959.1	ON	GD
05/11/2018 09:18	7.2	ON	QA	1959.1	ON	GD
05/11/2018 09:19	8.6	ON	QA	1959.1	ON	GD
05/11/2018 09:20	8.6	ON	QA	1959.1	ON	GD
05/11/2018 09:21	8.5	ON	QA	1959.1	ON	GD
05/11/2018 09:22	6.0	ON	GD	1959.1	ON	GD
05/11/2018 09:23	3.9	ON	GD	1959.1	ON	GD
05/11/2018 09:24	3.6	ON	GD	1959.1	ON	GD
05/11/2018 09:25	3.4	ON	GD	1959.1	ON	GD
05/11/2018 09:26	3.4	ON	GD			
Average	4.1			1891.7		
Maximum	6.0			1978.7		
Minimum	3.4			1488.9		
Total	20.3			77560.8		

OS - Operating Status:
SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:
GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/11/2018 09:25   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 CO_HIGH			CTG2 HTIP_OIL_P75		
	PPMD	OS	MS	MMBTUHR	OS	MS
05/10/2018 17:33	0.2	SU	MN	1880.7	SU	GD
05/10/2018 17:34	-0.1	SU	MN	1880.7	SU	GD
05/10/2018 17:35	-0.5	SU	QA	1880.7	SU	GD
05/10/2018 17:36	241.0	SU	QA	1880.7	SU	GD
05/10/2018 17:37	761.5	SU	QA	1880.7	SU	GD
05/10/2018 17:38	775.6	SU	QA	1880.7	SU	GD
05/10/2018 17:39	777.1	SU	QA	1880.7	SU	GD
05/10/2018 17:40	862.5	SU	QA	1880.7	SU	GD
05/10/2018 17:41	1629.8	SU	QA	1880.7	SU	GD
05/10/2018 17:42	1698.8	SU	QA	1880.7	SU	GD
05/10/2018 17:43	1698.8	SU	QA	1880.7	SU	GD
05/10/2018 17:44	1670.0	SU	QA	1880.7	SU	GD
05/10/2018 17:45	905.9	SU	QA	1880.7	SU	GD
05/10/2018 17:46	775.1	SU	QA	1880.7	SU	GD
05/10/2018 17:47	775.0	SU	QA	1880.7	SU	GD
05/10/2018 17:48	775.2	SU	QA	1900.3	SU	GD
05/10/2018 17:49	1508.1	SU	QA	1900.3	SU	GD
05/10/2018 17:50	1698.1	SU	QA	1900.3	SU	GD
05/10/2018 17:51	1699.3	SU	QA	1900.3	SU	GD
05/10/2018 17:52	1701.8	SU	QA	1900.3	SU	GD
05/10/2018 17:53	969.5	SU	QA	1900.3	SU	GD
05/10/2018 17:54	775.5	SU	QA	1900.3	SU	GD
05/10/2018 17:55	775.5	SU	QA	1900.3	SU	GD
05/10/2018 17:56	775.6	SU	QA	1900.3	SU	GD
05/10/2018 17:57	1319.8	SU	QA	1900.3	SU	GD
05/10/2018 17:58	1692.5	SU	QA	1900.3	SU	GD
05/10/2018 17:59	1698.5	SU	QA	1900.3	SU	GD
05/10/2018 18:00	1697.4	SU	QA	1900.3	SU	GD

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/10/2018 18:21   Data is expressed in Standard Time   Version 1.0

4.3 Cycle/Response Time Data

The following pages contain DAHS printouts and supporting documentation for the cycle/response time checks performed on the gas analyzers. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A, section 6.4 and 40 CFR 60, Appendix B, PS-4A (as applicable).

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Cycle Time - NOx Low Range

Pass

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**646**
Measurement Span (ppm):	**10**
Zero Calibration Gas (ppm):	0.00
Span Calibration Gas (ppm):	**8.68**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
86.84	OK	CC280797	12/06/20	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response at 95% Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	6.90	14:04	0.00	0.35	0.00	14:06	0:02:00
Upscale (Stack gas to span gas)	7.00	14:15	8.60	8.52	8.20	14:18	0:03:00

Maximum Response Time **0:03:00**

Cycle Time - NOx High Range

Pass

Measurement Span (ppm):	**100**
Zero Calibration Gas (ppm):	0.00
Span Calibration Gas (ppm):	**88.75**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
88.75	OK	CC477949	09/25/25	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	6.20	15:05	0.00	0.31	0.00	15:08	0:03:00
Upscale (Stack gas to span gas)	6.30	15:14	87.40	83.35	87.10	15:17	0:03:00

Maximum Response Time **0:03:00**
Analyzer Response (max value from low and high range) **0:03:00**

Notes:

Pass/fail criteria = 15 minutes or less
(40 CFR 75, Appendix A, Section 3.5)

Downscale: Stable flue gas point "down to" stable zero cal gas point
Upscale: Stable flue gas point "up to" stable span cal gas point

Stablized response value = reading with a change < 2% of span value for 2 minutes, or a reading with a change < 6% of the measured average concentration over 6 minutes. Or, reading is considered stable if it changes by no more than 0.5 ppm, or 0.2% CO2/O2 for two minutes.

Collect1-minute data from the DAHS and cal gas certs. Send minute data, cal gas certs and spreadsheet to office.

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Cycle Time - O2

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**646**
Measurement Span (ppm):	**25**
Zero Calibration Gas (ppm):	**0.00**
Span Calibration Gas (ppm):	**20.89**
Test Date:	**05/08/18**

Pass

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
83.56	OK	EB0095371	9/19/2025	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	13.70	15:29	0.00	0.69	0.00	15:31	0:02:00
Upscale (Stack gas to span gas)	12.90	15:39	20.90	20.50	20.80	15:40	0:01:00

Maximum Response Time **0:02:00**

Notes:

Pass/fail criteria = 15 minutes or less
(40 CFR 75, Appendix A, Section 3.5)

Stablized response value = reading with a change < 2% of span value for 2 minutes, or a reading with a change < 6% of the measured average concentration over 6 minutes. Or, reading is considered stable if it changes by no more than 0.5 ppm, or 0.2% CO2/O2 for two minutes.

Collect1-minute data from the DAHS and cal gas certs. Send minute data, cal gas certs and spreadsheet to office.

Siemens
CPV Valley Energy Center
CTG 2
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Cycle Time - CO Low Range

40 CFR 60, PS-4A

Pass

Manufacturer:	**TAPI**
Model:	**T300M**
Serial Number:	**354**
Measurement Span (ppm):	**10**
Zero Calibration Gas (ppm):	**0.00**
Span Calibration Gas (ppm):	**8.95**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
89.49	OK	CC280797	12/06/20	OK

	Step 1. Monitor Response at start point	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Zero to Span Cal Gas 1 (upscale)	0.90	15:56:00	9.30	8.88	9.30	15:59:00	0:03:00
Span to Zero Cal Gas 1 (downscale)	9.20	16:00:00	0.20	0.65	0.40	16:02:00	0:02:00
Zero to Span Cal Gas 2 (upscale)	0.20	16:03:00	9.40	8.94	9.20	16:05:00	0:02:00
Span to Zero Cal Gas 2 (downscale)	9.40	16:06:00	0.30	0.76	0.30	16:09:00	0:03:00
Zero to Span Cal Gas 3 (upscale)	0.30	16:09:00	9.30	8.85	9.30	16:12:00	0:03:00
Span to Zero Cal Gas 3 (downscale)	9.30	16:12:00	0.30	0.75	0.30	16:15:00	0:03:00

Average of Zero Gas Runs	0:02:40
Average of High Gas Runs	0:02:40
Longest Response Time	0:02:40

Cycle Time - CO High Range

40 CFR 60, PS-4A

Pass

Measurement Span (ppm):	**3000**
Zero Calibration Gas (ppm):	**0.00**
Span Calibration Gas (ppm):	**2591.00**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
86.37	OK	EB0095371	09/19/25	OK

	Step 1. Monitor Response at start point	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Zero to Span Cal Gas 1 (upscale)	0.20	15:06:00	2610.40	2479.89	2583.80	15:09:00	0:03:00
Span to Zero Cal Gas 1 (downscale)	2610.40	15:11:00	0.50	131.00	48.60	15:14:00	0:03:00
Zero to Span Cal Gas 2 (upscale)	0.50	15:16:00	2617.20	2486.37	2611.10	15:19:00	0:03:00
Span to Zero Cal Gas 2 (downscale)	2617.20	15:20:00	0.50	131.34	24.80	15:22:00	0:02:00
Zero to Span Cal Gas 3 (upscale)	0.50	15:23:00	2611.00	2480.48	2591.90	15:25:00	0:02:00
Span to Zero Cal Gas 3 (downscale)	2611.20	15:26:00	1.10	131.61	64.40	15:28:00	0:02:00

Average of Zero Gas Runs	0:02:40
Average of High Gas Runs	0:02:20
Longest Response Time	0:02:40
Analyzer Response Time	**0:02:40**

Notes:
Analyzer response time pass/fail criteria = 240 seconds (4 minutes or less (40 CFR 60, PS-4A per eCFR))
The longest average from the two ranges is reported as the analyzer response time.
Performed as a remote (at the probe) cal gas injection.
Collect 1-minute data

Test sequence:
Zero cal gas "up to" span cal gas (upscale)
Span cal gas "down to" zero cal gas (downscale)
3 upscale runs and 3 downscale runs

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_GT			CTG2 NOX_LOW_P75			
	MW	OS	MS	PPMD	OS	MS	
05/08/2018 14:00	188	SU	GD	6.8	SU	GD	
05/08/2018 14:01	188	SU	GD	6.7	SU	GD	
05/08/2018 14:02	188	SU	GD	6.6	SU	GD	
05/08/2018 14:03	188	SU	GD	6.7	SU	MN	
05/08/2018 14:04	188	SU	GD	6.9	SU	QA	START
05/08/2018 14:05	188	SU	GD	5.2	SU	QA	
05/08/2018 14:06	188	SU	GD	0.0	SU	QA	-95%
05/08/2018 14:07	188	SU	GD	0.0	SU	QA	
05/08/2018 14:08	188	SU	GD	0.0	SU	QA	
05/08/2018 14:09	188	SU	GD	0.0	SU	QA	
05/08/2018 14:10	189	SU	GD	0.0	SU	QA	
05/08/2018 14:11	189	SU	GD	2.9	SU	MN	
05/08/2018 14:12	189	SU	GD	6.9	SU	MN	
05/08/2018 14:13	189	SU	GD	6.8	SU	MN	
05/08/2018 14:14	189	SU	GD	7.0	SU	MN	
05/08/2018 14:15	189	SU	GD	7.0	SU	MN	START
05/08/2018 14:16	189	SU	GD	7.1	SU	QA	
05/08/2018 14:17	189	SU	GD	6.0	SU	QA	
05/08/2018 14:18	188	SU	GD	8.2	SU	QA	95%
05/08/2018 14:19	189	SU	GD	8.6	SU	QA	
05/08/2018 14:20	188	SU	GD	8.5	SU	QA	
Average	188			6.7			
Maximum	189			6.8			
Minimum	188			6.6			
Total	3957			20.1			

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/08/2018 14:17   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: NOX-H-RESPONSE

	CTG2 GEN_GT			CTG2 NOX_HIGH_P75			
	MW	OS	MS	PPMD	OS	MS	
05/08/2018 15:00	189	SU	GD	6.2	SU	MN	
05/08/2018 15:01	188	SU	GD	6.2	SU	MN	
05/08/2018 15:02	189	SU	GD	6.3	SU	MN	
05/08/2018 15:03	188	SU	GD	6.3	SU	MN	
05/08/2018 15:04	189	SU	GD	6.2	SU	MN	
05/08/2018 15:05	189	SU	GD	6.2	SU	QA	Strt
05/08/2018 15:06	189	SU	GD	5.4	SU	QA	
05/08/2018 15:07	188	SU	GD	0.6	SU	QA	
05/08/2018 15:08	189	SU	GD	0.0	SU	QA	— 9570
05/08/2018 15:09	189	SU	GD	0.0	SU	QA	Zero
05/08/2018 15:10	188	SU	GD	0.5	SU	MN	
05/08/2018 15:11	188	SU	GD	6.1	SU	MN	
05/08/2018 15:12	188	SU	GD	6.3	SU	MN	
05/08/2018 15:13	188	SU	GD	6.4	SU	MN	
05/08/2018 15:14	189	SU	GD	6.3	SU	QA	Strt
05/08/2018 15:15	189	SU	GD	12.6	SU	QA	
05/08/2018 15:16	188	SU	GD	79.6	SU	QA	
05/08/2018 15:17	188	SU	GD	87.1	SU	QA	— 9510
05/08/2018 15:18	188	SU	GD	87.2	SU	QA	
05/08/2018 15:19	189	SU	GD	87.4	SU	QA	
05/08/2018 15:20	189	SU	GD	80.9	SU	MN	Span
05/08/2018 15:21	189	SU	GD	20.3	SU	MN	
Average	189						
Maximum	189						
Minimum	188						
Total	4148						

OS - Operating Status:

SU - startup mode	OFF - off-line	CP - clean process equipment
SD - shutdown mode	CF - changing fuels	CC - clean control equipment
ON - normal operation	CM - control equipment malfunction	MD - unknown operating status

MS - General Monitor Status:

GD - good data	MN - maintenance activity
GO - monitor over range	IV - invalid
QA - quality assurance activity	

Date/Time	CTG2: O2_P75 (PCT) Raw Value	
5/8/2018 15:25	13.7	
5/8/2018 15:26	13.7	
5/8/2018 15:27	13.7	
5/8/2018 15:28	13.7	
5/8/2018 15:29	13.7	– START
5/8/2018 15:30	4.6	
5/8/2018 15:31	0	– 95%
5/8/2018 15:32	0	
5/8/2018 15:33	0	
5/8/2018 15:34	0	
5/8/2018 15:35	0	
5/8/2018 15:36	0	
5/8/2018 15:37	0	
5/8/2018 15:38	0	
5/8/2018 15:39	12.9	START
5/8/2018 15:40	20.8	
5/8/2018 15:41	20.9	95%
5/8/2018 15:42	16.3	
5/8/2018 15:43	13.7	
5/8/2018 15:44	13.7	
5/8/2018 15:45	13.7	
5/8/2018 15:46	13.7	
5/8/2018 15:47	13.7	

O2

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG2

		CTG2 CO_LOW			CTG2 HTIP_OIL_P75			
		PPMD	OS	MS	MMBTUHR	OS	MS	
05/10/2018 15:56		0.9	SU	QA	1900.3	SU	GD	START
05/10/2018 15:57		0.6	SU	QA	1900.3	SU	GD	
05/10/2018 15:58	95%	5.9	SU	QA	1880.7	SU	GD	
05/10/2018 15:59		9.3	SU	QA	1900.3	SU	GD	0
05/10/2018 16:00	1	9.2	SU	QA	1900.3	SU	GD	
05/10/2018 16:01		5.6	SU	QA	1900.3	SU	GD	
05/10/2018 16:02	95%	0.4	SU	QA	1900.3	SU	GD	1
05/10/2018 16:03	1	0.2	SU	QA	1900.3	SU	GD	
05/10/2018 16:04		3.7	SU	QA	1900.3	SU	GD	
05/10/2018 16:05	95%	9.2	SU	QA	1900.3	SU	GD	
05/10/2018 16:06	2	9.4	SU	QA	1880.7	SU	GD	2
05/10/2018 16:07		7.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:08		0.9	SU	QA	1880.7	SU	GD	2
05/10/2018 16:09	2 95%	0.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:10		2.1	SU	QA	1900.3	SU	GD	
05/10/2018 16:11		8.7	SU	QA	1900.3	SU	GD	
05/10/2018 16:12	3	9.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:13		8.9	SU	QA	1900.3	SU	GD	START 3
05/10/2018 16:14	3	2.8	SU	QA	1900.3	SU	GD	
05/10/2018 16:15	95%	0.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:16		0.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:17		6.4	SU	QA	1880.7	SU	GD	
05/10/2018 16:18		9.3	SU	QA	1900.3	SU	GD	
05/10/2018 16:19		9.3	SU	QA	1880.7	SU	GD	
Average					1896.2			
Maximum					1900.3			
Minimum					1880.7			

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG2

		CTG2 CO_HIGH			CTG2 HTIP_OIL_P75		
		PPMD	OS	MS	MMBTUHR	OS	MS
05/10/2018 15:00		-1.0	SU	QA	1900.3	SU	GD
05/10/2018 15:01		0.4	SU	QA	1900.3	SU	GD
05/10/2018 15:02		0.3	SU	QA	1900.3	SU	GD
05/10/2018 15:03		0.2	SU	QA	1900.3	SU	GD
05/10/2018 15:04		0.5	SU	MN	1900.3	SU	GD
05/10/2018 15:05		0.1	SU	MN	1900.3	SU	GD
05/10/2018 15:06		0.2	SU	MN	1900.3	SU	GD
05/10/2018 15:07		-0.4	SU	QA	1900.3	SU	GD
05/10/2018 15:08		918.6	SU	QA	1900.3	SU	GD
05/10/2018 15:09	95%	2583.8	SU	QA	1900.3	SU	GD
05/10/2018 15:10	(1)	2613.4	SU	QA	1900.3	SU	GD
05/10/2018 15:11		2610.4	SU	QA	1900.3	SU	GD
05/10/2018 15:12		2202.0	SU	MN	1900.3	SU	GD
05/10/2018 15:13		132.4	SU	QA	1900.3	SU	GD
05/10/2018 15:14	95%	48.6	SU	QA	1900.3	SU	GD
05/10/2018 15:15	(2)	13.8	SU	QA	1900.3	SU	GD
05/10/2018 15:16		0.5	SU	QA	1900.3	SU	GD
05/10/2018 15:17		9.1	SU	QA	1900.3	SU	GD
05/10/2018 15:18		2035.2	SU	QA	1900.3	SU	GD
05/10/2018 15:19	95%	2611.1	SU	QA	1900.3	SU	GD
05/10/2018 15:20		2617.2	SU	QA	1900.3	SU	GD
05/10/2018 15:21		1405.8	SU	QA	1900.3	SU	GD
05/10/2018 15:22	95%	24.8	SU	QA	1900.3	SU	GD
05/10/2018 15:23		0.5	SU	QA	1900.3	SU	GD
05/10/2018 15:24		1175.1	SU	QA	1900.3	SU	GD
05/10/2018 15:25		2591.9	SU	QA	1900.3	SU	GD
05/10/2018 15:26		2611.0	SU	QA Spn (3)	1900.3	SU	GD
05/10/2018 15:27		1857.5	SU	QA	1900.3	SU	GD

OS - Operating Status:

SU - startup mode	OFF - off-line	CP - clean process equipment
SD - shutdown mode	CF - changing fuels	CC - clean control equipment
ON - normal operation	CM - control equipment malfunction	MD - unknown operating status

MS - General Monitor Status:

GD - good data	MN - maintenance activity
GO - monitor over range	IV - invalid
QA - quality assurance activity	

Report generated on: 05/10/2018 15:38

Data is expressed in Standard Time

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 CO_HIGH			CTG2 HTIP_OIL_P75		
	PPMD	OS	MS	MMBTUHR	OS	MS
05/10/2018 15:28	0956 64.4	SU	QA	1900.3	SU	GD
05/10/2018 15:29	1.1	SU	QA	1900.3	SU	GD
05/10/2018 15:30	7.9	SU	QA	1900.3	SU	GD
05/10/2018 15:31	2023.4	SU	QA	1900.3	SU	GD
05/10/2018 15:32	2603.0	SU	QA	1900.3	SU	GD
05/10/2018 15:33	2611.2	SU	QA	1900.3	SU	GD
05/10/2018 15:34	922.5	SU	QA	1900.3	SU	GD
05/10/2018 15:35	956 -9.2	SU	QA	1900.3	SU	GD
05/10/2018 15:36	0.7	SU	QA	1900.3	SU	GD
05/10/2018 15:37	929.4	SU	QA	1900.3	SU	GD
05/10/2018 15:38	2567.8	SU	QA	1900.3	SU	GD
Average				1900.3		
Maximum				1900.3		
Minimum				1900.3		
Total				74111.7		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

4.4 Calibration Gas Certificates

The following attached pages contain copies of the calibration gas certificates representing the cylinder bottles used during the test program.

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI95E15A0029	Reference Number:	82-401041883-1
Cylinder Number:	CC280797	Cylinder Volume:	146.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	660
Gas Code:	CO,CO2,NO,NOX,BALN	Certification Date:	Dec 06, 2017

Expiration Date: Dec 06, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	9.000 PPM	8.684 PPM	G1	+/- 1.1% NIST Traceable	11/28/2017, 12/06/2017
CARBON MONOXIDE	9.000 PPM	8.949 PPM	G1	+/- 0.4% NIST Traceable	11/28/2017
NITRIC OXIDE	9.000 PPM	8.655 PPM	G1	+/- 1.1% NIST Traceable	11/28/2017, 12/06/2017
CARBON DIOXIDE	4.000 %	4.019 %	G1	+/- 0.5% NIST Traceable	11/22/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062815	CC366700	9.766 PPM CARBON MONOXIDE/NITROGEN	+/- 0.3%	Sep 07, 2018
NTRM	16060728	CC437497	10.08 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%	Jun 28, 2018
NTRM	16060728	CC437497-NOX	10.08 PPM NOx/NITROGEN	+/- 1.0%	Jun 28, 2018
NTRMplus	10060137	CC307784	5.027 % CARBON DIOXIDE/NITROGEN	+/- 0.4%	Dec 02, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Oct 30, 2017
Thermo 48i-TLE-CO-1133350708	NDIR	Nov 20, 2017
Thermo 42i-LS-NO-1123749326	Chemiluminescence	Nov 20, 2017
Thermo 42i-LS-NOx-1123749326	Chemiluminescence	Nov 20, 2017

Triad Data Available Upon Request

Approved for Release

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI95E15A0019	Reference Number:	82-400992434-1
Cylinder Number:	CC477949	Cylinder Volume:	146.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	660
Gas Code:	CO2,NO,NOX,BALN	Certification Date:	Sep 25, 2017

Expiration Date: Sep 25, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	90.00 PPM	88.75 PPM	G1	+/- 0.9% NIST Traceable	09/18/2017, 09/25/2017
NITRIC OXIDE	90.00 PPM	88.61 PPM	G1	+/- 0.9% NIST Traceable	09/18/2017, 09/25/2017
CARBON DIOXIDE	4.000 %	3.995 %	G1	+/- 0.5% NIST Traceable	09/18/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13010402	KAL003271	97.6 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	May 09, 2019
PRM	12367	APEX1099237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
GMIS	0315201604	CC503358	4.975 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%	Mar 15, 2019
NTRM	10060122	CC281392	5.027 % CARBON DIOXIDE/NITROGEN	+/- 0.4%	Oct 02, 2021

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO2	FTIR	Sep 11, 2017
Nicolet 6700 APW1100391 NO	FTIR	Sep 08, 2017
Nicolet 6700 APW1100391 NO2	FTIR	Sep 08, 2017

Triad Data Available Upon Request

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI69E15A0002	Reference Number:	82-400992440-1
Cylinder Number:	EB0095371	Cylinder Volume:	151.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO,CO2,O2,BALN	Certification Date:	Sep 19, 2017

Expiration Date: Sep 19, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	2700 PPM	2591 PPM	G1	+/- 1.0% NIST Traceable	09/19/2017
CARBON DIOXIDE	9.000 %	8.898 %	G1	+/- 0.7% NIST Traceable	09/19/2017
OXYGEN	21.00 %	20.89 %	G1	+/- 0.5% NIST Traceable	09/19/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12060724	CC356171	2498 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Dec 21, 2017
NTRM	13060408	CC412683	7.489 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 14, 2019
NTRM	09061415	CC273526	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Aug 31, 2017
Siemens Ultramat 6 J3-599 COHIGH	NDIR	Sep 15, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Aug 31, 2017

Triad Data Available Upon Request

C. Modzelewski
Approved for Release

to- NOX-L

RED BALL
TECHNICAL GAS SERVICES

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0072315	Certification Date:	07/05/2017
Product ID Number:	124743	Expiration Date:	07/04/2020
Cylinder Pressure:	1900 PSIG	MFG Facility:	RBTGS-Shreveport-LA
COA #:	EB0072315.20170613-0	Lot Number:	EB0072315.20170613
Customer PO. NO.:		Tracking Number:	084246967
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	2.67 PPM	±0.02 PPM	FTIR	06/30/2017
Nitric Oxide	2.4208 PPM	±0.0009 PPM	Chemiluminescence	06/19/2017, 06/26/2017, 07/05/2017
Total Oxides of Nitrogen	2.5177 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0003194	EB0003194.20160721	01/11/2025	GMS	N2	CO	12.16 PPM	1.023	091002
EB0005492	EB0005492.20160721	01/10/2025	GMS	N2	CO	13.53 PPM	1.014	091002
EB0052431	EB0052431.20151012	01/21/2019	GMS	N2	NO	5.799 PPM	1.012	2628a
[illegible]	[illegible]	[illegible]	[illegible]	N2	NO	[illegible] PPM	[illegible]	121001

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-58400-360	06/12/2017
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017145457	06/09/2017

Red Ball Technical Gas Service
PGVP Vendor ID # G12017
Information and Ordering
800-551-8150
Fax (318-425-6309)

ilac-MRA
PJLA Calibration and Testing
Accreditation #62754

Nate Fielder
Nate Fielder
Analyst

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

RED BALL TECHNICAL GAS SERVICES

ilac-MRA

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

O2

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0060674	Certification Date:	04/06/2018
Product ID Number:	126054	Expiration Date:	04/04/2026
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0060674.20180402-0	Lot Number:	EB0060674.20180402
Customer PO. NO.:		Tracking Number:	082989800
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Oxygen	13.82 %	±0.07 %	MPA	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0019964	EB0019964.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0032313	EB0032313.20170112	05/22/2025	GMIS	N2	O2	9.34 %	0.235	2658a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	03/26/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

HiQ® Certificate / Certificat HiQ®

LINDE CANADA LIMITED
530 Watson St. East
Whitby, ON, Canada L1N 5R9

02

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

Purchase order # 110585036
Lot # 1263941
Cylinder Number: EB 0049201

PGVP ID # L12013
Procedure: G1
Gas Type Code: 0C2
Cylinder pressure: 2000 psig

Certification date
August 12, 2013

Expiration Date
August 13, 2021

ANALYTICAL RESULTS

Component	Requested Concentration ± blending tolerance	Date of Assay	Mean Concentration	Certified Concentration Uncertainty expressed at 95% confidence
Carbon Dioxide	5 % ± 5%	August 12, 2013	5.07 %	5.07 ± 0.02 %
Oxygen	6 % ± 5%	August 9, 2013	6.36 %	6.36 ± 0.01 %

BALANCE GAS: Nitrogen

REFERENCE STANDARDS

Component	Type	Serial Number	Reference Number	Concentration	Expiration Date
Carbon Dioxide	GMIS NTRM	SX 21992 SG 9916842	1187915 101001	10 ± 0.02 % 19.98 ± 0.14 %	August 20, 2013 April 15, 2016
Oxygen	GMIS NTRM	SX 31579 CC 237234	1107503 071001	9.975 ± 0.06 % 24.12 ± 0.12 %	August 18, 2013 March 27, 2017

CERTIFICATION INSTRUMENTS

Component	Make/Model	Measurement Principle	Serial Number	Last Calibration
Carbon Dioxide	SICK MCS 100E	Infrared Photometer	04310670	August 1, 2013
Oxygen	Servomex 04100 C1	Paramagnetic Sensor	392350	August 9, 2013

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE 2012 EPA PROTOCOL PROCEDURE

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

Analyst: Keith Cybulski Signature

Date 08/12/13

Notes:

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service NOX-H
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0073000	Certification Date:	03/19/2018
Product ID Number:	125416	Expiration Date:	03/18/2021
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0073000.20180228-0	Lot Number:	EB0073000.20180228
Customer PO. NO.:		Tracking Number:	084247373
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	24.7 PPM	±0.14 PPM	FTIR	03/06/2018
Nitric Oxide	24.6 PPM	±0.3 PPM	Chemiluminescence	03/05/2018, 03/12/2018, 03/19/2018
Total Oxides of Nitrogen	24.7 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC-349582	12100115CC-349582	07/22/2019	NTRM	N2	NO	95.2 PPM	1.05	12100115
ALM022135	ALM022135.20160913	02/07/2021	GMIS	N2	NO	15.2 PPM	1.103	12100115
CC349576	CC349576.20170821	12/03/2025	GMIS	N2	NO	294 PPM	0.451	2735
EB0026633	EB0026633.20160718	01/19/2025	GMIS	N2	NO	90.67 PPM	1.054	12100115
EB0055450	EB0055450.20140403-0	12/21/2020	GMIS	N2	NO	32.02 PPM	1.058	12100115
EB0087668	EB0087668.20160721	10/30/2025	GMIS	N2	CO	202.6 PPM	0.395	1681B
EB0087736	EB0087736.20160721	10/30/2025	GMIS	N2	CO	202.6 PPM	0.395	1681B

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	02/08/2018
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	02/14/2018
NO	Chemiluminescence	Thermo	42i-HL	1162380008	02/13/2018
NO	Chemiluminescence	Thermo	42i-HL	1162380008	03/16/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

NOX-H

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0147	Reference Number:	122-401038758-1
Cylinder Number:	CC 503502	Cylinder Volume:	144.3 Cubic Feet
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22017	Valve Outlet:	660
Gas Code:	NO,NOX,BALN	Certification Date:	Nov 01, 2017

Expiration Date: Nov 01, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.89 PPM	G1	+/- 1.3% NIST Traceable	10/24/2017, 11/01/2017
NITRIC OXIDE	50.00 PPM	50.65 PPM	G1	+/- 1.1% NIST Traceable	10/24/2017, 11/01/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060610	CC442567	50.42 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Jun 27, 2020
PRM	12367	APEX1099237	10.00 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	May 29, 2016
NTRM	16060655	CC465081	50.42 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Jun 27, 2020
GMIS	1114201603	CC506722	4.985 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 NO	FTIR	Oct 26, 2017
Nicolet 6700 AHR0801549 NO	FTIR	Oct 26, 2017

Triad Data Available Upon Request

Approved for Release

RED BALL TECHNICAL GAS SERVICES

ilac-MRA

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

CO-H

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0072144	Certification Date:	04/06/2018
Product ID Number:	127180	Expiration Date:	04/04/2026
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #:	EB0072144.20180402-0	Lot Number:	EB0072144.20180402
Customer PO. NO.:		Tracking Number:	084214278
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	1670 PPM	±17 PPM	FTIR	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0003650	EB0003650.20161027	03/17/2026	GMIS	N2	CO	1514 PPM	0.568	2640A

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	04/06/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

B Theus

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

CO-H

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0040994
Product ID Number:	127179
Cylinder Pressure:	1900 PSIG
COA #	EB0040994.20180402-0
Customer PO. NO.:	
Customer:	

Certification Date:	04/06/2018
Expiration Date:	04/04/2026
MFG Facility:	- Shreveport - LA
Lot Number:	EB0040994.20180402
Tracking Number:	065159615
Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	753 PPM	±6 PPM	FTIR	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0016838	EB0016838.20161027	03/17/2026	GMIS	N2	CO	2310 PPM	0.56	2640a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	04/05/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Nate Fielder
Analyst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

CO-NOX
L

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0101725
Product ID Number:	124744
Cylinder Pressure:	1900 PSIG
COA #	EB0101725.20171114-0
Customer PO. NO.:	
Customer:	

Certification Date:	12/04/2017
Expiration Date:	12/03/2020
MFG Facility:	- Shreveport - LA
Lot Number:	EB0101725.20171114
Tracking Number:	095707020
Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	5.66 PPM	±0.07 PPM	FTIR	11/24/2017
Nitric Oxide	5.09 PPM	±0.06 PPM	Chemiluminescence	11/20/2017, 11/27/2017, 12/04/2017
Total Oxides of Nitrogen	5.19 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
ALM034813	ALM034813.20160913	09/01/2020	GMIS	N2	NO	15.5 PPM	1.079	12100115
EB0003194	EB0003194.20160721	01/11/2025	GMIS	N2	CO	12.16 PPM	1.033	091002
EB0052431	EB0052431.20151012g	01/21/2019	GMIS	N2	NO	5.799 PPM	1.012	2628a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	11/20/2017
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/24/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Anthony Cyr
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-L Revised on 2017-09-07

5 Relative Accuracy Test Audit

The full RATA report, provided by Air Hygiene Inc., is attached.

RELATIVE ACCURACY TEST AUDIT
FOR THE
SIEMENS, SCC6-5000F, UNIT #2 CEMS
PREPARED FOR
CPV VALLEY LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
MAY 10-12, 2018

RELATIVE ACCURACY TEST AUDIT
FOR THE
SIEMENS, SCC6-5000F, UNIT #2 CEMS
PREPARED FOR
CPV VALLEY LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
MAY 10-12, 2018

Prepared and Reviewed by:

Michael Whisenhunt, QSTI
Sr. Project Manager

Logan K. Tsotsoros
Logan Tsotsoros
AHU Support Staff

I, Michael Stockwell
Michael Stockwell, QSTI
Sr. Project Manager

certify that this testing was conducted and this report was created in conformance with the requirements of ASTM D7036

(this page intentionally left blank)

Table of Contents

APPENDICES

Relative Accuracy Test Audit
Siemens, SCC6-5000F, Unit #2 CEMS
CPV VALLEY LLC
CPV VALLEY ENERGY CENTER
Middletown, New York
May 10-12, 2018

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the Relative Accuracy Test Audit (RATA) for nitrogen oxides (NOx), carbon monoxide (CO), and oxygen (O_2) from the exhaust of the Siemens, SCC6-5000F, Unit #2 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on May 10-12, 2018.

The accumulated data from the RATA provides the figures for evaluating the acceptability of the operation of the on-site continuous emission monitoring system (CEMS) for the monitoring of NOx, CO, and O_2 from the Siemens, SCC6-5000F, Unit #2 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to perform the initial certification RATA on the CEMS that serves the Siemens, SCC6-5000F, Unit #2 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York. Reference method (RM) testing followed the Code of Federal Regulations (CFR), Title 40 (40 CFR), Part 60 (40 CFR 60), Appendix A, Methods 1, 3A, 7E, 10, and 19. RM values are compared with the on-site CEMS to document performance as required in the 40 CFR 60, Appendix B, Performance Specifications (PS) and 40 CFR 75 Appendix A and B. All relative accuracies were established on-site and were governed by the following sets of rules:

In accordance with 40 CFR 60, Appendix B, PS 2, Section 13.2, the NOx RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent when average emissions during the test are greater than 50 percent of the emission standard or alternative relative accuracy (ARA) does not exceed 10.0 percent when the average emissions during the test are less than 50 percent of the emission standard. Part 60 further requires that the unit be operating at greater than 50 percent of normal load.

In accordance with 40 CFR 75, Appendix A, Section 3.3.2(a) and (b), the NOx RATA results are acceptable if the relative accuracy (RA) does not exceed 10.0 percent or if during the RATA the average NOx emission rate is less than or equal to 0.200 lb/MMBtu and the average difference between the CEMS and reference method (RM) values does not exceed 0.020 lb/MMBtu. Passing this set of criteria requires the CEMS to be retested after no more than two operating quarters. Alternatively, in accordance with 40 CFR 75, Appendix B, Section 2.3.1.2(a) and (f), and Appendix B, Figure 2, the NOx RATA results are acceptable if the RA does not exceed 7.5 percent or if during the RATA the average NOx emission rate is less than or equal to 0.200 lb/MMBtu and the average difference between the CEMS and RM values does not exceed 0.015 lb/MMBtu. Passing this set of criteria allows the CEMS to be retested after four operating quarters or at least within eight calendar quarters.

In accordance with 40 CFR 60, Appendix B, PS 3, Section 13.2, the O_2 RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent or if the average difference between the CEMS and reference method (RM) values does not exceed plus or minus 1.0 percent of the measured value.

In accordance with 40 CFR 75, Appendix A, Section 3.3.3, the O_2 RATA results are acceptable if the relative accuracy (RA) does not exceed 10.0 percent or if during the RATA the average difference between the CEMS and reference method (RM) values does not exceed 1.0 percent. Passing this set of criteria requires the CEMS to be retested after no more than two operating quarters. Alternatively, in accordance with 40 CFR 75, Appendix B, Section 2.3.1.2(a) and (h), and Appendix B, Figure 2, the O_2 RATA results are acceptable if the RA does not exceed 7.5 percent or if during the RATA the average difference between the CEMS and RM values does not exceed 0.7 percent absolute. Passing this set of criteria allows the CEMS to be retested after four operating quarters or at least within eight calendar quarters.

In accordance with 40 CFR 60, Appendix B, PS 4 and 4A, Sections 13.2 of each, the CO relative accuracy (RA) test results are acceptable if the RA does not exceed 10.0 percent, if the average difference between the CEMS and reference method (RM) values plus the 2.5 percent confidence coefficient (2.5%CC) does not exceed 5.0 parts per million (ppm), or if the alternative relative accuracy (ARA) does not exceed 5.0 percent. Part 60 further requires that the unit be operating at greater than 50 percent of normal load.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

1.2.1 Participating Organizations
- New York State Department of Environmental Conservation (NYDEC)
- CPV VALLEY LLC
- Air Hygiene

1.2.2 Industry
- Electric Utility / Electric Services

1.2.3 Air Permit and Federal Requirements
- Permit Number: 3-3356-00136/00001
- 40 CFR 60, Appendix B, Performance Specifications (PS)
- 40 CFR 75, Appendix A
- 40 CFR 75, Appendix B

1.2.4 Plant Location
- CPV VALLEY ENERGY CENTER near Middletown, New York
  - GPS Coordinates [Latitude 41.413, Longitude -74.435]
  - Federal Registry System / Facility Registry Service (FRS) No. – 110043332471
  - Source Classification Code (SCC) – 20100201

1.2.5 Equipment Tested
- Siemens, SCC6-5000F, Unit #2
- NOx Analyzer (Teledyne API, T200M, 646)
- CO Analyzer (Teledyne API, T300M, 354)
- O_2 Analyzer (Teledyne API, T200M, 646)

1.2.6 Emission Points
- Exhaust from the Siemens, SCC6-5000F, Unit #2
- For all gases, one sample point in the exhaust duct from the Siemens, SCC6-5000F, Unit #2, determined after conducting a stratification test (refer to Appendix F)

1.2.7 Emission Parameters Measured
- NOx
- CO
- O_2

1.2.8 Dates of Emission Test
- May 10-12, 2018

1.2.9 Federal and State Certifications

- Stack Testing Accreditation Council AETB Certificate No. 3796.02
- International Standard ISO/IEC 17025:2005 Certificate No. 3796.01

1.3 KEY PERSONNEL

Siemens:	Jordan Haywood	407-736-3045
Air Hygiene:	Michael Stockwell (mstockwell@airhygiene.com)	918-307-8865
Air Hygiene:	Hunter Neal	918-307-8865
Air Hygiene:	Zach Van Ness	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on CPV VALLEY LLC's Siemens, SCC6-5000F, Unit #2 located at the CPV VALLEY ENERGY CENTER on May 10-12, 2018 are summarized in the following table and relate only to the items tested.

TABLE 2.1
SUMMARY OF SIEMENS, SCC6-5000F, UNIT #2 RATA RESULTS

Pollutant	Units	Criteria			Results	Passed / Test Frequency
		CFR	Specification / Section	Standard		
NOx	ppmvd	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 4.6%	YES / ANNUAL
NOx	ppmvd@15%O_2	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 5%	YES / ANNUAL
NOx	lb/hr	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 5.4%	YES / ANNUAL
NOx	lb/MMBtu	Part 75	Appendix A, Section 3.3.2(a),(b) Appendix B, Section 2.3.1.2(a),(f), Figure 2	RA ≤ 10%, or if lb/MMBtu ≤ 0.200, d ≤ ±0.020 lb/MMBtu Annual Incentive RA ≤ 7.5%, or if lb/MMBtu ≤ 0.2, d ≤ ±0.015 lb/MMBtu	RA = 7% RM = 0.02 lb/MMBtu d = 0.001 lb/MMBtu BAF=1.052	YES / ANNUAL
O_2	%vd	Part 60	Appendix B, Performance Specification 3, Section 13.2	RA ≤ 20%, or d ≤ ±1.0%	RA = 0.5% d = 0 %	YES / ANNUAL
O_2	%vd	Part 75	Appendix A, Section 3.3.3 Appendix B, Section 2.3.1.2(a),(h), Figure 2	RA ≤ 10%, or d ≤ ±1.0% Annual Incentive RA ≤ 7.5%, or d ≤ ±0.7%	RA = 0.5% d = 0 %	YES / ANNUAL
CO	ppmvd	Part 60	Appendix B, Performance Specification 4, 4A, from all Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.6 ppm	YES / ANNUAL
CO	ppmvd@15%O_2	Part 60	Appendix B, Performance Specification 4, 4A, from all Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.6 ppm	YES / ANNUAL
CO	lb/hr	Part 60	Appendix B, Performance Specification 4, 4A Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.6 ppm	YES / ANNUAL
Load	MW	Part 60	Appendix B, Performance Specifications	> 50% max load	187.7	WITHIN TOLERANCE
Load	MW	Part 75	Appendix A and B	normal or alternative normal load range	187.7	WITHIN TOLERANCE

Notes: RA = relative accuracy, ARA = alternative relative accuracy, RM = reference method value, d = difference between RM and CEMS value, CC = confidence coefficient, v = velocity, BAF = bias adjustment factor

The RATA passed for all pollutants (NOx, CO, and O_2) in all units (ppm, ppm@15%O_2, lb/hr, lb/MMBtu, and %) under all 40 CFR 60 and 40 CFR 75 criteria.

Specifically, NOx in units of ppm, ppm@15%O_2, and lb/hr, passed 40 CFR 60 criteria with an RA less than 20 percent. NOx in units of lb/MMBtu passed the 40 CFR 75 alternative annual incentive criteria with an emissions rate of less than 0.200 lb/MMBtu and a difference between the RM and CEMS analyzers of less than 0.015 lb/MMBtu. Also the Bias Adjustment Factor test passed with an adjustment factor equal to 1.052 (adjustment required). O_2 in units of % passed the 40 CFR 75 annual incentive criteria with an RA less than 7.5 percent. CO in units of ppm and ppm@15%O_2 passed the 40 CFR 60 alternative criteria with a concentration difference between the RM and CEMS analyzers plus the confidence coefficient of less than 5 ppm.

Unit load was within the 40 CFR 60 required criteria of greater than 50 percent of the maximum load and also fell within the alternative normal load criteria as defined by the plants Quality Control and Monitoring Plan which defined the upper and lower boundary on the unit and the normal and alternative normal load ranges.

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

The CPV Valley Energy Center is located at 3330 U.S. Route 6 in Middletown, New York. CPV Valley Energy Center is an electric generation facility. The facility consists of two Siemens SCC6-5000F Combined Cycle Combustion Turbines (CTG), designated as CTG1 and CTG2. Each CTG is rated for the turbine at 2,234 MMBtu/hr (HHV) on natural gas; and 2,145 MMBtu/hr (HHV) on ULSD fuel oil; and is rated at 500 MMBtu/hr on natural gas for the duct burner. The CTG's are equipped with dry low NOx combustors, selective catalytic reduction (SCR), and catalytic oxidizers. The interests of this report are CTG1 and CTG2 operating while burning fuel oil (ULSD).

3.2 SAMPLING LOCATION

The CTG1 and CTG2 stacks are vertical, circular and measures 19.35 feet (ft) (232.25 inches) in diameter at the test ports which are approximately 175 ft above grade level with an exit elevation of approximately 275 ft above grade level. The test ports are located approximately 91.25 ft (1095 inches) downstream and approximately 100 ft (1200 inches) upstream from the nearest disturbances.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Siemens, SCC6-5000F, Unit #2 at the CPV VALLEY ENERGY CENTER was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on May 10-12, 2018.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Oxygen	EPA Method 3A	Paramagnetic Cell
Nitrogen Oxides	EPA Method 7E	Chemiluminescent Analyzer
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 3A, 7E, 10, and 19.

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the real-time analyzers through rotameters that controlled the flow rate of the sample.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. NOx calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds. Data records can be found in Appendix A and B of this report.

Ten test runs of approximately 21 minutes each were conducted on the Siemens, SCC6-5000F, Unit #2 at the maximum test load for NOx, CO, and O_2. The unit operation was greater than 50 percent of capacity as required by the 40 CFR 60, Performance Specifications. The unit operation was at the normal / alternative normal load as required by 40 CFR 75.

The stack gas analysis for O_2 concentrations was performed in accordance with procedures set forth in EPA Method 3A. The O_2 analyzer uses a paramagnetic cell detector.

EPA Method 7E was used to determine concentrations of NOx. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO_2 in nitrogen certified gas cylinder was used to verify at least a 90 percent NO_2 conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NOx	THERMO 42i-HL	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO_2 to NO. Chemiluminescence of reaction of NO with O_3. Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48i	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
O_2	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.

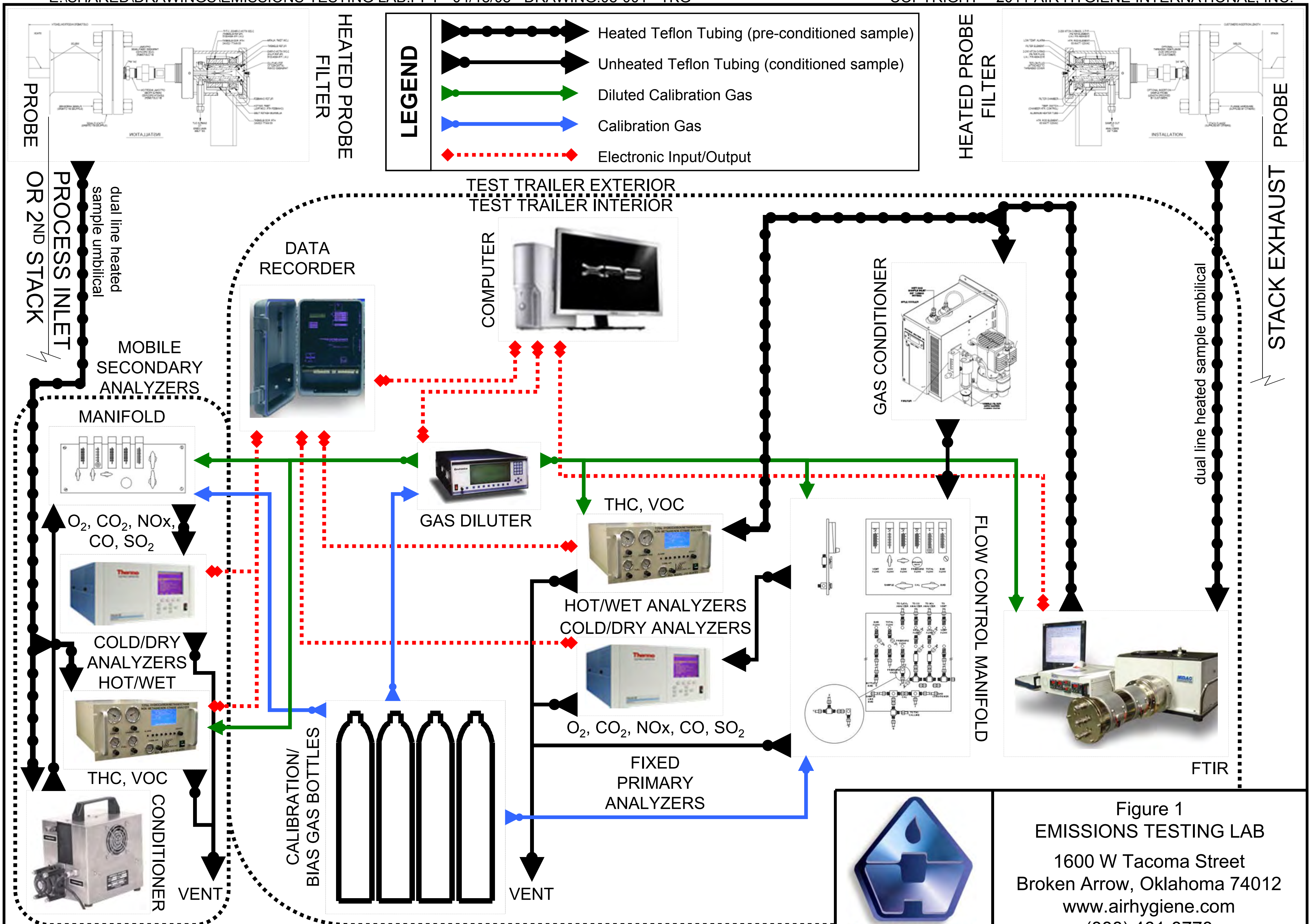
EPA Method 7E was used to determine concentrations of NOx. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO_2 in nitrogen certified gas cylinder was used to verify at least a 90 percent NO_2 conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NOx	THERMO 42i-HL	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO_2 to NO. Chemiluminescence of reaction of NO with O_3. Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48i	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
O_2	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.

E:\SHARED\DRAWINGS\EMISSIONS TESTING LAB.PPT 04/18/08 DRAWING:08-001 TKG



AIR HYGIENE

Figure 1
EMISSIONS TESTING LAB

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

APPENDIX A

TEST RESULTS AND CALCULATIONS

TABLE A.1:
EMISSIONS TESTING SCHEDULE

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
2	Max	Stratification Test	1	05/10/18	12:40:06	13:52:06	DAHS
2	Max	Gas RATA	1	05/11/18	12:06:21	12:26:51	DAHS
2	Max	Gas RATA	2	05/11/18	12:41:21	13:01:51	DAHS
2	Max	Gas RATA	3	05/11/18	13:15:22	13:35:52	DAHS
2	Max	Gas RATA	4	05/11/18	13:48:22	14:08:52	DAHS
2	Max	Gas RATA	5	05/11/18	14:23:22	14:43:52	DAHS
2	Max	Gas RATA	6	05/11/18	15:00:22	15:20:52	DAHS
2	Max	Gas RATA	7	05/12/18	8:08:07	8:28:37	DAHS
2	Max	Gas RATA	8	05/12/18	8:59:09	9:19:39	DAHS
2	Max	Gas RATA	9	05/12/18	9:32:00	9:52:30	DAHS
2	Max	Gas RATA	10	05/12/18	10:53:01	11:13:31	DAHS

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (ppmvd)	CEMS (ppmvd)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:06 - 12:26	YES	184.0	7.00	6.60	0.4000	0.16
2	12:41 - 13:01	YES	185.0	6.80	6.70	0.1000	0.01
3	13:15 - 13:35	YES	185.0	7.00	6.70	0.3000	0.09
4	13:48 - 14:08	NO	185.0	7.00	6.60		
5	14:23 - 14:43	YES	185.0	6.70	6.50	0.2000	0.04
6	15:00 - 15:20	YES	185.0	7.00	6.70	0.3000	0.09
7	08:08 - 08:28	YES	191.0	6.80	6.60	0.2000	0.04
8	08:59 - 09:19	YES	193.0	7.00	6.70	0.3000	0.09
9	09:32 - 09:52	YES	192.0	6.80	6.80	0.0000	0.00
10	10:53 - 11:13	YES	192.0	6.90	6.70	0.2000	0.04
11		NO					
12		NO					
	Total		**1692.0**	**62.00**	**60.00**	**2.000000**	**0.560000**
	Average		**188.0**	**6.89**	**6.67**	**0.222222**	
	Number of Runs			9			
	Standard Deviation			0.120185			
	T-value			2.306			
	Confidence Coefficient			0.092382			

Relative Accuracy = 4.6%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD	RM	CEMS	RM-CEMS	
			(MW)	(ppmvd)	(ppmvd)	(diff)	($diff^2$)
1	12:06 - 12:26	YES	184.0	0.30	0.00	0.3000	0.09
2	12:41 - 13:01	YES	185.0	0.30	0.00	0.3000	0.09
3	13:15 - 13:35	YES	185.0	0.20	0.00	0.2000	0.04
4	13:48 - 14:08	YES	185.0	0.30	0.00	0.3000	0.09
5	14:23 - 14:43	YES	185.0	0.30	0.00	0.3000	0.09
6	15:00 - 15:20	YES	185.0	0.20	0.00	0.2000	0.04
7	08:08 - 08:28	YES	191.0	0.60	1.50	-0.9000	0.81
8	08:59 - 09:19	YES	193.0	0.40	1.40	-1.0000	1.00
9	09:32 - 09:52	YES	192.0	0.30	1.40	-1.1000	1.21
10	10:53 - 11:13	NO	192.0	0.30	1.20		
11		NO					
12		NO					
		Total	**1685.0**	**2.90**	**4.30**	**-1.400000**	**3.460000**
		Average	**187.2**	**0.32**	**0.48**	**-0.155556**	
		Number of Runs		9			
		Standard Deviation		0.636614			
		T-value		2.306			
		Confidence Coefficient		0.489344			

Relative Accuracy =	**200.1%**
|d (difference in ppm)| + CC =	**0.6**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
O_2 RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (%vd)	CEMS (%vd)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:06 - 12:26	YES	184.0	13.80	13.80	0.0000	0.00
2	12:41 - 13:01	YES	185.0	13.90	13.80	0.1000	0.01
3	13:15 - 13:35	YES	185.0	13.80	13.80	0.0000	0.00
4	13:48 - 14:08	YES	185.0	13.80	13.80	0.0000	0.00
5	14:23 - 14:43	YES	185.0	13.80	13.80	0.0000	0.00
6	15:00 - 15:20	YES	185.0	13.80	13.80	0.0000	0.00
7	08:08 - 08:28	YES	191.0	13.70	13.70	0.0000	0.00
8	08:59 - 09:19	YES	193.0	13.80	13.70	0.1000	0.01
9	09:32 - 09:52	YES	192.0	13.80	13.70	0.1000	0.01
10	10:53 - 11:13	NO	192.0	13.80	13.70		
11		NO					
12		NO					
		Total	**1685.0**	**124.20**	**123.90**	**0.300000**	**0.030000**
		Average	**187.2**	**13.80**	**13.77**	**0.033333**	
		Number of Runs	9				
		Standard Deviation	0.050000				
		T-value	2.306				
		Confidence Coefficient	0.038433				

Average Difference = 0.0
Relative Accuracy = 0.5%

Part 60, Appendix B, Performance Specification 3,
13.2 CEMS Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent of the mean value of the reference method (RM) data. The results are also acceptable if the absolute value of the difference between the mean RM value and the mean CEMS value is less than or equal to 1.0 percent O2 (or CO2).

Part 75, Appendix A,
3.3.3 Relative Accuracy for CO2 and O2 Monitors
The relative accuracy for CO2 and O2 monitors shall not exceed 10.0 percent. The relative accuracy test results are also acceptable if the difference between the mean value of the CO2 or O2 monitor measurements and the corresponding reference method measurement mean value, calculated using equation A-7 of this appendix, does not exceed ± 1.0 percent CO2 or O2.

Part 75, Appendix B,
2.3.1.2 Reduced RATA Frequencies
Relative accuracy test audits of primary and redundant backup SO2 pollutant concentration monitors, CO2 pollutant concentration monitors (including O2 monitors used to determine CO2 emissions), CO2 or O2 diluent monitors used to determine heat input, moisture monitoring systems, NOX concentration monitoring systems, flow monitors, NOX-diluent monitoring systems or SO2-diluent monitoring systems may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the following conditions are met for the specific monitoring system involved:
(a) The relative accuracy during the audit of an SO2 or CO2 pollutant concentration monitor (including an O2 pollutant monitor used to measure CO2 using the procedures in appendix F to this part), or of a CO2 or O2 diluent monitor used to determine heat input, or of a NOX concentration monitoring system, or of a NOX-diluent monitoring system, or of an SO2-diluent continuous emissions monitoring system is ≤ 7.5 percent;

(e) For low SO_2 or NO_X emitting units (average SO_2 or NO_X reference method concentrations ≤ 250 ppm) during the RATA, when an SO_2 pollutant concentration monitor or NO_X concentration monitoring system fails to achieve a relative accuracy ≤ 7.5 percent during the audit, but the monitor mean value from the RATA is within ± 12 ppm of the reference method mean value;

Figure 2 to Appendix B of Part 75_Relative Accuracy Test Frequency Incentive System.

RATA	Semiannual(percent)(1)	Annual(1)
SO2 or NOX(3)	7.5% < RA ≤ 10.0% or ± 15.0 ppm(2)	RA ≤ 7.5% or ± 12.0 ppm(2)
SO2-diluent	7.5% < RA ≤ 10.0% or ± 0.030 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.025 lb/mmBtu(2)
NOX-diluent	7.5% < RA ≤ 10.0% or ± 0.020 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.015 lb/mmBtu(2)
Flow	7.5% < RA ≤ 10.0% or ± 2.0 fps(2)	RA ≤ 7.5% or ± 1.5 fps
CO2 or O2	7.5% < RA ≤ 10.0% or ± 1.0% CO2/O2(2)	RA ≤ 7.5% or ± 0.7% CO2/O2(2)
Moisture	7.5% < RA ≤ 10.0% or ± 1.5% H2O(2)	RA ≤ 7.5% or ± 1.0% H2O(2)

(1) The deadline for the next RATA is the end of the second (if semiannual) or fourth (if annual) successive QA operating quarter following the quarter in which the CEMS was last tested. Exclude calendar quarters with fewer than 168 unit operating hours (or, for common stacks and bypass stacks, exclude quarters with fewer than 168 stack operating hours) in determining the RATA deadline. For SO_2 monitors, QA operating quarters in which only very low sulfur fuel as defined in § 72.2, is combusted may also be excluded. However, the exclusion of calendar quarters is limited as follows: the deadline for the next RATA shall be no more than 8 calendar quarters after the quarter in which a RATA was last performed.
(2) The difference between monitor and reference method mean values applies to moisture monitors, CO_2, and O_2 monitors, low emitters, or low flow, only.
(3) A NO_X concentration monitoring system used to determine NO_X mass emissions under § 75.71.

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD	RM	CEMS	RM-CEMS	
			(MW)	(ppmvd@15%O_2)	(ppmvd@15%O_2)	(diff)	($diff^2$)
1	12:06 - 12:26	YES	184.0	5.80	5.40	0.4000	0.16
2	12:41 - 13:01	YES	185.0	5.70	5.60	0.1000	0.01
3	13:15 - 13:35	YES	185.0	5.80	5.60	0.2000	0.04
4	13:48 - 14:08	NO	185.0	5.80	5.50		
5	14:23 - 14:43	YES	185.0	5.60	5.40	0.2000	0.04
6	15:00 - 15:20	YES	185.0	5.80	5.60	0.2000	0.04
7	08:08 - 08:28	YES	191.0	5.60	5.40	0.2000	0.04
8	08:59 - 09:19	YES	193.0	5.80	5.50	0.3000	0.09
9	09:32 - 09:52	YES	192.0	5.70	5.50	0.2000	0.04
10	10:53 - 11:13	YES	192.0	5.70	5.50	0.2000	0.04
11		NO					
12		NO					
	Total		**1692.0**	**51.50**	**49.50**	**2.000000**	**0.500000**
	Average		**188.0**	**5.72**	**5.50**	**0.222222**	
	Number of Runs			9			
	Standard Deviation			0.083333			
	T-value			2.306			
	Confidence Coefficient			0.064056			

Relative Accuracy = 5.0%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM ($ppmvd@15\%O_2$)	CEMS ($ppmvd@15\%O_2$)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:06 - 12:26	YES	184.0	0.30	0.00	0.3000	0.09
2	12:41 - 13:01	YES	185.0	0.20	0.00	0.2000	0.04
3	13:15 - 13:35	YES	185.0	0.20	0.00	0.2000	0.04
4	13:48 - 14:08	YES	185.0	0.20	0.00	0.2000	0.04
5	14:23 - 14:43	YES	185.0	0.20	0.00	0.2000	0.04
6	15:00 - 15:20	YES	185.0	0.20	0.00	0.2000	0.04
7	08:08 - 08:28	YES	191.0	0.50	1.20	-0.7000	0.49
8	08:59 - 09:19	YES	193.0	0.40	1.10	-0.7000	0.49
9	09:32 - 09:52	YES	192.0	0.30	1.10	-0.8000	0.64
10	10:53 - 11:13	NO	192.0	0.30	1.00		
11		NO					
12		NO					
		Total	**1685.0**	**2.50**	**3.40**	**-0.900000**	**1.910000**
		Average	**187.2**	**0.28**	**0.38**	**-0.100000**	
		Number of Runs	9				
		Standard Deviation	0.476970				
		T-value	2.306				
		Confidence Coefficient	0.366631				

Relative Accuracy =	**168.0%**
|d (difference in ppm)| + CC =	**0.6**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (lb/hr)	CEMS (lb/hr)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:06 - 12:26	YES	184.0	44.00	41.00	3.0000	9.00
2	12:41 - 13:01	YES	185.0	43.20	42.10	1.1000	1.21
3	13:15 - 13:35	YES	185.0	44.10	42.10	2.0000	4.00
4	13:48 - 14:08	NO	185.0	44.00	41.60		
5	14:23 - 14:43	YES	185.0	42.60	41.20	1.4000	1.96
6	15:00 - 15:20	YES	185.0	44.00	41.80	2.2000	4.84
7	08:08 - 08:28	YES	191.0	43.50	41.50	2.0000	4.00
8	08:59 - 09:19	YES	193.0	44.90	42.60	2.3000	5.29
9	09:32 - 09:52	YES	192.0	43.90	42.40	1.5000	2.25
10	10:53 - 11:13	YES	192.0	44.30	42.40	1.9000	3.61
11		NO					
12		NO					
	Total		**1692.0**	**394.50**	**377.10**	**17.400000**	**36.160000**
	Average		**188.0**	**43.83**	**41.90**	**1.933333**	
	Number of Runs			9			
	Standard Deviation			0.561249			
	T-value			2.306			
	Confidence Coefficient			0.431413			

Relative Accuracy = 5.4%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD	RM	CEMS	RM-CEMS	
			(MW)	(lb/hr)	(lb/hr)	(diff)	($diff^2$)
1	12:06 - 12:26	YES	184.0	1.20	0.00	1.2000	1.44
2	12:41 - 13:01	YES	185.0	1.10	0.00	1.1000	1.21
3	13:15 - 13:35	YES	185.0	0.90	0.00	0.9000	0.81
4	13:48 - 14:08	YES	185.0	1.10	0.00	1.1000	1.21
5	14:23 - 14:43	YES	185.0	1.10	0.00	1.1000	1.21
6	15:00 - 15:20	YES	185.0	0.90	0.00	0.9000	0.81
7	08:08 - 08:28	YES	191.0	2.40	5.90	-3.5000	12.25
8	08:59 - 09:19	YES	193.0	1.70	5.70	-4.0000	16.00
9	09:32 - 09:52	YES	192.0	1.40	5.50	-4.1000	16.81
10	10:53 - 11:13	NO	192.0	1.30	4.50		
11		NO					
12		NO					
		Total	**1685.0**	**11.80**	**17.10**	**-5.300000**	**51.750000**
		Average	**187.2**	**1.31**	**1.90**	**-0.588889**	

Number of Runs	9
Standard Deviation	2.465484
T-value	2.306
Confidence Coefficient	1.895135

Relative Accuracy =	**189.5%**
|d (difference in ppm)| + CC =	**0.6**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (lb/MMBtu)	CEMS (lb/MMBtu)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:06 - 12:26	YES	184.0	0.023	0.021	0.0020	0.0000
2	12:41 - 13:01	YES	185.0	0.022	0.022	0.0000	0.0000
3	13:15 - 13:35	YES	185.0	0.023	0.022	0.0010	0.0000
4	13:48 - 14:08	NO	185.0	0.023	0.022		
5	14:23 - 14:43	YES	185.0	0.022	0.021	0.0010	0.0000
6	15:00 - 15:20	YES	185.0	0.023	0.022	0.0010	0.0000
7	08:08 - 08:28	YES	191.0	0.022	0.021	0.0010	0.0000
8	08:59 - 09:19	YES	193.0	0.023	0.021	0.0020	0.0000
9	09:32 - 09:52	YES	192.0	0.022	0.021	0.0010	0.0000
10	10:53 - 11:13	YES	192.0	0.022	0.021	0.0010	0.0000
11		NO					
12		NO					
	Total		**1692.0**	**0.202**	**0.192**	**0.010000**	**0.000014**
	Average		**188.0**	**0.022**	**0.021**	**0.001111**	

Number of Runs	9
Standard Deviation	0.000601
T-value	2.306
Confidence Coefficient	0.000462

Relative Accuracy = 7.01%

If the mean difference is less than or equal to the absolute value of the confidence coefficient, then the Bias Test passes and the bias adjustment factor is not applicable.

Mean Difference =	0.0011
Confidence Coefficient =	0.0005

BAF = 1 + (abs. value mean difference/avg. CEMS reading)

Average CEMS Reading =	0.021
BAF =	**1.052**

Part 75, Appendix A,
3.3.2 Relative Accuracy for NOX-Diluent Continuous Emission Monitoring Systems
(a) The relative accuracy for NOX-diluent continuous emission monitoring systems shall not exceed 10.0 percent.
(b) For affected units where the average of the reference method measurements of NOX emission rate (this means lb/MMBtu) during the relative accuracy test audit is less than or equal to 0.200 lb/mmBtu, the difference between the mean value of the continuous emission monitoring system measurements and the reference method mean value shall not exceed ±0.020 lb/mmBtu, wherever the relative accuracy specification of 10.0 percent is not achieved.

7.6.5 Bias Adjustment
(b) For single-load RATAs of SO2 pollutant concentration monitors, NOX concentration monitoring systems, and NOX-diluent monitoring systems and for the single-load flow RATAs required or allowed under section 6.5.2 of this appendix and sections 2.3.1.3(b) and 2.3.1.3(c) of Appendix B to this part, the appropriate BAF is determined directly from the RATA results at normal load, using Equation A-12. Notwithstanding, when a NOX concentration CEMS or an SO2 CEMS or a NOX-diluent CEMS installed on a low-emitting affected unit (i.e., average SO2 or NOX concentration during the RATA &IE; 250 ppm or average NOX emission rate &IE; 0.200 lb/mmBtu) meets the normal 10.0 percent relative accuracy specification (as calculated using Equation A-10) or the alternate relative accuracy specification in section 3.3 of this appendix for low-emitters, but fails the bias test, the BAF may either be determined using Equation A-12, or a default BAF of 1.111 may be used.

Part 75, Appendix B,
2.3.1.2 Reduced RATA Frequencies. Relative accuracy test audits of primary and redundant backup SO2 pollutant concentration monitors, CO2 pollutant concentration monitors (including O2 monitors used to determine CO2 emissions), CO2 or O2 diluent monitors used to determine heat input, moisture monitoring systems, NOX concentration monitoring systems, flow monitors, NOX-diluent monitoring systems or SO2-diluent monitoring systems may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the following conditions are met for the specific monitoring system involved:
(a) The relative accuracy during the audit of an SO2 or CO2 pollutant concentration monitor (including an O2 pollutant monitor used to measure CO2 using the procedures in appendix F to this part), or of a CO2 or O2 diluent monitor used to determine heat input, or of a NOX concentration monitoring system, or of a NOX-diluent monitoring system, or of an SO2-diluent continuous emissions monitoring system is ≤ 7.5 percent;
(f) For units with low NOX emission rates (average NOX emission rate measured by the reference method during the RATA ≤ 0.200 lb/mmBtu), when a NOX-diluent continuous emission monitoring system fails to achieve a relative accuracy ≤ 7.5 percent, but the monitoring system mean value from the RATA, calculated using Equation A-7 in appendix A to this part, is within ± 0.015 lb/mmBtu of the reference method mean value;

Figure 2 to Appendix B of Part 75_Relative Accuracy Test Frequency Incentive System.

RATA	Semiannual(percent)(1)	Annual(1)
SO2 or NOX(3)	7.5% < RA ≤ 10.0% or ± 15.0 ppm(2)	RA ≤ 7.5% or ± 12.0 ppm(2)
SO2-diluent	7.5% < RA ≤ 10.0% or ± 0.030 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.025 lb/mmBtu(2)
NOX-diluent	7.5% < RA ≤ 10.0% or ± 0.020 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.015 lb/mmBtu(2)
Flow	7.5% < RA ≤ 10.0% or ± 2.0 fps(2)	RA ≤ 7.5% or ± 1.5 fps
CO2 or O2	7.5% < RA ≤ 10.0% or ± 1.0% CO2/O2(2)	RA ≤ 7.5% or ± 0.7% CO2/O2(2)
Moisture	7.5% < RA ≤ 10.0% or ± 1.5% H2O(2)	RA ≤ 7.5% or ± 1.0% H2O(2)

(1) The deadline for the next RATA is the end of the second (if semiannual) or fourth (if annual) successive QA operating quarter following the quarter in which the CEMS was last tested. Exclude calendar quarters with fewer than 168 unit operating hours (or, for common stacks and bypass stacks, exclude quarters with fewer than 168 stack operating hours) in determining the RATA deadline. For SO2 monitors, QA operating quarters in which only very low sulfur fuel as defined in § 72.2, is combusted may also be excluded. However, the exclusion of calendar quarters is limited as follows: the deadline for the next RATA shall be no more than 8 calendar quarters after the quarter in which a RATA was last performed.
(2) The difference between monitor and reference method mean values applies to moisture monitors, CO2, and O2 monitors, low emitters, or low flow, only.
(3) A NOX concentration monitoring system used to determine NOX mass emissions under § 75.71.

Relative Accuracy Test Data
CEMS Results (NOx)
Siemens, SCC6-5000F, Unit #2

Parameter:	Oxides of Nitrogen
Date of Test:	May 11, 2018
Reference Method:	EPA Method 7E
CEMS Analyzer Type:	Chemiluminescence
Manufacturer:	Teledyne API
Model #:	T200M
Serial #:	646

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:06 - 12:26	184.0	6.60	5.40	41.00	0.021
2	12:41 - 13:01	185.0	6.70	5.60	42.10	0.022
3	13:15 - 13:35	185.0	6.70	5.60	42.10	0.022
4	13:48 - 14:08	185.0	6.60	5.50	41.60	0.022
5	14:23 - 14:43	185.0	6.50	5.40	41.20	0.021
6	15:00 - 15:20	185.0	6.70	5.60	41.80	0.022
7	08:08 - 08:28	191.0	6.60	5.40	41.50	0.021
8	08:59 - 09:19	193.0	6.70	5.50	42.60	0.021
9	09:32 - 09:52	192.0	6.80	5.50	42.40	0.021
10	10:53 - 11:13	192.0	6.70	5.50	42.40	0.021
11						
12						

Relative Accuracy Test Data
CEMS Results (CO)
Siemens, SCC6-5000F, Unit #2

Parameter:	Carbon Monoxide
Date of Test:	May 11, 2018
Reference Method:	EPA Method 10
CEMS Analyzer Type:	Infrared Absorption
Manufacturer:	Teledyne API
Model #:	T300M
Serial #:	354

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:06 - 12:26	184.0	0.00	0.00	0.00	
2	12:41 - 13:01	185.0	0.00	0.00	0.00	
3	13:15 - 13:35	185.0	0.00	0.00	0.00	
4	13:48 - 14:08	185.0	0.00	0.00	0.00	
5	14:23 - 14:43	185.0	0.00	0.00	0.00	
6	15:00 - 15:20	185.0	0.00	0.00	0.00	
7	08:08 - 08:28	191.0	1.50	1.20	5.90	
8	08:59 - 09:19	193.0	1.40	1.10	5.70	
9	09:32 - 09:52	192.0	1.40	1.10	5.50	
10	10:53 - 11:13	192.0	1.20	1.00	4.50	
11						
12						

Relative Accuracy Test Data
CEMS Results (O_2)
Siemens, SCC6-5000F, Unit #2

Parameter:	Oxygen
Date of Test:	May 11, 2018
Reference Method:	EPA Method 3A
CEMS Analyzer Type:	Paramagnetic Cell
Manufacturer:	Teledyne API
Model #:	T200M
Serial #:	646

RUN #	RUN TIME	UNIT LOAD (MW)	CONC. (%vd)
1	12:06 - 12:26	184.0	13.80
2	12:41 - 13:01	185.0	13.80
3	13:15 - 13:35	185.0	13.80
4	13:48 - 14:08	185.0	13.80
5	14:23 - 14:43	185.0	13.80
6	15:00 - 15:20	185.0	13.80
7	08:08 - 08:28	191.0	13.70
8	08:59 - 09:19	193.0	13.70
9	09:32 - 09:52	192.0	13.70
10	10:53 - 11:13	192.0	13.70
11			
12			

Relative Accuracy Test Data
Reference Method Results (NOx)
Siemens, SCC6-5000F, Unit #2

Parameter:	Oxides of Nitrogen
Date of Test:	May 11, 2018
Reference Method:	EPA Method 7E
RM Analyzer Type:	Chemiluminescence
Manufacturer: Model #:	THERMO 42i-HL
Serial #:	INST-NX-0064

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:06 - 12:26	184.0	6.95	5.80	43.99	0.023
2	12:41 - 13:01	185.0	6.79	5.70	43.17	0.022
3	13:15 - 13:35	185.0	6.97	5.82	44.07	0.023
4	13:48 - 14:08	185.0	6.95	5.81	43.97	0.023
5	14:23 - 14:43	185.0	6.73	5.62	42.60	0.022
6	15:00 - 15:20	185.0	6.96	5.81	44.03	0.023
7	08:08 - 08:28	191.0	6.85	5.61	43.47	0.022
8	08:59 - 09:19	193.0	6.96	5.78	44.86	0.023
9	09:32 - 09:52	192.0	6.82	5.67	43.89	0.022
10	10:53 - 11:13	192.0	6.90	5.72	44.26	0.022
11						
12						

Relative Accuracy Test Data
Reference Method Results (CO)
Siemens, SCC6-5000F, Unit #2

Parameter:	Carbon Monoxide
Date of Test:	May 11, 2018
Reference Method:	EPA Method 10
RM Analyzer Type:	Infrared Absorption
Manufacturer: Model #:	THERMO 48i
Serial #:	INST-CO-0016

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:06 - 12:26	184.0	0.31	0.26	1.19	
2	12:41 - 13:01	185.0	0.28	0.24	1.09	
3	13:15 - 13:35	185.0	0.23	0.19	0.88	
4	13:48 - 14:08	185.0	0.29	0.24	1.10	
5	14:23 - 14:43	185.0	0.30	0.25	1.14	
6	15:00 - 15:20	185.0	0.24	0.20	0.92	
7	08:08 - 08:28	191.0	0.61	0.50	2.37	
8	08:59 - 09:19	193.0	0.44	0.37	1.74	
9	09:32 - 09:52	192.0	0.35	0.29	1.36	
10	10:53 - 11:13	192.0	0.34	0.28	1.32	
11						
12						

Relative Accuracy Test Data
Reference Method Results (O_2)
Siemens, SCC6-5000F, Unit #2

Parameter:	Oxygen
Date of Test:	May 11, 2018
Reference Method:	EPA Method 3A
RM Analyzer Type:	Paramagnetic Cell
Manufacturer: Model #:	SERVOMEX 1440
Serial #:	inst-O2-0023

RUN #	RUN TIME	UNIT LOAD	CONC.
		(MW)	(%vd)
1	12:06 - 12:26	184.0	13.83
2	12:41 - 13:01	185.0	13.87
3	13:15 - 13:35	185.0	13.83
4	13:48 - 14:08	185.0	13.84
5	14:23 - 14:43	185.0	13.83
6	15:00 - 15:20	185.0	13.83
7	08:08 - 08:28	191.0	13.71
8	08:59 - 09:19	193.0	13.80
9	09:32 - 09:52	192.0	13.81
10	10:53 - 11:13	192.0	13.78
11			
12			

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

Note: RHsp (gr/lb) calculated using temperature, relative humidity, and barometric pressure with psychrometric chart, psychrometric calculator, or built in psychrometric algorithm.

$$RH_{sp}(lb/lb) = \left[\left(\frac{gr}{lb}\right) \times \frac{lb}{7000\,gr}\right]$$

$$RH_{sp} = \frac{36.94\ gr}{lb} \times \frac{l\ lb}{7000\ gr} = 0.005278\ \frac{lb\ H_2O}{lb\ Air}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Analyzer Calibration Error

RM 7E, (02-27-14), 12.2 Analyzer Calibration Error. For non-dilution systems, use Equation 7E-1 to calculate the analyzer calibration error for the low-, mid-, and high-level calibration gases. (calc for NOx analyzer mid gas, if applicable)

$$ACE = \left(\frac{C_{Dir} - C_V}{CS}\right) \times 100 \qquad \text{Eq. 7E-1}$$

$$ACE = \frac{9.60\ ppm - 9.30\ ppm}{18.30\ ppm} \times 100 = 1.64\ \%$$

EXAMPLE CALCULATIONS (BIAS, DRIFT, AND CORRECTED RAW AVERAGE)

System Bias

RM 7E, (02-27-14), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for NOx analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{CS}\right) \times 100 \qquad \text{Eq. 7E-2}$$

$$SB = \frac{9.26\ ppm - 9.60\ ppm}{18.30\ ppm} \times 100 = -1.86\ \%$$

Drift Assessment

RM 7E, (02-27-14), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for NOx analyzer upscale drift, Run 1, if applicable)

$$D = \left|SB_{final} - SB_i\right| \qquad \text{Eq. 7E-4}$$

$$D = |\ 0.16\ \% - -1.86\ \%\ | = 2.02\ \%$$

Bias Adjusted Average

RM 7E, (02-27-14), 12.6 Effluent Gas Concentration. For each test run, calculate Cavg, the arithmetic average of all valid NOx concentration values (e.g., 1-minute averages). Then adjust the value of Cavg for bias, using Equation 7E-5b. (calc for NOx analyzer, Run 1, if applicable)

$$C_{Gas} = \left(C_{Avg} - C_O\right) \times \left(\frac{C_{MA}}{C_M - C_O}\right) \qquad \text{Eq. 7E-5b}$$

$$C_{Gas} = \left(7.15\ ppm - 0.38\ ppm\right)\left(\frac{9.30\ ppm}{9.45\ ppm - 0.38\ ppm}\right) = 6.95\ ppm$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (RATA RESULTS)

Difference (d)

40 CFR 75, App A, (12-17-09), 7.3.1 Arithmetic Mean. Calculate the arithmetic mean of the differences, d , of a data set as follows. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$d = \sum_{i=1}^{n} d_i$$ Eq. A-7

d = 6.889 ppm - 6.667 ppm = 0.222 ppm

Standard Deviation

40 CFR 75, App A, (12-17-09), 7.3.2 Standard Deviation. Calculate the standard deviation, Sd, of a data set as follows:
(calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \left[\frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}\right]}{n-1}}$$ Eq. A-8

$$S_d = \sqrt{\frac{0.560 \text{ ppm}^2 - \frac{\left(2.000 \text{ ppm}\right)^2}{9}}{9 - 1}} = 0.120 \text{ ppm}$$

Confidence Coefficient

40 CFR 75, App A, (12-17-09), 7.3.3 Confidence Coefficient. Calculate the confidence coefficient (one-tailed), cc, of a data set as follows. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$CC = t_{0.025} \times \frac{S_d}{\sqrt{n}}$$ Eq. A-9

$$CC = 2.306 \times \frac{0.120 \text{ ppm}}{\sqrt{9}} = 0.092 \text{ ppm}$$

T-Values	n	2	3	4	5	6	7	8	9
	$t_{0.025}$	12.706	4.303	3.182	2.776	2.571	2.447	2.365	2.306

2.5 percent confidence coefficients

Relative Accuracy

40 CFR 75, App A, (12-17-09), 7.3.4 Relative Accuracy. Calculate the relative accuracy of a data set using the following equation. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$RA = \frac{|d_{AVG}| + |CC|}{RM_{AVG}} \times 100$$ Eq. A-10

$$RA = \frac{|\,0.222\,| \text{ ppm} + |\,0.092\,| \text{ ppm}}{6.889 \text{ ppm}} \times 100 = 4.57 \ \%$$

Bias Adjustment Factor (BAF)

40 CFR 75, App A, (12-17-09), 7.6.5 Bias Adjustment. (a) If the monitor or monitoring system fails to meet the bias test requirement, adjust the value obtained from the monitor using the following equation: (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$BAF = 1 + \left(\frac{|d_{AVG}|}{CEM_{AVG}}\right)$$ Eq. A-12

d_{AVG}= 0.222 > |CC| = 0.092 ⇨ $BAF = 1 + \frac{|\,0.222\,| \text{ ppm}}{6.667 \text{ ppm}} = 1.033$ ppm

Note: BAF only applies if the mean difference (d) is greater than the absolute value of the confidence coefficient.

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

RM 7E, (08-15-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

ACE = Analyzer calibration error, percent of calibration span.
B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100.
C_{Avg} = Average unadjusted gas concentration indicated by data recorder for the test run.
C_D = Pollutant concentration adjusted to dry conditions.
C_{Dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode.
C_{Gas} = Average effluent gas concentration adjusted for bias.
C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas.
C_{MA} = Actual concentration of the upscale calibration gas, ppmv.
C_O = Average of the initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas.
C_S = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode.
C_{SS} = Concentration of NOx measured in the spiked sample.
C_{Spike} = Concentration of NOx in the undiluted spike gas.
C_{Calc} = Calculated concentration of NOx in the spike gas diluted in the sample.
C_V = Manufacturer certified concentration of a calibration gas (low, mid, or high).
C_W = Pollutant concentration measured under moist sample conditions, wet basis.
CS = Calibration span.
D = Drift assessment, percent of calibration span.
E_p = The predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response.
Eff_{NO2} = NO_2 to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NOFinal = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NOxCorr = The NOx concentration corrected for the converter efficiency.
NOxFinal = The final NOx concentration observed during the converter efficiency test in Section 16.2.2.
NOxPeak = The highest NOx concentration observed during the converter efficiency test in Section 16.2.2.
Q_{Spike} = Flow rate of spike gas introduced in system calibration mode, L/min.
Q_{Total} = Total sample flow rate during the spike test, L/min.
R = Spike recovery, percent.
SB = System bias, percent of calibration span.
SB_i = Pre-run system bias, percent of calibration span.
SB_f = Post-run system bias, percent of calibration span.
SB / D_{Alt} = Alternative absolute difference criteria to pass bias and/or drift checks.
SCE = System calibration error, percent of calibration span.
SCE_i = Pre-run system calibration error, percent of calibration span.
SCE_{final} = Post-run system calibration error, percent of calibration span.
Z = Zero calibration gas, designator.

40CFR60.355(b)(1), (09-20-06), Nomenclature. The terms used in the equations are defined as follows:

P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H_2O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

Small Engine and FTIR Nomenclature. The terms used in the equations are defined as follows:

bhp = brake horsepower
hp = horsepower
Q_{sys} = system flow (lpm)
Q_m = matrix spike flow (lpm)

RM 19, (07-29-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
B_{wa} = Moisture fraction of ambient air, percent.
Btu = British thermal unit
$\%_C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
$\%_{CO2d}$,$\%_{CO2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
E = Pollutant emission rate, ng/J (lb/million Btu).
E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
E_d = Average pollutant rate for each sampling period (e.g.,24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu)
E_{di} = Average inlet SO_2 rate for each sampling period d, ng/J (lb/million Btu).
E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O_2.
E_{jo},E_{ji} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
E_h = Hourly average pollutant, ng/J (lb/million Btu).
E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
ft^3 = cubic feet
G = ideal gas conversion factor
(385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
GCM = gross Btu per SCF (constant, compound based)
GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
$\%_H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
$\%_{H2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
H_r = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
K = volume of combustion component per pound of component (constant)
K = Conversion factor, 10^{-5} (kJ/J)/(%) [10^6 Btu/million Btu].
K_c = (9.57 scm/kg)/% [(1.53 scf/lb)/%].
K_{cc} = (2.0 scm/kg)/% [(0.321 scf/lb)/%].
K_{hd} = (22.7 scm/kg)/% [(3.64 scf/lb)/%].
K_{hw} = (34.74 scm/kg)/% [(5.57 scf/lb)/%].
K_n = (0.86 scm/kg)/% [(0.14 scf/lb)/%].
K_o = (2.85 scm/kg)/% [(0.46 scf/lb)/%].
K_s = (3.54 scm/kg)/% [(0.57 scf/lb)/%].
K_{sulfur} = $2x10^4$ Btu/wt%-MMBtu
K_w = (1.30 scm/kg)/% [(0.21 scf/lb)/%].
lb = pound
ln = Natural log of indicated value.
L_p,L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
$\%_N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
$M_{\%}$ = mole percent
mol = mole
MW = molecular weight (lb/lb-mol)
MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)[1]
NCM = net Btu per SCF (constant based on compound)
$\%_O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
$\%_{O2d}$, $\%_{O2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
P_B = barometric pressure, in Hg
P_s = Potential SO2 emissions, percent.
$\%_S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
S_e = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
$\%_{Sf}$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
S(wt%) = weight percent of sulfur, per lab analysis by appropriate ASTM standard
S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
S_o = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
$\%S_p$, $\%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
SCF = standard cubic feet
SH = specific humidity, pounds of water per pound of air
$t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
T_{amb} = ambient temperature, ^oF
W/D Factor = 1.0236 = conv. at 14.696 psia and
68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
X_{CO2}=CO_2 Correction factor, percent.
X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

Ideal Gas Conversion Factor = 385.23 SCF/lb-mol at 68 deg F & 14.696 psia

Fuel Heating Value is based upon Air Hygiene's fuel gas calculation sheet. All calculations are based upon a correction to 68 deg F & 14.696 psia

High Heating Values (HHV) are used for the Fuel Heating Value, F-Factor, and Fuel Flow Data per EPA requirements.

ASTM D 3588		40CFR60, App. A., RM 19, Table 19-1	
Molecular Weight of NOx (lb/lb-mole) =	46.01	Conversion Constant for NOx =	0.0000001194351
Molecular Weight of CO (lb/lb-mole) =	28.00	Conversion Constant for CO =	0.0000000726839
Molecular Weight of SO_2 (lb/lb-mole) =	64.00	Conversion Constant for SO_2 =	0.0000001661345
Molecular Weight of THC (propane) (lb/lb-mole) =	44.00	Conversion Constant for THC =	0.0000001142175
Molecular Weight of VOC (methane) (lb/lb-mole) =	16.00	Conversion Constant for VOC (methane) =	0.0000000415336
Molecular Weight of NH_3 (lb/lb-mole) =	17.03	Conversion Constant for NH_3 =	0.0000000442074
Molecular Weight of HCHO (lb/lb-mole) =	30.03	Conversion Constant for HCHO =	0.0000000779534
Molecular Weight of CO_2 (lb/lb-mole) =	44.01	Conversion Constant for CO_2 =	0.0000001142434

NOTE: units are lb/ppm*ft^3

Formulas:

1. Corrected Raw Average (C_{Gas}), 40CFR60, App. A, RM 7E, Eq. 7E-5 (08/15/06)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right)$$

2. Correction to % O_2, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O2)}} \right)$$

3. Correction to % O_2 and ISO Conditions

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_r}{P_o}} \times e^{(19 \times (H_O - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

4. Method 19 stack exhaust flow (scfh) [ref. EPA EMC FAQ Method 19]

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1{,}000{,}000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O2)}} \right)$$

5. Emission Rate in lb/hr

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G}$$

6. Emission Rate in tons per year

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000}$$

7. Emission Concentration in lb/MMBtu (O_2 based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O2)}}$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp\text{-}hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1341.022} \ or \ \frac{E_{lb/hr} \times 453.6}{hp}$$

RATA SHEET CALCULATIONS

d = Reference Method Data - CEMS Data

S_d = Standard Deviation

CC = Confident Coefficient

n = number of runs

$t_{0.025}$ = 2.5 percent confidence coefficient T-values

RA = relative accuracy

ARA = alternative relative accuracy

BAF = Bias adjustment factor

n	t	n	t	n	t
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

1. Difference

$$d = \sum_{i=1}^{n} d_i$$

2. Standard Deviation

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \left[\frac{\left(\sum_{i=1}^{n} d_i \right)^2}{n} \right]}{n-1}}$$

3. Confident Coefficient

$$CC = t_{0.025} \times \frac{S_d}{\sqrt{n}}$$

4. Relative Accuracy

$$RA = \frac{|d_{AVG}| + |CC|}{RM_{AVG}} \times 100$$

5. Alternative Relative Accuracy

$$ARA = \frac{|d_{AVG}| + |CC|}{AS} \times 100$$

5. Bias Adjustment Factor

$$BAF = 1 + \left(\frac{|d_{AVG}|}{CEM_{AVG}} \right)$$

APPENDIX B

CEMS AND REFERENCE METHOD DATA

CPV VALLEY LLC

Air Permit Number:	3-3356-00136/00001
Plant Name or Location:	CPV VALLEY ENERGY CENTER
Date:	May 11, 2018
Project Number:	sie-17-middletown.ny-start#1
Manufacturer & Equipment:	Siemens
Model:	SCC6-5000F
Unit Number:	2
Test Load:	Max
Tester(s) / Test Unit(s):	MS

#N/A

		RUN									
	UNITS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Start Time	hh:mm:ss	12:06:21	12:41:21	13:15:22	13:48:22	14:23:22	15:00:22	08:08:07	08:59:09	09:32:00	10:53:01
End Time	hh:mm:ss	12:26:51	13:01:51	13:35:52	14:08:52	14:43:52	15:20:52	08:28:37	09:19:39	09:52:30	11:13:31
Bar. Pressure	in. Hg	29.55	29.54	29.56	29.56	29.56	29.57	29.71	29.65	29.66	29.66
Amb. Temp.	°F	68	67	67	68	67	68	57	70	51	51
Rel. Humidity	%	36	35	35	35	36	35	61	69	71	71
Spec. Humidity	lb water / lb air	0.005278	0.004956	0.004953	0.005128	0.005096	0.005126	0.006044	0.010893	0.005654	0.005654
Date	mm/dd/yy	05/11/18	05/11/18	05/11/18	05/11/18	05/11/18	05/11/18	05/12/18	05/12/18	05/12/18	05/12/18
Turbine Fuel Flow	gal/hr	14,049	14,036	14,036	14,016	14,049	14,049	14,347	14,374	14,333	14,333
Total Fuel Flow	SCFH	1,878	1,876	1,876	1,874	1,878	1,878	1,918	1,921	1,916	1,916
Power Output	megawatts	184.0	185.0	185.0	185.0	185.0	185.0	191.0	193.0	192.0	192.0
O_2 CEMS Data	%vd	13.8	13.8	13.8	13.8	13.8	13.8	13.7	13.7	13.7	13.7
NOx CEMS Data	ppmvd	6.60	6.70	6.70	6.60	6.50	6.70	6.60	6.70	6.80	6.70
	ppmvd@15%O_2	5.40	5.60	5.60	5.50	5.40	5.60	5.40	5.50	5.50	5.50
	lb/hr	41.00	42.10	42.10	41.60	41.20	41.80	41.50	42.60	42.40	42.40
	lb/MMBtu	0.021	0.022	0.022	0.022	0.021	0.022	0.021	0.021	0.021	0.021
CO CEMS Data	ppmvd	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.40	1.40	1.20
	ppmvd@15%O_2	0.00	0.00	0.00	0.00	0.00	0.00	1.20	1.10	1.10	1.00
	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	5.90	5.70	5.50	4.50

Created with Comp&RATA&Eng-AHI v20180227

CEMS AND REFERENCE METHOD DATA

CEMS Data

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 12:06	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:07	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:08	1939.5	ON	GD	13.8	ON	GD	0.1	ON	GD	0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:09	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:10	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:11	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:12	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:13	1919.9	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 12:14	1919.9	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	184
05/11/2018 12:15	1919.9	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 12:16	1919.9	ON	GD	13.8	ON	GD	0.2	ON	GD	0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 12:17	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:18	1939.5	ON	GD	13.8	ON	GD	0.1	ON	GD	0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:19	1939.5	ON	GD	13.8	ON	GD	0.1	ON	GD	0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:20	1939.5	ON	GD	13.8	ON	GD	0.2	ON	GD	0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:21	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 12:22	1919.9	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 12:23	1919.9	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	183
05/11/2018 12:24	1919.9	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	183
05/11/2018 12:25	1919.9	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 12:26	1919.9	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	184
Average	1930.2			13.8			-0.1			-0.1			-0.1			0.000			184
Maximum	1939.5			13.8			0.2			0.2			0.0			0.000			185
Minimum	1919.9			13.8			-0.3			-0.2			-1.9			-0.001			183
Total	40533.5			289.8			-1.2			-1.1			-1.9			-0.001			3874

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/11/2018 12:41   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT/		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	KLBHR	OS	MS
05/11/2018 12:06	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:07	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:08	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:09	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:10	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:11	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:12	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99	ON	GD
05/11/2018 12:13	ON	GD	5.6	ON	GD	42.2	ON	GD	6.7	ON	GD	0.022	ON	GD	98	ON	GD
05/11/2018 12:14	ON	GD	5.6	ON	GD	42.2	ON	GD	6.7	ON	GD	0.022	ON	GD	98	ON	GD
05/11/2018 12:15	ON	GD	5.5	ON	GD	40.3	ON	GD	6.6	ON	GD	0.021	ON	GD	98	ON	GD
05/11/2018 12:16	ON	GD	5.3	ON	GD	40.3	ON	GD	6.4	ON	GD	0.021	ON	GD	98	ON	GD
05/11/2018 12:17	ON	GD	5.2	ON	GD	38.4	ON	GD	6.2	ON	GD	0.020	ON	GD	98	ON	GD
05/11/2018 12:18	ON	GD	5.2	ON	GD	38.8	ON	GD	6.2	ON	GD	0.020	ON	GD	99	ON	GD
05/11/2018 12:19	ON	GD	5.2	ON	GD	38.8	ON	GD	6.2	ON	GD	0.020	ON	GD	99	ON	GD
05/11/2018 12:20	ON	GD	5.2	ON	GD	38.8	ON	GD	6.3	ON	GD	0.020	ON	GD	99	ON	GD
05/11/2018 12:21	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99	ON	GD
05/11/2018 12:22	ON	GD	6.2	ON	GD	46.1	ON	GD	7.5	ON	GD	0.024	ON	GD	98	ON	GD
05/11/2018 12:23	ON	GD	6.4	ON	GD	48.0	ON	GD	7.7	ON	GD	0.025	ON	GD	98	ON	GD
05/11/2018 12:24	ON	GD	6.3	ON	GD	48.0	ON	GD	7.6	ON	GD	0.025	ON	GD	98	ON	GD
05/11/2018 12:25	ON	GD	5.0	ON	GD	36.5	ON	GD	6.0	ON	GD	0.019	ON	GD	98	ON	GD
05/11/2018 12:26	ON	GD	4.6	ON	GD	34.6	ON	GD	5.5	ON	GD	0.018	ON	GD	98	ON	GD
Average			5.4			41.0			6.6			0.021			99		
Maximum			6.4			48.0			7.7			0.025			99		
Minimum			4.6			34.6			5.5			0.018			98		
Total			114.4			860.6			137.6			0.446			2069		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 13:15	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:16	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:17	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:18	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:19	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:20	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:21	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:22	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:23	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:24	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:25	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:26	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:27	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:28	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:29	1919.9	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:30	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:31	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:32	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:33	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:34	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:35	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	184
Average	1937.6			13.8			-0.1			-0.1			-0.2			0.000			185
Maximum	1939.5			13.8			0.0			0.0			0.0			0.000			186
Minimum	1919.9			13.8			-0.3			-0.2			-1.9			-0.001			184
Total	40690.3			289.8			-2.3			-2.1			-3.8			-0.002			3885

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/11/2018 13:55   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/11/2018 13:15	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:16	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:17	ON	GD	6.0	ON	GD	44.6	ON	GD	7.2	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:18	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:19	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:20	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:21	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:22	ON	GD	5.4	ON	GD	40.3	ON	GD	6.5	ON	GD	0.021	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:23	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:24	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:25	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:26	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:27	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:28	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:29	ON	GD	5.7	ON	GD	42.2	ON	GD	6.8	ON	GD	0.022	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:30	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:31	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:32	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:33	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:34	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:35	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
Average			5.6			42.1			6.7			0.022			98905			99		
Maximum			6.0			44.6			7.2			0.023			99000			99		
Minimum			5.3			40.3			6.4			0.021			98000			98		
Total			117.0			883.3			140.7			0.456			2077000			2077		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 13:15	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:16	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:17	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:18	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:19	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:20	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:21	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:22	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:23	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:24	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:25	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:26	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:27	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:28	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:29	1919.9	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:30	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:31	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:32	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:33	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:34	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:35	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	184
Average	1937.6			13.8			-0.1			-0.1			-0.2			0.000			185
Maximum	1939.5			13.8			0.0			0.0			0.0			0.000			186
Minimum	1919.9			13.8			-0.3			-0.2			-1.9			-0.001			184
Total	40690.3			289.8			-2.3			-2.1			-3.8			-0.002			3885

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/11/2018 13:15	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:16	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:17	ON	GD	6.0	ON	GD	44.6	ON	GD	7.2	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:18	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:19	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:20	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:21	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:22	ON	GD	5.4	ON	GD	40.3	ON	GD	6.5	ON	GD	0.021	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:23	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:24	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:25	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:26	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:27	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:28	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:29	ON	GD	5.7	ON	GD	42.2	ON	GD	6.8	ON	GD	0.022	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:30	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:31	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:32	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:33	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:34	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:35	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
Average			5.6			42.1			6.7			0.022			98905			99		
Maximum			6.0			44.6			7.2			0.023			99000			99		
Minimum			5.3			40.3			6.4			0.021			98000			98		
Total			117.0			883.3			140.7			0.456			2077000			2077		

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 13:48	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:49	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:50	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:51	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:52	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 13:53	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 13:54	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 13:55	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 13:56	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:57	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:58	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 13:59	1919.9	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	184
05/11/2018 14:00	1919.9	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:01	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:02	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 14:03	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:04	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:05	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:06	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:07	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:08	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
Average	1934.8			13.8			-0.2			-0.2			-0.7			0.000			185
Maximum	1939.5			13.8			0.0			0.0			0.0			0.000			186
Minimum	1919.9			13.8			-0.4			-0.3			-1.9			-0.001			184
Total	40631.5			289.8			-4.1			-3.3			-15.2			-0.008			3884

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/11/2018 13:48	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:49	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:50	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:51	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:52	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:53	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:54	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:55	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 13:56	ON	GD	5.9	ON	GD	44.2	ON	GD	7.1	ON	GD	0.023	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:57	ON	GD	5.7	ON	GD	42.2	ON	GD	6.8	ON	GD	0.022	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:58	ON	GD	5.6	ON	GD	42.2	ON	GD	6.7	ON	GD	0.022	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 13:59	ON	GD	5.5	ON	GD	40.3	ON	GD	6.6	ON	GD	0.021	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 14:00	ON	GD	5.4	ON	GD	40.3	ON	GD	6.5	ON	GD	0.021	ON	GD	98000	ON	GD	98	ON	GD
05/11/2018 14:01	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:02	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:03	ON	GD	5.2	ON	GD	38.8	ON	GD	6.3	ON	GD	0.020	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:04	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:05	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:06	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:07	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:08	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
Average			5.5			41.6			6.6			0.022			98762			99		
Maximum			5.9			44.6			7.1			0.023			99000			99		
Minimum			5.2			38.8			6.3			0.020			98000			98		
Total			116.1			874.4			139.4			0.452			2074000			2074		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/11/2018 14:43 | Data is expressed in Standard Time | Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 14:23	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:24	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:25	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:26	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:27	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:28	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:29	1939.5	ON	GD	13.8	ON	GD	-0.5	ON	GD	-0.4	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:30	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:31	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 14:32	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 14:33	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 14:34	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:35	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:36	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:37	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:38	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:39	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:40	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 14:41	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:42	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 14:43	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
Average	1939.5			13.8			-0.2			-0.2			-0.9			0.000			185
Maximum	1939.5			13.8			-0.1			-0.1			0.0			0.000			186
Minimum	1939.5			13.8			-0.5			-0.4			-1.9			-0.001			185
Total	40729.5			289.8			-5.2			-4.2			-19.0			-0.010			3888

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/11/2018 14:53   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/11/2018 14:23	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:24	ON	GD	5.9	ON	GD	44.6	ON	GD	7.1	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:25	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:26	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:27	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:28	ON	GD	5.8	ON	GD	44.6	ON	GD	7.0	ON	GD	0.023	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:29	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:30	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:31	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:32	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:33	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:34	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:35	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:36	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:37	ON	GD	5.3	ON	GD	40.7	ON	GD	6.4	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:38	ON	GD	5.1	ON	GD	38.8	ON	GD	6.1	ON	GD	0.020	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:39	ON	GD	4.8	ON	GD	36.9	ON	GD	5.8	ON	GD	0.019	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:40	ON	GD	4.7	ON	GD	34.9	ON	GD	5.6	ON	GD	0.018	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:41	ON	GD	4.6	ON	GD	34.9	ON	GD	5.5	ON	GD	0.018	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:42	ON	GD	4.7	ON	GD	34.9	ON	GD	5.6	ON	GD	0.018	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 14:43	ON	GD	4.9	ON	GD	36.9	ON	GD	5.9	ON	GD	0.019	ON	GD	99000	ON	GD	99	ON	GD
Average			5.4			41.2			6.5			0.021			99000			99		
Maximum			5.9			44.6			7.1			0.023			99000			99		
Minimum			4.6			34.9			5.5			0.018			99000			99		
Total			114.3			865.2			137.4			0.446			2079000			2079		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/11/2018 15:00	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:01	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:02	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:03	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:04	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:05	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:06	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:07	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:08	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	186
05/11/2018 15:09	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	186
05/11/2018 15:10	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:11	1939.5	ON	GD	13.8	ON	GD	-0.3	ON	GD	-0.2	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:12	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:13	1939.5	ON	GD	13.8	ON	GD	0.0	ON	GD	0.0	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:14	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:15	1939.5	ON	GD	13.8	ON	GD	-0.1	ON	GD	-0.1	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:16	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:17	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:18	1939.5	ON	GD	13.8	ON	GD	-0.2	ON	GD	-0.2	ON	GD	0.0	ON	GD	0.000	ON	GD	185
05/11/2018 15:19	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
05/11/2018 15:20	1939.5	ON	GD	13.8	ON	GD	-0.4	ON	GD	-0.3	ON	GD	-1.9	ON	GD	-0.001	ON	GD	185
Average	1939.5			13.8			-0.2			-0.2			-0.7			0.000			185
Maximum	1939.5			13.8			0.0			0.0			0.0			0.000			186
Minimum	1939.5			13.8			-0.4			-0.3			-1.9			-0.001			185
Total	40729.5			289.8			-4.1			-3.3			-15.2			-0.008			3887

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/11/2018 15:00	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:01	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:02	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:03	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:04	ON	GD	5.6	ON	GD	42.7	ON	GD	6.7	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:05	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:06	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:07	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:08	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:09	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:10	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:11	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:12	ON	GD	5.7	ON	GD	42.7	ON	GD	6.9	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:13	ON	GD	5.7	ON	GD	42.7	ON	GD	6.8	ON	GD	0.022	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:14	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:15	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:16	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:17	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:18	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:19	ON	GD	5.5	ON	GD	40.7	ON	GD	6.6	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
05/11/2018 15:20	ON	GD	5.4	ON	GD	40.7	ON	GD	6.5	ON	GD	0.021	ON	GD	99000	ON	GD	99	ON	GD
Average			5.6			41.8			6.7			0.022			99000			99		
Maximum			5.7			42.7			6.9			0.022			99000			99		
Minimum			5.4			40.7			6.5			0.021			99000			99		
Total			117.4			878.7			140.8			0.453			2079000			2079		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/12/2018 08:08	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:09	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:10	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:11	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:12	1978.7	SU	GD	13.7	SU	GD	1.7	SU	GD	1.4	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:13	1978.7	SU	GD	13.7	SU	GD	1.7	SU	GD	1.4	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:14	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:15	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:16	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:17	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:18	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:19	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:20	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:21	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 08:22	1998.3	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 08:23	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 08:24	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 08:25	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 08:26	1998.3	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 08:27	1978.7	SU	GD	13.7	SU	GD	1.8	SU	GD	1.5	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 08:28	1978.7	SU	GD	13.7	SU	GD	1.7	SU	GD	1.4	SU	GD	5.9	SU	GD	0.003	SU	GD	192
Average	1980.6			13.7			1.5			1.2			5.9			0.003			192
Maximum	1998.3			13.7			1.8			1.5			6.0			0.003			193
Minimum	1978.7			13.7			1.3			1.1			5.9			0.003			192
Total	41591.9			287.7			32.4			26.2			124.1			0.063			4038

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/12/2018 08:08	SU	GD	4.9	SU	GD	37.6	SU	GD	6.0	SU	GD	0.019	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:09	SU	GD	4.9	SU	GD	37.6	SU	GD	6.0	SU	GD	0.019	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:10	SU	GD	4.9	SU	GD	37.6	SU	GD	6.0	SU	GD	0.019	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:11	SU	GD	5.0	SU	GD	37.6	SU	GD	6.1	SU	GD	0.019	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:12	SU	GD	5.0	SU	GD	37.6	SU	GD	6.1	SU	GD	0.019	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:13	SU	GD	5.1	SU	GD	39.6	SU	GD	6.2	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:14	SU	GD	5.2	SU	GD	39.6	SU	GD	6.4	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:15	SU	GD	5.4	SU	GD	41.6	SU	GD	6.6	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:16	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:17	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:18	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:19	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:20	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:21	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:22	SU	GD	5.5	SU	GD	42.0	SU	GD	6.7	SU	GD	0.021	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 08:23	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:24	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:25	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:26	SU	GD	5.7	SU	GD	44.0	SU	GD	7.0	SU	GD	0.022	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 08:27	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 08:28	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
Average			5.4			41.5			6.6			0.021			101095			101		
Maximum			5.8			45.5			7.1			0.023			102000			102		
Minimum			4.9			37.6			6.0			0.019			101000			101		
Total			113.5			871.6			138.6			0.440			2123000			2123		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/12/2018 08:59	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:00	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	194
05/12/2018 09:01	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:02	1998.3	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:03	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:04	1998.3	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:05	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:06	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:07	1998.3	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:08	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:09	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:10	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 09:11	1998.3	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:12	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:13	1998.3	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:14	1998.3	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	6.0	SU	GD	0.003	SU	GD	193
05/12/2018 09:15	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	194
05/12/2018 09:16	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:17	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 09:18	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:19	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
Average	1984.3			13.7			1.4			1.1			5.7			0.003			193
Maximum	1998.3			13.7			1.6			1.3			6.0			0.003			194
Minimum	1978.7			13.7			1.1			0.9			4.0			0.002			193
Total	41670.3			287.7			29.5			23.8			120.7			0.061			4055

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG2

	CTG2 GEN_TOT/		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/12/2018 08:59	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:00	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:01	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:02	SU	GD	5.5	SU	GD	42.0	SU	GD	6.7	SU	GD	0.021	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:03	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:04	SU	GD	5.6	SU	GD	44.0	SU	GD	6.8	SU	GD	0.022	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:05	SU	GD	6.0	SU	GD	45.5	SU	GD	7.3	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:06	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:07	SU	GD	5.7	SU	GD	44.0	SU	GD	6.9	SU	GD	0.022	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:08	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:09	SU	GD	5.3	SU	GD	41.6	SU	GD	6.5	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:10	SU	GD	5.1	SU	GD	39.6	SU	GD	6.2	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:11	SU	GD	5.1	SU	GD	40.0	SU	GD	6.2	SU	GD	0.020	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:12	SU	GD	5.2	SU	GD	39.6	SU	GD	6.3	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:13	SU	GD	5.2	SU	GD	40.0	SU	GD	6.4	SU	GD	0.020	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:14	SU	GD	5.4	SU	GD	42.0	SU	GD	6.6	SU	GD	0.021	SU	GD	102000	SU	GD	102	SU	GD
05/12/2018 09:15	SU	GD	5.7	SU	GD	43.5	SU	GD	6.9	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:16	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:17	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:18	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:19	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
Average			5.5			42.6			6.7			0.021			101286			101		
Maximum			6.0			45.5			7.3			0.023			102000			102		
Minimum			5.1			39.6			6.2			0.020			101000			101		
Total			116.2			895.3			141.7			0.451			2127000			2127		

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/12/2018 09:35	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:36	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:37	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:38	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:39	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:40	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 09:41	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:42	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:43	1978.7	SU	GD	13.7	SU	GD	1.5	SU	GD	1.2	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:44	1978.7	SU	GD	13.7	SU	GD	1.6	SU	GD	1.3	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:45	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:46	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 09:47	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 09:48	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:49	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 09:50	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 09:51	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 09:52	1978.7	SU	GD	13.7	SU	GD	1.4	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
Average	1978.7			13.7			1.4			1.1			5.5			0.003			192
Maximum	1978.7			13.7			1.6			1.3			5.9			0.003			193
Minimum	1978.7			13.7			1.2			1.0			4.0			0.002			192
Total	35616.6			246.6			24.3			19.7			98.6			0.050			3458

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT/		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/12/2018 09:35	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:36	SU	GD	5.2	SU	GD	39.6	SU	GD	6.4	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:37	SU	GD	5.2	SU	GD	39.6	SU	GD	6.4	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:38	SU	GD	5.3	SU	GD	41.6	SU	GD	6.5	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:39	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:40	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:41	SU	GD	5.7	SU	GD	43.5	SU	GD	6.9	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:42	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:43	SU	GD	6.2	SU	GD	47.5	SU	GD	7.6	SU	GD	0.024	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:44	SU	GD	5.8	SU	GD	45.5	SU	GD	7.1	SU	GD	0.023	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:45	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:46	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:47	SU	GD	5.4	SU	GD	41.6	SU	GD	6.6	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:48	SU	GD	5.2	SU	GD	39.6	SU	GD	6.4	SU	GD	0.020	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:49	SU	GD	5.4	SU	GD	41.6	SU	GD	6.6	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:50	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:51	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 09:52	SU	GD	5.7	SU	GD	43.5	SU	GD	7.0	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
Average			5.5			42.4			6.8			0.021			101000			101		
Maximum			6.2			47.5			7.6			0.024			101000			101		
Minimum			5.2			39.6			6.4			0.020			101000			101		
Total			99.7			764.0			121.9			0.386			1818000			1818		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 HTIP_OIL_P75			CTG2 O2_P75			CTG2 CO			CTG2 CO_C15			CTG2 CO_MASS			CTG2 CO_RATE			CTG2 GEN_TOTAL
	MMBTUHR	OS	MS	PCT	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	MW
05/12/2018 10:53	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 10:54	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 10:55	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 10:56	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 10:57	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 10:58	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 10:59	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	193
05/12/2018 11:00	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:01	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 11:02	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 11:03	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 11:04	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:05	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:06	1978.7	SU	GD	13.7	SU	GD	1.3	SU	GD	1.1	SU	GD	5.9	SU	GD	0.003	SU	GD	192
05/12/2018 11:07	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:08	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:09	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:10	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:11	1978.7	SU	GD	13.7	SU	GD	1.1	SU	GD	0.9	SU	GD	4.0	SU	GD	0.002	SU	GD	192
05/12/2018 11:12	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	193
05/12/2018 11:13	1978.7	SU	GD	13.7	SU	GD	1.2	SU	GD	1.0	SU	GD	4.0	SU	GD	0.002	SU	GD	192
Average	1978.7			13.7			1.2			1.0			4.5			0.002			192
Maximum	1978.7			13.7			1.3			1.1			5.9			0.003			193
Minimum	1978.7			13.7			1.1			0.9			4.0			0.002			192
Total	41552.7			287.7			25.0			20.8			93.5			0.047			4042

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG2

	CTG2 GEN_TOT.		CTG2 NOX_C15_O			CTG2 NOX_MASS_P75			CTG2 NOX_P75			CTG2 NOX_RATE_P75			CTG2 OIL_FLOW_EPA			CTG2 OIL_FLOW_RAW_P75		
	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	LBHR	OS	MS	KLBHR	OS	MS
05/12/2018 10:53	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:54	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:55	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:56	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:57	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:58	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 10:59	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:00	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:01	SU	GD	5.4	SU	GD	41.6	SU	GD	6.6	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:02	SU	GD	5.4	SU	GD	41.6	SU	GD	6.6	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:03	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:04	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:05	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:06	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:07	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:08	SU	GD	5.7	SU	GD	43.5	SU	GD	6.9	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:09	SU	GD	5.7	SU	GD	43.5	SU	GD	6.9	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:10	SU	GD	5.7	SU	GD	43.5	SU	GD	6.9	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:11	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:12	SU	GD	5.5	SU	GD	41.6	SU	GD	6.7	SU	GD	0.021	SU	GD	101000	SU	GD	101	SU	GD
05/12/2018 11:13	SU	GD	5.6	SU	GD	43.5	SU	GD	6.8	SU	GD	0.022	SU	GD	101000	SU	GD	101	SU	GD
Average			5.5			42.4			6.7			0.021			101000			101		
Maximum			5.7			43.5			6.9			0.022			101000			101		
Minimum			5.4			41.6			6.6			0.021			101000			101		
Total			116.5			890.7			141.7			0.450			2121000			2121		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

CEMS AND REFERENCE METHOD DATA

Reference Method Data

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,049	gal/hr

Weather Data

Barometric Pressure	29.55	in. Hg
Relative Humidity	36	%
Ambient Temperature	68	°F
Specific Humidity	0.005278	lb H_2O / lb air

Unit Data

Unit Load	184.0	megawatts
Stack Exhaust Flow (M19)	52,991,274	SCFH

Max Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 12:06:21	50	13.87	6.92	0.26
05/11/18 12:06:51	80	13.86	6.91	0.42
05/11/18 12:07:21	110	13.86	6.86	0.40
05/11/18 12:07:51	140	13.87	6.83	0.24
05/11/18 12:08:21	170	13.87	6.80	0.50
05/11/18 12:08:51	200	13.87	6.83	0.40
05/11/18 12:09:21	230	13.86	6.93	0.39
05/11/18 12:09:51	260	13.85	6.83	0.39
05/11/18 12:10:21	290	13.85	6.82	0.30
05/11/18 12:10:51	320	13.85	6.78	0.54
05/11/18 12:11:21	350	13.83	6.89	0.36
05/11/18 12:11:51	380	13.82	7.07	0.40
05/11/18 12:12:21	410	13.83	7.04	0.38
05/11/18 12:12:51	440	13.84	7.04	0.33
05/11/18 12:13:21	470	13.84	7.12	0.34
05/11/18 12:13:51	500	13.85	7.29	0.32
05/11/18 12:14:21	530	13.85	7.35	0.49
05/11/18 12:14:51	560	13.87	7.29	0.47
05/11/18 12:15:21	590	13.87	7.22	0.40
05/11/18 12:15:51	620	13.87	7.14	0.33
05/11/18 12:16:21	650	13.86	7.23	0.30
05/11/18 12:16:51	680	13.86	7.09	0.51
05/11/18 12:17:21	710	13.85	7.00	0.43
05/11/18 12:17:51	740	13.85	6.82	0.44
05/11/18 12:18:21	770	13.86	6.90	0.36
05/11/18 12:18:51	800	13.85	6.80	0.39
05/11/18 12:19:21	830	13.85	6.86	0.53
05/11/18 12:19:51	860	13.85	6.80	0.26
05/11/18 12:20:21	890	13.84	6.82	0.41
05/11/18 12:20:51	920	13.82	6.87	0.37
05/11/18 12:21:21	950	13.81	6.93	0.36
05/11/18 12:21:51	980	13.82	6.96	0.34
05/11/18 12:22:21	1010	13.79	7.20	0.34
05/11/18 12:22:51	1040	13.80	7.61	0.30
05/11/18 12:23:21	1070	13.82	8.00	0.37
05/11/18 12:23:51	1100	13.86	7.97	0.47
05/11/18 12:24:21	1130	13.88	8.30	0.21
05/11/18 12:24:51	1160	13.90	8.55	0.31
05/11/18 12:25:21	1190	13.90	8.33	0.43
05/11/18 12:25:51	1220	13.88	7.85	0.31
05/11/18 12:26:21	1250	13.86	7.07	0.40
05/11/18 12:26:51	1280	13.85	6.51	0.32
RAW AVERAGE		**13.85**	**7.15**	**0.38**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.03	0.23	0.09
Bias	**Final Zero**	0.03	0.52	0.05
Bias	**Avg. Zero**	0.03	0.38	0.07
Bias	**Initial UpScale**	12.09	9.26	9.04
Bias	**Final UpScale**	11.99	9.63	9.11
Bias	**Avg. UpScale**	12.04	9.45	9.08
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.83	6.95	0.31
Concentration (ppm@ 15%O_2)	N/A	5.80	0.26
Emission Rate (lb/hr)	N/A	43.99	1.19
Emission Rate (lb/MMBtu)	N/A	0.023	0.001

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,036	gal/hr

Weather Data

Barometric Pressure	29.54	in. Hg
Relative Humidity	35	%
Ambient Temperature	67	°F
Specific Humidity	0.004956	lb H_2O / lb air

Unit Data

Unit Load	185.0	megawatts
Stack Exhaust Flow (M19)	53,219,608	SCFH

Max Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 12:41:21	50	13.87	7.05	0.34
05/11/18 12:41:51	80	13.85	6.41	0.34
05/11/18 12:42:21	110	13.85	6.05	0.35
05/11/18 12:42:51	140	13.85	5.89	0.33
05/11/18 12:43:21	170	13.85	5.89	0.24
05/11/18 12:43:51	200	13.84	6.17	0.37
05/11/18 12:44:21	230	13.84	6.52	0.28
05/11/18 12:44:51	260	13.83	6.65	0.32
05/11/18 12:45:21	290	13.84	6.72	0.29
05/11/18 12:45:51	320	13.85	7.01	0.36
05/11/18 12:46:21	350	13.87	7.33	0.36
05/11/18 12:46:51	380	13.88	7.81	0.30
05/11/18 12:47:21	410	13.87	7.98	0.41
05/11/18 12:47:51	440	13.87	8.02	0.29
05/11/18 12:48:21	470	13.87	7.69	0.44
05/11/18 12:48:51	500	13.87	7.53	0.35
05/11/18 12:49:21	530	13.87	7.61	0.40
05/11/18 12:49:51	560	13.86	7.59	0.37
05/11/18 12:50:21	590	13.86	7.53	0.30
05/11/18 12:50:51	620	13.87	7.35	0.45
05/11/18 12:51:21	650	13.87	7.30	0.36
05/11/18 12:51:51	680	13.87	7.30	0.38
05/11/18 12:52:21	710	13.87	7.22	0.26
05/11/18 12:52:51	740	13.87	7.25	0.36
05/11/18 12:53:21	770	13.87	7.31	0.38
05/11/18 12:53:51	800	13.86	7.33	0.36
05/11/18 12:54:21	830	13.86	7.21	0.31
05/11/18 12:54:51	860	13.87	7.08	0.29
05/11/18 12:55:21	890	13.87	7.18	0.44
05/11/18 12:55:51	920	13.86	7.36	0.35
05/11/18 12:56:21	950	13.85	7.36	0.31
05/11/18 12:56:51	980	13.85	7.11	0.41
05/11/18 12:57:21	1010	13.86	6.82	0.30
05/11/18 12:57:51	1040	13.84	6.84	0.31
05/11/18 12:58:21	1070	13.84	7.09	0.32
05/11/18 12:58:51	1100	13.83	7.22	0.24
05/11/18 12:59:21	1130	13.85	7.05	0.33
05/11/18 12:59:51	1160	13.86	7.17	0.40
05/11/18 13:00:21	1190	13.88	7.41	0.42
05/11/18 13:00:51	1220	13.89	7.70	0.34
05/11/18 13:01:21	1250	13.89	7.87	0.40
05/11/18 13:01:51	1280	13.88	7.51	0.40
RAW AVERAGE		**13.86**	**7.15**	**0.35**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	**(ppmvd)**	**(ppmvd)**
Bias	**Initial Zero**	0.03	0.52	0.05
	Final Zero	0.01	0.33	0.08
	Avg. Zero	0.02	0.43	0.07
	Initial UpScale	11.99	9.63	9.11
	Final UpScale	12.04	9.65	9.09
	Avg. UpScale	12.02	9.64	9.10
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.87	6.79	0.28
Concentration (ppm@ 15%O_2)	N/A	5.70	0.24
Emission Rate (lb/hr)	N/A	43.17	1.09
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,036	gal/hr

Weather Data

Barometric Pressure	29.56	in. Hg
Relative Humidity	35	%
Ambient Temperature	67	°F
Specific Humidity	0.004953	lb H_2O / lb air

Unit Data

Unit Load	185.0	megawatts
Stack Exhaust Flow (M19)	52,953,238	SCFH

Max Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 13:15:22	50	13.85	7.28	0.25
05/11/18 13:15:52	80	13.86	7.34	0.41
05/11/18 13:16:22	110	13.86	7.46	0.26
05/11/18 13:16:52	140	13.85	7.48	0.25
05/11/18 13:17:22	170	13.86	7.60	0.21
05/11/18 13:17:52	200	13.86	7.73	0.27
05/11/18 13:18:22	230	13.85	7.64	0.40
05/11/18 13:18:52	260	13.85	7.63	0.21
05/11/18 13:19:22	290	13.85	7.53	0.21
05/11/18 13:19:52	320	13.86	7.54	0.37
05/11/18 13:20:22	350	13.87	7.40	0.25
05/11/18 13:20:52	380	13.85	7.39	0.38
05/11/18 13:21:22	410	13.86	7.31	0.15
05/11/18 13:21:52	440	13.86	7.13	0.33
05/11/18 13:22:22	470	13.86	6.92	0.33
05/11/18 13:22:52	500	13.86	6.99	0.33
05/11/18 13:23:22	530	13.86	7.01	0.34
05/11/18 13:23:52	560	13.86	6.97	0.30
05/11/18 13:24:22	590	13.86	7.02	0.22
05/11/18 13:24:52	620	13.87	6.95	0.26
05/11/18 13:25:22	650	13.86	6.98	0.43
05/11/18 13:25:52	680	13.87	7.05	0.19
05/11/18 13:26:22	710	13.87	7.10	0.26
05/11/18 13:26:52	740	13.87	7.09	0.29
05/11/18 13:27:22	770	13.85	7.09	0.28
05/11/18 13:27:52	800	13.85	7.08	0.48
05/11/18 13:28:22	830	13.85	7.08	0.21
05/11/18 13:28:52	860	13.86	7.10	0.31
05/11/18 13:29:22	890	13.87	7.33	0.30
05/11/18 13:29:52	920	13.87	7.46	0.14
05/11/18 13:30:22	950	13.87	7.59	0.30
05/11/18 13:30:52	980	13.88	7.47	0.28
05/11/18 13:31:22	1010	13.88	7.25	0.42
05/11/18 13:31:52	1040	13.87	7.07	0.26
05/11/18 13:32:22	1070	13.87	6.91	0.17
05/11/18 13:32:52	1100	13.87	7.00	0.28
05/11/18 13:33:22	1130	13.87	7.01	0.24
05/11/18 13:33:52	1160	13.86	6.99	0.47
05/11/18 13:34:22	1190	13.86	7.02	0.25
05/11/18 13:34:52	1220	13.85	7.09	0.36
05/11/18 13:35:22	1250	13.85	7.12	0.26
05/11/18 13:35:52	1280	13.84	7.26	0.29
RAW AVERAGE		**13.86**	**7.23**	**0.29**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.01	0.33	0.08
	Final Zero	0.02	0.29	0.05
	Avg. Zero	0.01	0.31	0.07
	Initial UpScale	12.04	9.65	9.09
	Final UpScale	12.05	9.43	9.02
	Avg. UpScale	12.05	9.54	9.06
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.83	6.97	0.23
Concentration (ppm@ 15%O_2)	N/A	5.82	0.19
Emission Rate (lb/hr)	N/A	44.07	0.88
Emission Rate (lb/MMBtu)	N/A	0.023	0.000

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,016	gal/hr

Weather Data

Barometric Pressure	29.56	in. Hg
Relative Humidity	35	%
Ambient Temperature	68	°F
Specific Humidity	0.005128	lb H_2O / lb air

Unit Data

Unit Load	185.0	megawatts
Stack Exhaust Flow (M19)	52,952,391	SCFH

Max Load, Run - 4

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 13:48:22	50	13.87	7.18	0.29
05/11/18 13:48:52	80	13.87	7.10	0.23
05/11/18 13:49:22	110	13.87	7.13	0.45
05/11/18 13:49:52	140	13.89	7.15	0.12
05/11/18 13:50:22	170	13.88	7.13	0.28
05/11/18 13:50:52	200	13.89	7.09	0.22
05/11/18 13:51:22	230	13.89	7.00	0.27
05/11/18 13:51:52	260	13.88	6.99	0.50
05/11/18 13:52:22	290	13.88	6.96	0.25
05/11/18 13:52:52	320	13.87	7.02	0.30
05/11/18 13:53:22	350	13.87	6.99	0.29
05/11/18 13:53:52	380	13.87	6.98	0.24
05/11/18 13:54:22	410	13.87	7.11	0.16
05/11/18 13:54:52	440	13.86	7.23	0.21
05/11/18 13:55:22	470	13.87	7.30	0.39
05/11/18 13:55:52	500	13.88	7.45	0.31
05/11/18 13:56:22	530	13.88	7.59	0.40
05/11/18 13:56:52	560	13.87	7.89	0.23
05/11/18 13:57:22	590	13.88	7.86	0.25
05/11/18 13:57:52	620	13.88	7.51	0.38
05/11/18 13:58:22	650	13.88	7.32	0.18
05/11/18 13:58:52	680	13.88	7.39	0.34
05/11/18 13:59:22	710	13.87	7.25	0.20
05/11/18 13:59:52	740	13.88	7.19	0.16
05/11/18 14:00:22	770	13.88	7.05	0.13
05/11/18 14:00:52	800	13.89	7.08	0.29
05/11/18 14:01:22	830	13.89	7.22	0.36
05/11/18 14:01:52	860	13.89	7.11	0.29
05/11/18 14:02:22	890	13.88	6.95	0.36
05/11/18 14:02:52	920	13.87	7.05	0.30
05/11/18 14:03:22	950	13.87	7.08	0.16
05/11/18 14:03:52	980	13.87	6.92	0.42
05/11/18 14:04:22	1010	13.87	6.91	0.17
05/11/18 14:04:52	1040	13.87	7.01	0.43
05/11/18 14:05:22	1070	13.87	7.08	0.34
05/11/18 14:05:52	1100	13.88	7.26	0.29
05/11/18 14:06:22	1130	13.88	7.34	0.37
05/11/18 14:06:52	1160	13.88	7.43	0.29
05/11/18 14:07:22	1190	13.87	7.34	0.39
05/11/18 14:07:52	1220	13.87	7.33	0.34
05/11/18 14:08:22	1250	13.86	7.22	0.23
05/11/18 14:08:52	1280	13.87	7.13	0.23
RAW AVERAGE		**13.88**	**7.20**	**0.29**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	**(ppmvd)**	**(ppmvd)**
Bias	**Initial Zero**	0.02	0.29	0.05
	Final Zero	0.02	0.29	-0.04
	Avg. Zero	0.02	0.29	0.01
	Initial UpScale	12.05	9.43	9.02
	Final UpScale	12.05	9.63	9.04
	Avg. UpScale	12.05	9.53	9.03
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.84	6.95	0.29
Concentration (ppm@ 15%O_2)	N/A	5.81	0.24
Emission Rate (lb/hr)	N/A	43.97	1.10
Emission Rate (lb/MMBtu)	N/A	0.023	0.001

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,049	gal/hr

Weather Data

Barometric Pressure	29.56	in. Hg
Relative Humidity	36	%
Ambient Temperature	67	°F
Specific Humidity	0.005096	lb H_2O / lb air

Unit Data

Unit Load	185.0	megawatts
Stack Exhaust Flow (M19)	53,007,590	SCFH

Max Load, Run - 5

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 14:23:22	50	13.87	7.15	0.19
05/11/18 14:23:52	80	13.87	7.20	0.27
05/11/18 14:24:22	110	13.87	7.40	0.32
05/11/18 14:24:52	140	13.86	7.42	0.28
05/11/18 14:25:22	170	13.86	7.53	0.37
05/11/18 14:25:52	200	13.87	7.50	0.29
05/11/18 14:26:22	230	13.87	7.45	0.38
05/11/18 14:26:52	260	13.87	7.47	0.31
05/11/18 14:27:22	290	13.88	7.39	0.19
05/11/18 14:27:52	320	13.88	7.39	0.27
05/11/18 14:28:22	350	13.89	7.48	0.23
05/11/18 14:28:52	380	13.89	7.45	0.36
05/11/18 14:29:22	410	13.89	7.46	0.21
05/11/18 14:29:52	440	13.89	7.30	0.45
05/11/18 14:30:22	470	13.88	7.40	0.33
05/11/18 14:30:52	500	13.89	7.38	0.29
05/11/18 14:31:22	530	13.88	7.07	0.28
05/11/18 14:31:52	560	13.88	7.11	0.23
05/11/18 14:32:22	590	13.88	7.03	0.37
05/11/18 14:32:52	620	13.87	6.91	0.22
05/11/18 14:33:22	650	13.87	6.95	0.33
05/11/18 14:33:52	680	13.87	6.92	0.32
05/11/18 14:34:22	710	13.87	7.04	0.19
05/11/18 14:34:52	740	13.87	7.04	0.35
05/11/18 14:35:22	770	13.88	6.95	0.26
05/11/18 14:35:52	800	13.88	6.86	0.32
05/11/18 14:36:22	830	13.87	6.89	0.22
05/11/18 14:36:52	860	13.87	7.15	0.41
05/11/18 14:37:22	890	13.87	7.11	0.24
05/11/18 14:37:52	920	13.87	6.91	0.27
05/11/18 14:38:22	950	13.87	6.68	0.32
05/11/18 14:38:52	980	13.88	6.55	0.18
05/11/18 14:39:22	1010	13.87	6.45	0.36
05/11/18 14:39:52	1040	13.88	6.34	0.24
05/11/18 14:40:22	1070	13.88	6.20	0.42
05/11/18 14:40:52	1100	13.88	6.11	0.35
05/11/18 14:41:22	1130	13.88	6.01	0.28
05/11/18 14:41:52	1160	13.87	6.00	0.33
05/11/18 14:42:22	1190	13.87	6.02	0.22
05/11/18 14:42:52	1220	13.87	6.10	0.41
05/11/18 14:43:22	1250	13.87	6.24	0.19
05/11/18 14:43:52	1280	13.87	6.39	0.31
RAW AVERAGE		**13.88**	**6.94**	**0.29**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	**(ppmvd)**	**(ppmvd)**
Bias	**Initial Zero**	0.02	0.29	-0.04
	Final Zero	0.05	0.36	0.04
	Avg. Zero	0.04	0.33	0.00
	Initial UpScale	12.05	9.63	9.04
	Final UpScale	12.07	9.30	9.02
	Avg. UpScale	12.06	9.47	9.03
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.83	6.73	0.30
Concentration (ppm@ 15%O_2)	N/A	5.62	0.25
Emission Rate (lb/hr)	N/A	42.60	1.14
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,049	gal/hr

Weather Data

Barometric Pressure	29.57	in. Hg
Relative Humidity	35	%
Ambient Temperature	68	°F
Specific Humidity	0.005126	lb H_2O / lb air

Unit Data

Unit Load	185.0	megawatts
Stack Exhaust Flow (M19)	52,972,991	SCFH

Max Load, Run - 6

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/11/18 15:00:22	50	13.85	7.42	0.37
05/11/18 15:00:52	80	13.85	7.31	0.31
05/11/18 15:01:22	110	13.86	7.23	0.30
05/11/18 15:01:52	140	13.86	7.37	0.26
05/11/18 15:02:22	170	13.85	7.46	0.27
05/11/18 15:02:52	200	13.85	7.29	0.40
05/11/18 15:03:22	230	13.86	7.25	0.18
05/11/18 15:03:52	260	13.86	7.21	0.32
05/11/18 15:04:22	290	13.87	7.19	0.27
05/11/18 15:04:52	320	13.87	7.24	0.22
05/11/18 15:05:22	350	13.87	7.27	0.24
05/11/18 15:05:52	380	13.88	7.35	0.23
05/11/18 15:06:22	410	13.88	7.36	0.33
05/11/18 15:06:52	440	13.88	7.33	0.18
05/11/18 15:07:22	470	13.89	7.31	0.24
05/11/18 15:07:52	500	13.89	7.29	0.34
05/11/18 15:08:22	530	13.88	7.18	0.27
05/11/18 15:08:52	560	13.88	7.18	0.26
05/11/18 15:09:22	590	13.88	7.19	0.25
05/11/18 15:09:52	620	13.87	7.18	0.31
05/11/18 15:10:22	650	13.87	7.23	0.34
05/11/18 15:10:52	680	13.86	7.46	0.16
05/11/18 15:11:22	710	13.86	7.49	0.20
05/11/18 15:11:52	740	13.87	7.45	0.30
05/11/18 15:12:22	770	13.87	7.47	0.40
05/11/18 15:12:52	800	13.87	7.38	0.09
05/11/18 15:13:22	830	13.87	7.09	0.27
05/11/18 15:13:52	860	13.88	6.99	0.25
05/11/18 15:14:22	890	13.88	6.94	0.25
05/11/18 15:14:52	920	13.87	6.80	0.30
05/11/18 15:15:22	950	13.87	6.67	0.12
05/11/18 15:15:52	980	13.87	6.64	0.37
05/11/18 15:16:22	1010	13.87	6.65	0.19
05/11/18 15:16:52	1040	13.86	6.65	0.30
05/11/18 15:17:22	1070	13.87	6.63	0.40
05/11/18 15:17:52	1100	13.87	6.71	0.26
05/11/18 15:18:22	1130	13.88	6.84	0.27
05/11/18 15:18:52	1160	13.88	7.07	0.23
05/11/18 15:19:22	1190	13.88	7.06	0.31
05/11/18 15:19:52	1220	13.88	7.06	0.21
05/11/18 15:20:22	1250	13.88	6.99	0.25
05/11/18 15:20:52	1280	13.88	6.90	0.19
RAW AVERAGE		**13.87**	**7.14**	**0.27**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.05	0.36	0.04
Bias	**Final Zero**	0.02	0.29	0.02
Bias	**Avg. Zero**	0.04	0.33	0.03
Bias	**Initial UpScale**	12.07	9.30	9.02
Bias	**Final UpScale**	12.05	9.56	9.02
Bias	**Avg. UpScale**	12.06	9.43	9.02
Upscale Cal Gas		12.02	9.30	9.10
		Cal/Bias	***Cal/Bias***	***Cal/Bias***

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.83	6.96	0.24
Concentration (ppm@ 15%O_2)	N/A	5.81	0.20
Emission Rate (lb/hr)	N/A	44.03	0.92
Emission Rate (lb/MMBtu)	N/A	0.023	0.000

CPV VALLEY LLC
May 12, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,347	gal/hr

Weather Data

Barometric Pressure	29.71	in. Hg
Relative Humidity	61	%
Ambient Temperature	57	°F
Specific Humidity	0.006044	lb H_2O / lb air

Unit Data

Unit Load	191.0	megawatts
Stack Exhaust Flow (M19)	53,162,553	SCFH

Max Load, Run - 7

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/12/18 8:08:07	6290	13.65	6.32	0.55
05/12/18 8:08:37	6320	13.65	6.32	0.68
05/12/18 8:09:07	6350	13.65	6.31	0.62
05/12/18 8:09:37	6380	13.65	6.31	0.67
05/12/18 8:10:07	6410	13.66	6.37	0.62
05/12/18 8:10:37	6440	13.66	6.41	0.59
05/12/18 8:11:07	6470	13.65	6.43	0.70
05/12/18 8:11:37	6500	13.65	6.50	0.61
05/12/18 8:12:07	6530	13.66	6.45	0.75
05/12/18 8:12:37	6560	13.66	6.46	0.61
05/12/18 8:13:07	6590	13.66	6.47	0.58
05/12/18 8:13:37	6620	13.66	6.58	0.60
05/12/18 8:14:07	6650	13.65	6.66	0.49
05/12/18 8:14:37	6680	13.65	6.73	0.69
05/12/18 8:15:07	6710	13.66	6.84	0.62
05/12/18 8:15:37	6740	13.66	6.91	0.60
05/12/18 8:16:07	6770	13.67	7.05	0.49
05/12/18 8:16:37	6800	13.66	7.17	0.62
05/12/18 8:17:07	6830	13.66	7.24	0.59
05/12/18 8:17:37	6860	13.66	7.19	0.64
05/12/18 8:18:07	6890	13.66	7.17	0.56
05/12/18 8:18:37	6920	13.65	7.13	0.53
05/12/18 8:19:07	6950	13.66	7.21	0.60
05/12/18 8:19:37	6980	13.67	7.20	0.46
05/12/18 8:20:07	7010	13.67	7.31	0.64
05/12/18 8:20:37	7040	13.67	7.31	0.65
05/12/18 8:21:07	7070	13.67	7.39	0.54
05/12/18 8:21:37	7100	13.67	7.27	0.58
05/12/18 8:22:07	7130	13.67	7.33	0.44
05/12/18 8:22:37	7160	13.66	7.22	0.62
05/12/18 8:23:07	7190	13.66	7.38	0.50
05/12/18 8:23:37	7220	13.66	7.42	0.63
05/12/18 8:24:07	7250	13.66	7.41	0.61
05/12/18 8:24:37	7280	13.66	7.52	0.60
05/12/18 8:25:07	7310	13.67	7.55	0.68
05/12/18 8:25:37	7340	13.66	7.63	0.53
05/12/18 8:26:07	7370	13.66	7.66	0.62
05/12/18 8:26:37	7400	13.66	7.67	0.65
05/12/18 8:27:07	7430	13.65	7.61	0.59
05/12/18 8:27:37	7460	13.65	7.46	0.56
05/12/18 8:28:07	7490	13.66	7.28	0.47
05/12/18 8:28:37	7520	13.65	7.35	0.53
RAW AVERAGE		**13.66**	**7.03**	**0.59**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.02	0.08	0.05
Bias	**Final Zero**	0.01	0.22	-0.07
Bias	**Avg. Zero**	0.01	0.15	-0.01
Bias	**Initial UpScale**	12.08	9.44	8.93
Bias	**Final UpScale**	11.88	9.55	8.95
Bias	**Avg. UpScale**	11.98	9.50	8.94
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.71	6.85	0.61
Concentration (ppm@ 15%O_2)	N/A	5.61	0.50
Emission Rate (lb/hr)	N/A	43.47	2.37
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

CPV VALLEY LLC
May 12, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,374	gal/hr

Weather Data

Barometric Pressure	29.65	in. Hg
Relative Humidity	69	%
Ambient Temperature	70	°F
Specific Humidity	0.010893	lb H_2O / lb air

Unit Data

Unit Load	193.0	megawatts
Stack Exhaust Flow (M19)	53,996,264	SCFH

Max Load, Run - 8

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/12/18 8:59:09	60	13.63	6.88	0.39
05/12/18 8:59:39	90	13.64	7.06	0.47
05/12/18 9:00:09	120	13.65	7.12	0.53
05/12/18 9:00:39	150	13.65	7.10	0.43
05/12/18 9:01:09	180	13.64	7.16	0.48
05/12/18 9:01:39	210	13.65	7.19	0.43
05/12/18 9:02:09	240	13.65	7.23	0.48
05/12/18 9:02:39	270	13.65	7.17	0.33
05/12/18 9:03:09	300	13.65	7.23	0.44
05/12/18 9:03:39	330	13.65	7.24	0.49
05/12/18 9:04:09	360	13.65	7.34	0.41
05/12/18 9:04:39	390	13.65	7.32	0.53
05/12/18 9:05:09	420	13.66	7.38	0.36
05/12/18 9:05:39	450	13.66	7.47	0.53
05/12/18 9:06:09	480	13.66	7.71	0.37
05/12/18 9:06:39	510	13.66	8.16	0.53
05/12/18 9:07:09	540	13.66	7.95	0.31
05/12/18 9:07:39	570	13.66	7.67	0.32
05/12/18 9:08:09	600	13.66	7.49	0.46
05/12/18 9:08:39	630	13.66	7.36	0.40
05/12/18 9:09:09	660	13.66	7.27	0.56
05/12/18 9:09:39	690	13.66	7.17	0.45
05/12/18 9:10:09	720	13.65	7.10	0.54
05/12/18 9:10:39	750	13.62	7.11	0.37
05/12/18 9:11:09	780	13.61	7.09	0.45
05/12/18 9:11:39	810	13.61	6.80	0.39
05/12/18 9:12:09	840	13.61	6.78	0.48
05/12/18 9:12:39	870	13.61	6.91	0.45
05/12/18 9:13:09	900	13.62	6.82	0.33
05/12/18 9:13:39	930	13.61	6.83	0.52
05/12/18 9:14:09	960	13.62	7.02	0.41
05/12/18 9:14:39	990	13.63	7.06	0.45
05/12/18 9:15:09	1020	13.63	7.17	0.45
05/12/18 9:15:39	1050	13.63	7.38	0.41
05/12/18 9:16:09	1080	13.64	7.46	0.43
05/12/18 9:16:39	1110	13.64	7.56	0.34
05/12/18 9:17:09	1140	13.64	7.62	0.40
05/12/18 9:17:39	1170	13.64	7.62	0.33
05/12/18 9:18:09	1200	13.64	7.66	0.43
05/12/18 9:18:39	1230	13.65	7.71	0.51
05/12/18 9:19:09	1260	13.64	7.54	0.41
05/12/18 9:19:39	1290	13.64	7.67	0.40
RAW AVERAGE		**13.64**	**7.30**	**0.43**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.01	0.22	-0.07
	Final Zero	0.02	0.40	0.06
	Avg. Zero	0.01	0.31	-0.01
	Initial UpScale	11.88	9.55	8.95
	Final UpScale	11.88	9.76	9.05
	Avg. UpScale	11.88	9.66	9.00
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.80	6.96	0.44
Concentration (ppm@ 15%O_2)	N/A	5.78	0.37
Emission Rate (lb/hr)	N/A	44.86	1.74
Emission Rate (lb/MMBtu)	N/A	0.023	0.001

CPV VALLEY LLC
May 12, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,333	gal/hr

Weather Data

Barometric Pressure	29.66	in. Hg
Relative Humidity	71	%
Ambient Temperature	51	°F
Specific Humidity	0.005654	lb H_2O / lb air

Unit Data

Unit Load	192.0	megawatts
Stack Exhaust Flow (M19)	53,858,801	SCFH

Max Load, Run - 9

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/12/18 9:32:10	11333	13.64	6.77	0.43
05/12/18 9:32:40	11363	13.64	6.81	0.40
05/12/18 9:33:10	11393	13.63	7.01	0.46
05/12/18 9:33:40	11423	13.62	6.97	0.33
05/12/18 9:34:10	11453	13.62	6.99	0.36
05/12/18 9:34:40	11483	13.63	7.14	0.27
05/12/18 9:35:10	11513	13.62	7.18	0.34
05/12/18 9:35:40	11543	13.64	7.26	0.35
05/12/18 9:36:10	11573	13.64	7.25	0.34
05/12/18 9:36:40	11603	13.64	7.34	0.48
05/12/18 9:37:10	11633	13.64	7.37	0.34
05/12/18 9:37:40	11663	13.64	7.10	0.39
05/12/18 9:38:10	11693	13.63	6.87	0.37
05/12/18 9:38:40	11723	13.64	6.96	0.39
05/12/18 9:39:10	11753	13.63	7.16	0.35
05/12/18 9:39:40	11783	13.64	7.17	0.41
05/12/18 9:40:10	11813	13.63	7.43	0.37
05/12/18 9:40:40	11843	13.64	7.47	0.33
05/12/18 9:41:10	11873	13.65	7.51	0.38
05/12/18 9:41:40	11903	13.66	7.56	0.35
05/12/18 9:42:10	11933	13.64	7.72	0.38
05/12/18 9:42:40	11963	13.65	7.68	0.39
05/12/18 9:43:10	11993	13.67	7.69	0.33
05/12/18 9:43:40	12023	13.67	7.80	0.36
05/12/18 9:44:10	12053	13.67	8.23	0.28
05/12/18 9:44:40	12083	13.67	7.89	0.37
05/12/18 9:45:10	12113	13.65	7.54	0.40
05/12/18 9:45:40	12143	13.65	7.13	0.40
05/12/18 9:46:10	12173	13.65	7.00	0.35
05/12/18 9:46:40	12203	13.65	6.95	0.38
05/12/18 9:47:10	12233	13.66	6.97	0.31
05/12/18 9:47:40	12263	13.66	7.19	0.42
05/12/18 9:48:10	12293	13.66	7.34	0.45
05/12/18 9:48:40	12323	13.65	6.87	0.34
05/12/18 9:49:10	12353	13.64	6.73	0.36
05/12/18 9:49:40	12383	13.63	6.74	0.29
05/12/18 9:50:10	12413	13.63	6.82	0.38
05/12/18 9:50:40	12443	13.63	7.02	0.36
05/12/18 9:51:10	12473	13.63	7.12	0.32
05/12/18 9:51:40	12503	13.63	7.29	0.34
05/12/18 9:52:10	12533	13.64	7.37	0.33
05/12/18 9:52:40	12563	13.65	7.30	0.38
RAW AVERAGE		**13.64**	**7.23**	**0.37**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.02	0.40	0.06
	Final Zero	0.01	0.33	-0.02
	Avg. Zero	0.01	0.37	0.02
	Initial UpScale	11.88	9.76	9.05
	Final UpScale	11.88	9.69	9.10
	Avg. UpScale	11.88	9.73	9.08
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.81	6.82	0.35
Concentration (ppm@ 15%O_2)	N/A	5.67	0.29
Emission Rate (lb/hr)	N/A	43.89	1.36
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

CPV VALLEY LLC
May 12, 2018
Siemens, SCC6-5000F, Unit #2
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	14,333	gal/hr

Weather Data

Barometric Pressure	29.66	in. Hg
Relative Humidity	71	%
Ambient Temperature	51	°F
Specific Humidity	0.005654	lb H_2O / lb air

Unit Data

Unit Load	192.0	megawatts
Stack Exhaust Flow (M19)	53,676,083	SCFH

Max Load, Run - 10

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/12/18 10:53:11	16194	13.62	7.16	0.42
05/12/18 10:53:41	16224	13.62	7.24	0.25
05/12/18 10:54:11	16254	13.62	7.27	0.39
05/12/18 10:54:41	16284	13.62	7.23	0.39
05/12/18 10:55:11	16314	13.62	7.29	0.35
05/12/18 10:55:41	16344	13.63	7.29	0.39
05/12/18 10:56:11	16374	13.63	7.30	0.33
05/12/18 10:56:41	16404	13.63	7.29	0.38
05/12/18 10:57:11	16434	13.63	7.28	0.39
05/12/18 10:57:41	16464	13.63	7.26	0.23
05/12/18 10:58:11	16494	13.62	7.28	0.27
05/12/18 10:58:41	16524	13.63	7.26	0.30
05/12/18 10:59:11	16554	13.63	7.29	0.35
05/12/18 10:59:41	16584	13.63	7.24	0.38
05/12/18 11:00:11	16614	13.63	7.29	0.30
05/12/18 11:00:41	16644	13.63	7.27	0.27
05/12/18 11:01:11	16674	13.63	7.37	0.43
05/12/18 11:01:41	16704	13.63	7.27	0.37
05/12/18 11:02:11	16734	13.63	7.22	0.41
05/12/18 11:02:41	16764	13.63	7.21	0.29
05/12/18 11:03:11	16794	13.62	7.26	0.42
05/12/18 11:03:41	16824	13.62	7.27	0.39
05/12/18 11:04:11	16854	13.62	7.28	0.27
05/12/18 11:04:41	16884	13.62	7.33	0.43
05/12/18 11:05:11	16914	13.62	7.40	0.29
05/12/18 11:05:41	16944	13.62	7.41	0.38
05/12/18 11:06:11	16974	13.62	7.30	0.27
05/12/18 11:06:41	17004	13.62	7.33	0.26
05/12/18 11:07:11	17034	13.62	7.36	0.28
05/12/18 11:07:41	17064	13.63	7.32	0.37
05/12/18 11:08:11	17094	13.62	7.37	0.23
05/12/18 11:08:41	17124	13.62	7.49	0.24
05/12/18 11:09:11	17154	13.62	7.35	0.32
05/12/18 11:09:41	17184	13.62	7.07	0.32
05/12/18 11:10:11	17214	13.62	7.06	0.31
05/12/18 11:10:41	17244	13.62	7.08	0.32
05/12/18 11:11:11	17274	13.62	7.05	0.40
05/12/18 11:11:41	17304	13.62	7.11	0.29
05/12/18 11:12:11	17334	13.63	6.99	0.34
05/12/18 11:12:41	17364	13.63	6.92	0.30
05/12/18 11:13:11	17394	13.63	6.96	0.32
05/12/18 11:13:41	17424	13.63	7.03	0.23
RAW AVERAGE		**13.62**	**7.24**	**0.33**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.01	0.33	-0.02
	Final Zero	0.03	0.28	0.01
	Avg. Zero	0.02	0.31	-0.01
	Initial UpScale	11.88	9.69	9.10
	Final UpScale	11.89	9.60	9.03
	Avg. UpScale	11.89	9.65	9.07
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.78	6.90	0.34
Concentration (ppm@ 15%O_2)	N/A	5.72	0.28
Emission Rate (lb/hr)	N/A	44.26	1.32
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

APPENDIX C

CALIBRATION GAS CERTIFICATIONS

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0018276	**Certification Date:**	11/14/2017
Product ID Number:	124731	**Expiration Date:**	11/13/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0018276.20171101-0	**Lot Number:**	EB0018276.20171101
Customer PO. NO.:		**Tracking Number:**	040342692
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Nitrogen Dioxide	**49.7 PPM**	±0.6 PPM	FTIR	11/07/2017, 11/14/2017
Air	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0085284	EB0085284.20161201	11/02/2020	GMIS	AIR	NO2	97 PPM	1.027	5605008

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/06/2017
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/14/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

RED BALL TECHNICAL GAS SERVICES

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0026154	**Certification Date:**	09/30/2016
Product ID Number:	125780	**Expiration Date:**	09/30/2019
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0026154.20160901-0	**Lot Number:**	EB0026154.20160901
Customer PO. NO.:		**Tracking Number:**	083029619
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**18.41 PPM**	±0.07 PPM	FTIR	09/30/2016
Nitric Oxide	**18.1 PPM**	±0.11 PPM	Chemiluminescence	09/09/2016, 09/17/2016, 09/29/2016
Total Oxides of Nitrogen	18.3 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC279029	091002	03/10/2020	NTRM	N2	CO	19.14 PPM	0.9927	091002
EB0006931	EB0006931.20150713g	10/22/2018	GMIS	N2	NO	14.95 PPM	1.095	121001
EB0011692	EB0011692.20160329g	06/11/2024	GMIS	N2	NO	276.5 PPM	0.476	2735

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	09/06/2016
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	09/12/2016

Red Ball Technical Gas Service
PGVP Vendor ID # G12016
Information and Ordering
800-551-8150
Fax (318-425-6309)

ilac-MRA PJLA Calibration and Testing
Accreditation #62754

Fred Holt
Fred Holt
Analyst

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0098858	**Certification Date:**	09/19/2017
Product ID Number:	124737	**Expiration Date:**	09/18/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0098858.20170825-0	**Lot Number:**	EB0098858.20170825
Customer PO. NO.:		**Tracking Number:**	095688549
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**9.1 PPM**	±0.1 PPM	FTIR	09/08/2017
Nitric Oxide	**9.2 PPM**	±0.10 PPM	Chemiluminescence	09/12/2017, 09/19/2017
Total Oxides of Nitrogen	9.3 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC279029	091002	03/10/2020	NTRM	N2	CO	19.14 PPM	0.9927	091002
CC-349582	12100115CC-349582	07/22/2019	NTRM	N2	NO	95.2 PPM	1.05	12100115
ALM066143	ALM066143.20160913	05/24/2025	GMIS	N2	NO	31.77 PPM	1.05	12100115
CC238282	CC238282.2015012-0	12/20/2018	GMIS	N2	NO	9.36 PPM	1.004	2628a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	09/08/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	08/18/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	09/01/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Anthony Cyr
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0027723	**Certification Date:**	01/26/2018
Product ID Number:	125564	**Expiration Date:**	01/25/2021
Cylinder Pressure:	1800 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0027723.20171229-0	**Lot Number:**	EB0027723.20171229
Customer PO. NO.:		**Tracking Number:**	048406516
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**5.07 PPM**	±0.07 PPM	FTIR	01/03/2018
Nitric Oxide	**5.09 PPM**	±0.06 PPM	Chemiluminescence	01/18/2018, 01/26/2018
Total Oxides of Nitrogen	5.17 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0001986	EB0001986.20160718	01/19/2025	GMIS	N2	NO	90.61 PPM	1.054	12100115
EB0004877	EB0004877.20160721	07/05/2025	GMIS	N2	CO	18.78 PPM	1.005	091002
EB0027596	EB0027596.20151012g	12/20/2018	GMIS	N2	NO	5.802 PPM	1.01	2628a
EB0055450	EB0055450.20140403-0	12/21/2020	GMIS	N2	NO	32.02 PPM	1.058	12100115

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	12/26/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	12/22/2017
NO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	12/29/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

B Theus

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0032327	**Certification Date:**	10/09/2017
Product ID Number:	124605	**Expiration Date:**	10/07/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0032327.20171005-0	**Lot Number:**	EB0032327.20171005
Customer PO. NO.:		**Tracking Number:**	056562288
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**18.7 %**	±0.15 %	NDIR	10/09/2017
Oxygen	**21.0 %**	±0.11 %	MPA	10/09/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0060740	EB0060740.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0064384	EB0064384.20170112	08/13/2025	GMIS	N2	CO2	19.6 %	0.761	101001
SG9916836	SG-9916836	06/06/2022	NTRM	N2	CO2	19.98 %	0.7	101001

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	09/13/2017
CO2	NDIR	Thermo	410i	1162980025	09/22/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0081248	**Certification Date:**	03/14/2018
Product ID Number:	124606	**Expiration Date:**	03/12/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0081248.20180306-0	**Lot Number:**	EB0081248.20180306
Customer PO. NO.:		**Tracking Number:**	084092913
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**8.98 %**	±0.08 %	NDIR	03/14/2018
Oxygen	**12.02 %**	±0.06 %	MPA	03/12/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0019964	EB0019964.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0032313	EB0032313.20170112	05/22/2025	GMIS	N2	O2	9.34 %	0.235	2658a
EB0045483	EB0045483.20170424	11/25/2025	GMIS	N2	CO2	9.53 %	0.724	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	02/23/2018
CO2	NDIR	Thermo	410i	1162980025	03/14/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

CPV VALLEY LLC
May 11, 2018
Siemens, SCC6-5000F, Unit #2
AETB/QI and PGVP RATA Data Sheet
CPV VALLEY ENERGY CENTER

AirEmissionTestingData - Level 3

QILastName	QIFirstName	QIMiddleInitial	AETBName	AETBPhoneNumber	AETBEmail	ExamDate	ProviderName	ProviderEmail
Stockwell	Michael	D	Air Hygiene International Inc	888-461-8778	info@airhygiene.com	01/06/2017	Source Evaluation Society	qstiprogram@gmail.com

ProtocolGasData - Level 3

GasLevelCode	GasTypeCode	CylinderIdentifier	VendorIdentifier	ExpirationDate
HIGH	BALN,CO2,O2	EB0032327	G12017	1/7/2025
MID	BALN,CO2,O2	EB0081248	G12018	3/12/2026
HIGH	BALN,CO,NO,NOX	EB0026154	G12016	9/30/2019
MID	BALN,CO,NO,NOX	EB0098858	G12017	9/18/2020
LOW	BALN,CO,NO,NOX	EB0027723	G12018	1/25/2021

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

AIR HYGIENE ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses six major areas:

1. Field Qualifications
2. QA reviews of reports, laboratory work, and field testing;
3. Equipment calibration and maintenance;
4. Chain-of-custody;
5. Training; and
6. Knowledge of current test methods

Field Qualifications

Air Hygiene personnel are required to gain and maintain competence with testing methods and techniques according to their job titles and the roles they play during field testing events. Qualifications for each job description include:

Staff Technician - An entry level position with responsibility to test on the stack by performing duties that include: keep trucks and trailers stocked and clean, travel to and from job site, be the "hands of the test" on the stack; stay on a stack during the sample test, set up and tear down equipment on-site, perform maintenance on equipment in the shop and on-site.

Test Technician or Specialist - Acts as the "hands of the test" on the stack by performing duties that include: stay on a stack during the sample test, migrate to the testing trailer and learn the different analyzers and testing methods used on site, set up and tear down testing equipment on site, learn the system for testing from Testing Managers and Project Managers, travel to and from job site; including driving responsibilities under DOT requirements, follow directions of Testing Managers and Project Managers, learn the proper way to conduct on-site test of stationary stacks

Test Manager or Engineer - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Test Managers must hold as least one QSTI certificate.

Project Manager - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Project Managers typically hold QSTI certificates in Groups 1 through 4.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program. In conformance with ASTM D7036 Section 15.3.15, all metering and monitoring equipment meets or exceeds the uncertainty criteria contained in the method language that pertains to that equipment.

Chain-of-Custody
Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples are stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training
Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3 A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods
With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

Reproduction and Distribution Policy
Reproducing portions of this test report may omit critical or substantial documentation or be taken out of context and due care must be exercised in this regard. Furthermore, this test report and its associated data shall not be reproduced in full or in part without the written consent of the customer.

COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

In conformance with ASTM D7036 Section 15.3.11 and 13, all testing was performed without any real or apparent errors, with the exception of those that would be listed in Section 2.0 of this report. In addition, all testing was conducted according to the approved testing protocol, test methods, Air Hygiene Quality Manual, or ASTM D7036, with the exception of specifics noted in Section 2.0 of this report. A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values. NO_2 to NO conversion was checked via direct connect with an EPA Protocol certified concentration of NO_2 in a balance of air or nitrogen. Conversion was verified to be between 90 and 110 percent.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS
QUALITY ASSURANCE DATA

Date:	May 10-12, 2018
Company:	CPV VALLEY LLC
Location:	Middletown, New York
Techs:	MS/CM

Sample System Leak Check

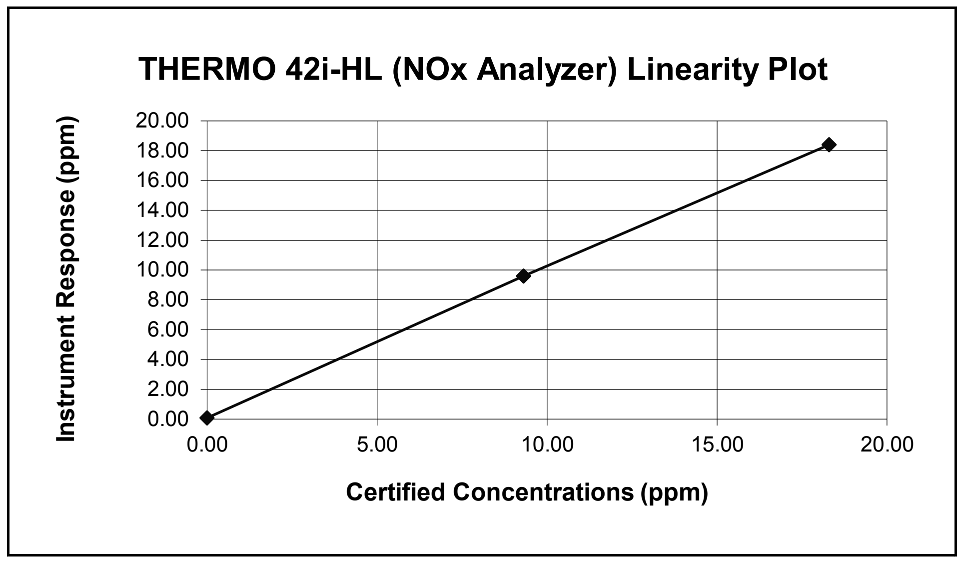
Date	Sample System	Leak Rate (l/min)
May 10-12, 2018	1	0

Calibration Date: May 11, 2018
Client: CPV VALLEY LLC

Location: CPV VALLEY ENERGY CENTER - Unit 2

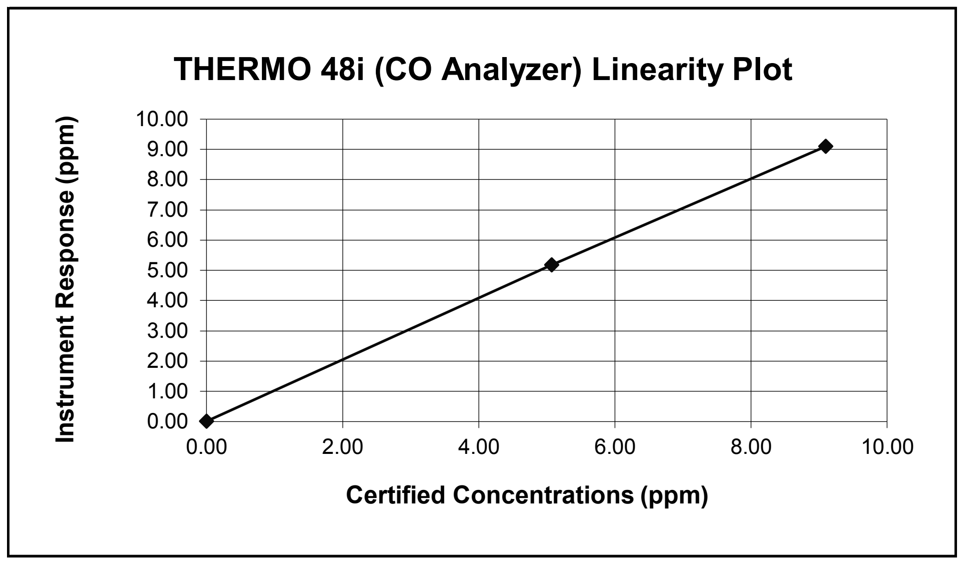
NOx Span (ppm) = 18.30

THERMO 42i-HL (NOx Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.08	0.44	0.08	YES (%)
9.30	9.60	1.64	0.30	YES (%)
18.30	18.40	0.55	0.10	YES (%)
Linearity = 0.999				



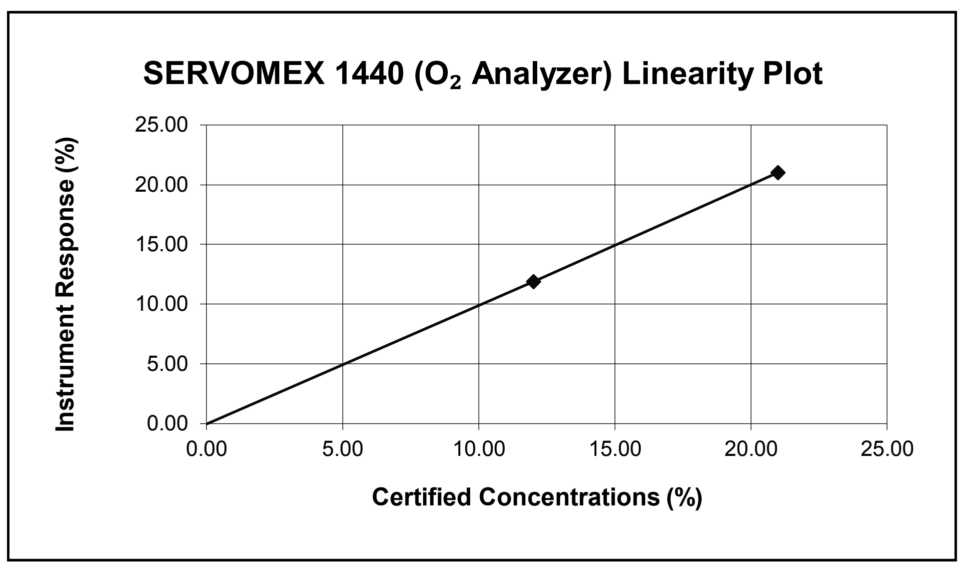
CO Span (ppm) = 9.10

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.01	0.11	0.01	YES (%)
5.07	5.18	1.21	0.11	YES (%)
9.10	9.10	0.00	0.00	YES (%)
Linearity = 1.000				



O_2 Span (%) = 21.00

SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	-0.04	-0.19	0.04	YES (%)
12.02	11.88	-0.67	0.14	YES (%)
21.00	21.02	0.10	0.02	YES (%)
Linearity = 0.998				



NOx Converter Efficiency

Date: May 11, 2018

Analyzer: INST-NX-0064

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**49.70**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**4.88**
	Analyzer Reading, NOx Channel, ppmvd	**52.43**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**47.55**
	Converter Efficiency, %	**95.67**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_V}\right) \times 100 \qquad \text{Eq. 7E-7} = \frac{47.55 \text{ ppmvd}}{49.70 \text{ ppmvd}} \times 100 = 95.67\%$$

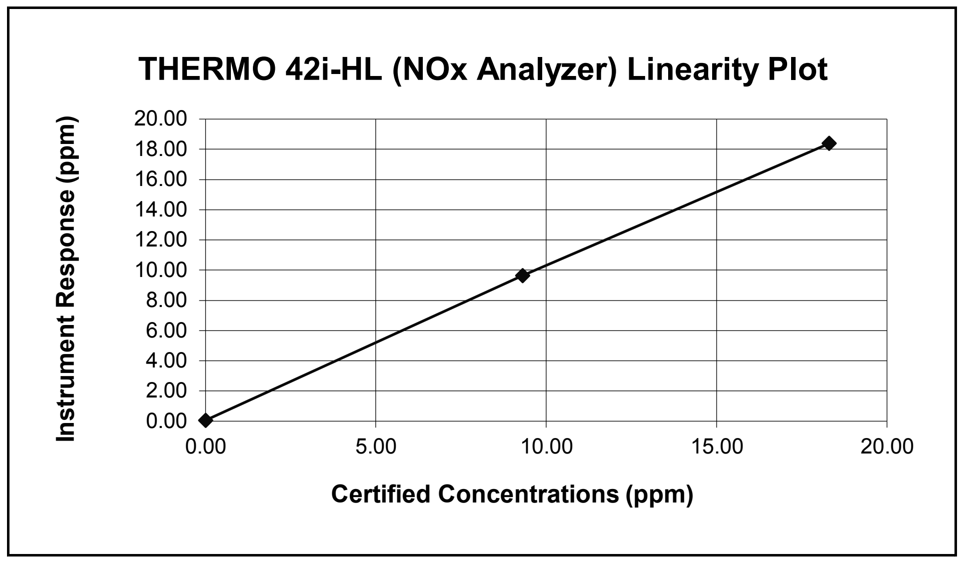
Date/Time mm/dd/yy hh:mm:ss	Elapsed Time Seconds	NOx ppmvd	NO ppmvd
05/11/18 06:06:24	2160	51.82	5.14
05/11/18 06:06:34	2170	51.86	5.10
05/11/18 06:06:44	2180	51.90	5.06
05/11/18 06:06:54	2190	51.95	5.02
05/11/18 06:07:04	2200	52.02	5.01
05/11/18 06:07:14	2210	52.05	4.99
05/11/18 06:07:24	2220	52.09	4.95
05/11/18 06:07:34	2230	52.16	4.90
05/11/18 06:07:44	2240	52.31	4.90
05/11/18 06:07:54	***2250***	***52.43***	***4.88***
05/11/18 06:08:04	2260	52.48	4.86

Calibration Date: May 12, 2018
Client: CPV VALLEY LLC

Location: CPV VALLEY ENERGY CENTER - Unit 2

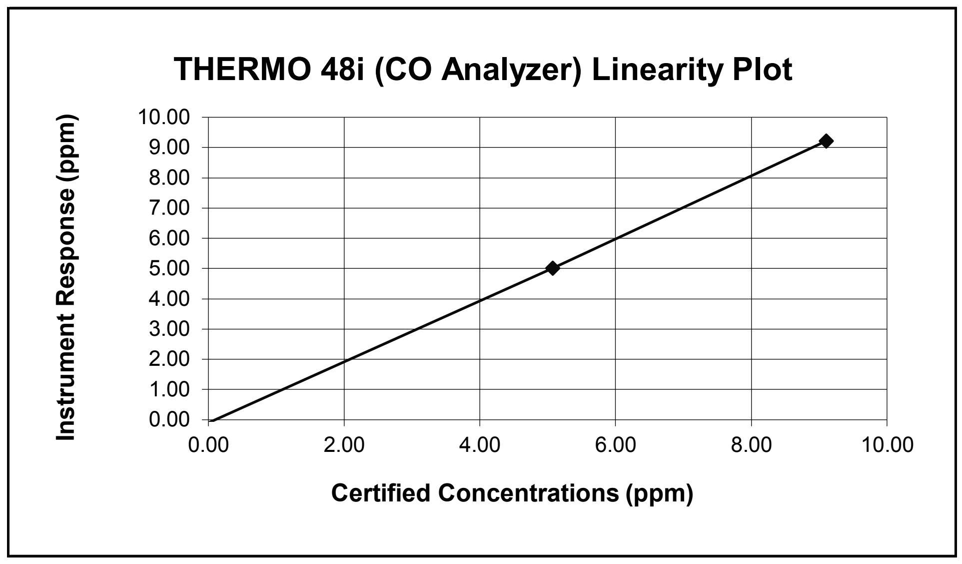
NOx Span (ppm) = 18.30

THERMO 42i-HL (NOx Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.06	0.33	0.06	YES (%)
9.30	9.63	1.80	0.33	YES (%)
18.30	18.38	0.44	0.08	YES (%)
Linearity = 0.998				



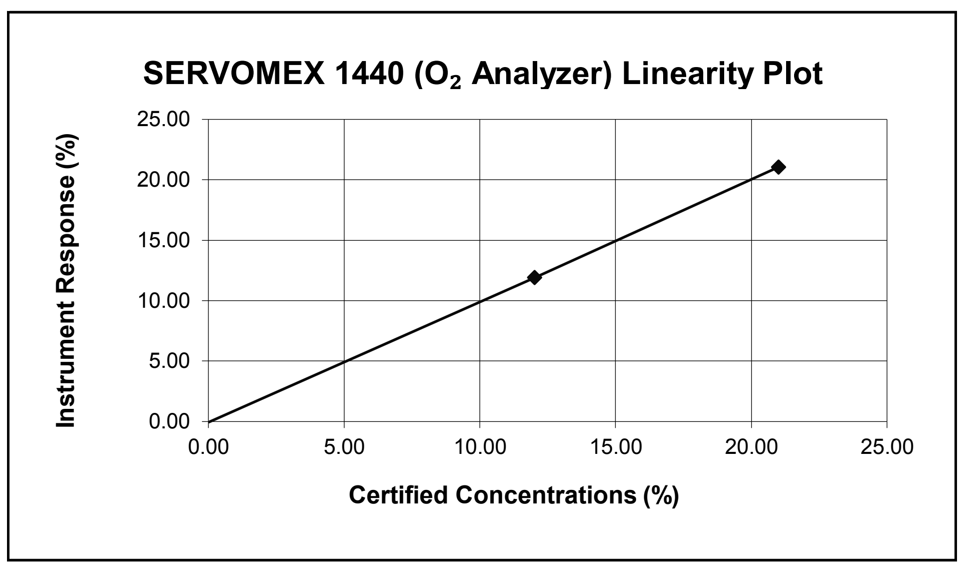
CO Span (ppm) = 9.10

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	-0.10	-1.10	0.10	YES (%)
5.07	5.01	-0.66	0.06	YES (%)
9.10	9.21	1.21	0.11	YES (%)
Linearity = 0.978				



O2 Span (%) = 21.00

SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	-0.06	-0.29	0.06	YES (%)
12.02	11.92	-0.48	0.10	YES (%)
21.00	21.05	0.24	0.05	YES (%)
Linearity = 0.995				



NOx Converter Efficiency

Date: May 11, 2018

Analyzer: INST-NX-0064

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**49.70**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**4.67**
	Analyzer Reading, NOx Channel, ppmvd	**53.45**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**48.78**
	Converter Efficiency, %	**98.15**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_V}\right) \times 100$$

Eq. 7E-7 = $\frac{48.78 \text{ ppmvd}}{49.70 \text{ ppmvd}}$ x 100 = 98.15%

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
05/12/18 06:51:37	1700	52.87	5.03
05/12/18 06:51:47	1710	52.97	4.97
05/12/18 06:51:57	1720	53.03	4.89
05/12/18 06:52:07	1730	53.09	4.86
05/12/18 06:52:17	1740	53.12	4.81
05/12/18 06:52:27	1750	53.14	4.76
05/12/18 06:52:37	1760	53.16	4.73
05/12/18 06:52:47	1770	53.23	4.71
05/12/18 06:52:57	1780	53.31	4.70
05/12/18 06:53:07	1790	53.39	4.69
05/12/18 06:53:17	***1800***	***53.45***	***4.67***

DRIFT AND BIAS CHECK			
Max Load, Run - 1	**O_2**	**NOx**	**CO**
Raw Average	13.85	7.15	0.38
Corrected Average	13.83	6.95	0.31
Initial Zero	0.03	0.23	0.09
Final Zero	0.03	0.52	0.05
Avg. Zero	0.03	0.38	0.07
Initial UpScale	12.09	9.26	9.04
Final UpScale	11.99	9.63	9.11
Avg. UpScale	12.04	9.45	9.08
Sys Resp (Zero)	-0.04	0.08	0.01
Sys Resp (Upscale)	11.88	9.60	9.10
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.33%	0.82%	0.88%
Final Zero Bias	0.33%	2.40%	0.44%
Zero Drift	0.00%	1.58%	0.44%
Initial Upscale Bias	1.00%	-1.86%	-0.66%
Final Upscale Bias	0.52%	0.16%	0.11%
Upscale Drift	0.48%	2.02%	0.77%
Alternative Specification Abs Diff **Initial Zero**	0.07	0.15	0.08
Final Zero	0.07	0.44	0.04
Initial Upscale	0.21	0.34	0.06
Final Upscale	0.11	0.03	0.01
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 2	**O_2**	**NOx**	**CO**
Raw Average	13.86	7.15	0.35
Corrected Average	13.87	6.79	0.28
Initial Zero	0.03	0.52	0.05
Final Zero	0.01	0.33	0.08
Avg. Zero	0.02	0.43	0.07
Initial UpScale	11.99	9.63	9.11
Final UpScale	12.04	9.65	9.09
Avg. UpScale	12.02	9.64	9.10
Sys Resp (Zero)	-0.04	0.08	0.01
Sys Resp (Upscale)	11.88	9.60	9.10
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.33%	2.40%	0.44%
Final Zero Bias	0.23%	1.37%	0.77%
Zero Drift	0.10%	1.04%	0.33%
Initial Upscale Bias	0.52%	0.16%	0.11%
Final Upscale Bias	0.76%	0.27%	-0.11%
Upscale Drift	0.24%	0.11%	0.22%
Alternative Specification Abs Diff **Initial Zero**	0.07	0.44	0.04
Final Zero	0.05	0.25	0.07
Initial Upscale	0.11	0.03	0.01
Final Upscale	0.16	0.05	0.01
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 3	**O_2**	**NOx**	**CO**
Raw Average	13.86	7.23	0.29
Corrected Average	13.83	6.97	0.23
Initial Zero	0.01	0.33	0.08
Final Zero	0.02	0.29	0.05
Avg. Zero	0.01	0.31	0.07
Initial UpScale	12.04	9.65	9.09
Final UpScale	12.05	9.43	9.02
Avg. UpScale	12.05	9.54	9.06
Sys Resp (Zero)	-0.04	0.08	0.01
Sys Resp (Upscale)	11.88	9.60	9.10
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.23%	1.37%	0.77%
Final Zero Bias	0.27%	1.15%	0.44%
Zero Drift	0.04%	0.22%	0.33%
Initial Upscale Bias	0.76%	0.27%	-0.11%
Final Upscale Bias	0.81%	-0.93%	-0.88%
Upscale Drift	0.05%	1.20%	0.77%
Alternative Specification Abs Diff **Initial Zero**	0.05	0.25	0.07
Final Zero	0.06	0.21	0.04
Initial Upscale	0.16	0.05	0.01
Final Upscale	0.17	0.17	0.08
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 4	**O_2**	**NOx**	**CO**
Raw Average	13.88	7.20	0.29
Corrected Average	13.84	6.95	0.29
Initial Zero	0.02	0.29	0.05
Final Zero	0.02	0.29	-0.04
Avg. Zero	0.02	0.29	0.01
Initial UpScale	12.05	9.43	9.02
Final UpScale	12.05	9.63	9.04
Avg. UpScale	12.05	9.53	9.03
Sys Resp (Zero)	-0.04	0.08	0.01
Sys Resp (Upscale)	11.88	9.60	9.10
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.27%	1.15%	0.44%
Final Zero Bias	0.29%	1.15%	-0.55%
Zero Drift	0.01%	0.00%	0.99%
Initial Upscale Bias	0.81%	-0.93%	-0.88%
Final Upscale Bias	0.81%	0.16%	-0.66%
Upscale Drift	0.00%	1.09%	0.22%
Alternative Specification Abs Diff **Initial Zero**	0.06	0.21	0.04
Final Zero	0.06	0.21	0.05
Initial Upscale	0.17	0.17	0.08
Final Upscale	0.17	0.03	0.06
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 5	O_2	NOx	CO
Raw Average	13.88	6.94	0.29
Corrected Average	13.83	6.73	0.30
Initial Zero	0.02	0.29	-0.04
Final Zero	0.05	0.36	0.04
Avg. Zero	0.04	0.33	0.00
Initial UpScale	12.05	9.63	9.04
Final UpScale	12.07	9.30	9.02
Avg. UpScale	12.06	9.47	9.03
Sys Resp (Zero)	-0.04	0.08	0.01
Sys Resp (Upscale)	11.88	9.60	9.10
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.29%	1.15%	-0.55%
Final Zero Bias	0.43%	1.53%	0.33%
Zero Drift	0.14%	0.38%	0.88%
Initial Upscale Bias	0.81%	0.16%	-0.66%
Final Upscale Bias	0.90%	-1.64%	-0.88%
Upscale Drift	0.10%	1.80%	0.22%
Alternative Specification Abs Diff: Initial Zero	0.06	0.21	0.05
Final Zero	0.09	0.28	0.03
Initial Upscale	0.17	0.03	0.06
Final Upscale	0.19	0.30	0.08
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 6	O_2	NOx	CO
Raw Average	13.87	7.14	0.27
Corrected Average	13.83	6.96	0.24
Initial Zero	0.05	0.36	0.04
Final Zero	0.02	0.29	0.02
Avg. Zero	0.04	0.33	0.03
Initial UpScale	12.07	9.30	9.02
Final UpScale	12.05	9.56	9.02
Avg. UpScale	12.06	9.43	9.02
Sys Resp (Zero)	-0.06	0.06	-0.10
Sys Resp (Upscale)	11.92	9.63	9.21
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.52%	1.64%	1.54%
Final Zero Bias	0.38%	1.26%	1.32%
Zero Drift	0.14%	0.38%	0.22%
Initial Upscale Bias	0.71%	-1.80%	-2.09%
Final Upscale Bias	0.62%	-0.38%	-2.09%
Upscale Drift	0.10%	1.42%	0.00%
Alternative Specification Abs Diff: Initial Zero	0.11	0.30	0.14
Final Zero	0.08	0.23	0.12
Initial Upscale	0.15	0.33	0.19
Final Upscale	0.13	0.07	0.19
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 7	**O_2**	**NOx**	**CO**
Raw Average	13.66	7.03	0.59
Corrected Average	13.71	6.85	0.61
Initial Zero	0.02	0.08	0.05
Final Zero	0.01	0.22	-0.07
Avg. Zero	0.01	0.15	-0.01
Initial UpScale	12.08	9.44	8.93
Final UpScale	11.88	9.55	8.95
Avg. UpScale	11.98	9.50	8.94
Sys Resp (Zero)	-0.06	0.06	-0.10
Sys Resp (Upscale)	11.92	9.63	9.21
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.37%	0.11%	1.65%
Final Zero Bias	0.31%	0.87%	0.33%
Zero Drift	0.06%	0.77%	1.32%
Initial Upscale Bias	0.76%	-1.04%	-3.08%
Final Upscale Bias	-0.19%	-0.44%	-2.86%
Upscale Drift	0.95%	0.60%	0.22%
Alternative Specification Abs Diff **Initial Zero**	0.08	0.02	0.15
Final Zero	0.07	0.16	0.03
Initial Upscale	0.16	0.19	0.28
Final Upscale	0.04	0.08	0.26
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 8	**O_2**	**NOx**	**CO**
Raw Average	13.64	7.30	0.43
Corrected Average	13.80	6.96	0.44
Initial Zero	0.01	0.22	-0.07
Final Zero	0.02	0.40	0.06
Avg. Zero	0.01	0.31	-0.01
Initial UpScale	11.88	9.55	8.95
Final UpScale	11.88	9.76	9.05
Avg. UpScale	11.88	9.66	9.00
Sys Resp (Zero)	-0.06	0.06	-0.10
Sys Resp (Upscale)	11.92	9.63	9.21
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.31%	0.87%	0.33%
Final Zero Bias	0.38%	1.86%	1.76%
Zero Drift	0.07%	0.98%	1.43%
Initial Upscale Bias	-0.19%	-0.44%	-2.86%
Final Upscale Bias	-0.19%	0.71%	-1.76%
Upscale Drift	0.00%	1.15%	1.10%
Alternative Specification Abs Diff **Initial Zero**	0.07	0.16	0.03
Final Zero	0.08	0.34	0.16
Initial Upscale	0.04	0.08	0.26
Final Upscale	0.04	0.13	0.16
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 9	O_2	NOx	CO
Raw Average	13.64	7.23	0.37
Corrected Average	13.81	6.82	0.35
Initial Zero	0.02	0.40	0.06
Final Zero	0.01	0.33	-0.02
Avg. Zero	0.01	0.37	0.02
Initial UpScale	11.88	9.76	9.05
Final UpScale	11.88	9.69	9.10
Avg. UpScale	11.88	9.73	9.08
Sys Resp (Zero)	-0.06	0.06	-0.10
Sys Resp (Upscale)	11.92	9.63	9.21
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.38%	1.86%	1.76%
Final Zero Bias	0.31%	1.48%	0.88%
Zero Drift	0.07%	0.38%	0.88%
Initial Upscale Bias	-0.19%	0.71%	-1.76%
Final Upscale Bias	-0.19%	0.33%	-1.21%
Upscale Drift	0.00%	0.38%	0.55%
Alternative Specification Abs Diff — Initial Zero	0.08	0.34	0.16
Final Zero	0.07	0.27	0.08
Initial Upscale	0.04	0.13	0.16
Final Upscale	0.04	0.06	0.11
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 10	O_2	NOx	CO
Raw Average	13.62	7.24	0.33
Corrected Average	13.78	6.90	0.34
Initial Zero	0.01	0.33	-0.02
Final Zero	0.03	0.28	0.01
Avg. Zero	0.02	0.31	-0.01
Initial UpScale	11.88	9.69	9.10
Final UpScale	11.89	9.60	9.03
Avg. UpScale	11.89	9.65	9.07
Sys Resp (Zero)	-0.06	0.06	-0.10
Sys Resp (Upscale)	11.92	9.63	9.21
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.31%	1.48%	0.88%
Final Zero Bias	0.43%	1.20%	1.18%
Zero Drift	0.12%	0.27%	0.30%
Initial Upscale Bias	-0.19%	0.33%	-1.21%
Final Upscale Bias	-0.14%	-0.16%	-1.98%
Upscale Drift	0.05%	0.49%	0.77%
Alternative Specification Abs Diff — Initial Zero	0.07	0.27	0.08
Final Zero	0.09	0.22	0.11
Initial Upscale	0.04	0.06	0.11
Final Upscale	0.03	0.03	0.18
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	O2	NOx
Initial Zero	0.06	0.50
Final Zero	0.02	0.11
Avg. Zero	0.04	0.31
Initial UpScale	12.09	9.32
Final UpScale	12.04	10.07
Avg. UpScale	12.07	9.70
Sys Resp (Zero)	-0.05	-0.20
Sys Resp (Upscale)	11.98	9.50
Upscale Cal Gas	12.02	9.30
Initial Zero Bias	0.50%	3.83%
Final Zero Bias	0.30%	1.69%
Zero Drift	0.20%	2.13%
Initial Upscale Bias	0.52%	-0.98%
Final Upscale Bias	0.29%	3.11%
Upscale Drift	0.24%	4.10%
Alternative Specification Abs Diff — Initial Zero	0.11	0.70
Final Zero	0.06	0.31
Initial Upscale	0.11	0.18
Final Upscale	0.06	0.57
Calibration Span	21.00	18.30
3% of Range (drift)	0.63	0.55
5% of Range (bias)	1.05	0.92

Respone Time (min)	0.7	2.8
Sys. Response (min)	2.8	

Date/Time mm/dd/yy hh:mm:ss	z	O2 %	s	z	NOx PPM	s	INJECTIONS
12:26:56		13.82			6.43		x
12:27:06		13.84			6.42		
12:27:16		7.47			6.48		
12:27:26		**11.68**	x		6.52		
12:27:36		**12.04**			6.51		
12:27:46		**12.05**			6.58		
12:27:56		**12.06**			6.64		
12:28:06		**12.06**			6.66		
12:28:16		**12.06**			6.72		
12:28:26		**12.07**			6.73		
12:28:36		**12.07**			6.75		
12:28:46		**12.07**			6.78		
12:28:56		**12.07**			7.06		
12:29:06		**12.07**			7.80		
12:29:16		**12.07**			5.61		
12:29:26		**12.08**			2.54		
12:29:36		**12.08**			1.59		
12:29:46		**12.08**		x	**0.79**		
12:29:56		**12.07**			**0.58**		
12:30:06		**12.08**			**0.51**		
12:30:16		**12.08**			**0.41**		x
12:30:26		**12.08**			**0.33**		
12:30:36		10.08			**0.29**		
12:30:46		0.67			**0.30**		
12:30:56	x	**0.15**			**0.30**		
12:31:06		**0.10**			**0.28**		
12:31:16		**0.08**			**0.27**		
12:31:26		**0.06**			**0.26**		
12:31:36		**0.06**			**0.20**		
12:31:46		**0.05**			**0.21**		
12:31:56		**0.04**			**0.18**		
12:32:06		**0.04**			**0.14**		
12:32:16		**0.04**			**0.20**		
12:32:26		**0.03**			-0.46		
12:32:36		**0.02**			2.59		
12:32:46		**0.02**			6.90		
12:32:56		**0.02**			8.17		
12:33:06		**0.02**			**9.04**		x
12:33:16		**0.02**			**9.32**		

Accredited Laboratory

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

Broken Arrow, OK

for technical competence in the field of

Environmental Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the NELAC Institute Field Sampling and Measurement Organization Volume 1(TNI FSMO V1 2007, Rev 0.1) requirements. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 20th day of July 2015

President & CEO
For the Accreditation Council
Certificate Number 3796.01
Valid to August 31, 2017

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

Broken Arrow, OK

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION CORPORATE SEAL 1978 DISTRICT OF COLUMBIA A2LA

Presented this 20th day of July 2015.

President & CEO
Certificate Number 3796.02
Valid to August 31, 2017

This accreditation program is not included under the A2LA ILAC Recognition Arrangement.

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

MICHAEL D. STOCKWELL

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 6TH DAY OF JANAURY 2017 AND EFFECTIVE UNTIL JANAURY 5TH, 2022

Peter R. Westlin

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Theresa M. Lowe

Theresa Lowe, QSTI/QSTO Review Board

Wade Bice

J. Wade Bice, QSTI/QSTO Review Board

Karen D. Kajiya-Mills

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2010-503

APPENDIX E

FUEL ANALYSIS RECORDS

Client: CPV VALLEY LLC
Location: CPV VALLEY ENERGY CENTER
Date: May 11, 2018
Project #: sie-17-middletown.ny-start#1

Fuel Oil - Fuel Analysis

Characteristics of Fuel Gas		
Molecular Weight of oil =	15.243	lb/lb-mole
Btu per lb. of oil =	19,602.00	gross (HHV)
Btu per lb. of oil =	18,371.000	net (LHV)
Density of fuel oil[2] =	52.7120	lb/cu. ft
Density of fuel oil[2] =	7.0466	lb/gal
Specific Gravity =	0.8461	@ 68 deg F

Standardized to 68 deg F and 14.696 psia

Component	Wt%
carbon	86.21
oxygen	0.00
hydrogen	13.49
nitrogen	0.00
helium	0.00
sulfur	0.00
Total	**99.70**

Fuel Oil HHV Conv.	
HHV (Btu/lb)	19,602.00
HHV (Btu/SCF)	1,033,261

Fuel Oil LHV Conv.	
LHV (Btu/lb)	18,371.00
LHV (Btu/SCF)	968,373

F-Factor (SCF dry exhaust per MMBtu [HHV]) =	**9,234.02**
(Based on EPA RM-19) at 68 deg F and 14.696 psia	

F-Factor Calculation:

F-Factor = 1,000,000*((3.64*%H)+(1.53*%C)+(0.57*%S)+(0.14*%N)-(0.46*%O))/GCV

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of fuel oil based on lab analysis or specific gravity multiplied by density of water at 68 deg F and 14.696 psia.

References:

[1] ASTM D 3588
[2] Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg
[3] Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III
[4] Introduction to Fluid Mechanics, 3rd ed. - William S. Janna
[5] GPA Reference Bulletin 181-86, revised 1986, reprinted 1995

Certificate of Analysis

SINCE 1985

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

Quality Controlled Through Analysis

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-001	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 02:25 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,371

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.79
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.27
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8486
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8381
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.21
Hydrogen	13.49
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-002	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 02:45 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,601
Net Heat of Combustion	18,369

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.25
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8487
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8381
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.20
Hydrogen	13.50
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

Certificate of Analysis

SINCE 1985

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

Quality Controlled Through Analysis

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-003	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:05 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,375

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.26
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8488
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8382
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8276
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-004	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:25 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,604
Net Heat of Combustion	18,372

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.27
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8488
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.20
Hydrogen	13.50
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-005	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:45 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,375

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.84
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8489
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8277
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-006	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 04:05 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,601
Net Heat of Combustion	18,374

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.83
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.25
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8490
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8277
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

APPENDIX F

STRATIFICATION TEST DATA

Source Information	
Company	CPV Valley LLC
Plant Name	CPV Valley Energy Center
Equipment	Siemens SCC6-5000F, CTG1 and CTG2
Location	Middletown, New York

Test Information	
Date	05/10/18
Project #	sie-17-middletown.ny-start#1
Unit Number	2
Load	multiple
Number of Ports Available	4
Number of Ports Used	4

Stack and Test Type			
○	Isokinetic Traverse (Wet Chemistry Testing)		**Circular Stack**
○	Velocity Traverse (Flow and Flow RATA Test)		
○	Stratification Traverse (Compliance Test)	☐ RM 20	
◉	**Stratification Traverse (RATA)**	☐ Part 60 ☑ Part 75	

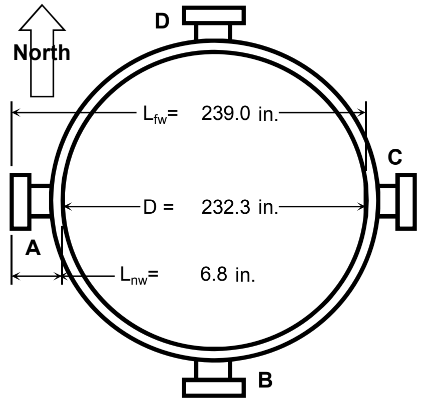
METHOD 1 - STRATIFICATION TEST FOR A CIRCULAR SOURCE

Company	CPV Valley LLC	**Date**	05/10/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	239.00	in.
Distance to Near Wall of Stack	(L_{nw})	6.75	in.*
Diameter of Stack	(D)	232.25	in.
Area of Stack	(A_s)	294.20	ft^2

*assume 6.75 in. reference (must be measured and verified in field)

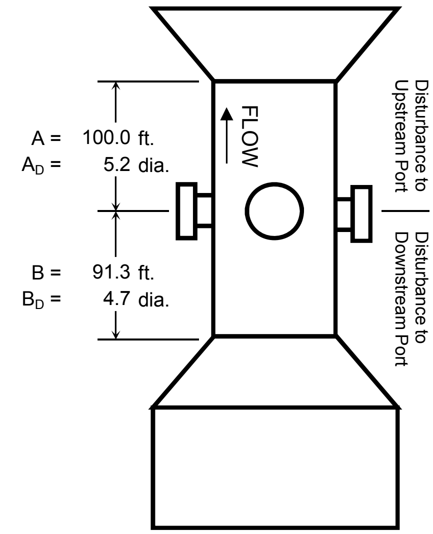
Distance from Disturbances to Port			
Distance Upstream	(A)	1200.00	in.
Diameters Upstream	(A_D)	5.17	diameters
Distance Downstream	(B)	1095.00	in.
Diameters Downstream	(B_D)	4.71	diameters



Number of Traverse Points Required

Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points		Minimum Number of Traverse Points Comp Stratification	
Down (B_D) Stream	Up (A_D) Stream	Particulate Points	Velocity Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	○ RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	○ Alt 7E 8.1.2	3 points
6.00-6.99	1.50-1.74	16	12		
7.00-7.99	1.75-1.99	12	12		
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]	**Minimum Number of Traverse Points RATA Stratification**	
Upstream Spec		12	12		
Downstream Spec		24	16		
Traverse Pts Required		24	16	**Criteria**	**Points**
				◉ Part75/60	12 RM1 pts
				○ 75 abrv (a)	3 points
				○ 75 abrv (b)	6 points
					12 points

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

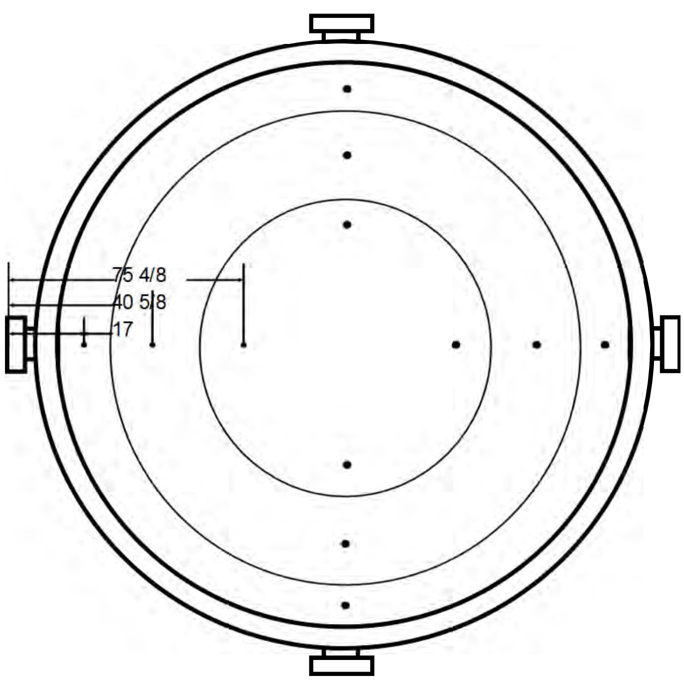


Number of Traverse Points Used

4	**Ports by**	3	**Pts / port**	**Stratification Traverse (RATA)**
12	**Pts Used**	12	**Required**	

Traverse Point Locations

Traverse Point Number	**Percent of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
	%	in.	in.
1	4.4%	10 2/8	17
2	14.6%	33 7/8	40 5/8
3	29.6%	68 6/8	75 4/8
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



STRATIFICATION TRAVERSE (RATA) RESULTS

Company	CPV Valley LLC	**Date**	05/10/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	232.25	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	294.20	ft^2	**Run Start**	12:40:06	**Run End**	13:52:06

Traverse Point	**Time Per Point**	**Point Start Time**	**Point Stop Time (Reading)**	**O2**	**Percent Difference**	**NOx**	**Percent Difference**
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%
D-3	6.00	12:40:06	12:46:06	13.83	0.02%	7.73	4.94%
D-2	6.00	12:46:06	12:52:06	13.84	0.09%	7.76	5.35%
D-1	6.00	12:52:06	12:58:06	13.86	0.24%	7.95	7.93%
C-3	6.00	12:58:06	13:04:06	13.85	0.16%	7.19	2.39%
C-2	6.00	13:04:06	13:10:06	13.83	0.02%	7.30	0.89%
C-1	6.00	13:10:06	13:16:06	13.84	0.09%	7.33	0.49%
B-3	6.00	13:16:06	13:22:06	13.86	0.24%	7.49	1.69%
B-2	6.00	13:22:06	13:28:06	13.85	0.16%	7.24	1.71%
B-1	6.00	13:28:06	13:34:06	13.83	0.02%	7.68	4.27%
A-3	6.00	13:34:06	13:40:06	13.76	**0.49%**	7.18	2.52%
A-2	6.00	13:40:06	13:46:06	13.79	0.27%	6.90	6.32%
A-1	6.00	13:46:06	13:52:06	13.79	0.27%	6.64	**9.85%**
Average				13.83		7.37	

RATA SAMPLE POINTS FOR CIRCULAR STACK

Company	CPV Valley LLC	**Date**	05/10/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	232.25	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	294.20	ft^2	**Run Start**	12:40:06	**Run End**	13:52:06

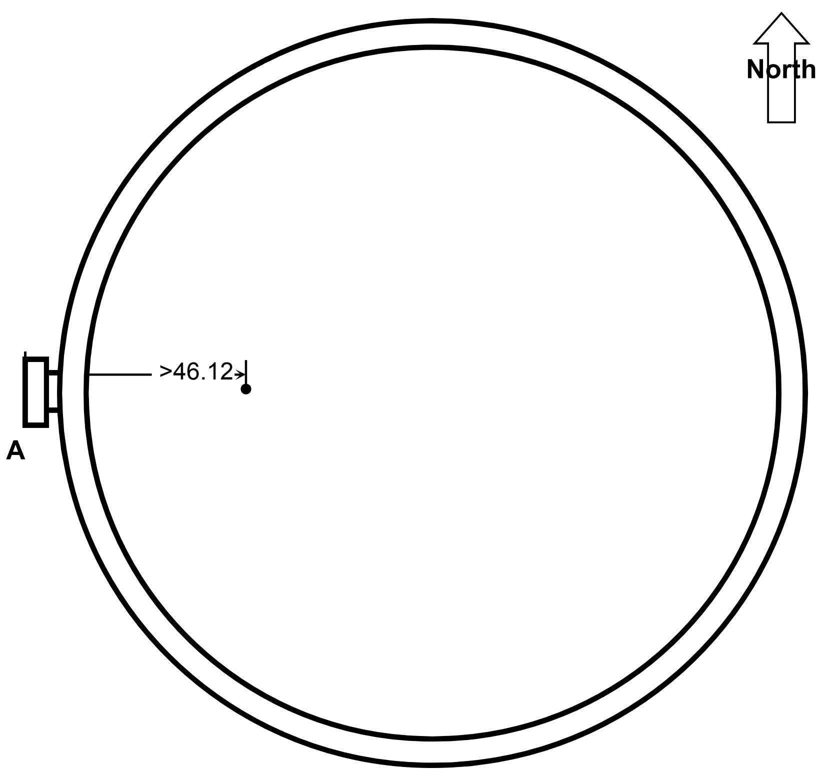
40 CFR 75 Criteria

Stratification Results	
Maximum Percent Difference	9.85 % for NOx
Maximum Pollutant Conc. Diff.	0.73 ppm for NOx
Maximum Diluent Conc. Diff.	0.07 % for O2
Stack Diameter	232.25 in.
Stratification Conclusions	
Maximum % Diff.	Percent Diff. ≤10% Passed 6.5.6.3(a) Criteria
Maximum Conc. Diff.	Conc. Diff. ≤ 3ppm Passed 6.5.6.3(b) Criteria
Stack Diameter	D > 93.6 in.

Passed Strat. Test Under 6.5.6.3(b) Criteria

Traverse Point Number	**Percent of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
	%	in.	in.
1	>16.95%	>39.37	>46.12
2			
3			

Test Type
- ☐ Moisture, for MW
- ☐ Moisture, for wet-to-dry
- ☑ Gas
- ☐ Use 6.5.6.3(a) points?
- ☐ 6.5.6(b)(2) alt. points could apply



this page intentionally left blank
end of report

Continuous Emissions Monitoring System (CEMS)

40 CFR 75 and 40 CFR 60 Certification Test Report

Report Date: June 2018
Revision: A
CEMTEK Project No.: 50478A
Siemens UNID No.: 498368484

Prepared for:

CPV Valley Energy Center
CTG Unit 1 Stack CEMS
Middletown, NY

Prepared by:

CEMTEK KVB-Enertec
3041 S. Orange Ave
Santa Ana, CA 92707-4247
Phone: 714-437-7100
Fax: 714-437-7177
www.cemteks.com

Contents

1 Introduction

This document is intended to satisfy the CEMS certification requirements of the USEPA as required by the Code of Federal Regulations, Title 40, Part 75 (40 CFR 75 or Part 75), Appendix A and 40 CFR 60 (Part 60) Appendix B Performance Specifications. This document summarizes the test program and test results.

Data from the various tests performed under this program provides resources for evaluating the acceptability of the operation of the facility's continuous emissions monitoring system (CEMS).

Tests were performed by personnel from CEMTEK Environmental Inc. with assistance from facility technicians.

The performance tests completed in this certification test program include:

- Part 75 Linearity Check – NO_X, O_2
- Part 75/Part 60 Cycle/Response Time Check – NO_X, O_2, CO
- Part 75/Part 60 Calibration Drift Check (7-day drift test) – NO_X, O_2, CO, CO_2
- Part 60 CGA – CO
- Relative Accuracy Test Audit (RATA)

1.1 Facility Description

The Valley Energy Center facility is located in Wawayanda, NY and consists of one combined cycle power plant operating on dual-fuel (natural gas and fuel oil) with duct burning.

The Facility consists of: two (2) Siemens SGT6-5000F (4) gas turbines with Dry Low NO_X (DLN) Combustion Systems, operating in 2x1 combined cycle configuration, firing natural gas and ultra-low sulfur diesel (ULSD) fuel oil; two (2) 3-drum HRSG's equipped with SCR systems for NO_X control and oxidation catalysts for CO and VOC control; and one (1) Siemens SST6-5000 steam turbine generator (STG).

This report summarizes test results for Unit 1.

1.2 CEMS Overview

The CEMS measures concentrations of carbon monoxide (CO), oxides of nitrogen (NO_X), and oxygen (O_2) from the turbine exhaust stack. All measurements are done on a real time basis. Contact closures are provided for alarms and system status.

All flue gas pollutant and diluent measurements are made on a dry basis. Effluent gas from the sampling location is filtered and transported through heated sample lines to the sample conditioning system in the main analyzer equipment rack. The sample conditioning system again filters the effluent gas. A sample gas cooler removes moisture. The dry, particulate-free effluent gas sample is supplied to each analyzer within the equipment rack. The analog outputs of each analyzer and certain plant signal inputs are transmitted to a system controller located with the analyzer components.

The system operates automatically so operator attention is necessary only for manual verification and accuracy and normal maintenance. Automatic zero and span calibrations are performed on the CEMS monitors every 24 hours. Certified EPA Protocol calibration gases are injected at a valve box in the back of the probe.

1.2.1 CEMS Analyzers

The following table summarizes the analyzer components of the CEMS.

CTG CEMS Unit 1

Analyzer	Manufacturer/Model	Range(s)	Serial Number
NO_X	Teledyne API T200M	0-10 ppm/0-100 ppm	645
O_2		0-25%	
CO	Teledyne API T300M	0-10 ppm/0-3000 ppm	355
CO_2		0-10%	

1.2.2 Data Acquisition System

The CEMS Data Acquisition and Reporting is controlled by the DAHS. The DAHS is a PC-based, multi-user, multi-tasking system. The DAHS provides automated data monitoring and management capabilities to the CEMS. The DAHS is utilized for operator interface, data storage, report generation, and data display.

The PLC transmits data from the analyzers to the DAHS. The DAHS polls the PLC for data to generate and store one (1) minute averages. The DAHS will indicate any occurrence of specification limit exceedances or CEM operational problems. In the DAHS, necessary reports are generated in the required format for submittal to the applicable regulatory agencies. These reports may be produced in either hard copy or electronic format and can be made available to state and local agencies.

All required reporting parameters follow the equations in 40 CFR Part 75 Appendices D, F, and G and facility operating permit as applicable.

2 Summary of Results

The results of all tests performed are summarized in the following tables. Procedural test descriptions are located in Section 3. DAHS printouts and supporting documentation for the 7-day calibration drift, response time, and linearity/CGA tests are located within Section 4 of this document. The Relative Accuracy Test Audit (RATA) report is attached as Section 5.

2.1 Results Summary Tables

Table 1: NO_X Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 75 RATA	5.45% lb/mmBtu by RM	≤10% semi-annual, ≤7.5% annual (by RM) or alternately ≤0.02 lb/mmBtu difference semi-annual, ≤0.015 lb/mmBtu difference annual (40 CFR 75, Appendix A and B)	5/9/28
Part 75 BAF	1.000	|d| > |cc|, the monitoring system has failed to meet bias test criteria, data to be adjusted to calculated BAF. If passed, BAF = 1.000	
Part 60 RATA	3.3% ppm @15% O_2 2.8% ppm 3.9% lb/hr	≤20% or ≤10% applicable standard (40 CFR 60, Appendix B, PS-2)	
Low Range Results			
Linearity Check	Low = 3.31% Mid = 0.28 ppm High = 2.08%	≤5% of reference or ≤5 ppm absolute difference (40 CFR 75, Appendix A)	5/8/18
Cycle Time	Zero run = 2 min Span run = 2 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 1.00% span = 1.70%	≤2.5% of span or for ranges ≤200 ppm, then ≤5 ppm absolute difference (40 CFR 75, Appendix A)	4/29/18 thru 5/8/18
High Range Results			
Linearity Check	Low = 1.90% Mid = 1.07% High = 1.36%	≤5% of reference or ≤5 ppm absolute difference (40 CFR 75, Appendix A)	5/8/18
Cycle Time	Zero run = 3 min Span run = 2 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 0.10% span = 1.42%	≤2.5% of span or for ranges ≤200 ppm, then ≤5 ppm absolute difference (40 CFR 75, Appendix A)	4/29/18 thru 5/8/18

Table 2: O_2 Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 75 RATA	0.5% by RM	≤10% semi-annual, ≤7.5% annual (by RM) or alternately ≤1.0% difference semi-annual, ≤0.7% difference annual (40 CFR 75, Appendix A and B)	5/9/18
Linearity Check	Low = 4.09% Mid = 0.87% High = 0.14%	≤5% of reference or ≤0.5% difference (40 CFR 75, Appendix A)	5/8/18
Cycle Time	Zero run = 3 min Span run = 3 min	≤15 minutes (40 CFR 75, Appendix A)	5/8/18
7-Day Drift, Highest Reading	zero = 0.00% span = 0.03%	≤0.5% difference (40 CFR 75, Appendix A)	4/29/18 thru 5/8/18

Table 3: CO Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
Part 60 RATA	0.3% ppm diff @ 15% O_2 diff 0.3 ppm diff 0.3 lb/hr diff	≤10% by RM or ≤5% of applicable standard or difference + CC ≤5 ppm (40 CFR 60, Appendix B, PS-4/4A)	5/9/18
Low Range Results			
Response Time	2 min 40 sec	≤240 seconds (4 minutes) (40 CFR 60, PS-4A eCFR)	5/8/18
7-Day Drift, Highest Reading	zero = 4.00% span = 1.22%	≤5.0% of full span 6 out of 7 days (40 CFR 60, Appendix B, PS-4)	4/29/18 thru 5/8/18
CGA	Low = -0.60 ppm Mid = -5.18%	≤15.0% of reference value or ≤5.0 ppm difference (40 CFR 60 Appendix F Procedure 1)	5/8/18
High Range Results			
Response Time	2 min	≤240 seconds (4 minutes) (40 CFR 60, PS-4A eCFR)	5/8/18
7-Day Drift, Highest Reading	zero = 0.04% span = 0.50%	≤5.0% of full span 6 out of 7 days (40 CFR 60, Appendix B, PS-4)	4/29/18 thru 5/8/18
CGA	Low = 0.42% Mid = 0.55%	≤15.0% of reference value or ≤5.0 ppm difference (40 CFR 60 Appendix F Procedure 1)	5/8/18

Table 4: CO_2 Analyzer Test Results Summary

Test	Results	Criteria	Test Date(s)
7-Day Drift, Highest Reading	zero = 0.10% span = 0.28%	≤0.5% difference (40 CFR 60, Appendix B, PS-3)	4/29/18 thru 5/8/18

3 Test Procedures

The test procedures used in this certification program were done in accordance with the methods outlined in 40 CFR 75 Appendix A and 40 CFR 60 Appendix B Performance Specifications. The following provides a brief overview on individual test procedures.

Test description for the RATA portion of the test program is attached as Section 5.

3.1 7-Day Calibration Error Test – NO_X, O_2

An on-site calibration error test (7-day drift test) was performed for each NO_X and O_2 monitoring system in accordance with 40 CFR 75, Appendix A, Section 6.3. The tests were performed while the unit was combusting fuel at stabilized stack temperature and pressure conditions.

The calibration error test consists of measuring the calibration error of each monitor scale once each day for seven (7) consecutive unit operating (process on line) days. The calibration error tests were conducted at two EPA Traceability Protocol 1 calibration gas concentrations: zero-level (0-20%) and high-level (80-100%) as specified in 40 CFR 75, Appendix A, Section 6.3.1.

In accordance with 40 CFR 75, Appendix A, Section 3.1, results of the 7-day calibration error test are acceptable if the daily calibration error does not exceed: 2.5% for NO_X and 0.5% for O_2. Alternatively, if the pollutant monitor's span value is equal to or less than 200 ppm, then calibration error shall not exceed 5.0 ppm difference.

Calibrations were performed automatically at approximately 24-hour intervals by the system controller during the drift test period. The readings for each analyzer were taken from the DAHS at the completion of the calibration routine. Copies of the DAHS reports are included with this test report. Manual or automatic adjustments were not made to the monitors until after the zero and high drift responses had been taken for that day during the 7-day test.

The percent calibration error is determined using the following equation:

Daily Drift for Pollutants 40 CFR 75, Appendix A Equation A-5	
$$CE = \frac{\lvert R - A \rvert}{S} \times 100$$	CE = Calibration error as a percentage of instrument span R = Zero or high-level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The calibration error for diluent (O_2) monitors is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Diluents **40 CFR 75, Appendix A, Equation A-5**	
$$CE = \lvert R - A \rvert$$	CE = Calibration error as a percentage of O_2 R = Zero or high-level calibration gas value in percent (%). A = Actual monitor response to calibration gas in percent (%)

3.2 7-Day Calibration Drift Test CO and CO_2 Monitors

The CO_2 analyzer is used for process monitoring and control (non-compliance). A 7-day caliabration drift check was performed as a demonstration of analyzer accuracy with results reported in this report.

Calibrations were performed on the CO and CO_2 analyzer(s) automatically at approximately 24-hour intervals by the DAHS for seven consecutive unit operating (process on-line) days. The calibration drift tests were conducted at two calibration gas concentrations: zero-level (0-20%) and high-level (50-100%) as specified in 40 CFR 60 Appendix B Performance Specifications. The low and high span (zero and span gas) readings for each analyzer were taken from the DAHS at the completion of the calibration routine (40 CFR 60, Appendix B, PS-2, Section 4.1).

The 24-hour calibration drifts were calculated and reported by the following method (40 CFR 60, Appendix B, PS-2). For CO analyzers, the raw zero reading is subtracted from the zero-gas bottle value, the difference is then divided by the analyzer's span and the resultant value is multiplied by 100 to give the percent calibration drift. The preceding procedure is repeated with the span gas to give the span drift.

Daily Drift for CO **40 CFR 60, Appendix B, PS-2 and PS-4**	
$$CD = \frac{R - A}{S} \times 100$$	CD = Calibration error as a percentage of instrument span R = Zero or high-level calibration gas value in ppm A = Actual monitor response to calibration gas in ppm S = Span of the instrument

The calibration error for the CO_2 monitor is computed by the DAHS from the test results for each concentration level as follows:

Daily Drift for Diluents ***40 CFR 60, Appendix B, PS-3 for CO_2***	
$$CD = R - A$$	CD = Calibration drift as a percentage of CO_2 R = Zero or high level calibration gas value in percent (%) A = Actual monitor response to calibration gas in percent (%)

The 24-hour calibration drift must not exceed ±5% for CO (6 out of 7 days) and ±0.5% difference for CO_2.

3.3 Linearity Error Check – NO_X, O_2

An on-site linearity check test was conducted in accordance with the 40 CFR 75, Appendix A, for each NO_X and O_2 monitoring system. The test was performed while the unit was combusting primary fuel at stabilized stack temperature and pressure conditions.

EPA Protocol certified calibration gases were used to conduct the linearity checks of the analyzers. Three points (concentrations) of calibration gases, low (20-30%), mid (50-60%) and high (80-100%) were introduced at the probe (40 CFR 75, Appendix A, Section 5.2). Each monitor was challenged three times with the appropriate reference gas, without using the same gas twice in succession. The monitors' response for each concentration was recorded. The average of the three responses will be used to calculate the linearity error (40 CFR 75, Appendix A, Section 6.2).

Linearity error was calculated using the following equation.

Linearity Error **Equation A-4, 40 CFR 75, Appendix A**	
$$LE = \frac{\lvert R - A \rvert}{R} \times 100$$	LE = Percent Linearity Error R = Calibration gas reference value A = Average of monitor response

Linearity Check: Alternate Criteria **40 CFR 75, Appendix A, Section 3**	
$$LE = \lvert R - A \rvert$$	LE = Percent linearity error R = Calibration gas reference value A = Average of monitor response

Linearity checks are acceptable for monitor certification if none of the test results exceed the applicable performance specification of 40 CFR 75, Appendix A, Section 3.2. The results of the NO_X and O_2 shall be less than 5.0% as calculated by the above equation or the alternative criteria of ≤0.5% O_2 or ≤5 ppm difference for NO_X.

Note: If the NO_X span value is ≤30 ppm, that range of the analyzer is exempt from the linearity test requirements per 40 CFR 75, Appendix A, Section 6.2.

3.4 CO Analyzer Cylinder Gas Audit

Although not required for certification compliance (per Part 60 PS-4A) a Cylinder Gas Audit (CGA) was performed on the CO analyzer utilizing procedures from 40 CFR 60 Appendix F Procedure 1. The CGA was conducted as a demonstration check with results included in the CO analyzer summary table.

Separate calibration gas cylinders are used for the two required concentration levels during the audit. Three non-consecutive runs at each concentration level are performed. The calibration gases are introduced at the probe interface box and transported through the CEMS sampling system (normal sampling flow path).

The accuracy values for each concentration should not exceed 15% as calculated in the following equation or 5 ppm difference:

Cylinder Gas Audit Accuracy ***40 CFR 60, Appendix F, Section 6.3***	
$$A = \frac{C_m - C_a}{C_a} x\, 100$$	A = Percent accuracy of the CEM C_m = The average monitor response to the specific audit gas (high or low) in units of concentration C_a = Certified value of audit gas (value according to EPA Protocol certification) in units of concentration

3.5 Cycle/Response Time Check – NO_X, O_2

The cycle time test measures the monitor's reaction time to a change in gas concentration (40 CFR 75, Appendix A, Section 6.4). The system measured stack concentrations until a stable response was observed. The stable stack value was recorded. A low-level (zero) calibration gas was injected at the probe sample interface. Gas injection at the probe continued until a stable monitor response was reached. Next the monitor was switched back to monitor stack gas until a stable reading was achieved and the time recorded. A span-level (80-100% of span) calibration gas was then injected at the probe until a stable response was reached. The amount of time required for the system to respond to 95% of the final stable calibration gas response value was recorded. The time was recorded for the upscale test and the downscale test for each analyzer. The response time for NO_X and O_2 will be ≤15 minutes.

The two cycle times for the upscale and downscale tests were compared. The longer of these two times was recorded as the cycle time for the analyzer.

For monitors with dual ranges, the test results from the range giving the longer cycle time was reported.

3.6 CO Analyzer Response Time Check

An on-site response time test for the CO monitoring system was performed in accordance with Performance Specification 4A, section 8.3 (as specified in recent eCFR posting). The response time test measures the monitor’s reaction time to a change in gas concentration. A zero-level calibration gas was injected at the probe interface valve box such that the entire sampling system is included in the test. Gas injection continued until a stable monitor response was reached. A high span gas was then introduced to probe valve box until a stable value was observed. The upscale response time required is the amount of time to reach 95% of the final stable end value. The zero gas was re-introduced until a stable reading was reached. The downscale response time required is the amount of time to reach 95% of the final stable end value. The response times for 3 repetitions of upscale and downscale runs were recorded. An average of the 3 upscale and 3 downscale runs was determined. The response time of the longer (slower) of the two means must be ≤240 seconds (4 minutes).

The daily zero and span calibration gases were utilized for response time testing.

4 Test Data and Supporting Documentation

This section contains DAHS printouts and supporting documentation for tests performed in this certification test program.

4.1 7-Day Calibration Drift Data

The following pages contain DAHS printouts and supporting documentation for the drift tests performed on the gas analyzers and flow monitors. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A and 40 CFR 60 Appendix B Performance Specifications (as applicable).

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - NOx Low Range

40 CFR 75

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **645**
Measurement Span (ppm): **10**

Span Gas Option
High 80-100%

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.17**	81.70	OK	CC19317	09/27/20	OK

			Zero Reading					
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Difference |R-A|**	**Alt. Criteria (5 ppm diff)**	**Zero Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	29-Apr-18	12:26	0.00	**0.00**	0.00	PASS	0.00	PASS
2	30-Apr-18	17:00	0.00	**0.00**	0.00	PASS	0.00	PASS
3	1-May-18	16:15	0.00	**0.00**	0.00	PASS	0.00	PASS
4	2-May-18	12:08	0.00	**0.00**	0.00	PASS	0.00	PASS
5	3-May-18	10:53	0.00	**0.00**	0.00	PASS	0.00	PASS
6	7-May-18	14:46	0.00	**0.10**	0.10	PASS	1.00	PASS
7	8-May-18	12:35	0.00	**0.00**	0.00	PASS	0.00	PASS

Highest Zero Difference **0.10** **Highest Zero Drift** **1.00**

			Span Reading					
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Difference |R-A|**	**Alt. Criteria (5 ppm diff)**	**Span Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	29-Apr-18	9:56	8.17	**8.30**	0.13	PASS	1.30	PASS
2	30-Apr-18	11:36	8.17	**8.20**	0.03	PASS	0.30	PASS
3	1-May-18	15:11	8.17	**8.10**	0.07	PASS	0.70	PASS
4	2-May-18	15:00	8.17	**8.20**	0.03	PASS	0.30	PASS
5	3-May-18	1:32	8.17	**8.20**	0.03	PASS	0.30	PASS
6	7-May-18	18:12	8.17	**8.20**	0.03	PASS	0.30	PASS
7	8-May-18	12:12	8.17	**8.00**	0.17	PASS	1.70	PASS

Highest Span Difference **0.17** **Highest Span Drift** **1.70**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Alternately a 40-60% of span may be used.
Change the Span Gas Option cell if a mid-level gas is used.

Pass/Fail Criteria: 2.5% of span each day of drift period
or if the span is 200 ppm or less, then 5 ppm difference
(40 CFR 75, Appendix A, Section 3.1)

*Only use alternate criteria when span is less than 200 ppm

Equation (40 CFR 75, Appendix A, Eq. A-5):

CE = (|R - A| / R) x 100
or alternate for span ranges less than or equal to 200 ppm
CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - NOx High Range

40 CFR 75

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **645**
Measurement Span (ppm): **100**

Span Gas Option
High 80-100%

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**89.52**	89.52	OK	CC329952	12/17/25	OK

			Zero Reading					
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Difference |R-A|	Alt. Criteria (5 ppm diff)	Zero Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	29-Apr-18	12:26	0.00	**0.10**	0.10	PASS	0.10	PASS
2	30-Apr-18	17:00	0.00	**0.10**	0.10	PASS	0.10	PASS
3	1-May-18	16:15	0.00	**0.00**	0.00	PASS	0.00	PASS
4	2-May-18	12:08	0.00	**0.10**	0.10	PASS	0.10	PASS
5	3-May-18	10:53	0.00	**0.00**	0.00	PASS	0.00	PASS
6	7-May-18	14:46	0.00	**0.10**	0.10	PASS	0.10	PASS
7	8-May-18	12:35	0.00	**0.00**	0.00	PASS	0.00	PASS

Highest Zero Difference **0.10** **Highest Zero Drift** **0.10**

			Span Reading					
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Difference |R-A|	Alt. Criteria (5 ppm diff)	Span Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	29-Apr-18	12:32	89.52	**90.40**	0.88	PASS	0.88	PASS
2	30-Apr-18	17:06	89.52	**89.30**	0.22	PASS	0.22	PASS
3	1-May-18	16:21	89.52	**88.80**	0.72	PASS	0.72	PASS
4	2-May-18	12:14	89.52	**88.30**	1.22	PASS	1.22	PASS
5	3-May-18	10:59	89.52	**88.40**	1.12	PASS	1.12	PASS
6	7-May-18	14:52	89.52	**88.20**	1.32	PASS	1.32	PASS
7	8-May-18	12:41	89.52	**88.10**	1.42	PASS	1.42	PASS

Highest Span Difference **1.42** **Highest Span Drift** **1.42**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Alternately a 40-60% of span may be used.
Change the Span Gas Option cell if a mid-level gas is used.

Pass/Fail Criteria: 2.5% of span each day of drift period
or if the span is 200 ppm or less, then 5 ppm difference
(40 CFR 75, Appendix A, Section 3.1)

*Only use alternate criteria when span is less than 200 ppm

Equation (40 CFR 75, Appendix A, Eq. A-5):

CE = (|R - A| / R) x 100
or alternate for span ranges less than or equal to 200 ppm
CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - O2

40 CFR 75, Appendix A, Section 3.1

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **645**
Analyzer Range (%): **25**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**20.93**	83.72	OK	EB0095428	09/19/25	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift |R-A|**	**Criteria (% diff)**
1	29-Apr-18	12:26	0.00	**0.00**	0.00	PASS
2	30-Apr-18	17:00	0.00	**0.00**	0.00	PASS
3	1-May-18	16:15	0.00	**0.00**	0.00	PASS
4	2-May-18	12:08	0.00	**0.00**	0.00	PASS
5	3-May-18	10:53	0.00	**0.00**	0.00	PASS
6	7-May-18	14:46	0.00	**0.00**	0.00	PASS
7	8-May-18	12:44	0.00	**0.00**	0.00	PASS

Highest Zero Drift **0.00**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift |R-A|**	**Criteria (% diff)**
1	29-Apr-18	12:35	20.93	**20.90**	0.03	PASS
2	30-Apr-18	17:09	20.93	**20.90**	0.03	PASS
3	1-May-18	16:24	20.93	**20.90**	0.03	PASS
4	2-May-18	12:17	20.93	**20.90**	0.03	PASS
5	3-May-18	11:02	20.93	**20.90**	0.03	PASS
6	7-May-18	14:55	20.93	**20.90**	0.03	PASS
7	8-May-18	12:44	20.93	**20.90**	0.03	PASS

Highest Span Drift **0.03**

Notes:

Allowed calibration gas ranges (40 CFR 75)
0-20% of span
80-100% of span

Pass/Fail Criteria: 0.5% difference for each day of the drift period
(40 CFR 75, Appendix A, Section 3.1)

Equation (40 CFR 75, Appendix A, Section 3.1):

CE = |R - A|

CE = Calibration Error, %
R = Calibration Gas Reference Value, %O2
A = Monitor Response, %O2

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **PASS**

7-Day Calibration Error (Drift) - CO Low Range

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **355**
Measurement Span (ppm): **10**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.78**	87.78	OK	CC192317	09/26/20	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Zero Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	29-Apr-18	12:26	0.00	**0.00**	0.00	PASS
2	30-Apr-18	17:00	0.00	**0.00**	0.00	PASS
3	1-May-18	16:15	0.00	**0.00**	0.00	PASS
4	2-May-18	12:08	0.00	**0.00**	0.00	PASS
5	3-May-18	10:53	0.00	**0.00**	0.00	PASS
6	7-May-18	14:46	0.00	**0.00**	0.00	PASS
7	8-May-18	12:35	0.00	**0.40**	4.00	PASS

Highest Zero Drift **4.00**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Span Calibration Error (|R-A|/S) x 100**	**Primary Criteria (%span)**
1	29-Apr-18	12:29	8.78	**8.90**	1.22	PASS
2	30-Apr-18	17:03	8.78	**8.90**	1.22	PASS
3	1-May-18	16:18	8.78	**8.90**	1.22	PASS
4	2-May-18	12:11	8.78	**8.90**	1.22	PASS
5	3-May-18	10:56	8.78	**8.90**	1.22	PASS
6	7-May-18	14:49	8.78	**8.70**	0.78	PASS
7	8-May-18	12:38	8.78	**8.80**	0.22	PASS

Highest Span Drift **1.22**

Notes:

Allowed calibration gas ranges (40 CFR 60)
0-20% of span
50-100% of span

Pass/Fail Criteria: 5.0% of span for 6 out of 7 days

Equation (40 CFR 60, Appendix B, PS-4):

CD = (R - A / S) x 100
CD = Calibration Drift, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **PASS**

7-Day Calibration Error (Drift) - CO High Range

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **355**
Measurement Span (ppm): **3000**

	Ref Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check*
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**2635.00**	87.83	OK	EB0095428	09/19/25	OK

			Zero Reading			
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Zero Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	29-Apr-18	12:26	0.00	**-0.80**	0.03	PASS
2	30-Apr-18	17:00	0.00	**-1.10**	0.04	PASS
3	1-May-18	16:15	0.00	**-0.20**	0.01	PASS
4	2-May-18	12:08	0.00	**0.90**	0.03	PASS
5	3-May-18	10:53	0.00	**0.80**	0.03	PASS
6	7-May-18	14:46	0.00	**-0.90**	0.03	PASS
7	8-May-18	12:35	0.00	**-0.20**	0.01	PASS

Highest Zero Drift **0.04**

			Span Reading			
Day	Date	Cal Time	Cal Gas (R)	Response (A)	Span Calibration Error (|R-A|/S) x 100	Primary Criteria (%span)
1	29-Apr-18	12:35	2635.00	**2642.60**	0.25	PASS
2	30-Apr-18	17:09	2635.00	**2643.90**	0.30	PASS
3	1-May-18	16:24	2635.00	**2642.80**	0.26	PASS
4	2-May-18	12:17	2635.00	**2649.20**	0.47	PASS
5	3-May-18	11:02	2635.00	**2650.10**	0.50	PASS
6	7-May-18	14:55	2635.00	**2638.30**	0.11	PASS
7	8-May-18	12:44	2635.00	**2639.80**	0.16	PASS

Highest Span Drift **0.50**

Notes:
Allowed calibration gas ranges (40 CFR 60)
0-20% of span
50-100% of span

Pass/Fail Criteria: 5.0% of span for 6 out of 7 days

Equation (40 CFR 60, Appendix B, PS-4):
CD = (R - A / S) x 100
CD = Calibration Drift, %
R = Calibration Gas Reference Value, ppm
A = Monitor Response, ppm
S = Analyzer Span Value

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Project # CN50478

Result: **Pass**

7-Day Calibration Error (Drift) - CO2

40 CFR 60, PS-3

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **355**
Analyzer Range (%): **10**

	Ref Value	*% of Span*	*% Span Status*	*Bottle #*	*Exp. Date*	*Date Check**
Zero Calibration Gas (ppm):	**0.00**	0.00	OK	CC307646	08/22/25	OK
Span Calibration Gas (ppm):	**8.82**	88.20	OK	EB0095428	09/19/25	OK

			Zero Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift |R-A|**	**Criteria (% diff)**
1	29-Apr-18	12:26	0.00	**0.00**	0.00	PASS
2	30-Apr-18	17:00	0.00	**0.00**	0.00	PASS
3	1-May-18	16:15	0.00	**0.10**	0.10	PASS
4	2-May-18	12:08	0.00	**0.10**	0.10	PASS
5	3-May-18	10:53	0.00	**0.00**	0.00	PASS
6	7-May-18	14:46	0.00	**0.00**	0.00	PASS
7	8-May-18	12:35	0.00	**0.10**	0.10	PASS

Highest Zero Drift **0.10**

			Span Reading			
Day	**Date**	**Cal Time**	**Cal Gas (R)**	**Response (A)**	**Drift (CD) |R-A|**	**Criteria (% diff)**
1	29-Apr-18	12:35	8.82	**9.00**	0.18	PASS
2	30-Apr-18	17:09	8.82	**9.10**	0.28	PASS
3	1-May-18	16:24	8.82	**9.00**	0.18	PASS
4	2-May-18	12:17	8.82	**9.00**	0.18	PASS
5	3-May-18	11:02	8.82	**9.10**	0.28	PASS
6	7-May-18	14:55	8.82	**9.00**	0.18	PASS
7	8-May-18	12:44	8.82	**9.00**	0.18	PASS

Highest Span Drift **0.28**

Notes:
Allowed calibration gas ranges (40 CFR 60, PS-3)
0-20% of span
50-100% of span

Pass/Fail Criteria: 0.5% difference for each day of the drift period

Equation (40 CFR 60, Appendix B):
CD = R - A

CD = Calibration Drift, %
R = Calibration Gas Value, %CO2
A = Monitor Response, %CO2

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/29/2018 12:26	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
04/29/2018 12:29	CTG1 NOx Low P75	Upscale	8.00	8.30	-3.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
04/30/2018 17:00	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
04/30/2018 17:03	CTG1 NOx Low P75	Upscale	8.00	8.20	-2.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/01/2018 16:15	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/01/2018 16:18	CTG1 NOx Low P75	Upscale	8.00	8.10	-1.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/02/2018 12:08	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/02/2018 12:11	CTG1 NOx Low P75	Upscale	8.00	8.20	-2.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/03/2018 10:53	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/03/2018 10:56	CTG1 NOx Low P75	Upscale	8.00	8.20	-2.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/07/2018 14:46	CTG1 NOx Low P75	Zero	0.00	0.10	-1.00	2.50	10.00		0	Pass			ON		
05/07/2018 14:49	CTG1 NOx Low P75	Upscale	8.00	8.20	-2.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/08/2018 12:35	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/08/2018 12:38	CTG1 NOx Low P75	Upscale	8.00	8.00	0.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/09/2018 11:17	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/09/2018 11:20	CTG1 NOx Low P75	Upscale	8.20	8.20	0.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20
05/09/2018 11:32	CTG1 NOx Low P75	Zero	0.00	0.00	0.00	2.50	10.00		0	Pass			ON		
05/09/2018 11:36	CTG1 NOx Low P75	Upscale	8.20	8.50	-3.00	2.50	10.00		0	Pass			ON	CC192317	09/26/20

Report generated on: 05/09/2018 13:00

Data is expressed in Standard Time

Version 1.0

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type		Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/29/2018 12:26	CTG1 NOx High P75	Zero	1	0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
04/29/2018 12:32	CTG1 NOx High P75	Upscale		89.00	90.40	-1.40	2.50	100.00		0	Pass			ON	CC329952	04/06/19
04/30/2018 17:00	CTG1 NOx High P75	Zero		0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
04/30/2018 17:06	CTG1 NOx High P75	Upscale	2	89.00	89.30	-0.30	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/01/2018 16:15	CTG1 NOx High P75	Zero		0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
05/01/2018 16:21	CTG1 NOx High P75	Upscale	3	89.00	88.80	0.20	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/02/2018 12:08	CTG1 NOx High P75	Zero		0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
05/02/2018 12:14	CTG1 NOx High P75	Upscale	4	89.00	88.30	0.70	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/03/2018 10:53	CTG1 NOx High P75	Zero		0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
05/03/2018 10:59	CTG1 NOx High P75	Upscale	5	89.00	88.40	0.60	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/07/2018 14:46	CTG1 NOx High P75	Zero		0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
05/07/2018 14:52	CTG1 NOx High P75	Upscale	6	89.00	88.20	0.80	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/08/2018 12:35	CTG1 NOx High P75	Zero		0.00	0.00	0.00	2.50	100.00		0	Pass			ON		
05/08/2018 12:41	CTG1 NOx High P75	Upscale	7	89.00	88.10	0.90	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/09/2018 11:17	CTG1 NOx High P75	Zero		0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
05/09/2018 11:23	CTG1 NOx High P75	Upscale		89.00	88.00	1.00	2.50	100.00		0	Pass			ON	CC329952	04/06/19
05/09/2018 11:32	CTG1 NOx High P75	Zero		0.00	0.10	-0.10	2.50	100.00		0	Pass			ON		
05/09/2018 11:40	CTG1 NOx High P75	Upscale		89.50	88.50	1.00	2.50	100.00		0	Pass			ON	CC329952	04/06/19

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer		Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/29/2018 12:26	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
04/29/2018 12:35	CTG1 O2 P75	1	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
04/30/2018 17:00	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
04/30/2018 17:09	CTG1 O2 P75	2	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/01/2018 16:15	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/01/2018 16:24	CTG1 O2 P75	3	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/02/2018 12:08	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/02/2018 12:17	CTG1 O2 P75	4	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/03/2018 10:53	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/03/2018 11:02	CTG1 O2 P75	5	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/07/2018 14:46	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/07/2018 14:55	CTG1 O2 P75	6	Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/08/2018 12:35	CTG1 O2 P75	7	Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/08/2018 12:44	CTG1 O2 P75		Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/09/2018 11:17	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/09/2018 11:26	CTG1 O2 P75		Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25
05/09/2018 11:32	CTG1 O2 P75		Zero	0.00	0.00	0.00	0.50	25.00		0	Pass			ON		
05/09/2018 11:43	CTG1 O2 P75		Upscale	20.90	20.90	0.00	0.50	25.00		0	Pass			ON	EB0095 428	09/25/25

4/29/2018 12:26	CTG1	CO_HIGH	Daily	Zero	0	-0.8	0.03	PASS	0	5	3000	FALSE	ON				
4/29/2018 12:35	CTG1	CO_HIGH	Daily	Upscale	2635	2642.6	-0.25	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
4/30/2018 17:00	CTG1	CO_HIGH	Daily	Zero	0	-1.1	0.04	PASS	0	5	3000	FALSE	ON				
4/30/2018 17:09	CTG1	CO_HIGH	Daily	Upscale	2635	2643.9	-0.3	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/1/2018 16:15	CTG1	CO_HIGH	Daily	Zero	0	-0.2	0.01	PASS	0	5	3000	FALSE	ON				
5/1/2018 16:24	CTG1	CO_HIGH	Daily	Upscale	2635	2642.8	-0.26	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/2/2018 12:08	CTG1	CO_HIGH	Daily	Zero	0	0.9	-0.03	PASS	0	5	3000	FALSE	ON				
5/2/2018 12:17	CTG1	CO_HIGH	Daily	Upscale	2635	2649.2	-0.47	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/3/2018 10:53	CTG1	CO_HIGH	Daily	Zero	0	0.8	-0.03	PASS	0	5	3000	FALSE	ON				
5/3/2018 11:02	CTG1	CO_HIGH	Daily	Upscale	2635	2650.1	-0.5	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/7/2018 14:46	CTG1	CO_HIGH	Daily	Zero	0	-0.9	0.03	PASS	0	5	3000	FALSE	ON				
5/7/2018 14:55	CTG1	CO_HIGH	Daily	Upscale	2635	2638.3	-0.11	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/8/2018 12:35	CTG1	CO_HIGH	Daily	Zero	0	-0.2	0.01	PASS	0	5	3000	FALSE	ON				
5/8/2018 12:44	CTG1	CO_HIGH	Daily	Upscale	2635	2639.8	-0.16	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/9/2018 11:17	CTG1	CO_HIGH	Daily	Zero	0	0.8	-0.03	PASS	0	5	3000	FALSE	ON				
5/9/2018 11:26	CTG1	CO_HIGH	Daily	Upscale	2635	2635.1	0	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/9/2018 11:32	CTG1	CO_HIGH	Daily	Zero	0	1.1	-0.04	PASS	0	5	3000	FALSE	ON				
5/9/2018 11:43	CTG1	CO_HIGH	Daily	Upscale	2635	2637.2	-0.07	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/10/2018 7:51	CTG1	CO_HIGH	Daily	Zero	0	-0.8	0.03	PASS	0	5	3000	FALSE	ON				
5/10/2018 8:00	CTG1	CO_HIGH	Daily	Upscale	2635	2641.9	-0.23	PASS	0	5	3000	FALSE	ON	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
5/10/2018 13:08	CTG1	CO_HIGH	Daily	Zero	0	1.3	-0.04	PASS	0	5	3000	FALSE	OFF				
5/10/2018 13:17	CTG1	CO_HIGH	Daily	Upscale	2635	2640	-0.17	PASS	0	5	3000	FALSE	OFF	CO,CO2,O2,BALN	EB0095428	B52017	9/25/2025
4/29/2018 12:26	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
4/29/2018 12:29	CTG1	CO_LOW	Daily	Upscale	8.8	8.9	-1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
4/30/2018 17:00	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
4/30/2018 17:03	CTG1	CO_LOW	Daily	Upscale	8.8	8.9	-1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/1/2018 16:15	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
5/1/2018 16:18	CTG1	CO_LOW	Daily	Upscale	8.8	8.9	-1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/2/2018 12:08	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
5/2/2018 12:11	CTG1	CO_LOW	Daily	Upscale	8.8	8.9	-1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/3/2018 10:53	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
5/3/2018 10:56	CTG1	CO_LOW	Daily	Upscale	8.8	8.9	-1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/7/2018 14:46	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
5/7/2018 14:49	CTG1	CO_LOW	Daily	Upscale	8.8	8.7	1	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/8/2018 12:35	CTG1	CO_LOW	Daily	Zero	0	0.4	-4	PASS	0	5	10	FALSE	ON				
5/8/2018 12:38	CTG1	CO_LOW	Daily	Upscale	8.8	8.8	0	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/9/2018 11:17	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	ON				
5/9/2018 11:20	CTG1	CO_LOW	Daily	Upscale	8.8	0.2	86	FAIL	1	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/9/2018 11:32	CTG1	CO_LOW	Daily	Zero	0	0.3	-3	PASS	0	5	10	FALSE	ON				
5/9/2018 11:36	CTG1	CO_LOW	Daily	Upscale	8.8	8.8	0	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/10/2018 7:51	CTG1	CO_LOW	Daily	Zero	0	0.4	-4	PASS	0	5	10	FALSE	ON				
5/10/2018 7:54	CTG1	CO_LOW	Daily	Upscale	8.8	9.1	-3	PASS	0	5	10	FALSE	ON	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020
5/10/2018 13:08	CTG1	CO_LOW	Daily	Zero	0	0	0	PASS	0	5	10	FALSE	OFF				
5/10/2018 13:11	CTG1	CO_LOW	Daily	Upscale	8.8	8.8	0	PASS	0	5	10	FALSE	OFF	CO,CO2,NO,NOX,B	CC192317	B52017	9/26/2020

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer		Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
04/29/2018 12:26	CTG1 CO2 P60		Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/29/2018 12:35	CTG1 CO2 P60	1	Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
04/30/2018 17:00	CTG1 CO2 P60		Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
04/30/2018 17:09	CTG1 CO2 P60	2	Upscale	8.80	9.10	-0.30	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/01/2018 16:15	CTG1 CO2 P60		Zero	0.00	0.10	-0.10	0.50	10.00	Pass	0				ON		
05/01/2018 16:24	CTG1 CO2 P60	3	Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/02/2018 12:08	CTG1 CO2 P60		Zero	0.00	0.10	-0.10	0.50	10.00	Pass	0				ON		
05/02/2018 12:17	CTG1 CO2 P60	4	Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/03/2018 10:53	CTG1 CO2 P60	5	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/03/2018 11:02	CTG1 CO2 P60		Upscale	8.80	9.10	-0.30	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/07/2018 14:46	CTG1 CO2 P60	6	Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		
05/07/2018 14:55	CTG1 CO2 P60		Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/08/2018 12:35	CTG1 CO2 P60	7	Zero	0.00	0.10	-0.10	0.50	10.00	Pass	0				ON		
05/08/2018 12:44	CTG1 CO2 P60		Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/09/2018 11:17	CTG1 CO2 P60		Zero	0.00	0.10	-0.10	0.50	10.00	Pass	0				ON		
05/09/2018 11:26	CTG1 CO2 P60		Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/09/2018 11:32	CTG1 CO2 P60		Zero	0.00	0.10	-0.10	0.50	10.00	Pass	0				ON		
05/09/2018 11:43	CTG1 CO2 P60		Upscale	8.80	9.00	-0.20	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25
05/10/2018 07:51	CTG1 CO2 P60		Zero	0.00	0.00	0.00	0.50	10.00	Pass	0				ON		

Calibration Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Date Time	Analyzer	Type	Target Value	Analyzer Value	Analyzer Drift	Perf Spec	Span	P60 Status	5-day Count	P75 Status	PADEP Status	CA Status	Process Status	Cylinder Number	Cylinder Exp
05/10/2018 08:00	CTG1 CO2 P60	Upscale	8.80	9.10	-0.30	0.50	10.00	Pass	0				ON	EB0095 428	09/25/25

4.2 Linearity and CGA Data

The following pages contain DAHS printouts and supporting documentation for the linearity and CGA checks performed on the gas analyzers. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A, section 6.2 and 40 CFR 60 Appendix F (as applicable).

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Linearity Test - NOx Low Range

40 CFR 75, Appendix A, Section 3.2

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**645**
Analyzer Range:	**10** *ppm*
Test Date:	**8-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	2.42	24.20	OK	EB0072315	07/04/20	OK
Mid	5.09	50.90	OK	EB0101725	12/03/20	OK
High	8.17	81.70	OK	CC192317	09/26/20	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A) Low	Difference (R-A) Mid	Difference (R-A) High
1	Low	2.42	**9:48**	**2.50**	-0.08	-0.21	0.17
2	Mid	5.09	**9:52**	**5.30**			
3	High	8.17	**9:58**	**8.00**			
4	Low	2.42	**10:02**	**2.50**	-0.08	-0.31	0.17
5	Mid	5.09	**10:09**	**5.40**			
6	High	8.17	**10:15**	**8.00**			
7	Low	2.42	**10:19**	**2.50**	-0.08	-0.31	0.17
8	Mid	5.09	**10:24**	**5.40**			
9	High	8.17	**10:29**	**8.00**			
				Average Response	2.50	5.37	8.00
				Absolute Difference of Average	0.08	0.28	0.17
				Status (for alternate criteria of 5 ppm difference)	PASS	PASS	PASS
				Linearity Error, %	**3.31**	**5.44**	**2.08**
				Status	PASS	FAIL	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 5 ppm or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances (40 CFR 75)
Low = 20-30% of span
Mid = 50-60% of span
High = 80-100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Linearity Test - NOx High Range

40 CFR 75, Appendix A, Section 3.2

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**645**
Analyzer Range:	**100** *ppm*
Test Date:	**8-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	24.60	24.60	OK	EB0073000	03/19/21	OK
Mid	50.89	50.89	OK	CC503502	11/01/25	OK
High	89.52	89.52	OK	CC329952	12/17/25	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A) Low	Difference (R-A) Mid	Difference (R-A) High
1	Low	24.60	**9:51**	**25.00**	-0.40	-0.51	1.32
2	Mid	50.89	**9:55**	**51.40**			
3	High	89.52	**10:00**	**88.20**			
4	Low	24.60	**10:04**	**25.10**	-0.50	-0.51	1.32
5	Mid	50.89	**10:08**	**51.40**			
6	High	89.52	**10:12**	**88.20**			
7	Low	24.60	**10:16**	**25.10**	-0.50	-0.61	1.02
8	Mid	50.89	**10:20**	**51.50**			
9	High	89.52	**10:24**	**88.50**			
				Average Response	25.07	51.43	88.30
				Absolute Difference of Average	0.47	0.54	1.22
				Status (for alternate criteria of 5 ppm difference)	PASS	PASS	PASS
				Linearity Error, %	**1.90**	**1.07**	**1.36**
				Status	PASS	PASS	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 5 ppm or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances (40 CFR 75)
Low = 20-30% of span
Mid = 50-60% of span
High = 80-100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by: Justin Saporito
Company: Cemtek KVB-Enertec
Project # CN50478

Linearity Test - O2

40 CFR 75, Appendix A, Section 3.2

Manufacturer: **TAPI**
Model: **T200M**
Serial Number: **645**
Analyzer Range: **25** %
Test Date: **8-May-18**

Pass

	Gas Value	% of Span	% Span Status	Bottle #	Exp. Date	Date Check
Low	6.36	25.44	OK	EB0049201	08/13/21	OK
Mid	13.82	55.28	OK	EB0060674	04/01/26	OK
High	20.93	83.72	OK	EB0095428	09/17/25	OK

Run Number	Run Level	Cal Gas Value (R)	Time	Monitor Response (A)	Difference (R-A) Low	Difference (R-A) Mid	Difference (R-A) High
1	Low	6.36	**7:05**	**6.10**	0.26	0.12	0.03
2	Mid	13.82	**7:09**	**13.70**			
3	High	20.93	**7:13**	**20.90**			
4	Low	6.36	**7:18**	**6.10**	0.26	0.12	0.03
5	Mid	13.82	**7:21**	**13.70**			
6	High	20.93	**7:26**	**20.90**			
7	Low	6.36	**7:30**	**6.10**	0.26	0.12	0.03
8	Mid	13.82	**7:34**	**13.70**			
9	High	20.93	**7:38**	**20.90**			
				Average Response	6.10	13.70	20.90
				Absolute Difference of Average	0.26	0.12	0.03
				Status (for alternate criteria of .5% difference)	PASS	PASS	PASS
				Linearity Error, %	**4.09**	**0.87**	**0.14**
				Status	PASS	PASS	PASS

Notes:
Pass/fail criteria = 5% or less; or abs mean difference = 0.5% or less
(40 CFR 75, Appendix A, Section 3.2)

Cal Gas Allowances
Low = 20-30% of span
Mid = 50-60% of span
High = 80 100% of span

Equation (40 CFR 75, Appendix A, Eq A-4):
LE = (|R - A| / R) x 100
or
LE = |R - A| (40 CFR 75, Appendix A, Section 3.2)

LE = Linearity Error
R = Calibration Gas Reference Value
A = Average of Monitor Response

CPV Valley Energy Center
CTG 1
Middletown NY

Project# 50478

Cylinder Gas Audit - CO Low Range

For quarter ending: **06/30/18**

Manufacturer:	TAPI
Model:	T300M
Serial Number:	355
Analyzer Range:	10
Test Date:	05/08/18

Reference Gas Value (Ca)		% of Span	Status	Bottle #	Exp. Date	Exp. Date Status
Low	2.67	26.70	OK	EB0072315	07/04/20	OK
Mid	5.66	56.60	OK	EB0101725	12/30/20	OK

Note: Cal gas values must be between 20-30% of span value for low and 50-60% of span value for mid

Run Number	Run Time	Low Response	Run Time	Mid Response
1	**9:48**	**2.10**	**9:53**	**5.40**
2	**10:02**	**2.00**	**10:09**	**5.40**
3	**10:19**	**2.10**	**10:24**	**5.30**
Average Response (Cm)		2.07		5.37
Difference (Cm-Ca)		-0.60		-0.29
Status (for alternate criteria of 5 ppm difference)		PASS		PASS
Accuracy %, ((Cm-Ca)/Ca) * 100		**-22.60**		**-5.18**
Status (for primary criteria of 15%)		**FAIL**		PASS

Cylinder Gas Audit - CO High Range

Analyzer Range:	3000
Test Date:	05/08/18

Reference Gas Value (Ca)		% of Span	Status	Bottle #	Exp. Date	Exp. Date Status
Low	753.00	25.10	OK	EB0040994	04/04/26	OK
Mid	1670.00	55.67	OK	EB00722144	04/04/26	OK

Note: Cal gas values must be between 20-30% of span value for low and 50-60% of span value for mid

Run Number	Run Time	Low Response	Run Time	Mid Response
1	**8:19**	**755.20**	**8:24**	**1680.80**
2	**8:29**	**754.70**	**8:33**	**1678.00**
3	**8:38**	**758.60**	**8:42**	**1678.90**
Average Response (Cm)		756.17		1679.23
Difference (Cm-Ca)		3.17		9.23
Status (for alternate criteria of 5 ppm difference)		PASS		**FAIL**
Accuracy %, ((Cm-Ca)/Ca) * 100		**0.42**		**0.55**
Status (for primary criteria of 15%)		PASS		PASS

Notes:
Pass/Fail Criteria: +/- 15% or 5.0 ppm difference for pollutants
(40 CFR 60, Appendix F)

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 NOX_LOW_P75		
	LBHR	OS	MS	PPMD	OS	MS
05/08/2018 10:15	96000	SU	GD	8.0	SU	QA
05/08/2018 10:16	96000	SU	GD	8.0	SU	QA
05/08/2018 10:17	96000	SU	GD	5.7	SU	MN
05/08/2018 10:18	96000	SU	GD	2.5	SU	MN
05/08/2018 10:19	96000	SU	GD	2.5	SU	MN
05/08/2018 10:20	96000	SU	GD	2.5	SU	MN
05/08/2018 10:21	96000	SU	GD	2.5	SU	MN
05/08/2018 10:22	96000	SU	GD	2.8	SU	MN
05/08/2018 10:23	96000	SU	GD	5.4	SU	MN
05/08/2018 10:24	96000	SU	GD	5.4	SU	MN
05/08/2018 10:25	96000	SU	GD	5.4	SU	MN
05/08/2018 10:26	96000	SU	GD	5.4	SU	MN
05/08/2018 10:27	96000	SU	GD	5.4	SU	QA
05/08/2018 10:28	96000	SU	GD	7.8	SU	QA
05/08/2018 10:29	96000	SU	GD	8.0	SU	QA
05/08/2018 10:30	96000	SU	GD	8.0	SU	QA
Average	96000					
Maximum	96000					
Minimum	96000					
Total	4224000					

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/10/2018 10:29   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 NOX_LOW_P75		
	LBHR	OS	MS	PPMD	OS	MS
05/08/2018 09:47	96000	SU	GD	2.5	SU	MN
05/08/2018 09:48	96000	SU	GD	2.5	SU	MN
05/08/2018 09:49	96000	SU	GD	2.5	SU	MN
05/08/2018 09:50	96000	SU	GD	3.2	SU	MN
05/08/2018 09:51	96000	SU	GD	5.3	SU	MN
05/08/2018 09:52	96000	SU	GD	5.3	SU	MN
05/08/2018 09:53	96000	SU	GD	5.3	SU	MN
05/08/2018 09:54	96000	SU	GD	5.5	SU	QA
05/08/2018 09:55	96000	SU	GD	7.7	SU	QA
05/08/2018 09:56	96000	SU	GD	8.1	SU	QA
05/08/2018 09:57	96000	SU	GD	8.0	SU	QA
05/08/2018 09:58	96000	SU	GD	8.0	SU	QA
05/08/2018 09:59	96000	SU	GD	8.0	SU	QA
05/08/2018 10:00	96000	SU	GD	3.1	SU	MN
05/08/2018 10:01	96000	SU	GD	2.5	SU	MN
05/08/2018 10:02	96000	SU	GD	2.5	SU	MN
05/08/2018 10:03	96000	SU	GD	2.5	SU	MN
05/08/2018 10:04	96000	SU	GD	2.4	SU	MN
05/08/2018 10:05	96000	SU	GD	2.4	SU	MN
05/08/2018 10:06	96000	SU	GD	2.4	SU	MN
05/08/2018 10:07	96000	SU	GD	3.2	SU	MN
05/08/2018 10:08	96000	SU	GD	5.3	SU	MN
05/08/2018 10:09	96000	SU	GD	5.4	SU	MN
05/08/2018 10:10	96000	SU	GD	5.4	SU	MN
05/08/2018 10:11	96000	SU	GD	5.4	SU	QA
05/08/2018 10:12	96000	SU	GD	6.5	SU	QA
05/08/2018 10:13	96000	SU	GD	8.1	SU	QA
05/08/2018 10:14	96000	SU	GD	8.0	SU	QA

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/10/2018 10:29   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 NOX_P75		
	LBHR	OS	MS	PPMD	OS	MS
05/10/2018 09:50	73000	SU	GD	25.0	SU	QA
05/10/2018 09:51	72000	SU	GD	25.0	SU	QA
05/10/2018 09:52	73000	SU	GD	25.0	SU	QA
05/10/2018 09:53	73000	SU	GD	27.2	SU	QA
05/10/2018 09:54	72000	SU	GD	51.4	SU	QA
05/10/2018 09:55	73000	SU	GD	51.4	SU	QA
05/10/2018 09:56	73000	SU	GD	51.4	SU	QA
05/10/2018 09:57	73000	SU	GD	54.4	SU	QA
05/10/2018 09:58	73000	SU	GD	81.6	SU	QA
05/10/2018 09:59	73000	SU	GD	88.2	SU	QA
05/10/2018 10:00	72000	SU	GD	88.2	SU	QA
05/10/2018 10:01	73000	SU	GD	88.2	SU	QA
05/10/2018 10:02	72000	SU	GD	69.8	SU	QA
05/10/2018 10:03	72000	SU	GD	25.2	SU	QA
05/10/2018 10:04	70000	SU	GD	25.1	SU	QA
05/10/2018 10:05	68000	SU	GD	25.1	SU	QA
05/10/2018 10:06	67000	SU	GD	38.2	SU	QA
05/10/2018 10:07	65000	SU	GD	51.4	SU	QA
05/10/2018 10:08	64000	SU	GD	51.4	SU	QA
05/10/2018 10:09	64000	SU	GD	51.4	SU	QA
05/10/2018 10:10	64000	SU	GD	66.6	SU	QA
05/10/2018 10:11	64000	SU	GD	88.1	SU	QA
05/10/2018 10:12	63000	SU	GD	88.2	SU	QA
05/10/2018 10:13	63000	SU	GD	88.3	SU	QA
05/10/2018 10:14	62000	SU	GD	67.3	SU	QA
05/10/2018 10:15	59000	SU	GD	25.2	SU	QA
05/10/2018 10:16	58000	SU	GD	25.1	SU	QA
05/10/2018 10:17	56000	SU	GD	25.1	SU	QA

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 NOX_P75		
	LBHR	OS	MS	PPMD	OS	MS
05/10/2018 10:18	55000	SU	GD	32.1	SU	QA
05/10/2018 10:19	52000	SU	GD	51.4	SU	QA
05/10/2018 10:20	50000	SU	GD	51.5	SU	QA
05/10/2018 10:21	48000	SU	GD	51.4	SU	QA
05/10/2018 10:22	46000	SU	GD	51.4	SU	QA
05/10/2018 10:23	44000	SU	GD	85.1	SU	QA
05/10/2018 10:24	42000	SU	GD	88.5	SU	QA
05/10/2018 10:25	40000	SU	GD	88.4	SU	QA
05/10/2018 10:26				81.5	SU	MN
Average	63361					
Maximum	73000					
Minimum	40000					
Total	2281000					

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/10/2018 10:23

Data is expressed in Standard Time

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 O2_P75		
	LBHR	OS	MS	PCT	OS	MS
05/10/2018 07:04	72000	SU	GD	6.1	SU	QA
05/10/2018 07:05	72000	SU	GD	6.1	SU	QA
05/10/2018 07:06	72000	SU	GD	6.1	SU	QA
05/10/2018 07:07	72000	SU	GD	10.1	SU	QA
05/10/2018 07:08	72000	SU	GD	13.7	SU	QA
05/10/2018 07:09	72000	SU	GD	13.7	SU	QA
05/10/2018 07:10	72000	SU	GD	13.7	SU	QA
05/10/2018 07:11	72000	SU	GD	16.5	SU	QA
05/10/2018 07:12	72000	SU	GD	20.9	SU	QA
05/10/2018 07:13	72000	SU	GD	20.9	SU	QA
05/10/2018 07:14	72000	SU	GD	20.9	SU	QA
05/10/2018 07:15	72000	SU	GD	19.9	SU	QA
05/10/2018 07:16	72000	SU	GD	6.3	SU	QA
05/10/2018 07:17	72000	SU	GD	6.1	SU	QA
05/10/2018 07:18	72000	SU	GD	6.1	SU	QA
05/10/2018 07:19	72000	SU	GD	6.3	SU	QA
05/10/2018 07:20	72000	SU	GD	13.5	SU	QA
05/10/2018 07:21	72000	SU	GD	13.7	SU	QA
05/10/2018 07:22	72000	SU	GD	13.7	SU	QA
05/10/2018 07:23	72000	SU	GD	13.7	SU	QA
05/10/2018 07:24	72000	SU	GD	19.7	SU	QA
05/10/2018 07:25	72000	SU	GD	20.9	SU	QA
05/10/2018 07:26	72000	SU	GD	20.9	SU	QA
05/10/2018 07:27	72000	SU	GD	20.9	SU	QA
05/10/2018 07:28	72000	SU	GD	11.6	SU	QA
05/10/2018 07:29	72000	SU	GD	6.1	SU	QA
05/10/2018 07:30	72000	SU	GD	6.1	SU	QA
05/10/2018 07:31	72000	SU	GD	6.1	SU	QA

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/10/2018 07:39   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 OIL_FLOW_EPA			CTG1 O2_P75		
	LBHR	OS	MS	PCT	OS	MS
05/10/2018 07:32	72000	SU	GD	9.9	SU	QA
05/10/2018 07:33	72000	SU	GD	13.7	SU	QA
05/10/2018 07:34	72000	SU	GD	13.7	SU	QA
05/10/2018 07:35	72000	SU	GD	13.7	SU	QA
05/10/2018 07:36	72000	SU	GD	16.6	SU	QA
05/10/2018 07:37	72000	SU	GD	20.9	SU	QA
05/10/2018 07:38	72000	SU	GD	20.9	SU	QA
05/10/2018 07:39	72000	SU	GD	20.9	SU	QA
05/10/2018 07:40	72000	SU	GD	18.1	SU	MN
05/10/2018 07:41	72000	SU	GD	13.8	SU	MN
05/10/2018 07:42	72000	SU	GD	13.7	SU	MN
Average	72000					
Maximum	72000					
Minimum	72000					
Total	2808000					

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CO LO CGA

	CTG1 CO_LOW			CTG2 GEN_GT		
	PPMD	OS	MS	MW	OS	MS
05/08/2018 09:47	2.1	SU	QA	189	SU	GD
05/08/2018 09:48	2.1	SU	QA	189	SU	GD
05/08/2018 09:49	2.0	SU	QA	190	SU	GD
05/08/2018 09:50	2.7	SU	QA	189	SU	GD
05/08/2018 09:51	5.2	SU	QA	189	SU	GD
05/08/2018 09:52	5.4	SU	QA	189	SU	GD
05/08/2018 09:53	5.4	SU	QA	190	SU	GD
05/08/2018 09:54	5.5	SU	QA	189	SU	GD
05/08/2018 09:55	8.0	SU	QA	189	SU	GD
05/08/2018 09:56	8.8	SU	QA	189	SU	GD
05/08/2018 09:57	8.8	SU	QA	189	SU	GD
05/08/2018 09:58	8.7	SU	QA	189	SU	GD
05/08/2018 09:59	8.7	SU	QA	189	SU	GD
05/08/2018 10:00	5.4	SU	QA	189	SU	GD
05/08/2018 10:01	2.1	SU	QA	189	SU	GD
05/08/2018 10:02	2.0	SU	QA	189	SU	GD
05/08/2018 10:03	2.0	SU	QA	189	SU	GD
05/08/2018 10:04	2.0	SU	QA	189	SU	GD
05/08/2018 10:05	2.1	SU	QA	189	SU	GD
05/08/2018 10:06	2.1	SU	QA	189	SU	GD
05/08/2018 10:07	2.5	SU	QA	189	SU	GD
05/08/2018 10:08	5.2	SU	QA	190	SU	GD
05/08/2018 10:09	5.4	SU	QA	190	SU	GD
05/08/2018 10:10	5.4	SU	QA	189	SU	GD
05/08/2018 10:11	5.3	SU	QA	189	SU	GD
05/08/2018 10:12	6.5	SU	QA	189	SU	GD
05/08/2018 10:13	8.6	SU	QA	189	SU	GD
05/08/2018 10:14	8.7	SU	QA	190	SU	GD
05/08/2018 10:15	8.7	SU	QA	190	SU	GD

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/08/2018 10:24   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda

Location: Middletown, NY

Source: CO LO CGA

	CTG1 CO_LOW			CTG2 GEN_GT		
	PPMD	OS	MS	MW	OS	MS
05/08/2018 10:16	8.7	SU	QA	189	SU	GD
05/08/2018 10:17	7.0	SU	QA	190	SU	GD
05/08/2018 10:18	2.4	SU	QA	190	SU	GD
05/08/2018 10:19	2.1	SU	QA	189	SU	GD
05/08/2018 10:20	2.1	SU	QA	189	SU	GD
05/08/2018 10:21	2.0	SU	QA	189	SU	GD
05/08/2018 10:22	2.6	SU	QA	189	SU	GD
05/08/2018 10:23	5.1	SU	QA	189	SU	GD
05/08/2018 10:24	5.3	SU	QA	189	SU	GD
05/08/2018 10:25	5.3	SU	QA	190	SU	GD
05/08/2018 10:26	5.3	SU	QA	189	SU	GD
05/08/2018 10:27				190	SU	GD
Average				189		
Maximum				190		
Minimum				189		
Total				7759		

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/08/2018 10:24

Data is expressed in Standard Time

Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CO HIGH CGA

	CTG1 CO_HIGH			CTG2 GEN_GT		
	PPMD	OS	MS	MW	OS	MS
05/08/2018 08:17	747.8	SU	QA	189	SU	GD
05/08/2018 08:18	757.6	SU	QA	190	SU	GD
05/08/2018 08:19	755.2	SU	QA	190	SU	GD
05/08/2018 08:20	752.3	SU	QA	190	SU	GD
05/08/2018 08:21	1403.7	SU	QA	190	SU	GD
05/08/2018 08:22	1676.0	SU	QA	190	SU	GD
05/08/2018 08:23	1679.4	SU	QA	190	SU	GD
05/08/2018 08:24	1680.8	SU	QA	190	SU	GD
05/08/2018 08:25	1681.5	SU	QA	190	SU	GD
05/08/2018 08:26	1241.0	SU	QA	190	SU	GD
05/08/2018 08:27	760.5	SU	QA	190	SU	GD
05/08/2018 08:28	759.6	SU	QA	190	SU	GD
05/08/2018 08:29	754.7	SU	QA	190	SU	GD
05/08/2018 08:30	1115.9	SU	QA	190	SU	GD
05/08/2018 08:31	1672.3	SU	QA	190	SU	GD
05/08/2018 08:32	1676.7	SU	QA	190	SU	GD
05/08/2018 08:33	1678.0	SU	QA	190	SU	GD
05/08/2018 08:34	1677.3	SU	QA	189	SU	GD
05/08/2018 08:35	1649.3	SU	QA	189	SU	GD
05/08/2018 08:36	873.2	SU	QA	189	SU	GD
05/08/2018 08:37	758.0	SU	QA	189	SU	GD
05/08/2018 08:38	758.6	SU	QA	189	SU	GD
05/08/2018 08:39	758.6	SU	QA	189	SU	GD
05/08/2018 08:40	1431.2	SU	QA	188	SU	GD
05/08/2018 08:41	1678.5	SU	QA	188	SU	GD
05/08/2018 08:42	1678.9	SU	QA	188	SU	GD
05/08/2018 08:43	1677.1	SU	QA	188	SU	GD
05/08/2018 08:44	508.9	SU	MN	189	SU	GD
05/08/2018 08:45				189	SU	GD

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/08/2018 08:42   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CO HIGH CGA

Average	189
Maximum	190
Minimum	188
Total	5493

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/08/2018 08:42

Data is expressed in Standard Time

4.3 Cycle/Response Time Data

The following pages contain DAHS printouts and supporting documentation for the cycle/response time checks performed on the gas analyzers. All test results are in accordance with the methods outlined in 40 CFR 75 Appendix A, section 6.4 and 40 CFR 60, Appendix B, PS-4A (as applicable).

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Cycle Time - NOx Low Range

Pass

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**645**
Measurement Span (ppm):	**10**
Zero Calibration Gas (ppm):	0.00
Span Calibration Gas (ppm):	**8.17**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
81.70	OK	CC192317	09/27/20	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response at 95% Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	4.20	10:39	0.00	0.21	0.00	10:41	0:02:00
Upscale (Stack gas to span gas)	4.20	10:48	8.10	7.91	8.10	10:50	0:02:00

Maximum Response Time 0:02:00

Cycle Time - NOx High Range

Pass

Measurement Span (ppm):	**100**
Zero Calibration Gas (ppm):	0.00
Span Calibration Gas (ppm):	**89.52**
Test Date:	**05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
89.52	OK	CC329952	04/06/19	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	43.90	9:12	0.10	2.29	0.20	9:15	0:03:00
Upscale (Stack gas to span gas)	42.80	9:22	87.60	85.36	87.60	9:24	0:02:00

Maximum Response Time 0:03:00
Analyzer Response (max value from low and high range) 0:03:00

Notes:

Pass/fail criteria = 15 minutes or less
(40 CFR 75, Appendix A, Section 3.5)

Downscale: Stable flue gas point "down to" stable zero cal gas point.
Upscale: Stable flue gas point "up to" stable span cal gas point

Stablized response value = reading with a change < 2% of span value for 2 minutes, or a reading with a change < 6% of the measured average concentration over 6 minutes. Or, reading is considered stable if it changes by no more than 0.5 ppm, or 0.2% CO2/O2 for two minutes.

Collect1-minute data from the DAHS and cal gas certs. Send minute data, cal gas certs and spreadsheet to office.

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by:	Justin Saporito
Company:	Cemtek KVB-Enertec
Project #	CN50478

Cycle Time - O2

Manufacturer:	**TAPI**
Model:	**T200M**
Serial Number:	**645**
Measurement Span (ppm):	**25**
Zero Calibration Gas (ppm):	**0.00**
Span Calibration Gas (ppm):	**20.93**
Test Date:	**05/08/18**

Pass

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
83.72	OK	EB0095428	9/17/2025	OK

	Step 1. Monitor Response at Stack Gas (start point)	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Downscale (Stack gas to zero gas)	13.70	18:11	0.00	0.69	0.00	18:14	0:03:00
Upscale (Stack gas to span gas)	13.90	18:18	20.90	20.55	20.90	18:21	0:03:00

Maximum Response Time 0:03:00

Notes:

Pass/fail criteria = 15 minutes or less
(40 CFR 75, Appendix A, Section 3.5)

Downscale: Stable flue gas point "down to" stable zero cal gas point
Upscale: Stable flue gas point "up to" stable span cal gas point

Stablized response value = reading with a change < 2% of span value for 2 minutes, or a reading with a change < 6% of the measured average concentration over 6 minutes. Or, reading is considered stable if it changes by no more than 0.5 ppm, or 0.2% CO2/O2 for two minutes.

Collect1-minute data from the DAHS and cal gas certs. Send minute data, cal gas certs and spreadsheet to office.

Siemens
CPV Valley Energy Center
CTG 1
Middletown, NY

Tested by: Justin Saporito
Company: Cemtek KVB-Enertec
Project # CN50478

Cycle Time - CO Low Range

40 CFR 60, PS-4A

Manufacturer: **TAPI**
Model: **T300M**
Serial Number: **355**
Measurement Span (ppm): **10**
Zero Calibration Gas (ppm): **0.00**
Span Calibration Gas (ppm): **8.78**
Test Date: **05/08/18**

Pass

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
87.80	OK	CC192317	09/26/20	OK

	Step 1. Monitor Response at start point	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Zero to Span Cal Gas 1 (upscale)	0.00	11:27:00	8.70	8.27	8.60	11:29:00	0:02:00
Span to Zero Cal Gas 1 (downscale)	8.70	11:30:00	0.00	0.44	0.00	11:33:00	0:03:00
Zero to Span Cal Gas 2 (upscale)	0.00	11:33:00	8.70	8.27	8.40	11:35:00	0:02:00
Span to Zero Cal Gas 2 (downscale)	8.70	11:36:00	0.00	0.44	0.00	11:39:00	0:03:00
Zero to Span Cal Gas 3 (upscale)	0.20	11:40:00	8.70	8.28	8.70	11:42:00	0:02:00
Span to Zero Cal Gas 3 (downscale)	8.70	11:44:00	0.00	0.44	0.20	11:46:00	0:02:00

Average of Zero Gas Runs	0:02:00
Average of High Gas Runs	0:02:40
Longest Response Time	0:02:40

Cycle Time - CO High Range

40 CFR 60, PS-4A

Pass

Measurement Span (ppm): **3000**
Zero Calibration Gas (ppm): **0.00**
Span Calibration Gas (ppm): **2635.00**
Test Date: **05/08/18**

% of Span	% Span Status	Bottle #	Exp. Date	Date Check
87.83	OK	EB0095428	09/19/25	OK

	Step 1. Monitor Response at start point	*Step 2. DAHS Time @ Step 1*	*Step 3. Monitor Response to Cal Gas Injection (end point)*	*Step 4. 95% of Step Change (calculated)*	*Step 5. Monitor Response Value at Step Change (from 1-min data)*	*Step 6. DAHS Time @ Step 5*	*Step 7. Cycle Time (calculated)*
Zero to Span Cal Gas 1 (upscale)	0.00	8:49:00	2638.00	2506.10	2637.50	8:51:00	0:02:00
Span to Zero Cal Gas 1 (downscale)	2636.50	8:53:00	0.40	132.21	1.10	8:55:00	0:02:00
Zero to Span Cal Gas 2 (upscale)	0.40	8:56:00	2633.70	2502.04	2630.50	8:58:00	0:02:00
Span to Zero Cal Gas 2 (downscale)	2633.70	8:59:00	0.00	131.69	7.00	9:01:00	0:02:00
Zero to Span Cal Gas 3 (upscale)	0.40	9:04:00	2634.40	2502.70	2608.70	9:06:00	0:02:00
Span to Zero Cal Gas 3 (downscale)	2636.70	9:15:00	0.00	131.84	1.80	9:17:00	0:02:00

Average of Zero Gas Runs	0:02:00
Average of High Gas Runs	0:02:00
Longest Response Time	0:02:00
Analyzer Response Time	**0:02:40**

Notes:
Analyzer response time pass/fail criteria = 240 seconds (4 minutes or less (40 CFR 60, PS-4A per eCFR))
The longest average from the two ranges is reported as the analyzer response time.
Performed as a remote (at the probe) cal gas injection.
Collect 1-minute data

Test sequence:
Zero cal gas "up to" span cal gas (upscale)
Span cal gas "down to" zero cal gas (downscale)
3 upscale runs and 3 downscale runs

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: NOX L LIN

	CTG2 GEN_GT				CTG1 NOX_LOW_P75		
	MW	OS	MS		PPMD	OS	MS
05/08/2018 10:35	190	SU	GD		4.3	SU	MN
05/08/2018 10:36	190	SU	GD		4.3	SU	MN
05/08/2018 10:37	190	SU	GD		4.2	SU	MN
05/08/2018 10:38	190	SU	GD		4.2	SU	MN
05/08/2018 10:39	189	SU	GD	start	4.2	SU	QA
05/08/2018 10:40	189	SU	GD		0.4	SU	QA
05/08/2018 10:41	189	SU	GD	95% -	0.0	SU	QA
05/08/2018 10:42	189	SU	GD		0.0	SU	QA
05/08/2018 10:43	189	SU	GD		0.0	SU	QA
05/08/2018 10:44	189	SU	GD		0.0	SU	QA
05/08/2018 10:45	189	SU	GD		0.0	SU	QA
05/08/2018 10:46	189	SU	GD		3.8	SU	MN
05/08/2018 10:47	189	SU	GD		4.2	SU	MN
05/08/2018 10:48	189	SU	GD	start	4.2	SU	QA
05/08/2018 10:49	189	SU	GD		4.3	SU	QA
05/08/2018 10:50	189	SU	GD	95% -	8.1	SU	QA
05/08/2018 10:51	189	SU	GD		8.1	SU	QA
05/08/2018 10:52	189	SU	GD		8.0	SU	QA
05/08/2018 10:53	190	SU	GD		8.0	SU	MN
05/08/2018 10:54	190	SU	GD		5.1	SU	MN
05/08/2018 10:55	190	SU	GD		4.2	SU	MN
05/08/2018 10:56	190	SU	GD		4.2	SU	GD
05/08/2018 10:57	190	SU	GD		4.1	SU	GD
05/08/2018 10:58	189	SU	GD		4.0	SU	GD
05/08/2018 10:59	190	SU	GD		4.0	SU	GD
Average	189				4.1		
Maximum	190				4.2		

OS - Operating Status:

SU - startup mode, SD - shutdown mode, ON - normal operation, OFF - off-line, CF - changing fuels, CM - control equipment malfunction, CP - clean process equipment, CC - clean control equipment, MD - unknown operating status

MS - General Monitor Status:

GD - good data, GO - monitor over range, QA - quality assurance activity, MN - maintenance activity, IV - invalid

Report generated on: 05/08/2018 11:15 | Data is expressed in Standard Time | Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: NOX- RESPONSE

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA		
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS
05/09/2018 09:10	0	SU	GD	44.2	SU	GD	63000	SU	GD
05/09/2018 09:11	0	SU	GD	44.3	SU	GD	63000	SU	GD
05/09/2018 09:12	0	SU	GD	43.9	SU	GD	64000	SU	GD
05/09/2018 09:13	0	SU	GD	43.1	SU	QA	64000	SU	GD
05/09/2018 09:14	0	SU	GD	35.8	SU	QA	64000	SU	GD
05/09/2018 09:15	0	SU	GD	95% 0.2	SU	QA	64000	SU	GD
05/09/2018 09:16	0	SU	GD	0.1	SU	QA	64000	SU	GD
05/09/2018 09:17	0	SU	GD	0.1	SU	QA	64000	SU	GD
05/09/2018 09:18	0	SU	GD	0.1	SU	QA	64000	SU	GD
05/09/2018 09:19	0	SU	GD	3.6	SU	MN	64000	SU	GD
05/09/2018 09:20	0	SU	GD	42.8	SU	MN	64000	SU	GD
05/09/2018 09:21	0	SU	GD	Start 42.6	SU	MN	64000	SU	GD
05/09/2018 09:22	0	SU	GD	42.8	SU	QA	65000	SU	GD
05/09/2018 09:23	0	SU	GD	50.7	SU	QA	68000	SU	GD
05/09/2018 09:24	0	SU	GD	95% 87.6	SU	QA	69000	SU	GD
05/09/2018 09:25	0	SU	GD	87.7	SU	QA	71000	SU	GD
Average	0			44.1			64938		
Maximum	0			44.3			71000		
Minimum	0			43.9			63000		
Total	0			132.4			1039000		

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

CTG1 CO_LOW

	PPMD	OS	MS	
05/10/2018 11:20	10.0	OFF	MN	
05/10/2018 11:21	10.0	OFF	MN	
05/10/2018 11:22	9.6	OFF	MN	
05/10/2018 11:23	9.2	OFF	MN	
05/10/2018 11:24	8.5	OFF	QA	
05/10/2018 11:25	2.5	OFF	QA	
05/10/2018 11:26	0.0	OFF	QA	
05/10/2018 11:27	0.0	OFF	QA	START
05/10/2018 11:28	3.0	OFF	QA	
05/10/2018 11:29	8.6	OFF	QA	- 95%
05/10/2018 11:30	8.7	OFF	QA	START
05/10/2018 11:31	6.9	OFF	QA	
05/10/2018 11:32	0.5	OFF	QA	
05/10/2018 11:33	0.0	OFF	QA	- 95% START
05/10/2018 11:34	2.0	OFF	QA	
05/10/2018 11:35	8.4	OFF	QA	- 95%
05/10/2018 11:36	8.7	OFF	QA	
05/10/2018 11:37	7.8	OFF	QA	
05/10/2018 11:38	1.2	OFF	QA	
05/10/2018 11:39	0.0	OFF	QA	- 95%
05/10/2018 11:40	0.2	OFF	QA	
05/10/2018 11:41	6.4	OFF	QA	START
05/10/2018 11:42	8.7	OFF	QA	95%
05/10/2018 11:43	8.7	OFF	QA	
05/10/2018 11:44	8.7	OFF	QA	=
05/10/2018 11:45	6.0	OFF	QA	
05/10/2018 11:46	0.2	OFF	QA	
05/10/2018 11:47	0.0	OFF	QA	
05/10/2018 11:48	0.1	OFF	QA	

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 CO_LOW		
	PPMD	OS	MS
05/10/2018 11:49	6.1	OFF	QA
05/10/2018 11:50	8.7	OFF	QA
05/10/2018 11:51	8.7	OFF	QA
05/10/2018 11:52	8.6	OFF	QA
05/10/2018 11:53	8.6	OFF	QA
05/10/2018 11:54	3.3	OFF	QA
05/10/2018 11:55	0.0	OFF	QA
05/10/2018 11:56	0.0	OFF	QA
05/10/2018 11:57	0.0	OFF	QA
05/10/2018 11:58	5.2	OFF	QA
05/10/2018 11:59	8.6	OFF	QA
05/10/2018 12:00	8.6	OFF	QA
05/10/2018 12:01	8.4	OFF	MN
Average			
Maximum			
Minimum			
Total			

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CO HIGH RESPONSE

		CTG1 CO_HIGH			CTG2 GEN_GT		
		PPMD	OS	MS	MW	OS	MS
05/08/2018 08:41		1678.5	SU	QA	188	SU	GD
05/08/2018 08:42		1678.9	SU	QA	188	SU	GD
05/08/2018 08:43		1677.1	SU	QA	188	SU	GD
05/08/2018 08:44		508.9	SU	MN	189	SU	GD
05/08/2018 08:45		1.2	SU	MN	189	SU	GD
05/08/2018 08:46		-0.3	SU	MN	189	SU	GD
05/08/2018 08:47		-0.5	SU	MN	189	SU	GD
05/08/2018 08:48		0.1	SU	MN	188	SU	GD
05/08/2018 08:49	Start	0.0	SU	QA	188	SU	GD
05/08/2018 08:50		1898.5	SU	QA	188	SU	GD
05/08/2018 08:51	95%	2637.5	SU	QA	188	SU	GD
05/08/2018 08:52		2638.0	SU	QA	189	SU	GD
05/08/2018 08:53		2636.5	SU	QA	189	SU	GD
05/08/2018 08:54		633.8	SU	QA	189	SU	GD
05/08/2018 08:55	95%	-1.1	SU	QA	189	SU	GD
05/08/2018 08:56		0.4	SU	QA	188	SU	GD
05/08/2018 08:57		1843.6	SU	QA	188	SU	GD
05/08/2018 08:58	95%	2630.5	SU	QA	188	SU	GD
05/08/2018 08:59		2633.7	SU	QA	188	SU	GD
05/08/2018 09:00		1214.7	SU	QA	188	SU	GD
05/08/2018 09:01	95%	7.0	SU	QA	189	SU	GD
05/08/2018 09:02		-0.4	SU	QA	189	SU	GD
05/08/2018 09:03		0.0	SU	QA	190	SU	GD
05/08/2018 09:04		0.4	SU	QA	190	SU	GD
05/08/2018 09:05	95%	825.2	SU	QA	190	SU	GD
05/08/2018 09:06		2608.7	SU	QA	190	SU	GD
05/08/2018 09:07		2634.4	SU	QA	190	SU	GD
05/08/2018 09:08		2089.0	SU	QA	190	SU	GD
05/08/2018 09:09		86.5	SU	QA	190	SU	GD

OS - Operating Status:
SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:
GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Report generated on: 05/08/2018 09:19   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CO HIGH RESPONSE

	CTG1 CO_HIGH			CTG2 GEN_GT		
	PPMD	OS	MS	MW	OS	MS
05/08/2018 09:10	0.4	SU	QA	190	SU	GD
05/08/2018 09:11	393.6	SU	QA	190	SU	GD
05/08/2018 09:12	2518.0	SU	QA	190	SU	GD
05/08/2018 09:13	2632.1	SU	QA	190	SU	GD
05/08/2018 09:14	2635.3	SU	QA	190	SU	GD
05/08/2018 09:15	~~2636.7~~	SU	QA	190	SU	GD
05/08/2018 09:16	661.6	SU	QA	190	SU	GD
05/08/2018 09:17	1.8	SU	QA	190	SU	GD
05/08/2018 09:18	0.0	SU	QA	190	SU	GD
05/08/2018 09:19	1079.8	SU	QA	190	SU	GD
05/08/2018 09:20	2620.5	SU	QA	190	SU	GD
05/08/2018 09:21	2634.3	SU	QA	190	SU	GD
05/08/2018 09:22	2634.7	SU	QA	190	SU	GD
Average				189		
Maximum				190		
Minimum				188		
Total				7946		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 OIL_FLOW_EPA				CTG1 O2_P75		
	LBHR	OS	MS		PCT	OS	MS
05/09/2018 18:08	93000	SU	GD		13.7	SU	GD
05/09/2018 18:09	92000	SU	GD		13.7	SU	GD
05/09/2018 18:10	92000	SU	GD		13.7	SU	GD
05/09/2018 18:11	90000	SU	GD		13.7	SU	QA
05/09/2018 18:12	84000	SU	GD		0.9	SU	QA
05/09/2018 18:13	78000	SU	GD	95%	0.0	SU	QA
05/09/2018 18:14	74000	SU	GD		0.0	SU	QA
05/09/2018 18:15	71000	SU	GD		0.0	SU	QA
05/09/2018 18:16	68000	SU	GD		1.1	SU	MN
05/09/2018 18:17	64000	SU	GD		13.7	SU	MN
05/09/2018 18:18	59000	SU	GD		13.9	SU	MN
05/09/2018 18:19	56000	SU	GD		14.2	SU	QA
05/09/2018 18:20	53000	SU	GD	95%	18.4	SU	QA
05/09/2018 18:21	49000	SU	GD		20.9	SU	QA
05/09/2018 18:22	44000	SU	GD		20.9	SU	QA
05/09/2018 18:23	40000	SU	GD		18.2	SU	MN
05/09/2018 18:24	37000	SU	GD		15.2	SU	MN
05/09/2018 18:25	36000	SU	GD		15.4	SU	MN
05/09/2018 18:26	31000	SU	GD		15.7	SU	GD
Average	63737				14.2		
Maximum	93000				15.7		
Minimum	31000				13.7		
Total	1211000				56.8		

OS - Operating Status:
SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:
GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/09/2018 18:23 | Data is expressed in Standard Time | Version 1.0

4.4 Calibration Gas Certificates

The following attached pages contain copies of the calibration gas certificates representing the cylinder bottles used during the test program.

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI95E15A0029	Reference Number:	82-400992455-1
Cylinder Number:	CC192317	Cylinder Volume:	146.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	660
Gas Code:	CO,CO2,NO,NOX,BALN	Certification Date:	Sep 26, 2017

Expiration Date: Sep 26, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	9.000 PPM	8.170 PPM	G1	+/- 1.2% NIST Traceable	09/19/2017, 09/26/2017
CARBON MONOXIDE	9.000 PPM	8.778 PPM	G1	+/- 0.7% NIST Traceable	09/19/2017
NITRIC OXIDE	9.000 PPM	8.036 PPM	G1	+/- 1.1% NIST Traceable	09/19/2017, 09/26/2017
CARBON DIOXIDE	4.000 %	4.076 %	G1	+/- 0.5% NIST Traceable	09/19/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060728	CC437497	10.08 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%	Jun 28, 2018
NTRM	16060728	CC437497-NOX	10.08 PPM NOx/NITROGEN	+/- 1.0%	Jun 28, 2018
NTRM	10060122	CC281392	5.027 % CARBON DIOXIDE/NITROGEN	+/- 0.4%	Oct 02, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Aug 31, 2017
Thermo 48i-TLE-CO-1133350708	NDIR	Aug 25, 2017
Thermo 42i-LS-NO-1123749326	Chemiluminescence	Sep 22, 2017
Thermo 42i-LS-NOx-1123749326	Chemiluminescence	Sep 22, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI95E15A0019	Reference Number:	82-401041129-1
Cylinder Number:	CC329952	Cylinder Volume:	146.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	660
Gas Code:	CO2,NO,NOX,BALN	Certification Date:	Nov 17, 2017

Expiration Date: Nov 17, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	90.00 PPM	89.52 PPM	G1	+/- 1.0% NIST Traceable	11/10/2017, 11/17/2017
NITRIC OXIDE	90.00 PPM	89.05 PPM	G1	+/- 1.0% NIST Traceable	11/10/2017, 11/17/2017
CARBON DIOXIDE	4.000 %	4.009 %	G1	+/- 1.0% NIST Traceable	11/10/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13010402	KAL003271	97.6 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	May 09, 2019
PRM	12367	APEX1099237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
GMIS	0315201604	CC503358	4.975 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%	Mar 15, 2019
NTRMplus	10060137	CC307784	5.027 % CARBON DIOXIDE/NITROGEN	+/- 0.4%	Dec 02, 2021

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO2	FTIR	Nov 06, 2017
Nicolet 6700 APW1100391 NO	FTIR	Oct 27, 2017
Nicolet 6700 APW1100391 NO2	FTIR	Oct 30, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E04NI69E15A0002	Reference Number:	82-400992440-1
Cylinder Number:	EB0095428	Cylinder Volume:	151.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO,CO2,O2,BALN	Certification Date:	Sep 19, 2017

Expiration Date: Sep 19, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	2700 PPM	2635 PPM	G1	+/- 1.0% NIST Traceable	09/19/2017
CARBON DIOXIDE	9.000 %	8.824 %	G1	+/- 0.7% NIST Traceable	09/19/2017
OXYGEN	21.00 %	20.93 %	G1	+/- 0.5% NIST Traceable	09/19/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12060724	CC356171	2498 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Dec 21, 2017
NTRM	13060408	CC412683	7.489 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 14, 2019
NTRM	09061415	CC273526	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Aug 31, 2017
Siemens Ultramat 6 J3-599 COHIGH	NDIR	Sep 15, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Aug 31, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

10- NOX-L

RED BALL TECHNICAL GAS SERVICES

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0072315	Certification Date:	07/05/2017
Product ID Number:	124743	Expiration Date:	07/04/2020
Cylinder Pressure:	1900 PSIG	MFG Facility:	RBTGS-Shreveport-LA
COA #:	EB0072315.20170613-0	Lot Number:	EB0072315.20170613
Customer PO. NO.:		Tracking Number:	084246967
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	2.67 PPM	±0.02 PPM	FTIR	06/30/2017
Nitric Oxide	2.4208 PPM	±0.0009 PPM	Chemiluminescence	06/19/2017, 06/28/2017, 07/05/2017
Total Oxides of Nitrogen	2.5177 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0003154	EB0003154.20160721	01/11/2025	GMS	N2	CO	12.16 PPM	1.033	091002
EB0005492	EB0005492.20160721	01/10/2025	GMS	N2	CO	13.83 PPM	1.014	091002
EB0052431	EB0052431.20151012	01/21/2019	GMS	N2	NO	5.799 PPM	1.012	2628a
[illegible]	[illegible]	[illegible]	[illegible]	N2	NO	[illegible]	[illegible]	[illegible]

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	06/12/2017
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017145457	06/05/2017

Red Ball Technical Gas Service
PGVP Vendor ID # G12017
Information and Ordering
800-551-8150
Fax (318-425-6309)

ILAC-MRA

PJLA Calibration and Testing
Accreditation #62754

Nate Fielder

Nate Fielder
Analyst

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

CO-NOX L

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0101725	Certification Date:	12/04/2017
Product ID Number:	124744	Expiration Date:	12/03/2020
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0101725.20171114-0	Lot Number:	EB0101725.20171114
Customer PO. NO.:		Tracking Number:	095707020
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	5.66 PPM	±0.07 PPM	FTIR	11/24/2017
Nitric Oxide	5.09 PPM	±0.06 PPM	Chemiluminescence	11/20/2017, 11/27/2017, 12/04/2017
Total Oxides of Nitrogen	5.19 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
ALM034813	ALM034813.20160913	09/01/2020	GMIS	N2	NO	15.5 PPM	1.079	12100115
EB0003194	EB0003194.20160721	01/11/2025	GMIS	N2	CO	12.16 PPM	1.033	091002
EB0052431	EB0052431.20151012g	01/21/2019	GMIS	N2	NO	5.799 PPM	1.012	2622a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	11/20/2017
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/24/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Anthony Cyr
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-L, Revised on 2017-09-07

Red Ball Technical Gas Service NOx-H
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0073000	Certification Date:	03/19/2018
Product ID Number:	125416	Expiration Date:	03/18/2021
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0073000.20180228-0	Lot Number:	EB0073000.20180228
Customer PO. NO.:		Tracking Number:	084247373
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	24.7 PPM	±0.14 PPM	FTIR	03/06/2018
Nitric Oxide	24.6 PPM	±0.3 PPM	Chemiluminescence	03/05/2018, 03/12/2018, 03/19/2018
Total Oxides of Nitrogen	24.7 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC-349582	12100115CC-349582	07/22/2019	NTRM	N2	NO	95.2 PPM	1.05	12100115
ALM022135	ALM022135.20160913	02/07/2021	GMIS	N2	NO	15.2 PPM	1.103	12100115
CC349576	CC349576.20170821	12/03/2025	GMIS	N2	NO	294 PPM	0.451	2735
EB0026633	EB0026633.20160718	01/19/2025	GMIS	N2	NO	90.67 PPM	1.054	12100115
EB0055450	EB0055450.20140403-0	12/21/2020	GMIS	N2	NO	32.02 PPM	1.058	12100115
EB0087668	EB0087668.20160721	10/30/2025	GMIS	N2	CO	202.6 PPM	0.395	1681B
EB0087736	EB0087736.20160721	10/30/2025	GMIS	N2	CO	202.6 PPM	0.395	1681B

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	02/08/2018
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	02/14/2018
NO	Chemiluminescence	Thermo	42i-HL	1162380008	02/13/2018
NO	Chemiluminescence	Thermo	42i-HL	1162380008	03/16/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

NOX-H

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0147	Reference Number:	122-401038758-1
Cylinder Number:	CC 503502	Cylinder Volume:	144.3 Cubic Feet
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22017	Valve Outlet:	660
Gas Code:	NO,NOX,BALN	Certification Date:	Nov 01, 2017

Expiration Date: **Nov 01, 2025**

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.89 PPM	G1	+/- 1.3% NIST Traceable	10/24/2017, 11/01/2017
NITRIC OXIDE	50.00 PPM	50.65 PPM	G1	+/- 1.1% NIST Traceable	10/24/2017, 11/01/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060610	CC442567	50.42 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Jun 27, 2020
PRM	12367	APEX1099237	10.00 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	May 29, 2018
NTRM	16060655	CC465081	50.42 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Jun 27, 2020
GMIS	1114201603	CC506722	4.965 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 NO	FTIR	Oct 26, 2017
Nicolet 6700 AHR0801549 NO	FTIR	Oct 26, 2017

Triad Data Available Upon Request

Approved for Release

HiQ® Certificate / Certificat HiQ®

LINDE CANADA LIMITED
530 Watson St. East
Whitby, ON, Canada L1N 5R9

02

CERTIFICATE OF ANALYSIS — EPA PROTOCOL MIXTURE

Purchase order # 110585036
Lot # 1263941
Cylinder Number: EB 0049201

PGVP ID # L12013
Procedure: G1
Gas Type Code: OC2
Cylinder pressure: 2000 psig

Certification date
August 12, 2013

Expiration Date
August 13, 2021

ANALYTICAL RESULTS

Component	Requested Concentration ± blending tolerance	Date of Assay	Mean Concentration	Certified Concentration Uncertainty expressed at 95% confidence
Carbon Dioxide	5 % ± 5%	August 12, 2013	5.07 %	5.07 ± 0.02 %
Oxygen	6 % ± 5%	August 9, 2013	6.36 %	6.36 ± 0.01 %

BALANCE GAS: Nitrogen

REFERENCE STANDARDS

Component	Type	Serial Number	Reference Number	Concentration	Expiration Date
Carbon Dioxide	GMIS NTRM	SX 21992 SG 9916842	1187915 101001	10 ± 0.02 % 19.98 ± 0.14 %	August 20, 2013 April 15, 2016
Oxygen	GMIS NTRM	SX 31579 CC 237234	1107503 071001	9.975 ± 0.06 % 24.12 ± 0.12 %	August 18, 2013 March 27, 2017

CERTIFICATION INSTRUMENTS

Component	Make/Model	Measurement Principle	Serial Number	Last Calibration
Carbon Dioxide	SICK MCS 100E	Infrared Photometer	04310670	August 1, 2013
Oxygen	Servomex 04100 C1	Paramagnetic Sensor	392350	August 9, 2013

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE 2012 EPA PROTOCOL PROCEDURE

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

Analyst: Keith Cybulski Signature Date 08/12/13

Notes:

RED BALL TECHNICAL GAS SERVICES

ilac-MRA

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

O2

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0060674	Certification Date:	04/06/2018
Product ID Number:	126054	Expiration Date:	04/04/2026
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0060674.20180402-0	Lot Number:	EB0060674.20180402
Customer PO. NO.:		Tracking Number:	082989800
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Oxygen	13.82 %	±0.07 %	MPA	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0019964	EB0019964.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0032313	EB0032313.20170112	05/22/2025	GMIS	N2	O2	9.34 %	0.235	2658a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410I	1162980025	03/26/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Analyst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

CO-H

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0040994	Certification Date:	04/06/2018
Product ID Number:	127179	Expiration Date:	04/04/2026
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0040994.20180402-0	Lot Number:	EB0040994.20180402
Customer PO. NO.:		Tracking Number:	065159615
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	753 PPM	±6 PPM	FTIR	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0016838	EB0016838.20161027	03/17/2026	GMIS	N2	CO	2310 PPM	0.50	2640a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	04/05/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder
Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

CO-H

RED BALL TECHNICAL GAS SERVICES

ilac-MRA

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0072144	Certification Date	04/06/2018
Product ID Number:	127180	Expiration Date:	04/04/2026
Cylinder Pressure:	1900 PSIG	MFG Facility:	- Shreveport - LA
COA #	EB0072144.20180402-0	Lot Number:	EB0072144.20180402
Customer PO. NO.:		Tracking Number:	084214278
Customer:		Previous Certification Dates:	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	1670 PPM	±17 PPM	FTIR	04/06/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0003650	EB0003650.20161027	03/17/2026	GMIS	N2	CO	1514 PPM	0.568	2640A

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	04/06/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CEM-CAL ZERO

Part Number:	NI CZ15A	Reference Number:	82-400984857-1
Cylinder Number:	CC307646	Cylinder Volume:	142.0 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2000 PSIG
Analysis Date:	Aug 22, 2017	Valve Outlet:	580
Lot Number:	82-400984857-1		

Expiration Date: Aug 22, 2025

ANALYTICAL RESULTS

Component		Requested Purity		Certified Concentration
NITROGEN		99.9995 %		99.9995 %
CARBON DIOXIDE	<	1.0 PPM	<LDL	0.06 PPM
NOx	<	0.1 PPM	<LDL	0.02 PPM
SO2	<	0.1 PPM	<LDL	0.10 PPM
THC	<	0.1 PPM	<LDL	0.02 PPM
CARBON MONOXIDE	<	0.5 PPM		0.160 PPM

Permanent Notes: Airgas certifies that the contents of this cylinder meet the requirements of 40 CFR 72.2

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Signature on file

Approved for Release

5 Relative Accuracy Test Audit

The full RATA report, provided by Air Hygiene Inc., is attached.

AIR HYGIENE, INC.

Testing Solutions for a Better World

RELATIVE ACCURACY TEST AUDIT
FOR THE
SIEMENS, SCC6-5000F, UNIT #1 CEMS
PREPARED FOR
CPV VALLEY LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
MAY 8-9, 2018

Corporate Headquarters
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012

AIR HYGIENE, INC.

(918) 307-8865 or (888) 461-8778
www.airhygiene.com

Remote Testing Offices
Las Vegas, NV 89156
Ft. Worth, TX 76028
Humble, TX 77338
Shreveport, LA 71115
Miami, FL 33101
Pittsburgh, PA 15205

RELATIVE ACCURACY TEST AUDIT
FOR THE
SIEMENS, SCC6-5000F, UNIT #1 CEMS
PREPARED FOR
CPV VALLEY LLC
AT THE
CPV VALLEY ENERGY CENTER
MIDDLETOWN, NEW YORK
MAY 8-9, 2018

Prepared and Reviewed by:

Michael Whisenhunt, QSTI
Sr. Project Manager

Logan Tsotsoros
AHU Support Staff

I, ______________________
Michael Stockwell, QSTI
Sr. Project Manager

certify that this testing was conducted and this report was created in conformance with the requirements of ASTM D7036

(this page intentionally left blank)

Table of Contents

APPENDICES

Relative Accuracy Test Audit
Siemens, SCC6-5000F, Unit #1 CEMS
CPV VALLEY LLC
CPV VALLEY ENERGY CENTER
Middletown, New York
May 8-9, 2018

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the Relative Accuracy Test Audit (RATA) for nitrogen oxides (NOx), carbon monoxide (CO), and oxygen (O_2) from the exhaust of the Siemens, SCC6-5000F, Unit #1 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on May 8-9, 2018.

The accumulated data from the RATA provides the figures for evaluating the acceptability of the operation of the on-site continuous emission monitoring system (CEMS) for the monitoring of NOx, CO, and O_2 from the Siemens, SCC6-5000F, Unit #1 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to perform the initial certification RATA on the CEMS that serves the Siemens, SCC6-5000F, Unit #1 for CPV VALLEY LLC at the CPV VALLEY ENERGY CENTER near Middletown, New York. Reference method (RM) testing followed the Code of Federal Regulations (CFR), Title 40 (40 CFR), Part 60 (40 CFR 60), Appendix A, Methods 1, 3A, 7E, 10, and 19. RM values are compared with the on-site CEMS to document performance as required in the 40 CFR 60, Appendix B, Performance Specifications (PS) and 40 CFR 75 Appendix A and B. All relative accuracies were established on-site and were governed by the following sets of rules:

In accordance with 40 CFR 60, Appendix B, PS 2, Section 13.2, the NOx RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent when average emissions during the test are greater than 50 percent of the emission standard or alternative relative accuracy (ARA) does not exceed 10.0 percent when the average emissions during the test are less than 50 percent of the emission standard. Part 60 further requires that the unit be operating at greater than 50 percent of normal load.

In accordance with 40 CFR 75, Appendix A, Section 3.3.2(a) and (b), the NOx RATA results are acceptable if the relative accuracy (RA) does not exceed 10.0 percent or if during the RATA the average NOx emission rate is less than or equal to 0.200 lb/MMBtu and the average difference between the CEMS and reference method (RM) values does not exceed 0.020 lb/MMBtu. Passing this set of criteria requires the CEMS to be retested after no more than two operating quarters. Alternatively, in accordance with 40 CFR 75, Appendix B, Section 2.3.1.2(a) and (f), and Appendix B, Figure 2, the NOx RATA results are acceptable if the RA does not exceed 7.5 percent or if during the RATA the average NOx emission rate is less than or equal to 0.200 lb/MMBtu and the average difference between the CEMS and RM values does not exceed 0.015 lb/MMBtu. Passing this set of criteria allows the CEMS to be retested after four operating quarters or at least within eight calendar quarters.

In accordance with 40 CFR 60, Appendix B, PS 3, Section 13.2, the O_2 RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent or if the average difference between the CEMS and reference method (RM) values does not exceed plus or minus 1.0 percent of the measured value.

In accordance with 40 CFR 75, Appendix A, Section 3.3.3, the O_2 RATA results are acceptable if the relative accuracy (RA) does not exceed 10.0 percent or if during the RATA the average difference between the CEMS and reference method (RM) values does not exceed 1.0 percent. Passing this set of criteria requires the CEMS to be retested after no more than two operating quarters. Alternatively, in accordance with 40 CFR 75, Appendix B, Section 2.3.1.2(a) and (h), and Appendix B, Figure 2, the O_2 RATA results are acceptable if the RA does not exceed 7.5 percent or if during the RATA the average difference between the CEMS and RM values does not exceed 0.7 percent absolute. Passing this set of criteria allows the CEMS to be retested after four operating quarters or at least within eight calendar quarters.

In accordance with 40 CFR 60, Appendix B, PS 4 and 4A, Sections 13.2 of each, the CO relative accuracy (RA) test results are acceptable if the RA does not exceed 10.0 percent, if the average difference between the CEMS and reference method (RM) values plus the 2.5 percent confidence coefficient (2.5%CC) does not exceed 5.0 parts per million (ppm), or if the alternative relative accuracy (ARA) does not exceed 5.0 percent. Part 60 further requires that the unit be operating at greater than 50 percent of normal load.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

1.2.1 Participating Organizations
- New York State Department of Environmental Conservation (NYDEC)
- CPV VALLEY LLC
- Air Hygiene

1.2.2 Industry
- Electric Utility / Electric Services

1.2.3 Air Permit and Federal Requirements
- Permit Number: 3-3356-00136/00001
- 40 CFR 60, Appendix B, Performance Specifications (PS)
- 40 CFR 75, Appendix A
- 40 CFR 75, Appendix B

1.2.4 Plant Location
- CPV VALLEY ENERGY CENTER near Middletown, New York
  - GPS Coordinates [Latitude 41.413, Longitude -74.435]
  - Federal Registry System / Facility Registry Service (FRS) No. – 110043332471
  - Source Classification Code (SCC) – 20100201

1.2.5 Equipment Tested
- Siemens, SCC6-5000F, Unit #1
- NOx Analyzer (Teledyne API, T200M, 645)
- CO Analyzer (Teledyne API, T300M, 355)
- O_2 Analyzer (Teledyne API, T200M, 645)

1.2.6 Emission Points
- Exhaust from the Siemens, SCC6-5000F, Unit #1
- For all gases, one sample point in the exhaust duct from the Siemens, SCC6-5000F, Unit #1, determined after conducting a stratification test (refer to Appendix F)

1.2.7 Emission Parameters Measured
- NOx
- CO
- O_2

1.2.8 Dates of Emission Test
- May 8-9, 2018

1.2.9 Federal and State Certifications

- Stack Testing Accreditation Council AETB Certificate No. 3796.02
- International Standard ISO/IEC 17025:2005 Certificate No. 3796.01

1.3 KEY PERSONNEL

Siemens:	Jordan Haywood	407-736-3045
Air Hygiene:	Michael Stockwell (mstockwell@airhygiene.com)	918-307-8865
Air Hygiene:	Hunter Neal	918-307-8865
Air Hygiene:	Zach Van Ness	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on CPV VALLEY LLC's Siemens, SCC6-5000F, Unit #1 located at the CPV VALLEY ENERGY CENTER on May 8-9, 2018 are summarized in the following table and relate only to the items tested.

TABLE 2.1
SUMMARY OF SIEMENS, SCC6-5000F, UNIT #1 RATA RESULTS

Pollutant	Units	Criteria			Results	Passed / Test Frequency
		CFR	Specification / Section	Standard		
NOx	ppmvd	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 2.8%	YES / ANNUAL
NOx	ppmvd@15%O_2	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 3.3%	YES / ANNUAL
NOx	lb/hr	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 3.9%	YES / ANNUAL
NOx	lb/MMBtu	Part 75	Appendix A, Section 3.3.2(a),(b) Appendix B, Section 2.3.1.2(a),(f), Figure 2	RA ≤ 10%, or if lb/MMBtu ≤ 0.200, d ≤ ±0.020 lb/MMBtu Annual Incentive RA ≤ 7.5%, or if lb/MMBtu ≤ 0.2, d ≤ ±0.015 lb/MMBtu	RA = 5.4% RM = 0.02 lb/MMBtu d = 0.001 lb/MMBtu BAF=1.000	YES / ANNUAL
O_2	%vd	Part 75	Appendix A, Section 3.3.3 Appendix B, Section 2.3.1.2(a),(h), Figure 2	RA ≤ 10%, or d ≤ ±1.0% Annual Incentive RA ≤ 7.5%, or d ≤ ±0.7%	RA = 0.5% d = 0 %	YES / ANNUAL
CO	ppmvd	Part 60	Appendix B, Performance Specification 4, 4A, from all Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.3 ppm	YES / ANNUAL
CO	ppmvd@15%O_2	Part 60	Appendix B, Performance Specification 4, 4A, from all Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.3 ppm	YES / ANNUAL
CO	lb/hr	Part 60	Appendix B, Performance Specification 4, 4A Section 13.2	RA ≤ 10%, or d + 2.5% CC ≤ ±5 ppmv, or ARA ≤ 5%	|d|+2.5%CC = 0.3 ppm	YES / ANNUAL
Load	MW	Part 60	Appendix B, Performance Specifications	> 50% max load	177.8	WITHIN TOLERANCE
Load	MW	Part 75	Appendix A and B	normal or alternative normal load range	177.8	WITHIN TOLERANCE

Notes: RA = relative accuracy, ARA = alternative relative accuracy, RM = reference method value, d = difference between RM and CEMS value, CC = confidence coefficient, v = velocity, BAF = bias adjustment factor

The RATA passed for all pollutants (NOx, CO, and O_2) in all units (ppm, ppm@15%O_2, lb/hr, lb/MMBtu, and %) under all 40 CFR 60 and 40 CFR 75 criteria.

Specifically, NOx in units of ppm, ppm@15%O_2, and lb/hr, passed 40 CFR 60 criteria with an RA less than 20 percent. NOx in units of lb/MMBtu passed the 40 CFR 75 alternative annual incentive criteria with an emissions rate of less than 0.200 lb/MMBtu and a difference between the RM and CEMS analyzers of less than 0.015 lb/MMBtu. Also the Bias Adjustment Factor test passed with an adjustment factor equal to 1.0 (no adjustment required). O_2 in units of % passed the 40 CFR 75 annual incentive criteria with an RA less than 7.5 percent. CO in units of ppm and ppm@15%O_2 passed the 40 CFR 60 alternative criteria with a concentration difference between the RM and CEMS analyzers plus the confidence coefficient of less than 5 ppm.

Unit load was within the 40 CFR 60 required criteria of greater than 50 percent of the maximum load and also fell within the alternative normal load criteria as defined by the plants Quality Control and Monitoring Plan which defined the upper and lower boundary on the unit and the normal and alternative normal load ranges.

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

The CPV Valley Energy Center is located at 3330 U.S. Route 6 in Middletown, New York. CPV Valley Energy Center is an electric generation facility. The facility consists of two Siemens SCC6-5000F Combined Cycle Combustion Turbines (CTG), designated as CTG1 and CTG2. Each CTG is rated for the turbine at 2,234 MMBtu/hr (HHV) on natural gas; and 2,145 MMBtu/hr (HHV) on ULSD fuel oil; and is rated at 500 MMBtu/hr on natural gas for the duct burner. The CTG's are equipped with dry low NOx combustors, selective catalytic reduction (SCR), and catalytic oxidizers. The interests of this report are CTG1 and CTG2 operating while burning fuel oil (ULSD).

3.2 SAMPLING LOCATION

The CTG1 and CTG2 stacks are vertical, circular and measures 19.35 feet (ft) (232.25 inches) in diameter at the test ports which are approximately 175 ft above grade level with an exit elevation of approximately 275 ft above grade level. The test ports are located approximately 91.25 ft (1095 inches) downstream and approximately 100 ft (1200 inches) upstream from the nearest disturbances.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Siemens, SCC6-5000F, Unit #1 at the CPV VALLEY ENERGY CENTER was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on May 8-9, 2018.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Oxygen	EPA Method 3A	Paramagnetic Cell
Nitrogen Oxides	EPA Method 7E	Chemiluminescent Analyzer
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 3A, 7E, 10, and 19.

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the real-time analyzers through rotameters that controlled the flow rate of the sample.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. NOx calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds. Data records can be found in Appendix A and B of this report.

Nine test runs of approximately 21 minutes each were conducted on the Siemens, SCC6-5000F, Unit #1 at the maximum test load for NOx, CO, and O_2. The unit operation was greater than 50 percent of capacity as required by the 40 CFR 60, Performance Specifications. The unit operation was at the normal / alternative normal load as required by 40 CFR 75.

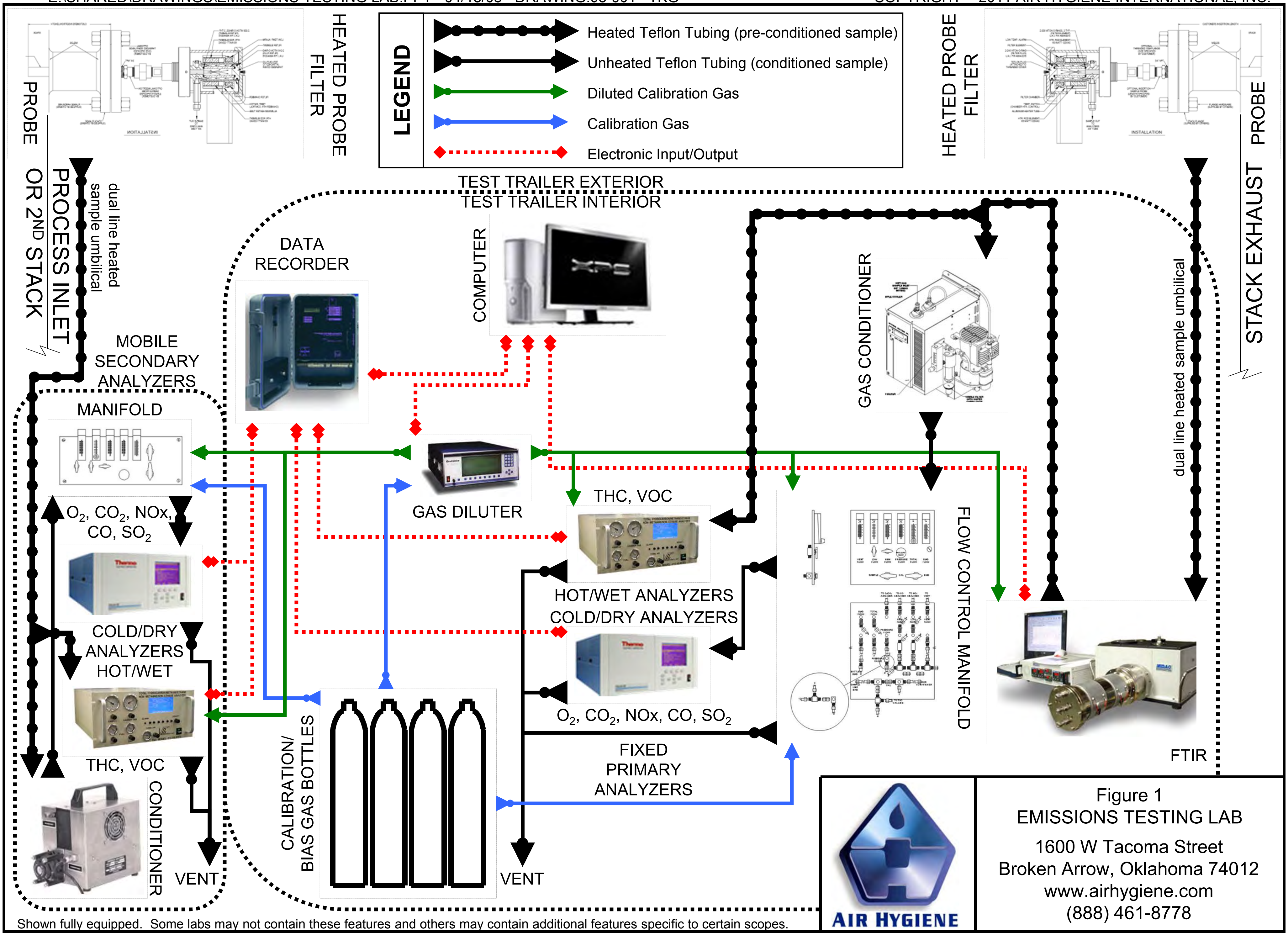
The stack gas analysis for O_2 concentrations was performed in accordance with procedures set forth in EPA Method 3A. The O_2 analyzer uses a paramagnetic cell detector.

EPA Method 7E was used to determine concentrations of NOx. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO_2 in nitrogen certified gas cylinder was used to verify at least a 90 percent NO_2 conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NOx	THERMO 42i-HL	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO_2 to NO. Chemiluminescence of reaction of NO with O_3. Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48i	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
O_2	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.



LEGEND
Heated Teflon Tubing (pre-conditioned sample)
Unheated Teflon Tubing (conditioned sample)
Diluted Calibration Gas
Calibration Gas
Electronic Input/Output
PROBE
HEATED PROBE FILTER
HEATED PROBE FILTER
PROBE
PROCESS INLET OR 2ND STACK
dual line heated sample umbilical
STACK EXHAUST
dual line heated sample umbilical
TEST TRAILER EXTERIOR
TEST TRAILER INTERIOR
DATA RECORDER
COMPUTER
GAS CONDITIONER
MOBILE SECONDARY ANALYZERS
MANIFOLD
O_2, CO_2, NOx, CO, SO_2
COLD/DRY ANALYZERS
HOT/WET
THC, VOC
CONDITIONER
VENT
GAS DILUTER
CALIBRATION/ BIAS GAS BOTTLES
THC, VOC
HOT/WET ANALYZERS
COLD/DRY ANALYZERS
O_2, CO_2, NOx, CO, SO_2
FIXED PRIMARY ANALYZERS
VENT
FLOW CONTROL MANIFOLD
FTIR
AIR HYGIENE
Figure 1
EMISSIONS TESTING LAB
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778
Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

APPENDIX A

TEST RESULTS AND CALCULATIONS

TABLE A.1:
EMISSIONS TESTING SCHEDULE

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
1	Max	Stratification Test	1	05/08/18	6:46:44	8:01:44	DAHS
1	Max	Gas RATA	1	05/09/18	12:46:23	13:06:53	DAHS
1	Max	Gas RATA	2	05/09/18	13:27:23	13:47:53	DAHS
1	Max	Gas RATA	3	05/09/18	14:03:23	14:23:53	DAHS
1	Max	Gas RATA	4	05/09/18	14:38:23	14:58:53	DAHS
1	Max	Gas RATA	5	05/09/18	15:16:29	15:36:59	DAHS
1	Max	Gas RATA	6	05/09/18	15:48:29	16:08:59	DAHS
1	Max	Gas RATA	7	05/09/18	16:23:29	16:43:59	DAHS
1	Max	Gas RATA	8	05/09/18	16:55:29	17:15:59	DAHS
1	Max	Gas RATA	9	05/09/18	17:28:29	17:48:59	DAHS

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (ppmvd)	CEMS (ppmvd)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	6.40	6.30	0.1000	0.01
2	13:27 - 13:47	YES	177.0	6.40	6.40	0.0000	0.00
3	14:03 - 14:23	YES	176.0	6.20	6.20	0.0000	0.00
4	14:38 - 14:58	YES	177.0	6.70	6.20	0.5000	0.25
5	15:16 - 15:36	YES	177.0	6.10	6.20	-0.1000	0.01
6	15:48 - 16:08	YES	177.0	6.20	6.20	0.0000	0.00
7	16:23 - 16:43	YES	179.0	6.10	6.30	-0.2000	0.04
8	16:55 - 17:15	YES	179.0	6.30	6.30	0.0000	0.00
9	17:28 - 17:48	YES	180.0	6.00	6.10	-0.1000	0.01
10		NO					
11		NO					
12		NO					
		Total	**1600.0**	**56.40**	**56.20**	**0.200000**	**0.320000**
		Average	**177.8**	**6.27**	**6.24**	**0.022222**	

Number of Runs	9
Standard Deviation	0.198606
T-value	2.306
Confidence Coefficient	0.152662

Relative Accuracy = 2.8%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (ppmvd)	CEMS (ppmvd)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	0.40	0.00	0.4000	0.16
2	13:27 - 13:47	YES	177.0	0.40	0.00	0.4000	0.16
3	14:03 - 14:23	YES	176.0	0.30	0.00	0.3000	0.09
4	14:38 - 14:58	YES	177.0	0.30	0.00	0.3000	0.09
5	15:16 - 15:36	YES	177.0	0.20	0.00	0.2000	0.04
6	15:48 - 16:08	YES	177.0	0.20	0.00	0.2000	0.04
7	16:23 - 16:43	YES	179.0	0.30	0.00	0.3000	0.09
8	16:55 - 17:15	YES	179.0	0.20	0.00	0.2000	0.04
9	17:28 - 17:48	YES	180.0	0.20	0.00	0.2000	0.04
10		NO					
11		NO					
12		NO					
		Total	**1600.0**	**2.50**	**0.00**	**2.500000**	**0.750000**
		Average	**177.8**	**0.28**	**0.00**	**0.277778**	
		Number of Runs	9				
		Standard Deviation	0.083333				
		T-value	2.306				
		Confidence Coefficient	0.064056				

Relative Accuracy =	**123.1%**
|d (difference in ppm)| + CC =	**0.3**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
O_2 RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (%vd)	CEMS (%vd)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	13.80	13.80	0.0000	0.00
2	13:27 - 13:47	YES	177.0	13.80	13.80	0.0000	0.00
3	14:03 - 14:23	YES	176.0	13.80	13.80	0.0000	0.00
4	14:38 - 14:58	YES	177.0	13.80	13.80	0.0000	0.00
5	15:16 - 15:36	YES	177.0	13.80	13.80	0.0000	0.00
6	15:48 - 16:08	YES	177.0	13.80	13.80	0.0000	0.00
7	16:23 - 16:43	YES	179.0	13.80	13.70	0.1000	0.01
8	16:55 - 17:15	YES	179.0	13.80	13.70	0.1000	0.01
9	17:28 - 17:48	YES	180.0	13.80	13.70	0.1000	0.01
10		NO					
11		NO					
12		NO					
	Total		**1600.0**	**124.20**	**123.90**	**0.300000**	**0.030000**
	Average		**177.8**	**13.80**	**13.77**	**0.033333**	

Number of Runs	9
Standard Deviation	0.050000
T-value	2.306
Confidence Coefficient	0.038433

Average Difference = 0.0
Relative Accuracy = 0.5%

Part 75, Appendix A,
3.3.3 Relative Accuracy for CO2 and O2 Monitors
The relative accuracy for CO2 and O2 monitors shall not exceed 10.0 percent. The relative accuracy test results are also acceptable if the difference between the mean value of the CO2 or O2 monitor measurements and the corresponding reference method measurement mean value, calculated using equation A-7 of this appendix, does not exceed ± 1.0 percent CO2 or O2.

Part 75, Appendix B,
2.3.1.2 Reduced RATA Frequencies
Relative accuracy test audits of primary and redundant backup SO2 pollutant concentration monitors, CO2 pollutant concentration monitors (including O2 monitors used to determine CO2 emissions), CO2 or O2 diluent monitors used to determine heat input, moisture monitoring systems, NOX concentration monitoring systems, flow monitors, NOX-diluent monitoring systems or SO2-diluent monitoring systems may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the following conditions are met for the specific monitoring system involved:
(a) The relative accuracy during the audit of an SO2 or CO2 pollutant concentration monitor (including an O2 pollutant monitor used to measure CO2 using the procedures in appendix F to this part), or of a CO2 or O2 diluent monitor used to determine heat input, or of a NOX concentration monitoring system, or of a NOX-diluent monitoring system, or of an SO2-diluent continuous emissions monitoring system is ≤ 7.5 percent;

(e) For low SO2 or NOX emitting units (average SO2 or NOX reference method concentrations ≤ 250 ppm) during the RATA, when an SO2 pollutant concentration monitor or NOX concentration monitoring system fails to achieve a relative accuracy ≤ 7.5 percent during the audit, but the monitor mean value from the RATA is within ± 12 ppm of the reference method mean value;

Figure 2 to Appendix B of Part 75_Relative Accuracy Test Frequency Incentive System.

RATA	Semiannual(percent)(1)	Annual(1)
SO2 or NOX(3)	7.5% < RA ≤ 10.0% or ± 15.0 ppm(2)	RA ≤ 7.5% or ± 12.0 ppm(2)
SO2-diluent	7.5% < RA ≤ 10.0% or ± 0.030 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.025 lb/mmBtu(2)
NOX-diluent	7.5% < RA ≤ 10.0% or ± 0.020 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.015 lb/mmBtu(2)
Flow	7.5% < RA ≤ 10.0% or ± 2.0 fps(2)	RA ≤ 7.5% or ± 1.5 fps
CO2 or O2	7.5% < RA ≤ 10.0% or ± 1.0% CO2/O2(2)	RA ≤ 7.5% or ± 0.7% CO2/O2(2)
Moisture	7.5% < RA ≤ 10.0% or ± 1.5% H2O(2)	RA ≤ 7.5% or ± 1.0% H2O(2)

(1) The deadline for the next RATA is the end of the second (if semiannual) or fourth (if annual) successive QA operating quarter following the quarter in which the CEMS was last tested. Exclude calendar quarters with fewer than 168 unit operating hours (or, for common stacks and bypass stacks, exclude quarters with fewer than 168 stack operating hours) in determining the RATA deadline. For SO2 monitors, QA operating quarters in which only very low sulfur fuel as defined in § 72.2, is combusted may also be excluded. However, the exclusion of calendar quarters is limited as follows: the deadline for the next RATA shall be no more than 8 calendar quarters after the quarter in which a RATA was last performed.
(2) The difference between monitor and reference method mean values applies to moisture monitors, CO2, and O2 monitors, low emitters, or low flow, only.
(3) A NOX concentration monitoring system used to determine NOX mass emissions under § 75.71.

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM ($ppmvd@15\%O_2$)	CEMS ($ppmvd@15\%O_2$)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	5.30	5.20	0.1000	0.01
2	13:27 - 13:47	YES	177.0	5.30	5.30	0.0000	0.00
3	14:03 - 14:23	YES	176.0	5.20	5.10	0.1000	0.01
4	14:38 - 14:58	YES	177.0	5.50	5.10	0.4000	0.16
5	15:16 - 15:36	YES	177.0	5.10	5.20	-0.1000	0.01
6	15:48 - 16:08	YES	177.0	5.20	5.10	0.1000	0.01
7	16:23 - 16:43	YES	179.0	5.10	5.20	-0.1000	0.01
8	16:55 - 17:15	YES	179.0	5.20	5.20	0.0000	0.00
9	17:28 - 17:48	YES	180.0	5.00	5.00	0.0000	0.00
10		NO					
11		NO					
12		NO					
		Total	**1600.0**	**46.90**	**46.40**	**0.500000**	**0.210000**
		Average	**177.8**	**5.21**	**5.16**	**0.055556**	

Number of Runs	9
Standard Deviation	0.150923
T-value	2.306
Confidence Coefficient	0.116010

Relative Accuracy = 3.3%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD	RM	CEMS	RM-CEMS	
			(MW)	(ppmvd@15%O_2)	(ppmvd@15%O_2)	(diff)	($diff^2$)
1	12:46 - 13:06	YES	178.0	0.40	0.00	0.4000	0.16
2	13:27 - 13:47	YES	177.0	0.30	0.00	0.3000	0.09
3	14:03 - 14:23	YES	176.0	0.20	0.00	0.2000	0.04
4	14:38 - 14:58	YES	177.0	0.20	0.00	0.2000	0.04
5	15:16 - 15:36	YES	177.0	0.10	0.00	0.1000	0.01
6	15:48 - 16:08	YES	177.0	0.10	0.00	0.1000	0.01
7	16:23 - 16:43	YES	179.0	0.20	0.00	0.2000	0.04
8	16:55 - 17:15	YES	179.0	0.20	0.00	0.2000	0.04
9	17:28 - 17:48	YES	180.0	0.20	0.00	0.2000	0.04
10		NO					
11		NO					
12		NO					
	Total		**1600.0**	**1.90**	**0.00**	**1.900000**	**0.470000**
	Average		**177.8**	**0.21**	**0.00**	**0.211111**	
	Number of Runs			9			
	Standard Deviation			0.092796			
	T-value			2.306			
	Confidence Coefficient			0.071329			

Relative Accuracy =	**133.8%**
|d (difference in ppm)| + CC =	**0.3**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (lb/hr)	CEMS (lb/hr)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	37.10	36.50	0.6000	0.36
2	13:27 - 13:47	YES	177.0	37.00	36.40	0.6000	0.36
3	14:03 - 14:23	YES	176.0	36.30	35.40	0.9000	0.81
4	14:38 - 14:58	YES	177.0	38.60	35.60	3.0000	9.00
5	15:16 - 15:36	YES	177.0	35.50	35.30	0.2000	0.04
6	15:48 - 16:08	YES	177.0	36.00	35.30	0.7000	0.49
7	16:23 - 16:43	YES	179.0	35.90	36.20	-0.3000	0.09
8	16:55 - 17:15	YES	179.0	36.80	36.30	0.5000	0.25
9	17:28 - 17:48	YES	180.0	35.40	35.20	0.2000	0.04
10		NO					
11		NO					
12		NO					
		Total	**1600.0**	**328.60**	**322.20**	**6.400000**	**11.440000**
		Average	**177.8**	**36.51**	**35.80**	**0.711111**	

Number of Runs	9
Standard Deviation	0.927961
T-value	2.306
Confidence Coefficient	0.713292

Relative Accuracy = 3.9%

Part 60, Appendix B, Performance Specification 2,
8.4.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.4.2 through 8.4.6 while the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart.
13.2 Relative Accuracy Performance Specification. The RA of the CEMS must be no greater than 20 percent when RM is used in the denominator of Eq. 2-6 (average emissions during test are greater than 50 percent of the emission standard) or 10 percent when the applicable emission standard (permit limit) is used in the denominator of Eq. 2-6 (average emissions during test are less than 50 percent of the emission standard).
Eq. 2.6 RA=([|d|+|CC|]*100)/RM

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CO RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (lb/hr)	CEMS (lb/hr)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	1.50	0.00	1.5000	2.25
2	13:27 - 13:47	YES	177.0	1.30	0.00	1.3000	1.69
3	14:03 - 14:23	YES	176.0	1.10	0.00	1.1000	1.21
4	14:38 - 14:58	YES	177.0	1.00	0.00	1.0000	1.00
5	15:16 - 15:36	YES	177.0	0.60	0.00	0.6000	0.36
6	15:48 - 16:08	YES	177.0	0.60	0.00	0.6000	0.36
7	16:23 - 16:43	YES	179.0	0.90	0.00	0.9000	0.81
8	16:55 - 17:15	YES	179.0	0.80	0.00	0.8000	0.64
9	17:28 - 17:48	YES	180.0	0.70	0.00	0.7000	0.49
10		NO					
11		NO					
12		NO					
	Total		**1600.0**	**8.50**	**0.00**	**8.500000**	**8.810000**
	Average		**177.8**	**0.94**	**0.00**	**0.944444**	

Number of Runs	9
Standard Deviation	0.312694
T-value	2.306
Confidence Coefficient	0.240358

Relative Accuracy =	**125.4%**
|d (difference in ppm)| + CC =	**0.3**

Part 60, Appendix B, Performance Specification 4,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard (permit limit) is used to calculate RA.

Part 60, Appendix B, Performance Specification 4A,
1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS that comply with low emission standards (less than 200 ppmv).
13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA, 5 percent when the applicable emission standard (permit limit) is used to calculate RA, or within 5 ppmv when the RA is calculated as the absolute average difference between the RM and CEMS plus the 2.5 percent confidence coefficient.

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
NOx RATA Data Sheet
CPV VALLEY ENERGY CENTER

RUN #	RUN TIME	USED	UNIT LOAD (MW)	RM (lb/MMBtu)	CEMS (lb/MMBtu)	RM-CEMS (diff)	RM-CEMS ($diff^2$)
1	12:46 - 13:06	YES	178.0	0.021	0.020	0.0010	0.0000
2	13:27 - 13:47	YES	177.0	0.021	0.020	0.0010	0.0000
3	14:03 - 14:23	YES	176.0	0.020	0.020	0.0000	0.0000
4	14:38 - 14:58	YES	177.0	0.022	0.020	0.0020	0.0000
5	15:16 - 15:36	YES	177.0	0.020	0.020	0.0000	0.0000
6	15:48 - 16:08	YES	177.0	0.020	0.020	0.0000	0.0000
7	16:23 - 16:43	YES	179.0	0.020	0.020	0.0000	0.0000
8	16:55 - 17:15	YES	179.0	0.020	0.020	0.0000	0.0000
9	17:28 - 17:48	YES	180.0	0.020	0.019	0.0010	0.0000
10		NO					
11		NO					
12		NO					
		Total	**1600.0**	**0.184**	**0.179**	**0.005000**	**0.000007**
		Average	**177.8**	**0.020**	**0.020**	**0.000556**	
		Number of Runs	9				
		Standard Deviation	0.000726				
		T-value	2.306				
		Confidence Coefficient	0.000558				

Relative Accuracy = 5.45%

If the mean difference is less than or equal to the absolute value of the confidence coefficient, then the Bias Test passes and the bias adjustment factor is not applicable.

Mean Difference = 0.0006
Confidence Coefficient = 0.0006

BAF = 1 + (abs. value mean difference/avg. CEMS reading)

Average CEMS Reading = 0.020
BAF = 1.000

Part 75, Appendix A,
3.3.2 Relative Accuracy for NOX-Diluent Continuous Emission Monitoring Systems
(a) The relative accuracy for NOX-diluent continuous emission monitoring systems shall not exceed 10.0 percent.
(b) For affected units where the average of the reference method measurements of NOX emission rate (this means lb/MMBtu) during the relative accuracy test audit is less than or equal to 0.200 lb/mmBtu, the difference between the mean value of the continuous emission monitoring system measurements and the reference method mean value shall not exceed ±0.020 lb/mmBtu, wherever the relative accuracy specification of 10.0 percent is not achieved.

7.6.5 Bias Adjustment

(b) For single-load RATAs of SO2 pollutant concentration monitors, NOX concentration monitoring systems, and NOX-diluent monitoring systems and for the single-load flow RATAs required or allowed under section 6.5.2 of this appendix and sections 2.3.1.3(b) and 2.3.1.3(c) of Appendix B to this part, the appropriate BAF is determined directly from the RATA results at normal load, using Equation A-12. Notwithstanding, when a NOX concentration CEMS or an SO2 CEMS or a NOX-diluent CEMS installed on a low-emitting affected unit (i.e., average SO2 or NOX concentration during the RATA ≦ 250 ppm or average NOX emission rate ≦ 0.200 lb/mmBtu) meets the normal 10.0 percent relative accuracy specification (as calculated using Equation A-10) or the alternate relative accuracy specification in section 3.3 of this appendix for low-emitters, but fails the bias test, the BAF may either be determined using Equation A-12, or a default BAF of 1.111 may be used.

Part 75, Appendix B,

2.3.1.2 Reduced RATA Frequencies. Relative accuracy test audits of primary and redundant backup SO2 pollutant concentration monitors, CO2 pollutant concentration monitors (including O2 monitors used to determine CO2 emissions), CO2 or O2 diluent monitors used to determine heat input, moisture monitoring systems, NOX concentration monitoring systems, flow monitors, NOX-diluent monitoring systems or SO2-diluent monitoring systems may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the following conditions are met for the specific monitoring system involved:

(a) The relative accuracy during the audit of an SO2 or CO2 pollutant concentration monitor (including an O2 pollutant monitor used to measure CO2 using the procedures in appendix F to this part), or of a CO2 or O2 diluent monitor used to determine heat input, or of a NOX concentration monitoring system, or of a NOX-diluent monitoring system, or of an SO2-diluent continuous emissions monitoring system is ≤ 7.5 percent;

(f) For units with low NOX emission rates (average NOX emission rate measured by the reference method during the RATA ≤ 0.200 lb/mmBtu), when a NOX-diluent continuous emission monitoring system fails to achieve a relative accuracy ≤ 7.5 percent, but the monitoring system mean value from the RATA, calculated using Equation A-7 in appendix A to this part, is within ± 0.015 lb/mmBtu of the reference method mean value;

Figure 2 to Appendix B of Part 75_Relative Accuracy Test Frequency Incentive System.

RATA	Semiannual(percent)(1)	Annual(1)
SO2 or NOX(3)	7.5% < RA ≤ 10.0% or ± 15.0 ppm(2)	RA ≤ 7.5% or ± 12.0 ppm(2)
SO2-diluent	7.5% < RA ≤ 10.0% or ± 0.030 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.025 lb/mmBtu(2)
NOX-diluent	7.5% < RA ≤ 10.0% or ± 0.020 lb/mmBtu(2)	RA ≤ 7.5% or ± 0.015 lb/mmBtu(2)
Flow	7.5% < RA ≤ 10.0% or ± 2.0 fps(2)	RA ≤ 7.5% or ± 1.5 fps
CO2 or O2	7.5% < RA ≤ 10.0% or ± 1.0% CO2/O2(2)	RA ≤ 7.5% or ± 0.7% CO2/O2(2)
Moisture	7.5% < RA ≤ 10.0% or ± 1.5% H2O(2)	RA ≤ 7.5% or ± 1.0% H2O(2)

(1) The deadline for the next RATA is the end of the second (if semiannual) or fourth (if annual) successive QA operating quarter following the quarter in which the CEMS was last tested. Exclude calendar quarters with fewer than 168 unit operating hours (or, for common stacks and bypass stacks, exclude quarters with fewer than 168 stack operating hours) in determining the RATA deadline. For SO2 monitors, QA operating quarters in which only very low sulfur fuel as defined in § 72.2, is combusted may also be excluded. However, the exclusion of calendar quarters is limited as follows: the deadline for the next RATA shall be no more than 8 calendar quarters after the quarter in which a RATA was last performed.

(2) The difference between monitor and reference method mean values applies to moisture monitors, CO2, and O2 monitors, low emitters, or low flow, only.

(3) A NOX concentration monitoring system used to determine NOX mass emissions under § 75.71.

Relative Accuracy Test Data
CEMS Results (NOx)
Siemens, SCC6-5000F, Unit #1

Parameter:	Oxides of Nitrogen
Date of Test:	May 9, 2018
Reference Method:	EPA Method 7E
CEMS Analyzer Type:	Chemiluminescence
Manufacturer:	Teledyne
Model #:	T200M
Serial #:	645

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:46 - 13:06	178.0	6.30	5.20	36.50	0.020
2	13:27 - 13:47	177.0	6.40	5.30	36.40	0.020
3	14:03 - 14:23	176.0	6.20	5.10	35.40	0.020
4	14:38 - 14:58	177.0	6.20	5.10	35.60	0.020
5	15:16 - 15:36	177.0	6.20	5.20	35.30	0.020
6	15:48 - 16:08	177.0	6.20	5.10	35.30	0.020
7	16:23 - 16:43	179.0	6.30	5.20	36.20	0.020
8	16:55 - 17:15	179.0	6.30	5.20	36.30	0.020
9	17:28 - 17:48	180.0	6.10	5.00	35.20	0.019
10						
11						
12						

Relative Accuracy Test Data
CEMS Results (CO)
Siemens, SCC6-5000F, Unit #1

Parameter:	Carbon Monoxide
Date of Test:	May 9, 2018
Reference Method:	EPA Method 10
CEMS Analyzer Type:	Infrared Absorption
Manufacturer:	Teledyne
Model #:	T300M
Serial #:	355

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:46 - 13:06	178.0	0.00	0.00	0.00	
2	13:27 - 13:47	177.0	0.00	0.00	0.00	
3	14:03 - 14:23	176.0	0.00	0.00	0.00	
4	14:38 - 14:58	177.0	0.00	0.00	0.00	
5	15:16 - 15:36	177.0	0.00	0.00	0.00	
6	15:48 - 16:08	177.0	0.00	0.00	0.00	
7	16:23 - 16:43	179.0	0.00	0.00	0.00	
8	16:55 - 17:15	179.0	0.00	0.00	0.00	
9	17:28 - 17:48	180.0	0.00	0.00	0.00	
10						
11						
12						

Relative Accuracy Test Data
CEMS Results (O_2)
Siemens, SCC6-5000F, Unit #1

Parameter:	Oxygen
Date of Test:	May 9, 2018
Reference Method:	EPA Method 3A
CEMS Analyzer Type:	Paramagnetic Cell
Manufacturer:	Teledyne
Model #:	T200M
Serial #:	645

RUN #	RUN TIME	UNIT LOAD	CONC.
		(MW)	(%vd)
1	12:46 - 13:06	178.0	13.80
2	13:27 - 13:47	177.0	13.80
3	14:03 - 14:23	176.0	13.80
4	14:38 - 14:58	177.0	13.80
5	15:16 - 15:36	177.0	13.80
6	15:48 - 16:08	177.0	13.80
7	16:23 - 16:43	179.0	13.70
8	16:55 - 17:15	179.0	13.70
9	17:28 - 17:48	180.0	13.70
10			
11			
12			

Relative Accuracy Test Data
Reference Method Results (NOx)
Siemens, SCC6-5000F, Unit #1

Parameter:	Oxides of Nitrogen
Date of Test:	May 9, 2018
Reference Method:	EPA Method 7E
RM Analyzer Type:	Chemiluminescence
Manufacturer: Model #:	THERMO 42i-HL
Serial #:	INST-NX-0064

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:46 - 13:06	178.0	6.39	5.29	37.13	0.021
2	13:27 - 13:47	177.0	6.36	5.30	37.00	0.021
3	14:03 - 14:23	176.0	6.24	5.20	36.28	0.020
4	14:38 - 14:58	177.0	6.65	5.54	38.64	0.022
5	15:16 - 15:36	177.0	6.14	5.10	35.55	0.020
6	15:48 - 16:08	177.0	6.25	5.17	36.03	0.020
7	16:23 - 16:43	179.0	6.14	5.09	35.90	0.020
8	16:55 - 17:15	179.0	6.28	5.21	36.81	0.020
9	17:28 - 17:48	180.0	6.02	5.00	35.45	0.020
10						
11						
12						

Relative Accuracy Test Data
Reference Method Results (CO)
Siemens, SCC6-5000F, Unit #1

Parameter:	Carbon Monoxide
Date of Test:	May 9, 2018
Reference Method:	EPA Method 10
RM Analyzer Type:	Infrared Absorption
Manufacturer: Model #:	THERMO 48i
Serial #:	INST-CO-0016

RUN #	RUN TIME	UNIT LOAD	CONCENTRATIONS		RATES	
		(MW)	(ppmvd)	(ppmvd@15%O_2)	(lb/hr)	(lb/MMBtu)
1	12:46 - 13:06	178.0	0.43	0.36	1.52	
2	13:27 - 13:47	177.0	0.38	0.31	1.33	
3	14:03 - 14:23	176.0	0.30	0.25	1.06	
4	14:38 - 14:58	177.0	0.28	0.23	0.99	
5	15:16 - 15:36	177.0	0.16	0.14	0.58	
6	15:48 - 16:08	177.0	0.16	0.13	0.56	
7	16:23 - 16:43	179.0	0.25	0.21	0.89	
8	16:55 - 17:15	179.0	0.23	0.19	0.80	
9	17:28 - 17:48	180.0	0.18	0.15	0.65	
10						
11						
12						

Relative Accuracy Test Data
Reference Method Results (O_2)
Siemens, SCC6-5000F, Unit #1

Parameter:	Oxygen
Date of Test:	May 9, 2018
Reference Method:	EPA Method 3A
RM Analyzer Type:	Paramagnetic Cell
Manufacturer: Model #:	SERVOMEX 1440
Serial #:	inst-O2-0023

RUN #	RUN TIME	UNIT LOAD (MW)	CONC. (%vd)
1	12:46 - 13:06	178.0	13.77
2	13:27 - 13:47	177.0	13.82
3	14:03 - 14:23	176.0	13.82
4	14:38 - 14:58	177.0	13.82
5	15:16 - 15:36	177.0	13.79
6	15:48 - 16:08	177.0	13.77
7	16:23 - 16:43	179.0	13.78
8	16:55 - 17:15	179.0	13.79
9	17:28 - 17:48	180.0	13.80
10			
11			
12			

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

Note: RHsp (gr/lb) calculated using temperature, relative humidity, and barometric pressure with psychrometric chart, psychrometric calculator, or built in psychrometric algorithm.

$$RH_{sp}(lb/lb) = \left[\left(\frac{gr}{lb}\right) \times \frac{lb}{7000\,gr}\right]$$

$$RH_{sp} = \frac{49.00\ gr}{lb} \times \frac{l\ lb}{7000\ gr} = 0.007001\ \frac{lb\ H_2O}{lb\ Air}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Analyzer Calibration Error

RM 7E, (02-27-14), 12.2 Analyzer Calibration Error. For non-dilution systems, use Equation 7E-1 to calculate the analyzer calibration error for the low-, mid-, and high-level calibration gases. (calc for NOx analyzer mid gas, if applicable)

$$ACE = \left(\frac{C_{Dir} - C_V}{CS}\right) \times 100$$

Eq. 7E-1

$$ACE = \frac{9.63\ ppm - 9.30\ ppm}{18.30\ ppm} \times 100 = 1.80\ \%$$

EXAMPLE CALCULATIONS (BIAS, DRIFT, AND CORRECTED RAW AVERAGE)

System Bias

RM 7E, (02-27-14), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for NOx analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{CS}\right) \times 100$$

Eq. 7E-2

$$SB = \frac{9.47\ ppm - 9.63\ ppm}{18.30\ ppm} \times 100 = -0.87\ \%$$

Drift Assessment

RM 7E, (02-27-14), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for NOx analyzer upscale drift, Run 1, if applicable)

$$D = \left|SB_{final} - SB_i\right|$$

Eq. 7E-4

$$D = |\ 0.71\ \% - -0.87\ \%\ | = 1.58\ \%$$

Bias Adjusted Average

RM 7E, (02-27-14), 12.6 Effluent Gas Concentration. For each test run, calculate Cavg, the arithmetic average of all valid NOx concentration values (e.g., 1-minute averages). Then adjust the value of Cavg for bias, using Equation 7E-5b. (calc for NOx analyzer, Run 1, if applicable)

$$C_{Gas} = \left(C_{Avg} - C_O\right) \times \left(\frac{C_{MA}}{C_M - C_O}\right)$$

Eq. 7E-5b

$$C_{Gas} = \left(6.67\ ppm - 0.20\ ppm\right)\left(\frac{9.30\ ppm}{9.62\ ppm - 0.20\ ppm}\right) = 6.39\ ppm$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (RATA RESULTS)

Difference (d)

40 CFR 75, App A, (12-17-09), 7.3.1 Arithmetic Mean. Calculate the arithmetic mean of the differences, d , of a data set as follows. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$d = \sum_{i=1}^{n} d_i$$ Eq. A-7

d = 6.267 ppm - 6.244 ppm = 0.022 ppm

Standard Deviation

40 CFR 75, App A, (12-17-09), 7.3.2 Standard Deviation. Calculate the standard deviation, Sd, of a data set as follows:
(calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \left[\frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}\right]}{n-1}}$$ Eq. A-8

$$S_d = \sqrt{\frac{0.320 \text{ ppm}^2 - \frac{(0.200 \text{ ppm})^2}{9}}{9 - 1}} = 0.199 \text{ ppm}$$

Confidence Coefficient

40 CFR 75, App A, (12-17-09), 7.3.3 Confidence Coefficient. Calculate the confidence coefficient (one-tailed), cc, of a data set as follows. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$CC = t_{0.025} \times \frac{S_d}{\sqrt{n}}$$ Eq. A-9

$$CC = 2.306 \times \frac{0.199 \text{ ppm}}{\sqrt{9}} = 0.153 \text{ ppm}$$

T-Values	n	2	3	4	5	6	7	8	9
	$t_{0.025}$	12.706	4.303	3.182	2.776	2.571	2.447	2.365	2.306

2.5 percent confidence coefficients

Relative Accuracy

40 CFR 75, App A, (12-17-09), 7.3.4 Relative Accuracy. Calculate the relative accuracy of a data set using the following equation. (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$RA = \frac{|d_{AVG}| + |CC|}{RM_{AVG}} \times 100$$ Eq. A-10

$$RA = \frac{|0.022| \text{ ppm} + |0.153| \text{ ppm}}{6.267 \text{ ppm}} \times 100 = 2.79 \%$$

Bias Adjustment Factor (BAF)

40 CFR 75, App A, (12-17-09), 7.6.5 Bias Adjustment. (a) If the monitor or monitoring system fails to meet the bias test requirement, adjust the value obtained from the monitor using the following equation: (calc for NOx ppm data, if applicable. Note: This is an example calculation which may not have any bearing on the actual test requirements.)

$$BAF = 1 + \left(\frac{|d_{AVG}|}{CEM_{AVG}}\right)$$ Eq. A-12

d_{AVG}= 0.022 < |CC| = 0.153 ⇨ BAF = $1 + \frac{| \quad | \text{ ppm}}{\text{ppm}}$ = 1.000 ppm

Note: BAF only applies if the mean difference (d) is greater than the absolute value of the confidence coefficient.

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

RM 7E, (08-15-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

ACE = Analyzer calibration error, percent of calibration span.
B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100.
C_{Avg} = Average unadjusted gas concentration indicated by data recorder for the test run.
C_D = Pollutant concentration adjusted to dry conditions.
C_{Dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode.
C_{Gas} = Average effluent gas concentration adjusted for bias.
C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas.
C_{MA} = Actual concentration of the upscale calibration gas, ppmv.
C_O = Average of the initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas.
C_S = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode.
C_{SS} = Concentration of NOx measured in the spiked sample.
C_{Spike} = Concentration of NOx in the undiluted spike gas.
C_{Calc} = Calculated concentration of NOx in the spike gas diluted in the sample.
C_V = Manufacturer certified concentration of a calibration gas (low, mid, or high).
C_W = Pollutant concentration measured under moist sample conditions, wet basis.
CS = Calibration span.
D = Drift assessment, percent of calibration span.
E_p = The predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response.
Eff_{NO2} = NO_2 to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NOFinal = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NOxCorr = The NOx concentration corrected for the converter efficiency.
NOxFinal = The final NOx concentration observed during the converter efficiency test in Section 16.2.2.
NOxPeak = The highest NOx concentration observed during the converter efficiency test in Section 16.2.2.
Q_{Spike} = Flow rate of spike gas introduced in system calibration mode, L/min.
Q_{Total} = Total sample flow rate during the spike test, L/min.
R = Spike recovery, percent.
SB = System bias, percent of calibration span.
SB_i = Pre-run system bias, percent of calibration span.
SB_f = Post-run system bias, percent of calibration span.
SB / D_{Alt} = Alternative absolute difference criteria to pass bias and/or drift checks.
SCE = System calibration error, percent of calibration span.
SCE_i = Pre-run system calibration error, percent of calibration span.
SCE_{final} = Post-run system calibration error, percent of calibration span.
Z = Zero calibration gas, designator.

40CFR60.355(b)(1), (09-20-06), Nomenclature. The terms used in the equations are defined as follows:

P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H_2O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

Small Engine and FTIR Nomenclature. The terms used in the equations are defined as follows:

bhp = brake horsepower
hp = horsepower
Q_{sys} = system flow (lpm)
Q_m = matrix spike flow (lpm)

RM 19, (07-29-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
B_{wa} = Moisture fraction of ambient air, percent.
Btu = British thermal unit
$\%_C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
$\%_{CO2d}$,$\%_{CO2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
E = Pollutant emission rate, ng/J (lb/million Btu).
E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
E_d = Average pollutant rate for each sampling period (e.g.,24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu)
E_{di} = Average inlet SO_2 rate for each sampling period d, ng/J (lb/million Btu).
E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O_2.
E_{jo},E_{ji} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
E_h = Hourly average pollutant, ng/J (lb/million Btu).
E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O_2.
EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
ft^3 = cubic feet
G = ideal gas conversion factor
(385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
GCM = gross Btu per SCF (constant, compound based)
GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
$\%_H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
$\%_{H2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
H_r = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
K = volume of combustion component per pound of component (constant)
K = Conversion factor, 10^{-5} (kJ/J)/(%) [10^6 Btu/million Btu].
K_c = (9.57 scm/kg)/% [(1.53 scf/lb)/%].
K_{cc} = (2.0 scm/kg)/% [(0.321 scf/lb)/%].
K_{hd} = (22.7 scm/kg)/% [(3.64 scf/lb)/%].
K_{hw} = (34.74 scm/kg)/% [(5.57 scf/lb)/%].
K_n = (0.86 scm/kg)/% [(0.14 scf/lb)/%].
K_o = (2.85 scm/kg)/% [(0.46 scf/lb)/%].
K_s = (3.54 scm/kg)/% [(0.57 scf/lb)/%].
K_{sulfur} = $2x10^4$ Btu/wt%-MMBtu
K_w = (1.30 scm/kg)/% [(0.21 scf/lb)/%].
lb = pound
ln = Natural log of indicated value.
L_p,L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
$\%_N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
$M_{\%}$ = mole percent
mol = mole
MW = molecular weight (lb/lb-mol)
MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)[1]
NCM = net Btu per SCF (constant based on compound)
$\%_O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
$\%_{O2d}$, $\%_{O2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
P_B = barometric pressure, in Hg
P_s = Potential SO2 emissions, percent.
$\%_S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
S_e = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
$\%_{Sf}$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
S(wt%) = weight percent of sulfur, per lab analysis by appropriate ASTM standard
S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
S_o = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
$\%S_p$, $\%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
SCF = standard cubic feet
SH = specific humidity, pounds of water per pound of air
$t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
T_{amb} = ambient temperature, ^oF
W/D Factor = 1.0236 = conv. at 14.696 psia and
68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
X_{CO2}=CO_2 Correction factor, percent.
X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

Ideal Gas Conversion Factor = 385.23 SCF/lb-mol at 68 deg F & 14.696 psia

Fuel Heating Value is based upon Air Hygiene's fuel gas calculation sheet. All calculations are based upon a correction to 68 deg F & 14.696 psia

High Heating Values (HHV) are used for the Fuel Heating Value, F-Factor, and Fuel Flow Data per EPA requirements.

ASTM D 3588		40CFR60, App. A., RM 19, Table 19-1	
Molecular Weight of NOx (lb/lb-mole) =	46.01	Conversion Constant for NOx =	0.0000001194351
Molecular Weight of CO (lb/lb-mole) =	28.00	Conversion Constant for CO =	0.0000000726839
Molecular Weight of SO_2 (lb/lb-mole) =	64.00	Conversion Constant for SO_2 =	0.0000001661345
Molecular Weight of THC (propane) (lb/lb-mole) =	44.00	Conversion Constant for THC =	0.0000001142175
Molecular Weight of VOC (methane) (lb/lb-mole) =	16.00	Conversion Constant for VOC (methane) =	0.0000000415336
Molecular Weight of NH_3 (lb/lb-mole) =	17.03	Conversion Constant for NH_3 =	0.0000000442074
Molecular Weight of HCHO (lb/lb-mole) =	30.03	Conversion Constant for HCHO =	0.0000000779534
Molecular Weight of CO_2 (lb/lb-mole) =	44.01	Conversion Constant for CO_2 =	0.0000001142434

NOTE: units are lb/ppm*ft^3

Formulas:

1. Corrected Raw Average (C_{Gas}), 40CFR60, App. A, RM 7E, Eq. 7E-5 (08/15/06)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right)$$

2. Correction to % O_2, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O2)}} \right)$$

3. Correction to % O_2 and ISO Conditions

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_r}{P_o}} \times e^{(19 \times (H_O - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

4. Method 19 stack exhaust flow (scfh) [ref. EPA EMC FAQ Method 19]

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1{,}000{,}000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O2)}} \right)$$

5. Emission Rate in lb/hr

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G}$$

6. Emission Rate in tons per year

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000}$$

7. Emission Concentration in lb/MMBtu (O_2 based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O2)}}$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp\text{-}hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1341.022} \; or \; \frac{E_{lb/hr} \times 453.6}{hp}$$

RATA SHEET CALCULATIONS

d = Reference Method Data - CEMS Data

S_d = Standard Deviation

CC = Confident Coefficient

n = number of runs

$t_{0.025}$ = 2.5 percent confidence coefficient T-values

RA = relative accuracy

ARA = alternative relative accuracy

BAF = Bias adjustment factor

n	t	n	t	n	t
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

1. Difference

$$d = \sum_{i=1}^{n} d_i$$

2. Standard Deviation

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \left[\frac{\left(\sum_{i=1}^{n} d_i \right)^2}{n} \right]}{n-1}}$$

3. Confident Coefficient

$$CC = t_{0.025} \times \frac{S_d}{\sqrt{n}}$$

4. Relative Accuracy

$$RA = \frac{|d_{AVG}| + |CC|}{RM_{AVG}} \times 100$$

5. Alternative Relative Accuracy

$$ARA = \frac{|d_{AVG}| + |CC|}{AS} \times 100$$

5. Bias Adjustment Factor

$$BAF = 1 + \left(\frac{|d_{AVG}|}{CEM_{AVG}} \right)$$

APPENDIX B

CEMS AND REFERENCE METHOD DATA

CPV VALLEY LLC

Air Permit Number:	3-3356-00136/00001
Plant Name or Location:	CPV VALLEY ENERGY CENTER
Date:	May 9, 2018
Project Number:	sie-17-middletown.ny-start#1
Manufacturer & Equipment:	Siemens
Model:	SCC6-5000F
Unit Number:	1
Test Load:	Max
Tester(s) / Test Unit(s):	MS

		RUN								
	UNITS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Start Time	hh:mm:ss	12:46:23	13:27:23	14:03:23	14:38:23	15:16:29	15:48:29	16:23:29	16:55:29	17:28:29
End Time	hh:mm:ss	13:06:53	13:47:53	14:23:53	14:58:53	15:36:59	16:08:59	16:43:59	17:15:59	17:48:59
Bar. Pressure	in. Hg	29.64	29.64	29.63	29.63	29.68	29.68	29.57	29.57	29.57
Amb. Temp.	°F	79	79	79	78	83	84	87	87	85
Rel. Humidity	%	33	32	33	32	31	31	33	33	33
Spec. Humidity	lb water / lb air	0.007001	0.006786	0.007003	0.006566	0.007487	0.007735	0.009116	0.009116	0.008545
Turbine Fuel Flow	gal/hr	13,002	12,934	12,921	12,914	12,914	12,914	13,076	13,090	13,130
Total Fuel Flow	SCFH	1,738	1,729	1,727	1,726	1,726	1,726	1,748	1,750	1,755
Power Output	megawatts	178.0	177.0	176.0	177.0	177.0	177.0	179.0	179.0	180.0
O_2 CEMS Data	%vd	13.8	13.8	13.8	13.8	13.8	13.8	13.7	13.7	13.7
NOx CEMS Data	ppmvd	6.30	6.40	6.20	6.20	6.20	6.20	6.30	6.30	6.10
	ppmvd@15%O_2	5.20	5.30	5.10	5.10	5.20	5.10	5.20	5.20	5.00
	lb/hr	36.50	36.40	35.40	35.60	35.30	35.30	36.20	36.30	35.20
	lb/MMBtu	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.019
CO CEMS Data	ppmvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ppmvd@15%O_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Created with Comp&RATA&Eng-AHI v20180227

CEMS AND REFERENCE METHOD DATA

CEMS Data

Data Summary Report

Facility Name: CPV_Valley_Wawayanda Location: Middletown, NY Source: NOX- RESPONSE

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 10:42	0	SU	GD	6.1	SU	GD	93000	SU	GD	0.8	SU	GD	0.7	SU	GD	3.6	SU	GD	182
05/09/2018 10:43	0	SU	GD	7.9	SU	GD	93000	SU	GD	0.8	SU	GD	0.7	SU	GD	3.6	SU	GD	181
05/09/2018 10:44	0	SU	GD	7.7	SU	GD	93000	SU	GD	0.8	SU	GD	0.7	SU	GD	3.6	SU	GD	180
05/09/2018 10:45	0	SU	GD	7.6	SU	GD	93000	SU	GD	0.8	SU	GD	0.7	SU	GD	3.6	SU	GD	178
05/09/2018 10:46	0	SU	GD	5.9	SU	GD	92000	SU	GD	0.8	SU	GD	0.7	SU	GD	3.6	SU	GD	178
05/09/2018 10:47	0	SU	GD	4.8	SU	GD	92000	SU	GD	0.7	SU	GD	0.6	SU	GD	1.8	SU	GD	178
05/09/2018 10:48	0	SU	GD	4.6	SU	GD	92000	SU	GD	0.7	SU	GD	0.6	SU	GD	1.8	SU	GD	179
05/09/2018 10:49	0	SU	GD	4.6	SU	GD	92000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	179
05/09/2018 10:50	0	SU	GD	4.6	SU	GD	93000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	180
05/09/2018 10:51	0	SU	GD	5.1	SU	GD	93000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	181
05/09/2018 10:52	0	SU	GD	7.4	SU	GD	93000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	181
05/09/2018 10:53	0	SU	GD	7.2	SU	GD	92000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	181
05/09/2018 10:54	0	SU	GD	6.4	SU	GD	92000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	180
05/09/2018 10:55	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	180
05/09/2018 10:56	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.6	SU	GD	0.5	SU	GD	1.8	SU	GD	178
05/09/2018 10:57	0	SU	GD	4.2	SU	GD	92000	SU	GD	0.5	SU	GD	0.4	SU	GD	1.8	SU	GD	179
05/09/2018 10:58	0	SU	GD	4.1	SU	GD	93000	SU	GD	0.5	SU	GD	0.4	SU	GD	1.8	SU	GD	179
05/09/2018 10:59	0	SU	GD	4.1	SU	GD	93000	SU	GD	0.4	SU	GD	0.3	SU	GD	1.8	SU	GD	179
05/09/2018 11:00	0	SU	GD	4.5	SU	GD	93000	SU	GD	0.4	SU	GD	0.3	SU	GD	1.8	SU	GD	179
05/09/2018 11:01	0	SU	GD	5.4	SU	GD	93000	SU	GD	0.3	SU	GD	0.2	SU	GD	1.8	SU	GD	179
05/09/2018 11:02	0	SU	GD	6.1	SU	GD	93000	SU	GD	0.3	SU	GD	0.2	SU	GD	1.8	SU	GD	179
Average	0			5.7			92571			0.6			0.5			2.2			180
Maximum	0			7.9			93000			0.8			0.7			3.6			182
Minimum	0			4.1			92000			0.3			0.2			1.8			178
Total	0			119.5			1944000			12.6			10.5			46.8			3770

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/09/2018 11:07 Data is expressed in Standard Time Version 1.0

Facility Name: CPV_Valley_Wawayanda Location: Middletown, NY Source: NOX- RESPONSE

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_P75			CTG1 NOX_RATE_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS
05/09/2018 10:42	SU	GD	5.2	SU	GD	6.6	SU	GD	36.4	SU	GD	6.4	SU	GD	0.020	SU	GD
05/09/2018 10:43	SU	GD	7.1	SU	GD	8.7	SU	GD	51.0	SU	GD	8.7	SU	GD	0.028	SU	GD
05/09/2018 10:44	SU	GD	7.4	SU	GD	9.0	SU	GD	52.8	SU	GD	9.0	SU	GD	0.029	SU	GD
05/09/2018 10:45	SU	GD	7.0	SU	GD	8.6	SU	GD	49.2	SU	GD	8.6	SU	GD	0.027	SU	GD
05/09/2018 10:46	SU	GD	5.6	SU	GD	6.7	SU	GD	39.7	SU	GD	6.7	SU	GD	0.022	SU	GD
05/09/2018 10:47	SU	GD	4.6	SU	GD	5.5	SU	GD	32.4	SU	GD	5.5	SU	GD	0.018	SU	GD
05/09/2018 10:48	SU	GD	4.4	SU	GD	5.3	SU	GD	30.6	SU	GD	5.3	SU	GD	0.017	SU	GD
05/09/2018 10:49	SU	GD	4.3	SU	GD	5.2	SU	GD	30.6	SU	GD	5.2	SU	GD	0.017	SU	GD
05/09/2018 10:50	SU	GD	4.2	SU	GD	5.1	SU	GD	29.2	SU	GD	5.1	SU	GD	0.016	SU	GD
05/09/2018 10:51	SU	GD	4.6	SU	GD	5.5	SU	GD	32.8	SU	GD	5.5	SU	GD	0.018	SU	GD
05/09/2018 10:52	SU	GD	6.7	SU	GD	8.2	SU	GD	47.4	SU	GD	8.2	SU	GD	0.026	SU	GD
05/09/2018 10:53	SU	GD	6.7	SU	GD	8.2	SU	GD	46.9	SU	GD	8.2	SU	GD	0.026	SU	GD
05/09/2018 10:54	SU	GD	5.9	SU	GD	7.2	SU	GD	41.5	SU	GD	7.2	SU	GD	0.023	SU	GD
05/09/2018 10:55	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	6.5	SU	GD	0.021	SU	GD
05/09/2018 10:56	SU	GD	4.9	SU	GD	6.0	SU	GD	34.2	SU	GD	6.0	SU	GD	0.019	SU	GD
05/09/2018 10:57	SU	GD	4.0	SU	GD	4.8	SU	GD	28.8	SU	GD	4.8	SU	GD	0.016	SU	GD
05/09/2018 10:58	SU	GD	3.8	SU	GD	4.6	SU	GD	27.3	SU	GD	4.6	SU	GD	0.015	SU	GD
05/09/2018 10:59	SU	GD	3.8	SU	GD	4.6	SU	GD	27.3	SU	GD	4.6	SU	GD	0.015	SU	GD
05/09/2018 11:00	SU	GD	4.2	SU	GD	5.1	SU	GD	29.2	SU	GD	5.1	SU	GD	0.016	SU	GD
05/09/2018 11:01	SU	GD	4.8	SU	GD	5.9	SU	GD	34.6	SU	GD	5.9	SU	GD	0.019	SU	GD
05/09/2018 11:02	SU	GD	5.4	SU	GD	6.6	SU	GD	38.3	SU	GD	6.6	SU	GD	0.021	SU	GD
Average			5.2			6.4			37.1			6.4			0.020		
Maximum			7.4			9.0			52.8			9.0			0.029		
Minimum			3.8			4.6			27.3			4.6			0.015		
Total			109.9			133.9			778.1			133.7			0.429		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 12:46	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:47	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:48	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:49	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:50	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:51	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:52	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:53	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:54	0	SU	GD	5.1	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 12:55	0	SU	GD	5.3	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 12:56	0	SU	GD	4.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 12:57	0	SU	GD	4.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:58	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 12:59	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:00	0	SU	GD	5.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:01	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:02	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:03	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:04	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:05	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:06	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
Average	0			5.4			91619			0.0			0.0			0.0			178
Maximum	0			5.9			92000			0.0			0.0			0.0			178
Minimum	0			4.5			91000			0.0			0.0			0.0			177
Total	0			113.5			1924000			0.0			0.0			0.0			3734

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment

SD - shutdown mode   CF - changing fuels   CC - clean control equipment

ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity

GO - monitor over range   IV - invalid

QA - quality assurance activity

Report generated on: 05/09/2018 13:16   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_TOT/		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS
05/09/2018 12:46	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	6.3	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 12:47	SU	GD	5.3	SU	GD	6.4	SU	GD	37.9	SU	GD	6.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 12:48	SU	GD	5.4	SU	GD	6.5	SU	GD	37.9	SU	GD	6.5	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 12:49	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	6.5	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 12:50	SU	GD	5.3	SU	GD	6.4	SU	GD	37.9	SU	GD	6.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 12:51	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	6.3	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 12:52	SU	GD	5.2	SU	GD	6.2	SU	GD	36.0	SU	GD	6.2	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 12:53	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	6.2	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 12:54	SU	GD	5.0	SU	GD	6.0	SU	GD	34.2	SU	GD	6.0	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 12:55	SU	GD	5.1	SU	GD	6.2	SU	GD	35.7	SU	GD	6.2	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 12:56	SU	GD	4.6	SU	GD	5.5	SU	GD	32.1	SU	GD	5.5	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 12:57	SU	GD	4.4	SU	GD	5.4	SU	GD	30.3	SU	GD	5.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 12:58	SU	GD	5.2	SU	GD	6.2	SU	GD	36.0	SU	GD	6.2	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 12:59	SU	GD	5.5	SU	GD	6.7	SU	GD	37.9	SU	GD	6.7	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 13:00	SU	GD	5.7	SU	GD	6.9	SU	GD	39.2	SU	GD	6.8	SU	GD	0.022	SU	GD	13.8	SU	GD
05/09/2018 13:01	SU	GD	5.7	SU	GD	6.9	SU	GD	39.7	SU	GD	6.9	SU	GD	0.022	SU	GD	13.8	SU	GD
05/09/2018 13:02	SU	GD	5.7	SU	GD	6.9	SU	GD	39.7	SU	GD	6.9	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 13:03	SU	GD	5.6	SU	GD	6.8	SU	GD	39.2	SU	GD	6.8	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 13:04	SU	GD	5.2	SU	GD	6.2	SU	GD	36.0	SU	GD	6.2	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 13:05	SU	GD	5.1	SU	GD	6.2	SU	GD	35.7	SU	GD	6.2	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 13:06	SU	GD	5.2	SU	GD	6.3	SU	GD	35.7	SU	GD	6.3	SU	GD	0.020	SU	GD	13.8	SU	GD
Average			5.2			6.3			36.5			6.3			0.020			13.8		
Maximum			5.7			6.9			39.7			6.9			0.022			13.8		
Minimum			4.4			5.4			30.3			5.3			0.017			13.7		
Total			110.1			133.0			766.7			132.8			0.427			289.2		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_GT			CTG1 OIL_FLOW_RAW_P75		
	MW	OS	MS	LBHR	OS	MS
05/09/2018 12:46	178	SU	GD	92	SU	GD
05/09/2018 12:47	178	SU	GD	92	SU	GD
05/09/2018 12:48	178	SU	GD	92	SU	GD
05/09/2018 12:49	178	SU	GD	92	SU	GD
05/09/2018 12:50	178	SU	GD	92	SU	GD
05/09/2018 12:51	178	SU	GD	92	SU	GD
05/09/2018 12:52	178	SU	GD	92	SU	GD
05/09/2018 12:53	178	SU	GD	91	SU	GD
05/09/2018 12:54	177	SU	GD	92	SU	GD
05/09/2018 12:55	177	SU	GD	91	SU	GD
05/09/2018 12:56	177	SU	GD	91	SU	GD
05/09/2018 12:57	178	SU	GD	91	SU	GD
05/09/2018 12:58	178	SU	GD	92	SU	GD
05/09/2018 12:59	178	SU	GD	92	SU	GD
05/09/2018 13:00	178	SU	GD	91	SU	GD
05/09/2018 13:01	178	SU	GD	92	SU	GD
05/09/2018 13:02	178	SU	GD	92	SU	GD
05/09/2018 13:03	178	SU	GD	91	SU	GD
05/09/2018 13:04	178	SU	GD	92	SU	GD
05/09/2018 13:05	177	SU	GD	91	SU	GD
05/09/2018 13:06	178	SU	GD	91	SU	GD
Average	178			92		
Maximum	178			92		
Minimum	177			91		
Total	3734			1924		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 13:27	0	SU	GD	6.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:28	0	SU	GD	6.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:29	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:30	0	SU	GD	5.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:31	0	SU	GD	4.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:32	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:33	0	SU	GD	6.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:34	0	SU	GD	6.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:35	0	SU	GD	6.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 13:36	0	SU	GD	6.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:37	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:38	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:39	0	SU	GD	4.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:40	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:41	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:42	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:43	0	SU	GD	4.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 13:44	0	SU	GD	4.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:45	0	SU	GD	4.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:46	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 13:47	0	SU	GD	6.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
Average	0			5.4			91143			0.0			0.0			0.0			177
Maximum	0			6.5			92000			0.0			0.0			0.0			178
Minimum	0			4.2			91000			0.0			0.0			0.0			176
Total	0			113.6			1914000			0.0			0.0			0.0			3716

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/09/2018 13:55   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS
05/09/2018 13:27	SU	GD	5.9	SU	GD	7.1	SU	GD	41.0	SU	GD	0.023	SU	GD	13.8	SU	GD
05/09/2018 13:28	SU	GD	6.0	SU	GD	7.2	SU	GD	41.0	SU	GD	0.023	SU	GD	13.8	SU	GD
05/09/2018 13:29	SU	GD	5.5	SU	GD	6.5	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 13:30	SU	GD	5.0	SU	GD	6.0	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 13:31	SU	GD	4.9	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 13:32	SU	GD	5.5	SU	GD	6.6	SU	GD	37.9	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 13:33	SU	GD	6.1	SU	GD	7.4	SU	GD	43.3	SU	GD	0.024	SU	GD	13.7	SU	GD
05/09/2018 13:34	SU	GD	6.3	SU	GD	7.7	SU	GD	45.1	SU	GD	0.025	SU	GD	13.7	SU	GD
05/09/2018 13:35	SU	GD	6.3	SU	GD	7.7	SU	GD	44.6	SU	GD	0.025	SU	GD	13.7	SU	GD
05/09/2018 13:36	SU	GD	5.7	SU	GD	7.0	SU	GD	39.2	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 13:37	SU	GD	5.2	SU	GD	6.4	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 13:38	SU	GD	4.8	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 13:39	SU	GD	4.8	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 13:40	SU	GD	4.7	SU	GD	5.7	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 13:41	SU	GD	4.7	SU	GD	5.7	SU	GD	32.1	SU	GD	0.018	SU	GD	13.7	SU	GD
05/09/2018 13:42	SU	GD	4.8	SU	GD	5.8	SU	GD	32.1	SU	GD	0.018	SU	GD	13.7	SU	GD
05/09/2018 13:43	SU	GD	4.3	SU	GD	5.2	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 13:44	SU	GD	4.1	SU	GD	4.9	SU	GD	28.5	SU	GD	0.016	SU	GD	13.8	SU	GD
05/09/2018 13:45	SU	GD	4.5	SU	GD	5.4	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 13:46	SU	GD	5.4	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 13:47	SU	GD	5.8	SU	GD	7.1	SU	GD	41.0	SU	GD	0.023	SU	GD	13.7	SU	GD
Average			5.3			6.4			36.4			0.020			13.8		
Maximum			6.3			7.7			45.1			0.025			13.8		
Minimum			4.1			4.9			28.5			0.016			13.7		
Total			110.3			133.4			764.6			0.428			288.9		

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 14:03	0	SU	GD	5.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:04	0	SU	GD	4.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:05	0	SU	GD	4.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:06	0	SU	GD	4.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:07	0	SU	GD	4.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:08	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:09	0	SU	GD	6.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:10	0	SU	GD	6.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	175
05/09/2018 14:11	0	SU	GD	5.3	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	175
05/09/2018 14:12	0	SU	GD	4.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:13	0	SU	GD	4.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:14	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:15	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 14:16	0	SU	GD	5.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 14:17	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:18	0	SU	GD	6.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:19	0	SU	GD	6.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:20	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:21	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:22	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:23	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
Average	0			5.3			91048			0.0			0.0			0.0			176
Maximum	0			6.4			92000			0.0			0.0			0.0			178
Minimum	0			4.2			91000			0.0			0.0			0.0			175
Total	0			110.9			1912000			0.0			0.0			0.0			3705

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS
05/09/2018 14:03	SU	GD	5.3	SU	GD	6.5	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 14:04	SU	GD	4.8	SU	GD	5.7	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 14:05	SU	GD	4.2	SU	GD	5.0	SU	GD	28.5	SU	GD	0.016	SU	GD	13.8	SU	GD
05/09/2018 14:06	SU	GD	4.2	SU	GD	5.0	SU	GD	28.5	SU	GD	0.016	SU	GD	13.8	SU	GD
05/09/2018 14:07	SU	GD	4.6	SU	GD	5.5	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 14:08	SU	GD	5.5	SU	GD	6.7	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 14:09	SU	GD	6.1	SU	GD	7.4	SU	GD	42.8	SU	GD	0.024	SU	GD	13.7	SU	GD
05/09/2018 14:10	SU	GD	5.8	SU	GD	7.1	SU	GD	41.0	SU	GD	0.023	SU	GD	13.7	SU	GD
05/09/2018 14:11	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 14:12	SU	GD	4.5	SU	GD	5.4	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 14:13	SU	GD	4.3	SU	GD	5.2	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 14:14	SU	GD	4.8	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 14:15	SU	GD	5.4	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 14:16	SU	GD	5.7	SU	GD	6.8	SU	GD	39.2	SU	GD	0.022	SU	GD	13.8	SU	GD
05/09/2018 14:17	SU	GD	5.7	SU	GD	6.8	SU	GD	39.7	SU	GD	0.022	SU	GD	13.8	SU	GD
05/09/2018 14:18	SU	GD	5.9	SU	GD	7.2	SU	GD	41.0	SU	GD	0.023	SU	GD	13.7	SU	GD
05/09/2018 14:19	SU	GD	5.7	SU	GD	7.0	SU	GD	39.2	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 14:20	SU	GD	5.3	SU	GD	6.4	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 14:21	SU	GD	4.8	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 14:22	SU	GD	4.7	SU	GD	5.6	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 14:23	SU	GD	4.6	SU	GD	5.6	SU	GD	32.1	SU	GD	0.018	SU	GD	13.7	SU	GD
Average			5.1			6.2			35.4			0.020			13.8		
Maximum			6.1			7.4			42.8			0.024			13.8		
Minimum			4.2			5.0			28.5			0.016			13.7		
Total			107.1			129.3			743.8			0.417			289.0		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 14:38	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:39	0	SU	GD	5.3	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:40	0	SU	GD	5.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:41	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:42	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:43	0	SU	GD	5.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:44	0	SU	GD	6.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:45	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:46	0	SU	GD	4.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:47	0	SU	GD	4.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:48	0	SU	GD	4.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:49	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 14:50	0	SU	GD	5.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 14:51	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:52	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:53	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:54	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 14:55	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:56	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:57	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 14:58	0	SU	GD	5.3	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	175
Average	0			5.4			91000			0.0			0.0			0.0			177
Maximum	0			6.1			91000			0.0			0.0			0.0			178
Minimum	0			4.4			91000			0.0			0.0			0.0			175
Total	0			112.4			1911000			0.0			0.0			0.0			3709

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 GEN_TOT/		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS
05/09/2018 14:38	SU	GD	5.5	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 14:39	SU	GD	5.3	SU	GD	6.4	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 14:40	SU	GD	4.9	SU	GD	5.9	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 14:41	SU	GD	4.9	SU	GD	5.9	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 14:42	SU	GD	5.1	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 14:43	SU	GD	5.7	SU	GD	6.9	SU	GD	39.2	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 14:44	SU	GD	5.7	SU	GD	7.0	SU	GD	39.2	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 14:45	SU	GD	5.0	SU	GD	6.1	SU	GD	33.9	SU	GD	0.019	SU	GD	13.7	SU	GD
05/09/2018 14:46	SU	GD	4.3	SU	GD	5.2	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 14:47	SU	GD	4.2	SU	GD	5.1	SU	GD	28.5	SU	GD	0.016	SU	GD	13.8	SU	GD
05/09/2018 14:48	SU	GD	4.4	SU	GD	5.3	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD
05/09/2018 14:49	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 14:50	SU	GD	5.6	SU	GD	6.8	SU	GD	39.2	SU	GD	0.022	SU	GD	13.7	SU	GD
05/09/2018 14:51	SU	GD	5.6	SU	GD	6.7	SU	GD	39.2	SU	GD	0.022	SU	GD	13.8	SU	GD
05/09/2018 14:52	SU	GD	5.5	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 14:53	SU	GD	5.3	SU	GD	6.4	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 14:54	SU	GD	5.2	SU	GD	6.3	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 14:55	SU	GD	5.1	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 14:56	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 14:57	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 14:58	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
Average			5.1			6.2			35.6			0.020			13.8		
Maximum			5.7			7.0			39.2			0.022			13.8		
Minimum			4.2			5.1			28.5			0.016			13.7		
Total			108.1			130.4			747.1			0.419			289.1		

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 15:16	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	176
05/09/2018 15:17	0	SU	GD	4.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:18	0	SU	GD	4.9	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:19	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:20	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:21	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:22	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:23	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:24	0	SU	GD	5.8	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:25	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:26	0	SU	GD	5.1	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:27	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:28	0	SU	GD	5.0	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:29	0	SU	GD	5.5	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:30	0	SU	GD	5.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:31	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:32	0	SU	GD	5.3	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:33	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:34	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 15:35	0	SU	GD	5.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 15:36	0	SU	GD	5.4	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
Average	0			5.3			91000			0.0			0.0			0.0			177
Maximum	0			5.8			91000			0.0			0.0			0.0			178
Minimum	0			4.8			91000			0.0			0.0			0.0			176
Total	0			112.0			1911000			0.0			0.0			0.0			3722

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS
05/09/2018 15:16	SU	GD	4.6	SU	GD	5.5	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 15:17	SU	GD	4.6	SU	GD	5.5	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 15:18	SU	GD	4.7	SU	GD	5.6	SU	GD	32.1	SU	GD	0.018	SU	GD	13.8	SU	GD
05/09/2018 15:19	SU	GD	5.2	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 15:20	SU	GD	5.2	SU	GD	6.4	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 15:21	SU	GD	5.5	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.8	SU	GD
05/09/2018 15:22	SU	GD	5.4	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 15:23	SU	GD	5.5	SU	GD	6.7	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 15:24	SU	GD	5.5	SU	GD	6.7	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 15:25	SU	GD	5.2	SU	GD	6.3	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 15:26	SU	GD	5.0	SU	GD	6.0	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 15:27	SU	GD	4.9	SU	GD	5.9	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 15:28	SU	GD	4.8	SU	GD	5.8	SU	GD	33.9	SU	GD	0.019	SU	GD	13.8	SU	GD
05/09/2018 15:29	SU	GD	5.2	SU	GD	6.4	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
05/09/2018 15:30	SU	GD	5.3	SU	GD	6.5	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 15:31	SU	GD	5.4	SU	GD	6.6	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD
05/09/2018 15:32	SU	GD	5.1	SU	GD	6.1	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 15:33	SU	GD	5.1	SU	GD	6.1	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 15:34	SU	GD	5.1	SU	GD	6.1	SU	GD	35.7	SU	GD	0.020	SU	GD	13.8	SU	GD
05/09/2018 15:35	SU	GD	5.0	SU	GD	6.1	SU	GD	33.9	SU	GD	0.019	SU	GD	13.7	SU	GD
05/09/2018 15:36	SU	GD	5.1	SU	GD	6.2	SU	GD	35.7	SU	GD	0.020	SU	GD	13.7	SU	GD
Average			5.1			6.2			35.3			0.020			13.8		
Maximum			5.5			6.7			37.4			0.021			13.8		
Minimum			4.6			5.5			32.1			0.018			13.7		
Total			107.4			129.9			741.9			0.416			288.9		

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 16:23	0	SU	GD	5.5	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 16:24	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:25	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:26	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 16:27	0	SU	GD	5.7	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:28	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:29	0	SU	GD	5.2	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:30	0	SU	GD	5.2	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 16:31	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 16:32	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:33	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:34	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:35	0	SU	GD	5.4	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:36	0	SU	GD	5.4	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:37	0	SU	GD	5.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:38	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:39	0	SU	GD	5.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:40	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:41	0	SU	GD	5.7	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:42	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:43	0	SU	GD	5.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
Average	0			5.5			92143			0.0			0.0			0.0			179
Maximum	0			5.8			93000			0.0			0.0			0.0			180
Minimum	0			5.2			92000			0.0			0.0			0.0			179
Total	0			115.6			1935000			0.0			0.0			0.0			3763

OS - Operating Status:

SU - startup mode   OFF - off-line   CP - clean process equipment
SD - shutdown mode   CF - changing fuels   CC - clean control equipment
ON - normal operation   CM - control equipment malfunction   MD - unknown operating status

MS - General Monitor Status:

GD - good data   MN - maintenance activity
GO - monitor over range   IV - invalid
QA - quality assurance activity

Facility Name: CPV_Valley_Wawayanda Location: Middletown, NY Source: CTG1

	CTG1 GEN_TOT/		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75			CTG1 CO2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS	PCT	OS	MS
05/09/2018 16:23	SU	GD	5.2	SU	GD	6.3	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:24	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:25	SU	GD	5.2	SU	GD	6.4	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:26	SU	GD	5.4	SU	GD	6.6	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:27	SU	GD	5.4	SU	GD	6.6	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:28	SU	GD	5.1	SU	GD	6.2	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:29	SU	GD	4.9	SU	GD	6.0	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:30	SU	GD	5.0	SU	GD	6.1	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:31	SU	GD	5.0	SU	GD	6.1	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:32	SU	GD	4.9	SU	GD	6.0	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:33	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:34	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:35	SU	GD	5.1	SU	GD	6.2	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:36	SU	GD	5.1	SU	GD	6.2	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:37	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:38	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:39	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:40	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:41	SU	GD	5.2	SU	GD	6.4	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:42	SU	GD	5.5	SU	GD	6.7	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:43	SU	GD	5.2	SU	GD	6.4	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
Average			5.2			6.3			36.2			0.020			13.7			5.4		
Maximum			5.5			6.7			37.9			0.021			13.7			5.5		
Minimum			4.9			6.0			34.2			0.019			13.7			5.4		
Total			108.8			132.7			759.5			0.421			287.7			114.2		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 16:55	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 16:56	0	SU	GD	5.6	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:57	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:58	0	SU	GD	5.4	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 16:59	0	SU	GD	5.7	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:00	0	SU	GD	5.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:01	0	SU	GD	5.6	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:02	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:03	0	SU	GD	5.3	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:04	0	SU	GD	5.4	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:05	0	SU	GD	5.5	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:06	0	SU	GD	5.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:07	0	SU	GD	5.3	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:08	0	SU	GD	5.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	181
05/09/2018 17:09	0	SU	GD	6.5	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	181
05/09/2018 17:10	0	SU	GD	6.9	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:11	0	SU	GD	6.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:12	0	SU	GD	5.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	177
05/09/2018 17:13	0	SU	GD	4.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 17:14	0	SU	GD	3.7	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 17:15	0	SU	GD	3.9	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
Average	0			5.5			92238			0.0			0.0			0.0			179
Maximum	0			6.9			93000			0.0			0.0			0.0			181
Minimum	0			3.7			91000			0.0			0.0			0.0			177
Total	0			114.8			1937000			0.0			0.0			0.0			3768

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Report generated on: 05/09/2018 17:26   Data is expressed in Standard Time   Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75			CTG1 CO2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS	PCT	OS	MS
05/09/2018 16:55	SU	GD	5.2	SU	GD	6.4	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:56	SU	GD	5.2	SU	GD	6.4	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 16:57	SU	GD	5.2	SU	GD	6.3	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:58	SU	GD	5.1	SU	GD	6.2	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 16:59	SU	GD	5.3	SU	GD	6.5	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:00	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:01	SU	GD	5.2	SU	GD	6.4	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:02	SU	GD	5.1	SU	GD	6.2	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:03	SU	GD	4.9	SU	GD	6.0	SU	GD	34.6	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:04	SU	GD	5.0	SU	GD	6.1	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:05	SU	GD	5.2	SU	GD	6.3	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:06	SU	GD	5.3	SU	GD	6.5	SU	GD	37.9	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:07	SU	GD	5.1	SU	GD	6.2	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:08	SU	GD	5.1	SU	GD	6.2	SU	GD	36.0	SU	GD	0.020	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:09	SU	GD	6.3	SU	GD	7.7	SU	GD	45.1	SU	GD	0.025	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:10	SU	GD	6.4	SU	GD	7.8	SU	GD	45.1	SU	GD	0.025	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:11	SU	GD	6.2	SU	GD	7.5	SU	GD	43.3	SU	GD	0.024	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:12	SU	GD	5.6	SU	GD	6.8	SU	GD	39.7	SU	GD	0.022	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:13	SU	GD	4.2	SU	GD	5.0	SU	GD	28.5	SU	GD	0.016	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:14	SU	GD	3.7	SU	GD	4.4	SU	GD	25.2	SU	GD	0.014	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:15	SU	GD	3.7	SU	GD	4.5	SU	GD	27.0	SU	GD	0.015	SU	GD	13.8	SU	GD	5.4	SU	GD
Average			5.2			6.3			36.3			0.020			13.7			5.4		
Maximum			6.4			7.8			45.1			0.025			13.8			5.5		
Minimum			3.7			4.4			25.2			0.014			13.7			5.4		
Total			108.3			131.9			762.4			0.422			288.0			114.1		

OS - Operating Status:

SU - startup mode
SD - shutdown mode
ON - normal operation
OFF - off-line
CF - changing fuels
CM - control equipment malfunction
CP - clean process equipment
CC - clean control equipment
MD - unknown operating status

MS - General Monitor Status:

GD - good data
GO - monitor over range
QA - quality assurance activity
MN - maintenance activity
IV - invalid

Data Summary Report

Facility Name: CPV_Valley_Wawayanda | Location: Middletown, NY | Source: CTG1

	CTG1 GEN_ST			CTG1 NOX_HIGH_P75			CTG1 OIL_FLOW_EPA			CTG1 CO			CTG1 CO_C15			CTG1 CO_MASS			CTG1 GEN_TOTAL
	MW	OS	MS	PPMD	OS	MS	LBHR	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	MW
05/09/2018 17:28	0	SU	GD	6.2	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:29	0	SU	GD	5.7	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:30	0	SU	GD	5.1	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 17:31	0	SU	GD	4.6	SU	GD	91000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	178
05/09/2018 17:32	0	SU	GD	3.6	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:33	0	SU	GD	3.7	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:34	0	SU	GD	3.8	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	179
05/09/2018 17:35	0	SU	GD	4.5	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:36	0	SU	GD	5.0	SU	GD	92000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:37	0	SU	GD	5.3	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:38	0	SU	GD	5.7	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:39	0	SU	GD	6.0	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:40	0	SU	GD	5.8	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:41	0	SU	GD	5.8	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:42	0	SU	GD	6.0	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:43	0	SU	GD	6.0	SU	GD	94000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:44	0	SU	GD	5.9	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:45	0	SU	GD	5.8	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:46	0	SU	GD	5.7	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:47	0	SU	GD	5.6	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	180
05/09/2018 17:48	0	SU	GD	5.7	SU	GD	93000	SU	GD	0.0	SU	GD	0.0	SU	GD	0.0	SU	GD	182
Average	0			5.3			92524			0.0			0.0			0.0			180
Maximum	0			6.2			94000			0.0			0.0			0.0			182
Minimum	0			3.6			91000			0.0			0.0			0.0			178
Total	0			111.5			1943000			0.0			0.0			0.0			3775

OS - Operating Status:

SU - startup mode | OFF - off-line | CP - clean process equipment
SD - shutdown mode | CF - changing fuels | CC - clean control equipment
ON - normal operation | CM - control equipment malfunction | MD - unknown operating status

MS - General Monitor Status:

GD - good data | MN - maintenance activity
GO - monitor over range | IV - invalid
QA - quality assurance activity

Report generated on: 05/09/2018 17:48 | Data is expressed in Standard Time | Version 1.0

Data Summary Report

Facility Name: CPV_Valley_Wawayanda   Location: Middletown, NY   Source: CTG1

	CTG1 GEN_TOT.		CTG1 NOX_C15_O			CTG1 NOX_LOW_P75			CTG1 NOX_MASS_P75			CTG1 NOX_RATE_P75			CTG1 O2_P75			CTG1 CO2_P75		
	OS	MS	PPMD	OS	MS	PPMD	OS	MS	LBHR	OS	MS	LBMMBTU	OS	MS	PCT	OS	MS	PCT	OS	MS
05/09/2018 17:28	SU	GD	5.8	SU	GD	7.1	SU	GD	41.0	SU	GD	0.023	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:29	SU	GD	5.3	SU	GD	6.5	SU	GD	37.4	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:30	SU	GD	4.9	SU	GD	6.0	SU	GD	34.2	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:31	SU	GD	4.5	SU	GD	5.4	SU	GD	30.3	SU	GD	0.017	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:32	SU	GD	3.6	SU	GD	4.3	SU	GD	25.2	SU	GD	0.014	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:33	SU	GD	3.6	SU	GD	4.3	SU	GD	25.2	SU	GD	0.014	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:34	SU	GD	3.7	SU	GD	4.4	SU	GD	25.2	SU	GD	0.014	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:35	SU	GD	4.2	SU	GD	5.1	SU	GD	29.2	SU	GD	0.016	SU	GD	13.8	SU	GD	5.4	SU	GD
05/09/2018 17:36	SU	GD	4.7	SU	GD	5.7	SU	GD	32.4	SU	GD	0.018	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:37	SU	GD	5.0	SU	GD	6.1	SU	GD	34.6	SU	GD	0.019	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:38	SU	GD	5.3	SU	GD	6.5	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:39	SU	GD	5.6	SU	GD	6.8	SU	GD	40.1	SU	GD	0.022	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:40	SU	GD	5.5	SU	GD	6.7	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:41	SU	GD	5.4	SU	GD	6.6	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:42	SU	GD	5.5	SU	GD	6.7	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:43	SU	GD	5.7	SU	GD	6.9	SU	GD	40.5	SU	GD	0.022	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:44	SU	GD	5.4	SU	GD	6.7	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:45	SU	GD	5.6	SU	GD	6.8	SU	GD	40.1	SU	GD	0.022	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:46	SU	GD	5.4	SU	GD	6.6	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.5	SU	GD
05/09/2018 17:47	SU	GD	5.3	SU	GD	6.5	SU	GD	38.3	SU	GD	0.021	SU	GD	13.7	SU	GD	5.4	SU	GD
05/09/2018 17:48	SU	GD	5.2	SU	GD	6.4	SU	GD	36.4	SU	GD	0.020	SU	GD	13.7	SU	GD	5.4	SU	GD
Average			5.0			6.1			35.2			0.019			13.7			5.4		
Maximum			5.8			7.1			41.0			0.023			13.8			5.5		
Minimum			3.6			4.3			25.2			0.014			13.7			5.4		
Total			105.2			128.1			739.9			0.408			288.2			113.6		

OS - Operating Status:

SU - startup mode	OFF - off-line	CP - clean process equipment
SD - shutdown mode	CF - changing fuels	CC - clean control equipment
ON - normal operation	CM - control equipment malfunction	MD - unknown operating status

MS - General Monitor Status:

GD - good data	MN - maintenance activity
GO - monitor over range	IV - invalid
QA - quality assurance activity	

CEMS AND REFERENCE METHOD DATA

Reference Method Data

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	13,002	gal/hr

Weather Data

Barometric Pressure	29.64	in. Hg
Relative Humidity	33	%
Ambient Temperature	79	°F
Specific Humidity	0.007001	lb H_2O / lb air

Unit Data

Unit Load	178.0	megawatts
Stack Exhaust Flow (M19)	48,642,220	SCFH

Max Load, Run - 1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 12:46:23	3350	13.58	6.33	0.33
05/09/18 12:46:53	3380	13.57	6.34	0.52
05/09/18 12:47:23	3410	13.57	6.46	0.44
05/09/18 12:47:53	3440	13.59	6.66	0.40
05/09/18 12:48:23	3470	13.57	6.76	0.44
05/09/18 12:48:53	3500	13.58	6.71	0.29
05/09/18 12:49:23	3530	13.57	6.90	0.44
05/09/18 12:49:53	3560	13.58	6.83	0.44
05/09/18 12:50:23	3590	13.58	6.84	0.53
05/09/18 12:50:53	3620	13.57	7.06	0.48
05/09/18 12:51:23	3650	13.58	7.07	0.36
05/09/18 12:51:53	3680	13.58	6.82	0.46
05/09/18 12:52:23	3710	13.57	6.68	0.40
05/09/18 12:52:53	3740	13.56	6.75	0.46
05/09/18 12:53:23	3770	13.56	6.68	0.45
05/09/18 12:53:53	3800	13.56	6.56	0.33
05/09/18 12:54:23	3830	13.55	6.53	0.44
05/09/18 12:54:53	3860	13.55	6.58	0.26
05/09/18 12:55:23	3890	13.57	6.46	0.39
05/09/18 12:55:53	3920	13.60	6.35	0.50
05/09/18 12:56:23	3950	13.60	6.41	0.31
05/09/18 12:56:53	3980	13.59	6.49	0.45
05/09/18 12:57:23	4010	13.56	6.36	0.41
05/09/18 12:57:53	4040	13.55	6.02	0.57
05/09/18 12:58:23	4070	13.54	5.73	0.45
05/09/18 12:58:53	4100	13.55	5.64	0.45
05/09/18 12:59:23	4130	13.56	5.95	0.32
05/09/18 12:59:53	4160	13.56	6.35	0.41
05/09/18 13:00:23	4190	13.56	6.80	0.42
05/09/18 13:00:53	4220	13.56	6.99	0.36
05/09/18 13:01:23	4250	13.56	7.19	0.47
05/09/18 13:01:53	4280	13.52	7.11	0.36
05/09/18 13:02:23	4310	13.53	7.03	0.32
05/09/18 13:02:53	4340	13.54	7.00	0.46
05/09/18 13:03:23	4370	13.56	7.13	0.27
05/09/18 13:03:53	4400	13.56	7.32	0.50
05/09/18 13:04:23	4430	13.54	7.20	0.33
05/09/18 13:04:53	4460	13.54	7.10	0.46
05/09/18 13:05:23	4490	13.54	6.75	0.41
05/09/18 13:05:53	4520	13.54	6.50	0.37
05/09/18 13:06:23	4550	13.54	6.57	0.43
05/09/18 13:06:53	4580	13.54	7.05	0.39
RAW AVERAGE		**13.56**	**6.67**	**0.41**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.00	0.16	0.05
Bias	**Final Zero**	0.00	0.23	-0.09
Bias	**Avg. Zero**	0.00	0.20	-0.02
Bias	**Initial UpScale**	11.89	9.47	5.00
Bias	**Final UpScale**	11.78	9.76	5.12
Bias	**Avg. UpScale**	11.84	9.62	5.06
Upscale Cal Gas		12.02	9.30	5.07

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.77	6.39	0.43
Concentration (ppm@ 15%O_2)	N/A	5.29	0.36
Emission Rate (lb/hr)	N/A	37.13	1.52
Emission Rate (lb/MMBtu)	N/A	0.021	0.001

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	12,934	gal/hr

Weather Data

Barometric Pressure	29.64	in. Hg
Relative Humidity	32	%
Ambient Temperature	79	°F
Specific Humidity	0.006786	lb H_2O / lb air

Unit Data

Unit Load	177.0	megawatts
Stack Exhaust Flow (M19)	48,704,244	SCFH

Max Load, Run - 2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 13:27:23	50	13.56	6.78	0.29
05/09/18 13:27:53	80	13.56	6.69	0.34
05/09/18 13:28:23	110	13.55	7.07	0.35
05/09/18 13:28:53	140	13.57	7.23	0.49
05/09/18 13:29:23	170	13.58	7.36	0.40
05/09/18 13:29:53	200	13.58	7.25	0.40
05/09/18 13:30:23	230	13.58	7.19	0.39
05/09/18 13:30:53	260	13.59	6.85	0.41
05/09/18 13:31:23	290	13.57	6.56	0.34
05/09/18 13:31:53	320	13.54	6.34	0.40
05/09/18 13:32:23	350	13.52	6.17	0.29
05/09/18 13:32:53	380	13.53	6.01	0.54
05/09/18 13:33:23	410	13.53	6.28	0.43
05/09/18 13:33:53	440	13.52	6.83	0.41
05/09/18 13:34:23	470	13.52	7.63	0.36
05/09/18 13:34:53	500	13.52	7.84	0.30
05/09/18 13:35:23	530	13.51	7.96	0.50
05/09/18 13:35:53	560	13.52	8.06	0.30
05/09/18 13:36:23	590	13.53	8.24	0.45
05/09/18 13:36:53	620	13.54	8.11	0.46
05/09/18 13:37:23	650	13.55	7.87	0.49
05/09/18 13:37:53	680	13.54	7.60	0.30
05/09/18 13:38:23	710	13.55	7.43	0.24
05/09/18 13:38:53	740	13.55	7.02	0.43
05/09/18 13:39:23	770	13.55	6.48	0.34
05/09/18 13:39:53	800	13.55	6.14	0.38
05/09/18 13:40:23	830	13.55	6.10	0.44
05/09/18 13:40:53	860	13.53	5.97	0.34
05/09/18 13:41:23	890	13.52	5.93	0.47
05/09/18 13:41:53	920	13.53	6.04	0.20
05/09/18 13:42:23	950	13.56	6.10	0.40
05/09/18 13:42:53	980	13.57	6.23	0.31
05/09/18 13:43:23	1010	13.59	6.33	0.35
05/09/18 13:43:53	1040	13.57	6.19	0.41
05/09/18 13:44:23	1070	13.55	5.96	0.38
05/09/18 13:44:53	1100	13.54	5.58	0.41
05/09/18 13:45:23	1130	13.52	5.24	0.27
05/09/18 13:45:53	1160	13.50	5.15	0.50
05/09/18 13:46:23	1190	13.51	5.48	0.30
05/09/18 13:46:53	1220	13.51	5.96	0.47
05/09/18 13:47:23	1250	13.52	6.51	0.32
05/09/18 13:47:53	1280	13.53	7.00	0.39
RAW AVERAGE		**13.54**	**6.68**	**0.38**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.00	0.23	-0.09
	Final Zero	0.02	0.24	0.09
	Avg. Zero	0.01	0.24	0.00
	Initial UpScale	11.78	9.76	5.12
	Final UpScale	11.78	9.57	5.16
	Avg. UpScale	11.78	9.67	5.14
Upscale Cal Gas		12.02	9.30	5.07

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.82	6.36	0.38
Concentration (ppm@ 15%O_2)	N/A	5.30	0.31
Emission Rate (lb/hr)	N/A	37.00	1.33
Emission Rate (lb/MMBtu)	N/A	0.021	0.001

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	12,921	gal/hr

Weather Data

Barometric Pressure	29.63	in. Hg
Relative Humidity	33	%
Ambient Temperature	79	°F
Specific Humidity	0.007003	lb H_2O / lb air

Unit Data

Unit Load	176.0	megawatts
Stack Exhaust Flow (M19)	48,640,505	SCFH

Max Load, Run - 3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 14:03:23	50	13.55	7.32	0.41
05/09/18 14:03:53	80	13.58	7.30	0.32
05/09/18 14:04:23	110	13.60	7.06	0.24
05/09/18 14:04:53	140	13.59	6.82	0.43
05/09/18 14:05:23	170	13.58	6.38	0.23
05/09/18 14:05:53	200	13.56	5.96	0.46
05/09/18 14:06:23	230	13.56	5.52	0.32
05/09/18 14:06:53	260	13.55	5.25	0.31
05/09/18 14:07:23	290	13.53	5.31	0.42
05/09/18 14:07:53	320	13.51	5.45	0.30
05/09/18 14:08:23	350	13.50	5.59	0.43
05/09/18 14:08:53	380	13.49	5.77	0.31
05/09/18 14:09:23	410	13.51	6.13	0.31
05/09/18 14:09:53	440	13.53	6.81	0.40
05/09/18 14:10:23	470	13.55	7.14	0.41
05/09/18 14:10:53	500	13.56	7.60	0.42
05/09/18 14:11:23	530	13.57	7.74	0.30
05/09/18 14:11:53	560	13.57	7.28	0.31
05/09/18 14:12:23	590	13.59	6.96	0.33
05/09/18 14:12:53	620	13.58	6.40	0.26
05/09/18 14:13:23	650	13.57	5.98	0.42
05/09/18 14:13:53	680	13.53	5.67	0.25
05/09/18 14:14:23	710	13.51	5.48	0.42
05/09/18 14:14:53	740	13.51	5.40	0.29
05/09/18 14:15:23	770	13.52	5.52	0.38
05/09/18 14:15:53	800	13.53	5.97	0.31
05/09/18 14:16:23	830	13.53	6.40	0.26
05/09/18 14:16:53	860	13.52	6.85	0.46
05/09/18 14:17:23	890	13.51	7.00	0.27
05/09/18 14:17:53	920	13.51	7.05	0.41
05/09/18 14:18:23	950	13.51	6.98	0.38
05/09/18 14:18:53	980	13.51	7.02	0.38
05/09/18 14:19:23	1010	13.53	7.14	0.33
05/09/18 14:19:53	1040	13.53	7.43	0.37
05/09/18 14:20:23	1070	13.55	7.37	0.44
05/09/18 14:20:53	1100	13.56	7.34	0.33
05/09/18 14:21:23	1130	13.56	6.98	0.42
05/09/18 14:21:53	1160	13.54	6.84	0.26
05/09/18 14:22:23	1190	13.52	6.49	0.36
05/09/18 14:22:53	1220	13.52	6.14	0.29
05/09/18 14:23:23	1250	13.52	5.77	0.30
05/09/18 14:23:53	1280	13.52	5.69	0.39
RAW AVERAGE		**13.54**	**6.48**	**0.35**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.02	0.24	0.09
	Final Zero	0.02	0.21	0.00
	Avg. Zero	0.02	0.23	0.04
	Initial UpScale	11.78	9.57	5.16
	Final UpScale	11.78	9.52	5.22
	Avg. UpScale	11.78	9.55	5.19
Upscale Cal Gas		12.02	9.30	5.07

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.82	6.24	0.30
Concentration (ppm@ 15%O_2)	N/A	5.20	0.25
Emission Rate (lb/hr)	N/A	36.28	1.06
Emission Rate (lb/MMBtu)	N/A	0.020	0.001

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	12,914	gal/hr

Weather Data

Barometric Pressure	29.63	in. Hg
Relative Humidity	32	%
Ambient Temperature	78	°F
Specific Humidity	0.006566	lb H_2O / lb air

Unit Data

Unit Load	177.0	megawatts
Stack Exhaust Flow (M19)	48,624,352	SCFH

Max Load, Run - 4

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 14:38:23	650	13.57	7.28	0.36
05/09/18 14:38:53	680	13.58	7.56	0.37
05/09/18 14:39:23	710	13.58	6.95	0.36
05/09/18 14:39:53	740	13.58	6.93	0.35
05/09/18 14:40:23	770	13.57	6.82	0.30
05/09/18 14:40:53	800	13.56	6.74	0.37
05/09/18 14:41:23	830	13.54	6.62	0.42
05/09/18 14:41:53	860	13.52	6.45	0.36
05/09/18 14:42:23	890	13.52	6.33	0.28
05/09/18 14:42:53	920	13.51	6.43	0.33
05/09/18 14:43:23	950	13.51	6.62	0.26
05/09/18 14:43:53	980	13.52	6.76	0.44
05/09/18 14:44:23	1010	13.52	7.09	0.44
05/09/18 14:44:53	1040	13.55	7.29	0.22
05/09/18 14:45:23	1070	13.58	7.50	0.31
05/09/18 14:45:53	1100	13.57	7.60	0.23
05/09/18 14:46:23	1130	13.56	7.37	0.43
05/09/18 14:46:53	1160	13.56	7.05	0.29
05/09/18 14:47:23	1190	13.57	6.42	0.43
05/09/18 14:47:53	1220	13.54	6.07	0.33
05/09/18 14:48:23	1250	13.54	5.97	0.40
05/09/18 14:48:53	1280	13.52	5.82	0.41
05/09/18 14:49:23	1310	13.51	5.84	0.22
05/09/18 14:49:53	1340	13.52	6.15	0.30
05/09/18 14:50:23	1370	13.54	6.46	0.48
05/09/18 14:50:53	1400	13.54	6.94	0.23
05/09/18 14:51:23	1430	13.54	7.33	0.42
05/09/18 14:51:53	1460	13.54	7.53	0.16
05/09/18 14:52:23	1490	13.54	7.54	0.30
05/09/18 14:52:53	1520	13.54	7.30	0.27
05/09/18 14:53:23	1550	13.54	7.28	0.30
05/09/18 14:53:53	1580	13.52	7.18	0.35
05/09/18 14:54:23	1610	13.53	7.13	0.22
05/09/18 14:54:53	1640	13.53	6.99	0.42
05/09/18 14:55:23	1670	13.53	7.00	0.32
05/09/18 14:55:53	1700	13.54	7.07	0.31
05/09/18 14:56:23	1730	13.53	6.94	0.32
05/09/18 14:56:53	1760	13.53	6.96	0.30
05/09/18 14:57:23	1790	13.53	6.93	0.48
05/09/18 14:57:53	1820	13.54	6.93	0.27
05/09/18 14:58:23	1850	13.55	6.96	0.41
05/09/18 14:58:53	1880	13.57	6.89	0.33
RAW AVERAGE		**13.54**	**6.88**	**0.34**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.02	0.21	0.00
Bias	**Final Zero**	0.01	0.23	0.10
Bias	**Avg. Zero**	0.01	0.22	0.05
Bias	**Initial UpScale**	11.78	9.52	5.22
Bias	**Final UpScale**	11.78	9.54	5.19
Bias	**Avg. UpScale**	11.78	9.53	5.21
Upscale Cal Gas		12.02	9.30	5.07

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.82	6.65	0.28
Concentration (ppm@ 15%O_2)	N/A	5.54	0.23
Emission Rate (lb/hr)	N/A	38.64	0.99
Emission Rate (lb/MMBtu)	N/A	0.022	0.001

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	12,914	gal/hr

Weather Data

Barometric Pressure	29.68	in. Hg
Relative Humidity	31	%
Ambient Temperature	83	°F
Specific Humidity	0.007487	lb H_2O / lb air

Unit Data

Unit Load	177.0	megawatts
Stack Exhaust Flow (M19)	48,440,939	SCFH

Max Load, Run - 5

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 15:16:29	80	13.55	6.77	0.41
05/09/18 15:16:59	110	13.54	6.52	0.32
05/09/18 15:17:29	140	13.54	6.35	0.43
05/09/18 15:17:59	170	13.53	6.26	0.26
05/09/18 15:18:29	200	13.52	6.28	0.38
05/09/18 15:18:59	230	13.51	6.06	0.34
05/09/18 15:19:29	260	13.52	6.12	0.24
05/09/18 15:19:59	290	13.52	6.36	0.29
05/09/18 15:20:29	320	13.52	6.59	0.23
05/09/18 15:20:59	350	13.52	6.75	0.44
05/09/18 15:21:29	380	13.51	6.72	0.19
05/09/18 15:21:59	410	13.51	6.76	0.32
05/09/18 15:22:29	440	13.51	6.85	0.33
05/09/18 15:22:59	470	13.51	6.88	0.23
05/09/18 15:23:29	500	13.51	6.87	0.27
05/09/18 15:23:59	530	13.52	7.03	0.18
05/09/18 15:24:29	560	13.52	7.08	0.46
05/09/18 15:24:59	590	13.53	6.87	0.32
05/09/18 15:25:29	620	13.53	6.55	0.32
05/09/18 15:25:59	650	13.54	6.59	0.27
05/09/18 15:26:29	680	13.54	6.52	0.25
05/09/18 15:26:59	710	13.54	6.30	0.43
05/09/18 15:27:29	740	13.53	6.12	0.25
05/09/18 15:27:59	770	13.52	5.99	0.33
05/09/18 15:28:29	800	13.52	5.85	0.34
05/09/18 15:28:59	830	13.51	5.72	0.22
05/09/18 15:29:29	860	13.51	5.85	0.36
05/09/18 15:29:59	890	13.50	6.02	0.30
05/09/18 15:30:29	920	13.52	6.11	0.38
05/09/18 15:30:59	950	13.52	6.34	0.35
05/09/18 15:31:29	980	13.54	6.52	0.29
05/09/18 15:31:59	1010	13.54	6.51	0.25
05/09/18 15:32:29	1040	13.54	6.48	0.26
05/09/18 15:32:59	1070	13.54	6.49	0.31
05/09/18 15:33:29	1100	13.54	6.27	0.25
05/09/18 15:33:59	1130	13.53	6.11	0.39
05/09/18 15:34:29	1160	13.52	6.12	0.36
05/09/18 15:34:59	1190	13.53	6.04	0.35
05/09/18 15:35:29	1220	13.53	5.91	0.38
05/09/18 15:35:59	1250	13.52	5.98	0.38
05/09/18 15:36:29	1280	13.53	6.06	0.42
05/09/18 15:36:59	1310	13.53	6.10	0.27
RAW AVERAGE		**13.53**	**6.37**	**0.32**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.01	0.23	0.10
	Final Zero	0.03	0.15	0.21
	Avg. Zero	0.02	0.19	0.16
	Initial UpScale	11.78	9.54	9.20
	Final UpScale	11.80	9.56	9.11
	Avg. UpScale	11.79	9.55	9.16
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.79	6.14	0.16
Concentration (ppm@ 15%O_2)	N/A	5.10	0.14
Emission Rate (lb/hr)	N/A	35.55	0.58
Emission Rate (lb/MMBtu)	N/A	0.020	0.000

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	12,914	gal/hr

Weather Data

Barometric Pressure	29.68	in. Hg
Relative Humidity	31	%
Ambient Temperature	84	°F
Specific Humidity	0.007735	lb H_2O / lb air

Unit Data

Unit Load	177.0	megawatts
Stack Exhaust Flow (M19)	48,309,679	SCFH

Max Load, Run - 6

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 15:48:29	80	13.54	6.67	0.40
05/09/18 15:48:59	110	13.54	6.17	0.29
05/09/18 15:49:29	140	13.53	6.08	0.41
05/09/18 15:49:59	170	13.54	6.16	0.25
05/09/18 15:50:29	200	13.54	6.17	0.27
05/09/18 15:50:59	230	13.53	6.22	0.42
05/09/18 15:51:29	260	13.54	6.29	0.20
05/09/18 15:51:59	290	13.53	6.27	0.44
05/09/18 15:52:29	320	13.52	6.33	0.36
05/09/18 15:52:59	350	13.51	6.28	0.31
05/09/18 15:53:29	380	13.52	6.34	0.26
05/09/18 15:53:59	410	13.51	6.28	0.19
05/09/18 15:54:29	440	13.52	6.43	0.31
05/09/18 15:54:59	470	13.52	6.64	0.30
05/09/18 15:55:29	500	13.52	6.56	0.37
05/09/18 15:55:59	530	13.51	6.57	0.50
05/09/18 15:56:29	560	13.52	6.55	0.29
05/09/18 15:56:59	590	13.53	6.65	0.41
05/09/18 15:57:29	620	13.52	6.55	0.11
05/09/18 15:57:59	650	13.51	6.77	0.28
05/09/18 15:58:29	680	13.51	6.78	0.35
05/09/18 15:58:59	710	13.51	6.64	0.25
05/09/18 15:59:29	740	13.50	6.58	0.37
05/09/18 15:59:59	770	13.51	6.86	0.24
05/09/18 16:00:29	800	13.51	6.85	0.29
05/09/18 16:00:59	830	13.50	6.89	0.32
05/09/18 16:01:29	860	13.50	6.98	0.34
05/09/18 16:01:59	890	13.51	6.82	0.34
05/09/18 16:02:29	920	13.50	6.71	0.13
05/09/18 16:02:59	950	13.50	6.79	0.29
05/09/18 16:03:29	980	13.51	6.82	0.36
05/09/18 16:03:59	1010	13.53	6.63	0.19
05/09/18 16:04:29	1040	13.52	6.51	0.22
05/09/18 16:04:59	1070	13.51	6.46	0.28
05/09/18 16:05:29	1100	13.50	6.40	0.30
05/09/18 16:05:59	1130	13.49	6.01	0.34
05/09/18 16:06:29	1160	13.49	6.07	0.30
05/09/18 16:06:59	1190	13.49	6.14	0.23
05/09/18 16:07:29	1220	13.50	6.32	0.30
05/09/18 16:07:59	1250	13.50	6.41	0.39
05/09/18 16:08:29	1280	13.51	6.50	0.19
05/09/18 16:08:59	1310	13.50	6.48	0.46
RAW AVERAGE		**13.51**	**6.49**	**0.31**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.03	0.15	0.21
	Final Zero	0.00	0.16	0.09
	Avg. Zero	0.01	0.16	0.15
	Initial UpScale	11.80	9.56	9.11
	Final UpScale	11.79	9.62	9.10
	Avg. UpScale	11.80	9.59	9.11
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	**O_2**	**NOx**	**CO**
Corrected Raw Average (ppm/% dry basis)	13.77	6.25	0.16
Concentration (ppm@ 15%O_2)	N/A	5.17	0.13
Emission Rate (lb/hr)	N/A	36.03	0.56
Emission Rate (lb/MMBtu)	N/A	0.020	0.000

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	13,076	gal/hr

Weather Data

Barometric Pressure	29.57	in. Hg
Relative Humidity	33	%
Ambient Temperature	87	°F
Specific Humidity	0.009116	lb H_2O / lb air

Unit Data

Unit Load	179.0	megawatts
Stack Exhaust Flow (M19)	48,961,665	SCFH

Max Load, Run - 7

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 16:23:29	80	13.53	6.06	0.48
05/09/18 16:23:59	110	13.54	6.15	0.39
05/09/18 16:24:29	140	13.54	6.17	0.25
05/09/18 16:24:59	170	13.53	6.06	0.43
05/09/18 16:25:29	200	13.53	6.24	0.12
05/09/18 16:25:59	230	13.53	6.44	0.43
05/09/18 16:26:29	260	13.52	6.29	0.33
05/09/18 16:26:59	290	13.52	6.44	0.25
05/09/18 16:27:29	320	13.51	6.58	0.28
05/09/18 16:27:59	350	13.54	6.52	0.34
05/09/18 16:28:29	380	13.53	6.66	0.44
05/09/18 16:28:59	410	13.53	6.54	0.30
05/09/18 16:29:29	440	13.53	6.64	0.30
05/09/18 16:29:59	470	13.52	6.23	0.35
05/09/18 16:30:29	500	13.52	6.20	0.32
05/09/18 16:30:59	530	13.52	6.27	0.31
05/09/18 16:31:29	560	13.52	6.22	0.16
05/09/18 16:31:59	590	13.51	6.31	0.38
05/09/18 16:32:29	620	13.50	6.36	0.31
05/09/18 16:32:59	650	13.49	6.22	0.24
05/09/18 16:33:29	680	13.50	6.33	0.34
05/09/18 16:33:59	710	13.50	6.30	0.20
05/09/18 16:34:29	740	13.51	6.26	0.33
05/09/18 16:34:59	770	13.51	6.41	0.27
05/09/18 16:35:29	800	13.51	6.41	0.16
05/09/18 16:35:59	830	13.51	6.44	0.30
05/09/18 16:36:29	860	13.53	6.32	0.32
05/09/18 16:36:59	890	13.50	6.38	0.27
05/09/18 16:37:29	920	13.53	6.46	0.29
05/09/18 16:37:59	950	13.50	6.44	0.32
05/09/18 16:38:29	980	13.51	6.48	0.19
05/09/18 16:38:59	1010	13.51	6.61	0.25
05/09/18 16:39:29	1040	13.50	6.50	0.25
05/09/18 16:39:59	1070	13.50	6.68	0.40
05/09/18 16:40:29	1100	13.51	6.87	0.49
05/09/18 16:40:59	1130	13.51	6.35	0.25
05/09/18 16:41:29	1160	13.51	6.66	0.25
05/09/18 16:41:59	1190	13.51	6.58	0.28
05/09/18 16:42:29	1220	13.51	6.41	0.26
05/09/18 16:42:59	1250	13.52	6.36	0.32
05/09/18 16:43:29	1280	13.51	6.42	0.18
05/09/18 16:43:59	1310	13.51	6.50	0.32
RAW AVERAGE		**13.52**	**6.40**	**0.30**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.00	0.16	0.09
	Final Zero	0.02	0.09	0.01
	Avg. Zero	0.01	0.13	0.05
	Initial UpScale	11.79	9.62	9.10
	Final UpScale	11.79	9.64	9.18
	Avg. UpScale	11.79	9.63	9.14
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.78	6.14	0.25
Concentration (ppm@ 15%O_2)	N/A	5.09	0.21
Emission Rate (lb/hr)	N/A	35.90	0.89
Emission Rate (lb/MMBtu)	N/A	0.020	0.000

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	13,090	gal/hr

Weather Data

Barometric Pressure	29.57	in. Hg
Relative Humidity	33	%
Ambient Temperature	87	°F
Specific Humidity	0.009116	lb H_2O / lb air

Unit Data

Unit Load	179.0	megawatts
Stack Exhaust Flow (M19)	49,044,285	SCFH

Max Load, Run - 8

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 16:55:29	620	13.52	6.09	0.09
05/09/18 16:55:59	650	13.52	6.13	0.36
05/09/18 16:56:29	680	13.52	6.37	0.28
05/09/18 16:56:59	710	13.53	6.57	0.17
05/09/18 16:57:29	740	13.53	6.51	0.31
05/09/18 16:57:59	770	13.51	6.60	0.26
05/09/18 16:58:29	800	13.50	6.51	0.36
05/09/18 16:58:59	830	13.49	6.46	0.24
05/09/18 16:59:29	860	13.50	6.12	0.22
05/09/18 16:59:59	890	13.50	6.25	0.23
05/09/18 17:00:29	920	13.50	6.41	0.19
05/09/18 17:00:59	950	13.51	6.66	0.23
05/09/18 17:01:29	980	13.50	6.79	0.11
05/09/18 17:01:59	1010	13.54	6.61	0.39
05/09/18 17:02:29	1040	13.52	6.52	0.23
05/09/18 17:02:59	1070	13.52	6.60	0.28
05/09/18 17:03:29	1100	13.52	6.55	0.36
05/09/18 17:03:59	1130	13.51	6.27	0.13
05/09/18 17:04:29	1160	13.52	6.18	0.45
05/09/18 17:04:59	1190	13.51	6.26	0.21
05/09/18 17:05:29	1220	13.50	6.28	0.28
05/09/18 17:05:59	1250	13.51	6.41	0.32
05/09/18 17:06:29	1280	13.53	6.57	0.24
05/09/18 17:06:59	1310	13.52	6.67	0.36
05/09/18 17:07:29	1340	13.52	6.86	0.28
05/09/18 17:07:59	1370	13.52	6.71	0.37
05/09/18 17:08:29	1400	13.48	6.44	0.30
05/09/18 17:08:59	1430	13.45	6.55	0.25
05/09/18 17:09:29	1460	13.48	6.34	0.40
05/09/18 17:09:59	1490	13.47	6.38	0.23
05/09/18 17:10:29	1520	13.49	7.29	0.35
05/09/18 17:10:59	1550	13.48	7.84	0.33
05/09/18 17:11:29	1580	13.50	7.94	0.27
05/09/18 17:11:59	1610	13.49	8.19	0.28
05/09/18 17:12:29	1640	13.54	7.79	0.24
05/09/18 17:12:59	1670	13.57	7.89	0.29
05/09/18 17:13:29	1700	13.56	7.61	0.35
05/09/18 17:13:59	1730	13.56	7.30	0.25
05/09/18 17:14:29	1760	13.53	6.41	0.41
05/09/18 17:14:59	1790	13.53	5.32	0.28
05/09/18 17:15:29	1820	13.53	5.00	0.34
05/09/18 17:15:59	1850	13.53	4.92	0.25
RAW AVERAGE		**13.51**	**6.60**	**0.28**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.02	0.09	0.01
Bias	**Final Zero**	0.03	0.27	0.10
Bias	**Avg. Zero**	0.02	0.18	0.06
Bias	**Initial UpScale**	11.79	9.64	9.18
Bias	**Final UpScale**	11.78	9.72	9.07
Bias	**Avg. UpScale**	11.79	9.68	9.13
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	**O_2**	**NOx**	**CO**
Corrected Raw Average (ppm/% dry basis)	13.79	6.28	0.23
Concentration (ppm@ 15%O_2)	N/A	5.21	0.19
Emission Rate (lb/hr)	N/A	36.81	0.80
Emission Rate (lb/MMBtu)	N/A	0.020	0.000

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
CPV VALLEY ENERGY CENTER

Fuel Data

Fuel Fd factor	9,234	SCF exh/MMBtu
Fuel Heating Value (HHV)	1,033,261	Btu/SCF fuel
Turbine Fuel Flow	13,130	gal/hr

Weather Data

Barometric Pressure	29.57	in. Hg
Relative Humidity	33	%
Ambient Temperature	85	°F
Specific Humidity	0.008545	lb H_2O / lb air

Unit Data

Unit Load	180.0	megawatts
Stack Exhaust Flow (M19)	49,289,542	SCFH

Max Load, Run - 9

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	NOx (ppmvd)	CO (ppmvd)
05/09/18 17:28:29	80	13.50	8.32	0.30
05/09/18 17:28:59	110	13.51	7.62	0.16
05/09/18 17:29:29	140	13.51	7.41	0.28
05/09/18 17:29:59	170	13.52	7.23	0.27
05/09/18 17:30:29	200	13.52	6.97	0.33
05/09/18 17:30:59	230	13.58	6.66	0.26
05/09/18 17:31:29	260	13.58	6.38	0.24
05/09/18 17:31:59	290	13.57	6.16	0.37
05/09/18 17:32:29	320	13.56	6.03	0.15
05/09/18 17:32:59	350	13.56	5.21	0.33
05/09/18 17:33:29	380	13.55	4.70	0.41
05/09/18 17:33:59	410	13.57	4.56	0.34
05/09/18 17:34:29	440	13.54	4.52	0.40
05/09/18 17:34:59	470	13.56	4.55	0.23
05/09/18 17:35:29	500	13.53	4.76	0.27
05/09/18 17:35:59	530	13.52	4.81	0.25
05/09/18 17:36:29	560	13.53	5.12	0.33
05/09/18 17:36:59	590	13.53	5.25	0.27
05/09/18 17:37:29	620	13.52	5.61	0.34
05/09/18 17:37:59	650	13.52	5.88	0.33
05/09/18 17:38:29	680	13.51	6.03	0.13
05/09/18 17:38:59	710	13.51	6.28	0.41
05/09/18 17:39:29	740	13.53	6.40	0.31
05/09/18 17:39:59	770	13.52	6.83	0.35
05/09/18 17:40:29	800	13.53	6.74	0.21
05/09/18 17:40:59	830	13.52	6.81	0.29
05/09/18 17:41:29	860	13.52	6.75	0.28
05/09/18 17:41:59	890	13.51	6.89	0.25
05/09/18 17:42:29	920	13.52	6.84	0.39
05/09/18 17:42:59	950	13.52	6.84	0.30
05/09/18 17:43:29	980	13.51	6.93	0.28
05/09/18 17:43:59	1010	13.52	6.99	0.13
05/09/18 17:44:29	1040	13.52	7.24	0.33
05/09/18 17:44:59	1070	13.53	7.14	0.19
05/09/18 17:45:29	1100	13.52	7.27	0.29
05/09/18 17:45:59	1130	13.52	6.98	0.22
05/09/18 17:46:29	1160	13.52	6.97	0.22
05/09/18 17:46:59	1190	13.51	6.98	0.30
05/09/18 17:47:29	1220	13.51	6.90	0.26
05/09/18 17:47:59	1250	13.51	6.82	0.25
05/09/18 17:48:29	1280	13.49	6.73	0.17
05/09/18 17:48:59	1310	13.44	6.80	0.34
RAW AVERAGE		**13.53**	**6.38**	**0.28**

		O_2	NOx	CO
	Serial Number:	inst-O2-0023	INST-NX-0064	INST-CO-0016
		(%)	(ppmvd)	(ppmvd)
Bias	**Initial Zero**	0.03	0.27	0.10
Bias	**Final Zero**	0.01	0.29	0.10
Bias	**Avg. Zero**	0.02	0.28	0.10
Bias	**Initial UpScale**	11.78	9.72	9.07
Bias	**Final UpScale**	11.79	9.68	9.11
Bias	**Avg. UpScale**	11.79	9.70	9.09
Upscale Cal Gas		12.02	9.30	9.10

EMISSIONS DATA	O_2	NOx	CO
Corrected Raw Average (ppm/% dry basis)	13.80	6.02	0.18
Concentration (ppm@ 15%O_2)	N/A	5.00	0.15
Emission Rate (lb/hr)	N/A	35.45	0.65
Emission Rate (lb/MMBtu)	N/A	0.020	0.000

APPENDIX C

CALIBRATION GAS CERTIFICATIONS

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0018276	**Certification Date:**	11/14/2017
Product ID Number:	124731	**Expiration Date:**	11/13/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0018276.20171101-0	**Lot Number:**	EB0018276.20171101
Customer PO. NO.:		**Tracking Number:**	040342692
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Nitrogen Dioxide	**49.7 PPM**	±0.6 PPM	FTIR	11/07/2017, 11/14/2017
Air	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0085284	EB0085284.20161201	11/02/2020	GMIS	AIR	NO2	97 PPM	1.027	5605008

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/06/2017
NO2	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	11/14/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0026154	**Certification Date:**	09/30/2016
Product ID Number:	125780	**Expiration Date:**	09/30/2019
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	RBTGS-Shreveport-LA
COA #	EB0026154.20160901-0	**Lot Number:**	EB0026154.20160901
Customer PO. NO.:		**Tracking Number:**	083029619
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**18.41 PPM**	±0.07 PPM	FTIR	09/30/2016
Nitric Oxide	**18.1 PPM**	±0.11 PPM	Chemiluminescence	09/09/2016, 09/17/2016, 09/29/2016
Total Oxides of Nitrogen	18.3 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC279029	091002	03/10/2020	NTRM	N2	CO	19.14 PPM	0.9927	091002
EB0006931	EB0006931.20150713g	10/22/2018	GMIS	N2	NO	14.95 PPM	1.095	121001
EB0011692	EB0011692.20160329g	06/11/2024	GMIS	N2	NO	276.5 PPM	0.476	2735

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	09/06/2016
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	09/12/2016

Red Ball Technical Gas Service
PGVP Vendor ID # G12016
Information and Ordering
800-551-8150
Fax (318-425-6309)

PJLA Calibration and Testing
Accreditation #62754

Fred Holt

Fred Holt
Analyst

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0098858	**Certification Date:**	09/19/2017
Product ID Number:	124737	**Expiration Date:**	09/18/2020
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0098858.20170825-0	**Lot Number:**	EB0098858.20170825
Customer PO. NO.:		**Tracking Number:**	095688549
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**9.1 PPM**	±0.1 PPM	FTIR	09/08/2017
Nitric Oxide	**9.2 PPM**	±0.10 PPM	Chemiluminescence	09/12/2017, 09/19/2017
Total Oxides of Nitrogen	9.3 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
CC279029	091002	03/10/2020	NTRM	N2	CO	19.14 PPM	0.9927	091002
CC-349582	12100115CC-349582	07/22/2019	NTRM	N2	NO	95.2 PPM	1.05	12100115
ALM066143	ALM066143.20160913	05/24/2025	GMIS	N2	NO	31.77 PPM	1.05	12100115
CC238282	CC238282.2015012-0	12/20/2018	GMIS	N2	NO	9.36 PPM	1.004	2628a

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	09/08/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	08/18/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	09/01/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Anthony Cyr
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

PJLA Calibration and Testing
Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0027723	**Certification Date:**	01/26/2018
Product ID Number:	125564	**Expiration Date:**	01/25/2021
Cylinder Pressure:	1800 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0027723.20171229-0	**Lot Number:**	EB0027723.20171229
Customer PO. NO.:		**Tracking Number:**	048406516
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G2.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Monoxide	**5.07 PPM**	±0.07 PPM	FTIR	01/03/2018
Nitric Oxide	**5.09 PPM**	±0.06 PPM	Chemiluminescence	01/18/2018, 01/26/2018
Total Oxides of Nitrogen	5.17 PPM			
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0001986	EB0001986.20160718	01/19/2025	GMIS	N2	NO	90.61 PPM	1.054	12100115
EB0004877	EB0004877.20160721	07/05/2025	GMIS	N2	CO	18.78 PPM	1.005	091002
EB0027596	EB0027596.20151012g	12/20/2018	GMIS	N2	NO	5.802 PPM	1.01	2628a
EB0055450	EB0055450.20140403-0	12/21/2020	GMIS	N2	NO	32.02 PPM	1.058	12100115

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
CO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	12/26/2017
NO	Chemiluminescence	Thermo	T42C	42C-68400-360	12/22/2017
NO	FTIR	MKS	MKS 2031DJG2EKVS13T	017146467	12/29/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12017

Accreditation #62754

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0032327	**Certification Date:**	10/09/2017
Product ID Number:	124605	**Expiration Date:**	10/07/2025
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0032327.20171005-0	**Lot Number:**	EB0032327.20171005
Customer PO. NO.:		**Tracking Number:**	056562288
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**18.7 %**	±0.15 %	NDIR	10/09/2017
Oxygen	**21.0 %**	±0.11 %	MPA	10/09/2017
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0060740	EB0060740.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0064384	EB0064384.20170112	08/13/2025	GMIS	N2	CO2	19.6 %	0.761	101001
SG9916836	SG-9916836	06/06/2022	NTRM	N2	CO2	19.98 %	0.7	101001

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	09/13/2017
CO2	NDIR	Thermo	410i	1162980025	09/22/2017

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

Nate Fielder

Nate Fielder
Anaylst
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

RED BALL TECHNICAL GAS SERVICES

PJLA Calibration and Testing
Accreditation #62754

Red Ball Technical Gas Service
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150
PGVP Vendor ID # G12018

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number:	EB0081248	**Certification Date:**	03/14/2018
Product ID Number:	124606	**Expiration Date:**	03/12/2026
Cylinder Pressure:	1900 PSIG	**MFG Facility:**	- Shreveport - LA
COA #	EB0081248.20180306-0	**Lot Number:**	EB0081248.20180306
Customer PO. NO.:		**Tracking Number:**	084092913
Customer:		**Previous Certification Dates:**	

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle	Assayed On
Carbon Dioxide	**8.98 %**	±0.08 %	NDIR	03/14/2018
Oxygen	**12.02 %**	±0.06 %	MPA	03/12/2018
Nitrogen	Balance			

Analytical Measurement Data Available Online.

Reference Standard(s)

Serial Number	Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
EB0019964	EB0019964.20170209	08/05/2025	GMIS	N2	O2	24 %	0.502	071001
EB0032313	EB0032313.20170112	05/22/2025	GMIS	N2	O2	9.34 %	0.235	2658a
EB0045483	EB0045483.20170424	11/25/2025	GMIS	N2	CO2	9.53 %	0.724	C1309410.01

Analytical Instrumentation

Component	Principle	Make	Model	Serial	MPC Date
O2	MPA	Thermo	410i	1162980025	02/23/2018
CO2	NDIR	Thermo	410i	1162980025	03/14/2018

SMART-CERT

This is to certify the gases referenced have been calibrated/tested, and verified to meet the defined specifications. This calibration/test was performed using Gases or Scales that are traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration/testing process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from Red Ball Technical Gas Services. If not included, the uncertainty of calibrations are available upon request and were taken into account when determining pass or fail.

B Theus

Brandon Theus
Analytical Chemist
Assay Laboratory: Red Ball TGS
Version 02-I, Revised on 2017-09-07

CPV VALLEY LLC
May 9, 2018
Siemens, SCC6-5000F, Unit #1
AETB/QI and PGVP RATA Data Sheet
CPV VALLEY ENERGY CENTER

AirEmissionTestingData - Level 3

QILastName	QIFirstName	QIMiddleInitial	AETBName	AETBPhoneNumber	AETBEmail	ExamDate	ProviderName	ProviderEmail
Stockwell	Michael	D	Air Hygiene International Inc	888-461-8778	info@airhygiene.com	01/06/2017	Source Evaluation Society	qstiprogram@gmail.com

ProtocolGasData - Level 3

GasLevelCode	GasTypeCode	CylinderIdentifier	VendorIdentifier	ExpirationDate
HIGH	BALN,CO2,O2	EB0032327	G12017	1/7/2025
MID	BALN,CO2,O2	EB0081248	G12018	3/12/2026
HIGH	BALN,CO,NO,NOX	EB0026154	G12016	9/30/2019
MID	BALN,CO,NO,NOX	EB0098858	G12017	9/18/2020
LOW	BALN,CO,NO,NOX	EB0027723	G12018	1/25/2021

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

AIR HYGIENE ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses six major areas:

1. Field Qualifications
2. QA reviews of reports, laboratory work, and field testing;
3. Equipment calibration and maintenance;
4. Chain-of-custody;
5. Training; and
6. Knowledge of current test methods

Field Qualifications

Air Hygiene personnel are required to gain and maintain competence with testing methods and techniques according to their job titles and the roles they play during field testing events. Qualifications for each job description include:

Staff Technician - An entry level position with responsibility to test on the stack by performing duties that include: keep trucks and trailers stocked and clean, travel to and from job site, be the "hands of the test" on the stack; stay on a stack during the sample test, set up and tear down equipment on-site, perform maintenance on equipment in the shop and on-site.

Test Technician or Specialist - Acts as the "hands of the test" on the stack by performing duties that include: stay on a stack during the sample test, migrate to the testing trailer and learn the different analyzers and testing methods used on site, set up and tear down testing equipment on site, learn the system for testing from Testing Managers and Project Managers, travel to and from job site; including driving responsibilities under DOT requirements, follow directions of Testing Managers and Project Managers, learn the proper way to conduct on-site test of stationary stacks

Test Manager or Engineer - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Test Managers must hold as least one QSTI certificate.

Project Manager - Directs and coordinates all aspects of a successful test by performing the following duties personally or through subordinate supervisors including: operating analyzers and consoles during testing along with QA/QC procedures, supervise set up and tear down of equipment on site, writing, reviewing, and revising final test reports, working with the client or state personnel while on the job site, managing pre-test checklists and onsite testing procedures, diagnose and repair any problems that may arise with the equipment, safely operate a man lift and drive a truck with or without a trailer, act as crew leader in the field, write protocols and reports, maintain project log of services performed on the job, verify all equipment needed for a job was loaded on the trailer. Project Managers typically hold QSTI certificates in Groups 1 through 4.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program. In conformance with ASTM D7036 Section 15.3.15, all metering and monitoring equipment meets or exceeds the uncertainty criteria contained in the method language that pertains to that equipment.

Chain-of-Custody

Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples are stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training

Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3 A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods

With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

Reproduction and Distribution Policy

Reproducing portions of this test report may omit critical or substantial documentation or be taken out of context and due care must be exercised in this regard. Furthermore, this test report and its associated data shall not be reproduced in full or in part without the written consent of the customer.

COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

In conformance with ASTM D7036 Section 15.3.11 and 13, all testing was performed without any real or apparent errors, with the exception of those that would be listed in Section 2.0 of this report. In addition, all testing was conducted according to the approved testing protocol, test methods, Air Hygiene Quality Manual, or ASTM D7036, with the exception of specifics noted in Section 2.0 of this report. A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values. NO_2 to NO conversion was checked via direct connect with an EPA Protocol certified concentration of NO_2 in a balance of air or nitrogen. Conversion was verified to be between 90 and 110 percent.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS
QUALITY ASSURANCE DATA

Date: May 8-9, 2018
Company: CPV VALLEY LLC
Location: Middletown, New York
Techs: MS/CM

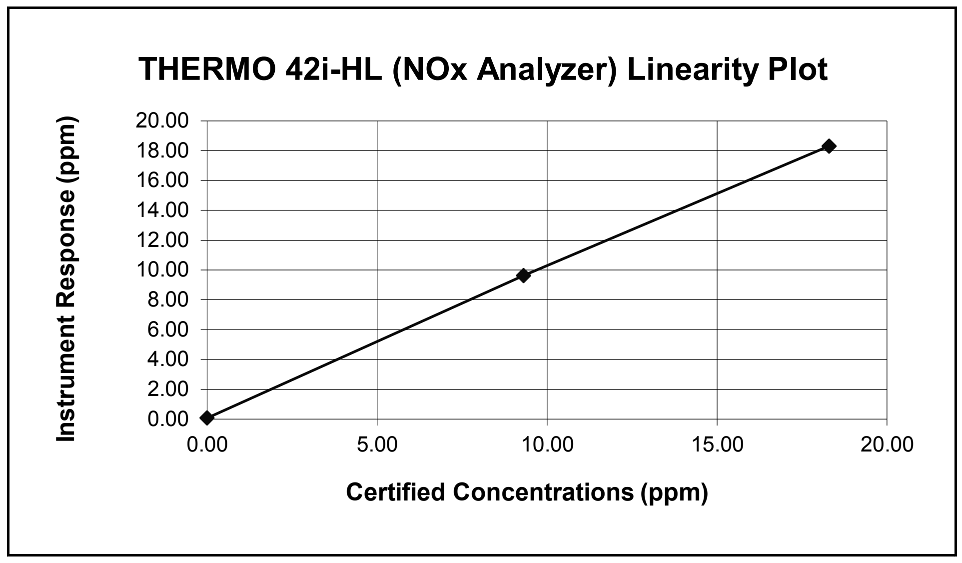
Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
May 8-9, 2018	1	0

Calibration Date: May 9, 2018 **Location:** CPV VALLEY ENERGY CENTER - Unit 1
Client: CPV VALLEY LLC

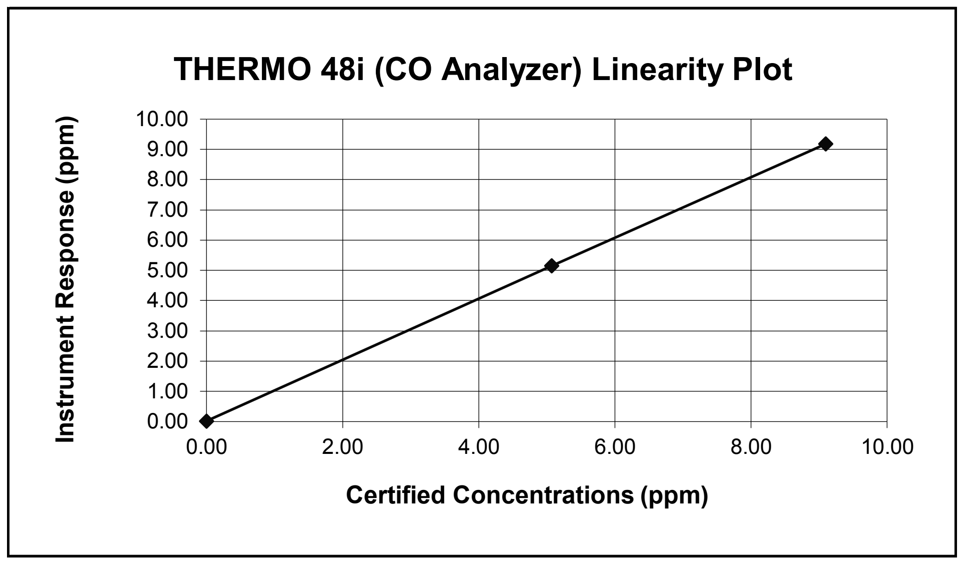
NOx Span (ppm) = 18.30

THERMO 42i-HL (NOx Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.07	0.38	0.07	YES (%)
9.30	9.63	1.80	0.33	YES (%)
18.30	18.32	0.11	0.02	YES (%)
Linearity = 1.002				



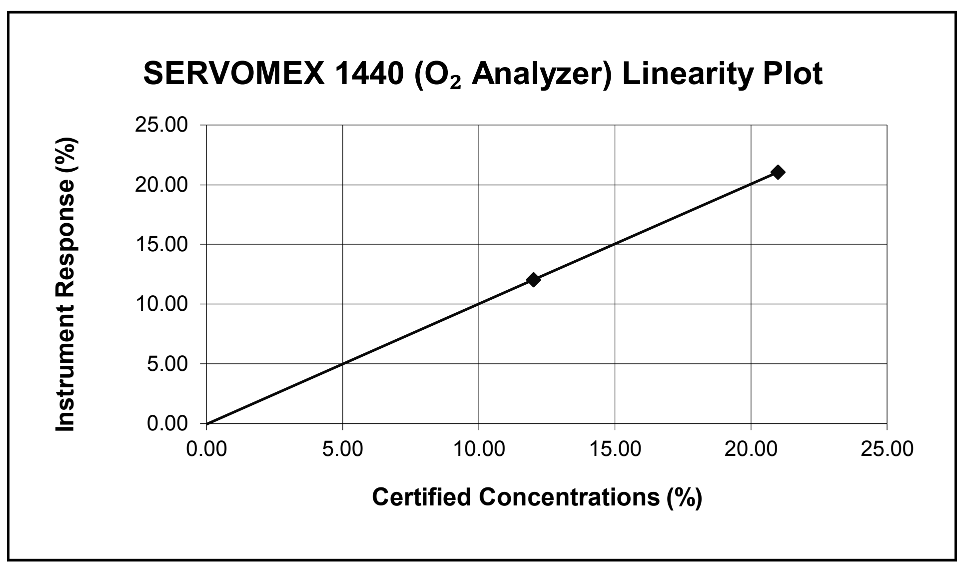
CO Span (ppm) = 9.10

THERMO 48i (CO Analyzer)				
Certified Concentration (ppm)	**Instrument Response (ppm)**	**Calibration Error (%)**	**Absolute Conc. (ppm)**	**Pass or Fail (±2%, ≤0.5ppm)**
0.00	0.02	0.22	0.02	YES (%)
5.07	5.15	0.88	0.08	YES (%)
9.10	9.18	0.88	0.08	YES (%)
Linearity = 0.993				



O_2 Span (%) = 21.00

SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	**Instrument Response (%)**	**Calibration Error (%)**	**Absolute Conc. (%)**	**Pass or Fail (±2%, ≤0.5%)**
0.00	-0.05	-0.24	0.05	YES (%)
12.02	12.05	0.14	0.03	YES (%)
21.00	21.06	0.29	0.06	YES (%)
Linearity = 0.995				



NOx Converter Efficiency

Date: May 9, 2018

Analyzer: INST-NX-0064

RM 7E, (02-27-14), Sections 7.1.4; 8.2.4.1; 12.7; and 13.5 Introduce NO_2 to the analyzer and record the NOx concentration displayed. ... Calculate the converter efficiency using Equation 7E-7. The specification for converter efficiency must be met. ... Air Hygiene also references ALT-0013 for specific NO_2 concentration (40-60 ppm) and EPA Traceability Protocol requirements (±2%).

Audit Gas:	NO_2 Concentration (C_v), ppmvd	**49.70**
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	**5.20**
	Analyzer Reading, NOx Channel, ppmvd	**53.04**
	Analyzer Reading, NO_2 Channel ($C_{Dir(NO2)}$), ppmvd	**47.84**
	Converter Efficiency, %	**96.26**

RM 7E, (02-27-14), 13.5 NO_2 to NO Conversion Efficiency Test (as applicable). The NO_2 to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

$$Eff_{NO2} = \left(\frac{C_{Dir}}{C_V}\right) \times 100$$

Eq. 7E-7 = $\frac{47.84 \text{ ppmvd}}{49.70 \text{ ppmvd}}$ x 100 = 96.26%

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
05/09/18 06:30:53	2420	52.35	5.32
05/09/18 06:31:03	2430	52.44	5.30
05/09/18 06:31:13	2440	52.44	5.30
05/09/18 06:31:23	2450	52.44	5.27
05/09/18 06:31:33	2460	52.43	5.24
05/09/18 06:31:43	2470	52.43	5.24
05/09/18 06:31:53	2480	52.52	5.22
05/09/18 06:32:03	2490	52.61	5.16
05/09/18 06:32:13	2500	51.74	5.09
05/09/18 06:32:23	2510	50.69	5.15
05/09/18 06:32:33	2520	51.87	5.20
05/09/18 06:32:43	2530	53.03	5.20
05/09/18 06:32:53	2540	53.09	5.20
05/09/18 06:33:03	2550	53.11	5.19
05/09/18 06:33:13	***2560***	***53.04***	***5.20***

DRIFT AND BIAS CHECK			
Max Load, Run - 1	O_2	NOx	CO
Raw Average	13.56	6.67	0.41
Corrected Average	13.77	6.39	0.43
Initial Zero	0.00	0.16	0.05
Final Zero	0.00	0.23	-0.09
Avg. Zero	0.00	0.20	-0.02
Initial UpScale	11.89	9.47	5.00
Final UpScale	11.78	9.76	5.12
Avg. UpScale	11.84	9.62	5.06
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	5.15
Upscale Cal Gas	12.02	9.30	5.07
Initial Zero Bias	0.25%	0.49%	0.33%
Final Zero Bias	0.26%	0.87%	-1.21%
Zero Drift	0.00%	0.38%	1.54%
Initial Upscale Bias	-0.76%	-0.87%	-1.65%
Final Upscale Bias	-1.29%	0.71%	-0.33%
Upscale Drift	0.52%	1.58%	1.32%
Alternative Specification Abs Diff: Initial Zero	0.05	0.09	0.03
Final Zero	0.05	0.16	0.11
Initial Upscale	0.16	0.16	0.15
Final Upscale	0.27	0.13	0.03
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 2	O_2	NOx	CO
Raw Average	13.54	6.68	0.38
Corrected Average	13.82	6.36	0.38
Initial Zero	0.00	0.23	-0.09
Final Zero	0.02	0.24	0.09
Avg. Zero	0.01	0.24	0.00
Initial UpScale	11.78	9.76	5.12
Final UpScale	11.78	9.57	5.16
Avg. UpScale	11.78	9.67	5.14
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	5.15
Upscale Cal Gas	12.02	9.30	5.07
Initial Zero Bias	0.26%	0.87%	-1.21%
Final Zero Bias	0.33%	0.93%	0.77%
Zero Drift	0.08%	0.05%	1.98%
Initial Upscale Bias	-1.29%	0.71%	-0.33%
Final Upscale Bias	-1.29%	-0.33%	0.11%
Upscale Drift	0.00%	1.04%	0.44%
Alternative Specification Abs Diff: Initial Zero	0.05	0.16	0.11
Final Zero	0.07	0.17	0.07
Initial Upscale	0.27	0.13	0.03
Final Upscale	0.27	0.06	0.01
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 3	O_2	NOx	CO
Raw Average	13.54	6.48	0.35
Corrected Average	13.82	6.24	0.30
Initial Zero	0.02	0.24	0.09
Final Zero	0.02	0.21	0.00
Avg. Zero	0.02	0.23	0.04
Initial UpScale	11.78	9.57	5.16
Final UpScale	11.78	9.52	5.22
Avg. UpScale	11.78	9.55	5.19
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	5.15
Upscale Cal Gas	12.02	9.30	5.07
Initial Zero Bias	0.33%	0.93%	0.77%
Final Zero Bias	0.32%	0.77%	-0.23%
Zero Drift	0.01%	0.16%	1.00%
Initial Upscale Bias	-1.29%	-0.33%	0.11%
Final Upscale Bias	-1.29%	-0.60%	0.77%
Upscale Drift	0.00%	0.27%	0.66%
Alternative Specification Abs Diff: Initial Zero	0.07	0.17	0.07
Final Zero	0.07	0.14	0.02
Initial Upscale	0.27	0.06	0.01
Final Upscale	0.27	0.11	0.07
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 4	O_2	NOx	CO
Raw Average	13.54	6.88	0.34
Corrected Average	13.82	6.65	0.28
Initial Zero	0.02	0.21	0.00
Final Zero	0.01	0.23	0.10
Avg. Zero	0.01	0.22	0.05
Initial UpScale	11.78	9.52	5.22
Final UpScale	11.78	9.54	5.19
Avg. UpScale	11.78	9.53	5.21
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	5.15
Upscale Cal Gas	12.02	9.30	5.07
Initial Zero Bias	0.32%	0.77%	-0.23%
Final Zero Bias	0.29%	0.87%	0.88%
Zero Drift	0.03%	0.11%	1.11%
Initial Upscale Bias	-1.29%	-0.60%	0.77%
Final Upscale Bias	-1.29%	-0.49%	0.44%
Upscale Drift	0.00%	0.11%	0.33%
Alternative Specification Abs Diff: Initial Zero	0.07	0.14	0.02
Final Zero	0.06	0.16	0.08
Initial Upscale	0.27	0.11	0.07
Final Upscale	0.27	0.09	0.04
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 5	O_2	NOx	CO
Raw Average	13.53	6.37	0.32
Corrected Average	13.79	6.14	0.16
Initial Zero	0.01	0.23	0.10
Final Zero	0.03	0.15	0.21
Avg. Zero	0.02	0.19	0.16
Initial UpScale	11.78	9.54	9.20
Final UpScale	11.80	9.56	9.11
Avg. UpScale	11.79	9.55	9.16
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.29%	0.87%	0.88%
Final Zero Bias	0.38%	0.44%	2.09%
Zero Drift	0.09%	0.44%	1.21%
Initial Upscale Bias	-1.29%	-0.49%	0.22%
Final Upscale Bias	-1.19%	-0.38%	-0.77%
Upscale Drift	0.10%	0.11%	0.99%
Alternative Specification Abs Diff — Initial Zero	0.06	0.16	0.08
Final Zero	0.08	0.08	0.19
Initial Upscale	0.27	0.09	0.02
Final Upscale	0.25	0.07	0.07
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 6	O_2	NOx	CO
Raw Average	13.51	6.49	0.31
Corrected Average	13.77	6.25	0.16
Initial Zero	0.03	0.15	0.21
Final Zero	0.00	0.16	0.09
Avg. Zero	0.01	0.16	0.15
Initial UpScale	11.80	9.56	9.11
Final UpScale	11.79	9.62	9.10
Avg. UpScale	11.80	9.59	9.11
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.38%	0.44%	2.09%
Final Zero Bias	0.23%	0.49%	0.77%
Zero Drift	0.15%	0.05%	1.32%
Initial Upscale Bias	-1.19%	-0.38%	-0.77%
Final Upscale Bias	-1.24%	-0.05%	-0.88%
Upscale Drift	0.05%	0.33%	0.11%
Alternative Specification Abs Diff — Initial Zero	0.08	0.08	0.19
Final Zero	0.05	0.09	0.07
Initial Upscale	0.25	0.07	0.07
Final Upscale	0.26	0.01	0.08
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 7	**O_2**	**NOx**	**CO**
Raw Average	13.52	6.40	0.30
Corrected Average	13.78	6.14	0.25
Initial Zero	0.00	0.16	0.09
Final Zero	0.02	0.09	0.01
Avg. Zero	0.01	0.13	0.05
Initial UpScale	11.79	9.62	9.10
Final UpScale	11.79	9.64	9.18
Avg. UpScale	11.79	9.63	9.14
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.23%	0.49%	0.77%
Final Zero Bias	0.32%	0.11%	-0.11%
Zero Drift	0.09%	0.38%	0.88%
Initial Upscale Bias	-1.24%	-0.05%	-0.88%
Final Upscale Bias	-1.24%	0.05%	0.00%
Upscale Drift	0.00%	0.11%	0.88%
Alternative Specification Abs Diff **Initial Zero**	0.05	0.09	0.07
Final Zero	0.07	0.02	0.01
Initial Upscale	0.26	0.01	0.08
Final Upscale	0.26	0.01	0.00
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 8	**O_2**	**NOx**	**CO**
Raw Average	13.51	6.60	0.28
Corrected Average	13.79	6.28	0.23
Initial Zero	0.02	0.09	0.01
Final Zero	0.03	0.27	0.10
Avg. Zero	0.02	0.18	0.06
Initial UpScale	11.79	9.64	9.18
Final UpScale	11.78	9.72	9.07
Avg. UpScale	11.79	9.68	9.13
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.32%	0.11%	-0.11%
Final Zero Bias	0.37%	1.09%	0.88%
Zero Drift	0.05%	0.98%	0.99%
Initial Upscale Bias	-1.24%	0.05%	0.00%
Final Upscale Bias	-1.29%	0.49%	-1.21%
Upscale Drift	0.05%	0.44%	1.21%
Alternative Specification Abs Diff **Initial Zero**	0.07	0.02	0.01
Final Zero	0.08	0.20	0.08
Initial Upscale	0.26	0.01	0.00
Final Upscale	0.27	0.09	0.11
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 9	**O_2**	**NOx**	**CO**
Raw Average	13.53	6.38	0.28
Corrected Average	13.80	6.02	0.18
Initial Zero	0.03	0.27	0.10
Final Zero	0.01	0.29	0.10
Avg. Zero	0.02	0.28	0.10
Initial UpScale	11.78	9.72	9.07
Final UpScale	11.79	9.68	9.11
Avg. UpScale	11.79	9.70	9.09
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.37%	1.09%	0.88%
Final Zero Bias	0.30%	1.20%	0.88%
Zero Drift	0.07%	0.11%	0.00%
Initial Upscale Bias	-1.29%	0.49%	-1.21%
Final Upscale Bias	-1.24%	0.27%	-0.77%
Upscale Drift	0.05%	0.22%	0.44%
Alternative Specification Abs Diff **Initial Zero**	0.08	0.20	0.08
Alternative Specification Abs Diff **Final Zero**	0.06	0.22	0.08
Alternative Specification Abs Diff **Initial Upscale**	0.27	0.09	0.11
Alternative Specification Abs Diff **Final Upscale**	0.26	0.05	0.07
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK			
Max Load, Run - 9	O_2	NOx	CO
Raw Average	13.53	6.38	0.28
Corrected Average	13.80	6.02	0.18
Initial Zero	0.03	0.27	0.10
Final Zero	0.01	0.29	0.10
Avg. Zero	0.02	0.28	0.10
Initial UpScale	11.78	9.72	9.07
Final UpScale	11.79	9.68	9.11
Avg. UpScale	11.79	9.70	9.09
Sys Resp (Zero)	-0.05	0.07	0.02
Sys Resp (Upscale)	12.05	9.63	9.18
Upscale Cal Gas	12.02	9.30	9.10
Initial Zero Bias	0.37%	1.09%	0.88%
Final Zero Bias	0.30%	1.20%	0.88%
Zero Drift	0.07%	0.11%	0.00%
Initial Upscale Bias	-1.29%	0.49%	-1.21%
Final Upscale Bias	-1.24%	0.27%	-0.77%
Upscale Drift	0.05%	0.22%	0.44%
Alternative Specification Abs Diff: Initial Zero	0.08	0.20	0.08
Final Zero	0.06	0.22	0.08
Initial Upscale	0.27	0.09	0.11
Final Upscale	0.26	0.05	0.07
Calibration Span	21.00	18.30	9.10
3% of Cal. Span (drift)	0.63	0.55	0.27
5% of Cal. Span (bias)	1.05	0.92	0.46

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	**O2**	**NOx**
Initial Zero	0.06	0.50
Final Zero	0.01	-0.01
Avg. Zero	0.04	0.25
Initial UpScale	11.98	5.08
Final UpScale	12.01	5.17
Avg. UpScale	12.00	5.13
Sys Resp (Zero)	-0.05	0.10
Sys Resp (Upscale)	12.02	5.21
Upscale Cal Gas	12.02	5.17
Initial Zero Bias	0.50%	4.30%
Final Zero Bias	0.27%	-1.14%
Zero Drift	0.24%	5.44%
Initial Upscale Bias	-0.19%	-1.40%
Final Upscale Bias	-0.05%	-0.43%
Upscale Drift	0.14%	0.97%
Alternative Specification Abs Diff: Initial Zero	0.11	0.40
Alternative Specification Abs Diff: Final Zero	0.06	0.11
Alternative Specification Abs Diff: Initial Upscale	0.04	0.13
Alternative Specification Abs Diff: Final Upscale	0.01	0.04
Calibration Span	21.00	9.30
3% of Range (drift)	0.63	0.28
5% of Range (bias)	1.05	0.47

Respone Time (min)	0.7	2.8
Sys. Response (min)	2.8	

Date/Time mm/dd/yy hh:mm:ss	z	O2 %	s	z	NOx PPM	s	INJECTIONS
6:32:14		13.38			7.75		x
6:32:24		13.41			7.84		
6:32:34		11.92			7.92		
6:32:44		0.89			7.97		
6:32:54	x	0.10			7.37		
6:33:04		0.06			7.82		
6:33:14		0.05			5.24		
6:33:24		0.04			0.94		
6:33:34		0.03			3.81		
6:33:44		0.02			7.02		
6:33:54		0.02			7.39		
6:34:04		0.02			8.11		
6:34:14		0.02			8.14		
6:34:24		0.01			8.66		
6:34:34		0.01			5.43		
6:34:44		0.01			2.43		
6:34:54		0.00			1.88		
6:35:04		0.00		x	0.67		
6:35:14		0.00			0.62		
6:35:24		0.00			0.54		
6:35:34		0.00			0.46		
6:35:44		0.00			0.37		x
6:35:54		0.00			0.34		
6:36:04		0.89			0.29		
6:36:14		10.56			0.30		
6:36:24		11.67	x		0.28		
6:36:34		11.92			0.27		
6:36:44		11.96			0.26		
6:36:54		11.96			0.26		
6:37:04		11.98			0.25		
6:37:14		11.97			0.25		
6:37:24		11.98			0.24		
6:37:34		11.99			0.24		x
6:37:44		9.57			0.24		
6:37:54		0.51			0.23		
6:38:04		0.10			0.22		
6:38:14		0.07			0.22		
6:38:24		0.05			0.22		
6:38:34		0.03			0.22		
6:38:44		0.03			0.22		
6:38:54		0.02			0.21		
6:39:04		0.02			0.20		
6:39:14		0.01			0.21		
6:39:24		0.01			0.20		
6:39:34		0.01			1.18		
6:39:44		0.00			1.47		
6:39:54		0.01			2.79		
6:40:04		0.00			4.70		
6:40:14		0.00			4.81		

Accredited Laboratory

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

Broken Arrow, OK

for technical competence in the field of

Environmental Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the NELAC Institute Field Sampling and Measurement Organization Volume 1(TNI FSMO V1 2007, Rev 0.1) requirements. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 20th day of July 2015

President & CEO
For the Accreditation Council
Certificate Number 3796.01
Valid to August 31, 2017

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

STAC STACK TESTING ACCREDITATION COUNCIL

American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

AIR HYGIENE INTERNATIONAL, INC.

Broken Arrow, OK

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 20th day of July 2015.

President & CEO
Certificate Number 3796.02
Valid to August 31, 2017

This accreditation program is not included under the A2LA ILAC Recognition Arrangement.

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

MICHAEL D. STOCKWELL

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 6TH DAY OF JANAURY 2017 AND EFFECTIVE UNTIL JANAURY 5TH, 2022

Wade Bice

Peter R. Westlin, QSTI/QSTO Review Board

J. Wade Bice, QSTI/QSTO Review Board

Karen D. Kajiya-Mills

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Theresa M. Lowe

Theresa Lowe, QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2010-503

APPENDIX E

FUEL ANALYSIS RECORDS

Client: CPV VALLEY LLC
Location: CPV VALLEY ENERGY CENTER
Date: May 9, 2018
Project #: sie-17-middletown.ny-start#1

Fuel Oil - Fuel Analysis

Characteristics of Fuel Gas		
Molecular Weight of oil =	15.243	lb/lb-mole
Btu per lb. of oil =	19,602.00	gross (HHV)
Btu per lb. of oil =	18,371.000	net (LHV)
Density of fuel oil[2] =	52.7120	lb/cu. ft
Density of fuel oil[2] =	7.0466	lb/gal
Specific Gravity =	0.8461	@ 68 deg F

Standardized to 68 deg F and 14.696 psia

Component	Wt%
carbon	86.21
oxygen	0.00
hydrogen	13.49
nitrogen	0.00
helium	0.00
sulfur	0.00
Total	**99.70**

Fuel Oil HHV Conv.	
HHV (Btu/lb)	19,602.00
HHV (Btu/SCF)	1,033,261

Fuel Oil LHV Conv.	
LHV (Btu/lb)	18,371.00
LHV (Btu/SCF)	968,373

F-Factor (SCF dry exhaust per MMBtu [HHV]) = 9,234.02
(Based on EPA RM-19) at 68 deg F and 14.696 psia

F-Factor Calculation:

F-Factor = 1,000,000*((3.64*%H)+(1.53*%C)+(0.57*%S)+(0.14*%N)-(0.46*%O))/GCV

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of fuel oil based on lab analysis or specific gravity multiplied by density of water at 68 deg F and 14.696 psia.

References:

[1] ASTM D 3588
[2] Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg
[3] Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III
[4] Introduction to Fluid Mechanics, 3rd ed. - William S. Janna
[5] GPA Reference Bulletin 181-86, revised 1986, reprinted 1995

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-001	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 02:25 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,371

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.79
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.27
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8486
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8381
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.21
Hydrogen	13.49
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Certificate of Analysis

SINCE 1985

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

Quality Controlled Through Analysis

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-002	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 02:45 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,601
Net Heat of Combustion	18,369

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.25
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8487
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8381
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.20
Hydrogen	13.50
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Certificate of Analysis

SINCE 1985
Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-003	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:05 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,375

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.26
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8488
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8382
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8276
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Certificate of Analysis

SINCE 1985

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

Quality Controlled Through Analysis

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-004	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:25 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,604
Net Heat of Combustion	18,372

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.82
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.27
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8488
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8275
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.20
Hydrogen	13.50
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-005	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 03:45 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,602
Net Heat of Combustion	18,375

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.84
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.28
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8489
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8277
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Certificate of Analysis

SINCE 1985

Quality Controlled Through Analysis

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

CLIENT:	Siemens Power Generation, Inc.	**REQUESTED BY:**	Mr. Steve Turner
CLIENT PROJECT:	Valley Energy Center	**PURCHASE ORDER NO:**	4500780102
LABORATORY NO:	87519-006	**REPORT DATE:**	May 17, 2018
SAMPLE:	Sample "A" 04:05 2018-05-09		

Heat of Combustion of Liquid Hydrocarbon Fuel by Bomb Calorimeter, ASTM D 4809

	Results, BTU/lb
Gross Heat of Combustion	19,601
Net Heat of Combustion	18,374

Parameter	***Results***
Viscosity, Kinematic, at 60°F, cSt, ASTM D 445.d, cSt	3.83
Viscosity, Kinematic, at 70°F, cSt, ASTM D 445.d, cSt	3.25
Viscosity, Kinematic, at 100°F, cSt, ASTM D 445.d, cSt	2.26
Density by Digital Density Meter @ 15ºC, Density, ASTM D 4052, g/cm³	0.8490
Density by Digital Density Meter @ 30ºC, Density, ASTM D 4052, g/cm³	0.8383
Density by Digital Density Meter @ 45ºC, Density, ASTM D 4052, g/cm³	0.8277
Sulfur by X-Ray Fluorescence Spectroscopy, ASTM D 4294, wt. %	<0.010

Carbon, Hydrogen and Nitrogen in Petroleum Products, Instrumental, ASTM D 5291.a

	Results, wt. %
Carbon	86.25
Hydrogen	13.45
Nitrogen	<0.30
Oxygen	<0.30

Respectfully submitted
For Texas OilTech Laboratories, L.P.

Roland Gore
Associate Laboratory Director

Cert. No.: 0005085, 17025
Quality Management System Certified to ISO 9001:2008, and ISO 17025:2005

APPENDIX F

STRATIFICATION TEST DATA

Source Information	
Company	CPV Valley LLC
Plant Name	CPV Valley Energy Center
Equipment	Siemens SCC6-5000F, CTG1 and CTG2
Location	Middletown, New York

Test Information	
Date	05/08/18
Project #	sie-17-middletown.ny-start#1
Unit Number	1
Load	multiple
Number of Ports Available	4
Number of Ports Used	4

Stack and Test Type			
○	Isokinetic Traverse (Wet Chemistry Testing)		**Circular Stack**
○	Velocity Traverse (Flow and Flow RATA Test)		
○	Stratification Traverse (Compliance Test)	☐ RM 20	
◉	**Stratification Traverse (RATA)**	☐ Part 60 ☑ Part 75	

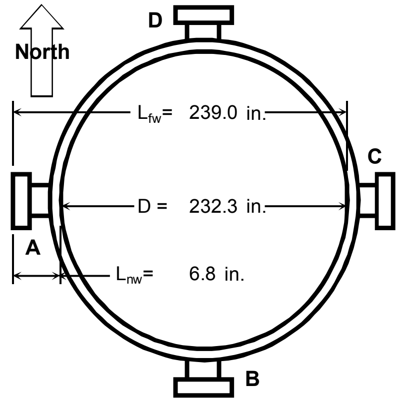
METHOD 1 - STRATIFICATION TEST FOR A CIRCULAR SOURCE

Company	CPV Valley LLC	**Date**	05/08/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	239.00	in.
Distance to Near Wall of Stack	(L_{nw})	6.75	in.*
Diameter of Stack	(D)	232.25	in.
Area of Stack	(A_s)	294.20	ft^2

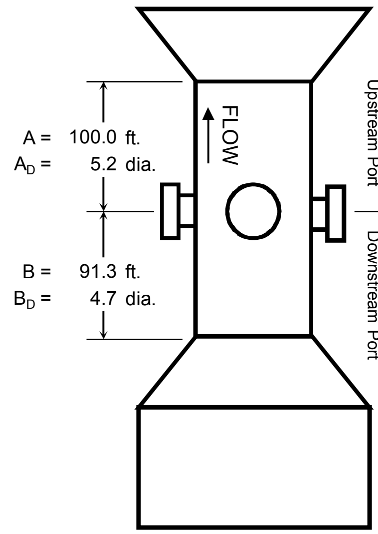
*assume 6.75 in. reference (must be measured and verified in field)

Distance from Disturbances to Port			
Distance Upstream	(A)	1200.00	in.
Diameters Upstream	(A_D)	5.17	diameters
Distance Downstream	(B)	1095.00	in.
Diameters Downstream	(B_D)	4.71	diameters



Number of Traverse Points Required

Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points		Minimum Number of Traverse Points	
Down (B_D) Stream	Up (A_D) Stream	Particulate Points	Velocity Points	Comp Stratification Criteria	Points
2.00-4.99	0.50-1.24	24	16	RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	Alt 7E 8.1.2	3 points
6.00-6.99	1.50-1.74	16	12		
7.00-7.99	1.75-1.99	12	12		
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]	**Minimum Number of**	
Upstream Spec		12	12	**Traverse Points**	
Downstream Spec		24	16	**RATA Stratification**	
Traverse Pts Required		24	16	**Criteria**	**Points**
[1] Check Minimum Number of Points for the Upstream				● Part75/60	12 RM1 pts
and Downstream conditions, then use the largest.				75 abrv (a)	3 points
[2] 8 for Circular Stacks 12 to 24 inches				75 abrv (b)	6 points
12 for Circular Stacks over 24 inches				12 points	

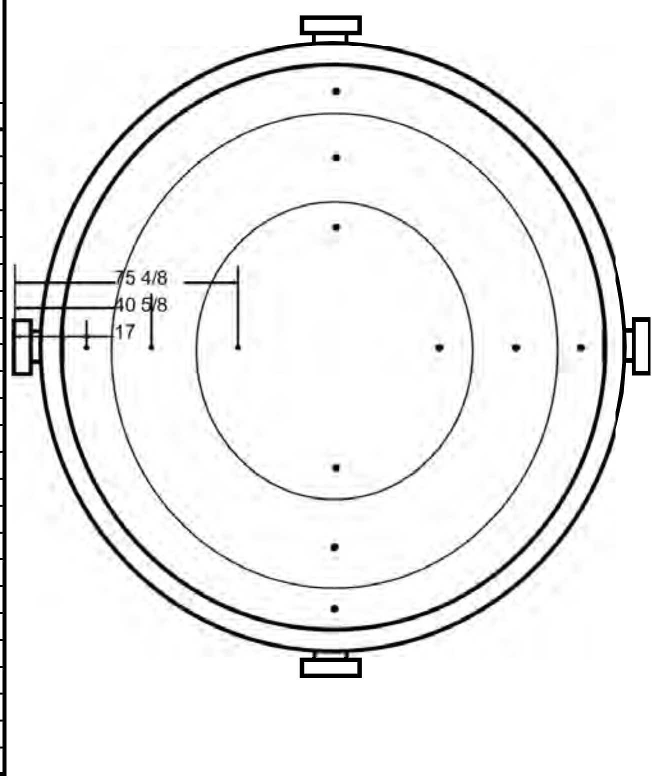


Number of Traverse Points Used

4	**Ports by**	3	**Pts / port**	**Stratification Traverse (RATA)**
12	**Pts Used**	12	**Required**	

Traverse Point Locations

Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
	%	in.	in.
1	4.4%	10 2/8	17
2	14.6%	33 7/8	40 5/8
3	29.6%	68 6/8	75 4/8
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



STRATIFICATION TRAVERSE (RATA) RESULTS

Company	CPV Valley LLC	**Date**	05/08/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	232.25	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	294.20	ft^2	**Run Start**	6:46:44	**Run End**	8:01:44

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O2	Percent Difference	NOx	Percent Difference	5.9325069
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%	
D-3	6.00	6:46:44	6:52:44	13.68	0.02%	7.19	**9.73%**	5.8754848
D-2	6.00	6:52:44	6:58:44	13.67	0.09%	7.40	7.09%	6.0387275
D-1	6.00	6:58:44	7:04:44	13.68	0.02%	7.51	5.71%	6.1369806
C-3	6.00	7:04:44	7:10:44	13.61	0.53%	7.83	1.69%	6.337037
C-2	6.00	7:10:44	7:16:44	13.60	0.60%	7.92	0.56%	6.4010959
C-1	6.00	7:16:44	7:22:44	13.65	0.24%	7.83	1.69%	6.372
B-3	8.00	7:22:44	7:30:44	13.70	0.13%	8.52	6.97%	6.9816667
B-2	6.00	7:30:44	7:36:44	13.70	0.13%	8.47	6.34%	6.9406944
B-1	6.00	7:36:44	7:42:44	13.77	**0.64%**	8.67	8.85%	7.1743338
A-3	7.00	7:42:44	7:49:44	13.71	0.20%	8.03	0.82%	6.5892907
A-2	6.00	7:49:44	7:55:44	13.72	0.27%	8.26	3.70%	6.7874652
A-1	6.00	7:55:44	8:01:44	13.70	0.13%	7.95	0.19%	6.5145833
Average				13.68		7.97		

RATA SAMPLE POINTS FOR CIRCULAR STACK

Company	CPV Valley LLC	**Date**	05/08/18
Plant Name	CPV Valley Energy Center	**Project #**	sie-17-middletown.ny-start#1
Equipment	Siemens SCC6-5000F, CTG1 and CTG2	**# of Ports Available**	4
Location	Middletown, New York	**# of Ports Used**	4

Stack Dimensions				**Traverse Data**			
Diameter or Length of Stack	(D)	232.25	in.	4	**Ports by**	3	**Pts / port**
Width of Stack	(W)		in.	12	**Pts Used**	12	**Required**
Area of Stack	(A_s)	294.20	ft^2	**Run Start**	6:46:44	**Run End**	8:01:44

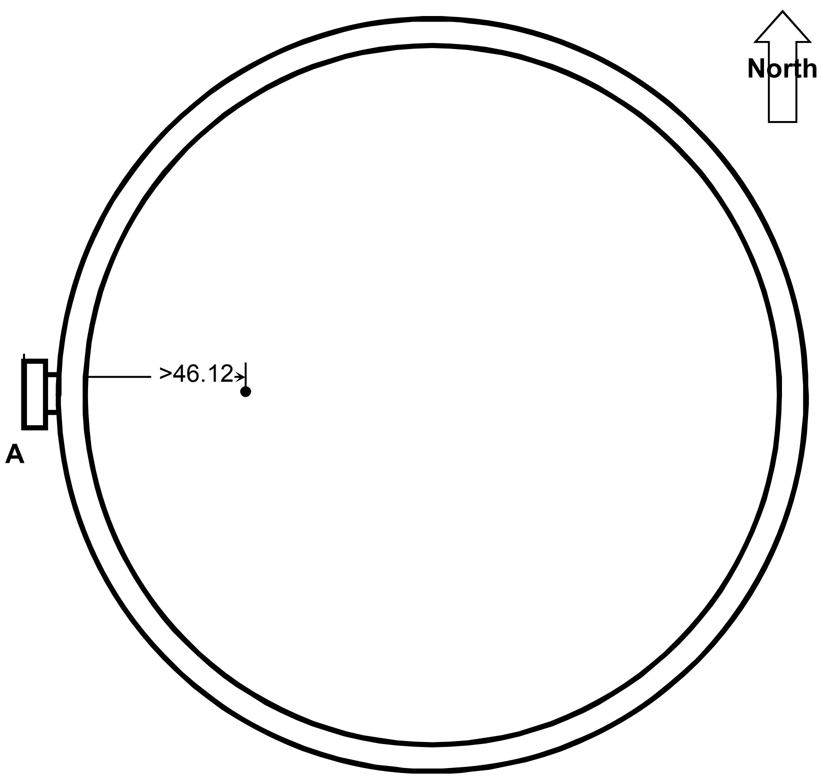
40 CFR 75 Criteria

Stratification Results	
Maximum Percent Difference	9.73 % for NOx
Maximum Pollutant Conc. Diff.	0.78 ppm for NOx
Maximum Diluent Conc. Diff.	0.09 % for O2
Stack Diameter	232.25 in.
Stratification Conclusions	
Maximum % Diff.	Percent Diff. ≤10% Passed 6.5.6.3(a) Criteria
Maximum Conc. Diff.	Conc. Diff. ≤ 0.3% Passed 6.5.6.3(b) Criteria
Stack Diameter	D > 93.6 in.

Passed Strat. Test Under 6.5.6.3(b) Criteria

Traverse Point Number	**Percent of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
	%	in.	in.
1	>16.95%	>39.37	>46.12
2			
3			

Test Type
- ☐ Moisture, for MW
- ☐ Moisture, for wet-to-dry
- ☑ Gas
- ☐ Use 6.5.6.3(a) points?
- ☐ 6.5.6(b)(2) alt. points could apply



this page intentionally left blank
end of report

ATTACHMENT 5

Opacity Monitoring Plan

DGC Operations, LLC		Visible Emissions Observation
Valley Energy Center		
Rev: 1	**Rev Date: 10/26/2018**	**3102-VEC-PRO**

<u>ATTACHMENTS</u>

2403.01-VEC-TOL Visible Emission Observations Log Sheet

1.0 PURPOSE

To establish a procedure for the determination of visible emissions compliance for the Valley Energy Center.

2.0 APPLICABILITY

This procedure applies to the Valley Energy Center.

3.0 REFERENCES

1. The regulatory requirements pertaining to compliance with visible emission standards are contained in the facility State Air Permit 3-3356-00136/00001Condition 61 and 62

4.0 DEFINITIONS

4.1 **Visible Emissions:** Particulate or gaseous matter that can be detected by the human eye. The radiant energy from an open flame is not considered a visible emission under this definition

4.2 **Opacity:** The degree to which an emission of air contaminants obstructs the transmission of light expressed as the percentage of light obstructed as measured by an optical instrument or trained observer.

4.3 **Method 9:** The EPA approved method for quantifying the opacity of emissions (determining a numerical value). This method will be utilized for all sources except for flares at the Valley Energy Center. The observer must be certified for performing this measurement.

5.0 REGULATORY REQUIREMENTS

5.1 Permit Condition 61: No owner or operator of a combustion installation shall operate the installation in such a way to emit greater than 20 percent opacity except for one six-minute period per hour, not to exceed 27 percent, based upon the six-minute average in reference test Method 9 in Appendix A of 40 CFR 60.

5.2 Permit Condition 62: No person shall operate a stationary combustion installation which exhibits greater than 20 percent opacity (six-minute average), except for one-six-minute period per hour of not more than 27 percent opacity. The Department reserves the right to perform or require the performance of a Method 9 opacity evaluation at any time during facility operation.

5.3 The permittee will conduct observations of visible emissions from the emission unit, process, etc. to which this condition applies at the monitoring frequency stated below while the process is in operation. The permittee will investigate, in a timely manner, any instance where there is causing to believe that visible emissions have the potential to exceed the opacity standard.

5.4 The permittee shall investigate the cause, make any necessary corrections, and verify that the excess visible emissions problem has been corrected. If visible emissions with the potential to exceed the standard continue, the permittee will conduct a Method 9 assessment within the next operating day of the sources associated with the potential noncompliance to determine the degree of opacity and will notify the NYSDEC if the method 9 test indicates that the opacity standard is not met.

5.5 Records of visible emissions observations (or any follow-up method 9 tests), investigations and corrective actions will be kept on-site. Should the Department determine that permittee's record keeping format is inadequate to demonstrate compliance with this condition, it shall provide written notice to the permittee stating the inadequacies, and permittee shall have 90 days to revise its prospective record-keeping format in a manner acceptable to the Department.

6.0 Procedure

6.1 Daily Visible Emissions Observations

Observe Unit 11 and 12 stacks for visible emissions least once each day during daylight hours when the unit operates on ***fuel oil***. Log each observation on attached Visible Emission Observations Log Sheet.

If visible emissions are observed, immediately contact the control room to take corrective actions to minimize visible emissions. Continue to observe the visible emissions for the next six minutes and note all deviations on the log sheet.

If the visible emissions stop after the corrective actions, note the duration of the visible emissions and document the corrective actions in the Log Sheet.

If visible emissions continue for more than six minutes, contact the Plant Manager to dispatch a certified Method 9 observer to verify the visible emissions.

6.2 Non-Routine Observations

If visible emissions are observed at the time OTHER than the daily observation for more than six (6) minutes in a one (1) hour period. Immediately contact the control room to take corrective actions to minimize visible emissions and documents the observation event in the Log Sheet.

Contact the Plant Manager to dispatch a certified Method 9 observer to verify the visible emissions.

6.3 Method 9

The facility will schedule and ensure that a Method 9 Opacity observation is performed within the next operating day to verify the visible emissions. If the Method 9 observations indicate that the opacity standard has not been met. The Plant Manager or the EH&S Coordinator will notify the NYSDEC of this deviation.

Records of the Method 9 observation must be documented and filed with the Visible Emission Observations Log Sheet.

Revision History Log

Rev.	Date	Description	By Initials	Approved Initials
0	01/2018 (estimated)	Initial	DT	BS
1	10/26/2018	Updated to standard document format, issued appropriate procedure number and made minor edits and corrections.	BS	BS

3102.02-VEC-TOL Rev.1
Valley Energy Center
Visible Emission Observations Log Sheet

Date of Observation:	Start Time:	Stop Time:
Emission Unit Observe:	Operation Status: Online	Offline
Emission Unit Operation Condition:		
Weather Conditions:		
Did you observe any visible emissions on the emission unit?	Yes	No
*If visible emissions is observed, immediately contact the control room to take corrective actions to minimize visible emissions. Continue to observe the visible emissions for the next six minutes and note all deviation on the log sheet.		
Additional Comments:		
Observer Name (Print):		

Date of Observation:	Start Time:	Stop Time:
Emission Unit Observe:	Operation Status: Online	Offline
Emission Unit Operation Condition:		
Weather Conditions:		
Did you observe any visible emissions on the emission unit?	Yes	No
*If visible emissions is observed, immediately contact the control room to take corrective actions to minimize visible emissions. Continue to observe the visible emissions for the next six minutes and note all deviation on the log sheet.		
Additional Comments:		
Observer Name (Print):		

Date of Observation:	Start Time:	Stop Time:
Emission Unit Observe:	Operation Status: Online	Offline
Emission Unit Operation Condition:		
Weather Conditions:		
Did you observe any visible emissions on the emission unit?	Yes	No
*If visible emissions is observed, immediately contact the control room to take corrective actions to minimize visible emissions. Continue to observe the visible emissions for the next six minutes and note all deviation on the log sheet.		
Additional Comments:		
Observer Name (Print):		

Date of Observation:	Start Time:	Stop Time:
Emission Unit Observe:	Operation Status: Online	Offline
Emission Unit Operation Condition:		
Weather Conditions:		
Did you observe any visible emissions on the emission unit?	Yes	No
*If visible emissions is observed, immediately contact the control room to take corrective actions to minimize visible emissions. Continue to observe the visible emissions for the next six minutes and note all deviation on the log sheet.		
Additional Comments:		
Observer Name (Print):		

ATTACHMENT 6

Revised Title V Application

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID	Application ID	Application Type
3-3356-00136	- - /	State Facility × Title V

Section I - Certification

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information required to complete this application, I believe the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Responsible Official Donald Atwood	Title Asset Management Rep.
Signature	Date 08-24-2018

Professional Engineer Certification

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments as they pertain to the practice of engineering. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Professional Engineer Peter T. Belmonte	NYS License No. 082540-1
Signature	Date 8-27-2018

STATE OF NEW YORK · PETER T. BELMONTE · 082540 · LICENSED PROFESSIONAL ENGINEER

Section II - Identification Information

Type of Permit Action Requested

× New Renewal Significant Modification Administrative Amendment Minor Modification

Application for the construction of a new facility Application involves the construction of new emission unit(s)

Facility Information

Name CPV Valley Energy Center	
Location Address 3330 Route 6	
× City / Town / Village Middletown, NY	Zip 10940

Owner/Firm Information

Business Taxpayer ID: 473947219

Name CPV Valley LLC.			
Street Address 8403 Colesville Road Suite 915			
City Silver Spring	State/Province MD	Country US	Zip 20910

Owner Classification: Federal State Municipal × Corporation/Partnership Individual

Owner/Firm Contact Information

Name Donald Atwood			Phone 781-848-2202
E-mail Address Datwood@cpv.com			Fax
Affiliation Asset Management Represenative			Title Asset Management Rep.
Street Address 50 Braintree Hill Office Park Suite 300			
City Braintree	State/Province MA	Country US	Zip 02184

Facility Contact Information

Name Ben Stanley			Phone 845-649-8300
E-mail Address b.stanley@dgc-ops.com			Fax
Affiliation Operator			Title Plant Manager
Street Address 3330 Route 6			
City Middletown	State/Province NY	Country US	Zip 10940

New York State Department of Environmental Conservation
Air Permit Application

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Project Description ☒ Continuation Sheet(s)

CPV Valley, LLC owns and operates the CPV Valley Energy Center, a 680 megawatt (MW) natural gas-fired electric generating facility. The CPV Valley Energy Center will use ultra-low sulfur distillate oil for back-up for reliability purposes. The CPV facility will use "combined cycle" generation technology and will be comprised of two combined-cycle units, each consisting of a combustion turbine generator (CTG), a Heat Recovery Steam Generator (HRSG) with supplemental duct firing, and a steam turbine generator (STG).

Section III - Facility Information

Facility Classification

☐ Hospital ☐ Residential ☐ Educational/Institutional ☐ Commercial ☐ Industrial ☒ Utility

Affected States (Title V Applications Only)

☐ Vermont ☐ Massachusetts ☐ Rhode Island ☒ Pennsylvania Tribal Land: N/A

☐ New Hampshire ☒ Connecticut ☒ New Jersey Ohio Tribal Land: N/A

SIC Code(s)			NAICS Code(s)			
4911			221112			

Facility Description ☒ Continuation Sheet(s)

The CPV Valley Energy Center consists of two dual fuel-fired Siemens F-class combustion turbine generators (CTGs), with a nominal heat input of 2,234 mm Btu/hr, each when operating on natural gas at base load, two 500 mmBtu/hr supplementary natural gas-fired duct burners, two heat recovery steam generators.

Compliance Statements (Title V Applications Only)

I certify that as of the date of this application the facility is in compliance with all applicable requirements. ☒ Yes ☐ No

If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at the facility that are operating in compliance with all applicable requirements, complete the following:

☒ This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those emission units referenced in the compliance plan portion of this application.

☒ For all emission units subject to any applicable requirements that will become effective during the term of the permit, this facility will meet such requirements on a timely basis.

☒ Compliance certification reports will be submitted at least once per year. Each report will certify compliance status with respect to each applicable requirement, and the method used to determine the status.

Facility Applicable Federal Requirements ☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
40	CFR	82	F						
40	CFR	72	A						
40	CFR	60	A	3,7,8,11					
40	CFR	60	A	12,13,19					

Facility State Only Requirements ☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	293							
6	NYCRR	202	1						
6	NYCRR	202	2						
6	NYCRR	621							

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section II - Identification Information

Project Description (continuation)

Auxiliary equipment includes a low nitrogen oxide (NOx) natural gas-fired auxiliary boiler, needed to keep the HRSGs warm during periods of turbine shutdown and to provide sealing steam during startups. The stacks for the facility are 275 feet tall. The project is located on an approximately 122-acre site in Wawayanda, Orange County, New York. The project activities are located on an approximately 21-acre area that is bounded to the east by State Route 17M/6; to the north by State Route 6 and to the south by Interstate 84.

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section III - Facility Information

Facility Description (continuation)

(HRSGs) and a single steam turbine generator (STG). Supporting ancillary equipment includes a 48.1 mmBtu/hr natural gas fired auxiliary boiler, a 10.08 mmBtu/hr ULSD emergency generator, one dew point heater with two 4.48 mmBtu/hr fuel gas burners and a 1.96 mmBtu/hr ULSD fire water pump engine. The CTGs are fueled by natural gas. Ultra-low sulfur diesel may be used as backup fuel for up to 720 hours per year per turbine. The duct burners will fire natural gas exclusively. The CTGs utilize dry low-NOx (DLN) combustors for gas firing and water injection for control of nitrogen oxides (NOx) when firing ultra-low sulfur diesel. Selective catalytic reduction (SCRs) systems are used to further control NOx emissions. Oxidation catalysts and efficient combustion controls will be used to control emissions of carbon monoxide (CO) as well as volatile organic compounds (VOCs). Emissions of SO2 and PM/PM-10 are minimized through the use of pipeline natural gas and ULSD as backup, as well as efficient combustion controls. Upon leaving the SCRs, turbines gases are directed to individual stacks at 275 feet above grade with a flue diameter of 19 feet. In addition, CTGs inlet air will be cooled using an evaporative cooler when ambient temperatures are high, to improve CTGs efficiency.

The auxiliary boiler employs low-NOx burners (LNB) and flue gas recirculation (FGR) to control emissions of NOx. The auxiliary boiler will operate as needed for any start up condition to keep the HRSG warm during periods of turbine shutdown and to provide sealing steam to the steam turbine in the case of warm and hot startups. Total boiler hours for the facility will be limited to 2,000 hours per year.

The dew point fuel gas heater employs two forced draft burners to reduce NOx emissions. The unit will heat the natural gas to optimum firing temperature. The dew point heaters is proposed to operate up to 8,760 hours per year.

The emergency diesel fire pump will provide on-site fire fighting capability independent of the utility grid. The emergency diesel generator will be operated only for testing and to maintain operational readiness or if needed for emergency operation. Each emergency engine will be allowed to operate for up to 500 hours per year.

A 1.3 megawatt or similar emergency mobile back up may be used only for testing and to maintain operational readiness or it needed for emergency operation.

The five space heaters are used inside the generation buildings for temperature regulation.

The 930,900 gallon fuel oil storage tank, 600 gallon emergency diesel generator storage tank, and 500 gallon emergency diesel fire pump storage tank are maintained at the facility.

Only the facility's combustion turbines, duct burners and auxiliary boiler are subject to NYSDEC NOx RACT provisions.

The dew point heater, the emergency diesel generator, the emergency diesel fire pump, the five space heaters, the mobile backup generator, the fuel oil storage tank, and the emergency diesel storage tanks are exempt activities pursuant to Part 201-3.2.

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section III - Facility Information

Facility Applicable Federal Requirements (continuation)									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
40	CFR	60	KKKK						
40	CFR	60	IIII						
40	CFR	60	Dc						
40	CFR	60	TTTT						
40	CFR	75	A						
40	CFR	75	B						
40	CFR	75	C						
40	CFR	75	D						
40	CFR	75	F						
40	CFR	75	G						
40	CFR	52	HH						
40	CFR	72	A	6	a	3			
40	CFR	72	A	9					
40	CFR	97	AAAAA						
40	CFR	97	BBBBB						
40	CFR	97	CCCCC						

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section III - Facility Information

Facility State Only Requirements (continuation)									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	3						
6	NYCRR	200	5						
6	NYCRR	200	6						
6	NYCRR	200	7						
6	NYCRR	201	1						
6	NYCRR	201	1	4					
6	NYCRR	201	1	11					
6	NYCRR	201	1	12					
6	NYCRR	201	1	13					
6	NYCRR	201	2						
6	NYCRR	201	3	1					
6	NYCRR	201	3	2					
6	NYCRR	201	3	3					
6	NYCRR	201	5						
6	NYCRR	201	6	1	a				
6	NYCRR	201	6	1	b				
6	NYCRR	201	6	2					
6	NYCRR	201	6	3					
6	NYCRR	201	6	4					
6	NYCRR	201	6	5					
6	NYCRR	201	6	6					
6	NYCRR	201	7						
6	NYCRR	202	1	1					
6	NYCRR	202	1	2					
6	NYCRR	202	1	3					
6	NYCRR	202	1	5					
6	NYCRR	207							
6	NYCRR	211	1						
6	NYCRR	211	2						
6	NYCRR	215							
6	NYCRR	225	1	2	h				

Continuation Sheet 1 of 2

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section III - Facility Information

Facility State Only Requirements (continuation)									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	225	1	6	a				
6	NYCRR	225	1	6	b				
6	NYCRR	227	1						
6	NYCRR	227	1	3	a				
6	NYCRR	227	2						
6	NYCRR	231	2						
6	NYCRR	231	2	1					
6	NYCRR	231	2	2					
6	NYCRR	231	2	3					
6	NYCRR	231	2	4					
6	NYCRR	231	2	5					
6	NYCRR	231	5	3					
6	NYCRR	231	5	4					
6	NYCRR	231	5	5					
6	NYCRR	231	7	5					
6	NYCRR	231	7	6					
6	NYCRR	242	1	5					
6	NYCRR	251	3	a					
6	NYCRR	621	6	a					
6	NYCRR	621	11						
6	NYCRR	621	13						

Continuation Sheet 2 of 2

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Facility Compliance Certification									
☒ Continuation Sheet(s)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	227	1	3	a				

☒ Applicable Federal Requirement ☐ State Only Requirement	☐ Capping	CAS Number	Contaminant Name

Monitoring Information

☒ Work Practice Involving Specific Operations ☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Compliance Activity Description

No owner or operator of a combustion installation shall operate the installation in such a way to emit greater than 20 percent opacity except for one six minute period per hour, not to exceed 27 percent, based upon the six minute average in reference test Method 9 in Appendix A of 40 CFR 60. The opacity standards apply at all times except during periods of start up, shutdown, and malfunction; and all other applicable conditions cited in section 40CFR 60.11.

Work Practice Type Code	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Method 9

Monitored Parameter Code	Monitored Parameter Description	Manufacturer's Name/Model Number
01	Opacity	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
20	0	136	Percent

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
18	6-min average	14	As required	10	Upon Request

Facility Emissions Summary ☒ Continuation Sheet(s)

CAS Number	Contaminant Name	Potential to Emit (tons/yr)	Actual Emissions (pounds/yr)
0NY075 - 00 - 5	PM-10	95.0	
0NY750 - 02 - 5	PM-2.5	95.0	
007446 - 09 - 5	Sulfur Dioxide	42.0	
0NY210 - 00 - 0	Oxides of Nitrogen	183.0	
000630 - 08 - 0	Carbon Monoxide	341.5	
007439 - 92 - 1	Lead (elemental)	0.02	
0NY998 - 00 - 0	Total Volatile Organic Compounds	64.0	
0NY100 - 00 - 0	Total Hazardous Air Pollutants	13.94	
0NY750 - 00 - 0	Carbon Dioxide Equivalents	2,164,438.0	
007664-93-9	Sulfuric Acid	13.0	
007664-41-7	Ammonia	104.8	

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section III - Facility Information

Facility Emissions Summary (continuation)				
CAS No.	Contaminant Name	PTE		Actual
		(lbs/yr)	Range	(lbs/yr)
106-99-0	1,3 Butadiene	6.50E+01	Y	
71-55-6	1, 1, 1-Trichloroethane	0.00E+00	Y	
56-49-5	3-Methylchloranthrene	4.49E-03	Y	
57-97-6	7, 12-Dimethylbenz(a)anthracene	4.40E-02	Y	
83-32-9	Acenaphthene	4.50E+01	Y	
208-96-8	Acenaphthylene	3.62E+00	Y	
75-07-0	Acetaldehyde	1.57E+03	Y	
107-02-8	Acrolein	2.50E+02	Y	
120-12-7	Anthracene	6.54E+00	Y	
07440-38-2	Arsenic	3.46E+01	Y	
56-55-3	Benz(a)anthracene	1.11E+01	Y	
71-43-2	Benzene	2.12E+03	Y	
50-32-8	Benzo(a)pyrene	2.24E+00	Y	
205-99-2	Benzo(b)fluoranthene	6.02E+00	Y	
191-24-2	Benzo(g, h, i)perylene	6.54E+00	Y	
207-08-9	Benzo(k)fluoranthene	6.02E+00	Y	
07740-41-7	Beryllium	9.90E-01	Y	
07740-43-9	Cadmium	1.78E+01	Y	
07740-47-3	Chromium	3.78E+01	Y	
218-01-9	Chrysene	7.82E+00	Y	
07740-48-4	Cobalt	2.30E-01	Y	
53-70-3	Dibenzo(a, h)anthracene	5.38E+00	Y	
106-46-7	Dichlorobenzene	3.30E+00	Y	
100-41-4	Ethylbenzene	1.25E+03	Y	
206-44-0	Fluoranthene	1.48E+01	Y	
7782-96-5	Fluorene	1.39E+01	Y	
50-00-0	Formaldehyde	5.02E+03	Y	
110-54-3	Hexane	4.94E+03	Y	
193-39-5	Indeno(1,2,3-cd)pyrene	7.34E+00	Y	
07439-92-1	Lead	4.46E+01	Y	

Continuation Sheet 1 of 2

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-356-00136

Section III - Facility Information

Facility Emissions Summary (continuation)				
CAS No.	Contaminant Name	PTE (lbs/yr)	PTE Range	Actual (lbs/yr)
07439-96-5	Manganese	2.44E+00	Y	
07439-97-6	Mercury	4.42E+00	Y	
133-02-7	Xylenes	2.50E+03	Y	
91-20-3	Naphthalene	1.57E+02	Y	
0770-02-0	Nickel	4.32E+01	Y	
130498-29-2	PAH	2.02E+02	Y	
85-01-8	Phenanthrene	5.00E+01	Y	
	POM	0.00E+00	Y	
75-56-9	Propylene Oxide	1.13E+03	Y	
129-00-0	Pyrene	1.70E+01	Y	
07782-49-2	Selenium	7.72E+01	Y	
108-88-3	Toluene	5.10E+03	Y	
56-23-5	Carbon Tetrachloride	7.08E+01	Y	
75-01-4	Vinyl Chloride	1.22E+02	Y	
79-01-06	Trichloroethylene	6.36E+01	Y	
127-18-4	Tetrachloroethylene (Perchloroethylene)	7.50E+01	Y	
7440-62-2	Vanadium	6.32E+00	Y	

Continuation Sheet 2 of 2

New York State Department of Environmental Conservation
Air Permit Application

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Description	☐ Continuation Sheet(s)
Emission Unit	U - 0 0 0 0 1

One Siemens SGT6-5000 F-Class combustion turbine which has a nominal rating of 1,998 mm Btu/hr at 51 °F (2,234 mmBtu/hr at -5°F) on natural gas and (2,145 mmBtu/hr at -5°F) on fuel oil (<0.0015% sulfur). The turbine is equipped with dry low-NOx combustors, steam injection, SCR and oxidation catalyst emission controls. This emission unit also contains a natural gas-fired duct burner rated at a nominal capacity of 500 mmBtu/hr.

Building Information ☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
GEN01	Generation Building	300	260	North
ACC01	Air Cooled Condenser	296	327	North
HRSG01	Heat Recovery Steam Generator - Inside Generation Building	160	105	North

Emission Unit U - 0 0 0 0 1 — **Emission Unit Emissions Summary** ☒ Continuation Sheet(s)

CAS Number	Contaminant Name			
0NY075-00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	**Contaminant Name**			
0NY075 - 00 - 5	PM-10			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	**Contaminant Name**			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	**Contaminant Name**			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		174,900.0		

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 0 0 0 0 1				
CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		334,000.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		41,000.0		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		62,800.0		
CAS No.	Contaminant Name			
0NY100 - 00 - 0	Total Hazardous Air Pollutants			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		13,770.0		
CAS No.	Contaminant Name			
0NY750 - 00 - 0	Carbon Dioxide Equivalents			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		2,164,438,000.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		12,600.0		
CAS No.	Contaminant Name			
007664-41-7	Ammonia			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		104,800.0		

Continuation Sheet 1 of 2

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit U - 0 0 0 0 1	Emission Unit Emissions Summary (continuation)			
CAS No.	Contaminant Name			
007439 - 92 - 1	Lead (elemental)			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		22.30		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 2 of 2

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Emission Point Information

☐ Continuation Sheet(s)

Emission Point: EP001

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
496	275	140	228	195		

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
74.26	1,310,911	546.98048	4584.69287		178	

Emission Point:

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Point:

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information

☒ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
CT001	C	08/2015	01/2018				Siemens SGT6-5000 Class-F Turbine

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
2234	25	mmBtu/hr				

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
DB001	C	08/2015	01/2018				Forney Duct Burner

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
500	25	mmBtu/hr				

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
DLN01	K	08/2015	01/2018		103	dry low NOx burner	

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Source/Control (continuation)

Emission Unit: U - 0 0 0 0 1

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
STI01	K	08/2015	01/2018		028	steam or water injection	

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
SCR01	K	08/2015	01/2018		033	selective catalytic reduction (SCR)	YARA SCR

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
OXY01	K	08/2015	01/2018		110	catalytic oxidation	SYNERGY

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Process Information ☒ Continuation Sheet(s)

Emission Unit	U-00001	Process	P1A

Process Description

Process P1A represents natural gas firing in the Siemens SGT6-5000 Class-F combustion turbine, which has a nominal rating of 2,234 mmBtu/hr at -5°F (maximum heat input scenario). Dry low-NOx combustion technology, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the nominal firing rate (2,234 mm Btu/hr at -5°F) and the quantity per year throughput represents the turbine at the firing rate at the annual average ambient temperature of 51 °F (1,998 mmBtu/hr). Natural gas Higher Heating Value (HHV) is assumed to be 1,048 Btu/cubic foot.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	2.13	1,690.51	0115	million cubic feet of natural gas

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

CT001	DLN01	SCR01	OXY01			

Emission Source/Control Identifier(s)

Emission Unit	U-00001	Process	P2A

Process Description

Process P2A represents combined natural gas firing in the Siemens SGT6-5000 Class-F combustion turbine, which has a nominal rating of 2,234 mmBtu/hr at -5°F (maximum heat input scenario) and natural gas firing with in the duct burner, which has a nominal rating of 500 mmBtu/hr. Dry low-NOx combustion technology, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the maximum firing rate of the turbine (2,234 mmBtu/hr at -5°F) plus the duct burner at rated capacity (500 mm Btu/hr) and the quantity per year throughput represents 8,760 hours of natural gas firing in the turbine at the annual average ambient temperature of 51 °F (1,998 mmBtu/hr) plus 2,628 hours of natural gas firing in the duct burner at rated capacity (500 mmBtu/hr). Natural gas Higher Heating Value (HHV) is assumed to be 1,048 Btu/cubic foot.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	2.61	1,690.51	0115	million cubic feet of natural gas

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

CT001	DB001	DLN01	SCR01	OXY01		

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Process Information (continuation)

Emission Unit	U-00001	Process	P3A

Description

Process P3A represents fuel oil firing in the Class-F combustion turbine, which has a nominal rating of 2,145 mm Btu/hr at -5 F (maximum heat input scenario). Dry low-NOx combustion technology, steam or water injection, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the nominal firing rate (2,145 mm Btu/hr at -5 F) and the quantity per year fuel oil firing at the firing rate at -5 F ambient temperature. Fuel oil Higher Heating Value (HHV) is assumed to be 139,728 throughput represents 720 hours of Btu/gallon.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-001-01	15.351	10,017	0607	1000 gallons burned

	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
☐ Confidential ☒ Operating at Maximum Capacity	24	30		

Emission Point Identifier(s)

CT001	DLN01	STI01	SCR01	OXY01		

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
☐ Confidential ☐ Operating at Maximum Capacity				

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Description ☐ Continuation Sheet(s)

Emission Unit: U - 0 0 0 0 2

One Siemens SGT6-5000 F-Class combustion turbine which has a nominal rating of 1,998 mm Btu/hr at 51 °F (2,234 mmBtu/hr at -5°F) on natural gas and (2,145 mmBtu/hr at -5°F) on fuel oil (<0.0015% sulfur). The turbine is equipped with dry low-NOx combustors, steam injection, SCR and oxidation catalyst emission controls. This emission unit also contains a natural gas-fired duct burner rated at a nominal capacity of 500 mmBtu/hr.

Building Information ☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
GEN02	Generation Building	300	260	North
ACC02	Air Cooled Condenser	296	327	North
HRSG02	Heat Recovery Steam Generator - Inside Generation Building	160	105	North

Emission Unit Emissions Summary ☒ Continuation Sheet(s)

Emission Unit: U - 0 0 0 0 2

CAS Number	Contaminant Name			
0NY075-00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	Contaminant Name			
0NY075 - 00 - 5	PM-10			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	Contaminant Name			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		94,200.0		
CAS Number	Contaminant Name			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		174,900.0		

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)
U - 0 0 0 0 2	

CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		334,000.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		41,000.0		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		62,800.0		
CAS No.	Contaminant Name			
0NY100 - 00 - 0	Total Hazardous Air Pollutants			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		13,770.0		
CAS No.	Contaminant Name			
0NY750 - 00 - 0	Carbon Dioxide Equivalents			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		2,164,438,000.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		12,600.0		
CAS No.	Contaminant Name			
007664-41-7	Ammonia			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		104,800.0		

Continuation Sheet 1 of 2

New York State Department of Environmental Conservation
Air Permit Application Form

New York | State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3356 - 00136

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 00002				
CAS No.	Contaminant Name			
007439 - 92 - 1	Lead (elemental)			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		22.30		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 2 of 2

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Emission Point Information

☐ Continuation Sheet(s)

Emission Point	EP002					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
496	275	140	228	195		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
76.91	1,357,528	546.99053	4584.65455		305	

Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information

☒ Continuation Sheet(s)

Emission Source ID	Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
CT002	C	08/2015	01/2018				Siemens SGT6-5000 Class-F Turbine
Design Capacity	**Design Capacity Units Code**	**Design Capacity Units Description**			**Waste Feed Code**	**Waste Feed Description**	**Waste Type Code / Description**
2234	25	mmBtu/hr					
Emission Source ID	**Type**	**Date of Construction**	**Date of Operation**	**Date of Removal**	**Control Type Code**	**Control Type Description**	**Manufacturer's Name/Model Number**
DB002	C	08/2015	01/2018				Forney Duct Burner
Design Capacity	**Design Capacity Units Code**	**Design Capacity Units Description**			**Waste Feed Code**	**Waste Feed Description**	**Waste Type Code / Description**
500	25	mmBtu/hr					
Emission Source ID	**Type**	**Date of Construction**	**Date of Operation**	**Date of Removal**	**Control Type Code**	**Control Type Description**	**Manufacturer's Name/Model Number**
DLN02	K	08/2015	01/2018		103	dry low NOx burner	
Design Capacity	**Design Capacity Units Code**	**Design Capacity Units Description**			**Waste Feed Code**	**Waste Feed Description**	**Waste Type Code / Description**

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Source/Control (continuation)							
Emission Unit	U - 0 0 0 0 2						
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
STI02	K	08/2015	01/2018		028	steam or water injection	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
SCR02	K	08/2015	01/2018		033	selective catalytic reduction (SCR)	YARA SCR
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
OXY02	K	08/2015	01/2018		110	catalytic oxidation	SYNERGY
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Process Information ☒ Continuation Sheet(s)

Emission Unit	U - 0 0 0 0 2	Process	P 0 1

Process Description

Process P01 represents natural gas firing in the Siemens SGT6-5000 Class-F combustion turbine, which has a nominal rating of 2,234 mmBtu/hr at -5°F (maximum heat input scenario). Dry low-NOx combustion technology, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the nominal firing rate (2,234 mm Btu/hr at -5°F) and the quantity per year throughput represents the turbine at the firing rate at the annual average ambient temperature of 51 °F (1,998 mmBtu/hr). Natural gas Higher Heating Value (HHV) is assumed to be 1,048 Btu/cubic foot.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	2.13	1,690.51	0115	million cubic feet of natural gas

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

CT002	DLN02	SCR02	OXY02			

Emission Source/Control Identifier(s)

Emission Unit	U - 0 0 0 0 2	Process	P 0 2

Process Description

Process P02 represents combined natural gas firing in the Siemens SGT6-5000 Class-F combustion turbine, which has a nominal rating of 2,234 mmBtu/hr at -5°F (maximum heat input scenario) and natural gas firing with the duct burner, which has a nominal rating of 500 mmBtu/hr. Dry low-NOx combustion technology, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the maximum firing rate of the turbine (2,234 mmBtu/hr at -5°F) plus the duct burner at rated capacity (500 mm Btu/hr) and the quantity per year throughput represents 8,760 hours of natural gas firing in the turbine at the annual average ambient temperature of 51 °F (1,998 mmBtu/hr) plus 2,628 hours of natural gas firing in the duct burner at rated capacity (500 mmBtu/hr). Natural gas Higher Heating Value (HHV) is assumed to be 1,048 Btu/cubic foot.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	2.61	1,690.51	0115	million cubic feet of natural gas

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

CT002	DB002	DLN02	SCR02	OXY02		

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Process Information (continuation)

Emission Unit	U - 0 0 0 0 2	Process	P 0 3

Description

Process P03 represents fuel oil firing in the Siemens SGT6-5000 Class-F combustion turbine, which has a nominal rating of 2,145 mm Btu/hr at -5 F (maximum heat input scenario). Dry low-NOx combustion technology, steam or water injection, selective catalytic reduction (SCR) and oxidation catalyst will be used to minimize emissions of NOx, CO, and VOC. The quantity per hour throughput listed below represents the nominal firing rate (2,145 mm Btu/hr at -5 F) and the quantity per year fuel oil firing at the firing rate at -5 F ambient temperature. Fuel oil Higher Heating Value (HHV) is assumed to be 139,728 throughput represents 720 hours of Btu/gallon.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-001-01	15.351	10,017	0607	1000 gallons burned

☐ Confidential ☒ Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
	24	30		

Emission Point Identifier(s)

CT002	DLN02	STI02	SCR02	OXY02		

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

☐ Confidential ☐ Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Description ☐ Continuation Sheet(s)

Emission Unit: U - 0 0 0 0 3

One auxiliary boiler with a nominal rating of 48.1 mmBtu/hr that will fire natural gas exclusively. The boiler hours will be limited to 2000 hours per year. The boiler will operate primarily to assist with startups and shutdowns of the turbine.

Building Information ☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
GEN02	Auxiliary Boiler Located Inside Generation Building	300	260	North

Emission Unit Emissions Summary ☒ Continuation Sheet(s)

Emission Unit: U - 0 0 0 0 3

CAS Number	Contaminant Name			
0NY075 - 00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		600.0		
CAS Number	**Contaminant Name**			
0NY075 - 00 - 5	PM-10			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		600.0		
CAS Number	**Contaminant Name**			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		600.0		
CAS Number	**Contaminant Name**			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		4,320.0		

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 0 0 0 0 3				
CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		6,940.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		220.0		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		360.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		220.0		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Emission Point Information

☐ Continuation Sheet(s)

Emission Point	EP003					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
496	275	140	228	301		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
57.53	14,194	546.99053	4584.65455		305	
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information

☐ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
AUX01	C	08/2015	01/2018			low NOx burner	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description			Waste Feed Code	Waste Feed Description	Waste Type Code / Description
48.1	25	mmBtu/hr					
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
LNB01	K	08/2015	01/2018		102	low NOx burner	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description			Waste Feed Code	Waste Feed Description	Waste Type Code / Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
FGR01	K	08/2015	01/2018		026	flue gas recirculation	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description			Waste Feed Code	Waste Feed Description	Waste Type Code / Description

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Process Information

☐ Continuation Sheet(s)

Emission Unit	U - 0 0 0 0 3	Process	P 3 B

Process Description

Process P3B represents natural gas firing in the auxiliary boiler, which has a nominal rating of 48.1 mmBtu/hr. Total natural gas usage will not exceed 2,000 full load boiler hours per year. Natural gas Higher Heating Value (HHV) is assumed to be 1,048 Btu/cubic foot.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
1-02-006-02	0.07	93.73	0115	million cubic feet of natural gas

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

AUX01	LNB01	FGR01				

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Process Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hours/Day	Days/Year		

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Description	☐ Continuation Sheet(s)
Emission Unit	U - 0 0 0 0 4

Kohler Power System
Model: 1000REOZDE
Engine Manufacturer: Detroit Diesel/MTU
Engine Model: 16V2000 G85 R163-8A37
Engine: type 4-Cycle,Turbocharged, Intercooled

Building Information ☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
DGB01	Generation Building	32	11	

Emission Unit U - 0 0 0 0 4

Emission Unit Emissions Summary ☒ Continuation Sheet(s)

CAS Number	Contaminant Name			
0NY075 - 00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		98.0		
CAS Number	Contaminant Name			
0NY075 - 00 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		98.0		
CAS Number	Contaminant Name			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		98.0		
CAS Number	Contaminant Name			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		6,660		

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 0 0 0 0 4				
CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		984.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		9.7		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		282.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		0.2		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Emission Point Information ☐ Continuation Sheet(s)

Emission Point: EP004

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
464	50	27	18	1,022		

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
104.3	7,840	547.12988	4584.6514	DGB01	262	

Emission Point:

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Point:

Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)

Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information ☐ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
EG01	C	08/2015	01/2018				16V2000 G85 R163-8A37

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
10.08	0104	mmBtu/hr				

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

New York State Department of Environmental Conservation
Air Permit Application

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Description ☐ Continuation Sheet(s)

Emission Unit: U-00005

Fire Pump Diesel Engine
Cummins CFP9E-F20

Building Information ☒ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
FPB01	Fire Water Pump Building	30	12	

Emission Unit Emissions Summary ☐ Continuation Sheet(s)

Emission Unit: U-00005

CAS Number	Contaminant Name			
0NY075 - 00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		36.0		
CAS Number	**Contaminant Name**			
0NY075 - 00 - 5	PM-10			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		36.0		
CAS Number	**Contaminant Name**			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		36.0		
CAS Number	**Contaminant Name**			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		684.0		

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 0 0 0 0 5				
CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		440.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		150.2		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		38.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		0.030		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Emission Point Information

☐ Continuation Sheet(s)

Emission Point	E P 0 0 5					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
464	50	37	6	1,030		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
136.2	1,813	546.81502	4584.66944	FPB01	161	
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information

☐ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
F P 0 1	C	08/2015	01/2018				CFP9E-F20
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
1.96	0104	mmBtu/hr					
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

New York State Department of Environmental Conservation
Air Permit Application

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3356 - 00136

Section IV - Emission Unit Information

Emission Unit Description	☐ Continuation Sheet(s)
Emission Unit	U - 00006

One Dew Point Heater with Two Fuel Gas Burners:
Model: Maxon OVENPAK® LE 45 Gas Burners – with SMARTLINK® DS Actuator

Building Information ☒ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
None	Located Outdoor			

Emission Unit Emissions Summary ☐ Continuation Sheet(s)

Emission Unit: U - 00006

CAS Number	Contaminant Name			
0NY075 - 00 - 0	Particulates			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		666.0		
CAS Number	**Contaminant Name**			
0NY075 - 00 - 5	PM-10			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		666.0		
CAS Number	**Contaminant Name**			
0NY750 - 02 - 5	PM-2.5			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		666.0		
CAS Number	**Contaminant Name**			
0NY210 - 00 - 0	Oxides of Nitrogen			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		3,190.0		

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Unit Emissions Summary (continuation)			
U - 0 0 0 0 6				
CAS No.	Contaminant Name			
000630 - 08 - 0	Carbon Monoxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		6,394.0		
CAS No.	Contaminant Name			
007446 - 09 - 5	Sulfur Dioxide			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		192.0		
CAS No.	Contaminant Name			
0NY998 - 00 - 0	Volatile Organic Compounds			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		438.0		
CAS No.	Contaminant Name			
007664-93-9	Sulfuric Acid			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
		17.6		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Emission Point Information

☐ Continuation Sheet(s)

Emission Point	E P 0 0 6					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
464	125		24	850		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
16.07	3,031	546.95885	4584.58	Outdoors	156	
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
Emission Point						
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control Information

☐ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
F G H 1	C	08/2015	01/2018		102	Low NOx Burner	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
9.0	0104	mmBtu/hr					
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
						Low NOx Burner	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements							☒ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-00001				40	CFR	60	A	3					
U-00001				40	CFR	60	A	7					
U-00001				40	CFR	60	A	8					
U-00001				40	CFR	60	A	11					

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements							☒ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-00001				6	NYCRR	204	1	6,7					
U-00001				6	NYCRR	204	2						
U-00001				6	NYCRR	204	3						
U-00001				6	NYCRR	204	4						

Emission Unit Compliance Certification

☐ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS Number	Contaminant Name
U-00001	EP001	P1A,P2A		NY210-00-0	Oxides of nitrogen

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of a Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Compliance Activity Description

2.0 ppmvd (corrected to 15% 02) NOx emission limit for the combustion turbine (with and without the duct burner) based upon the Higher Heating Value (HHV) of the fuel. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor NOx stack emissions. The emission limits represents LAER.

Work Practice Type Code	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 7E

Monitored Parameter Code	Monitored Parameter Description	Manufacturer's Name/Model Number
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-hour block average	01	Continuous	07	Quarterly

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00001				40	CFR	60	A	12					
U-00001				40	CFR	60	A	13					
U-00001				40	CFR	60	A	19					
U-00001				40	CFR	82	F						
U-00001				40	CFR	72	A	6					
U-00001				40	CFR	72	A	9					
U-00001				40	CFR	60	KKKK	4320	a,b				
U-00001				40	CFR	60	KKKK	4325					
U-00001				40	CFR	60	KKKK	4330	a	1,2			
U-00001				40	CFR	60	KKKK	4333	a,b	1,2			
U-00001				40	CFR	60	KKKK	4335	b	1,2,3			
U-00001				40	CFR	60	KKKK	4350					
U-00001				40	CFR	60	KKKK	4365	a				
U-00001				40	CFR	60	KKKK	4375	a				
U-00001				40	CFR	60	KKKK	4380	b				
U-00001				40	CFR	60	KKKK	4395					
U-00001				40	CFR	60	KKKK	4400					
U-00001				40	CFR	60	KKKK	4405					
U-00001				40	CFR	60	KKKK	4345	a,b,c,d,e				
U-00001				40	CFR	75	B	10					
U-00001				40	CFR	75	B	11	d				
U-00001				40	CFR	75	B	11	d	2			
U-00001				40	CFR	75	B	12	c				
U-00001				40	CFR	75	B	13	b				
U-00001				40	CFR	75	C						
U-00001				40	CFR	75	D						
U-00001				40	CFR	75	F	59					
U-00001				40	CFR	75	F	53	a,b,e,f				
U-00001				40	CFR	75	F	54					
U-00001				40	CFR	75	F	58	b	2,3			
U-00001				40	CFR	75	G						

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00001				6	NYCRR	204	5						
U-00001				6	NYCRR	204	6						
U-00001				6	NYCRR	204	7						
U-00001				6	NYCRR	204	8						
U-00001				6	NYCRR	204	9						
U-00001				6	NYCRR	237	1	4	a				
U-00001				6	NYCRR	237	1	6,7					
U-00001				6	NYCRR	237	2						
U-00001				6	NYCRR	237	3						
U-00001				6	NYCRR	237	4	1					
U-00001				6	NYCRR	237	5	3	a				
U-00001				6	NYCRR	237	6						
U-00001				6	NYCRR	237	7						
U-00001				6	NYCRR	237	8						
U-00001				6	NYCRR	238	1	4,6,7					
U-00001				6	NYCRR	238	2						
U-00001				6	NYCRR	238	3						
U-00001				6	NYCRR	238	4	1					
U-00001				6	NYCRR	238	5	3					
U-00001				6	NYCRR	238	6						
U-00001				6	NYCRR	238	7						
U-00001				6	NYCRR	238	8						
U-00001				6	NYCRR	242	1	6,7					
U-00001				6	NYCRR	242	2,3,4,5						
U-00001				6	NYCRR	242	6,7,8,10						
U-00001				6	NYCRR	227	1	2	a	1			
U-00001				6	NYCRR	227	1	3					
U-00001				6	NYCRR	227	1	4	d				
U-00001				6	NYCRR	227	2	4	e	2			
U-00001				6	NYCRR	227	2	6					

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements							☒ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-00002				40	CFR	60	A	3					
U-00002				40	CFR	60	A	7					
U-00002				40	CFR	60	A	8					
U-00002				40	CFR	60	A	11					

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements							☒ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-00002				6	NYCRR	204	1	6,7					
U-00002				6	NYCRR	204	2						
U-00002				6	NYCRR	204	3						
U-00002				6	NYCRR	204	4						

Emission Unit Compliance Certification

☐ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS Number	Contaminant Name
U-00002	EP002	P01,P02		NY210-00-0	Oxides of nitrogen

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of a Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Compliance Activity Description

2.0 ppmvd (corrected to 15% 02) NOx emission limit for the combustion turbine (with and without the duct burner) based upon the Higher Heating Value (HHV) of the fuel. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor NOx stack emissions. The emission limits represents LAER.

Work Practice Type Code	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 7E

Monitored Parameter Code	Monitored Parameter Description	Manufacturer's Name/Model Number
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-hour block average	01	Continuous	07	Quarterly

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00002				40	CFR	60	A	12					
U-00002				40	CFR	60	A	13					
U-00002				40	CFR	60	A	19					
U-00002				40	CFR	82	F						
U-00002				40	CFR	72	A	6	a	3			
U-00002				40	CFR	72	A	9					
U-00002				40	CFR	60	KKKK	4320	a,b				
U-00002				40	CFR	60	KKKK	4325					
U-00002				40	CFR	60	KKKK	4330	a	1,2			
U-00002				40	CFR	60	KKKK	4333	a,b	1,2			
U-00002				40	CFR	60	KKKK	4335	b	1,2,3			
U-00002				40	CFR	60	KKKK	4350					
U-00002				40	CFR	60	KKKK	4365	a				
U-00002				40	CFR	60	KKKK	4375	a				
U-00002				40	CFR	60	KKKK	4380	b				
U-00002				40	CFR	60	KKKK	4395					
U-00002				40	CFR	60	KKKK	4400					
U-00002				40	CFR	60	KKKK	4405					
U-00002				40	CFR	60	KKKK	4345	a,b,c,d,e				
U-00002				40	CFR	75	B	10					
U-00002				40	CFR	75	B	11	d				
U-00002				40	CFR	75	B	11	d	2			
U-00002				40	CFR	75	B	12	c				
U-00002				40	CFR	75	B	13	b				
U-00002				40	CFR	75	C						
U-00002				40	CFR	75	D						
U-00002				40	CFR	75	F	59					
U-00002				40	CFR	75	F	53	a,b,e,f				
U-00002				40	CFR	75	F	54					
U-00002				40	CFR	75	F	58	b	2,3			
U-00002				40	CFR	75	G						

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00002				6	NYCRR	204	5						
U-00002				6	NYCRR	204	6						
U-00002				6	NYCRR	204	7						
U-00002				6	NYCRR	204	8						
U-00002				6	NYCRR	204	9						
U-00002				6	NYCRR	237	1	4	a				
U-00002				6	NYCRR	237	1	6,7					
U-00002				6	NYCRR	237	2						
U-00002				6	NYCRR	237	3						
U-00002				6	NYCRR	237	4	1					
U-00002				6	NYCRR	237	5	3	a				
U-00002				6	NYCRR	237	6						
U-00002				6	NYCRR	237	7						
U-00002				6	NYCRR	237	8						
U-00002				6	NYCRR	238	1	4,6,7					
U-00002				6	NYCRR	238	2						
U-00002				6	NYCRR	238	3						
U-00002				6	NYCRR	238	4	1					
U-00002				6	NYCRR	238	5	3					
U-00002				6	NYCRR	238	6						
U-00002				6	NYCRR	238	7						
U-00002				6	NYCRR	238	8						
U-00002				6	NYCRR	242	1	6,7					
U-00002				6	NYCRR	242	2,3,4,5						
U-00002				6	NYCRR	242	6,7,8,10						
U-00002				6	NYCRR	227	1	2	a	1			
U-00002				6	NYCRR	227	1	3					
U-00002				6	NYCRR	227	1	4	d				
U-00002				6	NYCRR	227	2	4	e	2			
U-00002				6	NYCRR	227	2	6					

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00003				40	CFR	60	Dc	42c	d				
U-00003				40	CFR	60	Dc	43c	a	2			
U-00003				40	CFR	60	Dc	43c	c				

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements (continuation)									
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.
U-00003				6	NYCRR	227	2	4	d				
U-00003				6	NYCRR	227	2	6					

Continuation Sheet 1 of 1

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Request for Emission Reduction Credits

☐ Continuation Sheet(s)

Emission Source	0 0 0 0 1

Emission Reduction Description

The facility purchased Emission Reductions Credits in the amount of 216.0 tons NOx and 75.0 tons VOC. Please see appendix 11 for additional information.

Contaminant Emission Reduction Data

Baseline Period ____/____/________ to ____/ ____/ ________		Reduction	
		Date	Method
CAS Number	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset
0NY210 - 00 - 0	Oxides of Nitrogen		432,000.0
0NY998 - 00 - 0	Volatile Organic Compounds		150,000.0

Facility to Use Future Reduction

Name CPV Valley Energy Center	Application ID: - - /
Location Address 3330 Route 6	
× City/ ☐ Town / ☐ Village Middletown	State NY · Zip 10940

Use of Emission Reduction Credits

☐ Continuation Sheet(s)

Emission Source	

Proposed Project Description

Contaminant Emissions Increase Data

CAS Number	Contaminant Name	Project Emission Potential (lbs/yr)

Statement of Compliance

☐ All facilities under the ownership of this "owner/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.

Source of Emission Reduction Credit - Facility

Name	Permit ID: - - /
Location Address	
☐ City/ ☐ Town / ☐ Village	State · Zip

Emission Source	CAS Number	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Supporting Documentation and Attachments

Required Supporting Documentation	Date of Document
× List of Exempt Activities (attach form)	8/5/2018
× Plot Plan	5/5/2017
× Process Flow Diagram	7/16/2015
× Methods Used to Determine Compliance (attach form)	8/5/2018
× Emissions Calculations	Submitted 8/2017
Optional Supporting Documentation	**Date of Document**
× Air Quality Model	Attachment 11
Confidentiality Justification	
Ambient Air Quality Monitoring Plan or Reports	
× Stack Test Protocol	Submitted 8/9/2017
× Stack Test Report	USLD Test
× Continuous Emissions Monitoring Plan	
× Lowest Achievable Emission Rate (LAER) Demonstration	USLD Test
× Best Available Control Technology (BACT) Demonstration	USLD Test
Reasonably Available Control Technology (RACT) Demonstration	
Toxic Impact Assessment (TIA)	
Environmental Rating Demonstration	
Operational Flexibility Protocol/Description of Alternate Operating Scenarios	
× Title IV Permit Application	01/2018
Emission Reduction Credit (ERC) Quantification (attach form)	
Baseline Period Demonstration	
Use of Emission Reduction Credits (attach form)	
Analysis of Contemporaneous Emissions Increase/Decrease	
Other Supporting Documentation	**Date of Document**

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section III - Facility Information

Facility Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

		CAS No.	Contaminant Name
☒ Applicable Federal Requirement ☐ State Only Requirement	☐ Capping	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

Facility Sulfur Dioxide emissions are subject to BACT and the fuel sulfur limit listed in 6 NYCRR 225-1.2 (g). The facility is proposing to limit the sulfur content no greater than 0.0015% sulfur by weight. The sulfur content of the fuel will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	007	number 2 oil	ASTM D 2880-71

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	sulfur content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		57	Percent by weight.

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum - not to be exceeded	11	per delivery	15	Annually

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P3A	CT001	0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 6.0 ppmvd (corrected to 15% 02) NOx emission limit when firing on fuel oil from the combustion turbine based upon Higher Heating Value (HHV) of the fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor NOx stack emissions. The emission limits represents LAER.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Appendix A, Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
6.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

Continuation Sheet 2 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P03	CT002	0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 6.0 ppmvd (corrected to 15% 02) NOx emission limit when firing fuel oil from the combustion turbine based upon Higher Heating Value (HHV) of the fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor NOx stack emissions. The emission limits represents LAER.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Appendix A, Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
6.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

Continuation Sheet 3 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain 0.0450 lb/mmBtu NOx emission limit when firing natural gas from the auxiliary boiler based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the LAER emission limit, as required.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Appendix A, Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.045		07	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P3A	CT001	0NY998-00-0	VOC

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☒ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.7 ppmvd (corrected to 15% 02) VOC emission limit from the combustion turbine based upon Higher Heating Value (HHV) of the natural gas (without duct burner) and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A, Method 18

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.7		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P2A	CT001	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring ☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 1.8 ppmvd (corrected to 15% 02) VOC emission limit from the combustion turbine (with duct burner) based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
1.8		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 6 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P03	CT002	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.7 ppmvd (corrected to 15% 02) VOC emission limit from the combustion turbine based upon Higher Heating Value (HHV) of the natural gas (without duct burner) and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A, Method 18

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.7		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P02	CT002	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 1.8 ppmvd (corrected to 15% 02) VOC emission limit from the combustion turbine (with duct burner) based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A, Method 18

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
1.8		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0038 lb/mmBtu VOC emission limit when firing on natural gas from the auxiliary boiler based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the LAER emission limit, as required

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A, Method 18

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0038		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 9 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P3A	CT001	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 2.0 ppmvd (corrected to 15% 02) CO emission limit for the combustion turbine based upon the Higher Heating Value (HHV) of the the natural gas (without duct burner) and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor CO stack emissions. The emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P03	CT002	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 2.0 ppmvd (corrected to 15% 02) CO emission limit for the combustion turbine based upon the Higher Heating Value (HHV) of the the natural gas (without duct burner) and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor CO stack emissions. The emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

Continuation Sheet 11 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P2A	CT001	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 3.4 ppmvd (corrected to 15% 02) CO emission limit for the combustion turbine (with duct burner) based upon the Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor CO stack emissions. The emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
3.4		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P02	CT002	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 3.4 ppmvd (corrected to 15% 02) CO emission limit for the combustion turbine (with duct burner) based upon the Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor CO stack emissions. The emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
3.4		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	07	Quarterly

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	000630-08-0	Carbon Monoxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0721 lb/mmBtu CO emission limit when burning natural gas from the auxiliary boiler based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the BACT emission limit, as required.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0721		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 14 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P2A	CT001	0NY075-00-0, 0NY075-00-5	PARTICULATES, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0073 lb/mmBtu PM emission limit with and without duct burner from the combustion turbine based upon Higher Heating Value (HHV) of the natural gas. The emission limits applies at all load except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by stack testing.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA RM 5, 201/201A or 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0073		7	pounds per Million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 15 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P02	CT002	0NY075-00-0, 0NY075-00-5	PARTICULATES, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0073 lb/mmBtu PM emission limit with and without duct burner from the combustion turbine based upon Higher Heating Value (HHV) of the natural gas. The emission limits applies at all load except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by stack testing.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA RM 5, 201/201A or 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0073		7	pounds per Million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 16 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P3A	CT001	0NY075-00-0, 0NY075-00-5	Particulates, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0368 lb/mmBtu PM emission limit when firing fuel oil from the combustion turbine based upon Higher Heating Value (HHV) of the fuel oil. The emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by stack testing.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA RM 5, 201/201A or 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0368		7	pounds per Million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 17 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P03	CT002	0NY075-00-0, 0NY075-00-5	Particulates, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0368 lb/mmBtu PM emission limit when firing fuel oil from the combustion turbine based upon Higher Heating Value (HHV) of the fuel oil. The emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by stack testing.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA RM 5, 201/201A or 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0368		7	pounds per Million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 18 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	0NY075-00-0, 0NY075-00-5	Particulates, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0063 lb/mmBtu PM emission limit when firing natural gas from the auxiliary boiler based on the Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the BACT emission limit, as required.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA RM 5, 201A/201,and 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0063		7	pounds per Million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	13	single occurrence	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P2A	CT001	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0022 lb/mmBtu SO2 emission limit from the combustion turbine (with and without duct burner) based on the Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by limiting sulfur content of the natural gas to 0.8 grains/100 SCF. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuels supplier and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	012	natural gas	ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	14	as required	10	Upon Request

Continuation Sheet 20 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P02	CT002	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0022 lb/mmBtu SO2 emission limit from the combustion turbine (with and without duct burner) based on the Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by limiting sulfur content of the natural gas to 0.8 grains/100 SCF. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuels supplier and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	012	natural gas	ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	14	as required	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P3A	CT001	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0015 lb/mmBtu SO2 emission limit when firing fuel oil from the combustion turbine based on the Higher Heating Value (HHV) of the fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by maintaining compliance with the fuel oil sulfur limit of 0.0015%.The sulfur content of the fuel will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	007	Number 2 Oil	ASTM D 2880-71

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		57	percent by weight

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	11	Per Delivery	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P03	CT002	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0015 lb/mmBtu SO2 emission limit when firing fuel oil from the combustion turbine based on the Higher Heating Value (HHV) of the fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by maintaining compliance with the fuel oil sulfur limit of 0.0015%.The sulfur content of the fuel will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	007	Number 2 Oil	ASTM D 2880-71

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		57	percent by weight

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	11	Per Delivery	10	Upon Request

Continuation Sheet 23 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	007446-09-5	Sulfur Dioxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0022 lb/mm Btu SO2 emission limit from the auxiliary boiler based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will demonstrate compliance with the BACT emission limit by limiting the sulfur content of the natural gas to 0.8 grains/100 scf.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 24 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P2A	CT001	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring ☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0007 lb/mmBtu sulfuric acid mist emission limit from the combustion turbine (with and without duct burner) based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by limiting sulfur content of the natural gas to 0.8 grains/100 scf. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuels supplier and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	012	Natural Gas	ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	14	as required	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P02	CT002	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0007 lb/mmBtu sulfuric acid mist emission limit from the combustion turbine (with and without duct burner) based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by limiting sulfur content of the natural gas to 0.8 grains/100 scf. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuels supplier and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	012	Natural Gas	ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	14	as required	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P3A	CT001	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0005 lb/mm Btu sulfuric acid mist emission limit when firing fuel oil from the combustion turbine based upon Higher Heating Value (HHV) of the gas and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by maintaining compliance with the fuel oil sulfur limit of 0.0015%. The sulfur content of the fuel will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	007	Number 2 Oil	ASTM D 2880-71

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		57	percent by weight

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	11	Per Delivery	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P03	CT002	007664-93-9	Sulfuric Acid

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☒ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0005 lb/mm Btu sulfuric acid mist emission limit from the combustion turbine (with and without duct burner) based upon Higher Heating Value (HHV) of the gas and fuel oil. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will demonstrate compliance with the BACT emission limit by maintaining compliance with the fuel oil sulfur limit of 0.0015%. The sulfur content of the fuel will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	007	Number 2 Oil	ASTM D 2880-71

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		57	percent by weight

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	11	Per Delivery	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0002 lb/mm Btu sulfuric acid mist emission limit from the auxiliary boiler based upon Higher Heating Value (HHV) of the natural gas. This emission limit applies at all loads except during startup and shutdown. The facility will demonstrate compliance with the BACT emission limit by limiting the sulfur content of the natural gas to 0.8 grains/100 scf. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuels supplier and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	012	Natural Gas	ASTM 5504

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.8		13	grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	14	as required	10	Upon Request

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
40	CFR	60	43	3	c				

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00003	EP003	P3B	AUX01		

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

No owner or operator of a combustion installation shall operate the installation in such a way to emit greater than 20 percent opacity except for one six minute period per hour, not to exceed 27 percent, based upon the six minute average in reference test Method 9 in Appendix A of 40 CFR 60.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Method 9

Parameter Code	Parameter Description	Manufacturer Name/Model No.
01	Opacity	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
20	0	136	Percent

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
18	6-min average	13	single occurrence	01	once / batch or monitoring occurrence

Continuation Sheet 30 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	7						

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001	EP001	P1A,P2A,P3A	CT001	007664-41-7	Ammonia

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 5.0 ppmvd (corrected to 15% O2) limit applies during all fuels being fired and duct burner operations.. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor Ammonia stack emissions.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
	154	Ammonia	40 CFR 75 & 40 CFR 60 Appendices A/B/F

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
5.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-hour block average	01	Continuous	07	Quarterly

Continuation Sheet 31 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	7						

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00002	EP002	P01,P02,P03	CT002	007664-41-7	Ammonia

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 5.0 ppmvd (corrected to 15% O2) limit applies during all fuels being fired and duct burner operations. This emission limit applies at all loads except during startup, shutdown and fuel switching. The facility will use CEMS to monitor Ammonia stack emissions.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
	154	Ammonia	40 CFR 75 & 40 CFR 60 Appendices A/B/F

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
5.0		275	parts per million by volume (dry, corrected to 15% 02)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-hour block average	01	Continuous	07	Quarterly

Continuation Sheet 32 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	7						

☐ Applicable Federal Requirement ☒ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
				007664-41-7	Ammonia

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain records to verify concentration of ammonia stored on-site is less than 19%.The ammonia concentration will be certified by the vendor and monitored by the facility.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	154	Ammonia	

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
19		21	percent by volume

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum not to be exceeded	11	Per Delivery	15	annually (calendar)

Continuation Sheet 33 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001/U-00002	EP001/EP002	P1A,PO1	CT001/CT002		

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will have a heat rate of 7605 Btu/kW-hr (HHV) or less at ISO conditions without duct burner firing to achieve a design thermal efficiency.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			ASME PTC 46-1996

Parameter Code	Parameter Description	Manufacturer Name/Model No.
38	Heat Input	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
7605			BTU per kilowatt-hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
60	maximum - not to exceed stated value	09	annually	14	semi-annually (calendar)

Continuation Sheet 34 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	251	3	a					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00001/U-00002	EP001/EP002	P1A,P2A,P3A,P01,P02,P0	CT001/CT002	000124-38-9	Carbon Dioxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility are required to meet an emission rate of 925 pounds of CO2 per MW hour gross electrical output (output-based limit). These emission limits are measured on a 12-month rolling average basis, calculated by dividing the annual total of CO2 emissions over the relevant 12-month period by the annual total (gross) MW generated (output-based limit).

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
925		8	pounds per megawatt hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
17	annual maximum rolled monthly	01	continuous	13	quarterly (calendar)

Continuation Sheet 35 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

LAER is 0.0331 lb/mmBtu. Will be achieved using good combustion controls. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0331		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 36 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

LAER is 4.77 grams per brake horsepower-hour. Will be achieved using good combustion controls. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
4.77		319	grams per brake horsepower-hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 37 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		0NY075-00-0	PARTICULATES

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.03 g/hp-hr. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 201/201A and 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.03		319	grams per brake horsepower-hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 38 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		0NY075-00-5	PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.03 g/hp-hr. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice	Process Material		Reference Test Method
Type	Code	Description	
			Method 201/201A and 202

Parameter		Manufacturer Name/Model No.
Code	Description	
23	concentration	

Limit		Limit Units	
Upper	Lower	Code	Description
0.03		319	grams per brake horsepower-hour

Averaging Method		Monitoring Frequency		Reporting Requirements	
Code	Description	Code	Description	Code	Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		007446-09-5	SULFUR DIOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0014 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0014		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 40 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		007664-93-9	SULFURIC ACID

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☒ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0003 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.00003		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 41 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00004	EP004	P04		000630-08-0	CARBON MONOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.45 g/hp-hr. Will be achieved using good combustion controls. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.45		319	grams per brake horsepower-hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 42 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

LAER is 0.857 pounds per million Btus. Will be achieved using good combustion controls. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.857		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 43 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	5	6	-	0	0	1	3	6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

LAER is 0.3612 lb/mmBtu. Will be achieved using good combustion controls. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.3612		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 44 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		000630-08-0	CARBON MONOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.75 lbs/mmBtus. Will be achieved using good combustion controls. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.75		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 45 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		0NY075-00-0, 0NY075-00-5	PARTICULATES, PM-10

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.043 lb/mmBtus. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 201/201A and 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.043		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		007446-09-5	SULFUR DIOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0014 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0014		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 47 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3356-00136

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00005	EP005	P05		007664-93-9	SULFURIC ACID

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0003 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.00003		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 48 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

LAER is 0.058 pounds per million Btus for each individual gas heater. Will be achieved using forced draft low NOx Burner. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.058		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	5	4					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring ☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Description

LAER is 0.011 lb/mmBtu. Will be achieved using good combustion controls. Emission testing to be performed upon request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.011		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		007664-93-9	SULFURIC ACID

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☒ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0002 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0002		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 51 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		000630-08-0	CARBON MONOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.084 lbs/mmBtus.. Will be achieved using good combustion controls. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.084		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 52 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		0NY075-00-0, 0NY075-00-5	PARTICULATES, PM-10

Monitoring Information

☐ Continuous Emission Monitoring ☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0076 lb/mmBtus.. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			Method 201/201A and 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0076		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 53 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	7	6					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-00006	EP006	P06		007446-09-5	SULFUR DIOXIDE

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

BACT is 0.0022 lb/mmBtu. Will be achieved using low sulfur fuel. Emission testing to be performed at the request of the Department.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA approved methods

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0022		7	pounds per million Btus

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-hour average	14	as required	01	once / batch or monitoring occurrence

Continuation Sheet 54 of 55

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	201	7						

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
				0NY075-02-5	PM 2.5

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

Monthly facility-wide emissions of PM-2.5 will be calculated as the sum of monthly PM-2.5 emissions from individual emission units or source groups. Emissions will be calculated based on heat input (or, equivalently, from fuel use) and emission factors as described below. Annual facility-wide emissions will then be determined at the end of each month on a rolling 12-month basis in order to demonstrate compliance with the 95 ton per year cap.

Unit Op Load	Fuel	Grp	Emission Factor
CT only > 80%	Gas	1	0.0056
CT only < 80%	Gas	2	0.0073
CT + DB > 80%	Gas	3	0.0064
CT only > 85%	Oil	4	0.0247
CT only < 85%	Oil	5	0.0368
Aux Boiler All	Gas	6	0.0063
Gas Heater All	Gas	7	0.0076
EDG All	Oil	8	0.0091
EFP All	Oil	9	0.0429

In cases where fuel use (gallons of oil or SCF of gas) for a source group is monitored directly rather than heat input, the equivalent heat input will be determined by multiplying the monthly fuel usage for the source group by the corresponding fuel heating value (mmBtu/gallon or mmBtu/scf), using the higher heating. In cases where fuel use (gallons of oil or standard cubic feet of gas) for a source group is monitored directly rather than heat input, the equivalent heat input will be determined by multiplying the monthly fuel usage for the source group by the corresponding fuel heating value (mmBtu/gallon or mmBtu/scf), using the higher heating value basis for fuel.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	318	Fuel	

Parameter Code	Parameter Description	Manufacturer Name/Model No.
38	Heat Input	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
95		38	tons per year

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
17	annual maximum rolled monthly	01	CONTINUOUS	15	ANNUALLY (CALENDAR)

Continuation Sheet 55 of 55

New York State Department of Environmental Conservation
Air Permit Application

Department of Environmental Conservation

DEC ID
3-3356-00136

Process Information ☐ Continuation Sheet(s)

Emission Unit	U-00004	Process	P04

Process Description

Process P04 represents the emergency generator firing on diesel fuel.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	110.4	36,300	0045	gallons

	Operating Schedule		Building	Floor/Location
☐ Confidential × Operating at Maximum Capacity	Hours/Day	Days/Year		
	500 Hours			

Emission Point Identifier(s)

EG01						

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Process Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hours/Day	Days/Year		

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application

Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Process Information

☒ Continuation Sheet(s)

Emission Unit	U - 0 0 0 0 6	Process	P 0 6

Process Description

Process P06 represents one dew point heater with two fuel gas burners operating on natural gas.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	5.02	78,489.6	0104	million Btu heat input

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

FGH1						

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Process Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hours/Day	Days/Year		

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application

New York State of Opportunity | Department of Environmental Conservation

DEC ID
3-3356-00136

Process Information			☒ Continuation Sheet(s)
Emission Unit	U-00006	Process	P06

Process Description

Process P06 represents one 9.0 mmBtu/hr dew point heater with two fuel gas burners operating on natural gas.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01	5.02	78,489.6	0104	million Btu heat input

☐ Confidential ☒ Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

FGH1						

Emission Source/Control Identifier(s)

Emission Unit	-	Process	

Process Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

☐ Confidential ☐ Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hours/Day	Days/Year		

Emission Point Identifier(s)

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application

Department of Environmental Conservation

DEC ID
3 - 3 3 5 6 - 0 0 1 3 6

Section IV - Emission Unit Information

Emission Unit Description

☐ Continuation Sheet(s)

Emission Unit: U - 0 0 0 0 7

Five EngA Space Heaters
Model: DGP-500

Building Information

☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
GEN01	Generation Building	300	260	North
GEN02	Generation Building	300	260	North

Emission Unit Emissions Summary

Emission Unit: U - 0 0 0 0 7

☐ Continuation Sheet(s)

CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)