TETRA TECH EC, INC.

DOCKET	
11-AFC-3	
DATE	JUN 04 2012
RECD.	JUN 05 2012

June 4, 2012

Siting Committee
Raoul Renaud, Hearing Officer
Eric Solorio, Project Manager
California Energy Commission
Docket No. 11-AFC-3
1516 9th St.
Sacramento, CA 95814

Cogentrix Quail Brush Generation Project - Docket Number 11-AFC-3, Initial Response to CEC Data Requests, 71 through 74

Docket Clerk:

Pursuant to the provisions of Title 20, California Code of Regulations, and on behalf of Quail Brush Genco, LLC, a wholly owned subsidiary of Cogentrix Energy, LLC, Tetra Tech hereby submits the Initial Response to CEC's Data Requests, 71 through 74. The Quail Brush generation Project is a 100 megawatt natural gas fired electric generation peaking facility to be located in the City of San Diego, California.

The topics addressed in this letter include the following:

- Air Quality
- Worker Safety and Fire Protection

If you have any questions regarding this submittal, please contact Rick Neff at (704) 525-3800 or me at (303) 980.3653.

Sincerely,

Constance E. Farmer
Project Manager/Tetra Tech

cc: Lori Ziebart, Cogentrix
John Collins, Cogentrix
Rick Neff, Cogentrix
Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *QUAIL BRUSH GENERATION PROJECT*

DOCKET NO. 11-AFC-03

PROOF OF SERVICE
(Revised 4/12/2012)

APPLICANT

Cogentrix Energy, LLC
C. Richard "Rick" Neff, Vice President
Environmental, Health & Safety
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Cogentrix Energy, LLC
John Collins
Lori Ziebart
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APPLICANT'S CONSULTANTS

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INTERESTED AGENCIES

California ISO
e-mail service preferred
e-recipient@caiso.com

City of Santee
Department of Development Services
Melanie Kush
Director of Planning
10601 Magnolia Avenue, Bldg. 4
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mkush@ci.santee.ca.us

*Morris E. Dye
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mdye@sandiego.gov

*indicates change

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DECLARATION OF SERVICE

I, Constance Farmer, declare that on June 4, 2012, I served and filed a copy of the Quail Brush Generation Project (11-AFC-03) Initial Response to CEC's Data Requests, 71 through 74. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/quailbrush/index.html].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)
For service to all other parties:

☒ Served electronically to all e-mail addresses on the Proof of Service list;

☒ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first- class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

☒ by sending an electronic copy to the e-mail address below (preferred method); ***OR***

☐ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-3
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512 docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

☐ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Constance C. Farmer

Quail Brush Genco, LLC

A Project Company of Cogentrix Energy, LLC

9405 Arrowpoint Boulevard
Charlotte, North Carolina 28273-8110
(704) 525-3800
(704) 525-9934 – Fax

June 4, 2012

Siting Committee
Raoul Renaud, Hearing Officer
Eric Solorio, Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Re: Quail Brush Generation Project (11-AFC-03)
Initial Response to CEC's Data Requests, 71 through 74

Dear Members of the Siting Committee and Mr. Solorio:

In response to the CEC's Data Requests, 71 through 74, dated May 14, 2012 and pursuant to Section 1716(f) of the CEC's regulations, Quail Brush Generation Project (Quail Brush) objects to data requests 71, 72, and 73 and requests additional time to respond to data request 74. Each of these Data Requests is itemized below along with a description of the grounds for the objection or the reasons for the inability to provide the information, as applicable.

71. Perform source testing for nitrogen dioxide and nitric oxide on an existing Wartsila 20V34G-C2 engine or similar model. The Applicant objects to this request as it is seeks information that is not reasonably available to the applicant. The Applicant is also not aware of any recently certified facilities that have been subjected to pre-AFC certification testing. Our reasons for the objection are as follows:

1. The Applicant does not presently own a 20V34SG-C2 engine that can be tested to establish or verify the requested ratio data.

2. The Applicant sought this information from the manufacturer but was informed that no such data for the 20V34SG engines or variants is available.

3. The Applicant is not aware of any operating facility where it can obtain this information. The Applicant is aware of three (3) facilities in the US that have used the –C2 variant engine. These facilities are as follows:

   a. Hutchinson Utilities Commission
   225 Michigan St.
   Hutchinson, MN 55350
   # of engines installed = 1 (not PSD)
   Permit most likely issued by the State of Minnesota-Dept of Health
   Contract awarded 10/2011, operations expected in late 2012.

b. Golden Spread Electric Coop
905 South Filmore
Suite 300
Amarillo, TX 79101
# of engines installed = 18 (not PSD, prior to GHG Tailoring Rule)
At the Antelope Station in Abernathy, TX
Permit most likely issued by Texas CEQ-Air Div
Operations began in 6/2011.

c. Lea County Electric Coop
1300 W Ave D
Lovington, NM 88260
# of engines installed = 5 (not PSD)
At the LCEC Generation, LLC site
Permit most likely issued by NM Environment Dept-Air Quality Bureau
Contract awarded early 2010, operations expected in early fall 2012.

Based on preliminary contacts with these sources, as well as searches on the websites of the above-referenced permitting agencies, the one facility that is operational (GSEC-Antelope) has either not tested for NO_2/NO_x ratios, or if tests have been done, they have not been released for public use. The Applicant cannot compel this facility to conduct such testing or to release the results of any non-publicly available testing that has been completed.

4. The Applicant also believes that this information is not reasonably necessary to evaluate the potential impacts of the proposed project or for the CEC to make a decision on the AFC. The justification presented in the background section preceding this data requests includes what the Applicant believes to be premised on a misunderstanding of the data already submitted in these proceedings.

The background section states that the Applicant's use of the CAPCOA "statistical average value" for the source category is not appropriate for an engine that is 3 times larger than the units proposed by QBPP. The Applicant disagrees with this statement because the CAPCOA recommended value and the data used in the Applicant's modeling, constitutes the best available scientific data and is appropriate. Further, as is discussed below, this data is representative of the source class.

The Applicant notes that both the CAPCOA referenced document as well as the San Joaquin Valley APCD modeling guidance document titled "Assessment of Non-Regulatory Options in AERMOD-Specifically OLM and PVMRM, 9/2010", indicate that *"Currently, limited information is available on in-stack NO_2/NO_x ratios nation-wide. A literature search of available data revealed in-stack NO_2/NO_x ratios for a limited number of sources, see Appendix C. If a source is not listed, the source type that best represents the source under review will be used."* The Applicant, in its use of the CAPCOA "recommended value" for large natural gas fired, lean burn engines, with controls such as SCR and CO catalysts, is simply following the guidance document. The value used may well be for an engine that is smaller than what is proposed by QBPP, but the basic engine characteristics for the category delineated in the CAPCOA listing are present, i.e., 4000 HP or above, natural gas fired, lean burn design, 4-stroke configuration, equipped with SCR and CO catalyst.

The Applicant used the "recommended value" which was established by CAPCOA (Engineering Managers) and was based on a statistical average. The Applicant did not use the range, because, as we stated in response to CEC Data Request #13 (docketed on March 8, 2012 as one of Applicant's responses to the CEC's Data Request Set 1), the calculation of a statistical average of 1.15%, with a range of values from 0% to 21.28% requires that an overwhelming majority of the values in the range be less than 1%. For this

reason the average or "recommended value" was used. Furthermore we note that the CAPCOA document was a collaborative effort between such agencies as the Air Resources Board, various APCDs/AQMDs, the CEC, and EPA Region 9. As such, the Applicant should be afforded the option of relying upon the CAPCOA document until such time as the database(s) provide a more robust data set covering a wider variety and size of sources, as well as operational scenarios. Additionally, the applicant notes that the data submitted in response to CEC Data Request #13 included data for similar engine configurations that shows very low NO_2/NO_x ratios which are consistent with the CAPCOA listing. The Applicant has used, to the best of its ability, the best data available.

At the request of EPA Region 9, the Applicant also contacted San Joaquin Valley APCD on March 26, 2012 in an effort to obtain information on potentially similar engines and their emissions. In response, Leland Villalvazo at the San Joaquin Valley APCD has recently supplied the Applicant with the following additional information:

a. **Stationary Source data**, included as Attachment #1 was an excel spreadsheet that contains data on four (4) engine models. Data set 1 was for a Cooper-Bessemer, NG fired, 2-stroke engine rated at 4000 hp, this engine had no add-on controls for NOx or CO. Data set 2 was for a marine MaK/8M32 engine rated at 5046 hp, firing diesel fuel only, equipped with SCR and CO catalyst. Data set 3 was for a marine Stork/8TM410 engine rated at 5720 hp, firing diesel fuel only, with no controls. Data set 4 was for a Fairbanks Morse 38ETDD8-1/6, 2-stroke, dual-fueled engine rated at 4410 hp, equipped with SCR only. Applicant determined that none of these data sets were applicable to the proposed project. None of these engines are similar to the QBPP Wartsila engines in one or more of the following categories: fuel type, stroke configuration, HP, or service (peaking power units). Therefore, it does not make sense to rely on these data sets in analyzing the proposed project.
b. **Compliance Verification Report**, included as Attachment #2 was a variance compliance report dated February 2010 for California Power Holdings, LLC, Unit 12, which is a Deutz, natural gas fired engine, rated at 4157 hp, equipped with SCR, with **no** CO catalyst. The compliance report was accompanied by a summary of 70 "short term" source tests on Unit 12 for CO, NO, NO_2, NO_x, and CO_2. The statistical average NO_2/NO_x ratio from these tests was 0.67%, with 45 of the tests showing NO_2/NO_x ratios of 0.0%.

   Data contained in Attachment #2 is for an engine with similar characteristics as the QBPP engines, but notably has no CO catalyst. Even without the CO catalyst, this engine showed NO_2/NO_x ratios that are consistent with the CAPCOA listed values, and as such, the Applicant believes its use of the CAPCOA value is both representative of the source class, and is a reasonable value for use in the impact analysis.

72. <u>Provide NO_2/NO_x ratios during the times post combustion equipment are not operating or operating at reduced removal efficiencies</u>. Quail Brush objects to this data request as it seeks information that is not reasonably available and which is not necessary to evaluate the proposed project's potential impacts. For the reasons discussed in response to DR 71 above, the current NO_2/NO_x ratio databases and available information do not provide any applicable data on which to establish such ratios for any operational scenario other than normal or steady state operations with respect to large, natural gas-fired, lean burn, 4-stroke, internal combustion engines such as those proposed for the Quail Brush project.

The Applicant is also not aware of any basis for utilizing a lower or different ratio for non-steady state operational periods such as start-ups and commissioning. Being unaware of any basis for utilizing a lower NO_2/NO_x ratio for periods such startup, commissioning, etc., the Applicant's decision to refrain from using different values for these non steady-state operational scenarios is reasonable and justified. Therefore, no further calculations should be required.

73. Remodel 1-hour NO_2 AAQS using the appropriate NO_2/NO_x ratios for each operating scenario. Quail Brush objects to this data request as it seeks information that is not reasonably available and is not necessary for the CEC to make a determination on the AFC. As discussed in responses to DR 71 and 72 above, there is no information available which can be utilized to further refine the anticipated NO2/NOx ratio for the proposed project. Therefore, remodeling is not necessary.

74. Provide a plan to address safe temporary evacuation of the facility. Quail Brush will be unable to provide this plan on June 13, 2012. Quail Brush is working on its Fire Emergency Plan, which will include the items addressed in this data request. Quail Brush anticipates docketing its draft Fire Emergency Plan on July 9, 2012.

I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge

Regards,

C. Richard Neff
Vice President

ATTACHMENT 1

SJVAPCD
Variance

Compliance Verification Report

03/17/2010
11:41 am

Variance: C-10-05E **Type:** Emergency **Hearing Date:** 02/16/2010

Source: CALIFORNIA POWER HOLDINGS LLC

Location: 16457 AVENUE 24 1/2 **City:** Chowchilla

Rule(s): 1081,2070,2201,4702

Equipment: The subject equipment consists of a 4,157 HP Deutz natural gas fired engine used to generate electricity. The emissions are controlled by a selective catalytic reduction (SCR) system

Scope Of Variance: The variance shall allow for the operation of the subject engine with excess NOX while CPH operates the engine to diagnose the reason behind the high NOX measurements. In addition, the variance will allow for the postponement of the annual source test.

Please verify that the following increments of progress have been met. After verifying that final compliance has been achieved, send the report with any supporting documentation to the Central Region Office.

DATE	INCREMENTS OF PROGRESS	COMPLETED
02/16/2010	Variance Begins	2/16/2010
03/17/2010	Variance Ends/Compliance Required	3/01/2010
04/01/2010	Summary Report Due	3/15/2010

Compliance with all applicable District rules was achieved on 3 / 01 / 2010

Compliance with all of the above increments was achieved on 3 / 01 / 2010

Final compliance with this variance was verified on 3 / 17 / 2010

Method of verification: Summary Report

(CEM Data, Correspondence, District Action, Email, Hearing Board Action, Inspection, Production Data, Report, Source Test, Notice, or VEE)

Excess emissions associated with variance: Ø

Pollutant	Quantity	Units	Pollutant	Quantity	Units	Pollutant	Quantity	Units

Pollutant	Quantity	Units	Pollutant	Quantity	Units	Pollutant	Quantity	Units

Inspector

Supervisor

BEFORE THE HEARING BOARD
OF THE
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
CENTRAL REGION
STATE OF CALIFORNIA

In the matter of: California Power Holdings, LLC 16457 Avenue 24 ½ Chowchilla, CA 93610	)	**DOCKET NO. C-10-05E**
For a variance from: 1081 – *Source Sampling* 2070.7.0 – *Operation According to the Permit to Operate Conditions* 2201 – *New and Modified Stationary Source Review Rule* 4702 – *Internal Combustion Engines*	)	**ORDER GRANTING AN EMERGENCY VARIANCE**
District Permit Number: C-3775-12-5	)	**Granted on:** February 16, 2010
	)	**Effective from:** February 16, 2010
EPA Airs Number: N/A	)	**Effective to:** March 17, 2010

On February 11, 2010, California Power Holdings, LLC, (CPH) filed with the Central Region Hearing Board a petition for an emergency variance. CPH requested that the Hearing Board grant an emergency variance from San Joaquin Valley Unified Air Pollution Control District (District) Rules 1081, 2070.7.0, 2201, and 4702.

On February 16, 2010, CPH came before Mr. Robert Schumacher, Vice Chair of the Central Region Hearing Board, to obtain an emergency variance. The hearing was held pursuant to California Health and Safety Code (CH&SC) Section 42359.5 and District Rule 5200 – *Emergency Variance*. Mr. Ron Dahlin represented CPH, while Mr. Patrick Houlihan, Senior Air Quality Specialist, represented the District.

LOCATION AND EQUIPMENT

1. CPH operates a "peaker plant" electrical power generating facility located at 16457 Avenue 24 ½ in Chowchilla, CA.

2. The subject equipment consists of a 4,157 HP Deutz natural gas fired engine used to generate electricity. The emissions are controlled by a selective catalytic reduction (SCR) system.

3. The operation of the subject equipment is authorized by duly issued District Permit to Operate (PTO) #C-3775-12-5.

BACKGROUND

CPH operates 16 natural gas fired engines that are used to generate electricity. Each engine is connected to a 3.1 mega-watt generator. CPH is a "peaker plant" and only operates their engines when called upon to provide electricity to the grid. These engines were due for their annual source test by February 26, 2010. In anticipation of the source test, CPH started the engines to pre-test the exhaust emissions and perform any maintenance if deemed necessary. CPH pre-tested the emissions with a portable exhaust analyzer. Engine #12 tested with high NO_X emissions of 9.5 ppm. The PTO requires that NO_X emissions stay below a concentration of 9 ppm. CPH shut the engine down and replaced the catalyst, adjusted the engine valves, and replaced the spark plugs. Unfortunately, this still did not reduce emissions down below the PTO limit. CPH preceded with the source tests on the other 15 engines, but had to postpone engine #12's source test. Since CPH still hadn't brought the engine into compliance, they had to request a variance to allow for excess emissions and to postpone the source test. CPH needs to evaluate the engine and control technology to bring the engine into compliance quickly because they stand the chance of losing revenue if called upon to provide electricity and can't do so.

RULE REQUIREMENTS AND VIOLATIONS

1. The equipment subject to this variance is regulated by the following District Rules:

   A. 1081 – *Source Sampling*
   B. 2070.7.0 – *Operation According to the Permit to Operate Conditions*
   C. 2201 – *New and Modified Stationary Source Review Rule*
   D. 4702 – *Internal Combustion Engines*

2. District Rule 2070.7.0 requires that the subject equipment be operated in accordance with the conditions of the applicable PTO. District Rules 2201 and 4702 limits NO_X emissions. District Rules 1081 and 4702 require a source test every 12 months for this engine.

3. The subject equipment will be in violation of the applicable District Rules and PTO conditions if the subject engine operates during the variance period with excess NO_X emissions.

FINDING OF FACT

Pursuant to CH&SC Sections 42352 - 53 and District Rule 5200 – *Emergency Variance*, the following findings have been made:

1. ***That the petitioner for a variance is, or will be, in violation of Section 41701 or of any rule, regulation, or order of the District.***

   The Hearing Board finds that the operation of the engine with excess NO_X emissions is a violation of District Rules 2070.7.0, 2201, and 4702, in addition to the applicable PTO conditions. Not source testing every 12 months is a violation of District Rules 1081 and 4702 in addition to the applicable PTO conditions.

2. ***That, due to conditions beyond the reasonable control of the petitioner requiring compliance would result in either (1) an arbitrary or unreasonable taking of property, or (2) the practical closing and elimination of a lawful business.***

The Hearing Board finds that CPH attempted to correct the emissions violation within the timeframe allotted by the conditions of the PTO. The attempts were unsuccessful and a proper cause of the excess emissions was not diagnosed. Because the PTO does not allow for anymore operation with excess emissions, CPH would not be allowed to operate this engine without receiving a Notice of Violation. CPH did shut down the engine after measuring the excess emissions and have not operated it since. Not allowing future operation of this engine would result in an arbitrary or unreasonable taking of property.

3. ***That the closing or taking would be without a corresponding benefit in reducing air contaminants.***

The Hearing Board finds that given the minimal excess emissions, the closing or taking would be without a corresponding benefit in reducing air contaminants. In addition, if the variance is not granted to allow CPH to fix the engine, CPH could lose approximately $1000 a day each time the subject engine is called upon by the California Independent System Operator (Cal ISO) to provide electricity to the grid.

4. ***That the applicant for the variance has given consideration to curtailing operations of the source in lieu of obtaining a variance.***

The Hearing Board finds that CPH shut down the engine upon discovering the excess emissions. However, a long term operational curtailment is not feasible due to the contractual requirements to provide power when called into service by the Cal ISO. Also, a curtailment will not allow CPH to diagnose the problem. The engine needs to be in operation for diagnosis.

5. ***During the period the variance is in effect, that the applicant will reduce excess emissions to the maximum extent feasible.***

The Hearing Board finds that excess emissions will be reduced to the maximum extent feasible by only operating the engine as necessary to diagnose and fix the cause of the excess NO_X.

6. ***During the period the variance is in effect, that the applicant will monitor or otherwise quantify emission levels from the source, if requested to do so by the District, and report these emissions levels to the District pursuant to a schedule established by the District.***

The Hearing Board finds that during the variance period, CPH will continue to monitor emissions from the subject engine with a portable exhaust emissions analyzer. This information will be provided to the District upon request.

CONCLUSIONS AND ORDER

NOW, THEREFORE, the CENTRAL REGION HEARING BOARD ORDERS that an emergency variance be granted to California Power Holdings, LLC, subject to the following conditions:

1. The variance shall be effective from February 16, 2010 to March 17, 2010, or until such time the engine achieves compliance with the permitted emissions limit, whichever occurs first.

2. Variance relief shall only be granted from the applicable sections of District Rules 1081, 2070.7.0, 2201, and 4702, in addition to conditions 9 and 18 of PTO #C-3775-12-5, but only as they pertain to the operation of the subject engine with excess NO_X emissions and source testing every 12 months.

3. The variance shall allow for the operation of the subject engine with excess NO_X while CPH operates the engine to diagnose the reason behind the high NO_X measurements. In addition, the variance will allow for the postponement of the annual source test.

4. Excess NO_X emissions shall not exceed 0.5 pounds per hour during operation of the subject engine during the variance period.

5. No relief from other excess emissions shall be provided.

6. No relief shall be provided from the results of the source test.

7. No exceedences of the Daily Emission Limit shall be allowed.

8. CPH shall maintain records in accordance with condition #31 of PTO C-3775-12-5 and shall report those on the summary report as required below.

9. CPH shall utilize a portable exhaust analyzer to measure the emissions every time the subject engine operates. The results reported to the District shall be the average of a consecutive 15 minute run corrected to 15% oxygen.

10. Should the District receive complaints or if the facility experiences operation conditions likely to cause a public nuisance, CPH shall cease the operations causing the complaints or problems and take all necessary actions to abate the problem immediately.

11. By April 1, 2010, or 15 days after the emergency variance is completed, whichever occurs first, CPH shall submit to the District a summary report. However, if another variance or series of variances regarding this same matter should be granted by the Central Region Hearing Board, submittal of said summary report should occur in accordance with the time frames established within said variances. The report shall include:

    A. A summary of all corrective actions taken to bring the engine's emissions into compliance;
    B. Date, time, and duration of operation of the engine;
    C. Date of source test;

D. Copies of all emissions sampling and calibration data from the portable exhaust analyzer; and

E. Calculation of the actual excess NO_X emissions released during the variance period.

12. All notifications and submittals to the District pursuant to this variance shall be submitted to the attention of:

Mr. Ryan Hayashi, Supervising AQS
SJVUAPCD – Compliance Department
1990 E. Gettysburg Avenue
Fresno, CA 93726
Telephone: (559) 230-6000
E-mail: ryan.hayashi@valleyair.org

13. Failure to comply with any condition of this variance may render the variance null and void.

THE FORGOING DECISION IS APPROVED:

Mr. Robert Schumacher, Vice Chair
Hearing Board – Central Region
San Joaquin Valley Unified APCD

2-28-10
Date

ATTEST:

Angie DeSantiago, Clerk to the Boards

3/2/10
Date

Corrective Actions Summary

PTO Emissions Variance

California Power Holdings, Chow II Facility
Date: March 5, 2010
Asset Manager: John Walsh
Facility Manager: Ron Dahlin
Operator: Gary Dean

RE: Statement of corrective actions taken to correct Engine 12 emissions problem including sampling & calibration data.

February 24, 2010

- Replaced worn ball joints for both A & B side speed governor throttle linkages after they were found to be sticky.
- Re-checked all valve clearances to confirm proper adjustment.
- The engine was not operated.

February 25, 2010

- During calibration of the two fuel stepper motors, a strange sound was noticed from the B-side unit. The motor was tested off the engine and found to be intermittently faulty. It failed to move properly in both directions.
- Replaced the faulting stepper motor with spare.
- At 10:28 engine 12 was started and brought to proper operating temperature then operated until 14:53. While monitoring with the portable analyzer the engine emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 4.6ppm

February 26, 2010

- At 08:59 engine 12 was started and brought to normal operating temperature then operated until 13:48.
- Adjustments were made to the jacket water control valve to improve engine load fluctuations.
- Adjusted SCR dosing system back to standard operating levels.
- While monitoring with the portable analyzer emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 4.5ppm

March 1, 2010

- At 08:34 engine 12 was started and brought to normal operating temperature then operated until 12:26.
- Made additional adjustments to jacket water control system to further improve engine load fluctuations. Engine load now running with very little fluctuation, improving overall engine performance.
- While monitoring with the portable analyzer emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 5.8ppm

Conclusion

- Corrections for engine 12 are complete and the unit is available to operate normally with all emissions within compliance of the PTO.
- The follow-up source test for Engine 12 is scheduled for March 12, 2010.
- Copies of all emissions sampling and calibration data are attached.
- There were no excess NOx emissions during the period of time that the unit operated.

In accordance with Condition 1 of the Emergency Variance, Engine 12 achieved compliance with the permitted emission limits and was returned to normal operation on March 1, 2010. Therefore, the Emergency Variance is no longer in effect.

Asset Manager_____ Date _____

Corrective Actions Summary

PTO Emissions Variance

California Power Holdings, Chow II Facility
Date: March 8, 2010
Asset Manager: John Walsh
Facility Manager: Ron Dahlin
Operator: Gary Dean

RE: Statement of corrective actions taken to correct Engine 12 emissions problem including sampling & calibration data.

February 24, 2010

- Replaced worn ball joints for both A & B side speed governor throttle linkages after they were found to be sticky.
- Re-checked all valve clearances to confirm proper adjustment.
- The engine was not operated.

February 25, 2010

- During calibration of the two fuel stepper motors, a strange sound was noticed from the B-side unit. The motor was tested off the engine and found to be intermittently faulty. I failed to move properly in both directions.
- Replaced the faulting stepper motor with spare.
- At 10:28 engine 12 was started and brought to proper operating temperature then operated until 14:53. While monitoring with the portable analyzer the engine emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 4.6ppm

February 26, 2010

- At 08:59 engine 12 was started and brought to normal operating temperature then operated until 13:48.
- Adjustments were made to the jacket water control valve to improve engine load fluctuations.
- Adjusted SCR dosing system back to standard operating levels.
- While monitoring with the portable analyzer emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 4.5ppm

March 1, 2010

- At 08:34 engine 12 was started and brought to normal operating temperature then operated until 12:26.
- Made additional adjustments to jacket water control system to further improve engine load fluctuations. Engine load now running with very little fluctuation, improving overall engine performance.
- While monitoring with the portable analyzer emission levels were below permit limits.
- Measured 15-min average NOx @ 15% O2 – 5.8ppm

Conclusion

- Corrections for engine 12 are complete and the unit is available to operate normally with all emissions within compliance of the PTO.
- The follow-up source test for Engine 12 is scheduled for March 12, 2010.
- Copies of all emissions sampling and calibration data are attached.
- There were no excess NOx emissions during the period of time that the unit operated.

In accordance with Condition 1 of the Emergency Variance, Engine 12 achieved compliance with the permitted emission limits and was returned to normal operation on March 1, 2010. Therefore the Emergency Variance is no longer in effect.

Asset Manager _____ Date 3/12/10

2-25-10

Fax

Engine #12
During Variance

ECOM-A Plus

Date	Time
02.25.10	12:22:12 PM

Gas analysis

Fuel type		
Natural gas		
T.Air	68	°F
T.Gas	65	°F
O2	9.1	%
CO 15.0%	12	PPM
NO 15.0%	3.4	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	3.5	PPM
CO2	6.6	%
Exc.air	1.76	
Sen.temp.	71	°F

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ECOM-A Plus

Date	Time
02.25.10	02:24:10 PM

Gas analysis 12

Fuel type		
Natural gas		
T.Air	76	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	10	PPM
NO 15.0%	4.7	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.7	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date	Time
02.25.10	12:22:44 PM

Gas analysis

Fuel type		
Natural gas		
T.Air	68	°F
T.Gas	65	°F
O2	9.1	%
CO	25	PPM
NO	10.3	PPM
NO2	0.1	PPM
NOx	10.4	PPM
CO2	6.6	%
Exc.air	1.76	
Sen.temp.	71	°F

California Power
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ECOM-A Plus

Date	Time
02.25.10	02:24:31 PM

Gas analysis

Fuel type		
Natural gas		
T.Air	76	°F
T.Gas	68	°F
O2	9.3	%
CO	21	PPM
NO	9.1	PPM
NO2	0.0	PPM
NOx	9.1	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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2-25-10

ECOM-A Plus

Date 02.25.10 Time 01:58:35 PM

Gas analysis

Fuel type	Natural gas	
T.Air	73	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	9	PPM
NO 15.0%	6.1	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	6.1	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	76	°F

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ECOM-A Plus

Date 02.25.10 Time 02:01:17 PM

Gas analysis

Fuel type	Natural gas	
T.Air	74	°F
T.Gas	68	°F
O2	9.2	%
CO 15.0%	10	PPM
NO 15.0%	5.1	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.1	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 02.25.10 Time 02:05:08 PM

Gas analysis

Fuel type	Natural gas	
T.Air	74	°F
T.Gas	68	°F
O2	9.2	%
CO 15.0%	10	PPM
NO 15.0%	4.4	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.4	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	77	°F

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ECOM-A Plus

Date 02.25.10 Time 02:09:30

Gas analysis

Fuel type	Natural gas	
T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO 15.0%	10	PPM
NO 15.0%	4.2	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.2	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.25.10 Time 01:59:02 PM

Gas analysis

Fuel type	Natural gas	
T.Air	73	°F
T.Gas	68	°F
O2	9.3	%
CO	19	PPM
NO	11.4	PPM
NO2	0.0	PPM
NOx	11.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	76	°F

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Date 02.25.10 Time 02:01:17 PM

Gas analysis

Fuel type	Natural gas	
T.Air	74	°F
T.Gas	68	°F
O2	9.2	%
CO	20	PPM
NO	10.1	PPM
NO2	0.0	PPM
NOx	10.1	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 02.25.10 Time 02:05:32 PM

Gas analysis

Fuel type	Natural gas	
T.Air	74	°F
T.Gas	68	°F
O2	9.3	%
CO	29	PPM
NO	8.7	PPM
NO2	0.0	PPM
NOx	8.7	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	77	°F

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ECOM-A Plus

Date 02.25.10 Time 02:09:30 PM

Gas analysis

Fuel type	Natural gas	
T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO	21	PPM
NO	8.2	PPM
NO2	0.0	PPM
NOx	8.2	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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2-25-10

ECOM-A Plus

Date 02.25.10 Time 02:12:02 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.2	%
CO 15.0%	19	PPM
NO 15.0%	4.7	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.7	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.25.10 Time 02:13:06 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO	20	PPM
NO	9.0	PPM
NO2	0.0	PPM
NOx	9.0	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.25.10 Time 02:16:08 PM

Gas analysis

Fuel type
Natural gas

T.Air	76	°F
T.Gas	69	°F
O2	9.3	%
CO 15.0%	10	PPM
NO 15.0%	5.0	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.0	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.25.10 Time 02:16:33 PM

Gas analysis 12

Fuel type
Natural gas

T.Air	76	°F
T.Gas	69	°F
O2	9.3	%
CO	21	PPM
NO	9.5	PPM
NO2	0.0	PPM
NOx	9.5	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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Engine #12
During Variance.

ECOM-A Plus

Date 02.25.10 Time 02:18:50 PM

Gas analysis

Fuel type
Natural gas

T.Air	76	°F
T.Gas	69	°F
O2	9.2	%
CO 15.0%	10	PPM
NO 15.0%	4.7	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.7	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.25.10 Time 02:22:29 PM

Gas analysis

Fuel type
Natural gas

T.Air	76	°F
T.Gas	69	°F
O2	9.2	%
CO	21	PPM
NO	8.7	PPM
NO2	0.0	PPM
NOx	8.7	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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2-26-10

ECOM-A Plus

Date 02.26.10 Time 10:17:11 AM

Gas analysis

Fuel type Natural gas		
T.Air	71	°F
T.Gas	67	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	6.3	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	6.4	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	75	°F

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ECOM-A Plus

Date 02.26.10 Time 10:52:04 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	68	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	6.7	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	6.8	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 02.26.10 Time 11:10:53 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	67	°F
O2	9.2	%
CO 15.0%	12	PPM
NO 15.0%	6.2	PPM
NO2 15.0%	0.2	PPM
NOx 15.0%	6.4	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	77	°F

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ECOM-A Plus

Date 02.26.10 Time 10:18:05 AM

Gas analysis

Fuel type Natural gas		
T.Air	72	°F
T.Gas	67	°F
O2	9.2	%
CO	24	PPM
NO	11.9	PPM
NO2	0.3	PPM
NOx	12.2	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	75	°F

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ECOM-A Plus

Date 02.26.10 Time 10:52:27 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	68	°F
O2	9.2	%
CO	23	PPM
NO	13.4	PPM
NO2	0.2	PPM
NOx	13.6	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 02.26.10 Time 11:11:15 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	67	°F
O2	9.2	%
CO	24	PPM
NO	10.9	PPM
NO2	0.3	PPM
NOx	11.2	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	77	°F

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2-26-10

ECOM-A Plus

Date 02.26.10 Time 11:42:17 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	5.0	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	5.1	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 11:47:17 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	3.9	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	3.9	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 11:51:52 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	10	PPM
NO 15.0%	4.3	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.3	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 12:05:55 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	68	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	4.5	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.6	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 11:42:40 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.3	%
CO	22	PPM
NO	9.0	PPM
NO2	0.2	PPM
NOx	9.2	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 11:47:38 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.2	%
CO	23	PPM
NO	8.1	PPM
NO2	0.1	PPM
NOx	8.2	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 11:52:13 AM

Gas analysis

Fuel type
Natural gas

T.Air	74	°F
T.Gas	68	°F
O2	9.3	%
CO	22	PPM
NO	8.3	PPM
NO2	0.1	PPM
NOx	8.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	78	°F

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ECOM-A Plus

Date 02.26.10 Time 12:06:19 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	68	°F
O2	9.2	%
CO	22	PPM
NO	10.0	PPM
NO2	0.1	PPM
NOx	10.1	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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2-26-10

ECOM-A Plus

Date 02.26.10 Time 12:21:22 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	10	PPM
NO 15.0%	4.1	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.2	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:27:20 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.3	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:33:47 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.8	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.9	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:40:43 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.6	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.7	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:21:45 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO	21	PPM
NO	7.7	PPM
NO2	0.1	PPM
NOx	7.8	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:27:44 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO	22	PPM
NO	8.2	PPM
NO2	0.2	PPM
NOx	8.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

California Power
Holdings, LLC.
16457 Avenue 24 1/2
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Fax: 559-665-4866

ECOM-A Plus

Date 02.26.10 Time 12:34:00 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO	22	PPM
NO	8.9	PPM
NO2	0.1	PPM
NOx	9.0	PPM
CO2	5.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date 02.26.10 Time 12:41:05 PM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	68	°F
O2	9.2	%
CO	22	PPM
NO	9.0	PPM
NO2	0.2	PPM
NOx	9.2	PPM
CO2	5.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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2-26-10

ECOM-A Plus

Date Time
02.26.10 12:47:22 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	68	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.3	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date Time
02.26.10 01:01:34 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.4	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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Date Time
02.26.10 01:30:17 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.6	PPM
NO2 15.0%	0.1	PPM
NOx 15.0%	4.7	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date Time
02.26.10 12:47:48 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	68	°F
O2	9.2	%
CO	22	PPM
NO	8.6	PPM
NO2	0.2	PPM
NOx	6.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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ECOM-A Plus

Date Time
02.26.10 01:01:34 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.4	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.4	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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ECOM-A Plus

Date Time
02.26.10 01:30:41 PM

Gas analysis

Fuel type
Natural gas

T.Air	75	°F
T.Gas	69	°F
O2	9.3	%
CO	22	PPM
NO	9.0	PPM
NO2	0.2	PPM
NOx	9.2	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	79	°F

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3-1-10

ECOM-A Plus

Date 03.01.10 Time 09:29:15

Gas analysis

Fuel type Natural gas		
T.Air	71	°F
T.Gas	66	°F
O2	9.2	%
CO 15.0%	10	PPM
NO 15.0%	4.8	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.8	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	75	°F

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ECOM-A Plus

Date 03.01.10 Time 09:41:47 AM

Gas analysis

Fuel type Natural gas		
T.Air	72	°F
T.Gas	67	°F
O2	9.2	%
CO 15.0%	10	PPM
NO 15.0%	5.4	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.4	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 03.01.10 Time 09:49:59 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	67	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	5.3	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 03.01.10 Time 11:03:53 AM

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	69	°F
O2	9.2	%
CO 15.0%	12	PPM
NO 15.0%	5.9	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.9	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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ECOM-A Plus

Date 03.01.10 Time 09:29:43 A

Gas analysis

Fuel type Natural gas		
T.Air	71	°F
T.Gas	66	°F
O2	9.2	%
CO	21	PPM
NO	8.6	PPM
NO2	0.0	PPM
NOx	8.6	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	75	°F

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ECOM-A Plus

Date 03.01.10 Time 09:42:16 AM

Gas analysis

Fuel type Natural gas		
T.Air	72	°F
T.Gas	67	°F
O2	9.2	%
CO	21	PPM
NO	10.4	PPM
NO2	0.0	PPM
NOx	10.4	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 03.01.10 Time 09:50:41 AM

Gas analysis

Fuel type Natural gas		
T.Air	73	°F
T.Gas	67	°F
O2	9.2	%
CO	22	PPM
NO	9.3	PPM
NO2	0.0	PPM
NOx	9.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	76	°F

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ECOM-A Plus

Date 03.01.10 Time 11:04:29

Gas analysis

Fuel type Natural gas		
T.Air	75	°F
T.Gas	69	°F
O2	9.2	%
CO	23	PPM
NO	11.6	PPM
NO2	0.1	PPM
NOx	11.7	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	79	°F

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3-1-10

ECOM-A Plus

Date 03.01.10 Time 11:33:59 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	12	PPM
NO 15.0%	6.9	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	6.9	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	80	°F

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ECOM-A Plus

Date 03.01.10 Time 11:38:54 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	5.5	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.5	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 11:45:45 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	5.3	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 12:11:22 PM

Gas analysis

Fuel type
Natural gas

T.Air	78	°F
T.Gas	72	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	5.3	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	5.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	82	°F

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ECOM-A Plus

Date 03.01.10 Time 11:34:20 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO	24	PPM
NO	13.5	PPM
NO2	0.0	PPM
NOx	13.5	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	80	°F

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ECOM-A Plus

Date 03.01.10 Time 11:39:44 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO	23	PPM
NO	14.1	PPM
NO2	0.0	PPM
NOx	14.1	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 11:46:57 AM

Gas analysis

Fuel type
Natural gas

T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO	23	PPM
NO	10.3	PPM
NO2	0.0	PPM
NOx	10.3	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 12:11:44 PM

Gas analysis

Fuel type
Natural gas

T.Air	78	°F
T.Gas	72	°F
O2	9.2	%
CO	23	PPM
NO	11.7	PPM
NO2	0.0	PPM
NOx	11.7	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	82	°F

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3-1-10

ECOM-A Plus

Date 03.01.10 Time 11:54:16 AM

Gas analysis

Fuel type Natural gas		
T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	23	PPM
NO 15.0%	6.9	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	6.9	PPM
CO2	6.5	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 11:59:02 AM

Gas analysis

Fuel type Natural gas		
T.Air	78	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	7.5	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	7.5	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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Date 03.01.10 Time 12:04:29 PM

Gas analysis

Fuel type Natural gas		
T.Air	78	°F
T.Gas	71	°F
O2	9.2	%
CO 15.0%	11	PPM
NO 15.0%	6.9	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	6.9	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	82	°F

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Date 03.01.10 Time 12:08:10 PM

Gas analysis

Fuel type Natural gas		
T.Air	78	°F
T.Gas	72	°F
O2	9.3	%
CO 15.0%	11	PPM
NO 15.0%	4.0	PPM
NO2 15.0%	0.0	PPM
NOx 15.0%	4.0	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	82	°F

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Date 03.01.10 Time 11:54:39 AM

Gas analysis

Fuel type Natural gas		
T.Air	77	°F
T.Gas	71	°F
O2	9.2	%
CO	23	PPM
NO	12.0	PPM
NO2	0.0	PPM
NOx	12.0	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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Date 03.01.10 Time 11:59:26 AM

Gas analysis

Fuel type Natural gas		
T.Air	78	°F
T.Gas	71	°F
O2	9.2	%
CO	23	PPM
NO	12.8	PPM
NO2	0.0	PPM
NOx	12.8	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	81	°F

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ECOM-A Plus

Date 03.01.10 Time 12:04:52 PM

Gas analysis

Fuel type Natural gas		
T.Air	78	°F
T.Gas	71	°F
O2	9.3	%
CO	23	PPM
NO	12.8	PPM
NO2	0.0	PPM
NOx	12.8	PPM
CO2	6.5	%
Exc.air	1.79	
Sen.temp.	82	°F

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Date 03.01.10 Time 12:09:11 PM

Gas analysis

Fuel type Natural gas		
T.Air	79	°F
T.Gas	72	°F
O2	9.2	%
CO	23	PPM
NO	9.5	PPM
NO2	0.0	PPM
NOx	9.5	PPM
CO2	6.6	%
Exc.air	1.78	
Sen.temp.	82	°F

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Permit Required Emission Monitoring Data Sheet - Calendar Year 2010

Engine No.	Required Data																			April				
10	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5
	Date																							
	Time																							
	NOx PPM @ 15% O2						0.0						0.0						0.0					
	CO PPM @ 15% O2						0.0						0.0						0.0					
	O2 %						0.0						0.0						0.0					
11	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5
	Date																							
	Time																							
	NOx PPM @ 15% O2						0.0						0.0						0.0					
	CO PPM @ 15% O2						0.0						0.0						0.0					
	O2 %						0.0						0.0						0.0					
12	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5
	Date	25-Feb-10						26-Feb-10						1-Mar-10										
	Time	14:03	14:06	14:09	14:12	14:15		12:21	12:24	12:27	12:30	12:33		11:32	11:35	11:38	11:41	11:44						
	NOx PPM @ 15% O2	4.7	4.4	4.2	4.7	5.0	4.6	4.2	4.4	4.4	4.6	4.9	4.5	6.8	6.0	5.5	5.5	5.3	5.8					
	CO PPM @ 15% O2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	10.8	12.0	11.0	11.0	11.0	11.0	11.2					
	O2 %	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.2	9.2	9.2	9.2	9.2	9.2					
13	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	3.0	1	2	3	4	5
	Date																							
	Time																							
	NOx PPM @ 15% O2						0.0						0.0						0.0					
	CO PPM @ 15% O2						0.0						0.0						0.0					
	O2 %						0.0						0.0						0.0					
14	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5
	Date																							
	Time																							
	NOx PPM @ 15% O2						0.0						0.0						0.0					
	CO PPM @ 15% O2						0.0						0.0						0.0					
	O2 %						0.0						0.0						0.0					
15	Reading No.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5	Avg.	1	2	3	4	5
	Date																							
	Time																							
	NOx PPM @ 15% O2						0.0						0.0						0.0					
	CO PPM @ 15% O2						0.0						0.0						0.0					
	O2 %						0.0						0.0						0.0					

ECOM AMERICA, LTD.

1628 Oakbrook Drive
Gainesville, GA 30507

*Certificate of Calibration

This ECOM Model A Plus, Serial Number **9066,** has been Calibrated and found to be within manufacturer specifications.
Technician- *James Smith*
Factory service performed **February 2010.**
Next factory service recommended **August 2010.**

Certified Calibration Gases Used By ECOM

These gases are traceable to the National Institute of Standards and Technology.

CO Low 1000 PPM 2.00% Oxygen	Lot # CC121897
NO 30.0 PPM 0.00% Oxygen	Lot # SG9138680BAL
NO2 10.0 PPM Balanced In Air	Lot # XC002496B

Calibration Data

Type Gas	Actual Gas Value	As Found Data	Calibrated To Data
CO Low	1000 PPM	1359 PPM	1000 PPM
NO	30.0 PPM	37.9 PPM	30.0 PPM
NO2	10.0 PPM	10.1 PPM	10.0 PPM

***Suitability for use is the sole responsibility of the user. Factors affecting the calibration and response of gas sensors include, but are not limited to Frequency & Duration of use, Concentration of gases measured, Shifts in ambient temperature (> 20 deg. F), & age of sensors.**
This Certificate of Calibration verifies that the analyzer responded accurately, and within specification to the calibration gas concentrations listed above.

ATTACHMENT 2

Stationary Source	**Unit Description**
CenterPoint Energy - Dunn	2 stroke lean burn RICE
CenterPoint Energy - Dunn	
CenterPoint Energy - Dunn	
CenterPoint Energy - Dunn	2 stroke lean burn RICE
CenterPoint Energy - Dunn	
CenterPoint Energy - Dunn	
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Tor Viking II	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion
Vladimir Ignatuk	Main Propulsion

EQUIP_DESC	Mfg
Cogeneration Engine, Fairbanks Morse, Model 38ETDD8-1/6. 4410 bhp, dual fired (98.5% natural gas, 1.5% fuel oil), S/N 38E201001TDFS12, lean burn driving 3165 kW electric generator, and exhausted to a selective catalytic reduction system and an oxidation catalyst.	Fairbanks Morse
Cogeneration Engine, Fairbanks Morse, Model 38ETDD8-1/6. 4410 bhp, dual fired (98.5% natural gas, 1.5% fuel oil), S/N 38E201001TDFS12, lean burn driving 3165 kW electric generator, and exhausted to a selective catalytic reduction system and an oxidation catalyst.	Fairbanks Morse

Cogeneration Engine, Fairbanks Morse, Model 38ETDD8-1/6. 4410 bhp, dual fired (98.5% natural gas, 1.5% fuel oil), S/N 38E201001TDFS12, lean burn driving 3165 kW electric generator, and exhausted to a selective catalytic reduction system and an oxidation catalyst.	Fairbanks Morse
Cogeneration Engine, Fairbanks Morse, Model 38ETDD8-1/6. 4410 bhp, dual fired (98.5% natural gas, 1.5% fuel oil), S/N 38E201001TDFS12, lean burn driving 3165 kW electric generator, and exhausted to a selective catalytic reduction system and an oxidation catalyst.	Fairbanks Morse
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Cogeneration Engine, Fairbanks Morse, Model 38ETDD8-1/6. 4410 bhp, dual fired (98.5% natural gas, 1.5% fuel oil), S/N 38E201001TDFS12, lean burn driving 3165 kW electric generator, and exhausted to a selective catalytic reduction system and an oxidation catalyst.	Fairbanks Morse

Manufacture or Vendor	Emission Unit Number	Size	Fuel Type	Combustor Equipment	Control Equip
Cooper-bessemer	Unit 2	4000 HP	Natural Gas		none
Cooper-bessemer	Unit 4	4000 HP	Natural Gas		none
MaK/8M32	TV-2	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-3	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-2	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-2	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-2	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-3	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-3	5046 hp	Diesel		SCR, OxyC
MaK/8M32	TV-3	5046 hp	Diesel		SCR, OxyC
Stork/8TM410	VI-1	5720 hp	Diesel		None
Stork/8TM410	VI-2	5720 hp	Diesel		None
Stork/8TM410	VI-3	5720 hp	Diesel		None
Stork/8TM410	VI-4	5720 hp	Diesel		None
Stork/8TM410	VI-1	5720 hp	Diesel		None
Stork/8TM410	VI-1	5720 hp	Diesel		None
Stork/8TM410	VI-2	5720 hp	Diesel		None
Stork/8TM410	VI-2	5720 hp	Diesel		None
Stork/8TM410	VI-3	5720 hp	Diesel		None
Stork/8TM410	VI-3	5720 hp	Diesel		None
Stork/8TM410	VI-4	5720 hp	Diesel		None
Stork/8TM410	VI-4	5720 hp	Diesel		None

Model	BHP	Turbocharged	Aftercooled	Timing	Diesel Particulate Filter
38ETDD8-1/6	4410	—	—	—	—
38ETDD8-1/6	4410	—	—	—	—

38ETDD8-1/6	4410	—	—	—	—
38ETDD8-1/6	4410	—	—	—	—
38ETDD8-1/6	4410	—	—	—	—
38ETDD8-1/6	4410	—	—	—	—

Data Source (CEM, Source Test)	Test Run	If Source Load Lev	Source or Test Year	NO2 PPMv	NO PPMv
source test using	1	100	2000	442.72	1389.72
	2	100	2000	385.57	1299.45
	3	100	2000	341.11	1184.3
source test using	1	95	2000	416.07	1307.69
	2	95	2000	412.07	1328.61
	3	95	2000	498.88	1443.39
Methods 1 - 4, 7E	1	60%	2010	12	150.0
Methods 1 - 4, 7E	1	60%	2010	8	146.0
Methods 1 - 4, 7E	1	30%	2010	4	81.0
Methods 1 - 4, 7E	1	40%	2010	29	282.0
Methods 1 - 4, 7E	1	80%	2010	14	218.0
Methods 1 - 4, 7E	1	30%	2010	4	54.0
Methods 1 - 4, 7E	1	40%	2010	4	56.0
Methods 1 - 4, 7E	1	80%	2010	24	274.0
Methods 1 - 4, 7E	1	60%	2010	60	600.0
Methods 1 - 4, 7E	1	60%	2010	69	589.0
Methods 1 - 4, 7E	1	60%	2010	75	642.0
Methods 1 - 4, 7E	1	60%	2010	76	596.0
Methods 1 - 4, 7E	1	40%	2010	50	505.0
Methods 1 - 4, 7E	1	80%	2010	65	635.0
Methods 1 - 4, 7E	1	40%	2010	36	405.0
Methods 1 - 4, 7E	1	80%	2010	98	607.0
Methods 1 - 4, 7E	1	40%	2010	55	335.0
Methods 1 - 4, 7E	1	80%	2010	105	605.0
Methods 1 - 4, 7E	1	40%	2010	63	475.0
Methods 1 - 4, 7E	1	80%	2010	95	655.0

Add-on NOx Control	In-Combutor NOx Control	CO/VOC Control	Fuel	No. Tests	Average NOx, ppmv @ 15% O2
N/A	—	N/A	Natural Gas/Diesel	5	0.00
SCR	—	OxCat	Natural Gas/Diesel	5	7.42

N/A	—	N/A	Natural Gas/Diesel	5	0.00
SCR	—	OxCat	Natural Gas/Diesel	5	6.26
N/A	—	N/A	Natural Gas/Diesel	5	0.00
SCR	—	OxCat	Natural Gas/Diesel	5	6.40

NOx	NO2/NOx		
PPMv	Ratio	Company	Provided by
1832.44	0.24	Cetcon Inc.	Erik Snyder, R6
1685.02	0.23	Cetcon Inc.	Erik Snyder, R6
1525.41	0.22	Cetcon Inc.	Erik Snyder, R6
1723.76	0.24	Cetcon Inc.	Erik Snyder, R6
1740.68	0.24	Cetcon Inc.	Erik Snyder, R6
1942.28	0.26	Cetcon Inc.	Erik Snyder, R6
162.0	0.07	Emission Technologies, Inc.	Herman Wong R10
154.0	0.05	Emission Technologies, Inc.	Herman Wong R10
85.0	0.05	Emission Technologies, Inc.	Herman Wong R10
310.8	0.09	Emission Technologies, Inc.	Herman Wong R10
232.0	0.06	Emission Technologies, Inc.	Herman Wong R10
58.0	0.07	Emission Technologies, Inc.	Herman Wong R10
60.0	0.07	Emission Technologies, Inc.	Herman Wong R10
298.0	0.08	Emission Technologies, Inc.	Herman Wong R10
660.0	0.09	Emission Technologies, Inc.	Herman Wong R10
658.0	0.10	Emission Technologies, Inc.	Herman Wong R10
717.0	0.10	Emission Technologies, Inc.	Herman Wong R10
672.0	0.11	Emission Technologies, Inc.	Herman Wong R10
555.0	0.09	Emission Technologies, Inc.	Herman Wong R10
700.0	0.09	Emission Technologies, Inc.	Herman Wong R10
441.0	0.08	Emission Technologies, Inc.	Herman Wong R10
705.0	0.14	Emission Technologies, Inc.	Herman Wong R10
390.0	0.14	Emission Technologies, Inc.	Herman Wong R10
710.0	0.15	Emission Technologies, Inc.	Herman Wong R10
538.0	0.12	Emission Technologies, Inc.	Herman Wong R10
750.0	0.13	Emission Technologies, Inc.	Herman Wong R10

Average NO2/NOx	Maximum NO2/NOx	Minimum NO2/Nox	NO2/NOx Standard Deviation
23.38	35.40	12.20	8.48
57.80	61.00	54.60	2.30

29.72	43.90	19.40	9.76
54.08	55.80	52.90	1.16
27.12	35.30	19.40	6.11
42.26	62.10	19.60	19.29

Average Load, %	Notes	From
N/A	Sampled before the add-on control system.	San Diego AQMD
86.1%	Sampled after the add-on control system. Urea SCR.	San Diego AQMD

91.7%	Sampled before the add-on control system. Load only recorded during one test.	San Diego AQMD
87.4%	Sampled after the add-on control system. Urea SCR.	San Diego AQMD
92.0%	Sampled before the add-on control system. Load only recorded during one test.	San Diego AQMD
85.0%	Sampled after the add-on control system. Urea SCR.	San Diego AQMD