

# **Annual RATA Testing Report**

**in accordance with 40CFR75**

**City of Tallahassee**

**Hopkins Generating Station  
Units 2A, HC3 and HC4  
Tallahassee, Florida**

**July 2012**

**Prepared By:  
Spectrum Systems, Inc.  
Pensacola, Florida**

**Analyzers Tested:**

	Unit HC3	Unit HC4	Unit 2A
TECO 42CLS NO <sub>x</sub> Monitor:	0435709735	0436610038	TECO NOx Monitor : 0724323059
M&C PMA 100-L O2 Monitor:	0502188	0502194	TECO CO Monitor: 0723523610 M&C CO2 Monitor; 0704250

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Spectrum Systems, Inc.

Annual RATA Testing, July 2012

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Hopkins Units 2A, HC3 and HC4

## I. INTRODUCTION

City of Tallahassee contracted Spectrum Systems, Inc. of Pensacola, Florida to conduct annual Relative Accuracy Testing on the Hopkins Generating Station, Units 2A, HC3 and HC4 combustion turbines. The Hopkins Generating Station facility is located in Tallahassee, Florida. Testing was conducted on the Nitrogen Oxides (NO<sub>x</sub>) Continuous Emissions Monitoring System (CEMS). The testing was conducted in July 2012 by James Garrett of Spectrum Systems, Inc. This report contains the results of this testing.

Section II of this report, titled Installation and Source Description, gives a brief description of the Hopkins Facility and how it was operated during the test program.

Section III of this report, titled Summary of Results, presents a discussion of the test results.

Section IV of this report contains the certification of authenticity for the testing.

Section V of this report contains the mathematical equations used to calculate the results.

Section VI of this report contains a diagram of Spectrum System's TCEMS.

Actual test data, materials, and test results are presented in the different appendices of this report.



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City of Tallahassee

Hopkins Units 2A, HC3 and HC4

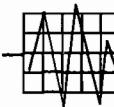
## **II. INSTALLATION and SOURCE DESCRIPTION**

The City of Tallahassee's Hopkins facility Unit 2A combustion turbine is a General Electric GE Combined cycle turbine, fired on pipeline quality natural gas. The unit is equipped with Selective Catalytic Reduction (SCR) technology for pollution control.

A dilution probe is installed at the stack with the analyzers housed in a dedicated temperature controlled shelter at the base of the stack. Further installation information can be obtained from the affected facility or City of Tallahassee's Electric Production Department located in Tallahassee, Florida. The monitoring system is used for compliance with the Clean Air Act of 1990 by reporting mass emissions of Nitrogen Oxides released into the atmosphere.

The City of Tallahassee's Hopkins facility Units HC3 and HC4 combustion turbines are General Electric GE LM 6000 simple cycle turbines, fired on pipeline quality natural gas and ultra low sulfur diesel fuel. The units are equipped with water injection, catalytic oxidation and Selective Catalytic Reduction (SCR) technology for pollution control.

A dilution probe is installed at the Unit HC3 and HC4 stacks with the analyzers housed in a common temperature controlled shelter at the base of the stacks. Further installation information can be obtained from the affected facility or City of Tallahassee's Electric Production Department located in Tallahassee, Florida. The monitoring systems are used for compliance with the Clean Air Act of 1990 by reporting mass emissions of Nitrogen Oxides released into the atmosphere.



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### III. SUMMARY OF RESULTS

Relative Accuracy testing was conducted on the Nitrogen Oxides ( $\text{NO}_x$ ) Continuous Emissions Monitoring System (CEMS). All testing was performed at normal loads while combusting natural gas.

Testing was conducted according to the procedures in the Code of Federal Regulations, Title 40, Part 75 (40CFR75), Appendix A. As applicable, Reference Methods 3A and 7E, as defined in 40 CFR 60 Appendix A, were used to determine Oxygen and Nitrogen oxides. Sample point selection was made using 0.4, 1.2, and 2.0 meters (40 CFR 60 Appendix B section 8.1.3.2).

The  $\text{NO}_x$  Relative Accuracy was performed using 40CFR75 Appendix A Section 6.5.  $\text{NO}_x$  Relative Accuracy results must meet the criteria of 40CFR75 Appendix A, Section 3.3 and shall not exceed 10.0% (or 7.5% to achieve reduced RATA frequency incentive for annual RATAs). Exceptions are as follows:

Low  $\text{NO}_x$  emitting units ( $\leq 0.2 \text{ lb/mmBtu}$ ): the difference between the mean value of the CEMS measurements and the reference method mean value is not to exceed  $\pm 0.02 \text{ lb/mmBtu}$  whenever the Relative Accuracy is greater than 10% (or  $\pm 0.015 \text{ lb/mmBtu}$  for reduced RATA frequency).

All monitors tested for Relative Accuracy meet the required criteria.

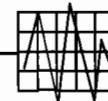
This report contains a summary of all the testing performed and the supporting data for all tests. Detailed test material is presented in the different appendices of this report. Within each appendix, data is presented by unit (if multiple tests are performed, then by test number and by unit within test number). Refer to the header or footer information to pinpoint or sequence a group of data.

40CFR75 test results are entered into the EPA ECMPS Software, Version. An electronic file is exported from this software and is made available for direct submittal to the EPA.

Appendix A of this report contains a printout of the detailed EPA testing results generated from ECMPS. This appendix includes summaries of the Relative Accuracy test data, as presented in the ECMPS-generated printout.

Subsequent Appendices contain test results and supporting data for testing required by both 40CFR75 and 40CFR60.

Appendix B of this report contains Gas Relative Accuracy reference method data. Gas reference method data include sampling system bias and drift results, average emission calculations, calibration data, and minute data and run averages.



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Annual RATA Testing, July 2012

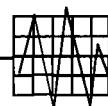
City of Tallahassee

Hopkins Units 2A, HC3 and HC4

Appendix C of this report contains all plant CEMS data associated with the RATA testing.

Appendix D of this report contains Quality Assurance data for the gas reference methods.

Appendix E of this report contains copies of the EPA Protocol Gas Certificates for the gases used during this testing.



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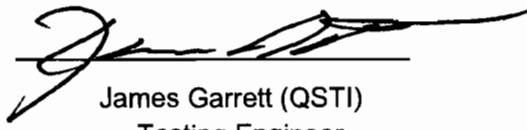
Hopkins Units 2A, HC3 and HC4

#### IV. STATEMENT OF AUTHENTICITY

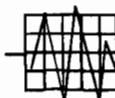
The sampling and analysis for this report was carried out under my direction and supervision. I have reviewed the testing details and results of this report and hereby certify that the data contained within is authentic and accurate to the best of my knowledge.

Date: July 27, 2012

Signature:



James Garrett (QSTI)  
Testing Engineer



Spectrum Systems, Inc.

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## V. MATHEMATICAL EXPLANATION

The following equations are used in the Relative Accuracy monitor comparisons and the Lbs/mmBtu emission calculations in compliance with 40CFR60 Appendix B, Performance Specification 2, Sections 7 and 8.

### Arithmetic Mean:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i$$

Where,

- n = Number of data points
- d = Arithmetic Mean
- $d_i$  = The individual difference between the reference method and corresponding CEMS value for an individual data point.
- $\Sigma$  = The summation of the individual differences  $d_i$  for all points

### Standard Deviation:

$$S_d = \sqrt{\frac{n \sum_{i=1}^n d_i^2 - \left[ \left( \frac{\sum_{i=1}^n d_i}{n} \right)^2 \right]}{n - 1}}$$

Where,

- n = Number of data points
- $d_i$  = The individual difference between the reference method and corresponding CEMS value for an individual data point.
- $\Sigma$  = The summation of the individual differences  $d_i$  for all points



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### **Confidence Coefficient:**

$$CC = t_{0.025} \sqrt{\frac{S_d}{n}}$$

Where,

$t_{0.025}$  = T value from the table below:

n-1	$t_{0.025}$	n-1	$t_{0.025}$	n-1	$t_{0.025}$
1	12.706	12	2.179	23	2.069
2	4.303	13	2.160	24	2.064
3	3.182	14	2.145	25	2.060
4	2.776	15	2.131	26	2.056
5	2.571	16	2.120	27	2.052
6	2.447	17	2.110	28	2.048
7	2.365	18	2.101	29	2.045
8	2.306	19	2.093	30	2.042
9	2.262	20	2.086	40	2.021
10	2.228	21	2.080	60	2.000
11	2.201	22	2.074	>80	1.980

### **Relative Accuracy:**

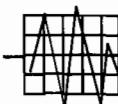
$$RA = \frac{|\bar{d}| + |\bar{cc}|}{RM} \times 100$$

Where,

$|\bar{d}|$  = The absolute value of the mean difference between Reference Method values and CEMS Monitor Readings

$|\bar{cc}|$  = The absolute value of the confidence coefficient

$RM$  = The absolute value of the reference method value or applicable standard



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## Emission Calculations

Reference method testing data analysis is performed using Title 40 of the Code of Federal Regulations, Part 60, Appendix A, Method 19. Measurements of pollutants and diluent gases in any combination of wet and dry instrument responses are detailed. "F" factor analysis techniques are used on both the CEMS and the TCEMS wherever possible. Plug values for moisture are applied when necessary, to compensate for ambient or added moisture gas phase dilution.

For pollutants measured on a dry basis with dry O<sub>2</sub> diluent, emissions in pounds of pollutant per hour are calculated by the formula:

$$\text{Emission lbs/mmBtu} = (\text{PPMd} \times \text{Fd} \times \text{K} \times 20.9) / (20.9 \times \%O_2 d)$$

Where:

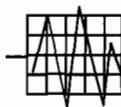
E	=	Emission in lbs/mmBtu
PPMd	=	Pollutant Concentration in dry ppm
Fd	=	Fuel Factor in dscf/mmBtu = 8710 for Natural Gas
%O <sub>2</sub> d	=	Oxygen Fraction in Flue Gas in % by volume dry
K	=	Conversion Factor in lbs/scf. NOx Conversion Factor = 1.194 E-7

For the pollutants measured on a wet basis with a wet CO<sub>2</sub> diluent, emissions in pounds of pollutant per hour are calculated by the formula:

$$\text{: Emission lbs/mmBtu} = \text{PPMw} \times \text{Fc} \times \text{K} \times (100 / \%w\text{CO}_2)$$

Where:

E	=	Pollutant Emission Concentration in Lbs/mmBtu
PPMw	=	Pollutant Concentration in wet ppm
Fc	=	Fuel Factor scf/mmBtu = 1040 for Natural Gas
%wO <sub>2</sub>	=	Wet Carbon Dioxide in Flue Gas in % by volume
K	=	Conversion Factor NOx Conversion Factor = 1.194 E-7



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## **Corrected Gas Pollutant Concentration**

Calculate the correction for the gas analyzer measured gas concentrations in ppm, using sampling bias and drift measurements of EPA Protocol 1 zero and higher calibration gas concentrations.

When O<sub>2</sub> is used as the diluent gas during analysis, NOx and O<sub>2</sub> ppm corrected readings are calculated using equation in 40 CFR 60 Appendix A Reference Method 6C Section 8 Equation 6C-1. (Reference 40 CFR 60 Appendix A Reference Method 3A Section 9 for O<sub>2</sub> AND 40 CFR Appendix A Reference Method 7E Section 8 for NOx BOTH reference procedure 40 CFR 60 Appendix A Reference Method 6C Section 8, Equation 6C-1.)

$$C_{\text{gas}} = C_{\text{ma}} * (C_{\text{avg}} - C_0) / (C_m - C_0)$$

Where:

- C<sub>gas</sub> = Corrected effluent gas concentration in ppm
- C<sub>ma</sub> = Actual upscale calibration gas concentration in ppm
- C<sub>avg</sub> = Gas analyzer reading in ppm
- C<sub>0</sub> = Average of initial and final system calibration bias check response for the zero gas
- C<sub>m</sub> = Average of initial and final system calibration bias check response for the upscale gas

## **Sampling System Bias and Calibration Drift**

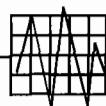
Sampling system bias and calibration drift data corrections are applied to the run's analyzer measurements. The NOx emissions were computed from each set of NOx and O<sub>2</sub> or NOx and O<sub>2</sub> analyzer measurements.

Sampling Bias in percent of span is calculated by the formula:

$$\text{Sampling Bias} = (100 (\text{System Cal Response} - \text{Analyzer Cal Response})) / \text{Span}$$

Calibration Drift in % of Span is calculated by the formula:

$$\text{Calibration Drift} = (100(\text{Final System Cal Response} - \text{Initial System Cal Response})) / \text{Span}$$



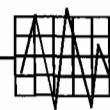
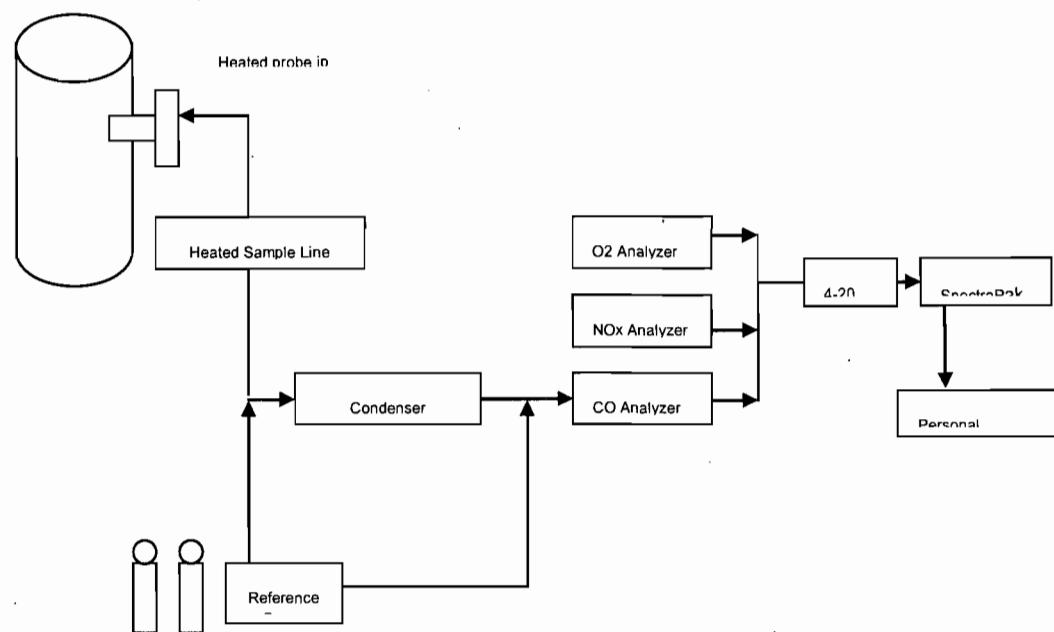
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Hopkins Units 2A, HC3 and HC4

## VI TCEMS Gas Sample Train Schematics



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City of Tallahassee

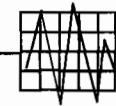
Hopkins Units 2A, HC3 and HC4

## **APPENDIX A**

**EPA Detailed Testing Report Printout**

**ECMPS**

**(Includes 40CFR75 Relative Accuracy Summaries)**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4



# ECMPS Client Tool

Version 1.0 2012 Q2

## QA/Cert Test Detail Report

July 27, 2012 12:21 PM

Facility Name: Arvah B Hopkins

### Facility Details

Facility ID (ORISPL): 688

State: FL

County: Leon

---

Unit/Stack/Pipe ID: 2A

### Relative Accuracy Test

System ID: 2A1      System Parameter: NOX  
Test Number: 01-2A1-20120710      Reason for Test: QA  
# of Op. Levels: 1      Grace Period Test?

Test Completion: 07/10/2012 13:11  
Reported Test Results: PASSED  
EPA Calculated Result: PASSED

Evaluation Status: No Errors  
Submission Status: Not Submitted  
Submission Date:

Reported BAF: 1.000  
EPA Calculated BAF: 1.000  
RATA Frequency: 4QTRS

### Air Emissions Testing Data

QI Name: Garrett, James L  
Exam Date: 02/17/2011  
Provider Name: Source Evaluation Society  
Provider Email: qstipprogram@gmail.com

AETB Name: Spectrum Systems, Inc  
AETB Phone Number: 800-432-6119  
AETB Email: jimmy@spectrumsystems.com

### Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	AIR			
High	NO	A12011	AAL069824	09/20/2013
Mid	NO	A12011	AAL3287	07/12/2013
Mid	O2	A12011	ALM028679	04/03/2014
Low	ZERO			

---

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

Facility Name: Arvah B Hopkins  
Facility ID (ORISPL): 688

QA/Cert Test Detail Report  
July 27, 2012 12:21 PM

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	0.017	0.017	Relative Accuracy	4.31	4.31
Mean of Reference Method Values	0.017	0.017	Bias Adjustment Factor	1.000	1.000
Mean of Difference	0.000	0.000	APS Indicator		
Standard Deviation of Difference	0.001	0.001	T-Value	2.306	2.306
Confidence Coefficient	0.000	0.000	Gross Unit Load or Velocity	220	220

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	07/10/2012 08:01	07/10/2012 08:22	RUNUSED	0.017	0.017	220
2	07/10/2012 08:35	07/10/2012 08:56	RUNUSED	0.017	0.016	220
3	07/10/2012 09:10	07/10/2012 09:31	RUNUSED	0.017	0.016	220
4	07/10/2012 09:45	07/10/2012 10:06	RUNUSED	0.017	0.017	220
5	07/10/2012 10:20	07/10/2012 10:41	RUNUSED	0.017	0.017	220
6	07/10/2012 11:04	07/10/2012 11:25	RUNUSED	0.017	0.016	220
7	07/10/2012 11:39	07/10/2012 12:00	RUNUSED	0.017	0.017	220
8	07/10/2012 12:15	07/10/2012 12:36	RUNUSED	0.017	0.017	220
9	07/10/2012 12:50	07/10/2012 13:11	RUNUSED	0.017	0.017	220

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)



# ECMPS Client Tool

Version 1.0 2012 Q2

## QA/Cert Test Detail Report

July 27, 2012 12:33 PM

Facility Name: Arvah B Hopkins

### Facility Details

Facility ID (ORISPL): 688

State: FL

County: Leon

---

Unit/Stack/Pipe ID: HC3

### Relative Accuracy Test

System ID: H31 System Parameter: NOX Test Completion: 07/13/2012 14:32  
Test Number: 01-H31-20120713 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: Not Submitted EPA Calculated BAF: 1.000  
Submission Date: RATA Frequency: 4QTRS

### Air Emissions Testing Data

QI Name:	Garrett, James L	AETB Name:	Spectrum Systems, Inc.
Exam Date:	02/17/2011	AETB Phone Number:	800-432-6119
Provider Name:	Source Evaluation Society	AETB Email:	jimmy@spectrumsystems.com
Provider Email:	qstiprogram@gmail.com		

### Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	AIR			
High	NO	A12011	AAL069824	09/20/2013
Mid	NO	A12011	AAL3287	07/12/2013
Mid	O2	A12011	ALM028679	04/03/2014
Low	ZERO			

---

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

Facility Name: Arvah B Hopkins  
Facility ID (ORISPL): 688

QA/Cert Test Detail Report  
July 27, 2012 12:33 PM

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	0.015	0.015	Relative Accuracy	5.46	5.46
Mean of Reference Method Values	0.015	0.015	Bias Adjustment Factor	1.000	1.000
Mean of Difference	0.000	0.000	APS Indicator		
Standard Deviation of Difference	0.001	0.001	T-Value	2.306	2.306
Confidence Coefficient	0.001	0.001	Gross Unit Load or Velocity	49	49

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	07/13/2012 09:36	07/13/2012 09:57	RUNUSED	0.015	0.016	49
2	07/13/2012 10:10	07/13/2012 10:31	RUNUSED	0.015	0.016	49
3	07/13/2012 10:44	07/13/2012 11:05	RUNUSED	0.015	0.016	49
4	07/13/2012 11:19	07/13/2012 11:40	RUNUSED	0.015	0.016	49
5	07/13/2012 11:54	07/13/2012 12:15	RUNUSED	0.015	0.015	49
6	07/13/2012 12:29	07/13/2012 12:50	RUNUSED	0.015	0.014	49
7	07/13/2012 13:03	07/13/2012 13:24	RUNUSED	0.015	0.014	49
8	07/13/2012 13:37	07/13/2012 13:58	RUNUSED	0.015	0.014	49
9	07/13/2012 14:11	07/13/2012 14:32	RUNUSED	0.015	0.015	49

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)



# ECMPS Client Tool

Version 1.0 2012 Q2

## QA/Cert Test Detail Report

July 27, 2012 12:50 PM

Facility Name: Arvah B Hopkins

### Facility Details

Facility ID (ORISPL): 688

State: FL

County: Leon

---

Unit/Stack/Pipe ID: HC4

### Relative Accuracy Test

System ID: H41      System Parameter: NOX  
Test Number: 01-H41-20120712      Reason for Test: QA  
# of Op. Levels: 1      Grace Period Test?

Test Completion: 07/12/2012 14:50  
Reported Test Results: PASSAPS  
EPA Calculated Result: PASSAPS

Evaluation Status: No Errors  
Submission Status: Not Submitted  
Submission Date:

Reported BAF: 1.000  
EPA Calculated BAF: 1.000  
RATA Frequency: 4QTRS

### Air Emissions Testing Data

QI Name: Garrett, James L  
Exam Date: 02/17/2011  
Provider Name: Source Evaluation Society  
Provider Email: qstiprogram@gmail.com

AETB Name: Spectrum Systems, Inc.  
AETB Phone Number: 800-432-6119  
AETB Email: jimmy@spectrumsystems.com

### Protocol Gas Data:

Gas Level Code	Gas Type Code	Vendor Identifier	Cylinder Identifier	Expiration Date
High	AIR			
High	NO	A12011	AAL069824	09/20/2013
Mid	NO	A12011	AAL3287	07/12/2013
Mid	O2	A12011	ALM028679	04/03/2014
Low	ZERO			

---

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

Facility Name: Arvah B Hopkins  
Facility ID (ORISPL): 688

QA/Cert Test Detail Report  
July 27, 2012 12:50 PM

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	0.015	0.015	Relative Accuracy	9.84	9.84
Mean of Reference Method Values	0.014	0.014	Bias Adjustment Factor	1.000	1.000
Mean of Difference	-0.001	-0.001	APS Indicator	Y	Y
Standard Deviation of Difference	0.000	0.000	T-Value	2.306	2.306
Confidence Coefficient	0.000	0.000	Gross Unit Load or Velocity	49	49

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	07/12/2012 09:51	07/12/2012 10:12	RUNUSED	0.015	0.014	49
2	07/12/2012 10:31	07/12/2012 10:52	RUNUSED	0.015	0.014	49
3	07/12/2012 11:05	07/12/2012 11:26	RUNUSED	0.015	0.014	49
4	07/12/2012 11:39	07/12/2012 12:00	RUNUSED	0.015	0.014	49
5	07/12/2012 12:13	07/12/2012 12:34	RUNUSED	0.015	0.014	49
6	07/12/2012 12:47	07/12/2012 13:08	RUNUSED	0.015	0.014	49
7	07/12/2012 13:21	07/12/2012 13:42	RUNUSED	0.015	0.013	49
8	07/12/2012 13:55	07/12/2012 14:16	RUNUSED	0.015	0.014	49
9	07/12/2012 14:29	07/12/2012 14:50	RUNUSED	0.015	0.014	49

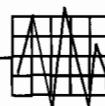
Additional Information:

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)

## **APPENDIX B**

### **Gas Relative Accuracy Reference Method Data**



Spectrum Systems, Inc.

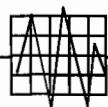
Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

## **Appendix B, Section 1**

### **Gas Sampling Bias and Drift Results**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: One  
Start Time: 8:01 AM  
Stop Time: 8:22 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	0.073	0.13	-0.029	-0.32	-0.44
CO	10.095	10.271	0.77	10.066	-0.13	-0.89
NOx	0.116	0.116	0.00	0.104	-0.05	-0.05
NOx	9.957	9.945	-0.05	9.963	0.03	0.08
O2	0.128	0.092	-0.17	0.098	-0.14	0.03
O2	11.081	10.904	-0.85	11.026	-0.26	0.58

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Two  
Start Time: 8:35 AM  
Stop Time: 8:56 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.029	-0.32	0.000	-0.19	0.13
CO	10.095	10.066	-0.13	10.139	0.19	0.32
NOx	0.116	0.104	-0.05	0.116	0.00	0.05
NOx	9.957	9.963	0.03	9.927	-0.13	-0.16
O2	0.128	0.098	-0.14	0.049	-0.38	-0.23
O2	11.081	11.026	-0.26	11.026	-0.26	0.00

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Three  
Start Time: 9:10 AM  
Stop Time: 9:31 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	0.000	-0.19	-0.044	-0.38	-0.19
CO	10.095	10.139	0.19	10.095	0.00	-0.19
NOx	0.116	0.116	0.00	0.098	-0.08	-0.08
NOx	9.957	9.927	-0.13	9.823	-0.59	-0.46
O2	0.128	0.049	-0.38	0.092	-0.17	0.21
O2	11.081	11.026	-0.26	10.971	-0.53	-0.26

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Four  
Start Time: 9:45 AM  
Stop Time: 10:06 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.044	-0.38	-0.044	-0.38	0.00
CO	10.095	10.095	0.00	10.095	0.00	0.00
NOx	0.116	0.098	-0.08	0.098	-0.08	0.00
NOx	9.957	9.823	-0.59	9.780	-0.78	-0.19
O2	0.128	0.092	-0.17	0.153	0.12	0.29
O2	11.081	10.971	-0.53	11.013	-0.33	0.20

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Five  
Start Time: 10:20 AM  
Stop Time: 10:41 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.044	-0.38	-0.044	-0.38	0.00
CO	10.095	10.095	0.00	10.022	-0.32	-0.32
NOx	0.116	0.098	-0.08	0.092	-0.11	-0.03
NOx	9.957	9.780	-0.78	9.921	-0.16	0.62
O2	0.128	0.153	0.12	0.104	-0.11	-0.23
O2	11.081	11.013	-0.33	10.995	-0.41	-0.09

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Six  
Start Time: 11:04 AM  
Stop Time: 11:25 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.044	-0.38	-0.117	-0.70	-0.32
CO	10.095	10.022	-0.32	10.286	0.83	1.15
NOx	0.116	0.092	-0.11	0.073	-0.19	-0.08
NOx	9.957	9.921	-0.16	9.933	-0.11	0.05
O2	0.128	0.104	-0.11	0.085	-0.21	-0.09
O2	11.081	10.995	-0.41	10.971	-0.53	-0.11

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Seven  
Start Time: 11:39 AM  
Stop Time: 12:00 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.117	-0.70	-0.220	-1.15	-0.45
CO	10.095	10.286	0.83	10.271	0.77	-0.07
NOx	0.116	0.073	-0.19	0.061	-0.24	-0.05
NOx	9.957	9.933	-0.11	9.853	-0.46	-0.35
O2	0.128	0.085	-0.21	0.073	-0.26	-0.06
O2	11.081	10.971	-0.53	10.933	-0.71	-0.18

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Eight  
Start Time: 12:15 PM  
Stop Time: 12:36 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.220	-1.15	-0.161	-0.89	0.26
CO	10.095	10.271	0.77	10.242	0.64	-0.13
NOx	0.116	0.061	-0.24	0.067	-0.22	0.03
NOx	9.957	9.853	-0.46	9.811	-0.64	-0.19
O2	0.128	0.073	-0.26	0.037	-0.44	-0.17
O2	11.081	10.933	-0.71	10.952	-0.62	0.09

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Nine  
Start Time: 12:50 PM  
Stop Time: 1:11 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.044	-0.161	-0.89	-0.161	-0.89	0.00
CO	10.095	10.242	0.64	10.271	0.77	0.13
NOx	0.116	0.067	-0.22	0.061	-0.24	-0.03
NOx	9.957	9.811	-0.64	9.786	-0.75	-0.11
O2	0.128	0.037	-0.44	0.073	-0.26	0.17
O2	11.081	10.952	-0.62	10.958	-0.59	0.03

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12

Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: One

Start Time: 9:36 AM

Stop Time: 9:57 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.234	-0.45	0.220	-0.51	-0.06
CO	10.227	10.168	-0.26	10.168	-0.26	0.00
NOx	0.085	0.128	0.19	0.116	0.14	-0.05
NOx	10.171	10.092	-0.35	10.226	0.24	0.59
O2	0.018	0.031	0.06	0.031	0.06	0.00
O2	11.020	11.026	0.03	10.995	-0.12	-0.15

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Two  
Start Time: 10:10 AM  
Stop Time: 10:31 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.220	-0.51	0.176	-0.70	-0.19
CO	10.227	10.168	-0.26	10.242	0.07	0.32
NOx	0.085	0.116	0.14	0.116	0.14	0.00
NOx	10.171	10.226	0.24	10.171	0.00	-0.24
O2	0.018	0.031	0.06	0.067	0.23	0.17
O2	11.020	10.995	-0.12	11.026	0.03	0.15

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Three  
Start Time: 10:44 AM  
Stop Time: 11:05 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.176	-0.70	0.176	-0.70	0.00
CO	10.227	10.242	0.07	10.271	0.19	0.13
NOx	0.085	0.116	0.14	0.098	0.06	-0.08
NOx	10.171	10.171	0.00	10.104	-0.30	-0.30
O2	0.018	0.067	0.23	0.049	0.15	-0.09
O2	11.020	11.026	0.03	11.007	-0.06	-0.09

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Four  
Start Time: 11:19 AM  
Stop Time: 11:40 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.176	-0.70	0.176	-0.70	0.00
CO	10.227	10.271	0.19	10.242	0.07	-0.13
NOx	0.085	0.098	0.06	0.092	0.03	-0.03
NOx	10.171	10.104	-0.30	10.128	-0.19	0.11
O2	0.018	0.049	0.15	0.073	0.26	0.11
O2	11.020	11.007	-0.06	11.026	0.03	0.09

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Five  
Start Time: 11:54 AM  
Stop Time: 12:15 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.176	-0.70	0.147	-0.83	-0.13
CO	10.227	10.242	0.07	10.198	-0.13	-0.19
NOx	0.085	0.092	0.03	0.092	0.03	0.00
NOx	10.171	10.128	-0.19	9.823	-1.53	-1.34
O2	0.018	0.073	0.26	0.073	0.26	0.00
O2	11.020	11.026	0.03	10.995	-0.12	-0.15

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Six  
Start Time: 12:29 PM  
Stop Time: 12:50 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.147	-0.83	0.220	-0.51	0.32
CO	10.227	10.198	-0.13	10.125	-0.44	-0.32
NOx	0.085	0.092	0.03	0.092	0.03	0.00
NOx	10.171	9.823	-1.53	9.866	-1.34	0.19
O2	0.018	0.073	0.26	0.043	0.12	-0.14
O2	11.020	10.995	-0.12	10.940	-0.38	-0.26

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Seven  
Start Time: 1:03 PM  
Stop Time: 1:24 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.220	-0.51	0.220	-0.51	0.00
CO	10.227	10.125	-0.44	10.242	0.07	0.51
NOx	0.085	0.092	0.03	0.092	0.03	0.00
NOx	10.171	9.866	-1.34	9.841	-1.45	-0.11
O2	0.018	0.043	0.12	0.031	0.06	-0.06
O2	11.020	10.940	-0.38	11.044	0.11	0.50

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Eight  
Start Time: 1:37 PM  
Stop Time: 1:58 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.220	-0.51	0.161	-0.77	-0.26
CO	10.227	10.242	0.07	10.227	0.00	-0.07
NOx	0.085	0.092	0.03	0.104	0.08	0.05
NOx	10.171	9.841	-1.45	9.878	-1.29	0.16
O2	0.018	0.031	0.06	0.098	0.38	0.32
O2	11.020	11.044	0.11	11.007	-0.06	-0.18

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Nine  
Start Time: 2:11 PM  
Stop Time: 2:32 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	0.337	0.161	-0.77	0.117	-0.96	-0.19
CO	10.227	10.227	0.00	10.139	-0.38	-0.38
NOx	0.085	0.104	0.08	0.098	0.06	-0.03
NOx	10.171	9.878	-1.29	9.902	-1.19	0.11
O2	0.018	0.098	0.38	0.085	0.32	-0.06
O2	11.020	11.007	-0.06	10.983	-0.18	-0.11

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: One  
Start Time: 9:51 AM  
Stop Time: 10:12 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.029	-0.06	-0.088	-0.32	-0.26
CO	10.476	10.022	-1.97	10.125	-1.53	0.45
NOx	0.085	0.116	0.14	0.116	0.14	0.00
NOx	9.890	10.092	0.89	10.281	1.72	0.83
O2	0.037	0.043	0.03	0.067	0.14	0.11
O2	10.989	11.038	0.23	11.068	0.38	0.14

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Two  
Start Time: 10:31 AM  
Stop Time: 10:52 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.088	-0.32	-0.103	-0.38	-0.07
CO	10.476	10.125	-1.53	9.993	-2.10	-0.57
NOx	0.085	0.116	0.14	0.104	0.08	-0.05
NOx	9.890	10.281	1.72	10.189	1.32	-0.41
O2	0.037	0.067	0.14	0.061	0.11	-0.03
O2	10.989	11.068	0.38	10.995	0.03	-0.35

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Three  
Start Time: 11:05 AM  
Stop Time: 11:26 AM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.103	-0.38	-0.147	-0.57	-0.19
CO	10.476	9.993	-2.10	10.095	-1.66	0.44
NOx	0.085	0.104	0.08	0.092	0.03	-0.05
NOx	9.890	10.189	1.32	10.140	1.10	-0.22
O2	0.037	0.061	0.11	0.018	-0.09	-0.21
O2	10.989	10.995	0.03	10.989	0.00	-0.03

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Four  
Start Time: 11:39 AM  
Stop Time: 12:00 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.147	-0.57	-0.176	-0.70	-0.13
CO	10.476	10.095	-1.66	10.095	-1.66	0.00
NOx	0.085	0.092	0.03	0.085	0.00	-0.03
NOx	9.890	10.140	1.10	10.061	0.75	-0.35
O2	0.037	0.018	-0.09	0.067	0.14	0.23
O2	10.989	10.989	0.00	10.995	0.03	0.03

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Five  
Start Time: 12:13 PM  
Stop Time: 12:34 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.176	-0.70	-0.147	-0.57	0.13
CO	10.476	10.095	-1.66	10.007	-2.04	-0.38
NOx	0.085	0.085	0.00	0.092	0.03	0.03
NOx	9.890	10.061	0.75	10.049	0.70	-0.05
O2	0.037	0.067	0.14	0.037	0.00	-0.14
O2	10.989	10.995	0.03	11.038	0.23	0.21

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Six  
Start Time: 12:47 PM  
Stop Time: 1:08 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.147	-0.57	-0.410	-1.72	-1.14
CO	10.476	10.007	-2.04	9.875	-2.61	-0.57
NOx	0.085	0.092	0.03	0.098	0.06	0.03
NOx	9.890	10.049	0.70	9.988	0.43	-0.27
O2	0.037	0.037	0.00	0.018	-0.09	-0.09
O2	10.989	11.038	0.23	11.026	0.18	-0.06

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Seven  
Start Time: 1:21 PM  
Stop Time: 1:42 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.410	-1.72	-0.220	-0.89	0.83
CO	10.476	9.875	-2.61	9.949	-2.29	0.32
NOx	0.085	0.098	0.06	0.098	0.06	0.00
NOx	9.890	9.988	0.43	9.927	0.16	-0.27
O2	0.037	0.018	-0.09	0.037	0.00	0.09
O2	10.989	11.026	0.18	11.020	0.15	-0.03

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Eight  
Start Time: 1:55 PM  
Stop Time: 2:16 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.220	-0.89	-0.308	-1.27	-0.38
CO	10.476	9.949	-2.29	10.022	-1.97	0.32
NOx	0.085	0.098	0.06	0.098	0.06	0.00
NOx	9.890	9.927	0.16	9.933	0.19	0.03
O2	0.037	0.037	0.00	0.012	-0.12	-0.12
O2	10.989	11.020	0.15	10.983	-0.03	-0.18

**Sampling System Bias and Drift**  
Reference Method Quality Assurance  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

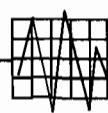
Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Nine  
Start Time: 2:29 PM  
Stop Time: 2:50 PM

Calibration Analyzer	Analyzer Response	Initial Cal	Initial Bias	Final Cal	Final Bias %	Cal Drift %
CO	-0.015	-0.308	-1.27	-0.147	-0.57	0.70
CO	10.476	10.022	-1.97	10.022	-1.97	0.00
NOx	0.085	0.098	0.06	0.098	0.06	0.00
NOx	9.890	9.933	0.19	9.982	0.41	0.22
O2	0.037	0.012	-0.12	0.043	0.03	0.15
O2	10.989	10.983	-0.03	10.989	0.00	0.03

## **Appendix B, Section 2**

### **Gas Run Average Emission Calculations**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: One  
Start Time: 8:01 AM  
Stop Time: 8:22 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.07	-0.03	0.02
10.20 ppm CO	10.27	10.07	10.17
0.00 ppm NOx	0.12	0.10	0.11
9.99 ppm NOx	9.95	9.96	9.95
0.00 percent O2	0.09	0.10	0.10
11.00 percent O2	10.90	11.03	10.97

**Mean Reference Values:**

0.494 ppm CO  
5.361 ppm NOx  
13.846 percent O2

**Corrected Results:**

0.476 ppmvd CO  
5.331 ppmvd NOx  
13.910 percent vd O2

**Emission Calculations:**

0.017 lbs/mmBtu NOx  
4.500 ppm (dry) NOx @15% O2  
0.402 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Two  
Start Time: 8:35 AM  
Stop Time: 8:56 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.03	0.00	-0.01
10.20 ppm CO	10.07	10.14	10.10
0.00 ppm NOx	0.10	0.12	0.11
9.99 ppm NOx	9.96	9.93	9.95
0.00 percent O2	0.10	0.05	0.07
11.00 percent O2	11.03	11.03	11.03

**Mean Reference Values:**

0.475 ppm CO  
5.367 ppm NOx  
13.864 percent O2

**Corrected Results:**

0.489 ppmvd CO  
5.337 ppmvd NOx  
13.844 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx  
4.463 ppm (dry) NOx @15% O2  
0.409 ppm (dry) CO @15% O2**

**Reference Method Gas**  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems                              Date: 10-Jul-12  
Pensacola, Florida    Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A                      Run: Three  
Unit HP 2A    Start Time: 9:10 AM  
Tallahassee, Florida    Stop Time: 9:31 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.00	-0.04	-0.02
10.20 ppm CO	10.14	10.10	10.12
0.00 ppm NOx	0.12	0.10	0.11
9.99 ppm NOx	9.93	9.82	9.88
0.00 percent O2	0.05	0.09	0.07
11.00 percent O2	11.03	10.97	11.00

**Mean Reference Values:**

0.440 ppm CO  
5.262 ppm NOx  
13.883 percent O2

**Corrected Results:**

0.463 ppmvd CO  
5.268 ppmvd NOx  
13.901 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx**  
**4.441 ppm (dry) NOx @15% O2**  
**0.390 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Four  
Start Time: 9:45 AM  
Stop Time: 10:06 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.04	-0.04	-0.04
10.20 ppm CO	10.10	10.10	10.10
0.00 ppm NOx	0.10	0.10	0.10
9.99 ppm NOx	9.82	9.78	9.80
0.00 percent O2	0.09	0.15	0.12
11.00 percent O2	10.97	11.01	10.99

**Mean Reference Values:**

0.417 ppm CO  
5.295 ppm NOx  
13.905 percent O2

**Corrected Results:**

0.460 ppmvd CO  
5.350 ppmvd NOx  
13.950 percent vd O2

**Emission Calculations:**

**0.017 lbs/mmBtu NOx**  
**4.542 ppm (dry) NOx @15% O2**  
**0.390 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Five  
Start Time: 10:20 AM  
Stop Time: 10:41 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.04	-0.04	-0.04
10.20 ppm CO	10.10	10.02	10.06
0.00 ppm NOx	0.10	0.09	0.10
9.99 ppm NOx	9.78	9.92	9.85
0.00 percent O2	0.15	0.10	0.13
11.00 percent O2	11.01	11.00	11.00

**Mean Reference Values:**

0.361 ppm CO  
5.446 ppm NOx  
13.927 percent O2

**Corrected Results:**

0.405 ppmvd CO  
5.478 ppmvd NOx  
13.962 percent vd O2

**Emission Calculations:**

**0.017 lbs/mmBtu NOx  
4.658 ppm (dry) NOx @15% O2  
0.344 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Six  
Start Time: 11:04 AM  
Stop Time: 11:25 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.04	-0.12	-0.08
10.20 ppm CO	10.02	10.29	10.15
0.00 ppm NOx	0.09	0.07	0.08
9.99 ppm NOx	9.92	9.93	9.93
0.00 percent O2	0.10	0.09	0.09
11.00 percent O2	11.00	10.97	10.98

**Mean Reference Values:**

0.317 ppm CO  
5.239 ppm NOx  
13.943 percent O2

**Corrected Results:**

0.396 ppmvd CO  
5.232 ppmvd NOx  
13.993 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx**  
**4.469 ppm (dry) NOx @15% O2**  
**0.338 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Seven  
Start Time: 11:39 AM  
Stop Time: 12:00 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.12	-0.22	-0.17
10.20 ppm CO	10.29	10.27	10.28
0.00 ppm NOx	0.07	0.06	0.07
9.99 ppm NOx	9.93	9.85	9.89
0.00 percent O2	0.09	0.07	0.08
11.00 percent O2	10.97	10.93	10.95

**Mean Reference Values:**

0.318 ppm CO  
5.303 ppm NOx  
13.939 percent O2

**Corrected Results:**

0.476 ppmvd CO  
5.324 ppmvd NOx  
14.025 percent vd O2

**Emission Calculations:**

**0.017 lbs/mmBtu NOx  
4.568 ppm (dry) NOx @15% O2  
0.409 ppm (dry) CO @15% O2**

**Reference Method Gas**  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Eight  
Start Time: 12:15 PM  
Stop Time: 12:36 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.22	-0.16	-0.19
10.20 ppm CO	10.27	10.24	10.26
0.00 ppm NOx	0.06	0.07	0.06
9.99 ppm NOx	9.85	9.81	9.83
0.00 percent O2	0.07	0.04	0.06
11.00 percent O2	10.93	10.95	10.94

**Mean Reference Values:**

0.325 ppm CO  
5.251 ppm NOx  
13.936 percent O2

**Corrected Results:**

0.503 ppmvd CO  
5.308 ppmvd NOx  
14.029 percent vd O2

**Emission Calculations:**

**0.017 lbs/mmBtu NOx**  
**4.558 ppm (dry) NOx @15% O2**  
**0.432 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit HP 2A

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida

Run: Nine  
Start Time: 12:50 PM  
Stop Time: 1:11 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.16	-0.16	-0.16
10.20 ppm CO	10.24	10.27	10.26
0.00 ppm NOx	0.07	0.06	0.06
9.99 ppm NOx	9.81	9.79	9.80
0.00 percent O2	0.04	0.07	0.06
11.00 percent O2	10.95	10.96	10.96

**Mean Reference Values:**

0.279 ppm CO  
5.264 ppm NOx  
13.938 percent O2

**Corrected Results:**

0.430 ppmvd CO  
5.338 ppmvd NOx  
14.005 percent vd O2

**Emission Calculations:**

0.017 lbs/mmBtu NOx  
4.568 ppm (dry) NOx @15% O2  
0.368 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: One  
Start Time: 9:36 AM  
Stop Time: 9:57 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.23	0.22	0.23
10.20 ppm CO	10.17	10.17	10.17
0.00 ppm NOx	0.13	0.12	0.12
9.99 ppm NOx	10.09	10.23	10.16
0.00 percent O2	0.03	0.03	0.03
11.00 percent O2	11.03	11.00	11.01

**Mean Reference Values:**

4.584 ppm CO  
4.597 ppm NOx  
14.761 percent O2

**Corrected Results:**

4.468 ppmvd CO  
4.455 ppmvd NOx  
14.758 percent vd O2

**Emission Calculations:**

0.016 lbs/mmBtu NOx  
4.279 ppm (dry) NOx @15% O2  
4.292 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Two  
Start Time: 10:10 AM  
Stop Time: 10:31 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.22	0.18	0.20
10.20 ppm CO	10.17	10.24	10.21
0.00 ppm NOx	0.12	0.12	0.12
9.99 ppm NOx	10.23	10.17	10.20
0.00 percent O2	0.03	0.07	0.05
11.00 percent O2	11.00	11.03	11.01

**Mean Reference Values:**

4.532 ppm CO  
4.662 ppm NOx  
14.767 percent O2

**Corrected Results:**

4.414 ppmvd CO  
4.501 ppmvd NOx  
14.771 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx  
4.333 ppm (dry) NOx @15% O2  
4.249 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Three  
Start Time: 10:44 AM  
Stop Time: 11:05 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.18	0.18	0.18
10.20 ppm CO	10.24	10.27	10.26
0.00 ppm NOx	0.12	0.10	0.11
9.99 ppm NOx	10.17	10.10	10.14
0.00 percent O2	0.07	0.05	0.06
11.00 percent O2	11.03	11.01	11.02

**Mean Reference Values:**

4.514 ppm CO  
4.512 ppm NOx  
14.763 percent O2

**Corrected Results:**

4.386 ppmvd CO  
4.384 ppmvd NOx  
14.757 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx  
4.211 ppm (dry) NOx @15% O2  
4.212 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Four  
Start Time: 11:19 AM  
Stop Time: 11:40 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.18	0.18	0.18
10.20 ppm CO	10.27	10.24	10.26
0.00 ppm NOx	0.10	0.09	0.10
9.99 ppm NOx	10.10	10.13	10.12
0.00 percent O2	0.05	0.07	0.06
11.00 percent O2	11.01	11.03	11.02

**Mean Reference Values:**

4.534 ppm CO  
4.564 ppm NOx  
14.763 percent O2

**Corrected Results:**

4.406 ppmvd CO  
4.451 ppmvd NOx  
14.757 percent vd O2

**Emission Calculations:**

**0.016 lbs/mmBtu NOx**  
**4.274 ppm (dry) NOx @15% O2**  
**4.231 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Five  
Start Time: 11:54 AM  
Stop Time: 12:15 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.18	0.15	0.16
10.20 ppm CO	10.24	10.20	10.22
0.00 ppm NOx	0.09	0.09	0.09
9.99 ppm NOx	10.13	9.82	9.98
0.00 percent O2	0.07	0.07	0.07
11.00 percent O2	11.03	11.00	11.01

**Mean Reference Values:**

4.505 ppm CO  
4.336 ppm NOx  
14.762 percent O2

**Corrected Results:**

4.405 ppmvd CO  
4.289 ppmvd NOx  
14.773 percent vd O2

**Emission Calculations:**

0.015 lbs/mmBtu NOx  
4.130 ppm (dry) NOx @15% O2  
4.242 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Six  
Start Time: 12:29 PM  
Stop Time: 12:50 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.15	0.22	0.18
10.20 ppm CO	10.20	10.13	10.16
0.00 ppm NOx	0.09	0.09	0.09
9.99 ppm NOx	9.82	9.87	9.84
0.00 percent O2	0.07	0.04	0.06
11.00 percent O2	11.00	10.94	10.97

**Mean Reference Values:**

4.514 ppm CO  
3.978 ppm NOx  
14.631 percent O2

**Corrected Results:**

4.430 ppmvd CO  
3.984 ppmvd NOx  
14.691 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx  
3.786 ppm (dry) NOx @15% O2  
4.209 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Seven  
Start Time: 1:03 PM  
Stop Time: 1:24 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.22	0.22	0.22
10.20 ppm CO	10.13	10.24	10.18
0.00 ppm NOx	0.09	0.09	0.09
9.99 ppm NOx	9.87	9.84	9.85
0.00 percent O2	0.04	0.03	0.04
11.00 percent O2	10.94	11.04	10.99

**Mean Reference Values:**

4.460 ppm CO  
4.112 ppm NOx  
14.647 percent O2

**Corrected Results:**

4.342 ppmvd CO  
4.117 ppmvd NOx  
14.674 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx  
3.901 ppm (dry) NOx @15% O2  
4.115 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Eight  
Start Time: 1:37 PM  
Stop Time: 1:58 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.22	0.16	0.19
10.20 ppm CO	10.24	10.23	10.23
0.00 ppm NOx	0.09	0.10	0.10
9.99 ppm NOx	9.84	9.88	9.86
0.00 percent O2	0.03	0.10	0.06
11.00 percent O2	11.04	11.01	11.03

**Mean Reference Values:**

4.417 ppm CO  
4.139 ppm NOx  
14.716 percent O2

**Corrected Results:**

4.294 ppmvd CO  
4.134 ppmvd NOx  
14.696 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx  
3.932 ppm (dry) NOx @15% O2  
4.084 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 3

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: Nine  
Start Time: 2:11 PM  
Stop Time: 2:32 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	0.16	0.12	0.14
10.20 ppm CO	10.23	10.14	10.18
0.00 ppm NOx	0.10	0.10	0.10
9.99 ppm NOx	9.88	9.90	9.89
0.00 percent O2	0.10	0.09	0.09
11.00 percent O2	11.01	10.98	11.00

**Mean Reference Values:**

4.395 ppm CO  
4.076 ppm NOx  
14.840 percent O2

**Corrected Results:**

4.323 ppmvd CO  
4.057 ppmvd NOx  
14.872 percent vd O2

**Emission Calculations:**

**0.015 lbs/mmBtu NOx  
3.971 ppm (dry) NOx @15% O2  
4.231 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: One  
Start Time: 9:51 AM  
Stop Time: 10:12 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.03	-0.09	-0.06
10.20 ppm CO	10.02	10.13	10.07
0.00 ppm NOx	0.12	0.12	0.12
9.99 ppm NOx	10.09	10.28	10.19
0.00 percent O2	0.04	0.07	0.06
11.00 percent O2	11.04	11.07	11.05

**Mean Reference Values:**

3.198 ppm CO  
4.057 ppm NOx  
14.881 percent O2

**Corrected Results:**

3.281 ppmvd CO  
3.906 ppmvd NOx  
14.834 percent vd O2

**Emission Calculations:**

0.014 lbs/mmBtu NOx  
3.799 ppm (dry) NOx @15% O2  
3.191 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Two  
Start Time: 10:31 AM  
Stop Time: 10:52 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.09	-0.10	-0.10
10.20 ppm CO	10.13	9.99	10.06
0.00 ppm NOx	0.12	0.10	0.11
9.99 ppm NOx	10.28	10.19	10.24
0.00 percent O2	0.07	0.06	0.06
11.00 percent O2	11.07	11.00	11.03

**Mean Reference Values:**

3.137 ppm CO  
3.963 ppm NOx  
14.871 percent O2

**Corrected Results:**

3.250 ppmvd CO  
3.800 ppmvd NOx  
14.852 percent vd O2

**Emission Calculations:**

0.014 lbs/mmBtu NOx  
3.706 ppm (dry) NOx @15% O2  
3.170 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Three  
Start Time: 11:05 AM  
Stop Time: 11:26 AM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.10	-0.15	-0.13
10.20 ppm CO	9.99	10.10	10.04
0.00 ppm NOx	0.10	0.09	0.10
9.99 ppm NOx	10.19	10.14	10.16
0.00 percent O2	0.06	0.02	0.04
11.00 percent O2	11.00	10.99	10.99

**Mean Reference Values:**

3.076 ppm CO  
3.873 ppm NOx  
14.864 percent O2

**Corrected Results:**

3.215 ppmvd CO  
3.747 ppmvd NOx  
14.892 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx**  
**3.679 ppm (dry) NOx @15% O2**  
**3.157 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Four  
Start Time: 11:39 AM  
Stop Time: 12:00 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.15	-0.18	-0.16
10.20 ppm CO	10.10	10.10	10.10
0.00 ppm NOx	0.09	0.09	0.09
9.99 ppm NOx	10.14	10.06	10.10
0.00 percent O2	0.02	0.07	0.04
11.00 percent O2	10.99	11.00	10.99

**Mean Reference Values:**

3.050 ppm CO  
3.858 ppm NOx  
14.865 percent O2

**Corrected Results:**

3.191 ppmvd CO  
3.760 ppmvd NOx  
14.893 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx  
3.693 ppm (dry) NOx @15% O2  
3.134 ppm (dry) CO @15% O2**

**Reference Method Gas**  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Five  
Start Time: 12:13 PM  
Stop Time: 12:34 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.18	-0.15	-0.16
10.20 ppm CO	10.10	10.01	10.05
0.00 ppm NOx	0.09	0.09	0.09
9.99 ppm NOx	10.06	10.05	10.06
0.00 percent O2	0.07	0.04	0.05
11.00 percent O2	11.00	11.04	11.02

**Mean Reference Values:**

3.057 ppm CO  
3.846 ppm NOx  
14.865 percent O2

**Corrected Results:**

3.214 ppmvd CO  
3.764 ppmvd NOx  
14.856 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx**  
**3.674 ppm (dry) NOx @15% O2**  
**3.137 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Six  
Start Time: 12:47 PM  
Stop Time: 1:08 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.15	-0.41	-0.28
10.20 ppm CO	10.01	9.88	9.94
0.00 ppm NOx	0.09	0.10	0.10
9.99 ppm NOx	10.05	9.99	10.02
0.00 percent O2	0.04	0.02	0.03
11.00 percent O2	11.04	11.03	11.03

**Mean Reference Values:**

3.044 ppm CO  
3.852 ppm NOx  
14.865 percent O2

**Corrected Results:**

3.317 ppmvd CO  
3.778 ppmvd NOx  
14.835 percent vd O2

**Emission Calculations:**

0.014 lbs/mmBtu NOx  
3.676 ppm (dry) NOx @15% O2  
3.227 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Seven  
Start Time: 1:21 PM  
Stop Time: 1:42 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.41	-0.22	-0.32
10.20 ppm CO	9.88	9.95	9.91
0.00 ppm NOx	0.10	0.10	0.10
9.99 ppm NOx	9.99	9.93	9.96
0.00 percent O2	0.02	0.04	0.03
11.00 percent O2	11.03	11.02	11.02

**Mean Reference Values:**

3.040 ppm CO  
3.820 ppm NOx  
14.847 percent O2

**Corrected Results:**

3.350 ppmvd CO  
3.769 ppmvd NOx  
14.830 percent vd O2

**Emission Calculations:**

0.013 lbs/mmBtu NOx  
3.664 ppm (dry) NOx @15% O2  
3.257 ppm (dry) CO @15% O2

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Eight  
Start Time: 1:55 PM  
Stop Time: 2:16 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.22	-0.31	-0.26
10.20 ppm CO	9.95	10.02	9.99
0.00 ppm NOx	0.10	0.10	0.10
9.99 ppm NOx	9.93	9.93	9.93
0.00 percent O2	0.04	0.01	0.02
11.00 percent O2	11.02	10.98	11.00

**Mean Reference Values:**

3.091 ppm CO  
3.796 ppm NOx  
14.856 percent O2

**Corrected Results:**

3.335 ppmvd CO  
3.756 ppmvd NOx  
14.863 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx**  
**3.671 ppm (dry) NOx @15% O2**  
**3.259 ppm (dry) CO @15% O2**

Reference Method Gas  
**Average Run Emission Calculations**  
Unit CT 4

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: Nine  
Start Time: 2:29 PM  
Stop Time: 2:50 PM

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 ppm CO	-0.31	-0.15	-0.23
10.20 ppm CO	10.02	10.02	10.02
0.00 ppm NOx	0.10	0.10	0.10
9.99 ppm NOx	9.93	9.98	9.96
0.00 percent O2	0.01	0.04	0.03
11.00 percent O2	10.98	10.99	10.99

**Mean Reference Values:**

3.114 ppm CO  
3.817 ppm NOx  
14.860 percent O2

**Corrected Results:**

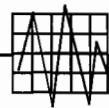
3.328 ppmvd CO  
3.766 ppmvd NOx  
14.884 percent vd O2

**Emission Calculations:**

**0.014 lbs/mmBtu NOx**  
**3.693 ppm (dry) Nox @15% O2**  
**3.264 ppm (dry) CO @15% O2**

## **Appendix B, Section 3**

### **Gas Calibration Raw Data**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/10/2012 6:41	ALM032048	NOX/A	NOx	BOTH	ZERO	0.116	0.000	PASS
7/10/2012 6:41	ALM032048	O2/A	O2	BOTH	ZERO	0.128	0.000	PASS
7/10/2012 6:41	ALM032048	CO/A	CO	BOTH	ZERO	0.044	0.000	PASS
7/10/2012 6:45	ALM028679	O2/A	O2	BOTH	MID	11.081	11.000	PASS
7/10/2012 6:47	AAL3287	NOX/A	NOx	BOTH	MID	9.957	9.990	PASS
7/10/2012 6:49	AAL069824	NOX/A	NOx	BOTH	HIGH	23.089	22.700	PASS
7/10/2012 6:52	AAL20222	CO/A	CO	BOTH	MID	10.095	10.200	PASS
7/10/2012 6:55	ALM025102	CO/A	CO	BOTH	HIGH	23.282	23.000	PASS
7/10/2012 6:58	Ambient Air	O2/A	O2	BOTH	HIGH	20.824	20.900	PASS
7/10/2012 7:50	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/10/2012 7:50	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/10/2012 7:50	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/10/2012 7:52	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.904	11.000	PASS
7/10/2012 7:54	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.945	9.990	PASS
7/10/2012 7:55	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.271	10.200	PASS
7/10/2012 8:23	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.104	0.000	PASS
7/10/2012 8:23	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/10/2012 8:23	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.029	0.000	PASS
7/10/2012 8:25	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/10/2012 8:27	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.963	9.990	PASS
7/10/2012 8:29	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.066	10.200	PASS
7/10/2012 8:57	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/10/2012 8:57	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.049	0.000	PASS
7/10/2012 8:57	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.000	0.000	PASS
7/10/2012 8:59	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/10/2012 9:01	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.927	9.990	PASS
7/10/2012 9:03	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.139	10.200	PASS
7/10/2012 9:32	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/10/2012 9:32	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/10/2012 9:32	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.044	0.000	PASS
7/10/2012 9:34	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.971	11.000	PASS
7/10/2012 9:36	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.823	9.990	PASS
7/10/2012 9:38	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.095	10.200	PASS
7/10/2012 10:07	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/10/2012 10:07	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.153	0.000	PASS
7/10/2012 10:07	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.044	0.000	PASS
7/10/2012 10:09	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.013	11.000	PASS
7/10/2012 10:11	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.780	9.990	PASS
7/10/2012 10:13	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.095	10.200	PASS
7/10/2012 10:42	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/10/2012 10:42	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.104	0.000	PASS
7/10/2012 10:42	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.044	0.000	PASS
7/10/2012 10:44	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.995	11.000	PASS
7/10/2012 10:46	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.921	9.990	PASS
7/10/2012 10:48	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.022	10.200	PASS

Reference Method  
 Calibration Data  
 Hopkins, Unit HP2A

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/10/2012 11:26	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/10/2012 11:26	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.085	0.000	PASS
7/10/2012 11:26	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.117	0.000	PASS
7/10/2012 11:28	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.971	11.000	PASS
7/10/2012 11:30	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.933	9.990	PASS
7/10/2012 11:32	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.286	10.200	PASS
7/10/2012 12:01	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.061	0.000	PASS
7/10/2012 12:01	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/10/2012 12:01	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.220	0.000	PASS
7/10/2012 12:03	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.933	11.000	PASS
7/10/2012 12:05	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.853	9.990	PASS
7/10/2012 12:07	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.271	10.200	PASS
7/10/2012 12:37	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.067	0.000	PASS
7/10/2012 12:37	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.037	0.000	PASS
7/10/2012 12:37	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.161	0.000	PASS
7/10/2012 12:39	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.952	11.000	PASS
7/10/2012 12:41	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.811	9.990	PASS
7/10/2012 12:43	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.242	10.200	PASS
7/10/2012 13:12	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.061	0.000	PASS
7/10/2012 13:12	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/10/2012 13:12	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.161	0.000	PASS
7/10/2012 13:14	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.958	11.000	PASS
7/10/2012 13:16	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.786	9.990	PASS
7/10/2012 13:18	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.271	10.200	PASS
7/10/2012 13:30	AAL064109	NOX/A	NOx	Nox Converter	MID	42.988	46.600	PASS

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/13/2012 8:51	ALM032048	NOX/A	NOx	BOTH	ZERO	0.085	0.000	PASS
7/13/2012 8:51	ALM032048	O2/A	O2	BOTH	ZERO	0.018	0.000	PASS
7/13/2012 8:51	ALM032048	CO/A	CO	BOTH	ZERO	0.337	0.000	PASS
7/13/2012 8:53	ALM028679	O2/A	O2	BOTH	MID	11.020	11.000	PASS
7/13/2012 8:58	AAL20222	CO/A	CO	BOTH	MID	10.227	10.200	PASS
7/13/2012 8:59	ALM025102	CO/A	CO	BOTH	HIGH	23.355	23.000	PASS
7/13/2012 9:04	Ambient Air	O2/A	O2	BOTH	HIGH	20.849	20.900	PASS
7/13/2012 9:07	AAL069824	NOX/A	NOx	BOTH	HIGH	22.857	22.700	PASS
7/13/2012 9:14	AAL3287	NOX/A	NOx	BOTH	MID	10.171	9.990	PASS
7/13/2012 9:19	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.128	0.000	PASS
7/13/2012 9:19	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.031	0.000	PASS
7/13/2012 9:19	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.234	0.000	PASS
7/13/2012 9:21	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/13/2012 9:24	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.092	9.990	PASS
7/13/2012 9:27	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.168	10.200	PASS
7/13/2012 9:58	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/13/2012 9:58	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.031	0.000	PASS
7/13/2012 9:58	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.220	0.000	PASS
7/13/2012 10:00	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.995	11.000	PASS
7/13/2012 10:01	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.226	9.990	PASS
7/13/2012 10:03	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.168	10.200	PASS
7/13/2012 10:32	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/13/2012 10:32	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.067	0.000	PASS
7/13/2012 10:32	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.176	0.000	PASS
7/13/2012 10:34	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/13/2012 10:36	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.171	9.990	PASS
7/13/2012 10:38	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.242	10.200	PASS
7/13/2012 11:06	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/13/2012 11:06	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.049	0.000	PASS
7/13/2012 11:06	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.176	0.000	PASS
7/13/2012 11:08	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.007	11.000	PASS
7/13/2012 11:10	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.104	9.990	PASS
7/13/2012 11:12	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.271	10.200	PASS
7/13/2012 11:41	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/13/2012 11:41	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/13/2012 11:41	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.176	0.000	PASS
7/13/2012 11:43	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/13/2012 11:45	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.128	9.990	PASS
7/13/2012 11:47	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.242	10.200	PASS
7/13/2012 12:16	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/13/2012 12:16	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.073	0.000	PASS
7/13/2012 12:16	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.147	0.000	PASS
7/13/2012 12:18	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.995	11.000	PASS
7/13/2012 12:20	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.823	9.990	PASS
7/13/2012 12:22	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.198	10.200	PASS
7/13/2012 12:51	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/13/2012 12:51	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.043	0.000	PASS
7/13/2012 12:51	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.220	0.000	PASS
7/13/2012 12:53	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.940	11.000	PASS
7/13/2012 12:55	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.866	9.990	PASS

Reference Method  
 Calibration Data  
 Hopkins, Unit CT 3

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/13/2012 12:57	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.125	10.200	PASS
7/13/2012 13:25	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/13/2012 13:25	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.031	0.000	PASS
7/13/2012 13:25	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.220	0.000	PASS
7/13/2012 13:27	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.044	11.000	PASS
7/13/2012 13:29	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.841	9.990	PASS
7/13/2012 13:31	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.242	10.200	PASS
7/13/2012 13:59	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.104	0.000	PASS
7/13/2012 13:59	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/13/2012 13:59	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.161	0.000	PASS
7/13/2012 14:01	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.007	11.000	PASS
7/13/2012 14:03	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.878	9.990	PASS
7/13/2012 14:05	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.227	10.200	PASS
7/13/2012 14:33	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/13/2012 14:33	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.085	0.000	PASS
7/13/2012 14:33	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.117	0.000	PASS
7/13/2012 14:35	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.983	11.000	PASS
7/13/2012 14:37	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.902	9.990	PASS
7/13/2012 14:38	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.139	10.200	PASS
7/13/2012 14:52	ALM064109	NOX/A	NOx	Nox Converter	MID	44.877	46.600	PASS

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/12/2012 9:15	ALM032048	NOX/A	NOx	BOTH	ZERO	0.085	0.000	PASS
7/12/2012 9:15	ALM032048	O2/A	O2	BOTH	ZERO	0.037	0.000	PASS
7/12/2012 9:15	ALM032048	CO/A	CO	BOTH	ZERO	-0.015	0.000	PASS
7/12/2012 9:16	ALM028679	O2/A	O2	BOTH	MID	10.989	11.000	PASS
7/12/2012 9:20	AAL20222	CO/A	CO	BOTH	MID	10.476	10.200	PASS
7/12/2012 9:23	ALM025102	CO/A	CO	BOTH	HIGH	23.370	23.000	PASS
7/12/2012 9:26	AAL3287	NOX/A	NOx	BOTH	MID	9.890	9.990	PASS
7/12/2012 9:28	AAL069824	NOX/A	NOx	BOTH	HIGH	22.894	22.700	PASS
7/12/2012 9:29	Ambient Air	O2/A	O2	BOTH	HIGH	20.702	20.900	PASS
7/12/2012 9:40	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/12/2012 9:40	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.043	0.000	PASS
7/12/2012 9:40	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.029	0.000	PASS
7/12/2012 9:41	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.038	11.000	PASS
7/12/2012 9:43	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.092	9.990	PASS
7/12/2012 9:45	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.022	10.200	PASS
7/12/2012 10:13	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.116	0.000	PASS
7/12/2012 10:13	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.067	0.000	PASS
7/12/2012 10:13	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.088	0.000	PASS
7/12/2012 10:15	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.068	11.000	PASS
7/12/2012 10:18	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.125	10.200	PASS
7/12/2012 10:22	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.281	9.990	PASS
7/12/2012 10:53	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.104	0.000	PASS
7/12/2012 10:53	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.061	0.000	PASS
7/12/2012 10:53	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.103	0.000	PASS
7/12/2012 10:55	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.995	11.000	PASS
7/12/2012 10:57	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.189	9.990	PASS
7/12/2012 10:59	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	9.993	10.200	PASS
7/12/2012 11:27	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/12/2012 11:27	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.018	0.000	PASS
7/12/2012 11:27	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.147	0.000	PASS
7/12/2012 11:29	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.989	11.000	PASS
7/12/2012 11:31	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.140	9.990	PASS
7/12/2012 11:33	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.095	10.200	PASS
7/12/2012 12:01	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.085	0.000	PASS
7/12/2012 12:01	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.067	0.000	PASS
7/12/2012 12:01	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.176	0.000	PASS
7/12/2012 12:03	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.995	11.000	PASS
7/12/2012 12:05	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.061	9.990	PASS
7/12/2012 12:07	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.095	10.200	PASS
7/12/2012 12:35	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.092	0.000	PASS
7/12/2012 12:35	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.037	0.000	PASS
7/12/2012 12:35	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.147	0.000	PASS
7/12/2012 12:37	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.038	11.000	PASS
7/12/2012 12:39	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	10.049	9.990	PASS
7/12/2012 12:41	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.007	10.200	PASS
7/12/2012 13:09	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/12/2012 13:09	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.018	0.000	PASS
7/12/2012 13:09	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.410	0.000	PASS
7/12/2012 13:11	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.026	11.000	PASS
7/12/2012 13:13	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.988	9.990	PASS

Reference Method  
 Calibration Data  
 Hopkins, Unit CT 4

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
7/12/2012 13:15	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	9.875	10.200	PASS
7/12/2012 13:43	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/12/2012 13:43	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.037	0.000	PASS
7/12/2012 13:43	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.220	0.000	PASS
7/12/2012 13:45	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	11.020	11.000	PASS
7/12/2012 13:47	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.927	9.990	PASS
7/12/2012 13:49	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	9.949	10.200	PASS
7/12/2012 14:17	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/12/2012 14:17	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.012	0.000	PASS
7/12/2012 14:17	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.308	0.000	PASS
7/12/2012 14:19	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.983	11.000	PASS
7/12/2012 14:21	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.933	9.990	PASS
7/12/2012 14:23	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.022	10.200	PASS
7/12/2012 14:51	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS
7/12/2012 14:51	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.043	0.000	PASS
7/12/2012 14:51	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.147	0.000	PASS
7/12/2012 14:53	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.989	11.000	PASS
7/12/2012 14:56	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.982	9.990	PASS
7/12/2012 14:58	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.022	10.200	PASS

## **Appendix B, Section 4**

### **Gas Minute and Run Averages Raw Data**



Spectrum Systems, Inc.  
Annual RATA Testing, July 2012

City of Tallahassee  
Hopkins Units 2A, HC3 and HC4

### Run #1

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 8:01	5.347	13.841	0.498
2	7/10/2012 8:02	5.345	13.844	0.520
3	7/10/2012 8:03	5.399	13.819	0.510
4	7/10/2012 8:04	5.375	13.818	0.508
5	7/10/2012 8:05	5.321	13.852	0.503
6	7/10/2012 8:06	5.328	13.839	0.513
7	7/10/2012 8:07	5.318	13.842	0.505
8	7/10/2012 8:08	5.394	13.834	0.491
9	7/10/2012 8:09	5.352	13.850	0.508
10	7/10/2012 8:10	5.324	13.832	0.481
11	7/10/2012 8:11	5.478	13.854	0.469
12	7/10/2012 8:12	5.703	13.843	0.471
13	7/10/2012 8:13	5.641	13.869	0.476
14	7/10/2012 8:14	5.594	13.849	0.481
15	7/10/2012 8:15	5.454	13.853	0.527
16	7/10/2012 8:16	5.381	13.847	0.505
17	7/10/2012 8:17	5.286	13.850	0.486
18	7/10/2012 8:18	5.101	13.841	0.486
19	7/10/2012 8:19	5.022	13.860	0.469
20	7/10/2012 8:20	5.082	13.870	0.479
21	7/10/2012 8:21	5.337	13.848	0.488
Average		5.361	13.846	0.494

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

## Run #2

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 8:35	5.433	13.859	0.479
2	7/10/2012 8:36	5.360	13.852	0.503
3	7/10/2012 8:37	5.236	13.840	0.479
4	7/10/2012 8:38	5.425	13.886	0.479
5	7/10/2012 8:39	5.404	13.878	0.449
6	7/10/2012 8:40	5.764	13.862	0.466
7	7/10/2012 8:41	5.740	13.864	0.481
8	7/10/2012 8:42	5.423	13.849	0.484
9	7/10/2012 8:43	5.119	13.851	0.452
10	7/10/2012 8:44	5.189	13.850	0.464
11	7/10/2012 8:45	5.459	13.879	0.464
12	7/10/2012 8:46	5.328	13.857	0.469
13	7/10/2012 8:47	5.250	13.864	0.486
14	7/10/2012 8:48	5.303	13.872	0.488
15	7/10/2012 8:49	5.317	13.880	0.466
16	7/10/2012 8:50	5.325	13.867	0.496
17	7/10/2012 8:51	5.360	13.863	0.496
18	7/10/2012 8:52	5.328	13.869	0.479
19	7/10/2012 8:53	5.345	13.864	0.462
20	7/10/2012 8:54	5.312	13.858	0.481
21	7/10/2012 8:55	5.284	13.873	0.462
Average		5.367	13.864	0.475

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #3

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 9:10	5.327	13.861	0.469
2	7/10/2012 9:11	5.166	13.853	0.432
3	7/10/2012 9:12	5.059	13.872	0.425
4	7/10/2012 9:13	5.169	13.865	0.435
5	7/10/2012 9:14	5.079	13.872	0.444
6	7/10/2012 9:15	5.023	13.876	0.457
7	7/10/2012 9:16	5.049	13.877	0.418
8	7/10/2012 9:17	5.066	13.874	0.440
9	7/10/2012 9:18	5.224	13.884	0.430
10	7/10/2012 9:19	5.305	13.884	0.452
11	7/10/2012 9:20	5.328	13.886	0.430
12	7/10/2012 9:21	5.344	13.880	0.437
13	7/10/2012 9:22	5.238	13.892	0.437
14	7/10/2012 9:23	5.381	13.880	0.449
15	7/10/2012 9:24	5.413	13.900	0.435
16	7/10/2012 9:25	5.631	13.883	0.459
17	7/10/2012 9:26	5.586	13.880	0.437
18	7/10/2012 9:27	5.381	13.905	0.437
19	7/10/2012 9:28	4.941	13.894	0.437
20	7/10/2012 9:29	5.243	13.909	0.440
21	7/10/2012 9:30	5.545	13.908	0.432
Average		5.262	13.883	0.440

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #4

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 9:45	5.200	13.901	0.422
2	7/10/2012 9:46	5.237	13.874	0.408
3	7/10/2012 9:47	5.321	13.900	0.420
4	7/10/2012 9:48	5.319	13.893	0.437
5	7/10/2012 9:49	5.322	13.906	0.430
6	7/10/2012 9:50	5.443	13.901	0.432
7	7/10/2012 9:51	5.437	13.912	0.415
8	7/10/2012 9:52	5.390	13.901	0.413
9	7/10/2012 9:53	5.268	13.908	0.413
10	7/10/2012 9:54	5.103	13.902	0.432
11	7/10/2012 9:55	5.079	13.909	0.420
12	7/10/2012 9:56	5.241	13.910	0.427
13	7/10/2012 9:57	5.212	13.915	0.403
14	7/10/2012 9:58	5.498	13.891	0.418
15	7/10/2012 9:59	5.196	13.917	0.418
16	7/10/2012 10:00	5.275	13.921	0.420
17	7/10/2012 10:01	5.306	13.908	0.408
18	7/10/2012 10:02	5.326	13.902	0.427
19	7/10/2012 10:03	5.188	13.918	0.418
20	7/10/2012 10:04	5.296	13.904	0.388
21	7/10/2012 10:05	5.534	13.910	0.398
Average		5.295	13.905	0.417

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #5

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 10:20	5.296	13.920	0.410
2	7/10/2012 10:21	5.287	13.929	0.410
3	7/10/2012 10:22	5.329	13.923	0.396
4	7/10/2012 10:23	5.391	13.926	0.398
5	7/10/2012 10:24	5.460	13.912	0.376
6	7/10/2012 10:25	5.438	13.926	0.386
7	7/10/2012 10:26	5.464	13.913	0.376
8	7/10/2012 10:27	5.518	13.933	0.369
9	7/10/2012 10:28	5.527	13.930	0.361
10	7/10/2012 10:29	5.477	13.921	0.366
11	7/10/2012 10:30	5.528	13.935	0.376
12	7/10/2012 10:31	5.740	13.922	0.393
13	7/10/2012 10:32	5.607	13.950	0.369
14	7/10/2012 10:33	5.495	13.947	0.357
15	7/10/2012 10:34	5.608	13.939	0.327
16	7/10/2012 10:35	5.578	13.927	0.339
17	7/10/2012 10:36	5.418	13.919	0.347
18	7/10/2012 10:37	5.294	13.940	0.366
19	7/10/2012 10:38	5.268	13.922	0.278
20	7/10/2012 10:39	5.240	13.914	0.295
21	7/10/2012 10:40	5.398	13.923	0.281
Average		5.446	13.927	0.361

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #6

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 11:04	5.228	13.936	0.344
2	7/10/2012 11:05	5.279	13.901	0.344
3	7/10/2012 11:06	5.152	13.911	0.357
4	7/10/2012 11:07	5.179	13.930	0.347
5	7/10/2012 11:08	5.280	13.935	0.335
6	7/10/2012 11:09	5.374	13.959	0.347
7	7/10/2012 11:10	5.163	13.961	0.361
8	7/10/2012 11:11	5.244	13.948	0.342
9	7/10/2012 11:12	5.416	13.930	0.332
10	7/10/2012 11:13	5.471	13.911	0.347
11	7/10/2012 11:14	5.293	13.939	0.281
12	7/10/2012 11:15	5.261	13.944	0.286
13	7/10/2012 11:16	5.157	13.963	0.313
14	7/10/2012 11:17	5.144	13.966	0.310
15	7/10/2012 11:18	5.196	13.962	0.303
16	7/10/2012 11:19	5.187	13.958	0.310
17	7/10/2012 11:20	5.200	13.940	0.325
18	7/10/2012 11:21	5.232	13.947	0.247
19	7/10/2012 11:22	5.196	13.939	0.330
20	7/10/2012 11:23	5.166	13.957	0.303
21	7/10/2012 11:24	5.196	13.957	0.198
Average		5.239	13.943	0.317

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

**Run #7**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 11:39	5.202	13.945	0.332
2	7/10/2012 11:40	5.201	13.923	0.315
3	7/10/2012 11:41	5.282	13.928	0.286
4	7/10/2012 11:42	5.273	13.955	0.303
5	7/10/2012 11:43	5.261	13.931	0.339
6	7/10/2012 11:44	5.265	13.938	0.298
7	7/10/2012 11:45	5.390	13.906	0.330
8	7/10/2012 11:46	5.407	13.912	0.249
9	7/10/2012 11:47	5.256	14.073	0.357
10	7/10/2012 11:48	5.186	13.934	0.366
11	7/10/2012 11:49	5.204	13.946	0.335
12	7/10/2012 11:50	5.362	13.940	0.247
13	7/10/2012 11:51	5.457	13.930	0.339
14	7/10/2012 11:52	5.449	13.942	0.369
15	7/10/2012 11:53	5.297	13.931	0.325
16	7/10/2012 11:54	5.168	13.928	0.308
17	7/10/2012 11:55	5.167	13.953	0.317
18	7/10/2012 11:56	5.229	13.925	0.313
19	7/10/2012 11:57	5.343	13.913	0.335
20	7/10/2012 11:58	5.518	13.930	0.349
21	7/10/2012 11:59	5.439	13.936	0.264
<b>Average</b>		<b>5.303</b>	<b>13.939</b>	<b>0.318</b>

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #8

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 12:15	5.164	13.936	0.342
2	7/10/2012 12:16	5.199	13.934	0.364
3	7/10/2012 12:17	5.238	13.930	0.354
4	7/10/2012 12:18	5.292	13.936	0.337
5	7/10/2012 12:19	5.207	13.963	0.264
6	7/10/2012 12:20	5.213	13.949	0.264
7	7/10/2012 12:21	5.179	13.934	0.298
8	7/10/2012 12:22	5.226	13.946	0.317
9	7/10/2012 12:23	5.250	13.940	0.300
10	7/10/2012 12:24	5.247	13.930	0.337
11	7/10/2012 12:25	5.342	13.923	0.335
12	7/10/2012 12:26	5.362	13.909	0.315
13	7/10/2012 12:27	5.229	13.928	0.332
14	7/10/2012 12:28	5.149	13.953	0.308
15	7/10/2012 12:29	5.236	13.925	0.347
16	7/10/2012 12:30	5.288	13.913	0.347
17	7/10/2012 12:31	5.352	13.931	0.352
18	7/10/2012 12:32	5.266	13.947	0.315
19	7/10/2012 12:33	5.286	13.957	0.330
20	7/10/2012 12:34	5.273	13.938	0.325
21	7/10/2012 12:35	5.271	13.945	0.337
Average		5.251	13.936	0.325

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

### Run #9

#	Date/Time	NOX/A	O2/A	CO/A
1	7/10/2012 12:50	5.252	13.916	0.303
2	7/10/2012 12:51	5.168	13.933	0.283
3	7/10/2012 12:52	5.173	13.942	0.256
4	7/10/2012 12:53	5.210	13.931	0.303
5	7/10/2012 12:54	5.217	13.931	0.264
6	7/10/2012 12:55	5.321	13.908	0.298
7	7/10/2012 12:56	5.263	13.944	0.298
8	7/10/2012 12:57	5.198	13.946	0.227
9	7/10/2012 12:58	5.234	13.953	0.249
10	7/10/2012 12:59	5.282	13.954	0.303
11	7/10/2012 13:00	5.293	13.939	0.271
12	7/10/2012 13:01	5.287	13.940	0.305
13	7/10/2012 13:02	5.298	13.956	0.225
14	7/10/2012 13:03	5.311	13.956	0.249
15	7/10/2012 13:04	5.342	13.925	0.278
16	7/10/2012 13:05	5.355	13.928	0.295
17	7/10/2012 13:06	5.283	13.948	0.310
18	7/10/2012 13:07	5.259	13.934	0.315
19	7/10/2012 13:08	5.270	13.935	0.271
20	7/10/2012 13:09	5.267	13.947	0.256
21	7/10/2012 13:10	5.268	13.942	0.291
Average		5.264	13.938	0.279

Reference Method  
One Minute Averages  
Hopkins, Unit HP2A

**Run #1**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 9:36	4.649	14.743	4.620
2	7/13/2012 9:37	4.660	14.751	4.615
3	7/13/2012 9:38	4.697	14.775	4.601
4	7/13/2012 9:39	4.761	14.775	4.574
5	7/13/2012 9:40	4.775	14.762	4.567
6	7/13/2012 9:41	4.701	14.786	4.608
7	7/13/2012 9:42	4.684	14.781	4.667
8	7/13/2012 9:43	4.722	14.785	4.642
9	7/13/2012 9:44	4.756	14.780	4.603
10	7/13/2012 9:45	4.773	14.773	4.581
11	7/13/2012 9:46	4.734	14.795	4.606
12	7/13/2012 9:47	4.717	14.772	4.606
13	7/13/2012 9:48	4.707	14.785	4.545
14	7/13/2012 9:49	4.774	14.770	4.523
15	7/13/2012 9:50	4.835	14.759	4.471
16	7/13/2012 9:51	4.781	14.776	4.530
17	7/13/2012 9:52	4.756	14.766	4.608
18	7/13/2012 9:53	4.741	14.777	4.584
19	7/13/2012 9:54	4.732	14.758	4.625
20	7/13/2012 9:55	4.752	14.774	4.564
21	7/13/2012 9:56	4.762	14.777	4.535
<b>Average</b>		<b>4.737</b>	<b>14.772</b>	<b>4.584</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

## Run #2

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 10:10	4.577	14.769	4.549
2	7/13/2012 10:11	4.576	14.772	4.574
3	7/13/2012 10:12	4.607	14.746	4.542
4	7/13/2012 10:13	4.598	14.772	4.527
5	7/13/2012 10:14	4.606	14.748	4.589
6	7/13/2012 10:15	4.591	14.775	4.554
7	7/13/2012 10:16	4.611	14.755	4.542
8	7/13/2012 10:17	4.647	14.754	4.505
9	7/13/2012 10:18	4.774	14.768	4.469
10	7/13/2012 10:19	4.761	14.773	4.535
11	7/13/2012 10:20	4.788	14.776	4.535
12	7/13/2012 10:21	4.815	14.777	4.569
13	7/13/2012 10:22	4.770	14.759	4.625
14	7/13/2012 10:23	4.759	14.759	4.532
15	7/13/2012 10:24	4.747	14.767	4.527
16	7/13/2012 10:25	4.692	14.773	4.486
17	7/13/2012 10:26	4.593	14.766	4.435
18	7/13/2012 10:27	4.600	14.773	4.505
19	7/13/2012 10:28	4.618	14.777	4.474
20	7/13/2012 10:29	4.587	14.764	4.501
21	7/13/2012 10:30	4.579	14.774	4.586
Average		4.662	14.767	4.532

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

### Run #3

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 10:44	4.438	14.780	4.589
2	7/13/2012 10:45	4.449	14.762	4.584
3	7/13/2012 10:46	4.474	14.757	4.549
4	7/13/2012 10:47	4.484	14.780	4.508
5	7/13/2012 10:48	4.550	14.750	4.440
6	7/13/2012 10:49	4.577	14.760	4.442
7	7/13/2012 10:50	4.596	14.742	4.388
8	7/13/2012 10:51	4.597	14.771	4.403
9	7/13/2012 10:52	4.550	14.761	4.427
10	7/13/2012 10:53	4.536	14.751	4.427
11	7/13/2012 10:54	4.532	14.754	4.471
12	7/13/2012 10:55	4.510	14.789	4.515
13	7/13/2012 10:56	4.484	14.774	4.567
14	7/13/2012 10:57	4.477	14.770	4.574
15	7/13/2012 10:58	4.493	14.768	4.623
16	7/13/2012 10:59	4.480	14.756	4.613
17	7/13/2012 11:00	4.460	14.781	4.581
18	7/13/2012 11:01	4.468	14.775	4.557
19	7/13/2012 11:02	4.504	14.747	4.542
20	7/13/2012 11:03	4.515	14.751	4.505
21	7/13/2012 11:04	4.584	14.744	4.479
Average		4.512	14.763	4.514

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

### Run #4

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 11:19	4.572	14.770	4.579
2	7/13/2012 11:20	4.598	14.749	4.540
3	7/13/2012 11:21	4.632	14.753	4.481
4	7/13/2012 11:22	4.660	14.755	4.442
5	7/13/2012 11:23	4.624	14.765	4.422
6	7/13/2012 11:24	4.541	14.763	4.488
7	7/13/2012 11:25	4.515	14.786	4.552
8	7/13/2012 11:26	4.519	14.767	4.562
9	7/13/2012 11:27	4.519	14.753	4.537
10	7/13/2012 11:28	4.515	14.750	4.554
11	7/13/2012 11:29	4.516	14.785	4.562
12	7/13/2012 11:30	4.491	14.782	4.613
13	7/13/2012 11:31	4.453	14.768	4.657
14	7/13/2012 11:32	4.432	14.763	4.676
15	7/13/2012 11:33	4.484	14.779	4.657
16	7/13/2012 11:34	4.565	14.754	4.589
17	7/13/2012 11:35	4.644	14.777	4.481
18	7/13/2012 11:36	4.662	14.769	4.471
19	7/13/2012 11:37	4.676	14.752	4.427
20	7/13/2012 11:38	4.642	14.760	4.432
21	7/13/2012 11:39	4.590	14.761	4.481
Average		4.564	14.765	4.534

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

### Run #5

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 11:54	4.385	14.753	4.444
2	7/13/2012 11:55	4.370	14.761	4.469
3	7/13/2012 11:56	4.335	14.776	4.496
4	7/13/2012 11:57	4.305	14.750	4.527
5	7/13/2012 11:58	4.309	14.776	4.559
6	7/13/2012 11:59	4.307	14.769	4.542
7	7/13/2012 12:00	4.290	14.774	4.579
8	7/13/2012 12:01	4.284	14.785	4.574
9	7/13/2012 12:02	4.255	14.790	4.576
10	7/13/2012 12:03	4.283	14.750	4.632
11	7/13/2012 12:04	4.300	14.775	4.559
12	7/13/2012 12:05	4.388	14.747	4.491
13	7/13/2012 12:06	4.392	14.746	4.430
14	7/13/2012 12:07	4.408	14.737	4.425
15	7/13/2012 12:08	4.421	14.754	4.383
16	7/13/2012 12:09	4.430	14.770	4.400
17	7/13/2012 12:10	4.404	14.760	4.405
18	7/13/2012 12:11	4.361	14.762	4.479
19	7/13/2012 12:12	4.312	14.757	4.518
20	7/13/2012 12:13	4.279	14.775	4.557
21	7/13/2012 12:14	4.243	14.744	4.557
Average		4.336	14.762	4.505

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

### Run #6

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 12:29	4.007	14.642	4.486
2	7/13/2012 12:30	3.996	14.628	4.567
3	7/13/2012 12:31	3.973	14.643	4.532
4	7/13/2012 12:32	3.958	14.647	4.520
5	7/13/2012 12:33	3.947	14.631	4.562
6	7/13/2012 12:34	3.926	14.647	4.579
7	7/13/2012 12:35	3.919	14.653	4.635
8	7/13/2012 12:36	3.919	14.630	4.613
9	7/13/2012 12:37	3.977	14.624	4.591
10	7/13/2012 12:38	4.008	14.643	4.484
11	7/13/2012 12:39	4.015	14.610	4.447
12	7/13/2012 12:40	4.016	14.624	4.408
13	7/13/2012 12:41	4.044	14.629	4.403
14	7/13/2012 12:42	4.075	14.616	4.361
15	7/13/2012 12:43	4.093	14.603	4.361
16	7/13/2012 12:44	4.042	14.629	4.383
17	7/13/2012 12:45	4.004	14.641	4.391
18	7/13/2012 12:46	3.939	14.608	4.481
19	7/13/2012 12:47	3.921	14.631	4.503
20	7/13/2012 12:48	3.915	14.632	4.742
21	7/13/2012 12:49	3.842	14.634	4.742
Average		3.978	14.631	4.514

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

**Run #7**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 13:03	4.123	14.632	4.498
2	7/13/2012 13:04	4.132	14.672	4.447
3	7/13/2012 13:05	4.088	14.666	4.474
4	7/13/2012 13:06	4.086	14.660	4.452
5	7/13/2012 13:07	4.069	14.661	4.540
6	7/13/2012 13:08	4.057	14.666	4.547
7	7/13/2012 13:09	4.123	14.645	4.518
8	7/13/2012 13:10	4.134	14.654	4.501
9	7/13/2012 13:11	4.126	14.658	4.408
10	7/13/2012 13:12	4.148	14.627	4.388
11	7/13/2012 13:13	4.194	14.634	4.408
12	7/13/2012 13:14	4.227	14.627	4.354
13	7/13/2012 13:15	4.240	14.635	4.357
14	7/13/2012 13:16	4.193	14.627	4.371
15	7/13/2012 13:17	4.149	14.640	4.403
16	7/13/2012 13:18	4.100	14.628	4.454
17	7/13/2012 13:19	4.084	14.640	4.420
18	7/13/2012 13:20	4.059	14.632	4.505
19	7/13/2012 13:21	4.042	14.653	4.484
20	7/13/2012 13:22	3.997	14.675	4.571
21	7/13/2012 13:23	3.991	14.649	4.571
<b>Average</b>		<b>4.112</b>	<b>14.647</b>	<b>4.460</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

### Run #8

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 13:37	4.135	14.694	4.430
2	7/13/2012 13:38	4.092	14.693	4.474
3	7/13/2012 13:39	4.060	14.707	4.523
4	7/13/2012 13:40	4.078	14.681	4.513
5	7/13/2012 13:41	4.142	14.704	4.481
6	7/13/2012 13:42	4.162	14.673	4.481
7	7/13/2012 13:43	4.167	14.707	4.422
8	7/13/2012 13:44	4.196	14.684	4.379
9	7/13/2012 13:45	4.212	14.678	4.371
10	7/13/2012 13:46	4.221	14.683	4.342
11	7/13/2012 13:47	4.206	14.718	4.300
12	7/13/2012 13:48	4.186	14.734	4.295
13	7/13/2012 13:49	4.135	14.733	4.315
14	7/13/2012 13:50	4.096	14.743	4.386
15	7/13/2012 13:51	4.114	14.726	4.388
16	7/13/2012 13:52	4.127	14.749	4.415
17	7/13/2012 13:53	4.128	14.745	4.442
18	7/13/2012 13:54	4.122	14.749	4.444
19	7/13/2012 13:55	4.128	14.750	4.444
20	7/13/2012 13:56	4.108	14.754	4.452
21	7/13/2012 13:57	4.111	14.725	4.462
Average		4.139	14.716	4.417

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

**Run #9**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/13/2012 14:11	4.058	14.840	4.418
2	7/13/2012 14:12	4.073	14.850	4.447
3	7/13/2012 14:13	4.068	14.841	4.415
4	7/13/2012 14:14	4.058	14.850	4.444
5	7/13/2012 14:15	4.033	14.847	4.449
6	7/13/2012 14:16	4.027	14.837	4.457
7	7/13/2012 14:17	4.012	14.851	4.508
8	7/13/2012 14:18	4.039	14.843	4.491
9	7/13/2012 14:19	4.124	14.819	4.400
10	7/13/2012 14:20	4.179	14.837	4.310
11	7/13/2012 14:21	4.184	14.822	4.313
12	7/13/2012 14:22	4.213	14.806	4.288
13	7/13/2012 14:23	4.167	14.835	4.230
14	7/13/2012 14:24	4.116	14.819	4.259
15	7/13/2012 14:25	4.083	14.854	4.332
16	7/13/2012 14:26	4.062	14.828	4.359
17	7/13/2012 14:27	4.048	14.849	4.371
18	7/13/2012 14:28	4.044	14.843	4.469
19	7/13/2012 14:29	3.998	14.856	4.474
20	7/13/2012 14:30	4.007	14.856	4.418
21	7/13/2012 14:31	3.997	14.858	4.447
<b>Average</b>		<b>4.076</b>	<b>14.840</b>	<b>4.395</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 3

**Run #1**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 9:51	3.875	14.879	3.275
2	7/12/2012 9:52	3.862	14.878	3.272
3	7/12/2012 9:53	3.916	14.881	3.233
4	7/12/2012 9:54	3.926	14.876	3.238
5	7/12/2012 9:55	3.923	14.880	3.236
6	7/12/2012 9:56	3.970	14.884	3.228
7	7/12/2012 9:57	4.078	14.881	3.238
8	7/12/2012 9:58	4.101	14.885	3.223
9	7/12/2012 9:59	4.115	14.868	3.216
10	7/12/2012 10:00	4.109	14.875	3.172
11	7/12/2012 10:01	4.124	14.906	3.184
12	7/12/2012 10:02	4.114	14.883	3.175
13	7/12/2012 10:03	4.112	14.882	3.153
14	7/12/2012 10:04	4.115	14.898	3.182
15	7/12/2012 10:05	4.122	14.891	3.140
16	7/12/2012 10:06	4.101	14.879	3.177
17	7/12/2012 10:07	4.085	14.880	3.165
18	7/12/2012 10:08	4.126	14.871	3.179
19	7/12/2012 10:09	4.135	14.861	3.170
20	7/12/2012 10:10	4.151	14.883	3.160
21	7/12/2012 10:11	4.128	14.887	3.138
<b>Average</b>		<b>4.057</b>	<b>14.881</b>	<b>3.198</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

## Run #2

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 10:31	3.966	14.851	3.099
2	7/12/2012 10:32	3.953	14.866	3.133
3	7/12/2012 10:33	3.958	14.898	3.109
4	7/12/2012 10:34	3.956	14.866	3.133
5	7/12/2012 10:35	3.953	14.881	3.121
6	7/12/2012 10:36	3.961	14.894	3.126
7	7/12/2012 10:37	3.962	14.878	3.148
8	7/12/2012 10:38	3.958	14.866	3.145
9	7/12/2012 10:39	3.986	14.881	3.155
10	7/12/2012 10:40	3.975	14.870	3.155
11	7/12/2012 10:41	3.962	14.875	3.170
12	7/12/2012 10:42	3.934	14.858	3.148
13	7/12/2012 10:43	3.972	14.862	3.140
14	7/12/2012 10:44	3.990	14.866	3.118
15	7/12/2012 10:45	3.974	14.861	3.128
16	7/12/2012 10:46	3.938	14.867	3.162
17	7/12/2012 10:47	3.954	14.828	3.162
18	7/12/2012 10:48	3.992	14.891	3.111
19	7/12/2012 10:49	3.987	14.872	3.114
20	7/12/2012 10:50	3.948	14.893	3.155
21	7/12/2012 10:51	3.937	14.879	3.153
Average		3.963	14.871	3.137

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

### Run #3

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 11:05	3.875	14.849	3.023
2	7/12/2012 11:06	3.899	14.857	3.060
3	7/12/2012 11:07	3.887	14.854	3.035
4	7/12/2012 11:08	3.889	14.863	3.057
5	7/12/2012 11:09	3.853	14.874	2.994
6	7/12/2012 11:10	3.870	14.883	3.067
7	7/12/2012 11:11	3.877	14.869	3.099
8	7/12/2012 11:12	3.853	14.862	3.109
9	7/12/2012 11:13	3.849	14.868	3.089
10	7/12/2012 11:14	3.888	14.879	3.087
11	7/12/2012 11:15	3.865	14.859	3.067
12	7/12/2012 11:16	3.871	14.867	3.082
13	7/12/2012 11:17	3.870	14.873	3.094
14	7/12/2012 11:18	3.884	14.860	3.106
15	7/12/2012 11:19	3.858	14.874	3.104
16	7/12/2012 11:20	3.847	14.863	3.106
17	7/12/2012 11:21	3.855	14.866	3.070
18	7/12/2012 11:22	3.863	14.860	3.121
19	7/12/2012 11:23	3.872	14.863	3.118
20	7/12/2012 11:24	3.889	14.857	3.062
21	7/12/2012 11:25	3.909	14.859	3.050
Average		3.873	14.864	3.076

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

**Run #4**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 11:39	3.891	14.861	3.023
2	7/12/2012 11:40	3.871	14.863	3.126
3	7/12/2012 11:41	3.850	14.869	3.121
4	7/12/2012 11:42	3.836	14.861	3.048
5	7/12/2012 11:43	3.836	14.863	3.079
6	7/12/2012 11:44	3.836	14.871	3.062
7	7/12/2012 11:45	3.856	14.863	3.043
8	7/12/2012 11:46	3.853	14.857	3.065
9	7/12/2012 11:47	3.867	14.853	2.967
10	7/12/2012 11:48	3.842	14.871	3.116
11	7/12/2012 11:49	3.877	14.874	3.079
12	7/12/2012 11:50	3.857	14.869	3.099
13	7/12/2012 11:51	3.852	14.845	3.079
14	7/12/2012 11:52	3.873	14.877	3.026
15	7/12/2012 11:53	3.852	14.871	3.043
16	7/12/2012 11:54	3.839	14.879	3.013
17	7/12/2012 11:55	3.869	14.869	2.908
18	7/12/2012 11:56	3.857	14.867	3.026
19	7/12/2012 11:57	3.874	14.887	2.991
20	7/12/2012 11:58	3.879	14.873	3.070
21	7/12/2012 11:59	3.852	14.871	3.060
<b>Average</b>		<b>3.858</b>	<b>14.867</b>	<b>3.050</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

### Run #5

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 12:13	3.910	14.866	3.065
2	7/12/2012 12:14	3.893	14.872	3.087
3	7/12/2012 12:15	3.855	14.847	3.067
4	7/12/2012 12:16	3.817	14.859	3.082
5	7/12/2012 12:17	3.819	14.878	3.065
6	7/12/2012 12:18	3.817	14.856	3.067
7	7/12/2012 12:19	3.843	14.863	3.060
8	7/12/2012 12:20	3.865	14.882	3.050
9	7/12/2012 12:21	3.873	14.885	3.070
10	7/12/2012 12:22	3.889	14.870	3.043
11	7/12/2012 12:23	3.841	14.874	3.079
12	7/12/2012 12:24	3.800	14.893	3.060
13	7/12/2012 12:25	3.816	14.881	3.043
14	7/12/2012 12:26	3.852	14.872	3.050
15	7/12/2012 12:27	3.862	14.889	3.033
16	7/12/2012 12:28	3.859	14.881	3.028
17	7/12/2012 12:29	3.848	14.852	3.053
18	7/12/2012 12:30	3.805	14.874	3.079
19	7/12/2012 12:31	3.826	14.871	3.035
20	7/12/2012 12:32	3.838	14.864	3.057
21	7/12/2012 12:33	3.846	14.874	3.021
Average		3.846	14.871	3.057

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

### Run #6

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 12:47	3.848	14.845	3.087
2	7/12/2012 12:48	3.880	14.852	3.062
3	7/12/2012 12:49	3.888	14.876	3.067
4	7/12/2012 12:50	3.860	14.857	3.050
5	7/12/2012 12:51	3.852	14.876	3.079
6	7/12/2012 12:52	3.874	14.863	3.077
7	7/12/2012 12:53	3.854	14.871	3.011
8	7/12/2012 12:54	3.840	14.863	3.035
9	7/12/2012 12:55	3.822	14.869	3.077
10	7/12/2012 12:56	3.834	14.870	3.045
11	7/12/2012 12:57	3.842	14.856	3.048
12	7/12/2012 12:58	3.848	14.858	3.053
13	7/12/2012 12:59	3.872	14.863	3.070
14	7/12/2012 13:00	3.849	14.875	2.987
15	7/12/2012 13:01	3.836	14.876	2.982
16	7/12/2012 13:02	3.839	14.883	3.004
17	7/12/2012 13:03	3.851	14.876	3.028
18	7/12/2012 13:04	3.823	14.874	3.011
19	7/12/2012 13:05	3.838	14.864	2.987
20	7/12/2012 13:06	3.870	14.853	3.043
21	7/12/2012 13:07	3.874	14.843	3.126
Average		3.852	14.865	3.044

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

### Run #7

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 13:21	3.864	14.829	3.031
2	7/12/2012 13:22	3.853	14.840	3.079
3	7/12/2012 13:23	3.839	14.843	3.067
4	7/12/2012 13:24	3.856	14.863	3.062
5	7/12/2012 13:25	3.853	14.838	3.079
6	7/12/2012 13:26	3.828	14.847	3.006
7	7/12/2012 13:27	3.798	14.851	3.055
8	7/12/2012 13:28	3.802	14.849	3.033
9	7/12/2012 13:29	3.800	14.838	3.043
10	7/12/2012 13:30	3.819	14.845	3.050
11	7/12/2012 13:31	3.807	14.860	3.094
12	7/12/2012 13:32	3.838	14.836	3.028
13	7/12/2012 13:33	3.798	14.838	3.089
14	7/12/2012 13:34	3.769	14.836	3.048
15	7/12/2012 13:35	3.769	14.845	3.055
16	7/12/2012 13:36	3.772	14.849	3.033
17	7/12/2012 13:37	3.792	14.846	2.999
18	7/12/2012 13:38	3.818	14.852	2.928
19	7/12/2012 13:39	3.807	14.839	3.038
20	7/12/2012 13:40	3.841	14.841	3.035
21	7/12/2012 13:41	3.884	14.837	2.996
Average		3.820	14.844	3.040

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

**Run #8**

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 13:55	3.751	14.834	3.099
2	7/12/2012 13:56	3.745	14.845	3.055
3	7/12/2012 13:57	3.783	14.845	3.067
4	7/12/2012 13:58	3.779	14.863	3.106
5	7/12/2012 13:59	3.766	14.820	3.116
6	7/12/2012 14:00	3.783	14.861	3.114
7	7/12/2012 14:01	3.797	14.841	3.145
8	7/12/2012 14:02	3.805	14.865	3.109
9	7/12/2012 14:03	3.806	14.850	3.136
10	7/12/2012 14:04	3.788	14.847	3.128
11	7/12/2012 14:05	3.790	14.868	3.106
12	7/12/2012 14:06	3.800	14.858	3.077
13	7/12/2012 14:07	3.801	14.856	3.087
14	7/12/2012 14:08	3.795	14.862	3.099
15	7/12/2012 14:09	3.791	14.863	3.087
16	7/12/2012 14:10	3.776	14.873	3.106
17	7/12/2012 14:11	3.815	14.869	3.067
18	7/12/2012 14:12	3.840	14.866	3.079
19	7/12/2012 14:13	3.851	14.872	3.018
20	7/12/2012 14:14	3.841	14.856	3.062
21	7/12/2012 14:15	3.805	14.866	3.057
<b>Average</b>		<b>3.796</b>	<b>14.856</b>	<b>3.091</b>

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

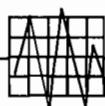
### Run #9

#	Date/Time	NOX/A	O2/A	CO/A
1	7/12/2012 14:29	3.817	14.862	3.111
2	7/12/2012 14:30	3.834	14.864	3.082
3	7/12/2012 14:31	3.822	14.852	3.160
4	7/12/2012 14:32	3.820	14.842	3.182
5	7/12/2012 14:33	3.793	14.859	3.128
6	7/12/2012 14:34	3.753	14.857	3.118
7	7/12/2012 14:35	3.782	14.864	3.143
8	7/12/2012 14:36	3.809	14.853	3.138
9	7/12/2012 14:37	3.812	14.871	3.150
10	7/12/2012 14:38	3.830	14.856	3.109
11	7/12/2012 14:39	3.834	14.861	3.123
12	7/12/2012 14:40	3.792	14.862	3.087
13	7/12/2012 14:41	3.824	14.859	3.116
14	7/12/2012 14:42	3.832	14.865	3.072
15	7/12/2012 14:43	3.817	14.868	3.118
16	7/12/2012 14:44	3.831	14.861	3.077
17	7/12/2012 14:45	3.832	14.862	3.123
18	7/12/2012 14:46	3.840	14.869	3.067
19	7/12/2012 14:47	3.812	14.848	3.065
20	7/12/2012 14:48	3.833	14.868	3.109
21	7/12/2012 14:49	3.844	14.860	3.118
Average		3.817	14.860	3.114

Reference Method  
One Minute Averages  
Hopkins, Unit CT 4

## **APPENDIX C**

### **Plant CEMS Data**



Spectrum Systems, Inc.

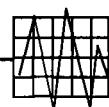
Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

## **Appendix C, Section 1**

### **CEMS Gas Data**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

DATE	TIME	CO_11	GAS12	GEN13	HTIP14	NOXL15	NOXLD16	NOXRT17	OXY18
7/10/2012	080200	0.700	1543.690	221	1577.60	5.500	4.600	0.017	13.765
7/10/2012	080300	0.700	1537.320	220	1571.10	5.500	4.500	0.017	13.767
7/10/2012	080400	0.700	1537.210	220	1571.00	5.600	4.600	0.017	13.760
7/10/2012	080500	0.600	1545.450	221	1579.40	5.500	4.500	0.017	13.756
7/10/2012	080600	0.600	1546.430	221	1580.40	5.500	4.500	0.017	13.755
7/10/2012	080700	0.600	1541.930	220	1575.80	5.500	4.500	0.017	13.761
7/10/2012	080800	0.600	1538.200	219	1572.00	5.500	4.500	0.017	13.762
7/10/2012	080900	0.600	1545.560	220	1579.60	5.600	4.600	0.017	13.753
7/10/2012	081000	0.600	1551.930	221	1586.10	5.500	4.500	0.017	13.755
7/10/2012	081100	0.600	1549.070	221	1583.10	5.500	4.500	0.017	13.758
7/10/2012	081200	0.600	1545.120	220	1579.10	5.500	4.600	0.016	13.767
7/10/2012	081300	0.600	1543.470	220	1577.40	5.900	4.900	0.018	13.763
7/10/2012	081400	0.600	1543.580	220	1577.60	5.800	4.800	0.018	13.763
7/10/2012	081500	0.600	1544.350	220	1578.30	5.800	4.800	0.018	13.766
7/10/2012	081600	0.600	1544.130	220	1578.10	5.600	4.600	0.017	13.762
7/10/2012	081700	0.700	1537.430	220	1571.20	5.500	4.600	0.017	13.770
7/10/2012	081800	0.700	1542.700	220	1576.60	5.400	4.500	0.017	13.761
7/10/2012	081900	0.600	1550.940	221	1585.10	5.200	4.300	0.016	13.758
7/10/2012	082000	0.500	1549.840	221	1583.90	5.100	4.200	0.016	13.760
7/10/2012	082100	0.700	1546.770	220	1580.80	5.100	4.200	0.016	13.770
7/10/2012	082200	0.600	1542.370	220	1576.30	5.500	4.600	0.017	13.768
	<b>AVG.</b>	<b>0.624</b>	<b>1544.166</b>	<b>220</b>	<b>1578.12</b>	<b>5.505</b>	<b>4.543</b>	<b>0.017</b>	<b>13.762</b>
7/10/2012	083600	0.600	1548.630	220	1582.70	5.600	4.600	0.017	13.780
7/10/2012	083700	0.600	1549.510	221	1583.60	5.600	4.600	0.017	13.773
7/10/2012	083800	0.600	1549.400	221	1583.50	5.300	4.400	0.016	13.777
7/10/2012	083900	0.600	1547.310	221	1581.30	5.600	4.600	0.017	13.780
7/10/2012	084000	0.600	1547.640	221	1581.70	5.400	4.500	0.016	13.776
7/10/2012	084100	0.600	1545.560	221	1579.60	6.000	5.000	0.018	13.774
7/10/2012	084200	0.600	1544.790	221	1578.80	5.900	4.900	0.018	13.780
7/10/2012	084300	0.600	1537.100	220	1570.90	5.600	4.600	0.017	13.778
7/10/2012	084400	0.700	1540.610	220	1574.50	5.200	4.300	0.016	13.772
7/10/2012	084500	0.600	1550.720	221	1584.80	5.300	4.400	0.016	13.773
7/10/2012	084600	0.600	1551.270	221	1585.40	5.600	4.600	0.017	13.774
7/10/2012	084700	0.600	1545.670	220	1579.70	5.400	4.600	0.017	13.789
7/10/2012	084800	0.600	1548.740	221	1582.80	5.400	4.400	0.016	13.787
7/10/2012	084900	0.600	1546.980	221	1581.00	5.400	4.500	0.017	13.791
7/10/2012	085000	0.600	1539.620	220	1573.50	5.500	4.600	0.017	13.799
7/10/2012	085100	0.600	1540.390	220	1574.30	5.400	4.600	0.017	13.793
7/10/2012	085200	0.600	1542.480	220	1576.40	5.500	4.600	0.017	13.787
7/10/2012	085300	0.600	1546.880	221	1580.90	5.500	4.600	0.017	13.793
7/10/2012	085400	0.500	1547.090	221	1581.10	5.500	4.600	0.017	13.790
7/10/2012	085500	0.600	1542.260	220	1576.20	5.500	4.600	0.017	13.795
7/10/2012	085600	0.600	1535.010	220	1568.80	5.400	4.500	0.017	13.795
	<b>AVG.</b>	<b>0.600</b>	<b>1545.127</b>	<b>220</b>	<b>1579.12</b>	<b>5.505</b>	<b>4.576</b>	<b>0.017</b>	<b>13.784</b>

DATE	TIME	CO_11	GAS12	GEN13	HTIP14	NOXL15	NOXLD16	NOXRT17	OXY18
7/10/2012	091100	0.600	1542.700	220	1576.60	5.500	4.600	0.017	13.798
7/10/2012	091200	0.600	1545.560	220	1579.60	5.300	4.400	0.017	13.795
7/10/2012	091300	0.600	1550.280	221	1584.30	5.200	4.300	0.016	13.796
7/10/2012	091400	0.600	1546.540	221	1580.60	5.400	4.400	0.017	13.796
7/10/2012	091500	0.600	1540.830	220	1574.70	5.200	4.300	0.016	13.798
7/10/2012	091600	0.600	1537.320	220	1571.10	5.200	4.300	0.016	13.797
7/10/2012	091700	0.600	1541.820	220	1575.70	5.200	4.300	0.016	13.799
7/10/2012	091800	0.600	1544.020	220	1578.00	5.200	4.400	0.016	13.802
7/10/2012	091900	0.600	1547.530	221	1581.60	5.400	4.600	0.017	13.803
7/10/2012	092000	0.600	1546.000	221	1580.00	5.400	4.500	0.017	13.804
7/10/2012	092100	0.600	1543.360	220	1577.30	5.600	4.600	0.017	13.817
7/10/2012	092200	0.600	1541.050	220	1574.90	5.500	4.600	0.017	13.806
7/10/2012	092300	0.600	1543.910	220	1577.90	5.400	4.500	0.017	13.815
7/10/2012	092400	0.600	1547.750	220	1581.80	5.600	4.600	0.017	13.805
7/10/2012	092500	0.600	1552.920	221	1587.10	5.600	4.700	0.017	13.808
7/10/2012	092600	0.600	1540.500	220	1574.40	5.800	4.800	0.018	13.809
7/10/2012	092700	0.600	1541.270	220	1575.20	5.800	4.800	0.018	13.806
7/10/2012	092800	0.600	1548.850	221	1582.90	5.600	4.700	0.017	13.798
7/10/2012	092900	0.600	1547.090	221	1581.10	5.100	4.200	0.016	13.802
7/10/2012	093000	0.600	1542.590	221	1576.50	5.400	4.500	0.016	13.824
7/10/2012	093100	0.600	1541.270	220	1575.20	5.800	4.900	0.018	13.825
	<b>AVG.</b>	<b>0.600</b>	<b>1544.436</b>	<b>220</b>	<b>1578.40</b>	<b>5.438</b>	<b>4.524</b>	<b>0.017</b>	<b>13.805</b>
7/10/2012	094600	0.600	1546.540	221	1580.60	5.400	4.500	0.017	13.820
7/10/2012	094700	0.600	1546.650	221	1580.70	5.400	4.500	0.017	13.827
7/10/2012	094800	0.600	1543.690	220	1577.70	5.600	4.600	0.017	13.829
7/10/2012	094900	0.600	1537.760	220	1571.60	5.500	4.600	0.017	13.832
7/10/2012	095000	0.500	1539.730	220	1573.60	5.500	4.600	0.017	13.832
7/10/2012	095100	0.600	1541.050	220	1574.90	5.700	4.800	0.018	13.829
7/10/2012	095200	0.600	1541.490	220	1575.40	5.700	4.800	0.018	13.839
7/10/2012	095300	0.600	1545.120	220	1579.10	5.600	4.700	0.017	13.836
7/10/2012	095400	0.600	1545.230	221	1579.20	5.500	4.600	0.017	13.840
7/10/2012	095500	0.600	1540.280	220	1574.20	5.300	4.400	0.016	13.846
7/10/2012	095600	0.600	1540.390	220	1574.30	5.300	4.400	0.016	13.845
7/10/2012	095700	0.600	1541.270	220	1575.10	5.500	4.600	0.017	13.834
7/10/2012	095800	0.600	1546.220	221	1580.20	5.400	4.500	0.017	13.838
7/10/2012	095900	0.600	1545.890	221	1579.90	5.800	4.800	0.018	13.840
7/10/2012	100000	0.600	1541.600	220	1575.50	5.400	4.600	0.017	13.850
7/10/2012	100100	0.600	1537.320	220	1571.10	5.400	4.500	0.016	13.842
7/10/2012	100200	0.600	1542.040	220	1575.90	5.600	4.600	0.018	13.835
7/10/2012	100300	0.600	1547.860	220	1581.90	5.600	4.600	0.017	13.826
7/10/2012	100400	0.600	1549.400	221	1583.50	5.400	4.600	0.017	13.834
7/10/2012	100500	0.600	1547.200	221	1581.20	5.500	4.600	0.017	13.845
7/10/2012	100600	0.600	1539.080	220	1572.90	5.800	4.900	0.018	13.847
	<b>AVG.</b>	<b>0.595</b>	<b>1543.134</b>	<b>220</b>	<b>1577.07</b>	<b>5.519</b>	<b>4.610</b>	<b>0.017</b>	<b>13.836</b>

DATE	TIME	CO_11	GAS12	GEN13	HTIP14	NOXL15	NOXLD16	NOXRT17	OXY18
7/10/2012	102100	0.600	1548.190	221	1582.20	5.300	4.400	0.016	13.855
7/10/2012	102200	0.600	1542.150	220	1576.10	5.300	4.400	0.016	13.860
7/10/2012	102300	0.600	1536.990	220	1570.80	5.400	4.400	0.017	13.863
7/10/2012	102400	0.600	1540.610	220	1574.50	5.400	4.500	0.017	13.858
7/10/2012	102500	0.600	1541.710	220	1575.60	5.500	4.600	0.017	13.856
7/10/2012	102600	0.600	1541.600	220	1575.50	5.500	4.600	0.017	13.859
7/10/2012	102700	0.600	1548.630	220	1582.70	5.500	4.600	0.017	13.848
7/10/2012	102800	0.600	1551.930	221	1586.10	5.600	4.700	0.017	13.851
7/10/2012	102900	0.600	1545.560	221	1579.60	5.600	4.700	0.017	13.859
7/10/2012	103000	0.600	1543.250	220	1577.20	5.500	4.600	0.017	13.865
7/10/2012	103100	0.600	1544.460	220	1578.40	5.600	4.600	0.017	13.860
7/10/2012	103200	0.600	1548.300	221	1582.40	5.800	4.900	0.018	13.855
7/10/2012	103300	0.600	1547.310	221	1581.30	5.700	4.800	0.018	13.860
7/10/2012	103400	0.600	1543.690	220	1577.70	5.500	4.600	0.017	13.871
7/10/2012	103500	0.600	1543.580	220	1577.50	5.700	4.800	0.018	13.864
7/10/2012	103600	0.600	1544.460	221	1578.40	5.600	4.700	0.018	13.862
7/10/2012	103700	0.600	1543.690	221	1577.60	5.500	4.600	0.017	13.861
7/10/2012	103800	0.500	1535.450	219	1569.20	5.300	4.400	0.016	13.858
7/10/2012	103900	0.600	1541.930	220	1575.80	5.300	4.400	0.016	13.847
7/10/2012	104000	0.600	1545.890	220	1579.90	5.200	4.400	0.016	13.838
7/10/2012	104100	0.600	1545.010	220	1579.00	5.500	4.600	0.017	13.854
	AVG.	0.595	1544.019	220	1577.98	5.490	4.586	0.017	13.857
7/10/2012	110500	0.600	1551.050	221	1585.20	5.300	4.500	0.016	13.865
7/10/2012	110600	0.500	1551.380	221	1585.50	5.500	4.600	0.017	13.835
7/10/2012	110700	0.500	1547.860	221	1581.90	5.300	4.400	0.016	13.828
7/10/2012	110800	0.600	1543.250	221	1577.20	5.300	4.400	0.016	13.851
7/10/2012	110900	0.600	1540.720	220	1574.60	5.400	4.500	0.017	13.887
7/10/2012	111000	0.600	1538.310	220	1572.10	5.600	4.700	0.017	13.891
7/10/2012	111100	0.600	1541.060	220	1574.90	5.300	4.500	0.016	13.889
7/10/2012	111200	0.600	1550.720	220	1584.80	5.400	4.500	0.017	13.884
7/10/2012	111300	0.600	1548.850	221	1582.90	5.600	4.700	0.017	13.858
7/10/2012	111400	0.500	1543.470	221	1577.40	5.700	4.800	0.018	13.866
7/10/2012	111500	0.600	1543.250	221	1577.20	5.400	4.600	0.017	13.882
7/10/2012	111600	0.600	1542.700	221	1576.60	5.400	4.500	0.017	13.892
7/10/2012	111700	0.600	1542.480	220	1576.40	5.400	4.600	0.017	13.900
7/10/2012	111800	0.600	1546.440	220	1580.50	5.300	4.500	0.016	13.895
7/10/2012	111900	0.500	1545.450	220	1579.40	5.400	4.500	0.017	13.891
7/10/2012	112000	0.600	1540.610	220	1574.50	5.400	4.500	0.017	13.893
7/10/2012	112100	0.600	1541.490	220	1575.40	5.400	4.500	0.017	13.897
7/10/2012	112200	0.500	1546.770	221	1580.80	5.400	4.500	0.017	13.880
7/10/2012	112300	0.600	1547.970	221	1582.00	5.400	4.500	0.017	13.882
7/10/2012	112400	0.600	1543.470	221	1577.40	5.300	4.500	0.016	13.889
7/10/2012	112500	0.600	1536.990	220	1570.80	5.400	4.500	0.017	13.893
	AVG.	0.576	1544.490	220	1578.45	5.410	4.538	0.017	13.878

DATE	TIME	CO_11	GAS12	GEN13	HTIP14	NOXL15	NOXLD16	NOXRT17	OXY18
7/10/2012	114000	0.500	1538.750	220	1572.60	5.400	4.500	0.017	13.890
7/10/2012	114100	0.600	1544.240	220	1578.20	5.300	4.500	0.016	13.883
7/10/2012	114200	0.600	1545.990	220	1580.00	5.400	4.500	0.017	13.876
7/10/2012	114300	0.500	1546.110	220	1580.10	5.400	4.500	0.017	13.886
7/10/2012	114400	0.600	1549.070	220	1583.10	5.400	4.500	0.017	13.886
7/10/2012	114500	0.600	1554.020	221	1588.20	5.400	4.500	0.017	13.876
7/10/2012	114600	0.600	1551.160	221	1585.30	5.600	4.700	0.017	13.836
7/10/2012	114700	0.600	1545.010	220	1579.00	5.600	4.700	0.017	13.844
7/10/2012	114800	0.600	1542.150	220	1576.10	5.400	4.500	0.017	13.876
7/10/2012	114900	0.600	1540.720	220	1574.60	5.400	4.500	0.017	13.889
7/10/2012	115000	0.600	1548.960	220	1583.00	5.400	4.500	0.017	13.878
7/10/2012	115100	0.600	1550.390	221	1584.50	5.500	4.600	0.017	13.846
7/10/2012	115200	0.600	1550.500	221	1584.60	5.600	4.700	0.017	13.830
7/10/2012	115300	0.600	1547.530	221	1581.60	5.600	4.700	0.017	13.840
7/10/2012	115400	0.600	1543.030	220	1577.00	5.400	4.500	0.017	13.860
7/10/2012	115500	0.500	1536.770	220	1570.60	5.300	4.500	0.016	13.889
7/10/2012	115600	0.600	1545.000	220	1579.00	5.300	4.500	0.016	13.889
7/10/2012	115700	0.600	1554.780	220	1589.00	5.400	4.500	0.017	13.870
7/10/2012	115800	0.600	1558.630	221	1592.90	5.500	4.600	0.017	13.846
7/10/2012	115900	0.600	1553.250	221	1587.40	5.700	4.800	0.018	13.822
7/10/2012	120000	0.600	1545.990	221	1580.00	5.600	4.700	0.018	13.853
	<b>AVG.</b>	<b>0.586</b>	<b>1547.240</b>	<b>220</b>	<b>1581.28</b>	<b>5.457</b>	<b>4.571</b>	<b>0.017</b>	<b>13.865</b>
7/10/2012	121600	0.500	1542.040	220	1576.00	5.300	4.500	0.016	13.883
7/10/2012	121700	0.600	1546.320	220	1580.30	5.400	4.500	0.017	13.884
7/10/2012	121800	0.600	1552.700	221	1586.90	5.400	4.500	0.017	13.877
7/10/2012	121900	0.600	1546.880	220	1580.90	5.500	4.600	0.017	13.861
7/10/2012	122000	0.600	1541.600	220	1575.50	5.400	4.500	0.017	13.889
7/10/2012	122100	0.500	1538.750	220	1572.60	5.400	4.500	0.017	13.887
7/10/2012	122200	0.500	1541.160	220	1575.10	5.400	4.500	0.017	13.884
7/10/2012	122300	0.500	1544.790	220	1578.80	5.400	4.500	0.017	13.879
7/10/2012	122400	0.500	1545.890	220	1579.90	5.400	4.500	0.017	13.884
7/10/2012	122500	0.500	1552.920	220	1587.10	5.400	4.500	0.017	13.881
7/10/2012	122600	0.600	1552.150	221	1586.30	5.500	4.600	0.017	13.842
7/10/2012	122700	0.600	1546.650	221	1580.70	5.600	4.700	0.017	13.841
7/10/2012	122800	0.500	1540.170	220	1574.10	5.400	4.500	0.017	13.875
7/10/2012	122900	0.500	1535.560	220	1569.30	5.300	4.500	0.016	13.886
7/10/2012	123000	0.600	1547.750	220	1581.80	5.400	4.500	0.017	13.870
7/10/2012	123100	0.500	1550.170	221	1584.30	5.500	4.600	0.017	13.852
7/10/2012	123200	0.500	1542.810	220	1576.80	5.600	4.600	0.017	13.849
7/10/2012	123300	0.500	1542.040	220	1576.00	5.400	4.600	0.017	13.887
7/10/2012	123400	0.600	1542.370	220	1576.30	5.400	4.600	0.017	13.878
7/10/2012	123500	0.600	1543.470	220	1577.40	5.400	4.500	0.017	13.871
7/10/2012	123600	0.600	1544.900	220	1578.90	5.400	4.600	0.017	13.882
	<b>AVG.</b>	<b>0.548</b>	<b>1544.814</b>	<b>220</b>	<b>1578.81</b>	<b>5.424</b>	<b>4.543</b>	<b>0.017</b>	<b>13.873</b>

<b>DATE</b>	<b>TIME</b>	<b>CO_11</b>	<b>GAS12</b>	<b>GEN13</b>	<b>HTIP14</b>	<b>NOXL15</b>	<b>NOXLD16</b>	<b>NOXRT17</b>	<b>OXY18</b>
7/10/2012	125000	0.600	1548.630	221	1582.70	5.500	4.600	0.017	13.856
7/10/2012	125100	0.600	1544.790	220	1578.80	5.400	4.500	0.017	13.862
7/10/2012	125200	0.600	1539.510	220	1573.40	5.400	4.400	0.017	13.864
7/10/2012	125300	0.600	1538.970	220	1572.80	5.300	4.500	0.016	13.884
7/10/2012	125400	0.600	1545.560	220	1579.60	5.400	4.500	0.017	13.867
7/10/2012	125500	0.600	1552.260	221	1586.40	5.400	4.500	0.017	13.871
7/10/2012	125600	0.600	1547.640	221	1581.70	5.500	4.600	0.017	13.846
7/10/2012	125700	0.600	1544.570	220	1578.60	5.400	4.600	0.017	13.872
7/10/2012	125800	0.600	1539.950	220	1573.80	5.400	4.500	0.017	13.884
7/10/2012	125900	0.600	1536.440	219	1570.20	5.400	4.500	0.017	13.879
7/10/2012	130000	0.600	1543.030	220	1577.00	5.500	4.600	0.017	13.868
7/10/2012	130100	0.500	1546.980	220	1581.00	5.500	4.600	0.017	13.871
7/10/2012	130200	0.600	1547.640	220	1581.70	5.500	4.600	0.017	13.883
7/10/2012	130300	0.600	1547.860	220	1581.90	5.500	4.600	0.017	13.868
7/10/2012	130400	0.600	1549.950	221	1584.00	5.500	4.600	0.017	13.869
7/10/2012	130500	0.600	1549.400	221	1583.50	5.500	4.600	0.017	13.858
7/10/2012	130600	0.600	1545.450	220	1579.40	5.500	4.600	0.017	13.865
7/10/2012	130700	0.600	1545.010	220	1579.00	5.400	4.500	0.017	13.879
7/10/2012	130800	0.600	1547.310	220	1581.30	5.400	4.500	0.017	13.860
7/10/2012	130900	0.600	1548.080	220	1582.20	5.400	4.500	0.017	13.857
7/10/2012	131000	0.600	1545.450	220	1579.40	5.400	4.600	0.017	13.859
7/10/2012	131100	0.600	1543.360	220	1577.30	5.400	4.500	0.017	13.869
<b>AVG.</b>		<b>0.595</b>	<b>1545.200</b>	<b>220</b>	<b>1579.19</b>	<b>5.433</b>	<b>4.543</b>	<b>0.017</b>	<b>13.868</b>

<b>DATE</b>	<b>TIME</b>	<b>GAS31</b>	<b>GEN32</b>	<b>NOX34</b>	<b>NOXD35</b>	<b>NOXRT36</b>	<b>OXY37</b>
7/13/2012	093700	7870.950	49	4.340	4.100	0.015	14.654
7/13/2012	093800	7875.400	49	4.370	4.100	0.015	14.651
7/13/2012	093900	7887.260	49	4.400	4.100	0.015	14.641
7/13/2012	094000	7880.590	49	4.450	4.200	0.015	14.632
7/13/2012	094100	7866.510	49	4.370	4.100	0.015	14.639
7/13/2012	094200	7861.320	49	4.330	4.100	0.015	14.648
7/13/2012	094300	7878.370	49	4.320	4.100	0.015	14.648
7/13/2012	094400	7879.110	49	4.390	4.100	0.015	14.642
7/13/2012	094500	7883.550	49	4.390	4.100	0.015	14.642
7/13/2012	094600	7877.620	49	4.390	4.100	0.015	14.649
7/13/2012	094700	7870.960	49	4.340	4.100	0.015	14.644
7/13/2012	094800	7872.440	49	4.310	4.100	0.015	14.645
7/13/2012	094900	7884.290	49	4.340	4.100	0.015	14.643
7/13/2012	095000	7890.960	49	4.400	4.100	0.015	14.634
7/13/2012	095100	7879.850	49	4.430	4.200	0.015	14.634
7/13/2012	095200	7882.810	49	4.350	4.100	0.015	14.636
7/13/2012	095300	7880.590	49	4.370	4.100	0.015	14.635
7/13/2012	095400	7874.660	49	4.380	4.100	0.015	14.641
7/13/2012	095500	7888.000	49	4.360	4.100	0.015	14.641
7/13/2012	095600	7883.550	49	4.410	4.100	0.015	14.639
7/13/2012	095700	7880.590	49	4.390	4.100	0.015	14.642
<b>AVG.</b>		<b>7878.54</b>	<b>49</b>	<b>4.373</b>	<b>4.110</b>	<b>0.015</b>	<b>14.642</b>
7/13/2012	101100	7874.660	49	4.320	4.100	0.015	14.636
7/13/2012	101200	7876.140	49	4.330	4.100	0.015	14.639
7/13/2012	101300	7882.070	49	4.340	4.100	0.015	14.639
7/13/2012	101400	7880.590	49	4.330	4.100	0.015	14.640
7/13/2012	101500	7881.330	49	4.330	4.100	0.015	14.637
7/13/2012	101600	7877.620	49	4.310	4.100	0.015	14.637
7/13/2012	101700	7888.000	49	4.360	4.100	0.015	14.638
7/13/2012	101800	7894.670	49	4.370	4.100	0.015	14.629
7/13/2012	101900	7885.040	49	4.390	4.100	0.015	14.632
7/13/2012	102000	7890.220	49	4.360	4.100	0.015	14.633
7/13/2012	102100	7888.740	49	4.420	4.100	0.015	14.632
7/13/2012	102200	7885.780	49	4.410	4.100	0.015	14.641
7/13/2012	102300	7892.450	49	4.370	4.100	0.015	14.637
7/13/2012	102400	7883.550	49	4.390	4.100	0.015	14.638
7/13/2012	102500	7885.040	49	4.360	4.100	0.015	14.636
7/13/2012	102600	7878.360	49	4.350	4.100	0.015	14.636
7/13/2012	102700	7878.370	49	4.340	4.100	0.015	14.637
7/13/2012	102800	7880.590	49	4.360	4.100	0.015	14.637
7/13/2012	102900	7875.400	49	4.330	4.100	0.015	14.638
7/13/2012	103000	7871.690	49	4.280	4.000	0.015	14.644
7/13/2012	103100	7881.330	49	4.330	4.100	0.015	14.646
<b>AVG.</b>		<b>7882.46</b>	<b>49</b>	<b>4.351</b>	<b>4.095</b>	<b>0.015</b>	<b>14.637</b>

CITY OF TALLAHASSEE  
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DATE	TIME	GAS31	GEN32	NOX34	NOXD35	NOXRT36	OXY37
7/13/2012	104500	7875.400	49	4.330	4.100	0.015	14.646
7/13/2012	104600	7873.920	49	4.320	4.100	0.015	14.646
7/13/2012	104700	7883.550	49	4.360	4.100	0.015	14.642
7/13/2012	104800	7890.960	49	4.390	4.100	0.015	14.635
7/13/2012	104900	7899.110	50	4.430	4.200	0.015	14.630
7/13/2012	105000	7905.790	50	4.460	4.200	0.015	14.629
7/13/2012	105100	7900.600	50	4.490	4.200	0.015	14.629
7/13/2012	105200	7893.190	49	4.450	4.200	0.016	14.630
7/13/2012	105300	7889.480	49	4.390	4.100	0.015	14.635
7/13/2012	105400	7885.780	49	4.360	4.100	0.015	14.636
7/13/2012	105500	7884.290	49	4.360	4.100	0.015	14.641
7/13/2012	105600	7882.070	49	4.340	4.100	0.015	14.646
7/13/2012	105700	7883.550	49	4.360	4.100	0.015	14.648
7/13/2012	105800	7881.330	49	4.310	4.100	0.015	14.646
7/13/2012	105900	7876.880	49	4.330	4.100	0.015	14.648
7/13/2012	110000	7873.180	49	4.310	4.100	0.015	14.653
7/13/2012	110100	7876.140	49	4.310	4.100	0.015	14.653
7/13/2012	110200	7888.000	49	4.300	4.100	0.015	14.646
7/13/2012	110300	7891.710	49	4.360	4.100	0.015	14.638
7/13/2012	110400	7901.340	50	4.380	4.100	0.015	14.633
7/13/2012	110500	7900.600	50	4.430	4.200	0.015	14.628
<b>AVG.</b>		<b>7887.47</b>	<b>49</b>	<b>4.370</b>	<b>4.124</b>	<b>0.015</b>	<b>14.640</b>
7/13/2012	112000	7900.600	50	4.440	4.200	0.015	14.635
7/13/2012	112100	7906.530	50	4.440	4.200	0.015	14.628
7/13/2012	112200	7908.750	50	4.470	4.200	0.015	14.627
7/13/2012	112300	7900.590	50	4.490	4.200	0.015	14.627
7/13/2012	112400	7888.000	49	4.400	4.100	0.015	14.635
7/13/2012	112500	7882.070	49	4.340	4.100	0.015	14.640
7/13/2012	112600	7884.290	49	4.330	4.100	0.015	14.641
7/13/2012	112700	7880.590	49	4.370	4.100	0.015	14.646
7/13/2012	112800	7881.330	49	4.350	4.100	0.015	14.650
7/13/2012	112900	7879.110	49	4.320	4.100	0.015	14.652
7/13/2012	113000	7868.730	49	4.310	4.100	0.015	14.649
7/13/2012	113100	7858.350	49	4.270	4.100	0.015	14.659
7/13/2012	113200	7860.580	49	4.250	4.000	0.015	14.661
7/13/2012	113300	7873.180	49	4.290	4.100	0.015	14.654
7/13/2012	113400	7893.930	49	4.340	4.100	0.015	14.638
7/13/2012	113500	7904.300	50	4.460	4.200	0.015	14.631
7/13/2012	113600	7907.270	50	4.510	4.200	0.016	14.630
7/13/2012	113700	7905.040	50	4.510	4.200	0.016	14.631
7/13/2012	113800	7895.410	50	4.520	4.200	0.016	14.624
7/13/2012	113900	7885.780	49	4.540	4.300	0.016	14.629
7/13/2012	114000	7884.290	49	4.510	4.200	0.016	14.632
<b>AVG.</b>		<b>7888.03</b>	<b>49</b>	<b>4.403</b>	<b>4.148</b>	<b>0.015</b>	<b>14.639</b>

CITY OF TALLAHASSEE  
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DATE	TIME	GAS31	GEN32	NOX34	NOXD35	NOXRT36	OXY37
7/13/2012	115500	7888.000	49	4.410	4.200	0.015	14.630
7/13/2012	115600	7882.070	49	4.420	4.200	0.015	14.636
7/13/2012	115700	7867.990	49	4.350	4.100	0.015	14.637
7/13/2012	115800	7879.110	49	4.350	4.100	0.015	14.639
7/13/2012	115900	7873.180	49	4.360	4.100	0.015	14.642
7/13/2012	120000	7870.960	49	4.340	4.100	0.015	14.641
7/13/2012	120100	7865.030	49	4.330	4.100	0.015	14.648
7/13/2012	120200	7860.580	49	4.310	4.100	0.015	14.648
7/13/2012	120300	7861.320	49	4.270	4.000	0.015	14.651
7/13/2012	120400	7876.140	49	4.330	4.100	0.015	14.639
7/13/2012	120500	7888.740	49	4.410	4.100	0.015	14.628
7/13/2012	120600	7891.710	49	4.480	4.200	0.015	14.624
7/13/2012	120700	7892.450	49	4.460	4.200	0.015	14.629
7/13/2012	120800	7902.820	50	4.490	4.200	0.016	14.623
7/13/2012	120900	7901.340	50	4.500	4.200	0.016	14.618
7/13/2012	121000	7896.890	50	4.500	4.200	0.016	14.622
7/13/2012	121100	7890.220	49	4.450	4.200	0.015	14.626
7/13/2012	121200	7880.590	49	4.370	4.100	0.015	14.629
7/13/2012	121300	7871.700	49	4.360	4.100	0.015	14.631
7/13/2012	121400	7870.950	49	4.270	4.000	0.015	14.630
7/13/2012	121500	7876.880	49	4.240	4.000	0.015	14.633
<b>AVG.</b>		<b>7880.41</b>	<b>49</b>	<b>4.381</b>	<b>4.124</b>	<b>0.015</b>	<b>14.634</b>
7/13/2012	123000	7868.730	49	4.430	4.200	0.015	14.636
7/13/2012	123100	7869.470	49	4.450	4.200	0.016	14.641
7/13/2012	123200	7866.510	49	4.420	4.200	0.015	14.638
7/13/2012	123300	7866.510	49	4.390	4.100	0.015	14.641
7/13/2012	123400	7857.620	49	4.380	4.100	0.015	14.640
7/13/2012	123500	7860.580	49	4.360	4.100	0.015	14.639
7/13/2012	123600	7861.320	49	4.340	4.100	0.015	14.651
7/13/2012	123700	7874.660	49	4.370	4.100	0.015	14.646
7/13/2012	123800	7888.000	49	4.450	4.200	0.015	14.635
7/13/2012	123900	7890.220	49	4.470	4.200	0.015	14.629
7/13/2012	124000	7891.710	49	4.470	4.200	0.016	14.623
7/13/2012	124100	7896.890	50	4.470	4.200	0.015	14.614
7/13/2012	124200	7913.200	50	4.530	4.200	0.016	14.613
7/13/2012	124300	7905.040	50	4.580	4.300	0.016	14.612
7/13/2012	124400	7897.630	50	4.550	4.300	0.016	14.619
7/13/2012	124500	7888.000	49	4.490	4.200	0.016	14.627
7/13/2012	124600	7884.290	49	4.500	4.200	0.015	14.631
7/13/2012	124700	7876.880	49	4.480	4.200	0.016	14.639
7/13/2012	124800	7876.140	49	4.470	4.200	0.016	14.640
7/13/2012	124900	7870.950	49	4.470	4.200	0.016	14.638
7/13/2012	125000	7865.770	49	4.330	4.100	0.015	14.635
<b>AVG.</b>		<b>7879.53</b>	<b>49</b>	<b>4.448</b>	<b>4.181</b>	<b>0.015</b>	<b>14.633</b>

CITY OF TALLAHASSEE  
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DATE	TIME	GAS31	GEN32	NOX34	NOXD35	NOXRT36	OXY37
7/13/2012	130400	7882.070	49	4.340	4.100	0.015	14.631
7/13/2012	130500	7870.210	49	4.350	4.100	0.015	14.635
7/13/2012	130600	7865.030	49	4.300	4.100	0.015	14.636
7/13/2012	130700	7859.840	49	4.310	4.000	0.015	14.639
7/13/2012	130800	7867.250	49	4.270	4.000	0.015	14.636
7/13/2012	130900	7876.140	49	4.300	4.000	0.015	14.634
7/13/2012	131000	7882.810	49	4.390	4.100	0.015	14.629
7/13/2012	131100	7888.000	49	4.360	4.100	0.015	14.626
7/13/2012	131200	7894.670	50	4.390	4.100	0.015	14.621
7/13/2012	131300	7902.820	50	4.430	4.100	0.015	14.615
7/13/2012	131400	7910.230	50	4.510	4.200	0.016	14.611
7/13/2012	131500	7913.190	50	4.510	4.200	0.016	14.611
7/13/2012	131600	7899.110	50	4.520	4.200	0.016	14.612
7/13/2012	131700	7896.150	50	4.460	4.200	0.015	14.620
7/13/2012	131800	7888.000	49	4.400	4.200	0.015	14.625
7/13/2012	131900	7881.330	49	4.340	4.100	0.015	14.626
7/13/2012	132000	7875.400	49	4.340	4.100	0.015	14.626
7/13/2012	132100	7865.770	49	4.300	4.100	0.015	14.627
7/13/2012	132200	7862.800	49	4.270	4.000	0.015	14.631
7/13/2012	132300	7862.800	49	4.250	4.000	0.015	14.629
7/13/2012	132400	7867.990	49	4.250	4.000	0.015	14.631
<b>AVG.</b>		<b>7881.51</b>	<b>49</b>	<b>4.361</b>	<b>4.095</b>	<b>0.015</b>	<b>14.626</b>
7/13/2012	133800	7864.290	49	4.310	4.100	0.015	14.632
7/13/2012	133900	7861.320	49	4.360	4.100	0.015	14.635
7/13/2012	134000	7865.770	49	4.330	4.100	0.015	14.631
7/13/2012	134100	7876.880	49	4.390	4.100	0.015	14.629
7/13/2012	134200	7876.880	49	4.440	4.200	0.015	14.633
7/13/2012	134300	7886.520	49	4.450	4.200	0.015	14.631
7/13/2012	134400	7891.710	49	4.470	4.200	0.015	14.624
7/13/2012	134500	7890.220	49	4.500	4.200	0.015	14.620
7/13/2012	134600	7893.190	49	4.510	4.200	0.016	14.615
7/13/2012	134700	7902.820	50	4.540	4.300	0.016	14.607
7/13/2012	134800	7903.560	50	4.530	4.200	0.016	14.605
7/13/2012	134900	7898.370	49	4.530	4.300	0.016	14.609
7/13/2012	135000	7890.220	49	4.440	4.200	0.015	14.619
7/13/2012	135100	7879.110	49	4.380	4.100	0.015	14.620
7/13/2012	135200	7875.400	49	4.360	4.100	0.015	14.622
7/13/2012	135300	7867.990	49	4.350	4.100	0.015	14.625
7/13/2012	135400	7864.290	49	4.330	4.100	0.015	14.624
7/13/2012	135500	7866.510	49	4.340	4.100	0.015	14.628
7/13/2012	135600	7862.060	49	4.330	4.100	0.015	14.626
7/13/2012	135700	7860.580	49	4.290	4.000	0.015	14.628
7/13/2012	135800	7859.100	49	4.280	4.100	0.015	14.630
<b>AVG.</b>		<b>7877.94</b>	<b>49</b>	<b>4.403</b>	<b>4.148</b>	<b>0.015</b>	<b>14.623</b>

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<b>DATE</b>	<b>TIME</b>	<b>GAS31</b>	<b>GEN32</b>	<b>NOX34</b>	<b>NOXD35</b>	<b>NOXRT36</b>	<b>OXY37</b>
7/13/2012	141200	7872.440	49	4.340	4.100	0.015	14.625
7/13/2012	141300	7870.950	49	4.340	4.100	0.015	14.627
7/13/2012	141400	7864.290	49	4.310	4.100	0.015	14.626
7/13/2012	141500	7859.100	49	4.300	4.000	0.015	14.626
7/13/2012	141600	7855.390	49	4.270	4.000	0.015	14.626
7/13/2012	141700	7845.010	49	4.270	4.000	0.015	14.624
7/13/2012	141800	7864.280	49	4.270	4.000	0.015	14.623
7/13/2012	141900	7883.550	49	4.380	4.100	0.015	14.613
7/13/2012	142000	7893.930	50	4.480	4.200	0.015	14.607
7/13/2012	142100	7899.120	50	4.510	4.200	0.016	14.598
7/13/2012	142200	7900.590	50	4.510	4.200	0.016	14.595
7/13/2012	142300	7891.710	49	4.520	4.200	0.016	14.592
7/13/2012	142400	7880.590	49	4.480	4.200	0.016	14.608
7/13/2012	142500	7867.250	49	4.400	4.100	0.015	14.612
7/13/2012	142600	7864.290	49	4.370	4.100	0.015	14.612
7/13/2012	142700	7862.060	49	4.350	4.100	0.015	14.616
7/13/2012	142800	7858.350	49	4.310	4.000	0.015	14.615
7/13/2012	142900	7854.650	49	4.310	4.100	0.015	14.617
7/13/2012	143000	7853.910	49	4.290	4.000	0.015	14.619
7/13/2012	143100	7851.690	49	4.300	4.000	0.015	14.618
7/13/2012	143200	7853.170	49	4.320	4.000	0.015	14.620
<b>AVG.</b>		<b>7868.87</b>	<b>49</b>	<b>4.363</b>	<b>4.086</b>	<b>0.015</b>	<b>14.615</b>

DATE	TIME	GAS41	GEN42	NOX44	NOXD45	NOXRT46	OXY47
7/12/2012	095200	7758.31	49	4.080	3.900	0.014	14.797
7/12/2012	095300	7761.27	49	4.110	4.000	0.015	14.801
7/12/2012	095400	7762.76	49	4.150	4.000	0.015	14.794
7/12/2012	095500	7758.31	49	4.130	4.000	0.015	14.799
7/12/2012	095600	7759.05	49	4.140	4.000	0.015	14.796
7/12/2012	095700	7760.53	49	4.140	4.000	0.015	14.791
7/12/2012	095800	7764.98	49	4.150	4.000	0.015	14.793
7/12/2012	095900	7764.24	49	4.170	4.000	0.015	14.787
7/12/2012	100000	7762.02	49	4.180	4.000	0.015	14.793
7/12/2012	100100	7762.02	49	4.190	4.100	0.015	14.789
7/12/2012	100200	7757.57	49	4.200	4.100	0.015	14.795
7/12/2012	100300	7760.54	49	4.180	4.000	0.015	14.796
7/12/2012	100400	7762.01	49	4.150	4.000	0.015	14.793
7/12/2012	100500	7759.79	49	4.180	4.000	0.015	14.789
7/12/2012	100600	7757.57	49	4.150	4.000	0.015	14.797
7/12/2012	100700	7759.05	49	4.140	4.000	0.015	14.794
7/12/2012	100800	7759.79	49	4.140	4.000	0.015	14.797
7/12/2012	100900	7763.50	49	4.160	4.000	0.015	14.785
7/12/2012	101000	7759.05	49	4.200	4.100	0.015	14.781
7/12/2012	101100	7759.05	49	4.200	4.100	0.015	14.785
7/12/2012	101200	7762.76	49	4.200	4.100	0.015	14.791
<b>AVG.</b>		<b>7760.67</b>	<b>49</b>	<b>4.159</b>	<b>4.019</b>	<b>0.015</b>	<b>14.793</b>
7/12/2012	103200	7744.97	49	4.160	4.000	0.015	14.795
7/12/2012	103300	7744.97	49	4.100	4.000	0.015	14.797
7/12/2012	103400	7744.23	49	4.130	4.000	0.015	14.795
7/12/2012	103500	7743.49	49	4.140	4.000	0.015	14.794
7/12/2012	103600	7744.97	49	4.140	4.000	0.015	14.791
7/12/2012	103700	7750.90	49	4.150	4.000	0.015	14.799
7/12/2012	103800	7750.16	49	4.140	4.000	0.015	14.795
7/12/2012	103900	7750.90	49	4.160	4.000	0.015	14.789
7/12/2012	104000	7754.61	49	4.160	4.000	0.015	14.789
7/12/2012	104100	7753.87	49	4.170	4.000	0.015	14.789
7/12/2012	104200	7755.35	49	4.120	4.000	0.015	14.791
7/12/2012	104300	7756.83	49	4.110	4.000	0.015	14.794
7/12/2012	104400	7756.83	49	4.160	4.000	0.015	14.795
7/12/2012	104500	7756.83	49	4.180	4.000	0.015	14.789
7/12/2012	104600	7756.83	49	4.170	4.000	0.015	14.790
7/12/2012	104700	7753.13	49	4.120	4.000	0.015	14.795
7/12/2012	104800	7756.83	49	4.140	4.000	0.015	14.791
7/12/2012	104900	7753.12	49	4.190	4.000	0.015	14.795
7/12/2012	105000	7756.09	49	4.170	4.000	0.015	14.794
7/12/2012	105100	7755.35	49	4.150	4.000	0.015	14.798
7/12/2012	105200	7753.12	49	4.140	4.000	0.015	14.798
<b>AVG.</b>		<b>7752.07</b>	<b>49</b>	<b>4.148</b>	<b>4.000</b>	<b>0.015</b>	<b>14.793</b>

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DATE	TIME	GAS41	GEN42	NOX44	NOXD45	NOXRT46	OXY47
7/12/2012	110600	7750.16	49	4.110	4.000	0.015	14.795
7/12/2012	110700	7750.90	49	4.130	4.000	0.015	14.785
7/12/2012	110800	7748.68	49	4.150	4.000	0.015	14.794
7/12/2012	110900	7748.68	49	4.130	4.000	0.015	14.794
7/12/2012	111000	7747.20	49	4.100	4.000	0.015	14.795
7/12/2012	111100	7746.45	49	4.120	4.000	0.015	14.799
7/12/2012	111200	7744.97	49	4.100	4.000	0.015	14.797
7/12/2012	111300	7743.49	49	4.100	4.000	0.015	14.795
7/12/2012	111400	7739.04	49	4.090	4.000	0.015	14.789
7/12/2012	111500	7736.82	49	4.140	4.000	0.015	14.791
7/12/2012	111600	7738.30	49	4.090	4.000	0.015	14.800
7/12/2012	111700	7739.04	49	4.120	4.000	0.015	14.797
7/12/2012	111800	7739.79	49	4.110	4.000	0.015	14.797
7/12/2012	111900	7737.56	49	4.080	4.000	0.015	14.798
7/12/2012	112000	7742.75	49	4.080	3.900	0.015	14.796
7/12/2012	112100	7738.30	49	4.090	4.000	0.015	14.797
7/12/2012	112200	7746.45	49	4.120	4.000	0.015	14.796
7/12/2012	112300	7749.42	49	4.130	4.000	0.015	14.795
7/12/2012	112400	7752.39	49	4.150	4.000	0.015	14.793
7/12/2012	112500	7751.64	49	4.140	4.000	0.015	14.795
7/12/2012	112600	7751.64	49	4.160	4.000	0.015	14.796
AVG.		<b>7744.94</b>	<b>49</b>	<b>4.116</b>	<b>3.995</b>	<b>0.015</b>	<b>14.795</b>
7/12/2012	114000	7729.41	49	4.140	4.000	0.015	14.794
7/12/2012	114100	7730.15	49	4.130	4.000	0.015	14.792
7/12/2012	114200	7730.89	49	4.100	4.000	0.015	14.793
7/12/2012	114300	7730.15	49	4.080	4.000	0.015	14.796
7/12/2012	114400	7727.93	49	4.100	4.000	0.015	14.789
7/12/2012	114500	7728.67	49	4.100	4.000	0.014	14.787
7/12/2012	114600	7729.41	49	4.110	4.000	0.015	14.799
7/12/2012	114700	7725.70	49	4.120	4.000	0.015	14.791
7/12/2012	114800	7729.41	49	4.120	4.000	0.015	14.791
7/12/2012	114900	7729.41	49	4.120	4.000	0.015	14.791
7/12/2012	115000	7730.89	49	4.140	4.000	0.015	14.793
7/12/2012	115100	7730.89	49	4.100	4.000	0.015	14.794
7/12/2012	115200	7733.86	49	4.140	4.000	0.015	14.789
7/12/2012	115300	7733.11	49	4.140	4.000	0.015	14.793
7/12/2012	115400	7735.34	49	4.130	4.000	0.015	14.794
7/12/2012	115500	7739.78	49	4.110	4.000	0.015	14.795
7/12/2012	115600	7744.23	49	4.150	4.000	0.015	14.792
7/12/2012	115700	7739.04	49	4.130	4.000	0.015	14.787
7/12/2012	115800	7739.04	49	4.150	4.000	0.015	14.787
7/12/2012	115900	7749.42	49	4.150	4.000	0.015	14.797
7/12/2012	120000	7747.19	49	4.140	4.000	0.015	14.798
AVG.		<b>7734.00</b>	<b>49</b>	<b>4.124</b>	<b>4.000</b>	<b>0.015</b>	<b>14.792</b>

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CEMS DATA

DATE	TIME	GAS41	GEN42	NOX44	NOXD45	NOXRT46	OXY47
7/12/2012	121400	7727.19	49	4.180	4.000	0.015	14.797
7/12/2012	121500	7730.89	49	4.160	4.000	0.015	14.792
7/12/2012	121600	7725.71	49	4.130	4.000	0.015	14.798
7/12/2012	121700	7730.89	49	4.070	3.900	0.014	14.794
7/12/2012	121800	7730.15	49	4.110	4.000	0.015	14.793
7/12/2012	121900	7733.86	49	4.100	4.000	0.015	14.795
7/12/2012	122000	7733.11	49	4.110	4.000	0.015	14.796
7/12/2012	122100	7734.60	49	4.160	4.000	0.015	14.796
7/12/2012	122200	7730.89	49	4.140	4.000	0.015	14.796
7/12/2012	122300	7733.11	49	4.170	4.000	0.015	14.797
7/12/2012	122400	7733.86	49	4.050	3.900	0.015	14.799
7/12/2012	122500	7730.89	49	4.090	3.900	0.015	14.801
7/12/2012	122600	7730.15	49	4.110	4.000	0.015	14.797
7/12/2012	122700	7730.15	49	4.140	4.000	0.015	14.801
7/12/2012	122800	7730.15	49	4.130	4.000	0.015	14.798
7/12/2012	122900	7728.67	49	4.140	4.000	0.015	14.797
7/12/2012	123000	7725.71	49	4.110	4.000	0.015	14.795
7/12/2012	123100	7724.96	49	4.060	3.900	0.014	14.801
7/12/2012	123200	7723.48	49	4.110	4.000	0.015	14.799
7/12/2012	123300	7722.74	49	4.120	4.000	0.015	14.800
7/12/2012	123400	7722.74	49	4.130	4.000	0.015	14.797
AVG.		<b>7729.23</b>	<b>49</b>	<b>4.120</b>	<b>3.981</b>	<b>0.015</b>	<b>14.797</b>
7/12/2012	124800	7732.37	49	4.150	4.000	0.015	14.785
7/12/2012	124900	7729.41	49	4.160	4.000	0.015	14.785
7/12/2012	125000	7734.60	49	4.150	4.000	0.015	14.786
7/12/2012	125100	7727.93	49	4.130	4.000	0.015	14.789
7/12/2012	125200	7727.93	49	4.140	4.000	0.015	14.785
7/12/2012	125300	7726.45	49	4.150	4.000	0.015	14.788
7/12/2012	125400	7722.00	49	4.120	4.000	0.015	14.796
7/12/2012	125500	7724.22	49	4.110	4.000	0.015	14.794
7/12/2012	125600	7730.15	49	4.120	4.000	0.015	14.785
7/12/2012	125700	7736.08	49	4.140	4.000	0.015	14.793
7/12/2012	125800	7730.15	49	4.140	4.000	0.015	14.791
7/12/2012	125900	7730.89	49	4.120	4.000	0.015	14.783
7/12/2012	130000	7731.63	49	4.140	4.000	0.015	14.784
7/12/2012	130100	7731.63	49	4.110	4.000	0.015	14.787
7/12/2012	130200	7729.41	49	4.100	4.000	0.015	14.787
7/12/2012	130300	7729.41	49	4.130	4.000	0.015	14.795
7/12/2012	130400	7723.48	49	4.110	4.000	0.015	14.791
7/12/2012	130500	7724.96	49	4.070	3.900	0.014	14.787
7/12/2012	130600	7727.93	49	4.130	4.000	0.015	14.792
7/12/2012	130700	7725.70	49	4.180	4.000	0.015	14.788
7/12/2012	130800	7726.45	49	4.180	4.000	0.015	14.779
AVG.		<b>7728.70</b>	<b>49</b>	<b>4.132</b>	<b>3.995</b>	<b>0.015</b>	<b>14.788</b>

CITY OF TALLAHASSEE  
HOPKINS UNIT HC4  
CEMS DATA

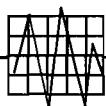
DATE	TIME	GAS41	GEN42	NOX44	NOXD45	NOXRT46	OXY47
7/12/2012	132200	7723.48	49	4.150	4.000	0.015	14.777
7/12/2012	132300	7721.25	49	4.140	4.000	0.015	14.777
7/12/2012	132400	7721.25	49	4.140	4.000	0.015	14.780
7/12/2012	132500	7721.26	49	4.180	4.000	0.015	14.782
7/12/2012	132600	7720.51	49	4.150	4.000	0.015	14.782
7/12/2012	132700	7719.77	49	4.140	4.000	0.015	14.778
7/12/2012	132800	7719.03	49	4.110	4.000	0.015	14.778
7/12/2012	132900	7716.81	49	4.120	4.000	0.015	14.778
7/12/2012	133000	7714.59	49	4.110	4.000	0.015	14.779
7/12/2012	133100	7710.14	49	4.110	4.000	0.015	14.781
7/12/2012	133200	7710.88	49	4.140	4.000	0.015	14.778
7/12/2012	133300	7711.62	49	4.150	4.000	0.015	14.779
7/12/2012	133400	7704.96	49	4.110	4.000	0.015	14.779
7/12/2012	133500	7713.11	49	4.080	3.900	0.014	14.779
7/12/2012	133600	7711.62	49	4.090	4.000	0.015	14.778
7/12/2012	133700	7712.36	49	4.120	4.000	0.015	14.777
7/12/2012	133800	7711.62	49	4.140	4.000	0.015	14.779
7/12/2012	133900	7706.44	49	4.170	4.000	0.015	14.777
7/12/2012	134000	7709.40	49	4.160	4.000	0.015	14.776
7/12/2012	134100	7714.59	49	4.190	4.000	0.015	14.777
7/12/2012	134200	7717.55	49	4.220	4.100	0.015	14.776
<b>AVG.</b>		<b>7714.87</b>	<b>49</b>	<b>4.139</b>	<b>4.000</b>	<b>0.015</b>	<b>14.778</b>
7/12/2012	135600	7717.55	49	4.090	3.900	0.014	14.775
7/12/2012	135700	7718.29	49	4.110	4.000	0.015	14.774
7/12/2012	135800	7720.52	49	4.140	4.000	0.015	14.771
7/12/2012	135900	7719.03	49	4.100	3.900	0.015	14.774
7/12/2012	140000	7717.55	49	4.110	4.000	0.015	14.780
7/12/2012	140100	7719.03	49	4.130	4.000	0.015	14.777
7/12/2012	140200	7722.00	49	4.140	4.000	0.015	14.776
7/12/2012	140300	7722.74	49	4.190	4.000	0.015	14.772
7/12/2012	140400	7722.74	49	4.140	4.000	0.015	14.775
7/12/2012	140500	7722.00	49	4.120	4.000	0.015	14.776
7/12/2012	140600	7720.51	49	4.150	4.000	0.015	14.772
7/12/2012	140700	7722.00	49	4.170	4.000	0.015	14.772
7/12/2012	140800	7722.74	49	4.150	4.000	0.015	14.776
7/12/2012	140900	7722.00	49	4.150	4.000	0.015	14.782
7/12/2012	141000	7725.71	49	4.140	4.000	0.015	14.779
7/12/2012	141100	7727.93	49	4.150	4.000	0.015	14.780
7/12/2012	141200	7730.89	49	4.180	4.000	0.015	14.780
7/12/2012	141300	7728.67	49	4.240	4.100	0.015	14.775
7/12/2012	141400	7734.60	49	4.230	4.100	0.015	14.772
7/12/2012	141500	7733.85	49	4.210	4.100	0.015	14.778
7/12/2012	141600	7731.63	49	4.160	4.000	0.015	14.780
<b>AVG.</b>		<b>7723.90</b>	<b>49</b>	<b>4.152</b>	<b>4.005</b>	<b>0.015</b>	<b>14.776</b>

CITY OF TALLAHASSEE  
HOPKINS UNIT HC4  
CEMS DATA

<b>DATE</b>	<b>TIME</b>	<b>GAS41</b>	<b>GEN42</b>	<b>NOX44</b>	<b>NOXD45</b>	<b>NOXRT46</b>	<b>OXY47</b>
7/12/2012	143000	7742.01	49	4.190	4.000	0.015	14.776
7/12/2012	143100	7745.71	49	4.190	4.000	0.015	14.772
7/12/2012	143200	7745.71	49	4.180	4.000	0.015	14.771
7/12/2012	143300	7745.71	49	4.160	4.000	0.015	14.773
7/12/2012	143400	7742.75	49	4.130	4.000	0.015	14.774
7/12/2012	143500	7744.23	49	4.090	3.900	0.015	14.778
7/12/2012	143600	7748.68	49	4.160	4.000	0.015	14.773
7/12/2012	143700	7745.71	49	4.150	4.000	0.015	14.771
7/12/2012	143800	7751.64	49	4.180	4.000	0.015	14.772
7/12/2012	143900	7747.19	49	4.190	4.000	0.015	14.771
7/12/2012	144000	7750.90	49	4.170	4.000	0.015	14.773
7/12/2012	144100	7748.68	49	4.140	4.000	0.015	14.779
7/12/2012	144200	7745.71	49	4.200	4.000	0.015	14.776
7/12/2012	144300	7747.94	49	4.190	4.000	0.015	14.772
7/12/2012	144400	7749.42	49	4.180	4.000	0.015	14.778
7/12/2012	144500	7749.42	49	4.160	4.000	0.015	14.775
7/12/2012	144600	7748.68	49	4.190	4.000	0.015	14.778
7/12/2012	144700	7747.94	49	4.180	4.000	0.015	14.775
7/12/2012	144800	7746.45	49	4.180	4.000	0.015	14.773
7/12/2012	144900	7747.94	49	4.190	4.100	0.015	14.775
7/12/2012	145000	7745.71	49	4.190	4.100	0.015	14.774
<b>AVG.</b>		<b>7747.05</b>	<b>49</b>	<b>4.171</b>	<b>4.005</b>	<b>0.015</b>	<b>14.774</b>

## **APPENDIX D**

### **Reference Method Quality Assurance Data**



Spectrum Systems, Inc.

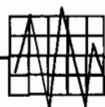
Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

## **Appendix D, Section 1**

### **Gas Analyzer Calibration Error**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

## Reference Analyzer Calibration Error

### Reference Method Quality Assurance

Performed By: Spectrum Systems  
Pensacola, Florida      Date: 10-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit HP 2A  
Unit HP 2A  
Tallahassee, Florida      Run: One

#### Carbon Monoxide Monitor

Full Scale: 23.00

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.04	0.04	0.19
AAL20222	10.20	10.10	-0.10	-0.46
ALM025102	23.00	23.28	0.28	1.23

#### Nitrogen Oxides Monitor

Full Scale: 22.70

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.12	0.12	0.51
AAL3287	9.99	9.96	-0.03	-0.15
AAL069824	22.70	23.09	0.39	1.71

#### Oxygen Monitor

Full Scale: 20.90

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.13	0.13	0.61
ALM028679	11.00	11.08	0.08	0.39
Dilution Air	20.90	20.82	-0.08	-0.36

## Reference Analyzer Calibration Error

### Reference Method Quality Assurance

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 13-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 3  
Unit CT 3  
Tallahassee, Florida

Run: One

#### Carbon Monoxide Monitor

Full Scale: 23.00

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.337	0.34	1.47
AAL20222	10.20	10.227	0.03	0.12
ALM025102	23.00	23.355	0.36	1.54

#### Nitrogen Oxides Monitor

Full Scale: 22.70

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.085	0.09	0.37
AAL3287	9.99	10.171	0.18	0.80
AAL069824	22.70	22.857	0.16	0.69

#### Oxygen Monitor

Full Scale: 20.90

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.00	0.018	0.02	0.09
ALM028679	11.00	11.020	0.02	0.10
Dilution Air	20.90	20.849	-0.05	-0.24

## Reference Analyzer Calibration Error

### Reference Method Quality Assurance

Performed By: Spectrum Systems  
Pensacola, Florida

Date: 12-Jul-12  
Test: 1

Source: City of Tallahassee, Plant Hopkins, Unit CT 4  
Unit CT 4  
Tallahassee, Florida

Run: One

#### Carbon Monoxide Monitor

Full Scale: 23.00

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.000	-0.015	-0.02	-0.07
AAL20222	10.200	10.476	0.28	1.20
ALM025102	23.000	23.370	0.37	1.61

#### Nitrogen Oxides Monitor

Full Scale: 22.70

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.000	0.085	0.09	0.37
AAL3287	9.990	9.890	-0.10	-0.44
AAL069824	22.700	22.894	0.19	0.85

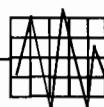
#### Oxygen Monitor

Full Scale: 20.90

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
ALM032048	0.000	0.037	0.04	0.18
ALM028679	11.000	10.989	-0.01	-0.05
Dilution Air	20.900	20.702	-0.20	-0.95

## **Appendix D, Section 2**

### **Gas Interference Tests**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

To Whom It May Concern:

In an effort to assist our customers with the requirements of the Instrumental methods for testing, 3A, 6C, 7E, 10, and 20, we are providing a summary of interferences for certain Thermo Scientific analyzers.

The requirement for conducting analyzer interference checks for potential interfering gases is the responsibility of the testing organizations. The Methods do, however, allow the manufacturer of instruments to provide this data. Test are required to be conducted on the same "make and model" as those being used for method testing.

The information contained in the accompanying tables pertains to the "make" of analyzers under the names of; Thermo Electron Corporation, Thermo Environmental Instruments and Thermo Scientific. The "model" are models; Model 42 for NO, NO<sub>2</sub>, NO<sub>x</sub>, Model 43 for SO<sub>2</sub>, and Model 410i for CO<sub>2</sub>. The specific pollutant detection and analytical technology for each of the above listed specific models have remained the same for the various series of analyzers manufactured over the past years. Therefore, the interference test results shown for iSeries analyzers, would produce essentially the same results for C Series and earlier Series of these models.

The potential interference gases test results shown in the tables to follow indicate that none of Thermo Scientific analyzers tested have a collective analytical detection interference that would sum more than 0.06% of analyzer span value. The acceptance criterion is; the sum of the interference responses must not be greater than 2.5% of analyzer span value.

If you have any questions regarding the information contained herein please do no hesitate to contact us.

Thermo Fisher Scientific



Frank Duckett  
Product Manager, Continuous Gas Analyzers  
Air Quality Instruments

## Thermo Scientific Model 42 NO-NO<sub>2</sub>-NO<sub>x</sub> Analyzer Potential Interference Gas Responses

Potential Interferent		Model 42iLS			Model 42iHL		
Test Gas	Concentration	NO	NO <sub>2</sub>	NO <sub>x</sub>	NO	NO <sub>2</sub>	NO <sub>x</sub>
CO <sub>2</sub>	5.20%	0.001	0.004	0.004	0.001	0.003	0.004
CO <sub>2</sub>	15.60%	0	0.003	0.003	0.001	0.004	0.005
H <sub>2</sub> O	1.00%	0	0	0	0.003	0.001	0.004
NO	15 ppm	14.9	0.1	15	15	-0.06	14.99
NO <sub>2</sub>	15 ppm	1.1	14	15	0.4	14.6	15
N <sub>2</sub> O	10 ppm	0	0	0	0	0	0
CO	50 ppm	0	0	0	0	0	0
SO <sub>2</sub>	21 ppm	-0.01	0	-0.01	0.007	0	0.007
CH <sub>4</sub>	50 ppm	0	0	0	0	0	0
HCl	10 ppm	0	0.006	0.006	0	0.004	0.004
NH <sub>3</sub> <sup>1</sup>	10 ppm	0	0	0	0.17	8.9	9.1
<b>Sum of Responses</b>		<b>0.011</b>	<b>0.01</b>	<b>0.02</b>	<b>0.011</b>	<b>0.009</b>	<b>0.02</b>
<b>Span Value</b>		<b>160</b>	<b>152</b>	<b>160</b>	<b>160</b>	<b>152</b>	<b>160</b>
<b>% of Calibration Span</b>		<b>0.01%</b>	<b>0.01%</b>	<b>0.01%</b>	<b>0.01%</b>	<b>0.01%</b>	<b>0.01%</b>

Acceptance Criteria found in Section 13.4 of Method 7E is the sum of responses must not be greater than 2.5% of the analyzer calibration span value.

<sup>1</sup>NH<sub>3</sub> interferent results shown for the Model 42iHL was not used in calculation of interference response check because it is a known interferent with an approximate 1 ppm to 1 ppm positive bias in analyzers using stainless steel NO<sub>2</sub> to NO converters. Thermo recommends that NO<sub>x</sub> analyzers with stainless steel NO<sub>2</sub> to NO converters must use a NH<sub>3</sub> scrubber when testing sources with potential NH<sub>3</sub> in the flue gas.

This document is subject to change without notice.

## Thermo Scientific Model 43 SO<sub>2</sub> and Model 410i CO<sub>2</sub> Analyzer Potential Interference Gas Responses

Potential Interferent		Model 43iHL	Model 410iHL
Test Gas	Concentration	SO <sub>2</sub>	CO <sub>2</sub>
CO <sub>2</sub>	5.20%	0.03	5.2
CO <sub>2</sub>	15.60%	0.14	15.6
H <sub>2</sub> O	1.00%	-0.05	0
NO	15 ppm	0.2	0
NO <sub>2</sub>	15 ppm	0.06	0
N <sub>2</sub> O	10 ppm	0	0
CO	50 ppm	0	0
SO <sub>2</sub>	21 ppm	21	0
CH <sub>4</sub>	50 ppm	0	0
HCl	10 ppm	0	0
NH <sub>3</sub>	10 ppm	0	0
<b>Sum of Responses</b>		<b>0.45</b>	<b>0</b>
<b>Span Value</b>		<b>800</b>	<b>16</b>
<b>% of Calibration Span</b>		<b>0.06%</b>	<b>0%</b>

*Acceptance Criteria found in Section 13.4 of Method 7E is the sum of responses must not be greater than 2.5% of the analyzer calibration span value.*

*This document is subject to change without notice.*

Oxygen Quality Assurance Interference Checks

Reference Method Analyzer O2/A-1

Spectrum Systems, Incorporated

Test Location      Spectrum Systems, Inc.  
Date of Test      1/12/2004

Analyzer Model    Servomex 1400 series  
Serial Number     01420/701/527  
Analyzer ID       O2/A-1

Analyzer Span     25

Test Gas Type	Concentration	Analyzer Response	% of Span
CO	375.00	0.03	0.12
SO2	195.00	0.02	0.08
NOX	442.00	0.01	0.04
CO2	10.08	0.00	0.00
		<b>Percent of Span Sum</b>	<b>0.24</b>

Carbon Monoxide Quality Assurance Interference Checks  
Reference Method Analyzer CO/A-2  
Spectrum Systems, Incorporated

Test Location      Spectrum Systems, Inc.  
Date of Test      3/12/2002

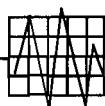
Analyzer Model    TECO Model 48  
Serial Number     48-42823-268  
Analyzer ID       CO/A-2

Analyzer Span     100

<b>Test Gas Type</b>	<b>Concentration</b>	<b>Analyzer Response</b>	<b>% of Span</b>
CO2	16.99	0	0
SO2	399.3	0.01	0.01
NOX	173.7	0.03	0.03
O2	12	-0.01	0.01
		<b>Percent of Span Sum</b>	<b>0.05</b>

## **Appendix D, Section 3**

### **NO<sub>x</sub> Converter Efficiency Test**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status	NOx/A Monitor
7/10/2012 6:41	ALM032048	NOX/A	NOx	BOTH	ZERO	0.116	0.000	PASS	TECO Model 42C
7/10/2012 6:41	ALM032048	O2/A	O2	BOTH	ZERO	0.128	0.000	PASS	
7/10/2012 6:41	ALM032048	CO/A	CO	BOTH	ZERO	0.044	0.000	PASS	Spectrum Systems Trailer
7/10/2012 6:45	ALM028679	O2/A	O2	BOTH	MID	11.081	11.000	PASS	
7/10/2012 6:47	AAL3287	NOX/A	NOx	BOTH	MID	9.957	9.990	PASS	
7/10/2012 6:49	AAL069824	NOX/A	NOx	BOTH	HIGH	23.089	22.700	PASS	
7/10/2012 6:52	AAL20222	CO/A	CO	BOTH	MID	10.095	10.200	PASS	
7/10/2012 6:55	ALM025102	CO/A	CO	BOTH	HIGH	23.282	23.000	PASS	
7/10/2012 6:58	Ambient Air	O2/A	O2	BOTH	HIGH	20.824	20.900	PASS	
7/10/2012 13:12	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.061	0.000	PASS	
7/10/2012 13:12	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.073	0.000	PASS	
7/10/2012 13:12	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	-0.161	0.000	PASS	
7/10/2012 13:14	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.958	11.000	PASS	
7/10/2012 13:16	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.786	9.990	PASS	
7/10/2012 13:18	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.271	10.200	PASS	
7/10/2012 13:30	AAL064109	NOX/A	NOx	Nox Converter	MID	42.988	46.600	PASS	NOx/A Converter Efficiency = 92.25 %

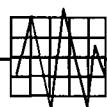
Reference Method  
 NOx Converter Efficiency  
 Hopkins, Unit HP2A

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status	NOx/A Monitor TECO Model 42C
7/13/2012 8:51	ALM032048	NOX/A	NOx	BOTH	ZERO	0.085	0.000	PASS	Spectrum Systems Trailer
7/13/2012 8:51	ALM032048	O2/A	O2	BOTH	ZERO	0.018	0.000	PASS	
7/13/2012 8:51	ALM032048	CO/A	CO	BOTH	ZERO	0.337	0.000	PASS	
7/13/2012 8:53	ALM028679	O2/A	O2	BOTH	MID	11.020	11.000	PASS	
7/13/2012 8:58	AAL20222	CO/A	CO	BOTH	MID	10.227	10.200	PASS	
7/13/2012 8:59	ALM025102	CO/A	CO	BOTH	HIGH	23.355	23.000	PASS	
7/13/2012 9:04	Ambient Air	O2/A	O2	BOTH	HIGH	20.849	20.900	PASS	
7/13/2012 9:07	AAL069824	NOX/A	NOx	BOTH	HIGH	22.857	22.700	PASS	
7/13/2012 9:14	AAL3287	NOX/A	NOx	BOTH	MID	10.171	9.990	PASS	
7/13/2012 14:33	ALM032048	NOX/A	NOx	BIAS AND DRIFT	ZERO	0.098	0.000	PASS	
7/13/2012 14:33	ALM032048	O2/A	O2	BIAS AND DRIFT	ZERO	0.085	0.000	PASS	
7/13/2012 14:33	ALM032048	CO/A	CO	BIAS AND DRIFT	ZERO	0.117	0.000	PASS	
7/13/2012 14:35	ALM028679	O2/A	O2	BIAS AND DRIFT	MID	10.983	11.000	PASS	
7/13/2012 14:37	AAL3287	NOX/A	NOx	BIAS AND DRIFT	MID	9.902	9.990	PASS	
7/13/2012 14:38	AAL20222	CO/A	CO	BIAS AND DRIFT	MID	10.139	10.200	PASS	
7/13/2012 14:52	ALM064109	NOX/A	NOx	Nox Converter	MID	44.877	46.600	PASS	NOx/A Converter Efficiency = 96.30 %

Reference Method  
NOx Converter Efficiency  
Hopkins, Unit CT 3

## **Appendix D, Section 4**

### **Reference Method Response Test**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4

# **RESPONSE TIME TEST**

## **Plant Hopkins**

### **Unit 2A**

**DATE:** 10-Jul-12

#### **UPSCALE (minutes)**

	<b>TIME</b>
O2	1.5
NOX	1.5
CO	1.5

#### **DOWNSCALE (minutes)**

	<b>TIME</b>
O2	1.5
NOX	1.5
CO	1.5

# **RESPONSE TIME TEST**

## **Plant Hopkins**

### **Unit 4**

**DATE:** 12-Jul-12

#### **UPSCALE (minutes)**

	<b>TIME</b>
O2	1.0
NOX	1.5
CO	1.5

#### **DOWNSCALE (minutes)**

	<b>TIME</b>
O2	1.0
NOX	1.5
CO	1.5

# **RESPONSE TIME TEST**

## **Plant Hopkins**

### **Unit 3**

**DATE:** 13-Jul-12

<b>UPSCALE (minutes)</b>	<b>TIME</b>
--------------------------	-------------

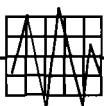
O2	1.0
NOX	1.5
CO	1.5

<b>DOWNSCALE (minutes)</b>	<b>TIME</b>
----------------------------	-------------

O2	1.0
NOX	1.5
CO	1.5

## **APPENDIX E**

### **EPA Protocol I Gas Certificates**



Spectrum Systems, Inc.

Annual RATA Testing, July 2012

City of Tallahassee

Hopkins Units 2A, HC3 and HC4



Shipped from:  
6141 EASTON ROAD, BLDG 1  
PO BOX 310  
PLUMSTEADVILLE PA 18949-0310  
Phone: 800-331-4953 Fax: 215-766-7226

## CERTIFICATE OF ANALYSIS

SPECTRUM SYSTEMS  
SEAN MYRIC  
3410 WEST NINE MILE ROAD  
PENSACOLA FL 32526  
US

DOCUMENT#: 43242720 -001  
PO#: 1101189F  
ITEM #: P811-30AL  
DATE: 06Sep2011

CYLINDER #: ALM032048  
FILL PRESSURE: 02000 PSIG  
PURE MATERIAL: NITROGEN  
GRADE: U Z A M  
PURITY: 99.999%

PRODUCT EXPIRATION: 06Sep2014  
CAS # 7727-37-9

IMPURITY	MAXIMUM CONCENTRATIONS	ACTUAL CONCENTRATIONS
THC	0.05 PPM	< 0.05 PPM
CO	0.10 PPM	< 0.10 PPM
O2	2 PPM	< 2 PPM
CO2	1 PPM	< 1 PPM
NOX	0.02 PPM	< 0.02 PPM
SF6	0.001 PPM	< 0.001 PPM
SO2	0.005 PPM	< 0.005 PPM
H2O	4 PPM	< 4 PPM

LOT # :49688

ANALYST: (signature on file)  
STEVEN A JANKOWSKI



6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

## RATA CLASS

### *Dual-Analyzed Calibration Standard*

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory - PGVP Vendor ID: A12011**

AIR LIQUIDE AMERICA SPECIALTY GASES LLC  
6141 EASTON ROAD, BLDG 1  
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 1100569F  
Document #: 41577193-002

**Customer**

SPECTRUM SYSTEMS  
LORI LEACH  
3410 WEST NINE MILE ROAD  
PENSACOLA FL 32526  
US

**ANALYTICAL INFORMATION      Gas Type : O2**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM028679  
**Cylinder Pressure\*\*\*:** 2000 PSIG

**Certification Date:** 04Apr2011

**Exp. Date:** 03Apr2014  
**Batch No:** PLU0033716

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
OXYGEN	11.0 %	+/- 1%	Direct NIST and VSL
NITROGEN	BALANCE		

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2350	01Dec2011	K008902	23.20 %	OXYGEN

**INSTRUMENTATION**

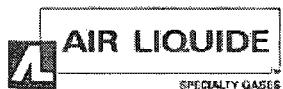
INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SIEMENS/OXYMAT 61/V1-0407	16Mar2011	PARAMAGNETIC

**ANALYZER READINGS**

First Triad Analysis OXYGEN	(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient) Second Triad Analysis	Calibration Curve
Date: 04Apr2011 Response Unit: VOLTS Z1=-0.00170 R1=4.58580 T1=2.18060 R2=4.58420 Z2=-0.00160 T2=2.18120 Z3=-0.00240 T3=2.18100 R3=4.58570 Avg. Concentration: 11.00 %		Concentration=A+Bx+Cx <sup>2</sup> +Dx <sup>3</sup> +Ex <sup>4</sup> r=0.999997791 2350 Constants: A=0.01732571 B=5.052260437 C= D= E=

**QUALITY ASSURANCE**

APPROVED BY: DAVID ASHNOFF  
(signature on file)



6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

## RATA CLASS

### *Dual-Analyzed Calibration Standard*

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

### Assay Laboratory - PGVP Vendor ID: A12012

AIR LIQUIDE AMERICA SPECIALTY GASES LLC  
6141 EASTON ROAD, BLDG 1  
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 1200183F  
Document #: 45117259-009

### Customer

SPECTRUM SYSTEMS  
TEST GROUP/J GARRETT  
3410 WEST NINE MILE ROAD  
PENSACOLA FL 32526  
US

### ANALYTICAL INFORMATION

Gas Type : NONE

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards, Procedure G-1; September, 1997.

Cylinder Number: ALM025102  
Cylinder Pressure\*\*\*: 1919 PSIG

Certification Date: 27Feb2012

Exp. Date: 26Feb2015  
Batch No: PLU0081243

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON MONOXIDE	23.0 PPM	+/- 1%	Direct NIST and VSL
NITROGEN	BALANCE		

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

### REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2635	05May2016	KAL003191	25.21 PPM	CARBON MONOXIDE

### INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000928781	24Feb2012	FTIR

### ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

#### First Triad Analysis

##### CARBON MONOXIDE

Date: 20Feb2012 Response Unit: PPM  
Z1=0.00539 R1=25.33535 T1=23.12298  
R2=25.35264 Z2=0.02652 T2=23.13704  
Z3=0.03939 T3=23.19377 R3=25.37177  
Avg. Concentration: 23.02 PPM

#### Second Triad Analysis

Date: 27Feb2012 Response Unit: PPM  
Z1=-0.00975 R1=25.29848 T1=23.13249  
R2=25.30853 Z2=-0.00842 T2=23.14008  
Z3=0.02066 T3=23.14888 R3=25.33887  
Avg. Concentration: 23.04 PPM

#### Calibration Curve

Concentration=A+Bx+Cx<sup>2</sup>+Dx<sup>3</sup>+Ex<sup>4</sup>  
r=9.99990E-1  
Constants: A=0.00000E+0  
B=9.73184E-1 C=1.04200E-3  
D=0.00000E+0 E=0.00000E+0

### QUALITY ASSURANCE

APPROVED BY: Michael A. Kuhns  
(signature on file)



6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

**RATA CLASS*****Dual-Analyzed Calibration Standard*****CERTIFICATE OF ACCURACY: EPA Protocol Gas****Assay Laboratory - PGVP Vendor ID: A12011**

AIR LIQUIDE AMERICA SPECIALTY GASES LLC  
 6141 EASTON ROAD, BLDG 1  
 PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 1200183F  
 Document #: 45117259-003

**Customer**

SPECTRUM SYSTEMS  
 TEST GROUP/J GARRETT  
 3410 WEST NINE MILE ROAD  
 PENSACOLA FL 32526  
 US

**ANALYTICAL INFORMATION****Gas Type : NO**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards, Procedure G-1; September, 1997.

**Cylinder Number:** AAL069824  
**Cylinder Pressure\*\*\*:** 2009 PSIG

**Certification Date:** 21Sep2011

**Exp. Date:** 20Sep2013  
**Batch No:** PLU0083565

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
NITRIC OXIDE	22.7 PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	22.8 PPM		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	14Jan2013	KAL004234	20.34 PPM	NITRIC OXIDE

**INSTRUMENTATION**

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000928781	02Sep2011	FTIR

**ANALYZER READINGS**

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis****Second Triad Analysis****Calibration Curve****NITRIC OXIDE**

Date: 13Sep2011 Response Unit: PPM  
 Z1=-0.09492 R1=20.32294 T1=22.71288  
 R2=20.37191 Z2=-0.02899 T2=22.80139  
 Z3=0.05801 T3=22.85156 R3=20.42274  
 Avg. Concentration: 22.75 PPM

Date: 21Sep2011 Response Unit: PPM  
 Z1=-0.04173 R1=20.30180 T1=22.58330  
 R2=20.45998 Z2=-0.00735 T2=22.66024  
 Z3=0.05658 T3=22.68099 R3=20.49968  
 Avg. Concentration: 22.55 PPM

Concentration=A+Bx+Cx<sup>2</sup>+Dx<sup>3</sup>+Ex<sup>4</sup>  
 r=0.99999E-1  
 Constants: A=0.00000E+0  
 B=9.55805E-1 C=1.78000E-4  
 D=0.00000E+0 E=0.00000E+0

**QUALITY ASSURANCE**

APPROVED BY: Michael A. Kuhns  
 (signature on file)



6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

**RATA CLASS*****Dual-Analyzed Calibration Standard*****CERTIFICATE OF ACCURACY: EPA Protocol Gas****Assay Laboratory - PGVP Vendor ID: A12011**

AIR LIQUIDE AMERICA SPECIALTY GASES LLC  
6141 EASTON ROAD, BLDG 1  
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 1110888F  
Document #: 42360956-001

**Customer**

SPECTRUM SYSTEMS

3410 WEST NINE MILE ROAD  
PENSACOLA FL 32526  
US

**ANALYTICAL INFORMATION      Gas Type : NO**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** AAL3287  
**Cylinder Pressure\*\*\*:** 2000 PSIG

**Certification Date:** 13Jul2011

**Exp. Date:** 12Jul2013  
**Batch No:** PLU0047655

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
NITRIC OXIDE	9.98 PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	9.99 PPM		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2628	20Jul2012	KAL004113	10.12 PPM	NITRIC OXIDE

**INSTRUMENTATION**

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA220/5708850810	23Jun2011	CHEMILUMINESCENCE

**ANALYZER READINGS**

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis****NITRIC OXIDE**

Date: 06Jul2011 Response Unit: VOLTS  
Z1=-0.00050 R1=2.32620 T1=2.29420  
R2=2.32460 Z2=-0.00070 T2=2.29270  
Z3=0.00010 T3=2.29200 R3=2.32320  
Avg. Concentration: 9.983 PPM

**Second Triad Analysis**

Date: 13Jul2011 Response Unit: VOLTS  
Z1=-0.00010 R1=2.31530 T1=2.28410  
R2=2.31430 Z2=-0.00130 T2=2.28390  
Z3=-0.00010 T3=2.28370 R3=2.31410  
Avg. Concentration: 9.987 PPM

**Calibration Curve**

Concentration=A+Bx+Cx<sup>2</sup>+Dx<sup>3</sup>+Ex<sup>4</sup>  
r=0.999989632  
Constants: A=0.06977162  
B=4.458448742 C=  
D= E=

**QUALITY ASSURANCE**

APPROVED BY: JAMES L. MCRAE  
(signature on file)