



AIR HYGIENE, INC.

Testing Solutions for a Better World

**EMISSION COMPLIANCE TEST
FOR THE
MITSUBISHI, MODEL 501G, UNIT 1B
PREPARED FOR
FLORIDA POWER AND LIGHT
AT THE
WEST COUNTY ENERGY CENTER
LOXAHATCHEE, FLORIDA
OCTOBER 6-7, 2009**



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AT THE
WEST COUNTY ENERGY CENTER
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**Emissions Compliance Test
Mitsubishi, Model 501G, Unit 1B
Florida Power and Light
West County Energy Center
Loxahatchee, Florida
October 6-7, 2009**

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the emissions testing study for nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), ammonia (NH₃), opacity, carbon dioxide (CO₂), and oxygen (O₂) from the exhaust of the Mitsubishi, Model 501G, Unit 1B for Florida Power and Light at the West County Energy Center near Loxahatchee, Florida. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on October 6-7, 2009.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct an initial compliance emission test to document levels of selected pollutants at two test loads (Base Load and Base Load with Duct Burners). The information will be used to confirm compliance with the operating permit issued by the Florida Department of Environmental Protection (FDEP). The specific objective was to determine the emission concentration of NO_x, CO, VOC, NH₃, opacity, CO₂, and O₂ from the exhaust of Florida Power and Light's Mitsubishi, Model 501G, Unit 1B at Base Load and Base Load with Duct Burners of total capacity.

1.2 SUMMARY OF TEST PROGRAM

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

- 1.2.1 Participating Organizations
 - Florida Department of Environmental Protection (FDEP)
 - Florida Power and Light
 - Black and Veatch
 - Air Hygiene
- 1.2.2 Industry
 - Electric Utility / Electric Services
- 1.2.3 Air Permit and Federal Requirements
 - Permit Number: PSD-FL-354
 - Emission Unit Identification (ID): 002
- 1.2.4 Plant Location
 - West County Energy Center near Loxahatchee, Florida
- 1.2.5 Equipment Tested
 - Mitsubishi, Model 501G, Unit 1B

1.2.6 Emission Points

- Exhaust from the Mitsubishi, Model 501G, Unit 1B
- For all gases, one sample point in the exhaust duct from the Mitsubishi, Model 501G, Unit 1B, determined after conducting a stratification test (refer to Appendix F)
- For all NH₃ testing, 24 sampling points in the exhaust duct from the Mitsubishi, Model 501G, Unit 1B (refer to Appendix A)
- For opacity, one sample visual observation point from the exit of the exhaust duct to the atmosphere from the Mitsubishi, Model 501G, Unit 1B

1.2.7 Pollutants Measured

- NO_x
- CO
- VOC
- NH₃
- Opacity
- CO₂
- O₂

1.2.8 Dates of Emission Test

- October 6-7, 2009

1.3 KEY PERSONNEL

Florida Power and Light:	John Mirino	305-242-3895
Florida Power and Light:	David Fawcett	561-904-4907
Florida Power and Light:	Emmett Callow	561-904-4922
Black and Veatch:	Bill Stevenson	913-458-8549
FDEP:	Michael Helmke	561-837-5936
Air Hygiene:	Jake Fahlenkamp	918-307-8865
Air Hygiene:	Tim Page	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Florida Power and Light's Mitsubishi, Model 501G, Unit 1B located at the West County Energy Center on October 6-7, 2009 are summarized in the following table.

**TABLE 2.1
SUMMARY OF MITSUBISHI, 501G, UNIT #1B RESULTS**

Parameter	Base W/O DB Load	Permit Limits	Base W/DB Load	Permit Limits
Run Duration (min / run)	60	–	60	–
Bar. Pressure (in. Hg)	29.93	–	29.81	–
Amb. Temp. (°F)	87	–	94	–
Rel. Humidity (%)	75	–	51	–
Spec. Humidity (lb water / lb air)	0.020412	–	0.017797	–
Avg. Stack Temp. (°F)	184	–	180	–
Comb. Inlet Pres. (psig)	265.4	–	263.7	–
Turbine Fuel Flow (lb/min)	1,848	–	1,639	–
Duct Burner Fuel Flow (lb/min)	0	–	198	–
Total Fuel Flow (SCFH)	2,565,426	–	2,550,004	–
Stack Flow (RM19) (SCFH)	57,675,469	–	51,530,970	–
Stack Moisture (% Method 4)	10.2	–	11.0	–
Power Output (megawatts)	249.1	–	247.2	–
NOx (ppmvd)	2.47	–	2.92	–
NOx (ppm@15%O ₂)	1.83	2.0	1.94	2.0
NOx (ppm@15%O ₂ &ISO)	2.21	–	2.18	–
NOx (lb/hr)	16.98	20.0	17.95	24.2
NOx (ton/year) at 8760 hr/year	74.39	–	78.61	–
NOx (lb/MMBtu)	0.007	–	0.007	–
CO (ppmvd)	0.96	–	3.49	–
CO (ppm@15%O ₂)	0.71	4.1	2.32	7.6
CO (ppm@15%O ₂ &ISO)	0.86	–	2.61	–
CO (lb/hr)	4.03	23.2	13.06	52.5
CO (ton/year) at 8760 hr/year	17.64	–	57.21	–
CO (lb/MMBtu)	0.002	–	0.005	–
VOC (ppmvd)	0.70	–	1.48	–
VOC (ppm@15%O ₂)	0.52	1.2	0.98	1.5
VOC (ppm@15%O ₂ &ISO)	0.63	–	1.11	–
VOC (lb/hr)	1.68	4.1	3.17	5.4
VOC (ton/year) at 8760 hr/year	7.38	–	13.87	–
VOC (lb/MMBtu)	0.001	–	0.001	–
Sulfur (gr S/100 scf)	0.0540	2	0.0540	2
NH ₃ (ppmvd)	1.73	–	1.44	–
NH ₃ (ppm@15%O ₂)	1.28	5.0	0.96	5.0
NH ₃ (lb/hr)	4.40	–	3.28	–
Opacity (%)	0	10	0	10
CO ₂ (%)	4.59	–	5.09	–
O ₂ (%)	12.95	–	12.03	–

The results of all measured pollutant emissions were below the required limits. All testing was performed without any real or apparent errors. All testing was conducted according to the approved testing protocol. Total hydrocarbons (THC) were report as VOC. Fuel Analysis, for C1-C6 and fuel sulfur content, was taken on October 6 and 7, 2009. The sample taken on October 6, 2009 contained insufficient sample for a fuel sulfur content analysis. The fuel sulfur content analyses for both October 6 and 7, 2009 were obtained from the October 7, 2009 sample (Appendix E).

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

Florida Power and Light (FPL) owns and operates the West County Energy Center (West County) located at 20505 State Road 80 in Loxahatchee, Florida. West County is a nominal 2,500 megawatt (MW) greenfield power plant and consists of two combined cycle units (Unit 1 and 2). Each combined cycle unit consists of: three nominal 250 MW Mitsubishi Model 501G combustion turbine-electrical generator (CTGs) sets with evaporative inlet cooling systems; three supplementary-fired heat recovery steam generators (HRSGs) with selective catalytic reduction (SCR) reactors; one nominal 428 million British thermal units per hour (MMBtu/hour) based on low heat value (LHV) natural gas-fired duct burner (DB) located within each of the three HRSG's; and a common nominal 500 MW steam turbine-electrical generator (STG). The total nominal generating capacity of each of the "3 on 1" combined cycle units is approximately 1,250 MW.

Each CTG has a nominal heat input rate of 2,333 MMBtu/hr when firing natural gas and 2,117 MMBtu/hr when firing distillate fuel oil (based on a compressor inlet air temperature of 59 degrees Fahrenheit (°F), the lower heating value (LHV) of each fuel, and 100 percent load), includes an automated gas turbine control system, and has dual-fuel capability of firing natural gas as the primary fuel or ultra low sulfur distillate (ULSD) fuel oil as a restricted alternate fuel. Each HRSG recovers exhaust, heat energy from each of the CTGs. Each Unit delivers steam to each STG. The efficient combustion of natural gas and restricted firing of ULSD fuel oil minimizes the emissions of carbon monoxide (CO), particulate matter (PM), sulfuric acid mist (H₂SO₄), sulfur dioxide (SO₂) and volatile organic compounds (VOCs). Dry Low-NOx (DLN) combustors for gas firing and water injection for oil firing reduce nitrogen oxides (NOx) emissions. A selective catalyst reduction (SCR) system further reduces NOx emissions.

3.2 SAMPLING LOCATION

The 501G stack is circular and measures 21.95 feet (ft) (263.38 inches) in diameter at the test ports which are approximately 138 ft above grade level with an exit elevation of approximately 150 ft above grade level. The test ports are located approximately 44.31 ft (531.75 inches) downstream and approximately 12 ft (144 inches) upstream from the nearest disturbances. All exhaust samples for gaseous emissions were continuously drawn from the exhaust system at the sample ports from a single point determined after conducting a stratification test (Appendix F). During the stratification test three points were traversed from each of the four ports. The probe was allowed to remain at a point for two times the system response time. For NH₃ testing, an initial velocity traverse was performed across the stack at base load from 24 total points. All NH₃ sampling occurred from the same 24 points by leaving the probe at each for an equal amount of time. All opacity observations were made by viewing the point where the exhaust system exited to the atmosphere at the top of the exhaust stack.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Mitsubishi, Model 501G, Unit 1B at the West County Energy Center was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on October 6-7, 2009.

**TABLE 4.1
SUMMARY OF SAMPLING METHODS**

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	Pitot
Oxygen	EPA Method 3a	Paramagnetic Cell
Carbon Dioxide	EPA Method 3a	Nondispersive Infrared Analyzer
Nitrogen Oxides	EPA Method 7e	Chemiluminescent Analyzer
Opacity	EPA Method 9	Visual Observation
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor
Total Hydrocarbons	EPA Method 25a	Flame Ionization Detector
Ammonia Slip	EPA CTM-027	Ion Chromatography M350.3
Sulfur Content Analysis	ASTM D 6667	Fuel Gas Sample and Laboratory Analysis

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 7e, 9, 10, 19, 25a, and Conditional Test Method (CTM)-027.

Figure 4.1 depicts the sample system used for the NO_x, CO, THC, CO₂, and O₂ tests. A stainless steel probe was inserted into the sample ports of the stack to extract gas measurements from the emission stream at a single point in the stack determined after passing an initial stratification test. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the NO_x, CO, CO₂, and O₂ analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the THC analyzer prior to gas conditioning.

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

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

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

Figure 4.2 represents the sample system used for the wet chemistry tests (NH₃). A heated stainless steel probe with an inconel liner and stainless steel nozzle was inserted into the sample ports of the stack to extract gas measurements from the emission stream through a filter and glass impinger train. Flow rates are monitored with oil filled manometers and total sample volumes are measured with a dry gas meter.

Three test runs of approximately 60 minutes each were conducted on the Mitsubishi, Model 501G, Unit 1B at each of the multiple test loads for NO_x, CO, THC, CO₂, NH₃, opacity, and O₂.

The stack gas analysis for O₂ and CO₂ concentrations was performed in accordance with procedures set forth in EPA Method 3a. The O₂ analyzer uses a paramagnetic cell detector and the CO₂ analyzer uses a continuous nondispersive infrared analyzer.

EPA Method 7e was used to determine concentrations of NO_x. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO₂ in nitrogen certified gas cylinder was used to verify at least a 90 percent NO₂ conversion on the day of the test.

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

THC emission concentrations were quantified in accordance with procedures set forth in EPA Method 25a. A continuous flame ionization (FID) analyzer was used for this purpose. THC emission concentrations were reported as VOC.

**TABLE 4.2
ANALYTICAL INSTRUMENTATION**

Parameter	Model and Manufacturer	Range	Sensitivity	Detection Principle
NO _x	THERMO 42C	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO ₂ to NO. Chemiluminescence of reaction of NO with O ₃ . Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48C	User may select up to 5,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
CO ₂	CAI 200	0-20%	0.1%	Non-dispersive infrared.
THC	THERMO 51	User may select up to 10,000 ppm	0.1 ppm	Flame Ionization Detector.
O ₂	CAI 200	0-25%	0.1%	Paramagnetic cell, inherently linear.

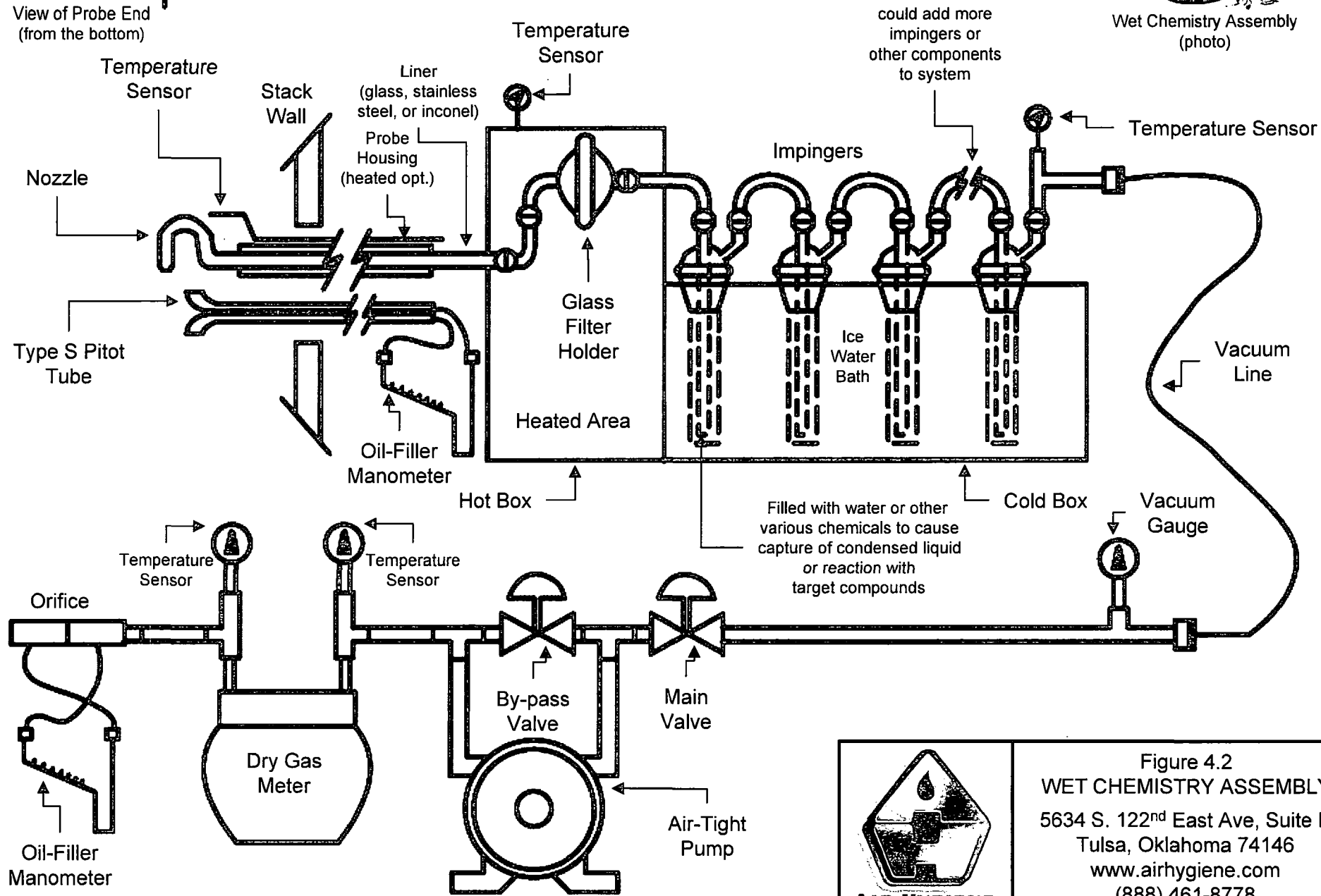
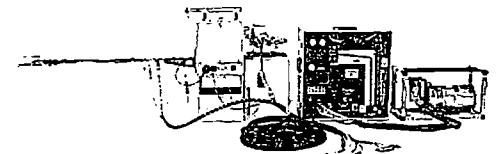
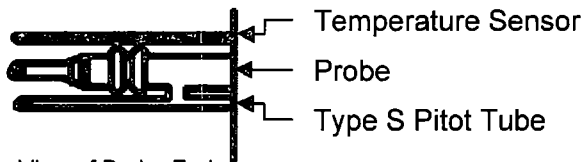


Figure 4.2
WET CHEMISTRY ASSEMBLY
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Tulsa, Oklahoma 74146
www.airhygiene.com
(888) 461-8778

APPENDIX A
TEST RESULTS AND CALCULATIONS

**TABLE A.1:
EMISSIONS TESTING SCHEDULE**

Unit	Load	Test Type	Run	Date	Start	Stop
1B	Base W/Db	Stratification Test	1	10/06/09	7:20:07	14:53:08
1B	Base W/O DB	Compliance	1-1	10/07/09	8:23:28	9:22:58
1B	Base W/O DB	Compliance	1-2	10/07/09	10:00:28	10:59:58
1B	Base W/O DB	Compliance	1-3	10/07/09	11:30:28	12:29:58
1B	Base W/Db	Compliance	2-1	10/06/09	15:21:28	16:20:58
1B	Base W/Db	Compliance	2-2	10/06/09	16:45:28	17:44:58
1B	Base W/Db	Compliance	2-3	10/06/09	18:00:28	18:59:58
1B	Base W/Db	Preliminaries	Base w/DB-V1	10/06/09	13:24:00	14:07:00
1B	Base W/Db	Ammonia	2-1	10/06/09	15:00:00	16:12:00
1B	Base W/Db	Ammonia	2-2	10/06/09	16:30:00	17:39:00
1B	Base W/Db	Ammonia	2-3	10/06/09	17:50:00	19:00:00
1B	Base W/O DB	Ammonia	1-1	10/07/09	8:23:00	9:35:00
1B	Base W/O DB	Ammonia	1-2	10/07/09	9:50:00	11:01:00
1B	Base W/O DB	Ammonia	1-3	10/07/09	11:10:00	12:18:00

TABLE A.2
mitsubishi, 501G, UNIT #1B BASE W/O DB LOAD DATA SUMMARY

Parameter	Base W/O Db Load, Run - 1-1	Base W/O Db Load, Run - 1-2	Base W/O Db Load, Run - 1-3	Average
Run Duration (min / run)	60	60	60	60
Bar. Pressure (in. Hg)	29.88	29.94	29.97	29.93
Amb. Temp. (°F)	82	85	93	87
Rel. Humidity (%)	85	78	62	75
Spec. Humidity (lb water / lb air)	0.020139	0.020321	0.020776	0.020412
Avg. Stack Temp. (°F)	184	184	184	184
Comb. Inlet Pres. (psig)	266.2	265.1	265.1	265.4
Turbine Fuel Flow (lb/min)	1,853	1,848	1,844	1,848
Duct Burner Fuel Flow (lb/min)	0	0	0	0
Total Fuel Flow (SCFH)	2,571,518	2,564,809	2,559,951	2,565,426
Stack Flow (RM19) (SCFH)	57,942,212	57,734,677	57,349,517	57,675,469
Stack Moisture (% Method 4)	10.4	10.4	9.9	10.2
Power Output (megawatts)	250.0	248.6	248.6	249.1
NOx (ppmvd)	2.61	2.39	2.39	2.47
NOx (ppm@15%O ₂)	1.94	1.78	1.77	1.83
NOx (ppm@15%O ₂ &ISO)	2.36	2.15	2.11	2.21
NOx (lb/hr)	18.06	16.51	16.38	16.98
NOx (ton/year) at 8760 hr/year	79.12	72.32	71.73	74.39
NOx (lb/MMBtu)	0.007	0.007	0.006	0.007
CO (ppmvd)	0.69	1.31	0.88	0.96
CO (ppm@15%O ₂)	0.51	0.97	0.65	0.71
CO (ppm@15%O ₂ &ISO)	0.63	1.17	0.78	0.86
CO (lb/hr)	2.91	5.48	3.69	4.03
CO (ton/year) at 8760 hr/year	12.76	24.02	16.14	17.64
CO (lb/MMBtu)	0.001	0.002	0.001	0.002
VOC (ppmvd)	0.14	0.99	0.99	0.70
VOC (ppm@15%O ₂)	0.10	0.74	0.73	0.52
VOC (ppm@15%O ₂ &ISO)	0.13	0.89	0.87	0.63
VOC (lb/hr)	0.33	2.37	2.35	1.68
VOC (ton/year) at 8760 hr/year	1.47	10.39	10.29	7.38
VOC (lb/MMBtu)	0.000	0.001	0.001	0.001
Sulfur (gr S/100 scf)	0.0540	0.0540	0.0540	0.0540
NH ₃ (ppmvd)	1.45	1.87	1.85	1.73
NH ₃ (ppm@15%O ₂)	1.08	1.39	1.37	1.28
NH ₃ (lb/hr)	3.71	4.79	4.70	4.40
Opacity (%)	0	0	0	0
CO ₂ (%)	4.60	4.57	4.60	4.59
O ₂ (%)	12.97	12.96	12.93	12.95

TABLE A.3
MITSUBISHI, 501G, UNIT #1B BASE W/DB LOAD DATA SUMMARY

Parameter	Base W/Db Load, Run - 2-1	Base W/Db Load, Run - 2-2	Base W/Db Load, Run - 2-3	Average
Run Duration (min / run)	60	60	60	60
Bar. Pressure (in. Hg)	29.83	29.80	29.80	29.81
Amb. Temp. (°F)	96	94	93	94
Rel. Humidity (%)	47	53	53	51
Spec. Humidity (lb water / lb air)	0.017259	0.018352	0.017778	0.017797
Avg. Stack Temp. (°F)	180	179	180	180
Comb. Inlet Pres. (psig)	264.1	263.8	263.2	263.7
Turbine Fuel Flow (lb/min)	1,641	1,641	1,637	1,639
Duct Burner Fuel Flow (lb/min)	198	198	198	198
Total Fuel Flow (SCFH)	2,551,392	2,551,392	2,547,228	2,550,004
Stack Flow (RM19) (SCFH)	51,597,202	51,601,762	51,393,946	51,530,970
Stack Moisture (% Method 4)	10.0	11.6	11.5	11.0
Power Output (megawatts)	247.7	247.3	246.6	247.2
NOx (ppmvd)	2.93	2.93	2.88	2.92
NOx (ppm@15%O ₂)	1.95	1.95	1.92	1.94
NOx (ppm@15%O ₂ &ISO)	2.16	2.22	2.16	2.18
NOx (lb/hr)	18.08	18.06	17.70	17.95
NOx (ton/year) at 8760 hr/year	79.20	79.10	77.51	78.61
NOx (lb/MMBtu)	0.007	0.007	0.007	0.007
CO (ppmvd)	3.78	3.67	3.01	3.49
CO (ppm@15%O ₂)	2.52	2.44	2.00	2.32
CO (ppm@15%O ₂ &ISO)	2.78	2.77	2.26	2.61
CO (lb/hr)	14.17	13.75	11.26	13.06
CO (ton/year) at 8760 hr/year	62.08	60.24	49.31	57.21
CO (lb/MMBtu)	0.006	0.005	0.004	0.005
VOC (ppmvd)	1.62	1.64	1.18	1.48
VOC (ppm@15%O ₂)	1.08	1.09	0.79	0.98
VOC (ppm@15%O ₂ &ISO)	1.19	1.24	0.89	1.11
VOC (lb/hr)	3.47	3.50	2.53	3.17
VOC (ton/year) at 8760 hr/year	15.18	15.35	11.07	13.87
VOC (lb/MMBtu)	0.001	0.001	0.001	0.001
Sulfur (gr S/100 scf)	0.0540	0.0540	0.0540	0.0540
NH ₃ (ppmvd)	1.41	1.41	1.51	1.44
NH ₃ (ppm@15%O ₂)	0.94	0.94	1.00	0.96
NH ₃ (lb/hr)	3.21	3.21	3.43	3.28
Opacity (%)	0	0	0	0
CO ₂ (%)	5.11	5.15	5.01	5.09
O ₂ (%)	12.04	12.04	12.02	12.03

TEST RESULTS

**NO_x, CO, VOC, CO₂, and O₂ Emissions
Base Load**

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data

Fuel Fd factor	8.649	SCF evh/MMBtu
Fuel Heating Value (HHV)	988	Btu/SCF fuel
Turbine Fuel Flow	1.853	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,571,518	SCFH

Weather Data

Barometric Pressure	29.88	in. Hg
Relative Humidity	85	%
Ambient Temperature	82	°F
Specific Humidity	0.020139	lb H ₂ O / lb air

Unit Data

Unit Load	250.0	megawatts
Combustor Inlet Pressure	266	psig
Meas. Stack Moisture	10.4	%
Stack Exhaust Flow (M19)	57,942,212	SCFH

Data from: NH3 Run 1

Base W/O Db Load, Run - 1-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmv)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/07/09 08:23:28	4188	12.96	2.58	0.10	0.49	4.73
10/07/09 08:23:58	4218	12.96	2.54	0.09	0.60	4.74
10/07/09 08:24:28	4248	12.96	2.59	0.08	0.50	4.74
10/07/09 08:24:58	4278	12.97	2.61	0.11	0.46	4.74
10/07/09 08:25:28	4308	12.97	2.62	0.08	0.40	4.74
10/07/09 08:25:58	4338	12.96	2.83	0.15	0.35	4.73
10/07/09 08:26:28	4368	12.96	2.59	0.08	0.34	4.74
10/07/09 08:26:58	4398	12.95	2.62	0.11	0.29	4.74
10/07/09 08:27:28	4428	12.95	2.57	0.13	0.27	4.73
10/07/09 08:27:58	4458	12.97	2.56	0.20	0.26	4.74
10/07/09 08:28:28	4488	12.96	2.57	0.14	0.42	4.74
10/07/09 08:28:58	4518	12.96	2.59	0.34	0.51	4.74
10/07/09 08:29:28	4548	12.96	2.62	0.21	0.41	4.73
10/07/09 08:29:58	4578	12.97	2.59	0.10	0.27	4.73
10/07/09 08:30:28	4608	12.98	2.55	0.16	0.31	4.74
10/07/09 08:30:58	4638	12.97	2.59	0.32	0.32	4.74
10/07/09 08:31:28	4668	12.97	2.54	0.26	0.33	4.74
10/07/09 08:31:58	4698	12.96	2.58	0.20	0.33	4.74
10/07/09 08:32:28	4728	12.95	2.58	0.37	0.28	4.74
10/07/09 08:32:58	4758	12.96	2.63	0.33	0.19	4.74
10/07/09 08:33:28	4788	12.97	2.60	0.17	0.30	4.74
10/07/09 08:33:58	4818	12.97	2.59	0.31	0.30	4.73
10/07/09 08:34:28	4848	12.96	2.55	0.44	0.28	4.73
10/07/09 08:34:58	4878	12.97	2.61	0.53	0.20	4.74
10/07/09 08:35:28	4908	12.97	2.59	0.54	0.18	4.74
10/07/09 08:35:58	4938	12.97	2.66	0.67	0.13	4.73
10/07/09 08:36:28	4968	12.96	2.83	0.90	0.19	4.74
10/07/09 08:36:58	4998	12.95	2.62	0.67	0.13	4.74
10/07/09 08:37:28	5028	12.95	2.64	0.72	0.17	4.74
10/07/09 08:37:58	5058	12.96	2.65	0.79	0.16	4.74
10/07/09 08:38:28	5088	12.97	2.58	0.67	0.24	4.74
10/07/09 08:38:58	5118	12.96	2.61	0.87	0.21	4.74
10/07/09 08:39:28	5148	12.96	2.58	0.71	0.24	4.75
10/07/09 08:39:58	5178	12.97	2.56	0.72	0.20	4.75
10/07/09 08:40:28	5208	12.97	2.58	0.71	0.15	4.75
10/07/09 08:40:58	5238	12.98	2.58	0.86	0.11	4.74
10/07/09 08:41:28	5268	12.97	2.57	0.88	0.21	4.75
10/07/09 08:41:58	5298	12.96	2.63	0.76	0.12	4.75
10/07/09 08:42:28	5328	12.98	2.67	0.93	0.19	4.78
10/07/09 08:42:58	5358	12.96	2.82	0.91	0.19	4.74
10/07/09 08:43:28	5388	12.96	2.63	0.81	0.20	4.75
10/07/09 08:43:58	5418	12.96	2.59	0.78	0.18	4.75
10/07/09 08:44:28	5448	12.96	2.62	0.71	0.21	4.75
10/07/09 08:44:58	5478	12.96	2.66	0.92	0.14	4.75
10/07/09 08:45:28	5508	12.96	2.64	0.74	0.08	4.75
10/07/09 08:45:58	5538	12.96	2.61	0.70	0.12	4.75
10/07/09 08:46:28	5568	12.98	2.60	0.87	0.13	4.75
10/07/09 08:46:58	5598	12.96	2.61	0.93	0.13	4.75
10/07/09 08:47:28	5628	12.96	2.61	0.84	0.19	4.74
10/07/09 08:47:58	5658	12.95	2.57	0.80	0.15	4.75
10/07/09 08:48:28	5688	12.94	2.64	0.87	0.19	4.76
10/07/09 08:48:58	5718	12.97	2.60	0.87	0.19	4.75
10/07/09 08:49:28	5748	12.98	2.64	0.86	0.21	4.76
10/07/09 08:49:58	5778	12.97	2.57	0.79	0.27	4.75
10/07/09 08:50:28	5808	12.97	2.54	0.67	0.21	4.76
10/07/09 08:50:58	5838	12.97	2.58	0.73	0.21	4.76
10/07/09 08:51:28	5868	12.97	2.64	0.75	0.19	4.76
10/07/09 08:51:58	5898	12.97	2.58	0.88	0.22	4.77
10/07/09 08:52:28	5928	12.97	2.60	0.65	0.20	4.77
10/07/09 08:52:58	5958	12.98	2.59	0.80	0.22	4.77
10/07/09 08:53:28	5988	12.97	2.58	0.87	0.26	4.78
10/07/09 08:53:58	6018	12.96	2.65	0.92	0.18	4.77
10/07/09 08:54:28	6048	12.96	2.61	0.89	0.25	4.77
10/07/09 08:54:58	6078	12.97	2.56	0.93	0.27	4.77
10/07/09 08:55:28	6108	12.96	2.58	0.76	0.28	4.78
10/07/09 08:55:58	6138	12.96	2.59	0.73	0.21	4.78
10/07/09 08:56:28	6168	12.96	2.58	0.74	0.34	4.77
10/07/09 08:56:58	6198	12.97	2.54	0.70	0.25	4.78
10/07/09 08:57:28	6228	12.97	2.51	0.91	0.29	4.78
10/07/09 08:57:58	6258	12.97	2.59	0.78	0.28	4.78
10/07/09 08:58:28	6288	12.98	2.58	0.75	0.24	4.78
10/07/09 08:58:58	6318	12.95	2.55	0.81	0.27	4.78
10/07/09 08:59:28	6348	12.96	2.58	0.86	0.27	4.78
10/07/09 08:59:58	6378	12.96	2.58	0.82	0.25	4.78
10/07/09 09:00:28	6408	12.96	2.54	0.91	0.34	4.78
10/07/09 09:00:58	6438	12.96	2.58	0.67	0.28	4.77
10/07/09 09:01:28	6468	12.96	2.52	0.75	0.34	4.78
10/07/09 09:01:58	6498	12.95	2.60	0.78	0.29	4.78
10/07/09 09:02:28	6528	12.96	2.57	0.93	0.29	4.78
10/07/09 09:02:58	6558	12.97	2.57	0.74	0.27	4.78
10/07/09 09:03:28	6588	12.96	2.57	0.83	0.42	4.79
10/07/09 09:03:58	6618	12.97	2.54	0.92	0.32	4.78
10/07/09 09:04:28	6648	12.97	2.58	0.72	0.39	4.78
10/07/09 09:04:58	6678	12.95	2.56	0.73	0.43	4.80

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data		
Fuel Fd factor	8,849	SCF ext/MMBtu
Fuel Heating Value (HHV)	988	Btu/SCF fuel
Turbine Fuel Flow	1,853	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,571,518	SCFH

Weather Data		
Barometric Pressure	29.85	In. Hg
Relative Humidity	85	%
Ambient Temperature	82	°F
Specific Humidity	0.020139	lb H ₂ O / lb air

Unit Data		
Unit Load	250.0	megawatts
Combustor Inlet Pressure	266	psig
Meas. Stack Moisture	10.4	%
Stack Exhaust Flow (M19)	57,942,212	SCFH

Data from: NH3 Run 1

Base W/O Db Load, Run - 1-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvv)	CO ₂ (%)
10/07/09 09:05:28	6708	12.95	2.58	0.66	0.46	4.80
10/07/09 09:05:58	6738	12.97	2.60	0.82	0.52	4.80
10/07/09 09:06:28	6768	12.97	2.54	0.87	0.49	4.79
10/07/09 09:06:58	6798	12.97	2.57	0.88	0.48	4.80
10/07/09 09:07:28	6828	12.97	2.60	0.72	0.45	4.80
10/07/09 09:07:58	6858	12.97	2.55	0.89	0.51	4.79
10/07/09 09:08:28	6888	12.96	2.58	0.90	0.49	4.80
10/07/09 09:08:58	6918	12.95	2.57	0.87	0.48	4.81
10/07/09 09:09:28	6948	12.96	2.66	0.90	0.52	4.80
10/07/09 09:09:58	6978	12.97	2.60	0.84	0.51	4.80
10/07/09 09:10:28	7008	12.97	2.57	0.74	0.50	4.81
10/07/09 09:10:58	7038	12.97	2.51	0.71	0.50	4.80
10/07/09 09:11:28	7068	12.96	2.50	0.80	0.55	4.81
10/07/09 09:11:58	7098	12.96	2.51	0.87	0.53	4.80
10/07/09 09:12:28	7128	12.97	2.64	0.92	0.54	4.80
10/07/09 09:12:58	7158	12.96	2.60	0.81	0.53	4.81
10/07/09 09:13:28	7188	12.97	2.59	0.81	0.50	4.80
10/07/09 09:13:58	7218	12.98	2.56	0.73	0.63	4.80
10/07/09 09:14:28	7248	12.98	2.57	0.92	0.60	4.80
10/07/09 09:14:58	7278	12.96	2.62	0.78	0.63	4.80
10/07/09 09:15:28	7308	12.96	2.56	0.70	0.64	4.80
10/07/09 09:15:58	7338	12.97	2.61	0.69	0.67	4.80
10/07/09 09:16:28	7368	12.97	2.52	0.67	0.60	4.80
10/07/09 09:16:58	7398	12.97	2.55	0.86	0.66	4.79
10/07/09 09:17:28	7428	12.97	2.55	0.76	0.64	4.80
10/07/09 09:17:58	7458	12.98	2.54	0.77	0.68	4.79
10/07/09 09:18:28	7488	12.97	2.57	0.74	0.65	4.80
10/07/09 09:18:58	7518	12.95	2.59	0.91	0.64	4.80
10/07/09 09:19:28	7548	12.96	2.56	0.65	0.65	4.80
10/07/09 09:19:58	7578	12.96	2.58	0.83	0.75	4.80
10/07/09 09:20:28	7608	12.96	2.56	0.91	0.76	4.80
10/07/09 09:20:58	7638	12.97	2.60	0.89	0.82	4.80
10/07/09 09:21:28	7668	12.97	2.64	0.65	0.74	4.80
10/07/09 09:21:58	7698	12.97	2.57	0.66	0.87	4.80
10/07/09 09:22:28	7728	12.97	2.57	0.80	0.95	4.81
10/07/09 09:22:58	7758	12.97	2.53	0.83	0.86	4.80

RAW AVERAGE O₂ 12.96 NOx 2.59 CO 0.68 VOC 0.37 CO₂ 4.77

	O ₂	NOx	CO	VOC	CO ₂
	(%)	(ppmvd)	(ppmvd)	(ppmvv)	(%)
Serial Number: INST-22-0001	INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001	
Initial Zero	0.04	0.03	-0.06	0.42	0.05
Final Zero	-0.01	0.01	0.03	0.16	0.20
Avg. Zero	0.02	0.02	-0.02	0.29	0.13
Initial UpScale	12.04	4.93	4.98	2.94	9.31
Final UpScale	11.95	4.92	4.87	2.73	9.41
Avg. UpScale	12.00	4.93	4.93	2.84	9.36

Upscale Cal Gas O₂ 12.00 NOx 4.99 CO 4.95 VOC 3.00 CO₂ 9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.97	2.61	0.69	0.14	4.60
Concentration (ppm@ 15%O ₂)	N/A	1.94	0.51	0.10	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.36	0.63	0.13	N/A
Emission Rate (lb/hr)	N/A	18.06	2.81	0.33	N/A
Emission Rate (tons/year) at 8760 hr/yr	N/A	79.12	12.76	1.47	N/A
Emission Rate (lb/MMBtu)	N/A	0.007	0.001	0.000	N/A

Florida Power and Light
 October 7, 2009
 Mitsubishi, 601G, Unit #1B
 West County Energy Center

Fuel Data			
Fuel Fd factor	6.649	SCF exdy/MMBtu	
Fuel Heating Value (HHV)	988	Btu/SCF fuel	
Turbine Fuel Flow	1.848	lb/min	
Duct Burner Fuel Flow	0	lb/min	
Total Fuel Flow	2,564,809	SCFH	

Weather Data		
Barometric Pressure	29.94	in. Hg
Relative Humidity	78	%
Ambient Temperature	85	°F
Specific Humidity	0.020321	lb H ₂ O / lb air

Unit Data		
Unit Load	248.6	megawatts
Combustor Inlet Pressure	265	psig
Meas. Stack Moisture	10.4	%
Stack Exhaust Flow (M19)	57,734,677	SCFH

Data from: NH3 Run 2

Base W/O Db Load, Run - 1-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 10:00:28	10008	12.93	2.41	1.20	0.91	4.79
10/07/09 10:00:58	10038	12.93	2.47	1.25	0.92	4.78
10/07/09 10:01:28	10068	12.93	2.39	1.31	0.93	4.78
10/07/09 10:01:58	10098	12.94	2.45	1.31	0.95	4.79
10/07/09 10:02:28	10128	12.94	2.40	1.42	0.89	4.79
10/07/09 10:02:58	10158	12.94	2.47	1.41	0.73	4.79
10/07/09 10:03:28	10188	12.95	2.37	1.35	0.95	4.79
10/07/09 10:03:58	10218	12.97	2.36	1.40	1.10	4.80
10/07/09 10:04:28	10248	12.96	2.37	1.59	0.74	4.79
10/07/09 10:04:58	10278	12.95	2.44	1.51	0.85	4.78
10/07/09 10:05:28	10308	12.95	2.33	1.54	1.05	4.78
10/07/09 10:05:58	10338	12.96	2.41	1.63	1.18	4.79
10/07/09 10:06:28	10368	12.95	2.34	1.64	1.05	4.80
10/07/09 10:06:58	10398	12.95	2.47	1.80	0.79	4.79
10/07/09 10:07:28	10428	12.95	2.41	1.68	0.98	4.79
10/07/09 10:07:58	10458	12.93	2.40	1.89	0.94	4.80
10/07/09 10:08:28	10488	12.94	2.39	1.92	0.85	4.79
10/07/09 10:08:58	10518	12.95	2.44	1.91	1.03	4.79
10/07/09 10:09:28	10548	12.95	2.46	1.94	1.08	4.79
10/07/09 10:09:58	10578	12.94	2.35	2.07	1.08	4.80
10/07/09 10:10:28	10608	12.95	2.39	2.19	0.90	4.78
10/07/09 10:10:58	10638	12.96	2.35	2.03	1.12	4.79
10/07/09 10:11:28	10668	12.98	2.38	2.04	1.20	4.80
10/07/09 10:11:58	10698	12.93	2.39	2.14	1.25	4.80
10/07/09 10:12:28	10728	12.93	2.43	2.30	0.98	4.80
10/07/09 10:12:58	10758	12.97	2.41	2.38	0.94	4.79
10/07/09 10:13:28	10788	12.96	2.38	2.40	0.92	4.79
10/07/09 10:13:58	10818	12.95	2.40	2.42	1.00	4.81
10/07/09 10:14:28	10848	12.95	2.45	2.29	1.03	4.80
10/07/09 10:14:58	10878	12.93	2.41	0.90	0.99	4.79
10/07/09 10:15:28	10908	12.93	2.38	0.87	0.87	4.80
10/07/09 10:15:58	10938	12.95	2.39	0.89	0.77	4.80
10/07/09 10:16:28	10968	12.96	2.42	0.87	0.81	4.80
10/07/09 10:16:58	10998	12.97	2.34	0.88	0.80	4.80
10/07/09 10:17:28	11028	12.94	2.32	0.95	0.81	4.81
10/07/09 10:17:58	11058	12.94	2.44	0.93	0.80	4.81
10/07/09 10:18:28	11088	12.95	2.45	0.94	0.79	4.80
10/07/09 10:18:58	11118	12.95	2.42	0.97	0.85	4.81
10/07/09 10:19:28	11148	12.95	2.39	0.98	0.89	4.81
10/07/09 10:19:58	11178	12.94	2.42	0.98	0.88	4.81
10/07/09 10:20:28	11208	12.95	2.39	1.00	0.95	4.80
10/07/09 10:20:58	11238	12.96	2.32	0.99	1.01	4.80
10/07/09 10:21:28	11268	12.94	2.32	1.05	1.05	4.81
10/07/09 10:21:58	11298	12.95	2.39	1.01	1.10	4.81
10/07/09 10:22:28	11328	12.96	2.37	1.01	1.20	4.80
10/07/09 10:22:58	11358	12.96	2.39	1.06	1.08	4.80
10/07/09 10:23:28	11388	12.96	2.38	1.06	0.73	4.80
10/07/09 10:23:58	11418	12.93	2.44	1.06	0.81	4.81
10/07/09 10:24:28	11448	12.94	2.38	1.06	0.83	4.82
10/07/09 10:24:58	11478	12.95	2.39	1.07	0.80	4.82
10/07/09 10:25:28	11508	12.96	2.36	1.09	0.88	4.81
10/07/09 10:25:58	11538	12.96	2.29	1.07	0.92	4.81
10/07/09 10:26:28	11568	12.95	2.42	1.11	0.92	4.81
10/07/09 10:26:58	11598	12.95	2.39	1.10	0.98	4.81
10/07/09 10:27:28	11628	12.95	2.29	1.12	0.96	4.81
10/07/09 10:27:58	11658	12.95	2.31	1.13	1.03	4.81
10/07/09 10:28:28	11688	12.94	2.33	1.11	1.06	4.81
10/07/09 10:28:58	11718	12.94	2.34	1.15	1.08	4.82
10/07/09 10:29:28	11748	12.94	2.34	1.15	1.14	4.82
10/07/09 10:29:58	11778	12.96	2.31	1.17	1.09	4.81
10/07/09 10:30:28	11808	12.97	2.39	1.10	1.10	4.82
10/07/09 10:30:58	11838	12.96	2.33	1.14	1.12	4.82
10/07/09 10:31:28	11868	12.95	2.32	1.13	1.12	4.82
10/07/09 10:31:58	11898	12.95	2.32	1.14	1.13	4.82
10/07/09 10:32:28	11928	12.95	2.35	1.19	1.19	4.83
10/07/09 10:32:58	11958	12.93	2.33	1.21	1.14	4.83
10/07/09 10:33:28	11988	12.94	2.39	1.23	1.09	4.82
10/07/09 10:33:58	12018	12.97	2.33	1.18	1.15	4.82
10/07/09 10:34:28	12048	12.96	2.28	1.21	1.14	4.83
10/07/09 10:34:58	12078	12.94	2.28	1.20	1.12	4.83
10/07/09 10:35:28	12108	12.95	2.38	1.20	1.21	4.83
10/07/09 10:35:58	12138	12.93	2.36	1.21	1.22	4.84
10/07/09 10:36:28	12168	12.94	2.34	1.26	1.20	4.83
10/07/09 10:36:58	12198	12.97	2.41	1.25	1.20	4.84
10/07/09 10:37:28	12228	12.96	2.33	1.23	1.17	4.84
10/07/09 10:37:58	12258	12.96	2.33	1.24	1.22	4.84
10/07/09 10:38:28	12288	12.95	2.28	1.22	1.27	4.84
10/07/09 10:38:58	12318	12.96	2.26	1.24	1.28	4.84
10/07/09 10:39:28	12348	12.94	2.28	1.25	1.29	4.85
10/07/09 10:39:58	12378	12.94	2.31	1.25	0.88	4.85
10/07/09 10:40:28	12408	12.95	2.33	1.24	0.78	4.85
10/07/09 10:40:58	12438	12.96	2.43	1.25	0.88	4.85
10/07/09 10:41:28	12468	12.97	2.34	1.25	0.92	4.84
10/07/09 10:41:58	12498	12.98	2.28	1.24	0.82	4.84

Florida Power and Light
October 7, 2009
Mitsubishi, 501G, Unit #1B
West County Energy Center

Fuel Data		
Fuel Fd factor	8,649	SCF exh/MMBtu
Fuel Heating Value (HHV)	986	Btu/SCF fuel
Turbine Fuel Flow	1,848	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,564,809	SCFH

Weather Data		
Barometric Pressure	29.94	In. Hg
Relative Humidity	78	%
Ambient Temperature	85	°F
Specific Humidity	0.020321	lb H ₂ O / lb air

Unit Data		
Unit Load	248.6	megawatts
Combustor Inlet Pressure	265	psig
Meas. Stack Moisture	10.4	%
Stack Exhaust Flow (M19)	57,734,677	SCFH

Data from: NH3 Run 2

Base W/O Db Load, Run - 1-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 10:42:28	12528	12.98	2.30	1.22	0.97	4.84
10/07/09 10:42:58	12558	12.98	2.28	1.25	1.03	4.84
10/07/09 10:43:28	12588	12.96	2.27	1.26	1.08	4.85
10/07/09 10:43:58	12618	12.96	2.39	1.25	1.02	4.85
10/07/09 10:44:28	12648	12.97	2.33	1.25	1.06	4.84
10/07/09 10:44:58	12678	12.95	2.27	1.19	1.10	4.85
10/07/09 10:45:28	12708	12.96	2.28	1.21	1.08	4.86
10/07/09 10:45:58	12738	12.96	2.30	1.23	1.01	4.85
10/07/09 10:46:28	12768	12.96	2.30	1.17	1.06	4.86
10/07/09 10:46:58	12798	12.95	2.27	1.24	1.01	4.86
10/07/09 10:47:28	12828	12.95	2.23	1.16	1.10	4.86
10/07/09 10:47:58	12858	12.97	2.25	1.19	1.08	4.86
10/07/09 10:48:28	12888	12.97	2.28	1.16	1.07	4.86
10/07/09 10:48:58	12918	12.97	2.31	1.18	1.04	4.86
10/07/09 10:49:28	12948	12.96	2.23	1.19	1.05	4.86
10/07/09 10:49:58	12978	12.96	2.27	1.19	1.04	4.87
10/07/09 10:50:28	13008	12.96	2.31	1.21	0.97	4.88
10/07/09 10:50:58	13038	12.95	2.36	1.18	1.00	4.87
10/07/09 10:51:28	13068	12.96	2.34	1.20	0.91	4.87
10/07/09 10:51:58	13098	12.96	2.32	1.17	0.96	4.87
10/07/09 10:52:28	13128	12.96	2.33	1.17	0.93	4.87
10/07/09 10:52:58	13158	12.95	2.33	1.17	0.89	4.87
10/07/09 10:53:28	13188	12.96	2.33	1.16	0.89	4.87
10/07/09 10:53:58	13218	12.98	2.28	1.16	0.96	4.86
10/07/09 10:54:28	13248	12.98	2.26	1.18	0.82	4.87
10/07/09 10:54:58	13278	12.97	2.28	1.14	0.88	4.87
10/07/09 10:55:28	13308	12.97	2.28	1.14	0.93	4.87
10/07/09 10:55:58	13338	12.96	2.28	1.13	0.81	4.88
10/07/09 10:56:28	13368	12.96	2.32	1.11	0.81	4.88
10/07/09 10:56:58	13398	12.96	2.37	1.11	0.69	4.89
10/07/09 10:57:28	13428	12.97	2.32	1.09	0.77	4.89
10/07/09 10:57:58	13458	12.97	2.34	1.10	0.71	4.88
10/07/09 10:58:28	13488	12.96	2.29	1.07	0.79	4.88
10/07/09 10:58:58	13518	12.97	2.27	1.07	0.86	4.89
10/07/09 10:59:28	13548	12.95	2.21	1.05	0.94	4.89
10/07/09 10:59:58	13578	12.95	2.26	1.07	1.03	4.90
RAW AVERAGE		12.95	2.35	1.29	0.98	4.83

	O ₂	NOx	CO	VOC	CO ₂
	(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Serial Number: INST-22-0001		INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001
Initial Zero	-0.01	0.01	0.03	0.16	0.20
Final Zero	0.01	-0.01	-0.06	0.39	0.23
Avg. Zero	0.00	0.00	-0.02	0.28	0.22
Initial UpScale	11.95	4.92	4.87	2.73	9.41
Final UpScale	12.03	4.87	4.98	2.82	9.50
Avg. UpScale	11.99	4.90	4.93	2.78	9.46
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.96	2.39	1.31	0.99	4.57
Concentration (ppm@ 15%O ₂)	N/A	1.78	0.97	0.74	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.15	1.17	0.89	N/A
Emission Rate (lb/hr)	N/A	18.51	5.48	2.37	N/A
Emission Rate (tons/year) at 8760 hr/yr	N/A	72.32	24.02	10.39	N/A
Emission Rate (lb/MMBtu)	N/A	0.007	0.002	0.001	N/A

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data

Fuel Fd factor	8.049	SCF inch/MMBtu
Fuel Heating Value (HHV)	988	Btu/SCF fuel
Turbine Fuel Flow	1,844	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,559,951	SCFH

Weather Data

Barometric Pressure	29.97	In. Hg
Relative Humidity	62	%
Ambient Temperature	93	° F
Specific Humidity	0.020778	lb H ₂ O / lb air

Unit Data

Unit Load	246.6	megawatts
Combustor Inlet Pressure	265	psig
Meas. Stack Moisture	9.9	%
Stack Exhaust Flow (M19)	57,349,517	SCFH

Data from: NH3 Run 3

Base W/O Db Load, Run - 1-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmv)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/07/09 11:30:28	15408	12.97	2.29	0.48	1.10	4.93
10/07/09 11:30:58	15438	12.96	2.34	0.49	1.09	4.93
10/07/09 11:31:28	15468	12.97	2.29	0.52	1.15	4.93
10/07/09 11:31:58	15498	12.97	2.25	0.55	1.14	4.93
10/07/09 11:32:28	15528	12.98	2.22	0.57	1.17	4.93
10/07/09 11:32:58	15558	12.97	2.24	0.62	1.16	4.93
10/07/09 11:33:28	15588	12.98	2.28	0.63	1.19	4.93
10/07/09 11:33:58	15618	12.97	2.27	0.65	1.24	4.92
10/07/09 11:34:28	15648	12.97	2.27	0.65	1.16	4.92
10/07/09 11:34:58	15678	12.97	2.27	0.70	1.16	4.93
10/07/09 11:35:28	15708	12.96	2.27	0.71	1.22	4.94
10/07/09 11:35:58	15738	12.95	2.29	0.72	1.25	4.93
10/07/09 11:36:28	15768	12.97	2.26	0.76	1.23	4.93
10/07/09 11:36:58	15798	12.98	2.25	0.76	1.27	4.91
10/07/09 11:37:28	15828	12.97	2.23	0.79	1.28	4.91
10/07/09 11:37:58	15858	12.96	2.22	0.79	1.30	4.92
10/07/09 11:38:28	15888	12.97	2.28	0.83	1.28	4.92
10/07/09 11:38:58	15918	12.97	2.30	0.84	1.33	4.92
10/07/09 11:39:28	15948	12.97	2.30	0.95	1.24	4.91
10/07/09 11:39:58	15978	12.98	2.35	0.82	1.31	4.91
10/07/09 11:40:28	16008	12.97	2.28	0.88	1.36	4.91
10/07/09 11:40:58	16038	12.96	2.28	0.92	1.33	4.92
10/07/09 11:41:28	16068	12.95	2.34	0.95	1.32	4.92
10/07/09 11:41:58	16098	12.94	2.42	0.92	0.97	4.92
10/07/09 11:42:28	16128	12.95	2.33	0.90	0.60	4.91
10/07/09 11:42:58	16158	12.97	2.32	0.95	0.73	4.91
10/07/09 11:43:28	16188	12.98	2.29	0.97	0.66	4.91
10/07/09 11:43:58	16218	12.98	2.26	1.00	0.69	4.90
10/07/09 11:44:28	16248	12.96	2.27	1.03	0.69	4.92
10/07/09 11:44:58	16278	12.97	2.36	1.27	0.32	4.91
10/07/09 11:45:28	16308	12.97	2.46	1.06	0.35	4.92
10/07/09 11:45:58	16338	12.96	2.43	1.05	0.31	4.92
10/07/09 11:46:28	16368	12.96	2.42	1.06	0.29	4.92
10/07/09 11:46:58	16398	12.97	2.41	1.21	0.27	4.92
10/07/09 11:47:28	16428	12.97	2.34	1.25	0.20	4.92
10/07/09 11:47:58	16458	12.96	2.36	1.17	0.41	4.92
10/07/09 11:48:28	16488	12.96	2.34	1.32	0.80	4.92
10/07/09 11:48:58	16518	12.98	2.37	1.25	0.73	4.91
10/07/09 11:49:28	16548	12.98	2.32	1.23	0.73	4.92
10/07/09 11:49:58	16578	12.98	2.28	1.26	0.71	4.93
10/07/09 11:50:28	16608	12.97	2.32	1.22	0.81	4.93
10/07/09 11:50:58	16638	12.95	2.33	1.27	0.84	4.93
10/07/09 11:51:28	16668	12.96	2.37	1.35	0.78	4.93
10/07/09 11:51:58	16698	12.97	2.32	1.26	0.79	4.93
10/07/09 11:52:28	16728	12.97	2.35	1.31	0.81	4.93
10/07/09 11:52:58	16758	12.95	2.34	1.23	0.99	4.94
10/07/09 11:53:28	16788	12.95	2.33	1.38	0.99	4.94
10/07/09 11:53:58	16818	12.97	2.33	1.13	1.16	4.94
10/07/09 11:54:28	16848	12.97	2.24	1.05	1.05	4.94
10/07/09 11:54:58	16878	12.97	2.30	1.13	0.97	4.94
10/07/09 11:55:28	16908	12.97	2.34	1.10	1.10	4.94
10/07/09 11:55:58	16938	12.98	2.28	1.10	1.13	4.94
10/07/09 11:56:28	16968	12.97	2.34	1.17	1.04	4.94
10/07/09 11:56:58	16998	12.97	2.33	1.08	1.13	4.95
10/07/09 11:57:28	17028	12.95	2.31	1.12	1.14	4.96
10/07/09 11:57:58	17058	12.96	2.33	1.13	1.14	4.95
10/07/09 11:58:28	17088	12.97	2.42	1.13	1.11	4.94
10/07/09 11:58:58	17118	12.98	2.35	1.09	1.15	4.95
10/07/09 11:59:28	17148	12.97	2.33	1.13	1.20	4.95
10/07/09 11:59:58	17178	12.94	2.33	1.08	1.15	4.96
10/07/09 12:00:28	17208	12.94	2.30	1.11	1.14	4.95
10/07/09 12:00:58	17238	12.96	2.37	1.15	1.06	4.96
10/07/09 12:01:28	17268	12.95	2.38	1.08	1.05	4.97
10/07/09 12:01:58	17298	12.95	2.35	1.05	1.11	4.96
10/07/09 12:02:28	17328	12.97	2.33	1.07	1.13	4.94
10/07/09 12:02:58	17358	12.99	2.20	1.05	1.13	4.94
10/07/09 12:03:28	17388	12.98	2.20	1.07	1.14	4.95
10/07/09 12:03:58	17418	12.95	2.27	1.03	1.15	4.97
10/07/09 12:04:28	17448	12.95	2.34	1.02	1.25	4.98
10/07/09 12:04:58	17478	12.96	2.40	1.01	1.20	4.97
10/07/09 12:05:28	17508	12.96	2.33	1.04	1.19	4.97
10/07/09 12:05:58	17538	12.96	2.35	1.06	1.16	4.97
10/07/09 12:06:28	17568	12.96	2.38	0.95	1.17	4.97
10/07/09 12:06:58	17598	12.95	2.31	1.00	1.18	4.97
10/07/09 12:07:28	17628	12.96	2.33	0.99	1.23	4.97
10/07/09 12:07:58	17658	12.98	2.29	0.96	1.17	4.97
10/07/09 12:08:28	17688	12.98	2.26	0.98	1.20	4.98
10/07/09 12:08:58	17718	12.96	2.25	1.01	1.14	4.97
10/07/09 12:09:28	17748	12.97	2.29	0.99	1.13	4.97
10/07/09 12:09:58	17778	12.99	2.23	0.95	1.22	4.96
10/07/09 12:10:28	17808	12.97	2.19	0.97	1.15	4.98
10/07/09 12:10:58	17838	12.98	2.25	1.04	1.13	4.98
10/07/09 12:11:28	17868	12.98	2.28	0.97	1.17	4.99
10/07/09 12:11:58	17898	12.95	2.31	1.03	1.16	4.98

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data		
Fuel Fd factor	8.649	SCF ezh/MMBtu
Fuel Heating Value (HV)	988	Btu/SCF fuel
Turbine Fuel Flow	1,844	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,559,951	SCFH

Weather Data		
Barometric Pressure	29.97	in. Hg
Relative Humidity	62	%
Ambient Temperature	93	°F
Specific Humidity	0.020776	lb H ₂ O / lb air

Unit Data		
Unit Load	248.6	megawatts
Combustor Inlet Pressure	265	psig
Meas. Stack Moisture	9.9	%
Stack Exhaust Flow (M19)	57,349,517	SCFH

Data from: NHG Run 3

Base W/O Db Load, Run - 1-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 12:12:28	17928	12.96	2.31	0.96	1.14	4.98
10/07/09 12:12:58	17958	12.96	2.32	1.01	1.14	4.98
10/07/09 12:13:28	17988	12.95	2.32	1.05	1.01	4.98
10/07/09 12:13:58	18018	12.97	2.28	0.93	1.16	4.99
10/07/09 12:14:28	18048	12.97	2.26	1.02	1.21	4.99
10/07/09 12:14:58	18078	12.98	2.30	1.10	1.09	4.99
10/07/09 12:15:28	18108	12.98	2.33	1.02	1.15	4.99
10/07/09 12:15:58	18138	12.97	2.37	0.98	1.16	5.00
10/07/09 12:16:28	18168	12.97	2.30	1.00	1.18	4.99
10/07/09 12:16:58	18198	12.97	2.35	1.06	1.24	5.00
10/07/09 12:17:28	18228	12.97	2.35	1.00	1.31	5.00
10/07/09 12:17:58	18258	12.98	2.35	1.05	1.17	4.99
10/07/09 12:18:28	18288	12.99	2.34	0.98	1.32	4.99
10/07/09 12:18:58	18318	12.99	2.34	1.11	1.18	4.99
10/07/09 12:19:28	18348	12.97	2.39	1.02	1.25	5.01
10/07/09 12:19:58	18378	12.98	2.40	1.03	1.33	5.01
10/07/09 12:20:28	18408	12.98	2.47	1.02	1.32	5.01
10/07/09 12:20:58	18438	12.99	2.40	1.06	1.33	5.00
10/07/09 12:21:28	18468	12.98	2.39	1.09	1.36	4.99
10/07/09 12:21:58	18498	12.98	2.41	1.01	1.33	5.00
10/07/09 12:22:28	18528	12.97	2.43	1.08	1.26	5.01
10/07/09 12:22:58	18558	12.95	2.40	1.00	1.35	5.02
10/07/09 12:23:28	18588	12.95	2.46	1.09	1.25	5.02
10/07/09 12:23:58	18618	12.96	2.48	0.96	1.40	5.01
10/07/09 12:24:28	18648	12.96	2.46	1.05	1.40	5.01
10/07/09 12:24:58	18678	12.97	2.45	1.06	1.39	5.01
10/07/09 12:25:28	18708	12.98	2.44	0.98	1.41	5.01
10/07/09 12:25:58	18738	12.97	2.40	1.05	1.33	5.00
10/07/09 12:26:28	18768	12.97	2.37	1.01	1.43	5.02
10/07/09 12:26:58	18798	12.96	2.38	1.13	1.30	5.01
10/07/09 12:27:28	18828	12.96	2.36	0.94	1.47	5.02
10/07/09 12:27:58	18858	12.97	2.34	1.06	1.34	5.02
10/07/09 12:28:28	18888	12.96	2.35	0.96	1.40	5.01
10/07/09 12:28:58	18918	12.95	2.33	1.02	1.43	5.02
10/07/09 12:29:28	18948	12.98	2.33	1.01	1.48	5.00
10/07/09 12:29:58	18978	13.01	2.32	1.03	1.42	5.00
RAW AVERAGE		12.97	2.33	1.00	1.10	4.96

Serial Number:	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
INST-22-0001	INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001	
Initial Zero	0.01	-0.01	-0.06	0.39	0.23
Final Zero	0.01	0.00	0.31	0.38	0.38
Avg. Zero	0.01	-0.01	0.13	0.38	0.31
Bias					
Initial UpScale	12.03	4.87	4.98	2.82	9.50
Final UpScale	12.05	4.86	5.11	3.10	9.60
Avg. UpScale	12.04	4.87	5.05	2.96	9.55

Upscale Cal Gas 12.00 4.99 4.95 3.00 9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.93	2.39	0.88	0.99	4.60
Concentration (ppm@ 15%O ₂)	N/A	1.77	0.65	0.73	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.11	0.78	0.87	N/A
Emission Rate (lb/hr)	N/A	16.38	3.69	2.35	N/A
Emission Rate (tons/year) at 8760 hr/yr	N/A	71.73	16.14	10.29	N/A
Emission Rate (lb/MMBtu)	N/A	0.006	0.001	0.001	N/A

TEST RESULTS

**NO_x, CO, VOC, CO₂, and O₂ Emissions
Base Load with Duct Burners**

Florida Power and Light
 October 6, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data			
Fuel Fd factor	8.642	SCF extvMMBtu	
Fuel Heating Value (HHV)	992	Btu/SCF fuel	
Turbine Fuel Flow	1.641	lb/min	
Duct Burner Fuel Flow	198	lb/min	
Total Fuel Flow	2,551,392	SCFH	

Weather Data		
Barometric Pressure	29.83	in. Hg
Relative Humidity	47	%
Ambient Temperature	96	°F
Specific Humidity	0.017259	lb H ₂ O / lb air

Unit Data		
Unit Load	247.7	megawatts
Combustor Inlet Pressure	264	psig
Meas. Stack Moisture	10.0	%
Stack Exhaust Flow (M19)	51,597,202	SCFH

Data from: NH3 Run 1

Base W/Db Load, Run - 2-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/06/09 15:21:28	28440	12.02	2.88	3.70	1.39	5.28
10/06/09 15:21:58	28470	12.02	2.89	3.66	1.28	5.22
10/06/09 15:22:28	28500	12.03	2.91	3.67	1.08	5.27
10/06/09 15:22:58	28530	12.05	2.93	3.84	1.17	5.19
10/06/09 15:23:28	28560	12.05	2.88	3.76	1.17	5.27
10/06/09 15:23:58	28590	12.02	2.93	3.59	1.05	5.29
10/06/09 15:24:28	28620	12.03	2.95	3.67	1.13	5.31
10/06/09 15:24:58	28650	12.03	2.92	3.78	1.12	5.32
10/06/09 15:25:28	28680	12.03	2.89	3.89	1.02	5.38
10/06/09 15:25:58	28710	12.02	2.87	4.08	1.06	5.32
10/06/09 15:26:28	28740	12.02	2.88	3.94	1.31	5.26
10/06/09 15:26:58	28770	12.04	2.93	3.79	1.27	5.24
10/06/09 15:27:28	28800	12.03	2.89	4.05	1.16	5.23
10/06/09 15:27:58	28830	12.03	2.91	3.94	1.24	5.27
10/06/09 15:28:28	28860	12.04	2.88	3.82	1.56	5.16
10/06/09 15:28:58	28890	12.04	2.82	3.85	1.44	5.27
10/06/09 15:29:28	28920	12.04	2.87	3.57	1.50	5.24
10/06/09 15:29:58	28950	12.04	2.83	3.62	1.48	5.20
10/06/09 15:30:28	28980	12.04	2.88	3.79	1.55	5.21
10/06/09 15:30:58	29010	12.03	2.87	3.90	1.69	5.29
10/06/09 15:31:28	29040	12.02	2.85	3.77	1.73	5.30
10/06/09 15:31:58	29070	12.00	2.86	4.04	1.68	5.29
10/06/09 15:32:28	29100	12.01	2.90	4.00	1.70	5.28
10/06/09 15:32:58	29130	12.04	2.87	3.69	1.73	5.28
10/06/09 15:33:28	29160	12.03	2.76	3.59	1.76	5.32
10/06/09 15:33:58	29190	12.04	2.76	3.53	1.81	5.30
10/06/09 15:34:28	29220	12.02	2.83	3.98	1.83	5.22
10/06/09 15:34:58	29250	12.00	2.88	3.56	1.80	5.20
10/06/09 15:35:28	29280	12.02	2.90	3.63	1.90	4.57
10/06/09 15:35:58	29310	12.03	2.91	3.59	1.64	4.53
10/06/09 15:36:28	29340	12.02	2.90	4.04	1.72	4.68
10/06/09 15:36:58	29370	12.01	2.87	4.07	1.75	5.18
10/06/09 15:37:28	29400	12.02	2.87	3.66	1.66	5.11
10/06/09 15:37:58	29430	12.03	2.90	4.02	1.71	4.87
10/06/09 15:38:28	29460	12.05	2.83	4.06	1.76	5.25
10/06/09 15:38:58	29490	12.04	2.75	3.58	2.03	5.31
10/06/09 15:39:28	29520	12.02	2.91	3.68	1.76	5.22
10/06/09 15:39:58	29550	12.01	2.99	3.59	1.81	5.41
10/06/09 15:40:28	29580	12.03	3.06	4.08	1.76	5.45
10/06/09 15:40:58	29610	12.03	2.93	4.05	1.92	5.39
10/06/09 15:41:28	29640	12.04	2.88	3.54	1.70	5.38
10/06/09 15:41:58	29670	12.04	2.86	3.72	1.71	5.29
10/06/09 15:42:28	29700	12.04	2.86	3.92	1.68	5.33
10/06/09 15:42:58	29730	12.02	2.83	3.56	1.77	5.38
10/06/09 15:43:28	29760	12.00	2.91	3.73	1.63	5.30
10/06/09 15:43:58	29790	12.01	2.92	3.81	1.67	5.27
10/06/09 15:44:28	29820	12.02	2.91	3.62	1.85	5.30
10/06/09 15:44:58	29850	12.01	2.93	3.85	1.81	5.34
10/06/09 15:45:28	29880	12.02	2.94	3.55	1.85	5.32
10/06/09 15:45:58	29910	12.03	2.87	3.81	1.16	5.22
10/06/09 15:46:28	29940	12.03	2.95	3.54	1.08	4.96
10/06/09 15:46:58	29970	12.01	2.95	4.05	1.38	4.98
10/06/09 15:47:28	30000	12.01	2.88	3.73	1.15	4.83
10/06/09 15:47:58	30030	12.01	2.97	3.57	1.07	5.13
10/06/09 15:48:28	30060	12.03	2.96	4.01	0.72	4.14
10/06/09 15:48:58	30090	12.04	2.95	3.90	0.67	4.95
10/06/09 15:49:28	30120	12.04	2.93	3.72	0.93	5.19
10/06/09 15:49:58	30150	12.03	2.94	3.84	1.59	5.22
10/06/09 15:50:28	30180	12.02	2.97	4.09	1.37	5.26
10/06/09 15:50:58	30210	12.02	3.04	3.74	1.61	5.09
10/06/09 15:51:28	30240	12.03	3.02	3.79	1.68	5.17
10/06/09 15:51:58	30270	12.02	2.94	3.61	1.32	5.21
10/06/09 15:52:28	30300	12.02	2.90	3.98	1.41	5.19
10/06/09 15:52:58	30330	12.02	2.83	3.65	1.43	5.04
10/06/09 15:53:28	30360	12.02	2.91	3.86	1.36	5.21
10/06/09 15:53:58	30390	12.03	2.98	3.76	1.49	5.22
10/06/09 15:54:28	30420	12.02	2.92	3.94	1.51	5.27
10/06/09 15:54:58	30450	12.01	2.95	3.88	1.64	5.23
10/06/09 15:55:28	30480	12.02	2.96	3.65	1.86	5.22
10/06/09 15:55:58	30510	12.03	2.98	3.63	1.88	5.28
10/06/09 15:56:28	30540	12.02	2.89	3.91	2.02	5.25
10/06/09 15:56:58	30570	12.03	2.88	3.62	1.62	5.26
10/06/09 15:57:28	30600	12.03	2.87	4.00	1.30	5.24
10/06/09 15:57:58	30630	12.03	2.92	3.59	1.33	5.17
10/06/09 15:58:28	30660	12.03	2.93	3.55	1.42	5.18
10/06/09 15:58:58	30690	12.03	2.95	4.01	1.45	5.16
10/06/09 15:59:28	30720	12.04	2.92	4.02	1.67	5.35
10/06/09 15:59:58	30750	12.02	2.90	4.09	1.74	5.23
10/06/09 16:00:28	30780	12.01	2.88	3.94	1.77	5.27
10/06/09 16:00:58	30810	12.01	2.89	3.53	1.98	5.21
10/06/09 16:01:28	30840	11.99	2.87	3.58	2.55	5.24
10/06/09 16:01:58	30870	12.02	2.90	3.80	1.71	5.45
10/06/09 16:02:28	30900	12.02	2.94	3.80	1.46	5.55
10/06/09 16:02:58	30930	12.02	3.00	3.76	1.61	5.29

Florida Power and Light
 October 6, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data		
Fuel Fd factor	8.642	SCF ex/MBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.641	lb/min
Duct Burner Fuel Flow	198	lb/min
Total Fuel Flow	2,551,392	SCFH

Weather Data		
Barometric Pressure	29.80	in. Hg
Relative Humidity	53	%
Ambient Temperature	94	°F
Specific Humidity	0.018352	lb H ₂ O / lb air

Unit Data		
Unit Load	247.3	megawatts
Combustor Inlet Pressure	264	psig
Meas. Stack Moisture	11.6	%
Stack Exhaust Flow (M19)	51,601,762	SCFH

Data from: NH3 Run 2

Base W/Db Load, Run - 2-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmv)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/06/09 16:45:28	33480	12.00	2.91	3.89	1.38	5.31
10/06/09 16:45:58	33510	12.01	3.03	3.67	1.28	5.16
10/06/09 16:46:28	33540	12.01	3.01	3.92	1.18	5.32
10/06/09 16:46:58	33570	12.01	2.95	3.90	1.11	5.34
10/06/09 16:47:28	33600	12.01	2.89	4.10	1.08	5.20
10/06/09 16:47:58	33630	12.00	2.91	4.13	1.09	5.17
10/06/09 16:48:28	33660	12.01	2.95	3.50	1.12	5.28
10/06/09 16:48:58	33690	12.01	2.90	3.82	1.13	5.29
10/06/09 16:49:28	33720	12.01	2.89	3.66	1.09	5.22
10/06/09 16:49:58	33750	12.01	2.89	3.60	1.07	5.24
10/06/09 16:50:28	33780	12.00	2.89	3.64	1.11	5.20
10/06/09 16:50:58	33810	12.01	2.89	3.97	1.04	5.26
10/06/09 16:51:28	33840	12.00	2.89	3.60	1.03	5.25
10/06/09 16:51:58	33870	12.01	2.90	3.76	1.05	5.27
10/06/09 16:52:28	33900	12.00	2.64	3.50	1.03	5.32
10/06/09 16:52:58	33930	11.99	2.89	3.85	1.25	5.18
10/06/09 16:53:28	33960	11.98	2.85	3.90	1.68	5.28
10/06/09 16:53:58	33990	12.00	2.85	3.63	1.75	5.26
10/06/09 16:54:28	34020	12.00	2.81	3.68	1.70	5.37
10/06/09 16:54:58	34050	12.00	2.80	3.50	1.67	5.17
10/06/09 16:55:28	34080	12.00	2.76	4.07	1.70	5.29
10/06/09 16:55:58	34110	11.99	2.81	4.03	1.78	5.32
10/06/09 16:56:28	34140	12.00	2.85	3.54	1.74	5.34
10/06/09 16:56:58	34170	12.01	2.89	3.73	1.74	5.18
10/06/09 16:57:28	34200	12.00	2.82	4.05	1.79	5.26
10/06/09 16:57:58	34230	12.00	2.79	4.16	1.77	5.35
10/06/09 16:58:28	34260	11.99	2.84	4.00	1.79	5.16
10/06/09 16:58:58	34290	11.99	2.89	4.06	1.82	5.19
10/06/09 16:59:28	34320	11.99	2.90	3.57	1.84	5.33
10/06/09 16:59:58	34350	12.00	2.88	3.95	1.79	5.32
10/06/09 17:00:28	34380	11.99	2.84	3.52	1.84	5.20
10/06/09 17:00:58	34410	12.01	2.84	3.54	1.80	5.37
10/06/09 17:01:28	34440	12.01	2.88	4.01	1.93	5.35
10/06/09 17:01:58	34470	12.02	2.88	3.65	1.70	5.19
10/06/09 17:02:28	34500	12.02	2.89	3.86	1.66	5.21
10/06/09 17:02:58	34530	11.99	2.92	3.95	1.78	5.29
10/06/09 17:03:28	34560	12.01	2.82	3.79	1.74	5.39
10/06/09 17:03:58	34590	12.00	2.82	3.64	1.75	5.20
10/06/09 17:04:28	34620	12.01	2.82	3.95	1.90	5.16
10/06/09 17:04:58	34650	12.01	2.81	4.09	1.79	5.37
10/06/09 17:05:28	34680	12.02	2.81	4.10	1.82	5.29
10/06/09 17:05:58	34710	12.01	2.83	3.65	1.88	5.24
10/06/09 17:06:28	34740	12.01	2.89	4.14	1.82	5.19
10/06/09 17:06:58	34770	12.01	2.85	3.88	1.60	5.25
10/06/09 17:07:28	34800	12.00	3.02	3.67	1.17	5.24
10/06/09 17:07:58	34830	12.00	3.08	3.67	1.28	5.24
10/06/09 17:08:28	34860	12.01	3.02	3.75	1.09	5.38
10/06/09 17:08:58	34890	12.00	2.90	3.63	1.06	5.32
10/06/09 17:09:28	34920	12.01	2.89	3.54	1.07	5.36
10/06/09 17:09:58	34950	12.01	2.94	3.73	1.04	5.27
10/06/09 17:10:28	34980	12.00	2.92	3.85	1.03	5.35
10/06/09 17:10:58	35010	11.99	2.99	3.57	0.96	5.37
10/06/09 17:11:28	35040	12.00	2.97	3.88	0.84	5.29
10/06/09 17:11:58	35070	12.01	2.96	3.65	0.85	5.32
10/06/09 17:12:28	35100	12.01	2.96	3.63	0.80	5.17
10/06/09 17:12:58	35130	12.02	2.99	3.84	0.71	5.36
10/06/09 17:13:28	35160	12.01	2.88	3.57	0.77	5.31
10/06/09 17:13:58	35190	12.01	2.91	3.50	0.78	5.20
10/06/09 17:14:28	35220	11.99	2.96	3.69	0.78	5.26
10/06/09 17:14:58	35250	12.01	2.98	3.61	0.80	5.31
10/06/09 17:15:28	35280	12.01	3.00	3.81	0.81	5.33
10/06/09 17:15:58	35310	12.02	2.94	3.92	0.91	5.32
10/06/09 17:16:28	35340	12.02	2.88	3.85	0.98	5.20
10/06/09 17:16:58	35370	12.01	2.90	3.69	1.08	5.38
10/06/09 17:17:28	35400	12.01	2.89	3.62	1.09	5.32
10/06/09 17:17:58	35430	12.03	2.93	3.61	1.17	5.28
10/06/09 17:18:28	35460	12.04	2.93	3.67	1.21	5.23
10/06/09 17:18:58	35490	12.02	2.88	3.71	1.28	5.19
10/06/09 17:19:28	35520	12.00	2.90	4.01	1.47	5.23
10/06/09 17:19:58	35550	12.00	2.98	3.86	1.41	5.36
10/06/09 17:20:28	35580	12.02	2.98	3.87	1.47	5.24
10/06/09 17:20:58	35610	12.02	2.88	3.89	1.52	5.28
10/06/09 17:21:28	35640	12.01	2.89	3.86	1.47	5.29
10/06/09 17:21:58	35670	12.01	2.84	4.08	1.52	5.29
10/06/09 17:22:28	35700	12.00	2.90	3.65	1.58	5.36
10/06/09 17:22:58	35730	12.01	2.92	4.09	1.57	5.37
10/06/09 17:23:28	35760	12.02	2.94	3.83	1.57	5.16
10/06/09 17:23:58	35790	12.02	2.86	3.79	1.60	5.38
10/06/09 17:24:28	35820	12.02	2.87	3.55	1.64	5.32
10/06/09 17:24:58	35850	12.01	2.90	3.98	1.63	5.19
10/06/09 17:25:28	35880	12.01	2.90	3.76	1.58	5.18
10/06/09 17:25:58	35910	12.01	2.90	3.86	1.58	5.18
10/06/09 17:26:28	35940	12.00	2.88	3.57	1.65	5.33
10/06/09 17:26:58	35970	12.00	2.87	4.11	1.62	5.20

Florida Power and Light
October 6, 2009
Mitsubishi, 501G, Unit #1B
West County Energy Center

Fuel Data

Fuel Fd factor	8,642	SCF ex/MBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,641	lb/min
Duct Burner Fuel Flow	198	lb/min
Total Fuel Flow	2,551,392	SCFH

Weather Data

Barometric Pressure	29.80	In. Hg
Relative Humidity	53	%
Ambient Temperature	94	°F
Specific Humidity	0.018352	lb H ₂ O / lb air

Unit Data

Unit Load	247.3	megawatts
Combustor Inlet Pressure	264	psig
Meas. Stack Moisture	11.6	%
Stack Exhaust Flow (M19)	51,801,762	SCFH

Data from: NH3 Run 2

Base W/Db Load, Run - 2-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/06/09 17:27:28	36000	12.01	2.88	3.56	1.67	5.29
10/06/09 17:27:58	36030	12.00	2.89	3.53	1.68	5.37
10/06/09 17:28:28	36060	12.00	2.83	3.70	1.70	5.38
10/06/09 17:28:58	36090	12.02	2.84	3.90	1.78	5.29
10/06/09 17:29:28	36120	12.01	2.88	3.98	1.78	5.23
10/06/09 17:29:58	36150	12.01	2.88	3.99	1.73	5.23
10/06/09 17:30:28	36180	12.02	2.88	3.51	1.80	5.19
10/06/09 17:30:58	36210	12.02	2.83	4.04	1.89	5.28
10/06/09 17:31:28	36240	12.02	2.86	3.95	2.05	5.30
10/06/09 17:31:58	36270	12.00	2.90	3.64	2.13	5.32
10/06/09 17:32:28	36300	12.00	2.97	3.81	2.15	5.23
10/06/09 17:32:58	36330	12.01	2.98	4.14	2.03	5.24
10/06/09 17:33:28	36360	12.02	2.99	4.14	2.05	5.28
10/06/09 17:33:58	36390	12.02	2.91	3.68	2.11	5.37
10/06/09 17:34:28	36420	12.03	2.84	3.58	2.16	5.21
10/06/09 17:34:58	36450	12.01	2.83	3.52	2.21	5.22
10/06/09 17:35:28	36480	12.00	2.87	3.78	2.26	5.38
10/06/09 17:35:58	36510	12.02	2.98	3.77	2.34	5.36
10/06/09 17:36:28	36540	12.01	2.97	3.73	2.27	5.36
10/06/09 17:36:58	36570	12.02	2.98	3.89	1.25	5.34
10/06/09 17:37:28	36600	12.01	2.99	4.03	0.99	5.25
10/06/09 17:37:58	36630	12.02	2.94	3.62	1.06	5.24
10/06/09 17:38:28	36660	12.03	2.92	3.66	1.21	5.21
10/06/09 17:38:58	36690	12.03	2.82	3.50	1.23	5.32
10/06/09 17:39:28	36720	12.02	2.80	4.16	1.31	5.37
10/06/09 17:39:58	36750	12.01	2.92	3.70	1.23	5.19
10/06/09 17:40:28	36780	12.02	2.94	3.98	1.04	5.18
10/06/09 17:40:58	36810	12.03	2.87	3.89	0.84	5.35
10/06/09 17:41:28	36840	12.02	3.20	3.86	1.58	5.17
10/06/09 17:41:58	36870	12.01	3.08	4.01	0.93	5.25
10/06/09 17:42:28	36900	12.02	2.95	3.52	0.95	5.26
10/06/09 17:42:58	36930	12.03	2.93	4.15	0.96	5.34
10/06/09 17:43:28	36960	12.00	2.90	3.66	1.21	5.26
10/06/09 17:43:58	36990	12.00	2.93	3.91	1.61	5.36
10/06/09 17:44:28	37020	12.01	2.92	3.91	1.61	5.36
10/06/09 17:44:58	37050	12.01	2.88	4.08	1.56	5.32
RAW AVERAGE		12.01	2.90	3.80	1.45	5.28

	O ₂	NOx	CO	VOC	CO ₂
	(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Serial Number: INST-22-0001	INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001	
Initial Zero	0.00	0.07	-0.21	0.27	-0.10
Final Zero	0.01	0.04	-0.13	0.19	0.15
Avg. Zero	0.01	0.06	-0.17	0.23	0.03
Initial UpScale	11.97	4.87	5.08	2.78	9.22
Final UpScale	11.97	4.94	5.29	2.87	9.49
Avg. UpScale	11.97	4.91	5.19	2.83	9.38
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.04	2.93	3.67	1.64	5.15
Concentration (ppm@ 15%O ₂)	N/A	1.95	2.44	1.09	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.22	2.77	1.24	N/A
Emission Rate (lb/hr)	N/A	18.06	13.75	3.50	N/A
Emission Rate (tons/year) at 8760 hr/yr	N/A	79.10	60.24	15.35	N/A
Emission Rate (lb/MMBtu)	N/A	0.007	0.005	0.001	N/A

Florida Power and Light
 October 6, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data		
Fuel Fd factor	8.642	SCF oxy/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.837	lb/min
Duct Burner Fuel Flow	198	lb/min
Total Fuel Flow	2,547,228	SCFH

Weather Data		
Barometric Pressure	29.60	in. Hg
Relative Humidity	53	%
Ambient Temperature	93	°F
Specific Humidity	0.017778	lb H ₂ O / lb air

Unit Data		
Unit Load	246.6	megawatts
Combustor Inlet Pressure	263	psig
Meas. Stack Moisture	11.5	%
Stack Exhaust Flow (M19)	51,383,946	SCFH

Data from: NH3 run 3

Base W/Db Load, Run - 2-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/06/09 18:00:26	37980	12.00	2.95	3.53	2.56	5.20
10/06/09 18:00:58	38010	12.00	2.87	3.43	2.37	5.36
10/06/09 18:01:28	38040	12.00	2.80	3.33	2.18	5.39
10/06/09 18:01:58	38070	12.01	2.78	3.30	1.85	5.13
10/06/09 18:02:28	38100	12.01	2.82	3.15	1.89	5.14
10/06/09 18:02:58	38130	12.00	2.84	3.44	1.87	5.26
10/06/09 18:03:28	38160	12.00	2.88	3.45	1.21	5.24
10/06/09 18:03:58	38190	11.99	2.84	3.46	1.14	5.24
10/06/09 18:04:28	38220	11.99	2.81	3.53	0.97	5.25
10/06/09 18:04:58	38250	11.99	2.77	3.52	1.01	5.26
10/06/09 18:05:28	38280	11.99	2.83	3.67	1.02	5.39
10/06/09 18:05:58	38310	12.00	2.84	3.68	1.06	5.19
10/06/09 18:06:28	38340	12.01	2.85	3.73	0.98	5.20
10/06/09 18:06:58	38370	12.01	2.85	3.86	0.77	5.25
10/06/09 18:07:28	38400	12.00	2.88	3.65	1.03	5.15
10/06/09 18:07:58	38430	11.99	2.90	3.87	1.26	5.33
10/06/09 18:08:28	38460	11.98	2.89	3.95	1.13	5.10
10/06/09 18:08:58	38490	12.01	2.89	3.86	1.13	5.40
10/06/09 18:09:28	38520	12.01	2.86	3.73	1.09	5.23
10/06/09 18:09:58	38550	12.01	2.83	3.85	1.16	5.29
10/06/09 18:10:28	38580	12.00	2.87	3.96	1.00	5.14
10/06/09 18:10:58	38610	12.00	2.90	3.83	1.20	5.24
10/06/09 18:11:28	38640	11.99	2.93	3.98	1.05	5.28
10/06/09 18:11:58	38670	11.98	2.94	3.87	1.00	5.36
10/06/09 18:12:28	38700	12.00	2.89	3.93	1.09	5.39
10/06/09 18:12:58	38730	11.99	2.82	4.05	0.95	5.27
10/06/09 18:13:28	38760	11.98	2.75	3.96	1.04	5.20
10/06/09 18:13:58	38790	11.99	2.75	4.11	1.57	5.11
10/06/09 18:14:28	38820	11.98	2.78	4.28	1.25	5.30
10/06/09 18:14:58	38850	11.98	2.80	4.17	1.32	5.19
10/06/09 18:15:28	38880	11.99	2.82	4.30	1.26	5.38
10/06/09 18:15:58	38910	11.99	2.81	4.25	1.30	5.10
10/06/09 18:16:28	38940	11.99	2.86	4.24	1.18	5.39
10/06/09 18:16:58	38970	11.99	2.90	4.21	1.20	5.13
10/06/09 18:17:28	39000	11.99	2.88	4.21	1.17	5.20
10/06/09 18:17:58	39030	12.00	2.89	4.27	1.16	5.13
10/06/09 18:18:28	39060	11.99	2.82	4.14	0.97	5.16
10/06/09 18:18:58	39090	11.99	2.82	4.04	0.88	5.20
10/06/09 18:19:28	39120	11.99	2.87	4.03	1.12	5.23
10/06/09 18:19:58	39150	11.98	2.93	4.10	1.06	5.30
10/06/09 18:20:28	39180	11.98	2.94	3.99	1.00	5.24
10/06/09 18:20:58	39210	11.99	2.87	3.96	0.95	5.39
10/06/09 18:21:28	39240	12.01	2.83	3.93	0.87	5.17
10/06/09 18:21:58	39270	12.00	2.93	3.96	0.72	5.29
10/06/09 18:22:28	39300	11.98	2.97	3.87	0.73	5.34
10/06/09 18:22:58	39330	11.97	3.02	3.84	0.62	5.29
10/06/09 18:23:28	39360	11.97	3.23	3.89	0.88	5.20
10/06/09 18:23:58	39390	11.98	2.98	3.74	1.00	5.35
10/06/09 18:24:28	39420	12.00	2.90	3.80	1.10	5.18
10/06/09 18:24:58	39450	11.99	2.82	3.88	1.03	5.28
10/06/09 18:25:28	39480	11.99	2.83	3.89	1.19	5.39
10/06/09 18:25:58	39510	11.98	2.84	3.81	1.20	5.12
10/06/09 18:26:28	39540	11.99	2.89	3.59	1.03	5.19
10/06/09 18:26:58	39570	12.00	2.94	3.73	1.07	5.19
10/06/09 18:27:28	39600	12.00	3.13	3.48	1.16	5.37
10/06/09 18:27:58	39630	12.00	2.95	3.59	1.06	5.28
10/06/09 18:28:28	39660	12.00	2.97	3.48	1.03	5.36
10/06/09 18:28:58	39690	11.98	3.06	3.44	1.08	5.35
10/06/09 18:29:28	39720	11.99	3.08	3.35	1.07	5.14
10/06/09 18:29:58	39750	11.98	2.96	3.43	1.18	5.30
10/06/09 18:30:28	39780	11.99	2.98	3.36	1.18	5.10
10/06/09 18:30:58	39810	12.00	2.92	3.35	1.07	5.21
10/06/09 18:31:28	39840	11.99	2.88	3.36	1.20	5.23
10/06/09 18:31:58	39870	11.99	2.87	3.27	1.10	5.38
10/06/09 18:32:28	39900	12.00	2.88	3.16	1.19	5.21
10/06/09 18:32:58	39930	11.99	2.86	3.11	1.21	5.40
10/06/09 18:33:28	39960	12.00	2.89	2.96	1.20	5.38
10/06/09 18:33:58	39990	12.02	2.79	3.02	1.08	5.37
10/06/09 18:34:28	40020	12.03	2.72	2.77	1.16	5.35
10/06/09 18:34:58	40050	12.00	2.75	2.75	1.08	5.31
10/06/09 18:35:28	40080	11.99	2.84	2.81	1.04	5.39
10/06/09 18:35:58	40110	12.00	2.92	2.63	1.17	5.27
10/06/09 18:36:28	40140	12.00	2.93	2.64	1.06	5.39
10/06/09 18:36:58	40170	11.98	2.87	2.71	1.11	5.16
10/06/09 18:37:28	40200	11.99	2.90	2.84	1.09	5.39
10/06/09 18:37:58	40230	12.00	2.87	2.67	1.05	5.14
10/06/09 18:38:28	40260	12.01	2.80	2.51	1.16	5.21
10/06/09 18:38:58	40290	12.01	2.78	2.49	1.11	5.19
10/06/09 18:39:28	40320	12.00	2.75	2.49	1.19	5.15
10/06/09 18:39:58	40350	12.00	2.79	2.42	1.14	5.21
10/06/09 18:40:28	40380	11.99	2.85	2.42	1.05	5.18
10/06/09 18:40:58	40410	11.99	2.89	2.47	1.03	5.25
10/06/09 18:41:28	40440	12.00	2.91	2.47	1.07	5.28
10/06/09 18:41:58	40470	11.99	2.84	2.33	1.17	5.13

Florida Power and Light
 October 6, 2009
 Mitsubishi, 501G, Unit #1B
 West County Energy Center

Fuel Data

Fuel Fd factor	8.642	SCF exv/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.637	lb/min
Duct Burner Fuel Flow	198	lb/min
Total Fuel Flow	2,547.228	SCFH

Weather Data

Barometric Pressure	29.80	in. Hg
Relative Humidity	53	%
Ambient Temperature	83	°F
Specific Humidity	0.017778	lb H ₂ O / lb air

Unit Data

Unit Load	246.6	megawatts
Combustor Inlet Pressure	263	psig
Meas. Stack Moisture	11.5	%
Stack Exhaust Flow (M19)	51,393,946	SCFH

Data from: NH3 run 3

Base W/Db Load, Run - 2-3

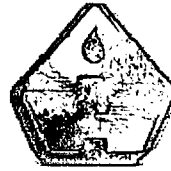
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/06/09 18:42:28	40500	11.99	2.90	2.36	1.11	5.10
10/06/09 18:42:58	40530	11.99	2.88	2.30	1.03	5.29
10/06/09 18:43:28	40560	11.98	2.87	2.32	1.20	5.39
10/06/09 18:43:58	40590	11.96	2.94	2.36	1.11	5.22
10/06/09 18:44:28	40620	11.97	2.94	2.43	1.04	5.39
10/06/09 18:44:58	40650	11.98	2.85	2.27	1.09	5.11
10/06/09 18:45:28	40680	12.00	2.77	2.26	1.15	5.37
10/06/09 18:45:58	40710	12.00	2.77	2.34	1.02	5.37
10/06/09 18:46:28	40740	11.99	2.81	2.36	1.06	5.24
10/06/09 18:46:58	40770	11.99	2.83	2.23	1.08	5.15
10/06/09 18:47:28	40800	11.99	2.88	2.32	1.18	5.14
10/06/09 18:47:58	40830	11.99	2.88	2.21	1.00	5.12
10/06/09 18:48:28	40860	11.99	2.85	2.14	1.02	5.16
10/06/09 18:48:58	40890	12.00	2.88	2.20	1.05	5.40
10/06/09 18:49:28	40920	11.99	2.98	2.28	1.06	5.15
10/06/09 18:49:58	40950	11.98	2.91	2.22	1.17	5.39
10/06/09 18:50:28	40980	11.99	2.93	2.32	1.16	5.21
10/06/09 18:50:58	41010	11.99	2.88	2.27	1.06	5.20
10/06/09 18:51:28	41040	12.00	2.85	2.14	1.04	5.14
10/06/09 18:51:58	41070	11.99	2.82	2.15	1.04	5.38
10/06/09 18:52:28	41100	11.98	2.82	2.18	1.16	5.28
10/06/09 18:52:58	41130	11.99	2.90	2.21	1.10	5.29
10/06/09 18:53:28	41160	11.99	2.93	2.13	1.14	5.38
10/06/09 18:53:58	41190	11.98	2.87	2.13	1.16	5.13
10/06/09 18:54:28	41220	12.00	2.89	2.21	1.10	5.27
10/06/09 18:54:58	41250	11.99	2.93	2.17	1.15	5.17
10/06/09 18:55:28	41280	12.00	2.83	2.04	1.02	5.15
10/06/09 18:55:58	41310	12.02	2.90	1.98	1.13	5.29
10/06/09 18:56:28	41340	11.99	2.91	1.83	1.03	5.22
10/06/09 18:56:58	41370	11.98	2.92	1.96	1.00	5.31
10/06/09 18:57:28	41400	12.00	2.95	1.84	1.17	5.27
10/06/09 18:57:58	41430	12.00	2.93	1.78	1.18	5.19
10/06/09 18:58:28	41460	12.00	2.87	2.06	1.15	5.10
10/06/09 18:58:58	41490	12.00	2.89	1.82	1.02	5.24
10/06/09 18:59:28	41520	11.98	2.89	1.73	1.00	5.18
10/06/09 18:59:58	41550	12.01	2.92	1.54	1.11	5.19
RAW AVERAGE		11.99	2.88	3.11	1.14	5.25

	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
Serial Number:	INST-22-0001	INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001
Initial Zero	0.01	0.04	-0.13	0.19	0.15
Final Zero	0.00	0.06	-0.27	0.29	0.10
Avg. Zero	0.01	0.05	-0.20	0.24	0.13
Initial UpScale	11.97	4.94	5.29	2.87	9.49
Final UpScale	11.98	4.95	5.17	2.92	9.46
Avg. UpScale	11.98	4.95	5.23	2.90	9.48
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.02	2.88	3.01	1.18	5.01
Concentration (ppm@ 15%O ₂)	N/A	1.82	2.00	0.79	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.16	2.26	0.89	N/A
Emission Rate (lb/hr)	N/A	17.70	11.26	2.53	N/A
Emission Rate (tons/year) at 8760 hr/yr	N/A	77.51	49.31	11.07	N/A
Emission Rate (lb/MMBtu)	N/A	0.007	0.004	0.001	N/A

TEST RESULTS

**NH₃ Emissions
Base Load**



Air Hygiene International, Inc.
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 (888) 461-8778
 www.airhygiene.com

AMMONIA ANALYSIS

PARAMETER	UNITS	RUN						BLANK
		1		2		3		
		Front (f)	Back (b)	Front (f)	Back (b)	Front (f)	Back (b)	
Sample Number		23	24	25	26	27	28	16
Lab Log Number		U1B-R1-FH	U1B-R1-BH	U1B-R2-FH	U1B-R2-BH	U1B-R3-FH	U1B-R3-BH	BLANK
Results (C_f or C_b)	(mg/L)	8.5300	0.1170	11.0000	0.1100	10.5000	0.1250	0.1000
Practical Quantitation Limit (PQL)	(mg/L)	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Sample Volume (V_{NH_3})	(ml)	200	230	200	250	210	210	80
DGM Volume (V_m) _{dscf}	(dscf)	55.56		55.19		55.96		55.96
DGM Volume (V_m) _{dstdL}	(L _{dstd})	1573.16		1562.72		1584.71		1584.71
Sum of NH ₃ Ion (N)	(mg/L)	8.5300	0.1170	11.0000	0.1100	10.5000	0.1250	0.1000
Total Sample Volume (S)	(ml)	200	230	200	250	210	210	80
Volume of NH ₃ (V_a)	(L)	0.00224	0.00004	0.00289	0.00004	0.00290	0.00003	0.00001
O ₂ Concentration	(%)	12.97		12.96		12.93		N/A
NH ₃ Concentration (C_{NH_3})	(ppmvd)	1.45		1.87		1.85		0.007
C_{NH_3} @ 15% O ₂	(ppmvd)	1.08		1.39		1.37		N/A

Equations & Constants:

Example Using Data from the 1st run

DGM Volume (L_{dstd})

$$(V_m)_{dstdL} (L_{dstd}) = (V_m)_{dscf} \times 28.31685$$

$$(V_m)_{dstdL} (L_{dstd}) = 55.56 \text{ dscf} \times 28.31685 \text{ L/ft}^3 = 1573.16 \text{ L}_{dstd}$$

$(V_m)_{dscf}$ = Volume of gas sample measured by the DGM, corrected to standard conditions.

C_f = Concentration of NH₃ ion in the front half of train (main catch)

C_b = Concentration of NH₃ ion in the back half of train (breakthrough)

MW = molecular weight (ref. ASTM D 3588)

Volume of NH₃ (L)

$$V_a(L) = \frac{N \times S}{MW \times 1000} \times 22.4$$

$$V_a(L) = \frac{8.53 \text{ mg}}{L} \times \frac{200 \text{ ml}}{1000 \text{ ml}} \times \frac{22.4 \text{ L ideal gas}}{\text{g-mol substance}} \times \frac{\text{g-mol NH}_3}{17.03 \text{ g}} \times \frac{\text{g}}{1000 \text{ mg}} = 0.00224 \text{ L}$$

NH₃ Concentration (ppmvd)

$$C_{NH_3}(\text{ppmvd}) = \frac{V_{a(\text{front})} + V_{a(\text{back})}}{(V_m)_{dstdL}} \times 10^6$$

$$C_{NH_3}(\text{ppmvd}) = \frac{0.00224 \text{ L} + 0.00004 \text{ L}}{1573.16 \text{ L}_{dstd}} \times \frac{10^6 \text{ parts}}{1 \text{ part}} = 1.449 \text{ ppmvd}$$

22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)

CTM 027 (AMMONIA) - RESULTS

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Stack Type	Circular

Historical Data						
Run Number		Base W/O DB-1	Base W/O DB-2	Base W/O DB-3	Average	
Run Start Time		8:23	9:50	11:10		hh:mm
Run Stop Time		9:35	11:01	12:18		hh:mm
Meter Calibration Factor	(Y)	1.054	1.054	1.054		
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840		
Average Nozzle Diameter	(D _{na})	0.248	0.248	0.248		in

Stack Test Data						
Initial Meter Volume	(V _m) _i	799.125	854.842	909.907		ft3
Final Meter Volume	(V _m) _f	852.835	908.070	963.897		ft3
Total Meter Volume	(V _m)	53.710	53.228	53.990	53.643	ft3
Total Sampling Time	(Θ)	60.0	60.0	60.0	60.0	min
Average Meter Temperature	(t _m) _{avg}	79.6	78.1	78.1	78.6	oF
Average Stack Temperature	(t _s) _{avg}	183.7	183.8	184.0	183.8	oF
Barometric Pressure	(P _b)	29.80	29.80	29.80	29.80	in Hg
Stack Static Pressure	(P _{static})	-0.70	-0.70	-0.70	-0.70	in H2O
Absolute Stack Pressure	(P _s)	29.75	29.75	29.75	29.75	in Hg
Average Orifice Pressure Drop	(ΔH) _{avg}	2.72	2.51	2.59	2.61	in H2O
Absolute Meter Pressure	(P _m)	29.92	29.92	29.92	29.92	in Hg
Avg Square Root Pitot Pressure	($\Delta P^{1/2}$) _{avg}	1.00	0.96	0.97	0.98	(in H2O) ^{1/2}

Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V _n)	117.7	112.4	119.0	116.4	ml
Impinger 4 Silica Gel Weight Gain	(W _n)	19.0	23.0	11.9	18.0	g
Total Water Volume Collected	(V _c)	136.7	135.4	130.9	134.4	ml
Standard Water Vapor Volume	(V _w) _{std}	6.437	6.375	6.163	6.325	scf
Standard Meter Volume	(V _m) _{std}	55.555	55.187	55.964	55.569	dscf
Calculated Stack Moisture	(B _{ws(calc)})	10.38	10.36	9.92	10.22	%
Saturated Stack Moisture	(B _{ws(evap)})	55.6	55.8	56.0	55.8	%
Reported Stack Moisture Content	(B _{ws})	10.38	10.36	9.92	10.22	%

Gas Analysis Data						
Carbon Dioxide Percentage	(%CO ₂)	4.6	4.6	4.6	4.6	%
Oxygen Percentage	(%O ₂)	13.0	13.0	12.9	13.0	%
Carbon Monoxide Percentage	(%CO)	0.0	0.0	0.0	0.0	%
Nitrogen Percentage	(%N ₂)	82.4	82.5	82.5	82.5	%
Dry Gas Molecular Weight	(M _d)	29.25	29.25	29.25	29.25	lb/lb-mole
Wet Stack Gas Molecular Weight	(M _w)	28.09	28.08	28.14	28.10	lb/lb-mole
Calculated Fuel Factor	(F _c)	1.724	1.737	1.733	1.731	
Fuel F-Factor	(F _d)	8644	8644	8644	8644	dscf/MMBtu
Percent Excess Air	(%EA)	147.5	147.1	146.2	146.9	%

Volumetric Flow Rate Data						
Average Stack Gas Velocity	(V _s)	62.93	60.33	61.20	61.49	ft/sec
Stack Cross-Sectional Area	(A _s)	378.35	378.35	378.35	378.35	ft2
Actual Stack Flow Rate	(Q _{aw})	1,428,566	1,369,459	1,389,329	1,395,784	acfm
Wet Standard Stack Flow Rate	(Q _{sw})	69,908	67,002	67,952	68,287	wkscfh
Dry Standard Stack Flow Rate	(Q _{sd})	1,044,142	1,001,024	1,020,203	1,021,790	dscfm
Percent of Isokinetic Rate	(I)	100.4	105.3	104.5	103.4	%

Ammonia Rate Data						
Stack Ammonia Concentration	(C _{NH3})	1.45	1.87	1.85	1.73	ppm
	(C _{NH3})	1.08	1.39	1.37	1.28	ppm@15%O ₂

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

ALARMS exist and have been acknowledged.

Source Information				
Plant Name	West County Energy Center			
Sampling Location	Unit 1B			
Fuel or Source Type	Gas, Natural			
Fuel F-Factor	8644	8644	8644	

Test Information			
Starting Test Date		10/07/09	
Project #		bv-09-westcounty.fl-comp#1	
Operator		TP	
Standard Temperature		68	oF
Standard Pressure		29.92	in Hg
Minimum Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		1B	
Load	% or w/DB	Base W/O DB	
Base Run Number		Base W/O DB	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Circular Stack			

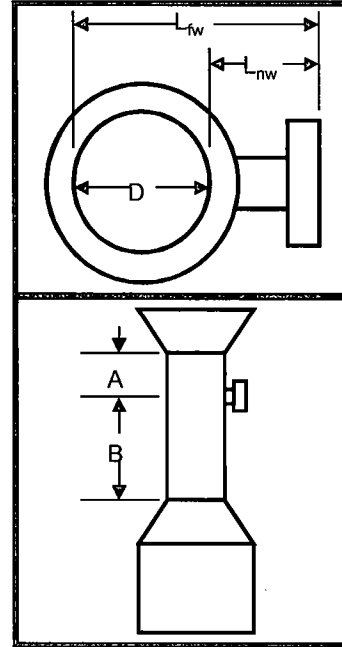
Test Equipment Information					
Run		1	2	3	
Meter Box Number	from ACS	samp-cp-0005	samp-cp-0005	samp-cp-0005	
Meter Calibration Factor	(Y)	1.054	1.054	1.054	
Orifice Meter Coefficient	($\Delta H @$)	1.694	1.694	1.694	in H ₂ O
Pitot Identification	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Nozzle Diameter	(D _n)	0.248	0.248	0.248	in
Probe Number	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Probe Length		120.00	120.00	120.00	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Sample Case / Oven Number	from ACS	samp-bh-0006	samp-bh-0006	samp-bh-0006	
Impinger Case Number	from ACS	samp-bc-0006	samp-bc-0006	samp-bc-0006	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	5634 S. 122nd East Ave., Suite F
City, State Country Zip	Tulsa, Oklahoma 74146
Project Manager	Jake Fahlenkamp
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	# of Ports Available	4
Stack Type	Circular	# of Ports Used	4
Stack Size	Large	Port Inside Diameter	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	282.38	in
Distance to Near Wall of Stack	(L _{nw})	19.00	in
Diameter of Stack	(D)	263.38	in
Area of Stack	(A _s)	378.35	ft ²



Distance from Port to Disturbances			
Distance Upstream	(A)	144.00	in
Diameters Upstream	(A _D)	0.55	diameters
Distance Downstream	(B)	531.75	in
Diameters Downstream	(B _D)	2.02	diameters

Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points	
Down Stream	Up Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
4	Ports by	6	Across
24	Pts Used	24	Required
		Particulate Traverse	

Location of Traverse Points in Circular Stacks										
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)									
	Number of Traverse Points Across the Stack									
Number	2	4	6	8	10	12	14	16	18	20
1	.146	.067	.044	.032	.026	.021	.018	.016	.014	
2	.854	.250	.146	.105	.082	.067	.057	.049	.044	
3		.750	.296	.194	.146	.118	.099	.085	.075	
4		.933	.704	.323	.226	.177	.146	.125	.109	
5			.854	.677	.342	.250	.201	.169	.146	
6			.956	.806	.658	.356	.269	.220	.188	
7				.895	.774	.644	.366	.283	.236	
8				.968	.854	.750	.634	.375	.296	
9					.918	.823	.731	.625	.382	
10					.974	.882	.799	.717	.618	
11						.933	.854	.780	.704	
12						.979	.901	.831	.764	

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in	in
1	0.02	5 4/8	24 4/8
2	0.07	17 5/8	36 5/8
3	0.12	31 1/8	50 1/8
4	0.18	46 5/8	65 5/8
5	0.25	65 7/8	84 7/8
6	0.36	93 6/8	112 6/8
7			
8			
9			
10			
11			
12			

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	West County Energy Center			Date	10/07/09	
Sampling Location	Unit 1B			Project #	bv-09-westcounty.fl-comp#1	
Operator	TP			# of Ports Used	4	
Fuel Type	Gas, Natural	Minimum Fuel Factor	1.600	Maximum Fuel Factor	1.836	
Orsat Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Orsat Identification	

Gas Analysis Data										
Run Number		Base W/O DB-1			Run Start Time		8:23	Run Stop Time		9:35
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:12	4.6	13.0	0.7	4.6	13.0	0.0	82.4	29.25	0.00	
Results			Averages	4.6	13.0	0.0	82.4	29.25		
Average Calculated Fuel Factor				(F _o) _{avg}	1.724	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	147.5	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data										
Run Number		Base W/O DB-2			Run Start Time		9:50	Run Stop Time		11:01
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:11	4.6	13.0	1.3	4.6	13.0	0.0	82.5	29.25	0.00	
Results			Averages	4.6	13.0	0.0	82.5	29.25		
Average Calculated Fuel Factor				(F _o) _{avg}	1.737	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	147.1	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data										
Run Number		Base W/O DB-3			Run Start Time		11:10	Run Stop Time		12:18
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:08	4.6	12.9	0.9	4.6	12.9	0.0	82.5	29.25	0.00	
Results			Averages	4.6	12.9	0.0	82.5	29.25		
Average Calculated Fuel Factor				(F _o) _{avg}	1.733	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	146.2	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Fuel Factor Fo		
Fuel Type	Minimum	Maximum
Coal, Anthracite	1.016	1.130
Coal, Lignite	1.016	1.130
Coal, Bituminous	1.083	1.230
Oil, Distillate	1.260	1.413
Oil, Residual	1.210	1.370
Gas, Natural	1.600	1.836
Gas, Propane	1.434	1.586
Gas, Butane	1.405	1.553
Wood	1.000	1.120
Wood Bark	1.003	1.130

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	West County Energy Center			Date	10/07/09		
Sampling Location	Unit 1B			Project #	bv-09-westcounty.fl-comp#1		
Operator	TP			# of Ports Used	4		
Stack Type	Circular			Meter Box Number	samp-cp-0005		
Train Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Meter Cal Factor (Y)	1.054	

Moisture Content Data								
Run Number	Base W/O DB-1		Run Start Time		8:23	Run Stop Time		9:35
Total Meter Volume	(V _m)	53.710	dcf	Barometric Press.		(P _b)	29.80	in Hg
Avg Stack Temp	(t _s) _{avg}	184	oF	Stack Static Press.		(P _{static})	-0.70	in H2O
Avg Meter Temp	(t _m) _{avg}	80	oF	Avg Orifice Press.		(ΔH) _{avg}	2.72	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	773.30	732.40	658.70	960.10			
Initial Value	(V _i),(W _i)	702.00	696.90	648.00	941.10			
Net Value	(V _n),(W _n)	71.3	35.5	10.7	19.0			
Results								
Total Weight	(W _t)	136.50	g	Water Vol Weighed		(V _{wsg(std)})	6.436	scf
Std Meter Volume	(V _{m(std)})	55.541	dscf	Sat. Moisture Content		(B _{ws(svp)})	55.6	%
Calc Moisture Content	(B _{ws(calc)})	10.4	%	Final Moisture Content		(B _{ws})	10.4	%

Moisture Content Data								
Run Number	Base W/O DB-2		Run Start Time		9:50	Run Stop Time		11:01
Total Meter Volume	(V _m)	53.228	dcf	Barometric Press.		(P _b)	29.80	in Hg
Avg Stack Temp	(t _s) _{avg}	184	oF	Stack Static Press.		(P _{static})	-0.70	in H2O
Avg Meter Temp	(t _m) _{avg}	78	oF	Avg Orifice Press.		(ΔH) _{avg}	2.51	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	785.00	736.60	623.70	936.00			
Initial Value	(V _i),(W _i)	737.80	690.90	604.40	913.00			
Net Value	(V _n),(W _n)	47.2	45.7	19.3	23.0			
Results								
Total Weight	(W _t)	135.20	g	Water Vol Weighed		(V _{wsg(std)})	6.375	scf
Std Meter Volume	(V _{m(std)})	55.168	dscf	Sat. Moisture Content		(B _{ws(svp)})	55.8	%
Calc Moisture Content	(B _{ws})	10.4	%	Final Moisture Content		(B _{ws})	10.4	%

Moisture Content Data								
Run Number	Base W/O DB-3		Run Start Time		11:10	Run Stop Time		12:18
Total Meter Volume	(V _m)	53.990	dcf	Barometric Press.		(P _b)	29.80	in Hg
Avg Stack Temp	(t _s) _{avg}	184	oF	Stack Static Press.		(P _{static})	-0.70	in H2O
Avg Meter Temp	(t _m) _{avg}	78	oF	Avg Orifice Press.		(ΔH) _{avg}	2.59	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	780.20	725.10	655.90	961.40			
Initial Value	(V _i),(W _i)	700.70	694.40	647.30	949.50			
Net Value	(V _n),(W _n)	79.5	30.7	8.6	11.9			
Results								
Total Weight	(W _t)	130.70	g	Water Vol Weighed		(V _{wsg(std)})	6.163	scf
Std Meter Volume	(V _{m(std)})	55.969	dscf	Sat. Moisture Content		(B _{ws(svp)})	56.0	%
Calc Moisture Content	(B _{ws})	9.9	%	Final Moisture Content		(B _{ws})	9.9	%

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/O DB-1
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	186	oF
Avg Gas Meter Temp	(t _m)	79	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{pit})	0.93	in H2O
Stack Moisture Content	(B _{wa})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.25	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.750	acfm
DP to DH Isokinetic Factor	(K)	2.68	

Leak Checks					
Train	Pre	0.02	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0.02	ft3/min @	16	in Hg
Pitot	Pre	6/7.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.1/7	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _{ni})	0.2246	in
Probe # / Length	samp-up-0002	/ 120	in
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Pressures			
Barometric Pressure	(P _b)	29.80	in Hg
Stack Static Pressure	(P _{static})	-0.70	in H2O
Absolute Stack Pressure	(P _s)	29.75	in Hg
Absolute Meter Pressure	(P _m)	29.92	in Hg

Run Time			
Start	8:23	End	9:35

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	702.00	696.90	648.00	941.10				
Post	773.30	732.40	658.70	960.10				

Wash Volume	H ₂ O	50.0	ml	Filter #
	MeCl		ml	

Traversal Point #	Sampling Time (θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp	Filter Temp	Impinger Exit Temp	Aux Temp	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumulative Meter Volume (V _m) _{stat}	Cumulative Percent IsoKinetic (%)	Est-Run Meter Volume (V _m) _{stat}
	min	hh:mm:ss	ft3	in H2O	in H2O	in H2O	oF	oF	oF	oF	oF	oF	oF	in Hg	(in H2O) ^{1/2}	ft/sec	V _m _{stat}	%	scf
A-1	0.0	0:00:00	799.125	0.850	2.282	2.300	183	257	225	64		79	76	2.5	0.92	58.02	1.947	90.7	46.718
A-2	2.5	0:02:30	801.002	0.860	2.309	2.300	182	255	230	64		82	76	3.0	0.93	58.35	3.912	90.9	46.938
A-3	5.0	0:05:00	802.902	0.790	2.121	2.100	182	257	229	62		83	76	3.0	0.89	55.91	5.445	86.2	43.561
A-4	7.5	0:07:30	804.387	0.800	2.148	2.100	185	254	232	65		83	77	2.5	0.89	56.40	7.545	90.3	45.269
A-5	10.0	0:10:00	806.422	0.740	1.987	2.000	184	257	231	65		84	77	2.0	0.86	54.18	9.652	93.6	46.331
A-6	12.5	0:12:30	808.467	0.760	2.040	2.000	182	256	233	66		84	77	2.0	0.87	54.85	11.780	95.7	47.121
B-1	15.0	0:15:00	810.532	0.780	2.094	2.100	182	257	232	62		82	78	2.0	0.88	55.56	13.730	95.5	47.076
B-2	17.5	0:17:30	812.422	0.810	2.175	2.200	186	256	232	67		83	77	3.0	0.90	56.78	15.691	95.3	47.074
B-3	20.0	0:20:00	814.322	0.790	2.121	2.100	183	257	229	65		83	81	2.5	0.89	55.94	17.763	95.9	47.367
B-4	22.5	0:22:30	816.337	0.750	2.014	2.000	182	255	230	66		83	78	2.0	0.87	54.48	19.813	96.5	47.552
B-5	25.0	0:25:00	818.327	0.770	2.067	2.100	185	256	227	66		83	78	2.5	0.88	55.31	21.885	97.0	47.750
B-6	27.5	0:27:30	820.337	0.780	2.094	2.100	184	253	229	67		83	77	2.5	0.88	55.65	23.984	97.4	47.968
C-1	30.0	0:30:00	822.371	1.100	2.953	3.000	184	256	232	64		82	79	5.0	1.05	66.08	26.531	98.1	48.981
C-2	32.5	0:32:30	824.837	1.200	3.222	3.200	182	254	232	61		82	77	4.5	1.10	68.92	29.203	98.7	50.062
C-3	35.0	0:35:00	827.417	1.300	3.490	3.500	183	256	228	62		82	77	5.0	1.14	71.78	32.089	99.6	51.343
C-4	37.5	0:37:30	830.202	1.300	3.490	3.500	182	257	226	68		82	77	6.0	1.14	71.72	34.302	98.6	51.452
C-5	40.0	0:40:00	832.337	1.300	3.490	3.500	183	256	230	67		82	77	5.5	1.14	71.78	36.970	98.7	52.193
C-6	42.5	0:42:30	834.912	1.300	3.490	3.500	185	254	232	64		82	77	5.5	1.14	71.91	39.578	98.7	52.771
D-1	45.0	0:45:00	837.429	1.000	2.685	2.700	184	254	230	64		80	77	4.0	1.00	62.98	42.281	99.8	53.407
D-2	47.5	0:47:30	840.037	1.200	3.222	3.200	185	254	228	65		81	77	5.0	1.10	69.07	45.006	100.3	54.008
D-3	50.0	0:50:00	842.667	1.200	3.222	3.200	185	254	230	67		82	77	5.0	1.10	69.05	47.823	100.9	54.655
D-4	52.5	0:52:30	845.387	1.300	3.490	3.500	185	255	232	60		81	76	5.0	1.14	71.88	50.367	100.7	54.945
D-5	55.0	0:55:00	847.837	1.300	3.490	3.500	185	256	232	64		81	76	5.5	1.14	71.88	52.962	100.5	55.265
D-6	57.5	0:57:30	850.337	1.300	3.490	3.500	184	254	228	65		81	76	6.0	1.14	71.83	55.555	100.4	55.555
Last Pt	60.0	1:00:00	852.835																
Final Val	60.0	1:00:00	852.835											Max Vac	6.0	Final Values	55.555	100.4	
Average Values				1.01		2.72	184	255	230	65		82	77		1.00	62.93			

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/O DB-2
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	184	oF
Avg Gas Meter Temp	(t _m)	80	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{dyn})	1.00	in H2O
Stack Moisture Content	(B _{st})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.25	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.895	acfm
DP to DH Isokinetic Factor	(K)	2.70	

Leak Checks					
Train	Pre	0.02	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0.02	ft3/min @	16	in Hg
Pitot	Pre	6/7.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.1/7	in. H ₂ O for	15	sec
Orsat	OK? <input type="checkbox"/>				

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2407	in
Probe # / Length	samp-up-0002 / 120		in
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.80	in Hg
Stack Static Pressure	(P _{static})	-0.70	in H2O
Absolute Stack Pressure	(P _s)	29.75	in Hg
Absolute Meter Pressure	(P _m)	29.92	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time			
Start	9:50	End	11:01

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	737.80	690.90	604.40	913.00				
Post	785.00	736.60	623.70	936.00				

Wash Volume	H₂O	50.0	ml	Filter #	
	MeCl		ml		

Traverse Point #	Sampling Time (min)	Timer Time (hh:mm:ss)	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp (oF)	Filter Temp (oF)	Impinger Exit Temp (oF)	Aux Temp (oF)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum (in Hg)	Square Root ΔP (in H2O) ^{1/2}	Local Stack Velocity (V _{s1})	Cumulative Meter Volume (V _m) _{std}	Cumulative Percent IsoKinetic (%)	Est-Run Meter Volume (V _m) _{std}	
A-1	0.0	0:00:00	854.842	1.200	3.237	3.300	183	254	231	67		75	73	4.0	1.10	68.93	2.543	99.8	61.028	
A-2	2.5	0:02:30	857.272	1.300	3.507	3.500	184	254	231	63		77	75	4.5	1.14	71.82	5.046	97.1	60.553	
A-3	5.0	0:05:00	859.672	1.300	3.507	3.500	185	253	226	67		78	73	5.0	1.14	71.88	7.667	97.7	61.333	
A-4	7.5	0:07:30	862.182	1.300	3.507	3.500	185	253	228	65		79	74	5.0	1.14	71.86	10.209	97.3	61.255	
A-5	10.0	0:10:00	864.622	1.200	3.237	3.200	185	254	230	62		80	74	5.0	1.10	69.09	12.690	97.4	60.914	
A-6	12.5	0:12:30	867.007	0.980	2.644	2.600	183	255	226	63		80	75	5.0	0.99	62.30	15.197	99.2	60.787	
B-1	15.0	0:15:00	869.422	0.880	2.374	2.400	183	256	232	63		79	75	5.0	0.94	59.07	17.777	102.0	60.949	
B-2	17.5	0:17:30	871.907	0.900	2.428	2.400	183	256	230	68		80	75	5.0	0.95	59.70	20.386	104.1	61.157	
B-3	20.0	0:20:00	874.422	1.300	3.507	3.500	184	253	226	68		80	76	5.5	1.14	71.82	22.953	103.3	61.207	
B-4	22.5	0:22:30	876.892	1.300	3.507	3.500	183	256	228	65		81	75	7.0	1.14	71.75	25.478	102.5	61.146	
B-5	25.0	0:25:00	879.322	1.100	2.967	3.000	183	255	229	64		82	76	6.5	1.05	66.00	28.005	102.6	61.103	
B-6	27.5	0:27:30	881.762	1.100	2.967	3.000	182	254	228	64		82	77	6.5	1.05	65.99	29.698	100.7	59.395	
C-1	30.0	0:30:00	883.397	0.560	1.511	1.500	185	257	229	65		81	76	3.0	0.75	47.18	31.635	101.3	58.403	
C-2	32.5	0:32:30	885.272	0.580	1.565	1.600	186	253	229	65		84	76	2.5	0.76	48.03	33.541	101.7	57.499	
C-3	35.0	0:35:00	887.122	0.670	1.807	1.800	186	256	230	64		82	76	3.0	0.82	51.64	35.540	101.9	56.864	
C-4	37.5	0:37:30	889.057	0.700	1.888	1.900	184	254	231	61		82	76	3.0	0.84	52.70	37.570	102.0	56.355	
C-5	40.0	0:40:00	891.022	0.750	2.023	2.000	182	255	232	63		82	76	2.5	0.87	54.49	39.554	101.9	55.841	
C-6	42.5	0:42:30	892.942	0.760	2.050	2.000	186	255	225	67		82	77	2.5	0.87	55.00	41.480	101.5	55.306	
D-1	45.0	0:45:00	894.807	0.630	1.699	1.700	186	256	228	62		79	76	2.5	0.79	50.07	43.735	102.6	55.244	
D-2	47.5	0:47:30	896.985	0.680	1.834	1.800	183	257	233	62		80	79	4.0	0.82	51.92	45.445	102.1	54.534	
D-3	50.0	0:50:00	898.642	0.760	2.050	2.000	184	255	227	66		81	76	3.5	0.87	54.92	47.493	102.1	54.278	
D-4	52.5	0:52:30	900.622	0.800	2.158	2.200	182	257	230	65		83	76	2.0	0.89	56.27	49.580	102.0	54.087	
D-5	55.0	0:55:00	902.642	0.830	2.239	2.200	184	253	232	64		83	76	2.0	0.91	57.38	51.908	102.4	54.165	
D-6	57.5	0:57:30	904.896	0.850	2.293	2.200	182	256	229	66		83	76	2.0	0.92	58.00	55.187	105.3	55.187	
Last Pt	60.0	1:00:00	908.070																	
Final Val	60.0	1:00:00	908.070											Max Vac	7.0		Final Values	55.187	105.3	
Average Values				0.93		2.51	184	255	229	64		81	76		0.96	60.33				

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/O DB-3
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	184	oF
Avg Gas Meter Temp	(t _m)	78	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{nm})	0.96	in H2O
Stack Moisture Content	(B _{ws})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.25	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.887	acfm
DP to DH Isokinetic Factor	(K)	2.69	

Leak Checks					
Train	Pre	0.02	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0.02	ft3/min @	16	in Hg
Pitot	Pre	6/7.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.1/7	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2425	in
Probe # / Length	samp-up-0002 / 120 in		
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Pressures			
Barometric Pressure	(P _b)	29.80	in Hg
Stack Static Pressure	(P _{static})	-0.70	in H2O
Absolute Stack Pressure	(P _s)	29.75	in Hg
Absolute Meter Pressure	(P _m)	29.92	in Hg

Run Time			
Start	11:10	End	12:18

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	700.70	694.40	647.30	949.50				
Post	780.20	725.10	655.90	961.40				

Wash Volume	H ₂ O	50.0	ml	Filter #
	MeCl		ml	

Traverse Point #	Sampling Time (min)	Timer Time (hh:mm:ss)	Dry Gas Meter Reading (V _m) ft3	Velocity Head (Δp) in H2O	Desired Orifice ΔH (ΔH _d) in H2O	Actual Orifice ΔH (ΔH _a) in H2O	Stack Temp (t _s) oF	Probe Temp oF	Filter Temp oF	Impinger Exit Temp oF	Aux Temp oF	Meter Inlet Temp (t _m) oF	Meter Outlet Temp (t _{mo}) oF	Pump Vacuum in Hg	Square Root ΔP (Δp ^{1/2}) (in H2O) ^{1/2}	Local Stack Velocity (v _s) ft/sec	Cumulative Meter Volume (V _m) _{tot} scf	Cumulative Percent IsoKinetic (%)	Est-Run Meter Volume (V _m) _{tot} scf
A-1	0.0	0:00:00	909.907	0.850	2.286	2.300	182	257	230	62		75	73	3.0	0.92	58.01	1.959	91.3	47.024
A-2	2.5	0:02:30	911.784	0.870	2.340	2.300	185	255	233	68		77	75	3.0	0.93	58.83	3.935	91.3	47.223
A-3	5.0	0:05:00	913.684	0.820	2.205	2.200	183	256	233	64		78	73	2.5	0.91	57.00	5.481	86.2	43.846
A-4	7.5	0:07:30	915.169	0.720	1.936	1.900	183	256	232	62		79	74	2.5	0.85	53.41	7.593	92.0	45.558
A-5	10.0	0:10:00	917.204	0.580	1.560	1.600	182	254	231	62		80	74	2.0	0.76	47.91	9.712	98.0	46.618
A-6	12.5	0:12:30	919.249	0.550	1.479	1.500	185	255	225	66		80	75	2.0	0.74	46.75	11.849	102.7	47.398
B-1	15.0	0:15:00	921.314	0.770	2.071	2.100	184	256	230	66		79	75	2.0	0.88	55.31	13.810	101.8	47.350
B-2	17.5	0:17:30	923.204	0.750	2.017	2.000	183	254	229	65		80	75	3.0	0.87	54.52	15.779	101.3	47.338
B-3	20.0	0:20:00	925.104	0.740	1.990	2.000	184	256	231	68		80	76	3.0	0.86	54.22	17.866	101.6	47.642
B-4	22.5	0:22:30	927.119	0.730	1.963	2.000	183	255	232	68		81	75	2.5	0.85	53.78	19.926	101.8	47.822
B-5	25.0	0:25:00	929.109	0.700	1.883	1.900	182	256	228	64		82	76	2.0	0.84	52.64	22.003	102.3	48.006
B-6	27.5	0:27:30	931.119	0.520	1.399	1.400	184	254	231	64		82	77	2.0	0.72	45.44	24.100	104.3	48.199
C-1	30.0	0:30:00	933.153	1.300	3.496	3.500	184	254	226	68		81	76	5.0	1.14	71.83	26.660	103.5	49.218
C-2	32.5	0:32:30	935.619	1.300	3.496	3.500	182	253	230	63		84	76	5.0	1.14	71.75	29.331	103.3	50.281
C-3	35.0	0:35:00	938.199	1.300	3.496	3.500	186	256	228	62		82	76	6.5	1.14	71.94	32.220	103.8	51.551
C-4	37.5	0:37:30	940.984	1.300	3.496	3.500	183	254	228	66		82	76	6.5	1.14	71.79	34.434	102.5	51.651
C-5	40.0	0:40:00	943.119	1.200	3.227	3.200	184	254	230	61		82	76	6.5	1.10	69.04	37.103	102.7	52.381
C-6	42.5	0:42:30	945.694	1.100	2.958	3.000	183	255	226	65		82	77	6.5	1.05	66.03	39.708	102.9	52.944
D-1	45.0	0:45:00	948.211	1.200	3.227	3.200	186	256	231	61		79	76	4.0	1.10	69.11	42.419	103.2	53.581
D-2	47.5	0:47:30	950.819	1.200	3.227	3.200	185	254	230	60		80	79	4.0	1.10	69.09	45.142	103.4	54.170
D-3	50.0	0:50:00	953.449	1.200	3.227	3.200	186	257	227	61		81	76	4.0	1.10	69.12	47.964	103.9	54.816
D-4	52.5	0:52:30	956.169	1.200	3.227	3.200	185	257	228	64		83	76	5.5	1.10	69.07	50.501	103.6	55.092
D-5	55.0	0:55:00	958.619	1.100	2.958	3.000	185	256	230	62		83	76	5.5	1.05	66.15	53.088	103.8	55.397
D-6	57.5	0:57:30	961.119	1.100	2.958	3.000	185	254	229	60		83	76	5.5	1.05	66.14	55.964	104.5	55.964
Last Pt	60.0	1:00:00	963.897																
Final Val	60.0	1:00:00	963.897										Max Vac	6.5	Final Values		55.964	104.5	
Average Values				0.963		2.592	184	255	229	64		81	76		0.97	61.20			

CTM 027 (AMMONIA) - SAMPLE RECOVERY AND INTEGRITY DATA SHEET

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Acetone Lot Number	

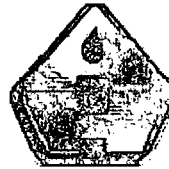
Run History Data				
Run Number	Base W/O DB-1	Base W/O DB-2	Base W/O DB-3	
Run Start Time	8:23	9:50	11:10	(hh:mm)
Run Stop Time	9:35	11:01	12:18	(hh:mm)
Train Prepared By	AS	AS	AS	
Train Recovered By	AS	AS	AS	
Recovery Date	10/7/2009	10/7/2009	10/7/2009	(mm/dd/yy)



Moisture Content Data					
Impingers 1, 2, and 3 - Liquid Volume					
Final Volume	(V _f)	2168.3	2149.2	2165.1	ml
Initial Volume	(V _i)	2050.6	2036.8	2046.1	ml
Net Volume	(V _n)	117.7	112.4	119.0	ml
Comments					
Impinger 4 - Silica Gel Weight					
Final Weight	(W _f)	960.1	936.0	961.4	g
Initial Weight	(W _i)	941.1	913.0	949.5	g
Net Weight	(W _n)	19.0	23.0	11.9	g
Comments					
Total Water Collected					
Total Volume	(V _c)	136.7	135.4	130.9	ml

TEST RESULTS

**NH₃ Emissions
Base Load with Duct Burners**



Air Hygiene International, Inc.
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AMMONIA ANALYSIS

PARAMETER	UNITS	RUN						BLANK
		1		2		3		
		Front (f)	Back (b)	Front (f)	Back (b)	Front (f)	Back (b)	
Sample Number		17	18	19	20	21	22	16
Lab Log Number		U1B-R1-FH	U1B-R1-BH	U1B-R2-FH	U1B-R2-BH	U1B-R3-FH	U1B-R3-BH	BLANK
Results (C_f or C_b)	(mg/L)	8.2500	0.1000	7.3100	0.1000	8.8100	0.1060	0.1000
Practical Quantitation Limit (PQL)	(mg/L)	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Sample Volume (V_{NH_3})	(ml)	200	230	220	250	200	250	80
DGM Volume (V_m) _{dscf}	(dscf)	55.14		53.95		55.03		55.14
DGM Volume (V_m) _{dstdL}	(L _{dstd})	1561.43		1527.82		1558.37		1561.43
Sum of NH ₃ Ion (N)	(mg/L)	8.2500	0.1000	7.3100	0.1000	8.8100	0.1060	0.1000
Total Sample Volume (S)	(ml)	200	230	220	250	200	250	80
Volume of NH ₃ (V_a)	(L)	0.00217	0.00003	0.00212	0.00003	0.00232	0.00003	0.00001
O ₂ Concentration	(%)	12.04		12.04		12.02		N/A
NH ₃ Concentration (C_{NH_3})	(ppmvd)	1.41		1.41		1.51		0.007
C_{NH_3} @ 15% O ₂	(ppmvd)	0.94		0.94		1.00		N/A

Equations & Constants:

Example Using Data from the 1st run

DGM Volume (L_{dstd})

$$(V_m)_{dstdL} (L_{dstd}) = (V_m)_{dscf} \times 28.31685$$

$$(V_m)_{dstdL} (L_{dstd}) = 55.14 \text{ dscf} \times 28.31685 \text{ L/ft}^3 = 1561.43 \text{ L}_{dstd}$$

$(V_m)_{dscf}$ = Volume of gas sample measured by the DGM, corrected to standard conditions.

C_f = Concentration of NH₃ ion in the front half of train (main catch)

C_b = Concentration of NH₃ ion in the back half of train (breakthrough)

MW = molecular weight (ref. ASTM D 3588)

Volume of NH₃ (L)

$$V_a(L) = \frac{N \times S}{MW \times 1000} \times 22.4$$

$$V_a(L) = \frac{8.25 \text{ mg}}{L} \times \frac{200 \text{ ml}}{1000 \text{ ml}} \times \frac{22.4 \text{ L ideal gas}}{\text{g-mol substance}} \times \frac{\text{g-mol NH}_3}{17.03 \text{ g}} \times \frac{\text{g}}{1000 \text{ mg}} = 0.00217 \text{ L}$$

NH₃ Concentration (ppmvd)

$$C_{NH_3}(\text{ppmvd}) = \frac{V_{a(\text{front})} + V_{a(\text{back})}}{(V_m)_{dstdL}} \times 10^6$$

$$C_{NH_3}(\text{ppmvd}) = \frac{0.00217 \text{ L} + 0.00003 \text{ L}}{1561.43 \text{ L}_{dstd}} \times \frac{10^6 \text{ parts}}{1 \text{ part}} = 1.409 \text{ ppmvd}$$

22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)

CTM 027 (AMMONIA) - RESULTS

Plant Name	West County Energy Center	Date	10/06/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Stack Type	Circular

Historical Data						
Run Number		Base w/DB-1	Base w/DB-2	Base w/DB-3	Average	
Run Start Time		15:00	16:30	17:50		hh:mm
Run Stop Time		16:12	17:39	19:00		hh:mm
Meter Calibration Factor	(Y)	1.054	1.054	1.054		
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840		
Average Nozzle Diameter	(D _{na})	0.248	0.248	0.248		in

Stack Test Data						
Initial Meter Volume	(V _m) _i	639.938	693.510	746.026		ft3
Final Meter Volume	(V _m) _f	693.112	745.635	799.125		ft3
Total Meter Volume	(V _m)	53.174	52.125	53.099	52.799	ft3
Total Sampling Time	(Θ)	60.0	60.0	60.0	60.0	min
Average Meter Temperature	(t _m) _{avg}	78.1	79.6	78.4	78.7	oF
Average Stack Temperature	(t _s) _{avg}	179.7	178.7	180.3	179.6	oF
Barometric Pressure	(P _b)	29.80	29.83	29.80	29.81	in Hg
Stack Static Pressure	(P _{static})	-0.50	-0.50	-0.50	-0.50	in H2O
Absolute Stack Pressure	(P _s)	29.76	29.79	29.76	29.77	in Hg
Average Orifice Pressure Drop	(ΔH) _{avg}	2.74	2.68	2.71	2.71	in H2O
Absolute Meter Pressure	(P _m)	29.92	29.95	29.92	29.93	in Hg
Avg Square Root Pitot Pressure	(ΔP ^{1/2}) _{avn}	1.00	0.98	0.99	0.99	(in H2O) ^{1/2}

Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V _n)	109.4	132.1	124.0	121.9	ml
Impinger 4 Silica Gel Weight Gain	(W _n)	20.3	18.7	27.7	22.2	g
Total Water Volume Collected	(V _c)	129.7	150.9	151.8	144.1	ml
Standard Water Vapor Volume	(V _w) _{std}	6.107	7.102	7.144	6.784	scf
Standard Meter Volume	(V _m) _{std}	55.141	53.954	55.033	54.710	dscf
Calculated Stack Moisture	(B _{ws(calc)})	9.97	11.63	11.49	11.03	%
Saturated Stack Moisture	(B _{ws(svp)})	50.9	49.8	51.6	50.8	%
Reported Stack Moisture Content	(B _{ws})	9.97	11.63	11.49	11.03	%

Gas Analysis Data						
Carbon Dioxide Percentage	(%CO ₂)	5.1	5.2	5.0	5.1	%
Oxygen Percentage	(%O ₂)	12.0	12.0	12.0	12.0	%
Carbon Monoxide Percentage	(%CO)	0.0	0.0	0.0	0.0	%
Nitrogen Percentage	(%N ₂)	82.8	82.8	83.0	82.9	%
Dry Gas Molecular Weight	(M _d)	29.30	29.31	29.28	29.30	lb/lb-mole
Wet Stack Gas Molecular Weight	(M _w)	28.17	27.99	27.99	28.05	lb/lb-mole
Calculated Fuel Factor	(F _c)	1.734	1.720	1.772	1.742	
Fuel F-Factor	(F _d)	8644	8644	8644	8644	dscf/MMBtu
Percent Excess Air	(%EA)	122.4	122.6	121.6	122.2	%

Volumetric Flow Rate Data						
Average Stack Gas Velocity	(V _s)	62.65	61.63	62.06	62.11	ft/sec
Stack Cross-Sectional Area	(A _s)	378.35	378.35	378.35	378.35	ft2
Actual Stack Flow Rate	(Q _{aw})	1,422,137	1,399,131	1,408,793	1,410,020	acfm
Wet Standard Stack Flow Rate	(Q _{sw})	70,059	69,103	69,338	69,500	wkscfh
Dry Standard Stack Flow Rate	(Q _{sd})	1,051,244	1,017,761	1,022,858	1,030,621	dscfm
Percent of Isokinetic Rate	(I)	98.9	98.5	99.6	99.0	%

Ammonia Rate Data						
Stack Ammonia Concentration	(C _{NH3})	1.41	1.41	1.51	1.44	ppm
	(C _{NH3})	0.94	0.94	1.00	0.96	ppm@15%O ₂

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

ALARMS exist and have been acknowledged.

Source Information			
Plant Name	West County Energy Center		
Sampling Location	Unit 1B		
Fuel or Source Type	Gas, Natural		
Fuel F-Factor	8644	8644	8644

Test Information			
Starting Test Date		10/06/09	
Project #		bv-09-westcounty.fl-comp#1	
Operator		TP	
Standard Temperature		68	oF
Standard Pressure		29.92	in Hg
Minimum Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		1B	
Load	% or w/DB	Base w/DB	
Base Run Number		Base w/DB	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Circular Stack			

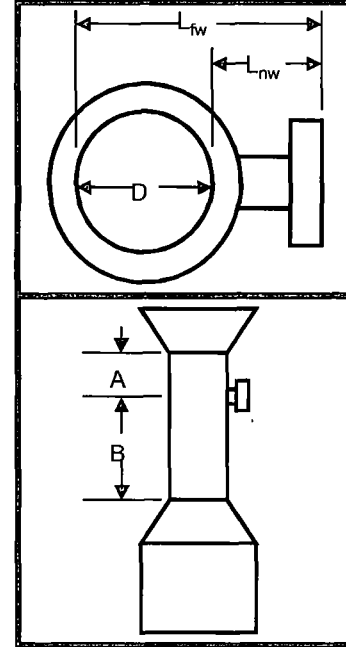
Test Equipment Information					
Run		1	2	3	
Meter Box Number	from ACS	samp-cp-0005	samp-cp-0005	samp-cp-0005	
Meter Calibration Factor	(Y)	1.054	1.054	1.054	
Orifice Meter Coefficient	($\Delta H @$)	1.694	1.694	1.694	in H ₂ O
Pitot Identification	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Nozzle Diameter	(D _n)	0.248	0.248	0.248	in
Probe Number	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Probe Length		120.00	120.00	120.00	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Sample Case / Oven Number	from ACS	samp-bh-0006	samp-bh-0006	samp-bh-0006	
Impinger Case Number	from ACS	samp-bc-0006	samp-bc-0006	samp-bc-0006	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	5634 S. 122nd East Ave., Suite F
City, State Country Zip	Tulsa, Oklahoma 74146
Project Manager	Jake Fahlenkamp
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	West County Energy Center	Date	10/06/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	# of Ports Available	4
Stack Type	Circular	# of Ports Used	4
Stack Size	Large	Port Inside Diameter	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	282.38	in
Distance to Near Wall of Stack	(L_{nw})	19.00	in
Diameter of Stack	(D)	263.38	in
Area of Stack	(A_s)	378.35	ft ²



Distance from Port to Disturbances			
Distance Upstream	(A)	144.00	in
Diameters Upstream	(A_D)	0.55	diameters
Distance Downstream	(B)	531.75	in
Diameters Downstream	(B_D)	2.02	diameters

Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points	
Down Stream	Up Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
4	Ports by	6	Across
24	Pts Used	24	Required
		Particulate Traverse	

Location of Traverse Points in Circular Stacks												
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)											
Number	Number of Traverse Points Across the Stack											
1	.146	.067	.044	.032	.026	.021	.018	.016	.014			
2	.854	.250	.146	.105	.082	.067	.057	.049	.044			
3		.750	.296	.194	.146	.118	.099	.085	.075			
4		.933	.704	.323	.226	.177	.146	.125	.109			
5			.854	.677	.342	.250	.201	.169	.146			
6			.956	.806	.658	.356	.269	.220	.188			
7				.895	.774	.644	.366	.283	.236			
8				.968	.854	.750	.634	.375	.296			
9					.918	.823	.731	.625	.382			
10					.974	.882	.799	.717	.618			
11						.933	.854	.780	.704			
12						.979	.901	.831	.764			

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in	in
1	0.02	5 4/8	24 4/8
2	0.07	17 5/8	36 5/8
3	0.12	31 1/8	50 1/8
4	0.18	46 5/8	65 5/8
5	0.25	65 7/8	84 7/8
6	0.36	93 6/8	112 6/8
7			
8			
9			
10			
11			
12			

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	West County Energy Center			Date	10/06/09	
Sampling Location	Unit 1B			Project #	bv-09-westcounty.fl-comp#1	
Operator	TP			# of Ports Used	4	
Fuel Type	Gas, Natural	Minimum Fuel Factor	1.600	Maximum Fuel Factor	1.836	
Orsat Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Orsat Identification	

Gas Analysis Data									
Run Number		Base w/DB-1		Run Start Time		15:00	Run Stop Time		16:12
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:12	5.1	12.0	3.8	5.1	12.0	0.0	82.8	29.30	0.00
Results			Averages	5.1	12.0	0.0	82.8	29.30	
Average Calculated Fuel Factor			(F _o) _{avg}	1.734	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air			(%EA) _{avg}	122.4	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data									
Run Number		Base w/DB-2		Run Start Time		16:30	Run Stop Time		17:39
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:09	5.2	12.0	3.7	5.2	12.0	0.0	82.8	29.31	0.00
Results			Averages	5.2	12.0	0.0	82.8	29.31	
Average Calculated Fuel Factor			(F _o) _{avg}	1.720	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air			(%EA) _{avg}	122.6	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data									
Run Number		Base w/DB-3		Run Start Time		17:50	Run Stop Time		19:00
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:10	5.0	12.0	3.0	5.0	12.0	0.0	83.0	29.28	0.00
Results			Averages	5.0	12.0	0.0	83.0	29.28	
Average Calculated Fuel Factor			(F _o) _{avg}	1.772	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air			(%EA) _{avg}	121.6	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Fuel Factor Fo		
Fuel Type	Minimum	Maximum
Coal, Anthracite	1.016	1.130
Coal, Lignite	1.016	1.130
Coal, Bituminous	1.083	1.230
Oil, Distillate	1.260	1.413
Oil, Residual	1.210	1.370
Gas, Natural	1.600	1.836
Gas, Propane	1.434	1.586
Gas, Butane	1.405	1.553
Wood	1.000	1.120
Wood Bark	1.003	1.130

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	West County Energy Center			Date	10/06/09
Sampling Location	Unit 1B			Project #	bv-09-westcounty.fl-comp#1
Operator	TP			# of Ports Used	4
Stack Type	Circular			Meter Box Number	samp-cp-0005
Train Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Meter Cal Factor (Y) 1.054

Moisture Content Data								
Run Number	Base w/DB-1		Run Start Time		15:00	Run Stop Time		16:12
Total Meter Volume	(V _m)	53.174	dcf	Barometric Press.		(P _b)	29.80	in Hg
Avg Stack Temp	(t _s) _{avg}	180	oF	Stack Static Press.		(P _{static})	-0.50	in H2O
Avg Meter Temp	(t _m) _{avg}	78	oF	Avg Orifice Press.		(ΔH) _{avg}	2.74	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	787.20	737.90	622.50	1005.30			
Initial Value	(V _i),(W _i)	741.60	692.80	604.00	985.00			
Net Value	(V _n),(W _n)	45.6	45.1	18.5	20.3			
Results								
Total Weight	(W _t)	129.50	g	Water Vol Weighed		(V _{wsg(std)})	6.106	scf
Std Meter Volume	(V _{m(std)})	55.142	dscf	Sat. Moisture Content		(B _{ws(svp)})	50.9	%
Calc Moisture Content	(B _{ws(calc)})	10.0	%	Final Moisture Content		(B _{ws})	10.0	%

Moisture Content Data								
Run Number	Base w/DB-2		Run Start Time		16:30	Run Stop Time		17:39
Total Meter Volume	(V _m)	52.125	dcf	Barometric Press.		(P _b)	29.83	in Hg
Avg Stack Temp	(t _s) _{avg}	179	oF	Stack Static Press.		(P _{static})	-0.50	in H2O
Avg Meter Temp	(t _m) _{avg}	80	oF	Avg Orifice Press.		(ΔH) _{avg}	2.68	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	793.60	764.70	658.00	958.50			
Initial Value	(V _i),(W _i)	716.90	721.60	645.90	939.80			
Net Value	(V _n),(W _n)	76.7	43.1	12.1	18.7			
Results								
Total Weight	(W _t)	150.60	g	Water Vol Weighed		(V _{wsg(std)})	7.101	scf
Std Meter Volume	(V _{m(std)})	53.950	dscf	Sat. Moisture Content		(B _{ws(svp)})	49.8	%
Calc Moisture Content	(B _{ws})	11.6	%	Final Moisture Content		(B _{ws})	11.6	%

Moisture Content Data								
Run Number	Base w/DB-3		Run Start Time		17:50	Run Stop Time		19:00
Total Meter Volume	(V _m)	53.099	dcf	Barometric Press.		(P _b)	29.80	in Hg
Avg Stack Temp	(t _s) _{avg}	180	oF	Stack Static Press.		(P _{static})	-0.50	in H2O
Avg Meter Temp	(t _m) _{avg}	78	oF	Avg Orifice Press.		(ΔH) _{avg}	2.71	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4	H2SO4		Sil Gel				
Final Value	(V _f),(W _f)	777.00	749.10	624.90	971.20			
Initial Value	(V _i),(W _i)	724.80	698.80	603.60	943.50			
Net Value	(V _n),(W _n)	52.2	50.3	21.3	27.7			
Results								
Total Weight	(W _t)	151.50	g	Water Vol Weighed		(V _{wsg(std)})	7.143	scf
Std Meter Volume	(V _{m(std)})	55.027	dscf	Sat. Moisture Content		(B _{ws(svp)})	51.6	%
Calc Moisture Content	(B _{ws})	11.5	%	Final Moisture Content		(B _{ws})	11.5	%

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/6/2009
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base w/DB-1
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	178	oF
Avg Gas Meter Temp	(t _m)	79	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{nm})	0.95	in H2O
Stack Moisture Content	(B _{wa})	10.00	%
Stack Dry Molecular Weight	(M _{dw})	29.30	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.750	acfm
DP to DH Isokinetic Factor	(K)	2.72	

Leak Checks					
Train	Pre	0.015	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0.01	ft3/min @	15	in Hg
Pitot	Pre	5.9/7.2	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.4/5.4	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2228	in
Probe # / Length	samp-up-0002	/ 120	in
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.80	in Hg
Stack Static Pressure	(P _{static})	-0.50	in H2O
Absolute Stack Pressure	(P _s)	29.76	in Hg
Absolute Meter Pressure	(P _m)	29.92	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time		
Start	15:00	End 16:12

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	741.60	692.80	604.00	985.00				
Post	787.20	737.90	622.50	1005.30				

Wash Volume	H ₂ O	50.0	ml	Filter #
	MeCl		ml	

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp	Filter Temp	Impinger Exit Temp	Aux Temp	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumulative Meter Volume (V _m) _{total}	Cumulative Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{est}
	min	hh:mm:ss	ft3	in H2O	in H2O	in H2O	oF	oF	oF	oF	oF	oF	oF	in Hg	(in H2O) ^{1/2}	ft/sec	scf	%	scf
A-1	0.0	0:00:00	639.938	0.860	2.339	2.300	185	253	223	67		75	73	2.5	0.93	58.41	2.100	97.6	50.406
A-2	2.5	0:02:30	641.950	0.870	2.366	2.400	182	249	237	61		77	75	2.5	0.93	58.61	4.285	99.1	51.417
A-3	5.0	0:05:00	644.050	0.800	2.176	2.300	181	251	248	60		78	73	2.5	0.89	56.16	6.439	100.6	51.516
A-4	7.5	0:07:30	646.120	0.780	2.122	2.100	180	251	248	58		79	74	2.5	0.88	55.41	8.548	101.0	51.286
A-5	10.0	0:10:00	648.150	0.750	2.040	2.000	182	253	252	61		80	74	2.0	0.87	54.42	10.586	101.1	50.812
A-6	12.5	0:12:30	650.115	0.750	2.040	2.000	180	251	260	63		80	75	2.0	0.87	54.34	12.581	100.7	50.323
B-1	15.0	0:15:00	652.040	0.770	2.094	2.100	178	250	257	66		79	75	2.5	0.88	54.97	14.614	100.5	50.106
B-2	17.5	0:17:30	654.000	0.800	2.176	2.200	176	252	257	66		80	75	2.5	0.89	55.94	16.652	100.1	49.955
B-3	20.0	0:20:00	655.965	0.800	2.176	2.200	176	251	257	66		80	76	2.5	0.89	55.94	18.739	100.1	49.970
B-4	22.5	0:22:30	657.980	0.740	2.013	2.000	176	253	259	66		81	75	2.0	0.86	53.80	20.830	100.5	49.993
B-5	25.0	0:25:00	660.000	0.760	2.067	2.100	175	260	258	67		82	76	2.5	0.87	54.48	22.655	99.6	49.429
B-6	27.5	0:27:30	661.765	0.780	2.122	2.100	177	253	258	67		82	77	2.5	0.88	55.28	24.782	99.9	49.564
C-1	30.0	0:30:00	663.825	1.100	2.992	3.000	179	253	233	68		81	76	4.5	1.05	65.75	27.115	99.5	50.059
C-2	32.5	0:32:30	666.075	1.200	3.264	3.300	179	255	260	68		84	76	5.0	1.10	68.68	29.625	99.4	50.785
C-3	35.0	0:35:00	668.500	1.300	3.536	3.500	177	257	259	68		82	76	5.0	1.14	71.37	32.088	98.9	51.341
C-4	37.5	0:37:30	670.875	1.300	3.536	3.500	177	256	257	61		82	76	5.5	1.14	71.37	34.655	98.7	51.983
C-5	40.0	0:40:00	673.350	1.300	3.536	3.500	177	255	258	64		82	76	5.5	1.14	71.37	37.196	98.5	52.513
C-6	42.5	0:42:30	675.800	1.300	3.536	3.500	176	257	260	68		82	77	5.5	1.14	71.31	39.854	98.5	53.139
D-1	45.0	0:45:00	678.365	1.000	2.720	2.700	183	256	223	59		79	76	4.0	1.00	62.89	42.278	98.9	53.404
D-2	47.5	0:47:30	680.700	1.200	3.264	3.300	184	254	253	58		80	79	5.0	1.10	68.94	44.764	98.8	53.717
D-3	50.0	0:50:00	683.100	1.200	3.264	3.300	183	255	255	58		81	76	5.0	1.10	68.89	47.301	98.9	54.059
D-4	52.5	0:52:30	685.545	1.300	3.536	3.300	183	254	250	59		83	76	5.0	1.14	71.70	50.051	99.1	54.601
D-5	55.0	0:55:00	688.200	1.300	3.536	3.500	184	256	254	60		83	76	6.0	1.14	71.76	52.487	98.8	54.769
D-6	57.5	0:57:30	690.550	1.300	3.536	3.500	183	256	253	65		83	76	6.0	1.14	71.70	55.141	98.9	55.141
Last Pt	60.0	1:00:00	693.112																
Final Val	60.0	1:00:00	693.112											Max Vac	6.0	Final Values	55.141	98.9	
Average Values				1.01		2.74	180	254	251	64		81	76		1.00	62.65			

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/6/2009
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base w/DB-2
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	180	oF
Avg Gas Meter Temp	(t _m)	78	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{avg})	1.00	in H2O
Stack Moisture Content	(B _{ws})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.30	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.886	acfm
DP to DH Isokinetic Factor	(K)	2.71	

Leak Checks					
Train	Pre	0.01	ft3/min @	15	in Hg
OK?	<input checked="" type="checkbox"/>				
	Post	0	ft3/min @	15	in Hg
Pitot	Pre	6.4/6.2	in. H ₂ O for	15	sec
OK?	<input checked="" type="checkbox"/>				
	Post	7.0/6.6	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2396	in
Probe # / Length	samp-up-0002 / 120 in		
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.83	in Hg
Stack Static Pressure	(P _{static})	-0.50	in H2O
Absolute Stack Pressure	(P _s)	29.79	in Hg
Absolute Meter Pressure	(P _m)	29.95	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time			
Start	16:30	End	17:39

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	716.90	721.60	645.90	939.80				
Post	793.60	764.70	658.00	958.50				

Wash Volume	H ₂ O	50.0	ml	Filter #	
	MeCl		ml		

Traverse Point #	Sampling Time (min)	Timer Time (hh:mm:ss)	Dry Gas Meter Reading (V _m) (ft3)	Velocity Head (Δp) (in H2O)	Desired Orifice ΔH (ΔH _d) (in H2O)	Actual Orifice ΔH (ΔH _a) (in H2O)	Stack Temp (t _s) (oF)	Probe Temp (oF)	Filter Temp (oF)	Impinger Exit Temp (oF)	Aux Temp (oF)	Meter Inlet Temp (t _m) (oF)	Meter Outlet Temp (t _{mo}) (oF)	Pump Vacuum (in Hg)	Square Root ΔP (ΔP ^{1/2}) (in H2O) ^{1/2}	Local Stack Velocity (v _s) (ft/sec)	Cumulative Meter Volume (V _{m,Std}) (scf)	Cumulative Percent IsoKinetic (%)	Est-Run Meter Volume (V _{m,Std}) (scf)
A-1	0.0	0:00:00	693.510	1.000	2.708	2.700	184	248	223	68		79	76	4.0	1.00	62.91	2.276	97.9	54.617
A-2	2.5	0:02:30	695.700	1.100	2.979	3.000	183	251	224	68		82	76	5.0	1.05	65.92	4.661	97.8	55.929
A-3	5.0	0:05:00	698.000	1.100	2.979	3.000	183	252	225	60		83	76	5.0	1.05	65.92	7.018	97.4	56.142
A-4	7.5	0:07:30	700.275	1.300	3.521	3.500	183	251	226	63		83	77	5.0	1.14	71.67	9.842	100.0	59.051
A-5	10.0	0:10:00	703.000	1.300	3.521	3.500	183	253	227	68		84	77	5.0	1.14	71.67	11.835	95.8	56.808
A-6	12.5	0:12:30	704.925	1.300	3.521	3.500	181	255	230	68		84	77	5.0	1.14	71.56	14.242	95.0	56.969
B-1	15.0	0:15:00	707.250	1.100	2.979	3.000	181	253	235	67		82	78	5.0	1.05	65.82	16.778	96.3	57.525
B-2	17.5	0:17:30	709.700	1.300	3.521	3.500	180	251	236	66		83	77	5.0	1.14	71.50	19.058	95.0	57.174
B-3	20.0	0:20:00	711.900	1.300	3.521	3.500	178	253	238	65		83	81	6.0	1.14	71.39	21.603	95.1	57.609
B-4	22.5	0:22:30	714.365	1.400	3.792	3.800	176	250	232	67		83	78	7.0	1.18	73.97	24.297	95.3	58.313
B-5	25.0	0:25:00	716.965	1.300	3.521	3.500	176	251	229	68		83	78	6.5	1.14	71.28	26.870	95.5	58.626
B-6	27.5	0:27:30	719.450	1.400	3.792	3.800	176	250	227	64		83	77	7.0	1.18	73.97	29.686	96.0	59.372
C-1	30.0	0:30:00	722.165	0.800	2.167	2.200	170	258	224	66		82	79	3.0	0.89	55.65	31.972	97.0	59.025
C-2	32.5	0:32:30	724.380	0.830	2.248	2.200	179	258	231	66		82	77	3.0	0.91	57.09	34.061	97.0	58.390
C-3	35.0	0:35:00	726.400	0.850	2.302	2.300	177	261	226	68		82	77	3.5	0.92	57.68	36.181	97.1	57.889
C-4	37.5	0:37:30	728.450	0.700	1.896	1.900	176	255	234	67		82	77	2.5	0.84	52.30	38.185	97.4	57.278
C-5	40.0	0:40:00	730.390	0.700	1.896	1.900	177	255	236	66		82	77	2.5	0.84	52.34	40.149	97.5	56.680
C-6	42.5	0:42:30	732.290	0.680	1.842	1.800	176	260	231	66		82	77	2.5	0.82	51.55	42.117	97.8	56.157
D-1	45.0	0:45:00	734.196	0.850	2.302	2.300	176	259	230	68		80	77	2.5	0.92	57.63	44.121	97.5	55.732
D-2	47.5	0:47:30	736.130	0.870	2.356	2.400	180	257	231	65		81	77	3.5	0.93	58.49	46.213	97.5	55.456
D-3	50.0	0:50:00	738.150	0.880	2.383	2.400	181	256	227	65		82	77	3.5	0.94	58.87	48.386	97.6	55.298
D-4	52.5	0:52:30	740.250	0.600	1.625	1.600	178	260	230	67		81	76	1.5	0.77	48.50	50.268	97.8	54.838
D-5	55.0	0:55:00	742.070	0.570	1.544	1.500	178	262	227	68		81	76	1.5	0.75	47.27	52.161	98.2	54.428
D-6	57.5	0:57:30	743.900	0.500	1.354	1.400	177	261	227	68		81	76	1.5	0.71	44.24	53.954	98.5	53.954
Last Pt	60.0	1:00:00	745.635																
Final Val	60.0	1:00:00	745.635											Max Vac	7.0	Final Values	53.954	98.5	
Average Values				0.99		2.68	179	255	229	66		82	77		0.98	61.63			

CTM 027 (AMMONIA) - SAMPLE RECOVERY AND INTEGRITY DATA SHEET

Plant Name	West County Energy Center	Date	10/06/09
Sampling Location	Unit 1B	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Acetone Lot Number	

Run History Data				
Run Number	Base w/DB-1	Base w/DB-2	Base w/DB-3	
Run Start Time	15:00	16:30	17:50	(hh:mm)
Run Stop Time	16:12	17:39	19:00	(hh:mm)
Train Prepared By	AS	AS	AS	
Train Recovered By	AS	AS	AS	
Recovery Date	10/6/2009	10/6/2009	10/6/2009	(mm/dd/yy)



Moisture Content Data					
Impingers 1, 2, and 3 - Liquid Volume					
Final Volume	(V _f)	2151.5	2220.3	2154.9	ml
Initial Volume	(V _i)	2042.1	2088.2	2030.9	ml
Net Volume	(V _n)	109.4	132.1	124.0	ml
Comments					
Impinger 4 - Silica Gel Weight					
Final Weight	(W _f)	1005.3	958.5	971.2	g
Initial Weight	(W _i)	985.0	939.8	943.5	g
Net Weight	(W _n)	20.3	18.7	27.7	g
Comments					
Total Water Collected					
Total Volume	(V _c)	129.7	150.9	151.8	ml

Ammonia Sample Measurement

Lab Tech:	Albert Septiano
Project:	bv-09-westcounty.fl-comp#1
Date Analyzed:	10/7/2009
Time Analyzed:	8:30 AM
Temp (°F)	75.0
Humidity	48%
BP (In HG)	29.90
Analysis Method	350.3



AIR HYGIENE

Calibration Data		
Concentration (ppm)	Pre-Cal (ppm)	Pre-Cal (mV)
0.0	0.0	113.5
1.0	1.0	-2.0
5.0	5.0	-42.4
10.0	10.0	-58.0
20.0	20.0	-77.0
Slope		
Linearity	1.0000	N/A

Sample ID	Sample Amt Used (ml)	ISA/pH Volume (ml)	Meter Reading (mg/L)	Time Analyzed (hh:mm:ss)	Dilution Factor	Sample Volume	MQL (mg/L)	PQL (mg/L)	Final Conc. (mg/L)
BLANK	80.0	2.0	0.0	9:06:00	1.0	80.0	0.10	0.1	BPQL
U1B-R1-FH	90.0	2.0	8.3	9:00:00	1.0	200.0	0.10	0.1	8.3
U1B-R1-BH	80.0	2.0	0.1	9:13:00	1.0	230.0	0.10	0.1	BPQL
U1B-R2-FH	80.0	2.0	7.3	9:22:00	1.0	220.0	0.10	0.1	7.3
U1B-R2-BH	80.0	2.0	0.1	9:30:00	1.0	250.0	0.10	0.1	BPQL
U1B-R3-FH	85.0	2.0	8.8	9:38:00	1.0	200.0	0.10	0.1	8.8
U1B-R3-BH	90.0	2.0	0.1	9:44:00	1.0	250.0	0.10	0.1	0.1
U1B-R1-FH	90.0	2.0	8.5	14:35:00	1.0	200.0	0.10	0.1	8.5
U1B-R1-BH	90.0	2.0	0.1	14:42:00	1.0	230.0	0.10	0.1	0.1
U1B-R2-FH	90.0	2.0	11.0	14:49:00	1.0	200.0	0.10	0.1	11.0
U1B-R2-BH	90.0	2.0	0.1	14:57:00	1.0	250.0	0.10	0.1	0.1
U1B-R3-FH	90.0	2.0	10.5	15:05:00	1.0	210.0	0.10	0.1	10.5
U1B-R3-BH	90.0	2.0	0.1	15:11:00	1.0	210.0	0.10	0.1	0.1



Ammonia Analysis

Project Name: bv-09-westcounty.fl-comp#1
Date Received: 10/7/2009

AHI Lab No.: BLANK
Sample ID: 16
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	BPQL	0.10	10/7/09 9:06
Volume	Volume in ml	N/A	80	N/A	10/7/09 8:30

AHI Lab No.: U1B-R1-FH
Sample ID: 17
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	8.25	0.10	10/7/09 9:00
Volume	Volume in ml	N/A	200	N/A	10/7/09 8:30

AHI Lab No.: U1B-R1-BH
Sample ID: 18
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	BPQL	0.10	10/7/09 9:13
Volume	Volume in ml	N/A	230	N/A	10/7/09 8:30

AHI Lab No.: U1B-R2-FH
Sample ID: 19
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	7.31	0.10	10/7/09 9:22
Volume	Volume in ml	N/A	220	N/A	10/7/09 8:30

AHI Lab No.: U1B-R2-BH
Sample ID: 20
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	BPQL	0.10	10/7/09 9:30
Volume	Volume in ml	N/A	250	N/A	10/7/09 8:30

AHI Lab No.: U1B-R3-FH
Sample ID: 21
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	8.81	0.10	10/7/09 9:38
Volume	Volume in ml	N/A	200	N/A	10/7/09 8:30

AHI Lab No.: U1B-R3-BH
Sample ID: 22
Sampling Date: 10/6/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.106	0.10	10/7/09 9:44
Volume	Volume in ml	N/A	250	N/A	10/7/09 8:30



Ammonia Analysis

AHI Lab No.: U1B-R1-FH
 Sample ID: 23
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	8.53	0.10	10/7/09 14:35
Volume	Volume in ml	N/A	200	N/A	10/7/09 8:30

AHI Lab No.: U1B-R1-BH
 Sample ID: 24
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.117	0.10	10/7/09 14:42
Volume	Volume in ml	N/A	230	N/A	10/7/09 8:30

AHI Lab No.: U1B-R2-FH
 Sample ID: 25
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	11	0.10	10/7/09 14:49
Volume	Volume in ml	N/A	200	N/A	10/7/09 8:30

AHI Lab No.: U1B-R2-BH
 Sample ID: 26
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.11	0.10	10/7/09 14:57
Volume	Volume in ml	N/A	250	N/A	10/7/09 8:30

AHI Lab No.: U1B-R3-FH
 Sample ID: 27
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	10.5	0.10	10/7/09 15:05
Volume	Volume in ml	N/A	210	N/A	10/7/09 8:30

AHI Lab No.: U1B-R3-BH
 Sample ID: 28
 Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.125	0.10	10/7/09 15:11
Volume	Volume in ml	N/A	210	N/A	10/7/09 8:30

TEST RESULTS

**Opacity
Base Load**

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 2
Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

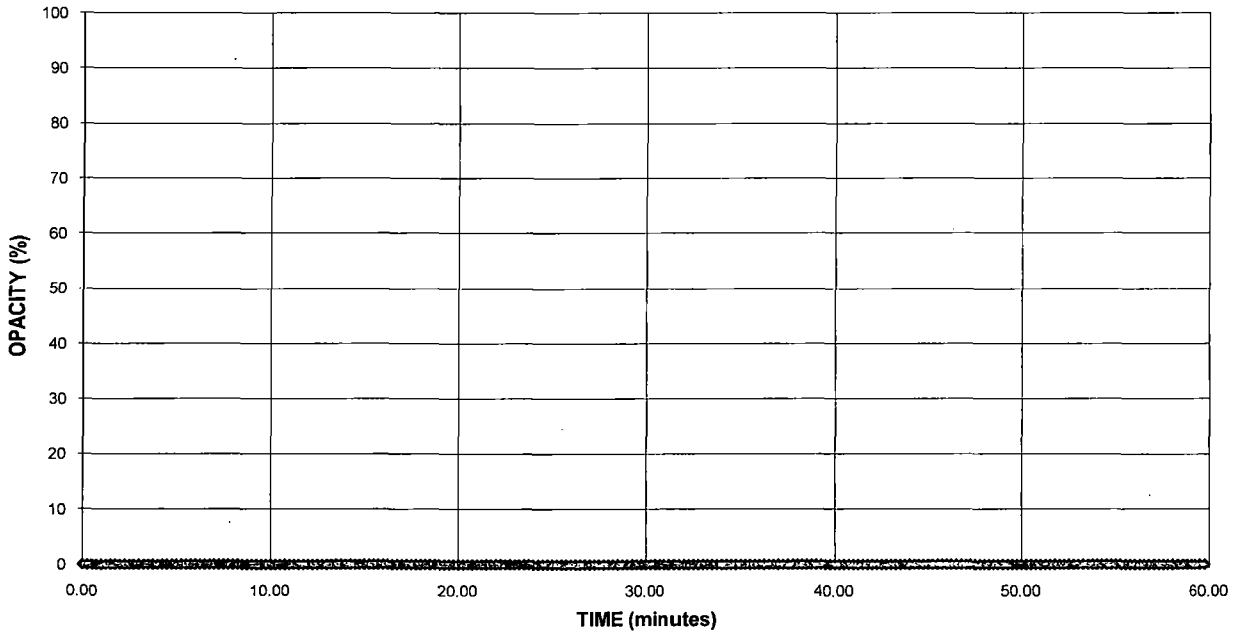
TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

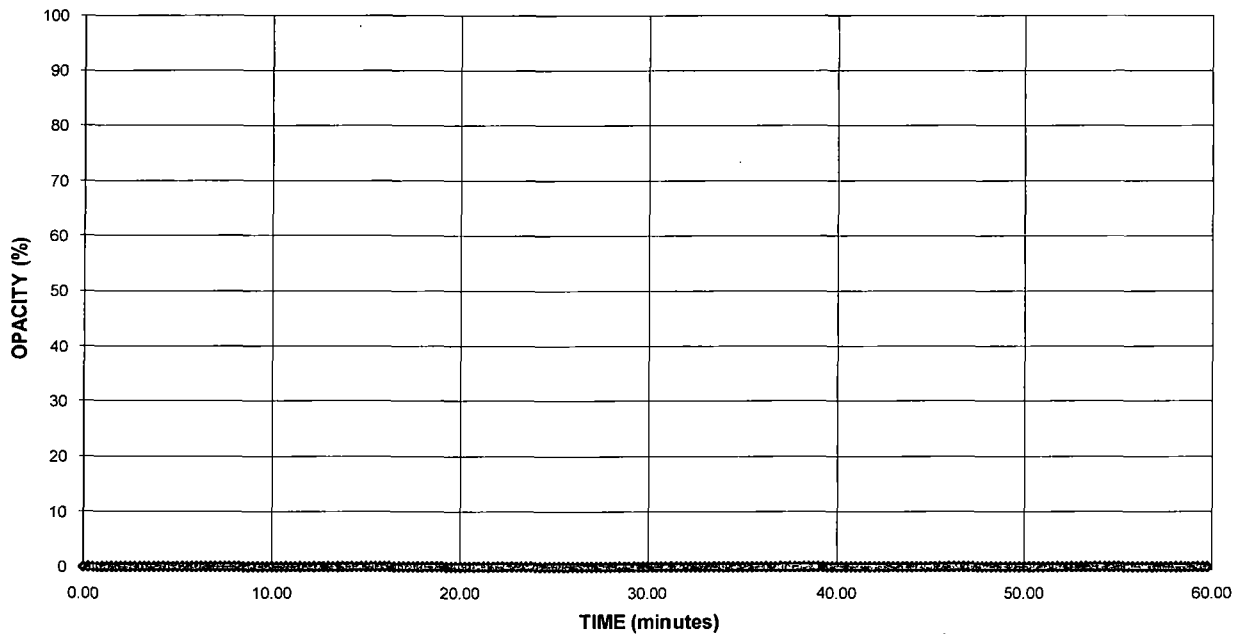
Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

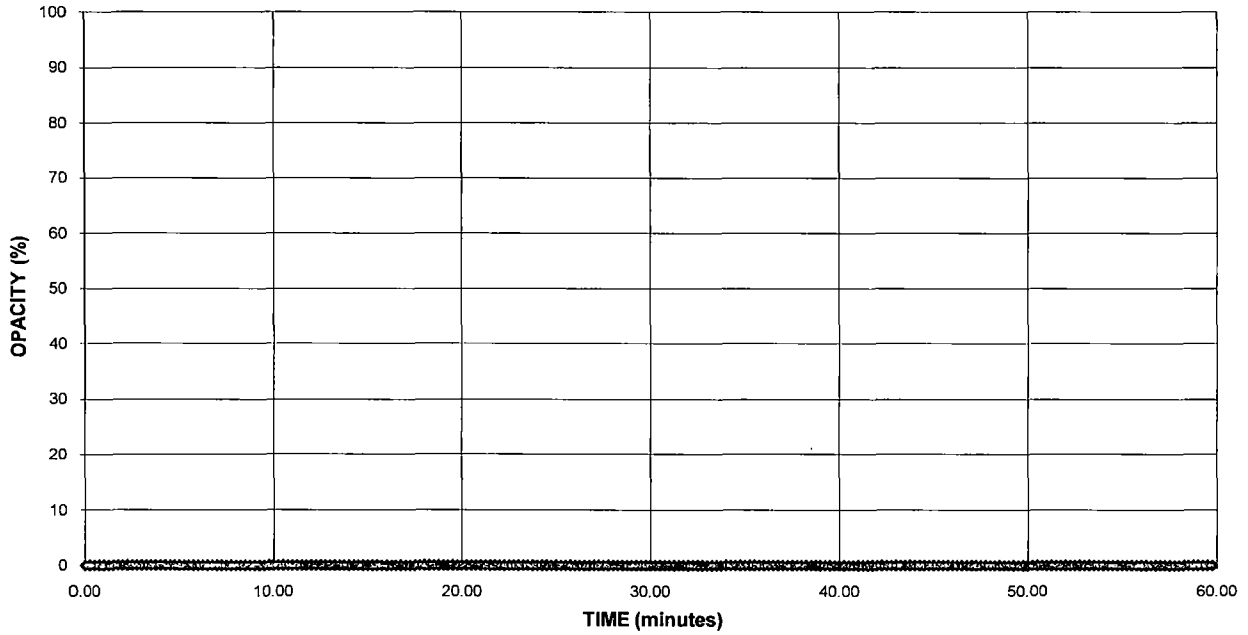


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

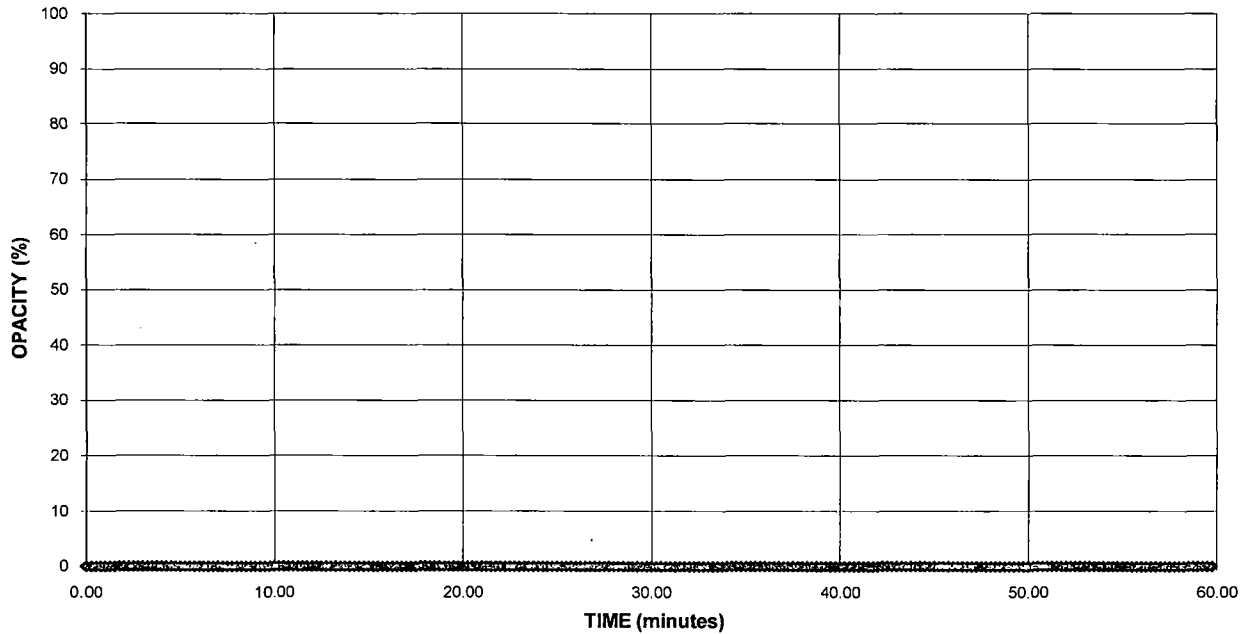
Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

**OPACITY READINGS
(15 second intervals)**



**OPACITY RESULTS
(6 minute averages)**

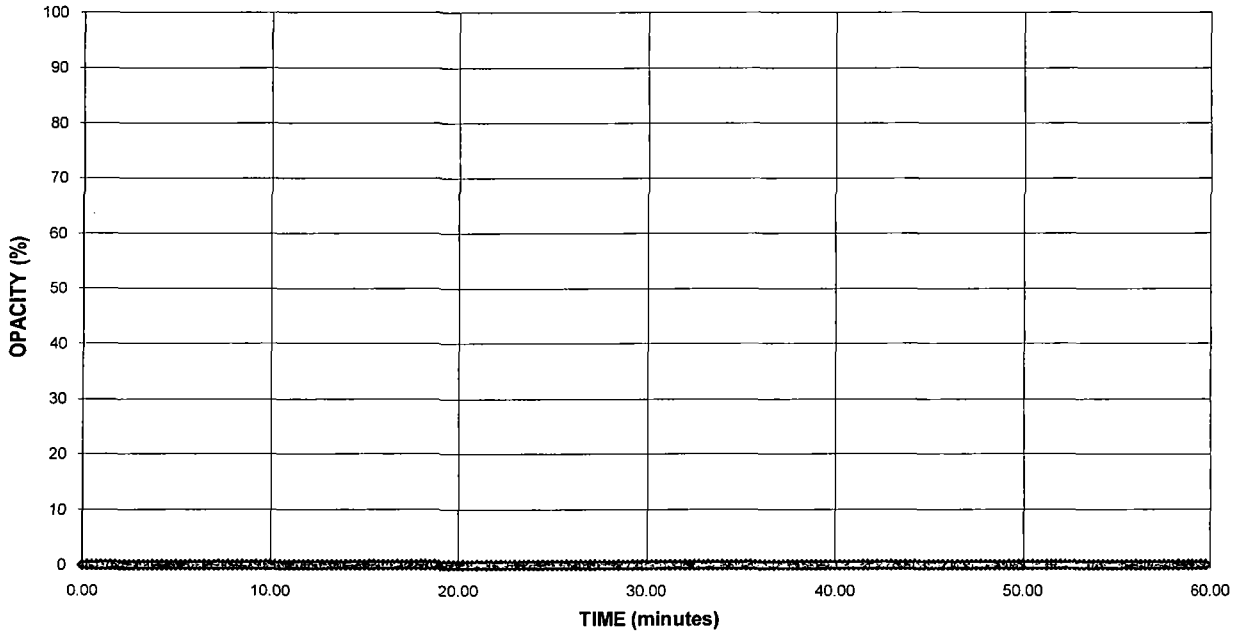


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/o DB
Location: West County Energy Center
Date: October 7, 2009
Project #: bv-09-westcounty.fl-comp#1

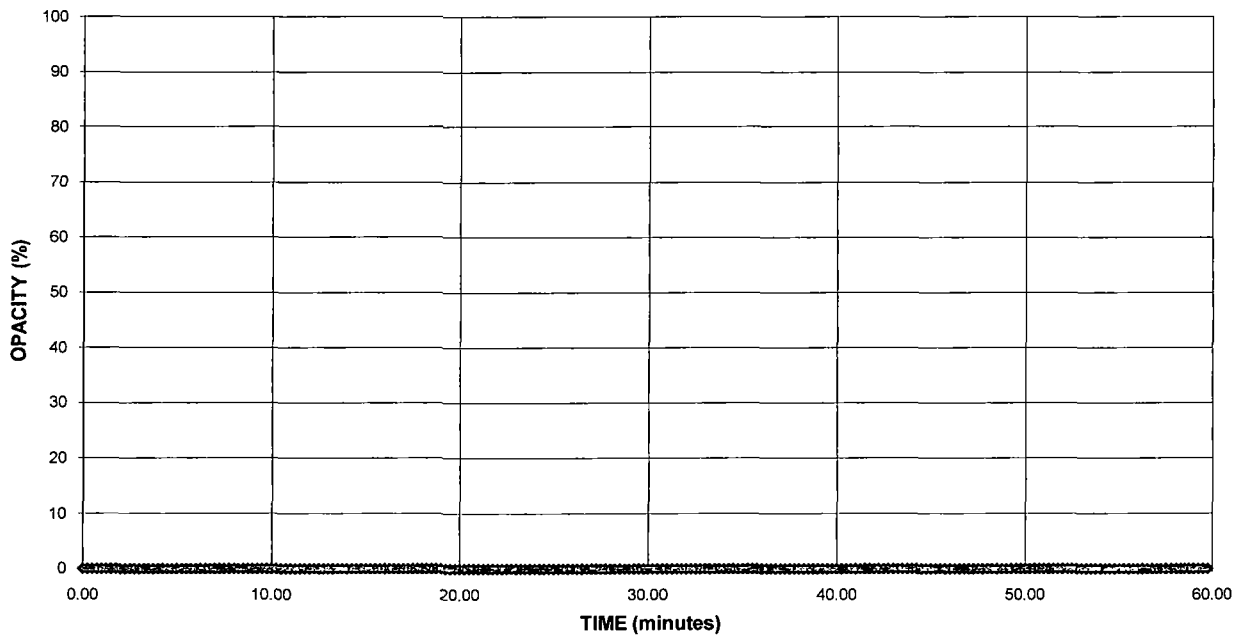
Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)



Method Used (Circle One)
 Method 9. 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
 Florida Power Light
 Facility Name
 West County Energy Center
 Street Address
 20505 State Road 80
 City State Zip
 Loxatchee Florida 33470

Form Number _____ Page 1 of 6

Continued on Form Number _____

Process Unit # Operating Mode
 Electricity Production 1B Base Load
 Control Equipment Operating Mode
 Ammonia Injection Normal

Observation Date 10/19/09 Time Zone EST Start Time 8:25 End Time 8:55

Describe Emissions Point
 middle of three stacks
 Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 150 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

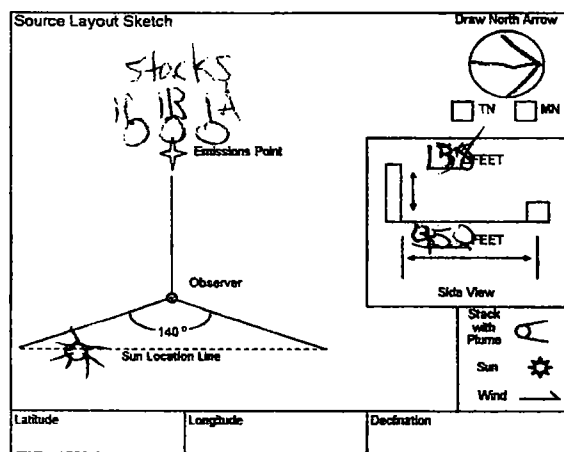
Min	Sec	0	15	30	45	Comments
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Vertical Angle to Obs. Pt. Direction to Obs. Pt. (Degrees)
 Start 26 End 26 Start 18 End 18
 Distance and Direction to Observation Point from Emission Point
 Start 350 SE End 450 SE
 N/D - not visible

1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Describe Emissions
 Start N/V End N/V
 Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background
 Start Blue Sky End Blue Sky
 Background Color Start Blue End Blue Sky Conditions Start Same End Same
 Wind Speed Start 10-15 End 10-15 Wind Direction Start SW End SW
 Ambient Temp Start 82 End 82 Wet Bulb Temp. RH Percent Start 85



Latitude _____ Longitude _____ Declination _____
 Additional Information _____

Observer's Name (Print) Devin Grimes
 Observer's Signature [Signature] Date 10/19/09
 Organization Air Hygiene Assoc
 Certified by Eastern Technical Associates Date 4/29/09

Method Used (Circle One)
 Method 9. 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxatchee Florida 33470

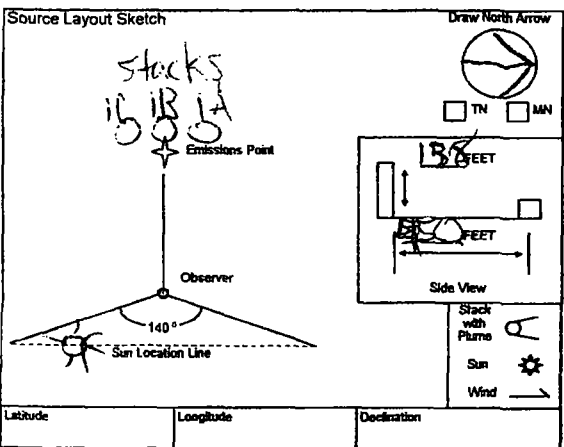
Process: Electricity Production Unit # 1B Base Stacks
 Control Equipment: Analytic Injection Normal

Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start 138 End 138
 Height of Emiss. Pt. Rel. to Observer Start 152 End 152
 Distance to Emiss. Pt. Start 450 End 450
 Direction to Emiss. Pt. (Degrees) Start 28 End 28

Vertical Angle to Obs. Pt. Start 16 End 16
 Direction to Obs. Pt. (Degrees) Start 18 End 18
 Distance and Direction to Observation Point from Emission Point Start 550 SE End 550 SE

Describe Emissions: Start N/V End N/V
 Emission Color: Start N/V End N/V
 Water Droplet Plume: Start None End None

Describe Plume Background: Start Blue Sky End Blue Sky
 Background Color: Start Blue End Blue Sky Conditions: Start Scattered End Same
 Wind Speed: Start 10-15 End 10-15
 Wind Direction: Start SW End SW
 Ambient Temp.: Start 82 End 82
 Wet Bulb Temp.: Start 85 End 85
 RH Percent: Start 85 End 85



Latitude: _____ Longitude: _____ Declination: _____
 Additional Information: _____

Form Number: _____ Page 2 of 6

Continued on Form Number _____

Observation Date	Time Zone				Start Time	End Time	Comments
	Min	Sec	0	15			
10/17/09			EST		8:54	9:26	
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			
5	0	0	0	0			
6	0	0	0	0			
7	0	0	0	0			
8	0	0	0	0			
9	0	0	0	0			
10	0	0	0	0			
11	0	0	0	0			
12	0	0	0	0			
13	0	0	0	0			
14	0	0	0	0			
15	0	0	0	0			
16	0	0	0	0			
17	0	0	0	0			
18	0	0	0	0			
19	0	0	0	0			
20	0	0	0	0			
21	0	0	0	0			
22	0	0	0	0			
23	0	0	0	0			
24	0	0	0	0			
25	0	0	0	0			
26	0	0	0	0			
27	0	0	0	0			
28	0	0	0	0			
29	0	0	0	0			
30	0	0	0	0			

Observer's Name (Print): DAVID CRIMES
 Observer's Signature: [Signature] Date: 10/17/09
 Organization: Air Hygiene Inc.
 Certified by: Eastern Technical Associates Date: 4/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxatchee Florida 33470

Form Number _____ Page 3 of 6
 Continued on Form Number _____

Process: Electricity Production Unit # 1B Operating Mode: Without
 Control Equipment: Automatic Injection Normal Operating Mode

Observation Date: 10/12/09 Time Zone: EST Start Time: 9:57 End Time: 9:57

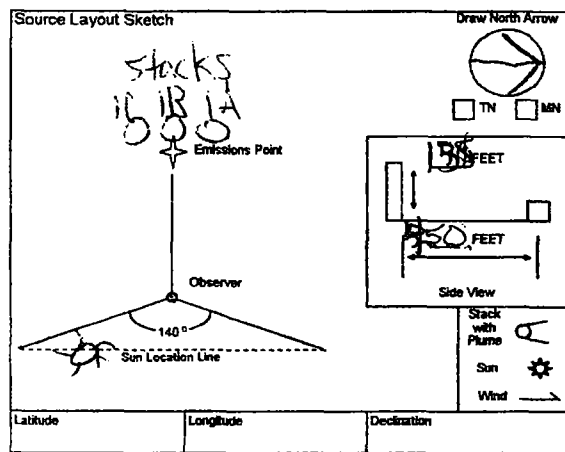
No.	Time				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start: 138 End: 138 Height of Emiss. Pt. Rel. to Observer Start: 132 End: 132
 Distance to Emiss. Pt. Start: 450 End: 450 Direction to Emiss. Pt. (Degrees) Start: 28 End: 28

Vertical Angle to Obs. Pt. Start: 16 End: 16 Direction to Obs. Pt. (Degrees) Start: 8 End: 8
 Distance and Direction to Observation Point from Emission Point Start: 450 SE End: 450 SE

Describe Emissions: Start: N/V End: N/V Emission Color: Start: N/V End: N/V Water Droplet Plume: Start: None End: None

Describe Plume Background: Start: Blue Sky End: Blue Sky Background Color: Start: Blue End: Blue Sky Conditions: Start: Scattered End: Same
 Wind Speed: Start: 10-15 End: 10-15 Wind Direction: Start: SW End: SW
 Ambient Temp.: Start: 85 End: 85 Wet Bulb Temp.: RH Percent: 78



Latitude _____ Longitude _____ Declination _____
 Additional Information _____

Observer's Name (Print): DEAN STRIMES
 Observer's Signature: [Signature] Date: 10/12/09
 Organization: Air Hygiene Inc. Certified by: Eastern Technical Associates Date: 4/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 4 of 6
 Continued on Form Number _____

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Leachville Florida 33470

Observation Date: 10/27/09 Time Zone: EST Start Time: 10:00 End Time: 10:30

Process: Electricity Production Unit #: 1B Operating Mode: Without Base Load
 Control Equipment: Air Injection Normal

Min	Time Zone				Comments
	0	15	30	45	

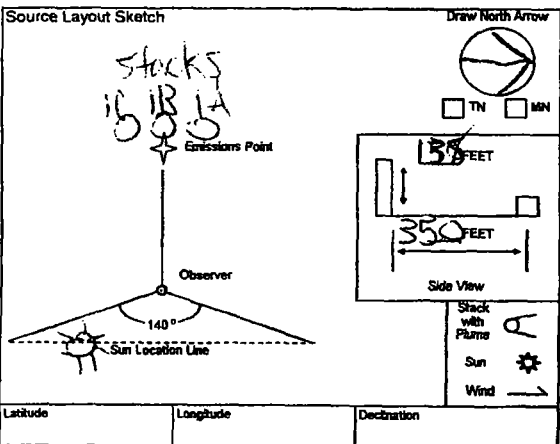
Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start: 158 End: 158
 Height of Emiss. Pt. Rel. to Observer Start: 152 End: 152
 Distance to Emiss. Pt. Start: 350 End: 350
 Direction to Emiss. Pt. (Degrees) Start: 28 End: 28

1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start: 16 End: 16
 Direction to Obs. Pt. (Degrees) Start: 18 End: 18
 Distance and Direction to Observation Point from Emission Point Start: 450 SE End: 450 SE

Describe Emissions: Start: N/V End: N/V
 Emission Color: Start: N/V End: N/V
 Water Droplet Plume: Start: None End: None

Describe Plume Background: Start: Blue Sky End: Blue Sky
 Background Color: Start: Blue End: Blue
 Sky Conditions: Start: Scattered End: Same
 Wind Speed: Start: 10-15 End: 10-15
 Wind Direction: Start: SW End: SW
 Ambient Temp: Start: 85 End: 85
 Wet Bulb Temp: Start: RH Percent End: 38



Observer's Name (Print): D. M. CRIMES
 Observer's Signature: [Signature] Date: 10/27/09
 Organization: Air Hygiene Assoc
 Certified by: Eastern Technical Associates Date: 4/22/09

Additional Information

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 5 of 6

Company Name Florida Power and Light
 Facility Name West County Energy Center
 Street Address 20505 State Road 80
 City Loxatchee State Florida Zip 33470

Continued on Form Number _____

Process Electricity Production Unit # 1B Operating Mode Without Base Loads
 Control Equipment Proportional Injection Normal

Observation Date 10/17/09 Time Zone EST Start Time 10:31 End Time 11:01

Describe Emissions Point
Middle of three stacks

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 138 End 138
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

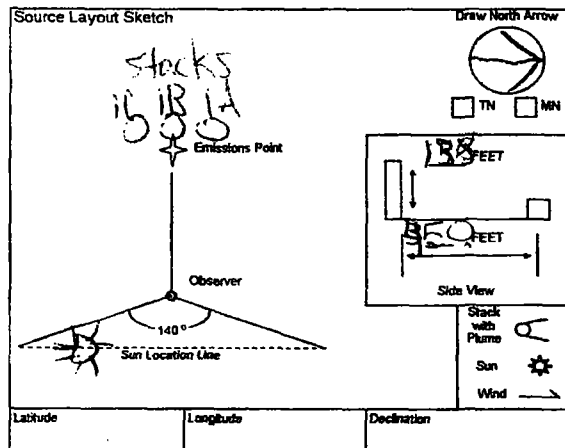
Min	0	15	30	45	Comments
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Vertical Ang. to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 18 End 18
 Distance and Direction to Observation Point from Emission Point Start 450 SE End 450 SE

Describe Emissions Start N/V End N/V
 Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background Start Blue Sky End Blue Sky
 Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 10-15 End 10-15 Wind Direction Start SW End SW
 Ambient Temp. Start 93 End 93 Wet Bulb Temp. _____ RH Percent 62

1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	



Observer's Name (Print) Devin Grimes
 Observer's Signature _____ Date 10/17/09
 Organization Air Hygiene Inc
 Certified by Eastern Technical Associates Date 7/22/09

Additional Information

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 6 of 6

Company Name Florida Power and Light
 Facility Name West County Energy Center
 Street Address 20505 State Road 80
 City Leesatchee State Florida Zip 33420

Continued on Form Number _____

Process Electricity Production Unit # 1B Base Ducks Operating Mode without
 Control Equipment Automatic Injection Operating Mode Normal

Observation Date 10/17/09 Time Zone EST Start Time 11:02 End Time 11:32

Describe Emissions Port
middle of three stacks

Height of Emiss. Pt. Start 130 End 130 Height of Emiss. Pt. Rel. to Observer Start 130 End 130
 Distance to Emiss. Pt. Start 350 End 350 Direction to Emiss. Pt. (Degrees) Start 28 End 28

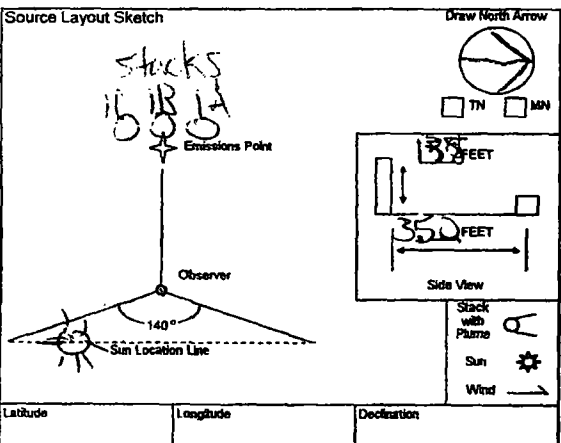
Min	Sec.				Comments
	0	15	30	45	

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 18 End 18
 Distance and Direction to Observation Point from Emission Point Start 450 SE End 350 SE

1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Describe Emissions Start N/V End N/V
 Emission Color Start N/V End N/V Water Droplet Plume Start Noise End Noise

Describe Plume Background Start Blue Sky End Blue Sky
 Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 10-15 End 10-15 Wind Direction Start SW End SW
 Ambient Temp. Start 93 End 93 Wet Bulb Temp. _____ RH Percent 63



Observer's Name (Print) DEAN CRIMES
 Observer's Signature _____ Date 10/17/09
 Organization Alc Hygiene Inc
 Certified by Eastern Technical Associates Date 4/22/09

Additional Information

TEST RESULTS

**Opacity
Base Load with Duct Burners**

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 3
Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

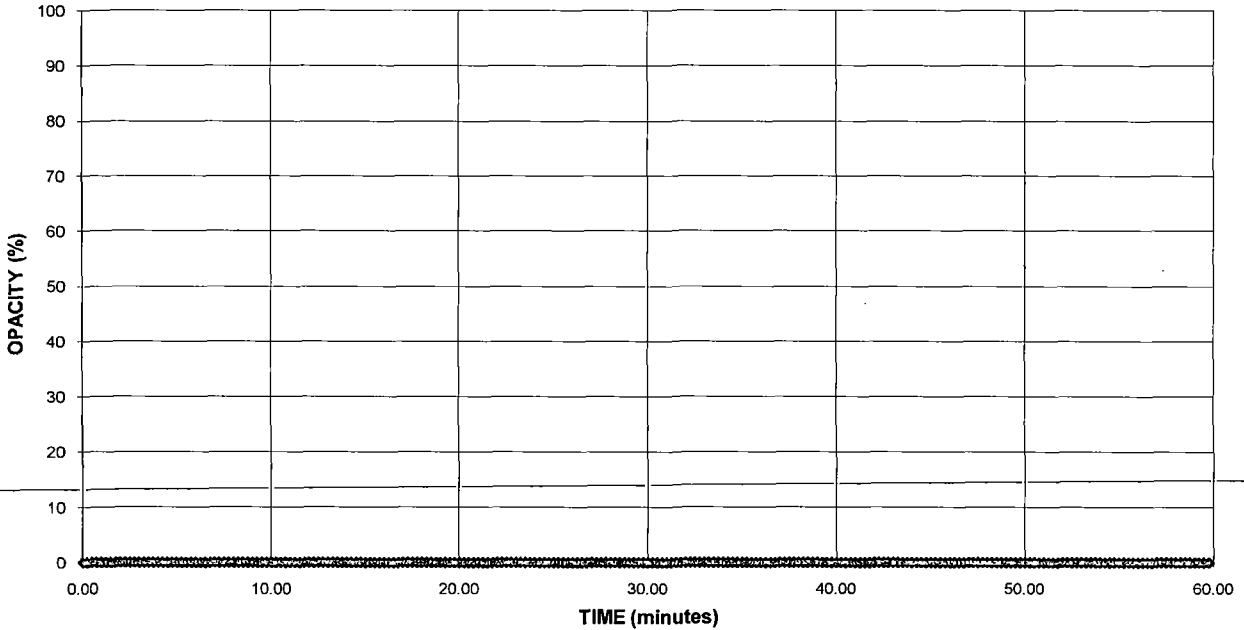
TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

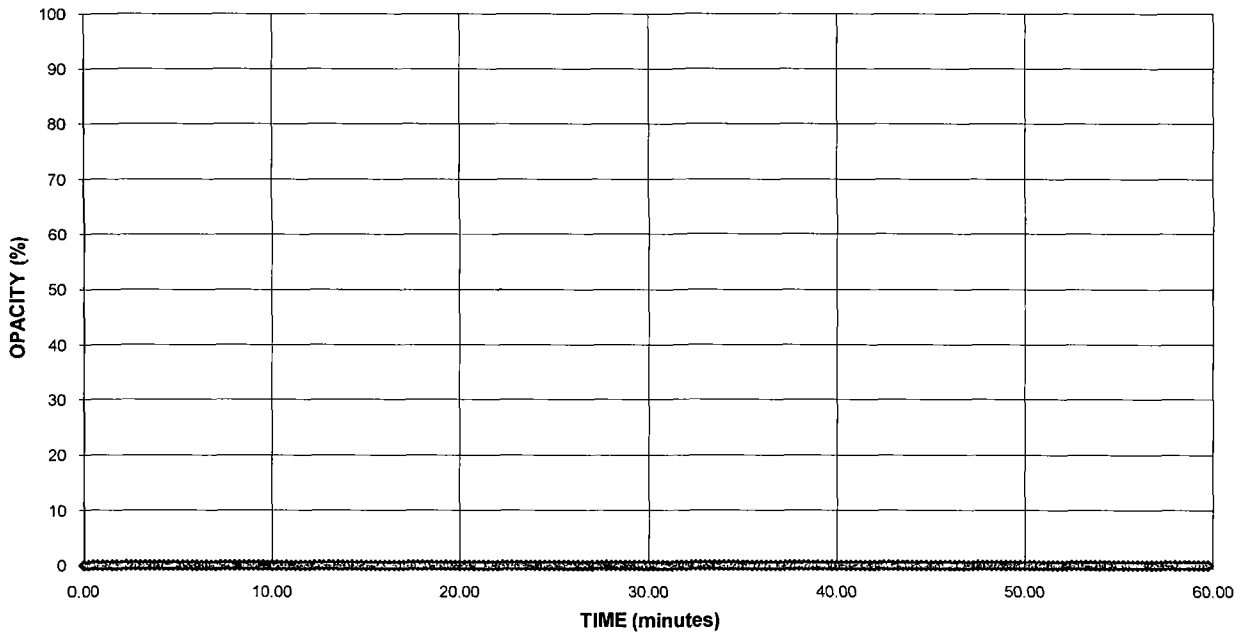
Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

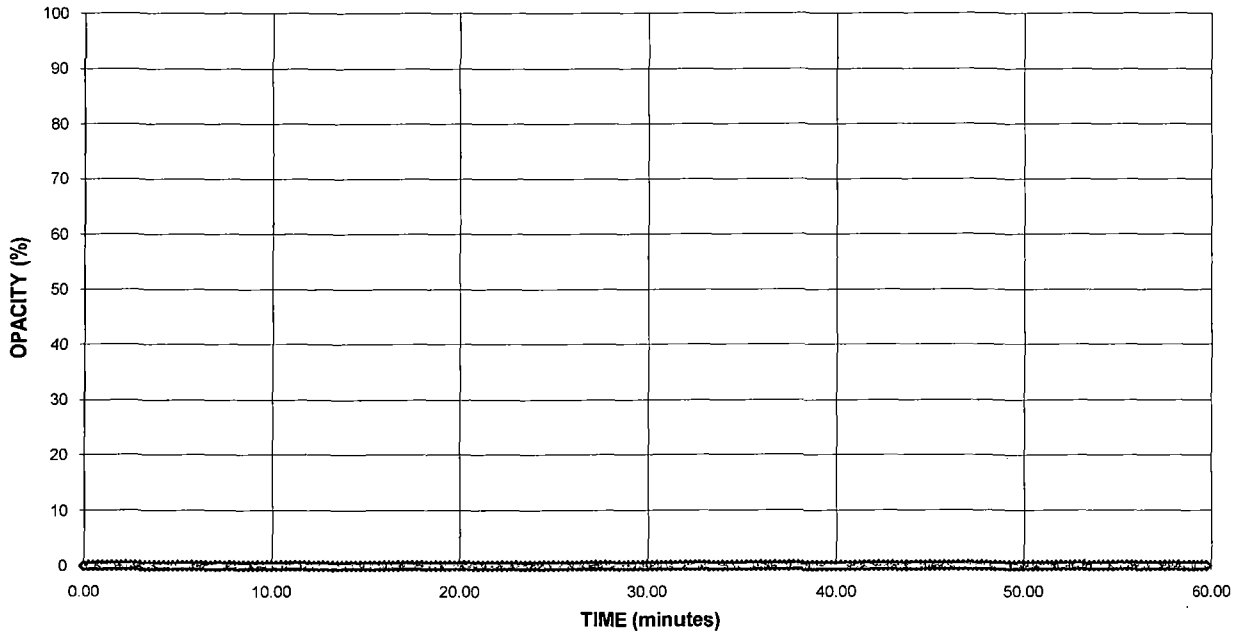


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

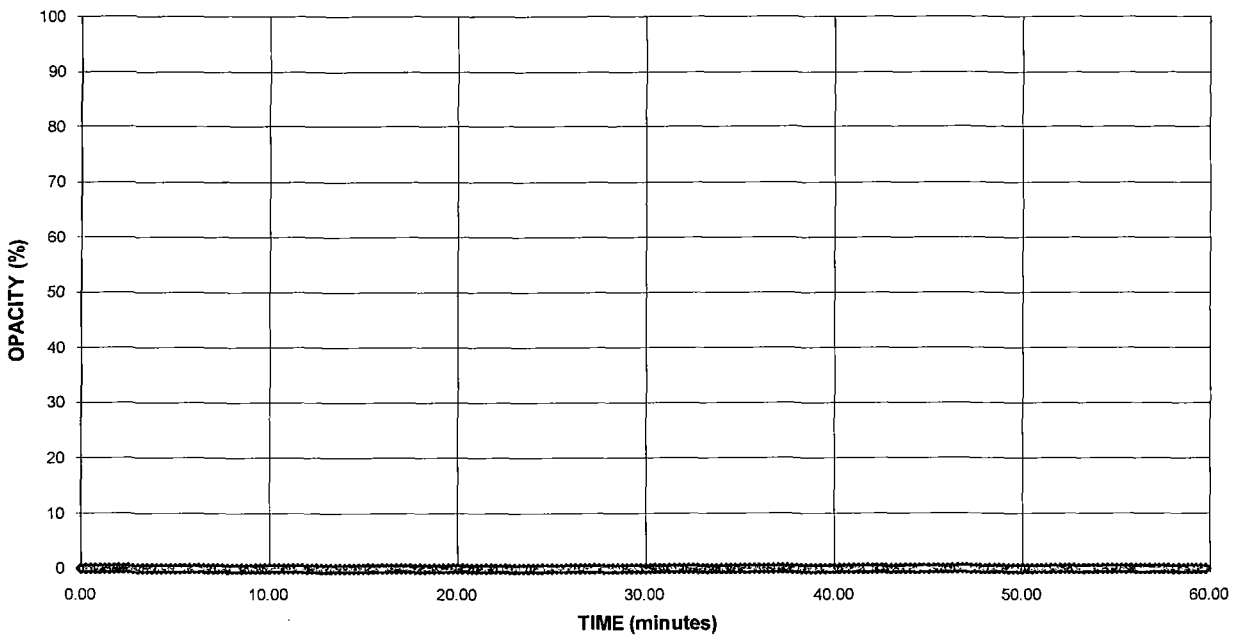
Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

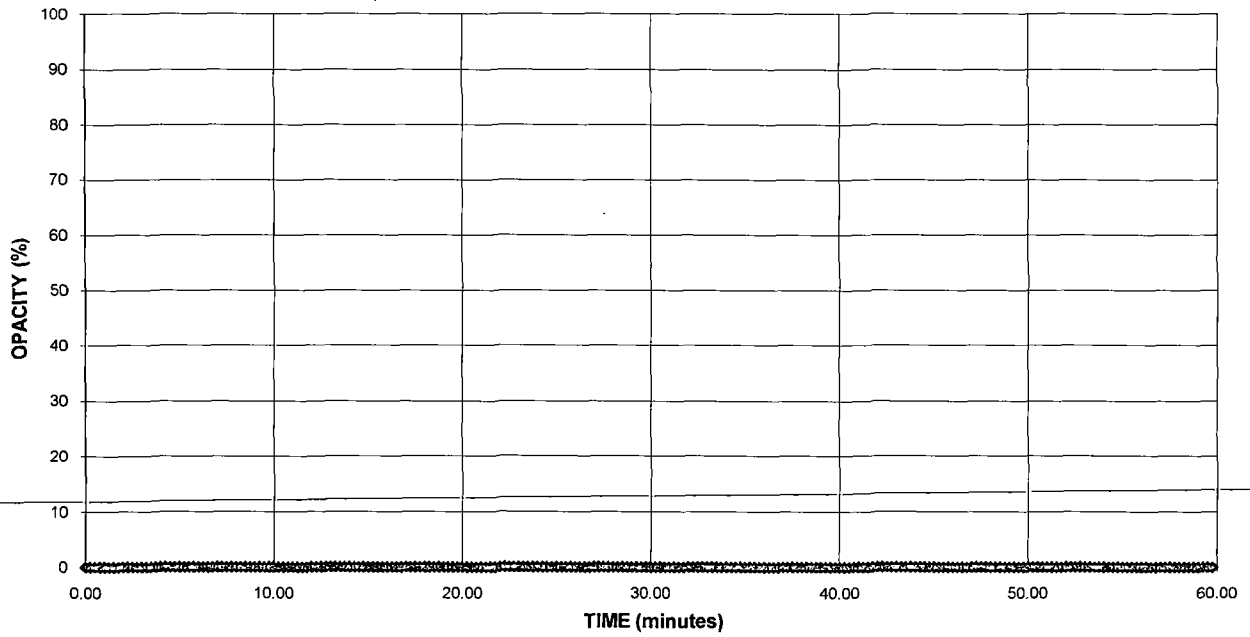


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1B base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

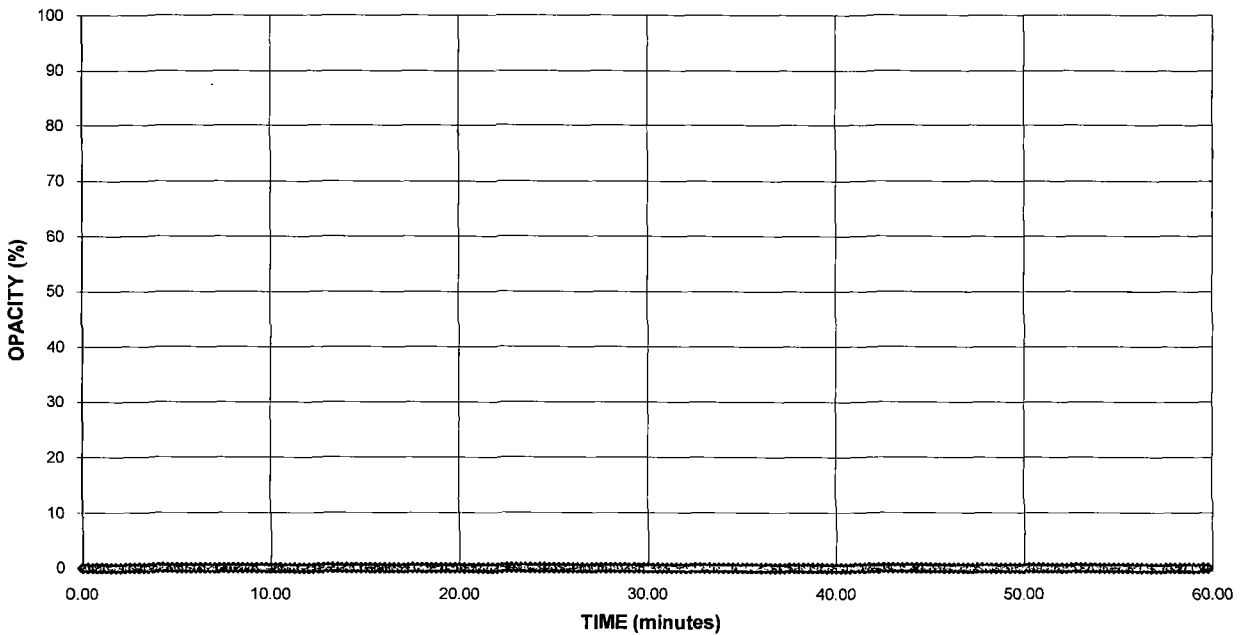
Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

**OPACITY READINGS
(15 second intervals)**



**OPACITY RESULTS
(6 minute averages)**



Method Used (Circle One)
 Method 9 203A 203B Other: _____

Company Name
Florida Power Light
 Facility Name
West County Energy Center
 Street Address
20505 State Road 80
 City State Zip
Loxatchee Florida 33470

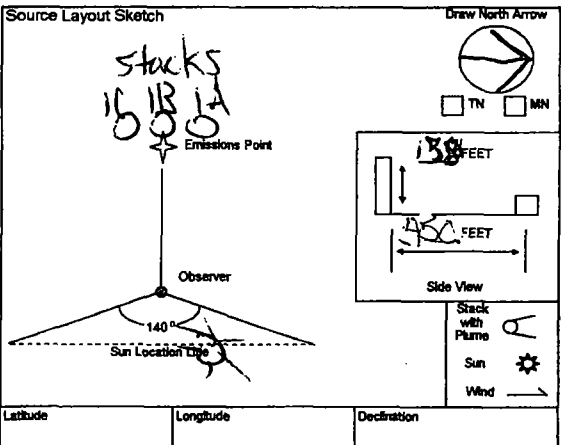
Process Unit # Operating Mode
Electricity Production 1B Base Stacks
 Control Equipment Operating Mode
Ammonia Injection Normal

Describe Emissions Point
middle of three stacks
 Height of Emiss. Pt. Start **130** End **130** Height of Emiss. Pt. Rel. to Observer Start **150** End **150**
 Distance to Emiss. Pt. Start **450** End **450** Direction to Emiss. Pt. (Degrees) Start **26** End **26**

Vertical Angle to Obs. Pt. Direction to Obs. Pt. (Degrees)
 Start **16** End **16** Start **24** End **24**
 Distance and Direction to Observation Point from Emission Point
 Start **450 SW** End **450 SW**
N/V non visible

Describe Emissions
 Start **N/V** End **N/V** Water Droplet Plume Start **None** End **None**
 Emission Color Start **N/V** End **N/V**

Describe Plume Background
 Start **Blue Sky** End **Blue Sky**
 Background Color Start **Blue** End **Blue** Sky Conditions Start **Scattered** End **Same**
 Wind Speed Start **10-15** End **10-15** Wind Direction Start **NE** End **NE**
 Ambient Temp. Start **91** End **91** Wet Bulb Temp. RH Percent **45**



Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page **1** of **6**

Continued on Form Number _____

Observation Date	Time Zone			Start Time	End Time	Comments
	Min.	Sec.				
10/6/09	0	15	EST	15:20	15:50	
1	0	0	0	0		
2	0	0	0	0		
3	0	0	0	0		
4	0	0	0	0		
5	0	0	0	0		
6	0	0	0	0		
7	0	0	0	0		
8	0	0	0	0		
9	0	0	0	0		
10	0	0	0	0		
11	0	0	0	0		
12	0	0	0	0		
13	0	0	0	0		
14	0	0	0	0		
15	0	0	0	0		
16	0	0	0	0		
17	0	0	0	0		
18	0	0	0	0		
19	0	0	0	0		
20	0	0	0	0		
21	0	0	0	0		
22	0	0	0	0		
23	0	0	0	0		
24	0	0	0	0		
25	0	0	0	0		
26	0	0	0	0		
27	0	0	0	0		
28	0	0	0	0		
29	0	0	0	0		
30	0	0	0	0		

Observer's Name (Print)
Darin Grimes
 Observer's Signature
Darin Grimes
 Date
10/6/09
 Organization
Air Hygiene Inc
 Certified by
Eastern Technical Associates
 Date
10/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxatchee Florida 33470

Form Number _____ Page 2 of 6
 Continued on Form Number _____

Process: Electricity Production Unit # 1B Base Stack
 Control Equipment: Ammonia Injection Normal

Observation Date: 10/6/09 Time Zone: EST Start Time: 15:51 End Time: 16:21

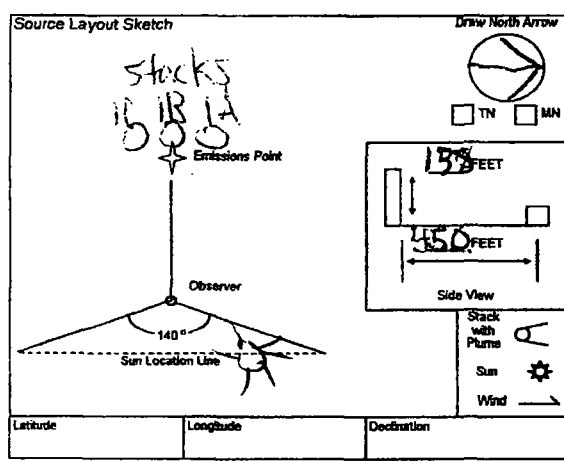
Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start: 130 End: 150
 Height of Emiss. Pt. Rel. to Observer Start: 130 End: 150
 Distance to Emiss. Pt. Start: 450 End: 450
 Direction to Emiss. Pt. (Degrees) Start: 26 End: 26

Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start: 16 End: 16
 Direction to Obs. Pt. (Degrees) Start: 24 End: 24
 Distance and Direction to Observation Point from Emission Point Start: 450 SW End: 450 SW

Describe Emissions: Start: N/V End: N/V
 Emission Color: Start: N/V End: N/V
 Water Droplet Plume: Start: None End: None

Describe Plume Background: Start: Blue Sky End: Blue Sky
 Background Color: Start: Blue End: Blue
 Sky Conditions: Start: Scattered End: Same
 Wind Speed: Start: 10-15 End: 10-15
 Wind Direction: Start: NE End: NE
 Ambient Temp: Start: 91 End: 91
 Wet Bulb Temp: _____ RH Percent: 45



Latitude: _____ Longitude: _____ Declination: _____

Observer's Name (Print): Daria Crimes
 Observer's Signature: [Signature] Date: 10/6/09

Additional Information: _____

Organization: Air Hygiene Inc
 Certified by: Eastern Technical Associates Date: 4/20/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxatchee Florida 33470

Form Number _____ Page 3 of 6
 Continued on Form Number _____

Process: Electricity Production Unit # 1B Operating Mode: Base
 Control Equipment: Annular Injection Normal Operating Mode

Observation Date: 10/6/09 Time Zone: EST Start Time: 16:22 End Time: 16:52

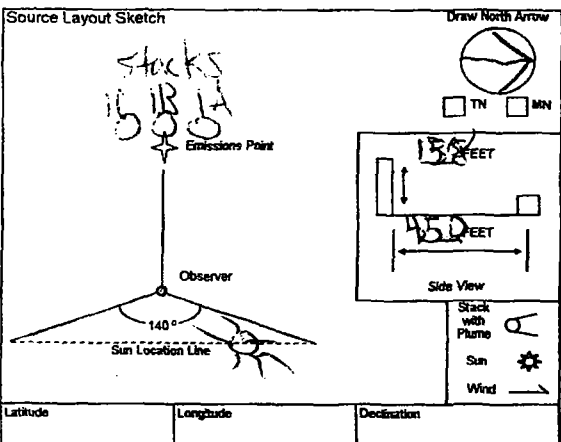
Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start: 138 End: 138
 Distance to Emiss. Pt. Start: 450 End: 450

Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start: 16 End: 16
 Direction to Obs. Pt. (Degrees) Start: 29 End: 29
 Distance and Direction to Observation Point from Emission Point Start: 3505W End: 3505W
 N/D Not Visible

Describe Emissions: Start: N/V End: N/V
 Emission Color: Start: N/V End: N/V
 Water Droplet Plume: Start: None End: None

Describe Plume Background: Start: Blue Sky End: Blue Sky
 Background Color: Start: Blue End: Blue
 Sky Conditions: Start: Scattered End: Same
 Wind Speed: Start: 10-15 End: 10-15
 Wind Direction: Start: NE End: NE
 Ambient Temp.: Start: 94 End: 94
 Wet Bulb Temp.: Start: 53 End: 53



Latitude _____ Longitude _____ Elevation _____
 Additional Information _____

Observer's Name (Print): Dean Grimes
 Observer's Signature: [Signature] Date: 10/6/09
 Organization: Air Hygiene Assoc
 Certified by: Eastern Technical Associates Date: 4/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 4 of 6
 Continued on Form Number _____

Company Name: Florida Power Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxatchee Florida State: _____ Zip: 33470

Observation Date: 10/6/09 Time Zone: EST Start Time: 16:53 End Time: 17:23

Process: Electricity Production 1B Base Loads Unit #: _____ Operating Mode: Normal
 Control Equipment: Automatic Injection Operating Mode: _____

Min	Sec				Comments
	0	15	30	45	

Describe Emissions Port: middle of three stacks

1	0	0	0	0	
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Height of Emiss. Pt. Start: 138 End: 138 Height of Emiss. Pt. Rel. to Observer Start: 132 End: 132
 Distance to Emiss. Pt. Start: 450 End: 450 Direction to Emiss. Pt. (Degrees) Start: 26 End: 26

2	0	0	0	0	
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Vertical Angle to Obs. Pt. Start: 14 End: 14 Direction to Obs. Pt. (Degrees) Start: 24 End: 24
 Distance and Direction to Observation Point from Emission Point Start: 450 SW End: 450 SW

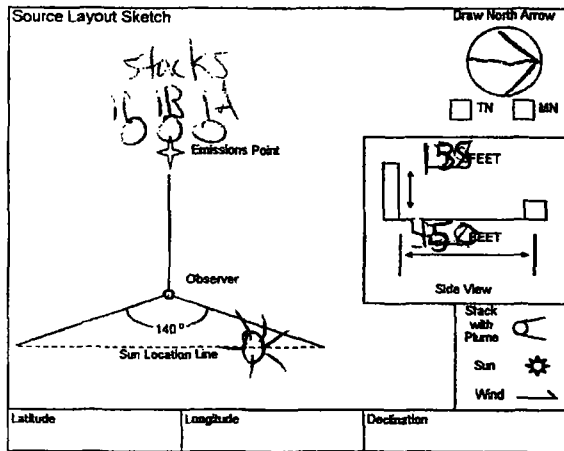
3	0	0	0	0	
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Describe Emissions Start: N/V End: N/V Emission Color: N/V Water Droplet Plume: None
 Start: N/V End: N/V Start: None End: None

4	0	0	0	0	
---	---	---	---	---	--

Describe Plume Background Start: Blue Sky End: Blue Sky
 Background Color: Blue Sky Conditions: Scattered End: Same
 Wind Speed: 10-15 End: 10-15 Wind Direction: NE End: NE
 Ambient Temp: 94 End: 94 Wet Bulb Temp: _____ RH Percent: 53

5	0	0	0	0	
---	---	---	---	---	--



6	0	0	0	0	
---	---	---	---	---	--

7	0	0	0	0	
---	---	---	---	---	--

8	0	0	0	0	
---	---	---	---	---	--

9	0	0	0	0	
---	---	---	---	---	--

10	0	0	0	0	
----	---	---	---	---	--

11	0	0	0	0	
----	---	---	---	---	--

12	0	0	0	0	
----	---	---	---	---	--

13	0	0	0	0	
----	---	---	---	---	--

14	0	0	0	0	
----	---	---	---	---	--

15	0	0	0	0	
----	---	---	---	---	--

16	0	0	0	0	
----	---	---	---	---	--

17	0	0	0	0	
----	---	---	---	---	--

18	0	0	0	0	
----	---	---	---	---	--

19	0	0	0	0	
----	---	---	---	---	--

20	0	0	0	0	
----	---	---	---	---	--

21	0	0	0	0	
----	---	---	---	---	--

22	0	0	0	0	
----	---	---	---	---	--

23	0	0	0	0	
----	---	---	---	---	--

24	0	0	0	0	
----	---	---	---	---	--

25	0	0	0	0	
----	---	---	---	---	--

26	0	0	0	0	
----	---	---	---	---	--

27	0	0	0	0	
----	---	---	---	---	--

28	0	0	0	0	
----	---	---	---	---	--

29	0	0	0	0	
----	---	---	---	---	--

30	0	0	0	0	
----	---	---	---	---	--

Additional Information: _____

Observer's Name (Print): Darin Trimes Date: 10/6/09

Observer's Signature: _____

Organization: At Hygiene Inc Certified by: Eastern Technical Associates Date: 4/22/09

Method Used (Circle One)
 Method 9. 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power and Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Loxley Florida 33420

Form Number _____ Page 5 of 6

Continued on Form Number _____

Process: Electricity Production Unit # 1B Base Stack
 Control Equipment: Air Pollution Injection Normal

Observation Date: 10/6/09 Time Zone: EST Start Time: 17:24 End Time: 18:04

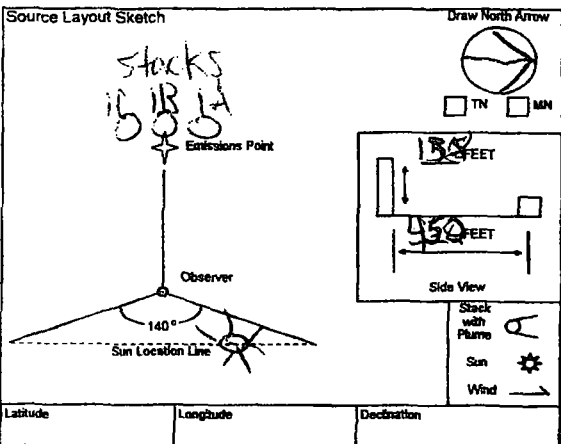
Describe Emissions Point: middle of three stacks
 Height of Emis. Pt. Start: 130 End: 130
 Height of Emis. Pt. Rel. to Observer Start: 130 End: 130
 Distance to Emis. Pt. Start: 450 End: 450
 Direction to Emis. Pt. (Degrees) Start: 24 End: 24

Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start: 16 End: 16
 Direction to Obs. Pt. (Degrees) Start: 24 End: 24
 Distance and Direction to Observation Point from Emission Point Start: 450 SW End: 450 SW

Describe Emissions: Start: N/V End: N/V
 Emission Color: Start: N/V End: N/V
 Water Droplet Plume: Start: None End: None

Describe Plume Background: Start: Blue Sky End: Blue Sky
 Background Color: Start: Blue End: Blue
 Sky Conditions: Start: Scattered End: Same
 Wind Speed: Start: 10-15 End: 10-15
 Wind Direction: Start: W End: NE
 Ambient Temp.: Start: 93 End: 93
 Wet Bulb Temp.: _____ RH Percent: 53



Latitude _____ Longitude _____ Declination _____

Additional Information _____

Observer's Name (Print): DASH LOZIMES
 Observer's Signature: [Signature] Date: 10/6/09
 Organization: Air Hygiene Inc.
 Certified by: Eastern Technical Associates Date: 4/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 6 of 6
 Continued on Form Number _____

Company Name Florida Power Light
 Facility Name West County Energy Center
 Street Address 20505 State Road 80
 City Loxatchee State Florida Zip 33470

Observation Date 10/6/09 Time Zone EST Start Time 18:05 End Time 18:35

Process Electricity Production Unit # 1B Operating Mode Normal
 Control Equipment Automation Injection Normal Operating Mode _____

Min	Sec	Time Zone				Comments
		0	15	30	45	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	
5	0	0	0	0	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	0	0	0	0	0	
13	0	0	0	0	0	
14	0	0	0	0	0	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	0	0	0	0	0	
18	0	0	0	0	0	
19	0	0	0	0	0	
20	0	0	0	0	0	
21	0	0	0	0	0	
22	0	0	0	0	0	
23	0	0	0	0	0	
24	0	0	0	0	0	
25	0	0	0	0	0	
26	0	0	0	0	0	
27	0	0	0	0	0	
28	0	0	0	0	0	
29	0	0	0	0	0	
30	0	0	0	0	0	

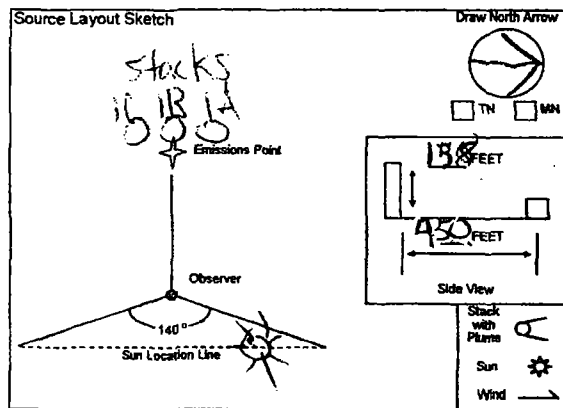
Describe Emissions Point
middle of three stacks

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 138 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 26 End 26

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 24 End 24
 Distance and Direction to Observation Point from Emission Point Start 350 SW End 350 SW
N/D Not Visible

Describe Emissions
 Start N/V End N/V Water Droplet Plume Start None End None
 Emission Color Start N/V End N/V

Describe Plume Background
 Start Blue Sky End Blue Sky Sky Conditions Start Same End Same
 Background Color Start Blue End Blue
 Wind Speed Start 10-15 End 10-15 Wind Direction Start NE End NE
 Ambient Temp. Start 93 End 93 Wet Bulb Temp. RH Percent Start 53 End 53



Observer's Name (Print) DEAN CRIMES
 Observer's Signature _____ Date 10/6/09
 Organization Air Hygiene Inc
 Certified by Eastern Technical Associates Date 4/22/09

Additional Information

CALCULATIONS

EXAMPLE CALCULATIONS (FFACTOR)

RM 19, (07-19-06),
2.0 Summary of Method,
2.1 Emission Rates. Oxygen (O₂) or carbon dioxide (CO₂) concentrations and appropriate F factors (ratios of combustion gas volumes to heat inputs) are used to calculate pollutant emission rates from pollutant concentrations.

RM 19, (07-19-06),
12.2 Emission Rates of PM, SO₂, and NOx. Select from the following sections the applicable procedure to compute the PM, SO₂, or NOx emission rate (E) in lb/MMBtu. The pollutant concentration must be in lb/scf and the F factor must be in scf/MMBtu. If the pollutant concentration (C) is not in the appropriate units, use Table 19-1 in Section 17.0 to make the proper conversion. An F factor is the ratio of the gas volume of the products of combustion to the heat content of the fuel. The dry F factor (F_d) includes all components of combustion less water, the wet F factor (F_w) includes all components of combustion, and the carbon F factor (F_c) includes only carbon dioxide.

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

$$HHV_{dry} (Btu / SCF) = \left[\left(\frac{M\%}{100} \right) \times GCM \right] \quad HHV_{dry} = \frac{96.57\%}{100.00} \times \frac{994.85 \text{ Btu}}{SCF} = \frac{960.72 \text{ Btu}}{SCF}$$

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

$$LHV_{dry} (Btu / SCF) = \left[\left(\frac{M\%}{100} \right) \times NCM \right] \quad LHV_{dry} = \frac{96.57\%}{100.00} \times \frac{895.75 \text{ Btu}}{SCF} = \frac{865.03 \text{ Btu}}{SCF}$$

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

$$HHV_{wet} (Btu / SCF) = \frac{HHV_{dry}}{W / D. \text{ factor}} \quad HHV_{wet} = \frac{988.40 \text{ Btu/SCF}}{1.0236} = 965.61 \text{ Btu/SCF}$$

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

$$LHV_{wet} (Btu / SCF) = \frac{LHV_{dry}}{W / D. \text{ factor}} \quad LHV_{wet} = \frac{890.39 \text{ Btu/SCF}}{1.0236} = 869.86 \text{ Btu/SCF}$$

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

$$CM (lb / lb - mol) = \left[\left(\frac{M\%}{100} \right) \times MW \right] \quad CM = \frac{96.57\%}{100.00} \times \frac{16.04 \text{ lb}}{\text{lb-mol}} = 15.49 \text{ lb/lb-mol}$$

ASTM D 3588

Fuel Molecular Weight (MW_{Fuel})

$$MW_{Fuel} (lb / lb - mol) = \left[\sum (CM) \right] \quad MW_{Fuel} = 15.49 \text{ lb/lb-mol} + 0.38 \text{ lb/lb-mol} + \text{etc.} = 16.652 \text{ lb/lb-mol}$$

Btu per Lb of Gas Gross (GCV)

$$GCV (Btu / lb) = \left[\frac{HHV_{dry} \times G}{MW_{Fuel}} \right] \quad GCV = \frac{988.40 \text{ Btu/SCF} \times 385.23 \text{ ft}^3/\text{lbmol}}{16.652 \text{ lb/lb-mol}} = 22,865.21 \text{ Btu/lb}$$

ASTM D 3588 (SG)

Specific Gravity

$$SG = \left[\frac{MW_{Fuel}}{MW_{AIR}} \right] \quad SG = \frac{16.65 \text{ lb/lb-mol}}{28.96 \text{ lb/lb-mol}} = 0.5750$$

Btu per Lb of Gas Net (NCV)

$$NCV (Btu / lb) = \left[\frac{LHV_{dry} \times G}{MW_{Fuel}} \right] \quad NCV = \frac{890.39 \text{ Btu/SCF} \times 385.23 \text{ ft}^3/\text{lbmol}}{16.652 \text{ lb/lb-mol}} = 20,597.78 \text{ Btu/lb}$$

Weight Percent of Component (C%), methane

$$C\% (\%) = \left[\left(\frac{CM}{MW_{Fuel}} \right) \times 100 \right] \quad C\% = \frac{15.49 \text{ lb/lb-mol}}{16.65 \text{ lb/lb-mol}} \times 100 = 93.04\%$$

RM 19, (07-19-06), **Weight Percent of Volatile Organic Compounds (VOC%)**

$$VOC\% (\%) = \left[\sum_{C_3H_8}^{C_8H_{18}} M\% \right] \quad VOC\% = 0.32\% + 0.07\% + 0.07\% + \text{etc.} = 0.58\%$$

RM 19, (07-19-06), 12.3.2 **Determined F Factors**. If the fuel burned is not listed in Table 19-2 or if the owner or operator chooses to determine an F factor rather than use the values in Table 19-2, use the procedure below: 12.3.2.1 Equations. Use the eq

RM 19, (07-19-6),
12.1 Nomenclature

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

K (scf/lb)/%

H	3.64
C	1.53
S	0.57
N ₂	0.14
O ₂	0.46

$$F_d = \frac{10^6 \text{ Btu}}{\text{MMBtu}} \times \left[\frac{3.64 \text{ SCF}}{\text{lb} \cdot \%} \times 23.95\% + \frac{1.53 \text{ SCF}}{\text{lb} \cdot \%} \times 72.55\% + \frac{0.57 \text{ SCF}}{\text{lb} \cdot \%} \times 0.00\% + \frac{0.14 \text{ SCF}}{\text{lb} \cdot \%} \times 1.96\% - \frac{0.46 \text{ SCF}}{\text{lb} \cdot \%} \times 1.54\% \right] \times \frac{\text{lb}}{22,865.21 \text{ Btu}} = \frac{8,648.59 \text{ SCF}}{\text{MMBtu}}$$

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

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

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

$$RH_{sp} \text{ (lb/lb)} = \left[\left(\frac{gr}{lb} \right) \times \frac{lb}{7000gr} \right] \quad RH_{sp} = \frac{140.97 \text{ gr}}{lb} \times \frac{1 \text{ lb}}{7000 \text{ gr}} = 0.020139 \frac{\text{lb H}_2\text{O}}{\text{lb Air}}$$

Fuel Flow Conversion (Q_f)

Note: Q_f(lb/min) is a value uptained from the source operator.

$$Q_f = \left[Q_f \times G \times \left(\frac{1}{MW_{Fuel}} \right) \right] \quad Q_f = \frac{1,852.67 \text{ lb}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{385.23 \text{ ft}^3}{\text{lb-mol}} \times \frac{\text{lb-mol}}{16.65 \text{ lb}} = 2,571,518 \text{ SCFH}$$

Combustor Inlet Pressure / Compressor Discharge Pressure (CIP / CDP)
(corrected from gauge to atmospheric pres. and conv. to mm Hg.)

Note: CIP / CDP (psig) is a value obtained from the source operator.

$$CIP / CDP = \left[(psig + P) \times \frac{51.71493 \text{ mmHg}}{1 \text{ psi}} \right] \quad CIP / CDP = [266.2 \text{ psig} + 14.6757] \times \frac{51.71493 \text{ mmHg}}{1 \text{ psia}} = 14,524 \text{ mmHg (abs)}$$

Heat Rate (MMBtu/hr)

$$HR = \frac{HHV_{DRY} \times Q_f}{1,000,000} \quad \text{Heat Rate} = \frac{988.40 \text{ Btu}}{\text{SCF}} \times \frac{2,571,518.12 \text{ SCF}}{\text{hr}} \times \frac{\text{MMBtu}}{10^6 \text{ Btu}} = \frac{2,541.70 \text{ MMBtu}}{\text{hr}}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Analyzer Calibration Error

RM 7E, (08-15-06), 12.2 Analyzer Calibration Error. For non-dilution systems, use Equation 7E-1 to calculate the analyzer calibration error for the low-, mid-, and high-level calibration gases. (calc for NO_x analyzer mid gas, if applicable)

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \quad \text{Eq. 7E-1} \quad ACE = \frac{5.08 \text{ ppm} - 4.99 \text{ ppm}}{12.10 \text{ ppm}} \times 100 = 0.74 \%$$

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

RM 25A, (07-19-06), 8.4 Calibration Error Test. Immediately prior to the test series (within 2 hours of the start of the test), introduce zero gas and high-level calibration gas at the calibration valve assembly. Adjust the analyzer output to the appropriate levels, if necessary. Calculate the predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response. Then introduce low-level and mid-level calibration gases successively to the measurement system. ... These differences must be less than 5 percent of the respective calibration gas value. (calc for THC analyzer mid gas, if applicable)

$$E_p = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)} \quad \text{Eq. of a line } y=mx+b \quad E_p = \frac{8.60 \text{ ppm} - 0.00 \text{ ppm}}{8.40 \text{ ppm} - 0.00 \text{ ppm}} \times 4.94 \text{ ppm} + 0.00 = 5.06 \text{ ppm}$$

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \quad \text{Eq. 7E-1} \quad ACE_{THC} = \frac{5.29 \text{ ppm} - 5.06 \text{ ppm}}{4.94 \text{ ppm}} \times 100 = 4.70 \%$$

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

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

System Bias

RM 7E, (08-15-06), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for NOx analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{C_S} \right) \times 100 \quad \text{Eq. 7E-2} \quad SB = \frac{4.93 \text{ ppm} - 5.08 \text{ ppm}}{12.10 \text{ ppm}} \times 100 = -1.24 \%$$

Drift Assessment

RM 7E, (08-15-06), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for NOx analyzer upscale drift, Run 1, if applicable)

$$D = |SB_{final} - SB_i| \quad \text{Eq. 7E-4} \quad D = | -1.32 \% - -1.24 \% | = 0.08 \%$$

Alternative Drift and Bias

RM 7E, (08-15-06), 13.2 / 13.3 System Bias and Drift. Alternatively, the results are acceptable if |Cs - Cdir| is ≤ 0.5 ppmv or if |Cs - Cv| is ≤ 0.5 ppmv (as applicable). (calc for NOx analyzer initial upscale, Run 1, if applicable)

$$SB / D_{Alt} = |C_S - C_{Dir}| \quad \text{Eq. Section 13.2 and 13.3} \quad SB / D_{Alt} = | 4.93 \text{ ppm} - 5.08 \text{ ppm} | = 0.15 \text{ ppm}$$

Bias Adjusted Average

RM 7E, (08-15-06), 12.6 Effluent Gas Concentration. For each test run, calculate Cavg, the arithmetic average of all valid NOx concentration values (e.g., 1-minute averages). Then adjust the value of Cavg for bias, using Equation 7E-5. (calc for NOx analyzer, Run 1, if applicable)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right) \quad \text{Eq. 7E-5} \quad C_{Gas} = \left(2.59 \text{ ppm} - 0.02 \text{ ppm} \right) \times \left(\frac{4.99 \text{ ppm}}{4.93 \text{ ppm} - 0.02 \text{ ppm}} \right) = 2.61 \text{ ppm}$$

EXAMPLE CALCULATIONS (RUNS)

Stack Exhaust Flow (Qs) - RM19

$$Q_s = \left(\frac{FFactor \times Q_f \times HHV}{1,000,000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O_2)}} \right) \quad Q_s = \frac{8,648.59 \text{ SCF}}{\text{MMBtu}} \times \frac{2,571,518.12 \text{ SCF}}{\text{hr}} \times \frac{988.40 \text{ Btu}}{\text{SCF}} \times \frac{\text{MMBtu}}{10^6 \text{ Btu}} \times \left(\frac{20.90\%}{20.9\% - 12.97\%} \right) = 57,942,212.40 \text{ SCFH}$$

Diluent-Corrected Pollutant Concentration, O₂ Based

RM 20, (11-26-02), 7.3.1 Correction of Pollutant Concentration Using O₂ Concentration. Calculate the O₂ corrected pollutant concentration, as follows: (calc for NOx gas, Run 1, if applicable)

$$C_{adj} = C_{Gas(T_{avg})} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O_2)}} \right) \quad \text{Eq. 20-4} \quad C_{adj} = 2.61 \text{ ppm} \times \left(\frac{20.9\% - 15.00\%}{20.9\% - 12.97\%} \right) = 1.94 \text{ ppm@15\%O}_2$$

Diluent-Corrected Polutant Concentration Corrected to ISO Conditions

40CFR60.335(b)(1), Conversion for conc. at ISO Conditions (68°F, 1 atm). Calculate, as follows: (calc for NOx@15% with Run 1 data, if applicable)

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

$$C_{ISO} = 1.94 \text{ ppm@15\%O}_2 \times \sqrt{\frac{266.2 \text{ psig} + 14.69232 \text{ psi}}{0.01933677 \text{ psi/mm Hg}}} \times e^{(19 \times (0.020139 \text{ lb/lb} - 0.00633))} \times \left(\frac{288 \text{ K}}{301 \text{ K}} \right)^{1.53} = 2.36 \text{ ppm@15\% and ISO}$$

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

EXAMPLE CALCULATIONS (RUNS)

Emissions Rate (lb/hr)

Calculation for pound per hour emission rate. Calculate, as follows: (calc for NOx gas Run 1, if applicable)

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G} \qquad E_{lb/hr} = \frac{2.61 \text{ ppm}}{10^6 \text{ ppm/part}} \times \frac{57,942,212 \text{ SCFH} \times 46.01 \text{ lb/lb-mol}}{385.23 \text{ SCF/lb-mol}} = \frac{18.06 \text{ lb}}{\text{hr}}$$

Emissions Rate (ton/year)

Calculation for tons per year emission rate based on 8760 hours per year. Calculate, as follows: (calc for NOx gas Run 1, if applicable)

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000} \qquad E_{ton/yr} = \frac{18.06 \text{ lb}}{\text{hr}} \times \frac{8,760 \text{ hr}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{79.12 \text{ ton}}{\text{year}}$$

Emissions Rate (lb/MMBtu)

RM 19, (07-19-06), 12.2 Emission Rates of PM, SO₂, and NOx. Select from the following sections the applicable procedure to compute the PM, SO₂, or NOx emission rate (E) in ng/J (lb/million Btu). (calc for NOx gas Run 1, if applicable)

Oxygen Based

12.2.1 Oxygen-Based F Factor, Dry Basis. When measurements are on a dry basis for both O₂ (%O₂d) and pollutant (Cd) concentrations, use the following equation:

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d \text{ Factor} \times Conv_c \times 20.9\%}{20.9\% - C_{Gas(O_2)}} \qquad \text{Eq. 19-1}$$

$$E_{lb/MMBtu} = \frac{2.61 \text{ ppm} \times 8,648.59 \text{ SCF/MMBtu} \times 0.0000001194 \text{ lb/ppm} \cdot \text{ft}^3 \times 20.9\%}{20.9\% - 12.97\%} = \frac{0.007 \text{ lb}}{\text{MMBtu}}$$

Conversion Constant

Conv_c for NOx

$$Conv_c (\text{lb} / \text{ppm} \cdot \text{ft}^3) = \frac{MW}{10^6} \qquad Conv_c = \frac{46.01 \text{ lb}}{\text{lb} \cdot \text{mole}} \times \frac{\text{lb} \cdot \text{mole}}{385.23 \text{ SCF}} = \frac{0.0000001194 \text{ lb}}{\text{ppm} \cdot \text{ft}^3}$$

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

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

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

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

P_i = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H₂O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

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

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
 B_{va} = Moisture fraction of ambient air, percent.
 Btu = British thermal unit
 $\%_C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
 $\%_{CO_2d}, \%_{CO_2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
 CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
 E = Pollutant emission rate, ng/J (lb/million Btu).
 E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
 E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
 E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
 E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
 E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
 E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
 E_d = Average pollutant rate for each sampling period (e.g., 24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu).
 E_{di} = Average inlet SO₂ rate for each sampling period d, ng/J (lb/million Btu).
 E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
 E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O₂.
 E_{jo}, E_{ji} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O₂.
 E_h = Hourly average pollutant, ng/J (lb/million Btu).
 E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O₂.
 EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
 Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
 F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scf/million Btu).
 ft^3 = cubic feet
 G = ideal gas conversion factor
 (385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
 GCM = gross Btu per SCF (constant, compound based)
 GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
 GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
 $\%_H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
 H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
 H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
 $\%_{H_2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
 H_t = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
 K = volume of combustion component per pound of component (constant)
 $K =$ Conversion factor, 10^{-5} (kJ/J)/(%) [10^8 Btu/million Btu].
 $K_c = (9.57 \text{ scm/kg})/\% [(1.53 \text{ scf/lb})/\%]$.
 $K_{cc} = (2.0 \text{ scm/kg})/\% [(0.321 \text{ scf/lb})/\%]$.
 $K_{hd} = (22.7 \text{ scm/kg})/\% [(3.64 \text{ scf/lb})/\%]$.
 $K_{hw} = (34.74 \text{ scm/kg})/\% [(5.57 \text{ scf/lb})/\%]$.
 $K_n = (0.86 \text{ scm/kg})/\% [(0.14 \text{ scf/lb})/\%]$.
 $K_o = (2.85 \text{ scm/kg})/\% [(0.46 \text{ scf/lb})/\%]$.
 $K_s = (3.54 \text{ scm/kg})/\% [(0.57 \text{ scf/lb})/\%]$.
 $K_{sulfur} = 2 \times 10^4 \text{ Btu/wt}\% \text{-MMBtu}$
 $K_w = (1.30 \text{ scm/kg})/\% [(0.21 \text{ scf/lb})/\%]$.
 lb = pound
 ln = Natural log of indicated value.
 L_p, L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
 $\%_N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
 $M\%$ = mole percent
 mol = mole
 MW = molecular weight (lb/lb-mol)
 $MW_{AIR} =$ molecular weight of air (28.9625 lb/lb-mole)¹
 NCM = net Btu per SCF (constant based on compound)
 $\%_O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
 $\%_{O_2d}, \%_{O_2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
 P_B = barometric pressure, in Hg
 P_s = Potential SO₂ emissions, percent.
 $\%_S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
 S_d = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
 $\%_{Sf}$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
 $S(w\%)$ = weight percent of sulfur, per lab analysis by appropriate ASTM standard
 S_d = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
 S_d = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
 $\%S_p, \%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
 SCF = standard cubic feet
 SH = specific humidity, pounds of water per pound of air
 $t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
 T_{amb} = ambient temperature, °F
 W/D Factor = 1.0236 = conv. at 14.696 psia and
 68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
 X_{CO_2} = CO₂ Correction factor, percent.
 X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

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

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

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

ASTM D 3588

Molecular Weight of NOx (lb/lb-mole) = 46.01
 Molecular Weight of CO (lb/lb-mole) = 28.00
 Molecular Weight of SO₂ (lb/lb-mole) = 64.00
 Molecular Weight of THC (propane) (lb/lb-mole) = 44.00
 Molecular Weight of VOC (methane) (lb/lb-mole) = 16.00
 Molecular Weight of NH₃ (lb/lb-mole) = 17.03
 Molecular Weight of HCHO (lb/lb-mole) = 30.03

40CFR60, App. A, RM 19, Table 19-1

Conversion Constant for NOx = 0.0000001194351
 Conversion Constant for CO = 0.000000726839
 Conversion Constant for SO₂ = 0.0000001661345
 Conversion Constant for THC = 0.0000001142175
 Conversion Constant for VOC (methane) = 0.0000000415336
 Conversion Constant for NH₃ = 0.0000000442074
 Conversion Constant for HCHO = 0.0000000779534

NOTE: units are lb/ppm*ft³

Formulas:

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

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

5. Emission Rate in lb/hr

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

2. Correction to % O₂, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(T\ arg\ et)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O_2)}} \right)$$

6. Emission Rate in tons per year

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

3. Correction to % O₂ and ISO Conditions

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

7. Emission Concentration in lb/MMBtu (O₂ based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O_2)}}$$

4. Method 19 stack exhaust flow (scfh)

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1,000,000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O_2)}} \right)$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp-hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1314.022} \text{ OR } \frac{E_{lb/hr} \times 453.6}{hp}$$

APPENDIX B
UNIT OPERATION PARAMETERS

Florida Power and Light

Air Permit # :	PSD-FL-354
Plant Name or Location:	West County Energy Center
Date:	October 6-7, 2009
Project Number:	bv-09-westcounty.fl-comp#1
Manufacturer & Equipment:	Mitsubishi
Model:	501G
Unit Number:	1B
Test Load:	Base with and without Duct Burners
Tester(s) / Test Unit(s):	JRF/TP 210

	UNITS	RUN					
		1-1	1-2	1-3	2-1	2-2	2-3
Start Time	hh:mm:ss	08:23:28	10:00:28	11:30:28	15:21:28	16:45:28	18:00:28
End Time	hh:mm:ss	09:22:58	10:59:58	12:29:58	16:20:58	17:44:58	18:59:58
Bar. Pressure	in. Hg	29.88	29.94	29.97	29.83	29.80	29.80
Amb. Temp.	°F	82	85	93	96	94	93
Rel. Humidity	%	85	78	62	47	53	53
Spec. Humidity	lb water / lb air	0.020139	0.020321	0.020776	0.017259	0.018352	0.017778
Date	mm/dd/yy	10/07/09	10/07/09	10/07/09	10/06/09	10/06/09	10/06/09
Avg. Stack Temp.	°F	184	184	184	180	179	180
Comb. Inlet Pres.	psig	266.2	265.1	265.1	264.1	263.8	263.2
Turbine Fuel Flow	lb/min	1,853	1,848	1,844	1,641	1,641	1,637
Duct Burner Fuel Flow	lb/min	0	0	0	198	198	198
Total Fuel Flow	SCFH	2,571,518	2,564,809	2,559,951	2,551,392	2,551,392	2,547,228
Stack Moisture	% Method 4	10.4	10.4	9.9	10.0	11.6	11.5
Power Output	megawatts	250.0	248.6	248.6	247.7	247.3	246.6

UNIT OPERATION PARAMETERS

Base Load

Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
psig	KPPH	KPPH	MW

06-Oct-09 15:21:28	263.92	98.34	11.86	247.59
06-Oct-09 15:22:28	264.00	98.35	11.86	247.43
06-Oct-09 15:23:28	264.12	98.31	11.84	247.46
06-Oct-09 15:24:28	264.20	98.24	11.85	247.55
06-Oct-09 15:25:28	264.21	98.79	11.84	247.86
06-Oct-09 15:26:28	264.26	98.14	11.83	247.59
06-Oct-09 15:27:28	264.15	98.65	11.83	247.76
06-Oct-09 15:28:28	264.08	98.77	11.83	247.69
06-Oct-09 15:29:28	264.13	98.02	11.83	247.95
06-Oct-09 15:30:28	264.26	98.00	11.83	247.80
06-Oct-09 15:31:28	264.43	98.51	11.84	247.89
06-Oct-09 15:32:28	264.47	98.60	11.83	247.99
06-Oct-09 15:33:28	264.13	98.34	11.84	247.85
06-Oct-09 15:34:28	264.03	98.40	11.83	247.03
06-Oct-09 15:35:28	264.09	98.55	11.84	247.63
06-Oct-09 15:36:28	263.96	98.11	11.87	247.59
06-Oct-09 15:37:28	263.93	97.66	11.90	247.29
06-Oct-09 15:38:28	263.96	97.91	11.93	247.59
06-Oct-09 15:39:28	264.07	98.24	11.95	247.11
06-Oct-09 15:40:28	264.21	98.17	11.96	248.02
06-Oct-09 15:41:28	264.07	98.54	11.97	247.72
06-Oct-09 15:42:28	264.17	98.02	11.98	247.75
06-Oct-09 15:43:28	264.35	98.17	11.97	247.81
06-Oct-09 15:44:28	264.30	98.23	11.97	248.29
06-Oct-09 15:45:28	264.23	98.33	11.99	247.99
06-Oct-09 15:46:28	264.05	98.31	11.97	247.84
06-Oct-09 15:47:28	263.95	98.50	11.97	247.51
06-Oct-09 15:48:28	263.89	98.73	11.97	247.73
06-Oct-09 15:49:28	263.80	98.29	11.96	247.60
06-Oct-09 15:50:28	264.14	97.79	11.95	247.33
06-Oct-09 15:51:28	264.29	98.18	11.95	247.78
06-Oct-09 15:52:28	264.11	97.99	11.93	247.97
06-Oct-09 15:53:28	264.10	98.78	11.93	247.40
06-Oct-09 15:54:28	264.05	98.72	11.93	247.79
06-Oct-09 15:55:28	264.13	98.20	11.93	247.49
06-Oct-09 15:56:28	264.03	98.24	11.93	248.09
06-Oct-09 15:57:28	264.00	98.42	11.93	247.49
06-Oct-09 15:58:28	264.09	97.96	11.92	247.74
06-Oct-09 15:59:28	264.15	98.57	11.91	247.87
06-Oct-09 16:00:28	264.10	98.38	11.91	247.59
06-Oct-09 16:01:28	264.15	98.49	11.90	247.86
06-Oct-09 16:02:28	264.15	98.81	11.89	247.65
06-Oct-09 16:03:28	264.01	98.92	11.89	247.85
06-Oct-09 16:04:28	263.90	98.03	11.88	247.23
06-Oct-09 16:05:28	264.18	98.30	11.86	247.56
06-Oct-09 16:06:28	264.29	98.42	11.84	248.18
06-Oct-09 16:07:28	264.03	98.89	11.84	247.77
06-Oct-09 16:08:28	263.94	98.63	11.83	247.52
06-Oct-09 16:09:28	264.04	98.47	11.80	247.56
06-Oct-09 16:10:28	264.23	98.85	11.79	247.92
06-Oct-09 16:11:28	264.02	98.64	11.77	247.94
06-Oct-09 16:12:28	263.89	98.84	11.76	247.59
06-Oct-09 16:13:28	263.85	98.26	11.75	247.49
06-Oct-09 16:14:28	263.80	98.88	11.74	247.56
06-Oct-09 16:15:28	263.90	98.60	11.73	247.46
06-Oct-09 16:16:28	264.07	98.96	11.72	247.65
06-Oct-09 16:17:28	264.08	98.74	11.69	247.77
06-Oct-09 16:18:28	264.08	99.00	11.68	247.68
06-Oct-09 16:19:28	264.09	99.03	11.66	247.71
06-Oct-09 16:20:28	264.07	98.88	11.65	247.69
Average	264.09	98.43	11.86	247.68

	Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
	psig	KPPH	KPPH	MW
06-Oct-09 16:45:28	263.65	98.04	11.81	247.02
06-Oct-09 16:46:28	263.65	98.10	11.82	247.20
06-Oct-09 16:47:28	263.58	98.42	11.82	246.86
06-Oct-09 16:48:28	263.65	98.78	11.83	247.31
06-Oct-09 16:49:28	263.64	98.49	11.84	247.18
06-Oct-09 16:50:28	263.68	98.09	11.84	247.12
06-Oct-09 16:51:28	263.73	98.47	11.84	247.14
06-Oct-09 16:52:28	263.76	98.52	11.85	247.41
06-Oct-09 16:53:28	263.64	98.89	11.84	247.47
06-Oct-09 16:54:28	263.58	98.47	11.85	247.21
06-Oct-09 16:55:28	263.52	98.07	11.85	246.90
06-Oct-09 16:56:28	263.75	98.33	11.85	247.11
06-Oct-09 16:57:28	263.92	98.10	11.85	247.51
06-Oct-09 16:58:28	264.14	98.30	11.85	247.22
06-Oct-09 16:59:28	264.18	98.76	11.85	248.02
06-Oct-09 17:00:28	264.07	98.82	11.85	247.66
06-Oct-09 17:01:28	263.91	98.97	11.85	247.57
06-Oct-09 17:02:28	263.77	98.18	11.86	247.54
06-Oct-09 17:03:28	263.75	98.66	11.86	247.05
06-Oct-09 17:04:28	263.78	98.43	11.85	247.35
06-Oct-09 17:05:28	263.84	98.34	11.85	247.25
06-Oct-09 17:06:28	263.92	98.54	11.84	247.31
06-Oct-09 17:07:28	263.88	98.34	11.85	247.37
06-Oct-09 17:08:28	263.90	98.34	11.85	247.34
06-Oct-09 17:09:28	263.80	98.57	11.85	247.45
06-Oct-09 17:10:28	263.79	98.32	11.86	247.21
06-Oct-09 17:11:28	263.72	98.23	11.85	247.33
06-Oct-09 17:12:28	263.57	98.46	11.86	247.27
06-Oct-09 17:13:28	263.44	98.40	11.86	246.91
06-Oct-09 17:14:28	263.60	98.19	11.87	246.77
06-Oct-09 17:15:28	263.73	98.52	11.86	247.16
06-Oct-09 17:16:28	263.68	98.71	11.86	247.28
06-Oct-09 17:17:28	263.73	98.85	11.87	247.07
06-Oct-09 17:18:28	263.79	98.59	11.86	247.21
06-Oct-09 17:19:28	263.90	98.42	11.86	246.98
06-Oct-09 17:20:28	264.02	98.42	11.88	247.73
06-Oct-09 17:21:28	263.83	98.74	11.87	247.61
06-Oct-09 17:22:28	263.80	97.90	11.87	247.22
06-Oct-09 17:23:28	263.74	98.13	11.87	247.29
06-Oct-09 17:24:28	263.70	98.47	11.87	247.24
06-Oct-09 17:25:28	263.86	98.07	11.86	247.05
06-Oct-09 17:26:28	263.87	98.52	11.88	247.30
06-Oct-09 17:27:28	263.80	98.10	11.87	247.52
06-Oct-09 17:28:28	263.73	98.57	11.87	247.42
06-Oct-09 17:29:28	263.74	98.11	11.87	247.05
06-Oct-09 17:30:28	263.73	98.59	11.87	247.29
06-Oct-09 17:31:28	263.88	98.33	11.87	247.26
06-Oct-09 17:32:28	264.15	98.37	11.88	247.58
06-Oct-09 17:33:28	264.21	98.47	11.86	247.64
06-Oct-09 17:34:28	264.12	98.47	11.86	248.05
06-Oct-09 17:35:28	264.03	98.20	11.87	247.56
06-Oct-09 17:36:28	264.04	98.69	11.86	247.62
06-Oct-09 17:37:28	264.01	98.45	11.85	247.65
06-Oct-09 17:38:28	263.86	98.89	11.87	247.38
06-Oct-09 17:39:28	263.83	98.07	11.87	247.35
06-Oct-09 17:40:28	263.93	98.60	11.87	247.25
06-Oct-09 17:41:28	264.01	98.38	11.87	247.55
06-Oct-09 17:42:28	264.03	98.45	11.88	247.42
06-Oct-09 17:43:28	264.02	98.47	11.88	247.49
06-Oct-09 17:44:28	264.00	98.63	11.87	247.56
Average	263.83	98.43	11.86	247.33

Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
psig	KPPH	KPPH	MW

06-Oct-09 18:00:28	264.08	98.37	11.86	247.56
06-Oct-09 18:01:28	264.05	98.49	11.86	247.34
06-Oct-09 18:02:28	264.11	98.77	11.86	247.46
06-Oct-09 18:03:28	264.04	98.60	11.87	247.81
06-Oct-09 18:04:28	263.99	98.48	11.88	247.43
06-Oct-09 18:05:28	263.82	98.55	11.88	247.51
06-Oct-09 18:06:28	263.67	98.40	11.87	247.24
06-Oct-09 18:07:28	263.66	98.75	11.87	247.10
06-Oct-09 18:08:28	263.54	98.22	11.87	247.17
06-Oct-09 18:09:28	263.62	98.53	11.87	246.91
06-Oct-09 18:10:28	263.70	98.26	11.87	247.38
06-Oct-09 18:11:28	263.79	98.44	11.87	247.19
06-Oct-09 18:12:28	263.63	98.46	11.88	247.32
06-Oct-09 18:13:28	263.35	98.36	11.87	246.90
06-Oct-09 18:14:28	263.18	98.07	11.88	246.58
06-Oct-09 18:15:28	262.99	97.78	11.88	246.16
06-Oct-09 18:16:28	262.89	98.49	11.88	246.22
06-Oct-09 18:17:28	262.84	98.28	11.89	246.37
06-Oct-09 18:18:28	262.77	97.87	11.89	245.97
06-Oct-09 18:19:28	262.75	98.17	11.90	245.67
06-Oct-09 18:20:28	262.83	98.12	11.90	245.96
06-Oct-09 18:21:28	262.82	97.99	11.91	246.12
06-Oct-09 18:22:28	262.88	98.13	11.91	246.20
06-Oct-09 18:23:28	263.00	98.50	11.90	246.28
06-Oct-09 18:24:28	262.83	98.48	11.91	246.21
06-Oct-09 18:25:28	262.64	97.99	11.92	245.92
06-Oct-09 18:26:28	262.63	98.10	11.92	245.80
06-Oct-09 18:27:28	262.77	97.87	11.92	246.04
06-Oct-09 18:28:28	262.92	98.03	11.92	246.03
06-Oct-09 18:29:28	262.99	98.22	11.91	246.09
06-Oct-09 18:30:28	263.03	98.15	11.92	246.42
06-Oct-09 18:31:28	262.89	97.95	11.92	246.25
06-Oct-09 18:32:28	262.87	97.98	11.91	246.11
06-Oct-09 18:33:28	263.01	98.14	11.90	246.33
06-Oct-09 18:34:28	262.97	98.09	11.90	246.34
06-Oct-09 18:35:28	263.36	98.09	11.90	246.16
06-Oct-09 18:36:28	263.60	98.24	11.89	246.57
06-Oct-09 18:37:28	263.62	98.39	11.88	247.00
06-Oct-09 18:38:28	263.32	98.49	11.88	246.95
06-Oct-09 18:39:28	263.31	97.74	11.89	246.54
06-Oct-09 18:40:28	263.29	98.21	11.87	246.59
06-Oct-09 18:41:28	263.33	98.34	11.87	246.84
06-Oct-09 18:42:28	263.24	98.21	11.87	246.62
06-Oct-09 18:43:28	263.30	98.10	11.87	246.62
06-Oct-09 18:44:28	263.22	98.50	11.88	246.81
06-Oct-09 18:45:28	262.99	98.41	11.87	246.75
06-Oct-09 18:46:28	262.82	97.83	11.88	246.34
06-Oct-09 18:47:28	262.99	98.38	11.87	246.25
06-Oct-09 18:48:28	262.96	98.12	11.89	246.31
06-Oct-09 18:49:28	263.13	97.80	11.89	246.11
06-Oct-09 18:50:28	263.09	98.30	11.89	246.43
06-Oct-09 18:51:28	263.00	98.06	11.89	246.50
06-Oct-09 18:52:28	262.95	98.03	11.89	246.22
06-Oct-09 18:53:28	262.93	97.98	11.89	246.25
06-Oct-09 18:54:28	263.06	97.99	11.90	246.10
06-Oct-09 18:55:28	262.79	98.06	11.90	246.38
06-Oct-09 18:56:28	262.93	97.83	11.90	245.90
06-Oct-09 18:57:28	263.13	96.44	11.91	246.01
06-Oct-09 18:58:28	263.30	97.89	11.91	246.51
06-Oct-09 18:59:28	263.22	100.76	11.90	246.63
Average	263.21	98.22	11.89	246.55

UNIT OPERATION PARAMETERS

Base Load with Duct Burners

	Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
	psig	KPPH	KPPH	MW
07-Oct-09 08:23:28	265.96	109.84	0.00	249.17
07-Oct-09 08:24:28	266.24	112.45	0.00	250.28
07-Oct-09 08:25:28	266.02	112.17	0.00	250.11
07-Oct-09 08:26:28	266.13	110.78	0.00	249.69
07-Oct-09 08:27:28	266.08	111.76	0.00	250.31
07-Oct-09 08:28:28	265.99	110.59	0.00	249.58
07-Oct-09 08:29:28	266.16	111.97	0.00	250.21
07-Oct-09 08:30:28	265.90	112.12	0.00	249.88
07-Oct-09 08:31:28	266.12	110.36	0.00	249.38
07-Oct-09 08:32:28	266.30	111.91	0.00	250.20
07-Oct-09 08:33:28	266.08	110.80	0.00	249.67
07-Oct-09 08:34:28	266.11	111.22	0.00	249.99
07-Oct-09 08:35:28	266.29	111.93	0.00	250.03
07-Oct-09 08:36:28	266.15	112.64	0.00	250.22
07-Oct-09 08:37:28	266.02	112.46	0.00	249.93
07-Oct-09 08:38:28	265.98	111.11	0.00	249.69
07-Oct-09 08:39:28	266.02	112.39	0.00	250.00
07-Oct-09 08:40:28	265.96	111.29	0.00	249.35
07-Oct-09 08:41:28	266.22	111.18	0.00	249.89
07-Oct-09 08:42:28	266.39	111.77	0.00	250.39
07-Oct-09 08:43:28	266.10	109.98	0.00	249.70
07-Oct-09 08:44:28	266.38	110.08	0.00	250.05
07-Oct-09 08:45:28	266.18	111.69	0.00	250.36
07-Oct-09 08:46:28	266.02	109.95	0.00	249.88
07-Oct-09 08:47:28	266.28	111.10	0.00	249.96
07-Oct-09 08:48:28	266.36	111.96	0.00	250.22
07-Oct-09 08:49:28	266.12	110.34	0.00	249.86
07-Oct-09 08:50:28	266.17	110.48	0.00	249.97
07-Oct-09 08:51:28	266.26	111.80	0.00	250.49
07-Oct-09 08:52:28	266.23	110.09	0.00	250.11
07-Oct-09 08:53:28	266.37	110.88	0.00	250.07
07-Oct-09 08:54:28	266.42	112.67	0.00	250.63
07-Oct-09 08:55:28	266.28	111.55	0.00	250.13
07-Oct-09 08:56:28	266.27	110.02	0.00	249.87
07-Oct-09 08:57:28	266.37	111.11	0.00	250.28
07-Oct-09 08:58:28	266.39	111.52	0.00	250.38
07-Oct-09 08:59:28	266.20	110.57	0.00	249.91
07-Oct-09 09:00:28	266.14	110.07	0.00	249.58
07-Oct-09 09:01:28	266.41	110.25	0.00	249.91
07-Oct-09 09:02:28	266.40	111.04	0.00	250.48
07-Oct-09 09:03:28	266.34	111.78	0.00	250.51
07-Oct-09 09:04:28	266.06	110.35	0.00	249.80
07-Oct-09 09:05:28	266.17	110.01	0.00	249.34
07-Oct-09 09:06:28	266.36	112.84	0.00	250.91
07-Oct-09 09:07:28	266.29	112.42	0.00	250.39
07-Oct-09 09:08:28	266.17	111.39	0.00	250.28
07-Oct-09 09:09:28	266.17	111.44	0.00	250.18
07-Oct-09 09:10:28	266.05	112.50	0.00	250.26
07-Oct-09 09:11:28	265.98	110.15	0.00	249.60
07-Oct-09 09:12:28	266.26	110.52	0.00	249.57
07-Oct-09 09:13:28	266.33	111.25	0.00	250.07
07-Oct-09 09:14:28	266.18	110.38	0.00	250.30
07-Oct-09 09:15:28	266.15	110.57	0.00	250.26
07-Oct-09 09:16:28	266.22	111.78	0.00	250.06
07-Oct-09 09:17:28	266.27	111.42	0.00	250.11
07-Oct-09 09:18:28	266.21	111.43	0.00	250.00
07-Oct-09 09:19:28	266.20	110.72	0.00	250.07
07-Oct-09 09:20:28	266.09	110.69	0.00	250.10
07-Oct-09 09:21:28	266.03	110.31	0.00	249.71
07-Oct-09 09:22:28	265.89	109.50	0.00	249.37
Average	266.18	111.16	0.00	250.01

	Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
	psig	KPPH	KPPH	MW
07-Oct-09 10:00:28	265.27	111.66	0.00	249.48
07-Oct-09 10:01:28	265.14	110.75	0.00	248.92
07-Oct-09 10:02:28	265.13	111.41	0.00	248.95
07-Oct-09 10:03:28	265.28	111.47	0.00	249.13
07-Oct-09 10:04:28	265.32	112.00	0.00	249.03
07-Oct-09 10:05:28	265.38	111.00	0.00	248.99
07-Oct-09 10:06:28	265.27	111.46	0.00	249.02
07-Oct-09 10:07:28	265.45	110.73	0.00	248.90
07-Oct-09 10:08:28	265.32	111.57	0.00	249.07
07-Oct-09 10:09:28	265.28	112.14	0.00	249.38
07-Oct-09 10:10:28	264.89	110.77	0.00	247.69
07-Oct-09 10:11:28	264.82	114.80	0.00	249.05
07-Oct-09 10:12:28	264.98	113.02	0.00	248.79
07-Oct-09 10:13:28	265.06	110.14	0.00	248.18
07-Oct-09 10:14:28	265.07	110.69	0.00	248.72
07-Oct-09 10:15:28	265.04	111.02	0.00	248.47
07-Oct-09 10:16:28	265.00	110.52	0.00	248.47
07-Oct-09 10:17:28	265.09	112.32	0.00	248.92
07-Oct-09 10:18:28	264.97	110.39	0.00	248.95
07-Oct-09 10:19:28	264.94	111.49	0.00	248.49
07-Oct-09 10:20:28	264.92	109.54	0.00	248.47
07-Oct-09 10:21:28	264.88	109.99	0.00	248.21
07-Oct-09 10:22:28	264.77	110.49	0.00	248.10
07-Oct-09 10:23:28	264.85	110.64	0.00	248.49
07-Oct-09 10:24:28	264.94	110.56	0.00	248.11
07-Oct-09 10:25:28	265.08	109.19	0.00	248.72
07-Oct-09 10:26:28	265.19	110.35	0.00	248.44
07-Oct-09 10:27:28	265.04	110.94	0.00	248.68
07-Oct-09 10:28:28	265.12	111.73	0.00	248.67
07-Oct-09 10:29:28	265.02	110.59	0.00	248.33
07-Oct-09 10:30:28	265.01	110.81	0.00	248.41
07-Oct-09 10:31:28	264.95	110.76	0.00	248.24
07-Oct-09 10:32:28	264.98	110.77	0.00	248.24
07-Oct-09 10:33:28	264.88	110.73	0.00	248.40
07-Oct-09 10:34:28	264.91	110.62	0.00	248.27
07-Oct-09 10:35:28	265.06	110.64	0.00	247.96
07-Oct-09 10:36:28	265.16	111.02	0.00	248.64
07-Oct-09 10:37:28	264.92	110.56	0.00	248.60
07-Oct-09 10:38:28	264.89	110.36	0.00	248.52
07-Oct-09 10:39:28	265.09	110.40	0.00	248.27
07-Oct-09 10:40:28	265.06	110.51	0.00	248.16
07-Oct-09 10:41:28	265.01	110.71	0.00	248.45
07-Oct-09 10:42:28	264.85	110.30	0.00	248.05
07-Oct-09 10:43:28	264.95	110.61	0.00	248.08
07-Oct-09 10:44:28	265.12	110.13	0.00	248.40
07-Oct-09 10:45:28	265.09	110.74	0.00	248.63
07-Oct-09 10:46:28	265.14	110.83	0.00	248.67
07-Oct-09 10:47:28	265.04	110.78	0.00	248.69
07-Oct-09 10:48:28	264.99	110.94	0.00	248.38
07-Oct-09 10:49:28	264.88	110.44	0.00	248.45
07-Oct-09 10:50:28	265.04	110.40	0.00	248.53
07-Oct-09 10:51:28	265.11	110.66	0.00	248.94
07-Oct-09 10:52:28	265.18	110.60	0.00	248.44
07-Oct-09 10:53:28	265.15	110.74	0.00	248.34
07-Oct-09 10:54:28	264.98	110.56	0.00	248.73
07-Oct-09 10:55:28	265.19	110.58	0.00	248.36
07-Oct-09 10:56:28	265.23	110.83	0.00	248.89
07-Oct-09 10:57:28	265.26	110.39	0.00	248.70
07-Oct-09 10:58:28	265.19	110.89	0.00	248.97
07-Oct-09 10:59:28	265.13	110.72	0.00	248.53
Average	265.07	110.87	0.00	248.58

Combustor Inlet Pressure B	CT B Gas Flow	DB B Gas Flow	CT B Load
psig	KPPH	KPPH	MW

07-Oct-09 11:30:28	265.10	110.52	0.00	248.86
07-Oct-09 11:31:28	265.03	110.31	0.00	248.26
07-Oct-09 11:32:28	264.98	110.93	0.00	248.38
07-Oct-09 11:33:28	265.04	110.39	0.00	248.22
07-Oct-09 11:34:28	264.92	110.63	0.00	248.46
07-Oct-09 11:35:28	264.95	110.46	0.00	248.30
07-Oct-09 11:36:28	264.95	110.73	0.00	248.44
07-Oct-09 11:37:28	264.97	110.76	0.00	248.30
07-Oct-09 11:38:28	265.02	110.70	0.00	248.10
07-Oct-09 11:39:28	265.10	110.52	0.00	248.78
07-Oct-09 11:40:28	265.17	110.44	0.00	248.68
07-Oct-09 11:41:28	265.23	110.89	0.00	248.78
07-Oct-09 11:42:28	265.28	110.25	0.00	248.75
07-Oct-09 11:43:28	265.01	110.77	0.00	248.56
07-Oct-09 11:44:28	265.15	110.83	0.00	248.57
07-Oct-09 11:45:28	265.36	110.49	0.00	248.71
07-Oct-09 11:46:28	265.42	110.59	0.00	248.92
07-Oct-09 11:47:28	265.35	110.79	0.00	248.98
07-Oct-09 11:48:28	265.24	110.97	0.00	248.96
07-Oct-09 11:49:28	265.23	110.88	0.00	248.69
07-Oct-09 11:50:28	265.17	110.36	0.00	248.41
07-Oct-09 11:51:28	265.18	110.69	0.00	248.88
07-Oct-09 11:52:28	265.17	110.63	0.00	248.77
07-Oct-09 11:53:28	265.16	110.91	0.00	248.60
07-Oct-09 11:54:28	265.02	111.23	0.00	248.72
07-Oct-09 11:55:28	265.01	110.81	0.00	248.32
07-Oct-09 11:56:28	265.08	110.90	0.00	248.68
07-Oct-09 11:57:28	265.10	110.12	0.00	248.62
07-Oct-09 11:58:28	265.16	110.41	0.00	248.68
07-Oct-09 11:59:28	264.93	110.11	0.00	248.43
07-Oct-09 12:00:28	264.90	110.64	0.00	248.33
07-Oct-09 12:01:28	264.77	110.66	0.00	248.29
07-Oct-09 12:02:28	264.72	110.28	0.00	248.19
07-Oct-09 12:03:28	264.61	110.14	0.00	248.11
07-Oct-09 12:04:28	264.85	110.76	0.00	248.08
07-Oct-09 12:05:28	265.00	110.85	0.00	248.80
07-Oct-09 12:06:28	264.87	110.54	0.00	248.27
07-Oct-09 12:07:28	264.74	110.93	0.00	248.25
07-Oct-09 12:08:28	264.74	110.88	0.00	248.27
07-Oct-09 12:09:28	264.77	110.29	0.00	247.88
07-Oct-09 12:10:28	264.83	110.55	0.00	248.00
07-Oct-09 12:11:28	265.04	110.41	0.00	248.11
07-Oct-09 12:12:28	265.26	110.49	0.00	248.63
07-Oct-09 12:13:28	265.10	110.78	0.00	248.74
07-Oct-09 12:14:28	265.06	111.04	0.00	248.94
07-Oct-09 12:15:28	265.18	111.09	0.00	248.60
07-Oct-09 12:16:28	265.19	110.63	0.00	248.56
07-Oct-09 12:17:28	265.22	110.14	0.00	248.91
07-Oct-09 12:18:28	265.14	110.25	0.00	248.65
07-Oct-09 12:19:28	265.33	111.06	0.00	248.82
07-Oct-09 12:20:28	265.54	111.19	0.00	249.21
07-Oct-09 12:21:28	265.48	110.94	0.00	249.57
07-Oct-09 12:22:28	265.50	110.41	0.00	248.98
07-Oct-09 12:23:28	265.65	110.81	0.00	249.09
07-Oct-09 12:24:28	265.39	111.38	0.00	249.44
07-Oct-09 12:25:28	265.10	111.08	0.00	248.94
07-Oct-09 12:26:28	264.94	110.63	0.00	248.62
07-Oct-09 12:27:28	264.99	110.54	0.00	248.45
07-Oct-09 12:28:28	265.08	110.35	0.00	248.41
07-Oct-09 12:29:28	265.01	110.59	0.00	248.35
Average	265.09	110.66	0.00	248.59

APPENDIX C

CALIBRATION GAS CERTIFICATIONS



CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2 Procedure: G-1

Cylinder Number: CC54452

Customer: AIR HYGIENE
P.O. Number: 9021401
Item Number: SGZCAH094
Notes:
File Name: 326407864E
Assay Date: 17-Mar-09

Shipping Order #: 32650786
Transfer #: 32640786
LOT #: LPX249096
Valve: CGA590
Cyl. Pressure*: 1900psig

Expiration Date: 16-Mar-12

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Carbon Dioxide	9 %	9.20 ±0.17 %
Oxygen	12 %	12.0 ±0.1 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS105	GMIS105	8.02	%	0.05	CO2	N2	AL-0105	10/27/2010	N.A.
SRM128	2658a	9.397	%	0.049	O2	N2	CAL014583	7/1/2011	72-C-45

Analysis Information:

Component 1: Carbon Dioxide		First Triad Analysis On: 3/16/2009				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	KVB/Analect	Zero	0.18	0.28	0.20	Zero			
Model Number:	EN3024	Reference	7.82	7.58	7.66	Reference			
Serial Number:	3024	Candidate	8.75	8.60	8.78	Candidate			
Analytical Principle:	FTIR	Result	9.25	9.09	9.28	Result			
MPC Calibrated:	02/18/09	Mean Result:			9.20	Mean Result:			

Component 2: Oxygen		First Triad Analysis On: 3/17/2009				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	Servomex	Zero	0.02	0.01	0.02	Zero			
Model Number:	4605C	Reference	9.30	9.31	9.31	Reference			
Serial Number:	1101	Candidate	11.84	11.84	11.85	Candidate			
Analytical Principle:	Paramag.	Result	11.96	11.96	11.97	Result			
MPC Calibrated:	02/24/09	Mean Result:			11.96	Mean Result:			

Analyst Signature: M. Adnane

Calculated by: M. Adnane



CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2 Procedure: G-1

Cylinder Number: **AL-2533**

Customer: AIR HYGIENE
P.O. Number: 110207
Item Number: SGZCAH095
Notes:

Shipping Order #: 27432766
Transfer #: 27432766
LOT #: LPX229603
Valve: CGA590
Cyl. Pressure:* 1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 16-Nov-07

Expiration Date: 15-Nov-10

Component	Requested Concentration	Assay Concentration
Carbon Dioxide	19 %	19.3 ±0.1 %
Oxygen	21 %	20.9 ±0.2 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS327	GMIS327	14.05	%	0.06	CO2	N2	CC180047	7/24/2008	N.A.
GMIS355	GMIS355	10.0	%	0.1	O2	N2	CC180358	4/14/2009	N.A.

Analysis Information:

Component 1: Carbon Dioxide		First Triad Analysis On: 11/9/2007				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	KVB/Analect								
Model Number:	EN3024	Zero	0.29	0.30	0.31	Zero			
Serial Number:	3024	Reference	16.07	16.08	16.17	Reference			
Analytical Principle:	FTIR	Candidate	21.93	22.11	21.98	Candidate			
MPC Calibrated:	10/11/07	Result	19.22	19.38	19.27	Result			
		Mean Result:			19.29	Mean Result:			

Component 2: Oxygen		First Triad Analysis On: 11/16/2007				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	Servomex								
Model Number:	4605C	Zero	0.05	0.05	0.05	Zero			
Serial Number:	1101	Reference	9.92	9.92	9.91	Reference			
Analytical Principle:	Paramag.	Candidate	20.68	20.70	20.68	Candidate			
MPC Calibrated:	11/06/07	Result	20.91	20.93	20.91	Result			
		Mean Result:			20.92	Mean Result:			

Analyst Signature: M. Adnane

Calculated by: M. Adnane



AIR LIQUIDE

Air Liquide America
Specialty Gases LLC



Scott

RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: ALAS-47882
Project No.: 05-76528-008

Customer

AIR LIQUIDE AMERICA L.P.

ATTN: STEPHANIE PADGETT
801 W NORTH CARRIER PKWY
GRAND PRAIRIE TX 75050-1003

ANALYTICAL INFORMATION

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

Cylinder Number: **AAL069415** Certification Date: **01Jun2009** Exp. Date: **30Nov2009**
Cylinder Pressure***: **2000 PSIG**

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON MONOXIDE	4.94 PPM	+/- 1%	Direct NIST and NMI
NITRIC OXIDE	4.96 PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	4.99 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 2635	02Oct2010	KAL003090	25.21 PPM	CARBON MONOXIDE
NTRM 2629	15Aug2013	KAL003016	19.83 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/APMA-360/42244670011	08May2009	NDIR
ECO PHYSICS/CLD 84M/84M0359	19May2009	CHEMI

ANALYZER READINGS

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

First Triad Analysis

Second Triad Analysis

Calibration Curve

CARBON MONOXIDE

Date: 27May2009 Response Unit: MV
Z1=0.00000 R1=25.22000 T1=5.01200
R2=25.21000 Z2=0.00000 T2=5.01300
Z3=0.00000 T3=5.01500 R3=25.21000
Avg. Concentration: 4.963 PPM

Date: 03Jun2009 Response Unit: MV
Z1=0.00000 R1=10.02000 T1=4.93600
R2=10.00000 Z2=0.00000 T2=4.94200
Z3=0.00000 T3=4.94000 R3=10.00000
Avg. Concentration: 4.916 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999978
Constants: A = -0.01235827
B = 0.985727112 C = 0.0015772
D = 0 E = 0

NITRIC OXIDE

Date: 27May2009 Response Unit: MV
Z1=0.00000 R1=19.83000 T1=4.94500
R2=19.86000 Z2=0.00000 T2=4.93500
Z3=0.00000 T3=4.95100 R3=19.78000
Avg. Concentration: 4.966 PPM

Date: 03Jun2009 Response Unit: MV
Z1=0.00000 R1=19.83000 T1=4.94800
R2=19.84000 Z2=0.00000 T2=4.94500
Z3=0.00000 T3=4.94300 R3=19.87000
Avg. Concentration: 4.962 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999996
Constants: A = 0.021602025
B = 1.002315407 C = 0
D = 0 E = 0

Special Notes: AIR HYGIENE PART #SGZCAH070

APPROVED BY:

JEFF CROTEAU



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121 Section 2.2, Procedure G-1

Customer: AIR HYGIENE
Location: TULSA, OK

Cylinder S/N: CC60943

Shipping Order Number: 32650834
Transfer Number: 32650934
Lot Number: SFS130142
Valve: CGA 660
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

P.O. Number: 9021401
Item Number: SGZCAH072

Assay Date: 26-Mar-2009

Expiration Date: 26-Mar-2011

Table with 3 columns: Components, Requested Concentration, Assay Concentration. Rows include Nitrogen, Carbon Monoxide, Nitric Oxide, and NOx.

Reference Standard(s) Employed For Analysis

Table with 9 columns: Certified Concentration and Uncertainty, Component, Balance, Cyl. No., SRM/PRM/Mix No., Exp. Date, Sample No., Type. Rows for Carbon Monoxide and Nitric Oxide.

Analytical Data

Two detailed analytical data tables for Carbon Monoxide and Nitric Oxide, including analyzer information, trial results, and mean analytical results.

Analyst: [Signature] Tan Ngo

Approved by: [Signature] Thuan Tran



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC150921

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30555150
Transfer Number: 30555150
Lot Number: SFS124130
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

P.O. Number: 8080801
Item Number: SGZCAH001

Assay Date: 25-Aug-2008

Expiration Date: 25-Aug-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Methane	3 ppm	3.00 ± 0.03 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
9.853 ± 0.030 ppm	Methane	Air	FF28576	1659a	25-Apr-2012	11-G-24	SRM

Analytical Data

Component: Methane		FIRST TRIAD ANALYSIS 25-Aug-2008				
Analyzer Information		Zero	Trial 1	Trial 2	Trial 3	Units
Analyzer Type:	Gas Chromatograph	0.058	0.058	0.0000	0.161	Area
Manufacturer:	Hewlett Packard	Reference	87.036	87.257	87.485	Area
Model Number:	G1540A	Candidate	28.557	28.535	26.651	Area
Serial Number:	US00003390/Meth	Result	3.005	2.999	2.992	ppm
MPR Last Calibrated:	12-Aug-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD	Mean Analytical Result: 2.999				ppm

Analyst:  Tan Ngo

Approved by:  Thuan Tran



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC150841

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30336104
Transfer Number: 30336104
Lot Number: SFS123631
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

P.O. Number: 8071801
Item Number: SGZCAH002

Assay Date: 4-Aug-2008

Expiration Date: 4-Aug-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Methane	5 ppm	4.94 ± 0.06 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
9.863 ± 0.030 ppm	Methane	Air	FF26576	1659a	25-Apr-2012	11-G-24	SRM

Analytical Data

Component:	Methane	FIRST TRIAD ANALYSIS 4-Aug-2008			Units	
		Zero	Trial 1	Trial 2		Trial 3
Analyzer Information						
Analyzer Type:	Gas Chromatograph	Zero	0.114	0.073	0.022	Area
Manufacturer:	Hewlett Packard	Reference	91.233	91.401	91.269	Area
Model Number:	G1540A	Candidate	45.834	45.729	45.799	Area
Serial Number:	US00003390/Meth	Result	4.949	4.931	4.948	ppm
MPR Last Calibrated:	11-Jul-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD	Mean Analytical Result:			4.943	ppm

Analyst:

Gary Williams

Approved by:

Thuan Tran



CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC53032

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30736937
Transfer Number: 30736937
Lot Number: SFS125022
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

P.O. Number: 8082701
Item Number: SGZCAH006

Assay Date: 25-Sep-2008

Expiration Date: 25-Sep-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Methano	8.5 ppm	8.40 ± 0.10 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
10.06 ± 0.04 ppm	Methane	Air	CC52347	SFS103877	18-Mar-2010	NK	GMIS

Analytical Data

Component:	Methane	FIRST TRIAD ANALYSIS 25-Sep-2008			Units	
		Zero	Trial 1	Trial 2		Trial 3
Analyzer Information	Gas Chromatograph	0.0000	0.0000	0.0000	Area	
Manufacturer:	Hewlett Packard	Reference	95.357	95.042	95.188	Area
Model Number:	G1540A	Candidate	79.484	79.558	79.410	Area
Serial Number:	US00003390/Meth	Result	8.385	8.421	8.392	ppm
MPR Last Calibrated:	24-Sep-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD	Mean Analytical Result:			8.399	ppm

Analyst:  Tan Ngo

Approved by:  Thuan Tran



CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: EB0011231

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 33431111
Transfer Number: 33431111
Lot Number: SFS131864
Valve: CGA 660
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

P.O. Number: 9042601
Item Number: SGZCAH032

Assay Date: 21-May-2009

Expiration Date: 21-Nov-2009

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Nitrogen Dioxide	45-50 ppm	48.0 ± 1.2 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
51.4 ± 1.2 ppm	Nitrogen Dioxide	Nitrogen	EB0009973	SFS119543	12-Jul-2010	BI	GMIS

Analytical Data

Component:	Nitrogen Dioxide	FIRST TRIAD ANALYSIS 13-May-2009				Units	SECOND TRIAD ANALYSIS 21-May-2009				Units
		Zero	Trial 1	Trial 2	Trial 3		Zero	Trial 1	Trial 2	Trial 3	
Analyzer Information	Fourier Transform IR	-0.008	-0.012	-0.011	ppm	0.048	0.021	0.030	ppm		
Manufacturer:	MKS Instruments	Reference	50.127	50.162	50.262	ppm	Reference	50.071	50.164	50.252	ppm
Model Number:	2031	Candidate	48.799	48.807	48.814	ppm	Candidate	48.904	48.907	48.886	ppm
Serial Number:	10387278	Result	47.99	47.96	47.87	ppm	Result	48.15	48.06	47.96	ppm
MPR Last Calibrated:	29-Apr-2009	Evaluation	Valid	Valid	Valid		Evaluation	Valid	Valid	Valid	
Analytical Principle:	FTIR	Mean Analytical Result: 47.94 ppm					Mean Analytical Result: 48.08 ppm				

Analyst:  Tan Ngo

Approved by:  Thuan Tran

APPENDIX D
QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

Air Hygiene ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses five major areas:

1. QA reviews of reports, laboratory work, and field testing
2. Equipment calibration and maintenance
3. Chain-of-custody
4. Training
5. Knowledge of current test methods

Each of these areas is discussed individually below.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program.

Chain-of-Custody

Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples are stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training

Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3. A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods

With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values. NO₂ to NO conversion was checked via direct connect with an EPA Protocol certified concentration of NO₂ in a balance of nitrogen. Conversion was verified to be between 90 and 110 percent.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS QUALITY ASSURANCE DATA

Date: October 6-7, 2009
Company: Florida Power and Light
Location: Loxahatchee, Florida
Techs: JRF/TP

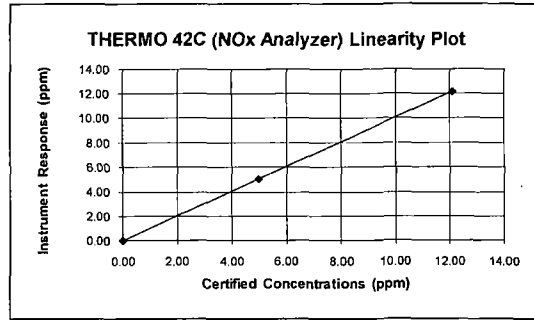
Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
October 6-7, 2009	1	0

Calibration Date: October 6, 2009
 Client: Florida Power and Light

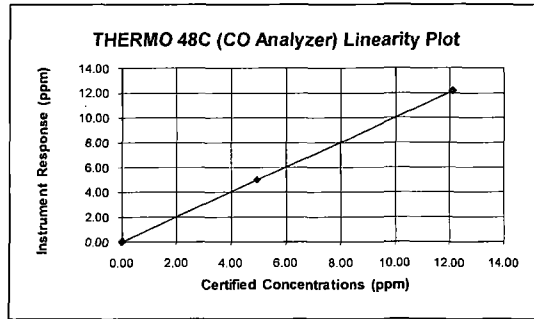
NOx Span (ppm) = 12.10

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.02	0.17	0.02	YES (%)
4.99	5.08	0.74	0.09	YES (%)
12.10	12.17	0.58	0.07	YES (%)
Linearity = 0.996				



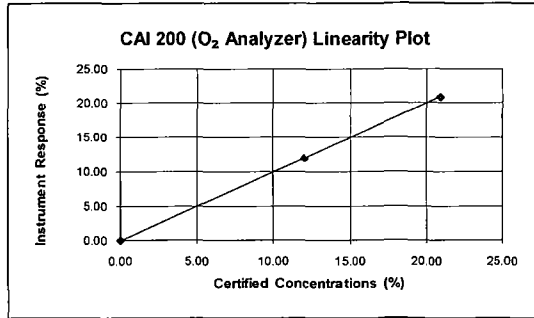
CO Span (ppm) = 12.10

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.03	0.25	0.03	YES (%)
4.94	5.00	0.50	0.06	YES (%)
12.10	12.18	0.66	0.08	YES (%)
Linearity = 0.996				



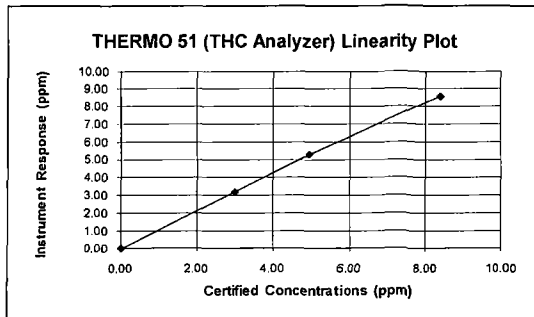
O₂ Span (%) = 20.90

CAI 200 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.04	0.19	0.04	YES (%)
12.00	11.97	-0.14	0.03	YES (%)
20.90	20.91	0.05	0.01	YES (%)
Linearity = 1.002				



THC Range (ppm) = 10.5

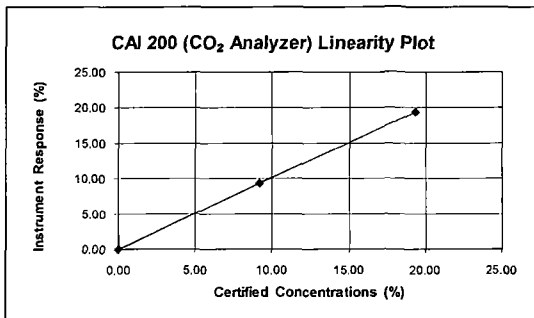
THERMO 51 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2.5%) ¹
0.00	0.00	0.00	N/A	YES
3.00	3.19	3.95	3.07	YES
4.94	5.29	4.70	5.06	YES
8.40	8.60	1.90	N/A	YES
Linearity = 1.002				



¹-zero/high based on 2% of span, low/mid based on 5% of concentration

CO₂ Span (%) = 19.30

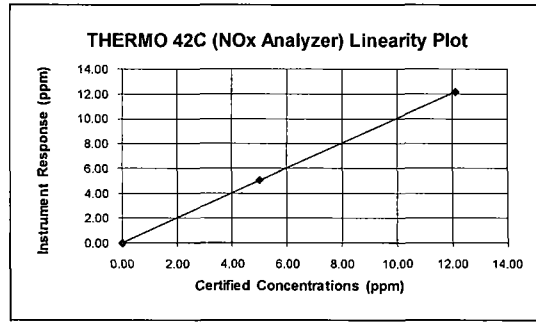
CAI 200 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.05	0.26	0.05	YES (%)
9.20	9.42	1.14	0.22	YES (%)
19.30	19.39	0.47	0.09	YES (%)
Linearity = 0.998				



Calibration Date: October 7, 2009
 Client: Florida Power and Light

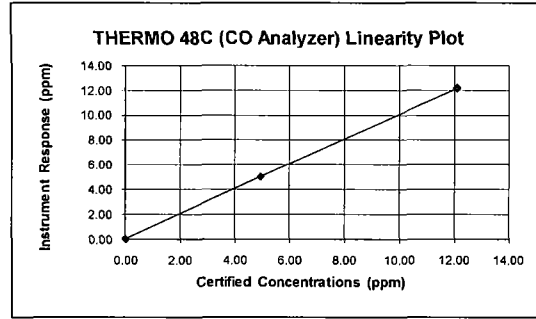
NOx Span (ppm) = 12.10

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.01	0.08	0.01	YES (%)
4.99	5.08	0.74	0.09	YES (%)
12.10	12.15	0.41	0.05	YES (%)
Linearity = 0.997				



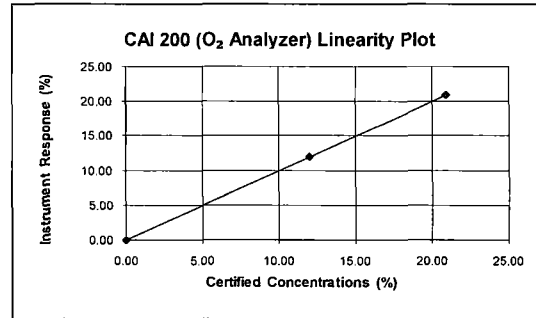
CO Span (ppm) = 12.10

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.08	0.66	0.08	YES (%)
4.95	5.05	0.83	0.10	YES (%)
12.10	12.18	0.66	0.08	YES (%)
Linearity = 1.000				



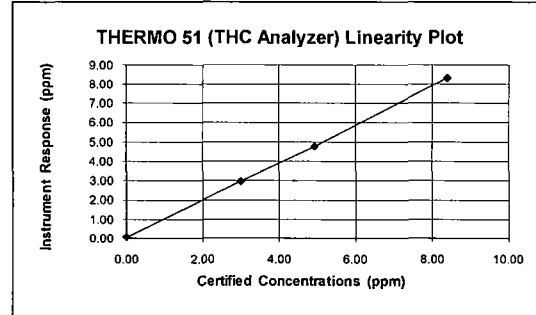
O2 Span (%) = 20.90

CAI 200 (O2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.06	0.29	0.06	YES (%)
12.00	11.96	-0.19	0.04	YES (%)
20.90	20.89	-0.05	0.01	YES (%)
Linearity = 1.004				



THC Range (ppm) = 10.5

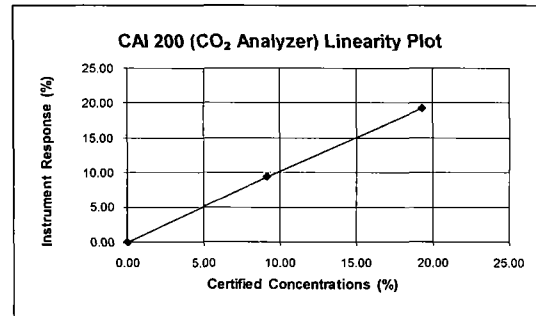
THERMO 51 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2,5\%$) ¹
0.00	0.10	0.95	N/A	YES
3.00	2.98	-2.10	3.04	YES
4.94	4.78	-3.36	4.95	YES
8.40	8.34	-0.57	N/A	YES
Linearity = 1.002				



¹zero/high based on 2% of span, low/mid based on 5% of concentration

CO2 Span (%) = 19.30

CAI 200 (CO2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.00	0.00	0.00	YES (%)
9.15	9.44	1.50	0.29	YES (%)
19.30	19.26	-0.21	0.04	YES (%)
Linearity = 1.002				



NOx Converter Efficiency

Date: October 6, 2009

Analyzer: INST-NX-0010

RM 7E, (08-15-06), 8.2.4.1 Introduce a concentration of 40 to 60 ppmv NO₂ to the analyzer in direct calibration mode and record the NOx concentration displayed by the analyzer. ... Calculate the converter efficiency using Equation 7E-7 in Section 12.7. The specification for converter efficiency in Section 13.5 must be met. ... The NO₂ must be prepared according to the EPA Traceability Protocol and have an accuracy within 2.0 percent.

Audit Gas:	NO ₂ Concentration (C _v), ppmvd	48.00
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	2.32
	Analyzer Reading, NOx Channel, ppmvd	49.74
	Analyzer Reading, NO ₂ Channel (C _{Dir(NO2)}), ppmvd	47.42
	Converter Efficiency, %	98.79

RM 7E, (08-15-06), 13.5 NO₂ to NO Conversion Efficiency Test (as applicable). The NO₂ to NO conversion efficiency, calculated according to Equation 7E-7 or Equation 7E-9, must be greater than or equal to 90 percent.

$$Eff_{NO_2} = \left(\frac{C_{Dir}}{C_V} \right) \times 100 \quad \text{Eq. 7E-7} = \frac{47.42 \text{ ppmvd}}{48.00 \text{ ppmvd}} \times 100 = 98.79\%$$

Date/Time mm/dd/yy hh:mm:ss	Elapsed Time Seconds	NOx ppmvd	NO ppmvd
10/06/09 07:48:58	1290	5.10	4.98
10/06/09 07:49:28	1320	23.89	3.81
10/06/09 07:49:58	1350	45.70	2.27
10/06/09 07:50:28	1380	48.48	2.17
10/06/09 07:50:58	1410	49.65	2.03
10/06/09 07:51:28	1440	49.33	1.93
10/06/09 07:51:58	1470	49.73	1.87
10/06/09 07:52:28	1500	49.74	2.32

NOx Converter Efficiency

Date: October 7, 2009

Analyzer: INST-NX-0010

RM 7E, (08-15-06), 8.2.4.1 Introduce a concentration of 40 to 60 ppmv NO₂ to the analyzer in direct calibration mode and record the NOx concentration displayed by the analyzer. ... Calculate the converter efficiency using Equation 7E-7 in Section 12.7. The specification for converter efficiency in Section 13.5 must be met. ... The NO₂ must be prepared according to the EPA Traceability Protocol and have an accuracy within 2.0 percent.

Audit Gas:	NO ₂ Concentration (C _v), ppmvd	48.00
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	1.86
	Analyzer Reading, NOx Channel, ppmvd	49.19
	Analyzer Reading, NO ₂ Channel (C _{Dir(NO2)}), ppmvd	47.33
	Converter Efficiency, %	98.60

RM 7E, (08-15-06), 13.5 NO₂ to NO Conversion Efficiency Test (as applicable). The NO₂ to NO conversion efficiency, calculated according to Equation 7E-7 or Equation 7E-9, must be greater than or equal to 90 percent.

$$Eff_{NO_2} = \left(\frac{C_{Dir}}{C_V} \right) \times 100 \quad \text{Eq. 7E-7} = \frac{47.33 \text{ ppmvd}}{48.00 \text{ ppmvd}} \times 100 = 98.6\%$$

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
10/07/09 07:30:28	1008	37.71	1.93
10/07/09 07:30:58	1038	46.74	2.24
10/07/09 07:31:28	1068	48.17	2.05
10/07/09 07:31:58	1098	48.79	1.94
10/07/09 07:32:28	1128	49.19	1.86
10/07/09 07:32:58	1158	48.63	2.16

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	O2	NOx
Initial Zero	0.02	0.00
Final Zero	0.01	0.12
Avg. Zero	0.02	0.06
Initial UpScale	12.00	4.81
Final UpScale	12.00	4.87
Avg. UpScale	12.00	4.84
Sys Resp (Zero)	0.04	0.02
Sys Resp (Upscale)	11.97	5.08
Upscale Cal Gas	12.00	4.99
Initial Zero Bias	-0.10%	-0.17%
Final Zero Bias	-0.14%	0.83%
Zero Drift	0.05%	0.99%
Initial Upscale Bias	0.14%	-2.23%
Final Upscale Bias	0.14%	-1.74%
Upscale Drift	0.00%	0.50%
Alternative Specification Abs Diff	Initial Zero	0.02
	Final Zero	0.03
	Initial Upscale	0.03
	Final Upscale	0.03
Calibration Span	20.90	12.10
3% of Range (drift)	0.63	0.36
5% of Range (bias)	1.05	0.61

Response Time (min)	0.5	1.3
Sys. Response (min)	1.3	

INJECTIONS

Date/Time mm/dd/yy hh:mm:ss	Z	O2 %	S Z	NOx PPM	S
10/06/09 11:00:28		12.04		2.69	x
10/06/09 11:00:38		10.00		2.72	
10/06/09 11:00:48		0.95		2.70	
10/06/09 11:00:58	x	0.07		2.73	
10/06/09 11:01:08		0.05		3.70	
10/06/09 11:01:18		0.04		4.61	x
10/06/09 11:01:28		0.03		4.69	
10/06/09 11:01:38		0.02		4.84	
10/06/09 11:01:48		0.02		4.91	
10/06/09 11:01:58		0.02		4.90	
10/06/09 11:04:28		-0.01		4.90	x
10/06/09 11:04:38		1.00		4.91	
10/06/09 11:04:48		0.06		4.91	
10/06/09 11:04:58		0.01		4.74	
10/06/09 11:05:08		0.01		2.56	
10/06/09 11:05:18		0.01		0.75	
10/06/09 11:05:28		0.00		0.50	
10/06/09 11:05:38		0.01		0.11	
10/06/09 11:05:48		0.00	x	0.06	
10/06/09 11:06:48		0.01		0.07	
10/06/09 11:06:58		0.00		0.06	x
10/06/09 11:07:08		0.00		0.07	
10/06/09 11:07:18		6.04		0.06	
10/06/09 11:07:28		11.88	x	0.05	
10/06/09 11:07:38		11.96		-0.01	
10/06/09 11:07:48		11.97		0.04	
10/06/09 11:07:58		11.98		0.04	

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-1	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.96	2.59	0.68	0.37	4.77	
Corrected Average	12.97	2.61	0.69	0.14	4.60	
Initial Zero	0.04	0.03	-0.06	0.42	0.05	
Final Zero	-0.01	0.01	0.03	0.16	0.20	
Avg. Zero	0.02	0.02	-0.02	0.29	0.13	
Initial UpScale	12.04	4.93	4.98	2.94	9.31	
Final UpScale	11.95	4.92	4.87	2.73	9.41	
Avg. UpScale	12.00	4.93	4.93	2.84	9.36	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.10%	0.17%	-1.16%	3.05%	0.26%	
Final Zero Bias	-0.33%	0.00%	-0.41%	0.57%	1.04%	
Zero Drift	0.24%	0.17%	0.74%	2.48%	0.78%	
Initial Upscale Bias	0.38%	-1.24%	-0.58%	-0.38%	-0.67%	
Final Upscale Bias	-0.05%	-1.32%	-1.49%	-2.38%	-0.16%	
Upscale Drift	0.43%	0.08%	0.91%	2.00%	0.52%	
Alternative Specification Abs Diff	Initial Zero	0.02	0.02	0.14	--	0.05
	Final Zero	0.07	0.00	0.05	--	0.20
	Initial Upscale	0.08	0.15	0.07	--	0.13
	Final Upscale	0.01	0.16	0.18	--	0.03
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-2	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.95	2.35	1.29	0.98	4.83	
Corrected Average	12.96	2.39	1.31	0.99	4.57	
Initial Zero	-0.01	0.01	0.03	0.16	0.20	
Final Zero	0.01	-0.01	-0.06	0.39	0.23	
Avg. Zero	0.00	0.00	-0.02	0.28	0.22	
Initial UpScale	11.95	4.92	4.87	2.73	9.41	
Final UpScale	12.03	4.87	4.98	2.82	9.50	
Avg. UpScale	11.99	4.90	4.93	2.78	9.46	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.33%	0.00%	-0.41%	0.57%	1.04%	
Final Zero Bias	-0.24%	-0.17%	-1.16%	2.76%	1.19%	
Zero Drift	0.10%	0.17%	0.74%	2.19%	0.16%	
Initial Upscale Bias	-0.05%	-1.32%	-1.49%	-2.38%	-0.16%	
Final Upscale Bias	0.33%	-1.74%	-0.58%	-1.52%	0.31%	
Upscale Drift	0.38%	0.41%	0.91%	0.86%	0.47%	
Alternative Specification Abs Diff	Initial Zero	0.07	0.00	0.05	--	0.20
	Final Zero	0.05	0.02	0.14	--	0.23
	Initial Upscale	0.01	0.16	0.18	--	0.03
	Final Upscale	0.07	0.21	0.07	--	0.06
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-3	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.97	2.33	1.00	1.10	4.96	
Corrected Average	12.93	2.39	0.88	0.99	4.60	
Initial Zero	0.01	-0.01	-0.06	0.39	0.23	
Final Zero	0.01	0.00	0.31	0.36	0.38	
Avg. Zero	0.01	-0.01	0.13	0.38	0.31	
Initial UpScale	12.03	4.87	4.98	2.82	9.50	
Final UpScale	12.05	4.86	5.11	3.10	9.60	
Avg. UpScale	12.04	4.87	5.05	2.96	9.55	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.24%	-0.17%	-1.16%	2.76%	1.19%	
Final Zero Bias	-0.24%	-0.08%	1.90%	2.48%	1.97%	
Zero Drift	0.00%	0.08%	3.06%	0.29%	0.78%	
Initial Upscale Bias	0.33%	-1.74%	-0.58%	-1.52%	0.31%	
Final Upscale Bias	0.43%	-1.82%	0.50%	1.14%	0.83%	
Upscale Drift	0.10%	0.08%	1.07%	2.67%	0.52%	
Alternative Specification Abs Diff	Initial Zero	0.05	0.02	0.14	--	0.23
	Final Zero	0.05	0.01	0.23	--	0.38
	Initial Upscale	0.07	0.21	0.07	--	0.06
	Final Upscale	0.09	0.22	0.06	--	0.16
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-1	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.02	2.90	3.80	1.51	5.20	
Corrected Average	12.04	2.93	3.78	1.62	5.11	
Initial Zero	0.01	0.12	0.00	0.38	0.10	
Final Zero	0.00	0.07	-0.21	0.27	-0.10	
Avg. Zero	0.01	0.10	-0.11	0.33	0.00	
Initial UpScale	12.00	4.87	4.94	2.88	9.42	
Final UpScale	11.97	4.87	5.08	2.78	9.22	
Avg. UpScale	11.99	4.87	5.01	2.83	9.32	
Sys Resp (Zero)	0.04	0.02	0.03	0.00	0.05	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.14%	0.83%	-0.25%	3.62%	0.26%	
Final Zero Bias	-0.19%	0.41%	-1.98%	2.57%	-0.78%	
Zero Drift	0.05%	0.41%	1.74%	1.05%	1.04%	
Initial Upscale Bias	0.19%	-1.74%	-0.91%	-0.95%	-0.10%	
Final Upscale Bias	0.05%	-1.74%	0.25%	-1.90%	-1.14%	
Upscale Drift	0.14%	0.00%	1.16%	0.95%	1.04%	
Alternative Specification Abs Diff	Initial Zero	0.03	0.10	0.03	--	0.05
	Final Zero	0.04	0.05	0.24	--	0.15
	Initial Upscale	0.04	0.21	0.11	--	0.02
	Final Upscale	0.01	0.21	0.03	--	0.22
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-2	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.01	2.90	3.80	1.45	5.28	
Corrected Average	12.04	2.93	3.67	1.64	5.15	
Initial Zero	0.00	0.07	-0.21	0.27	-0.10	
Final Zero	0.01	0.04	-0.13	0.19	0.15	
Avg. Zero	0.01	0.06	-0.17	0.23	0.03	
Initial UpScale	11.97	4.87	5.08	2.78	9.22	
Final UpScale	11.97	4.94	5.29	2.87	9.49	
Avg. UpScale	11.97	4.91	5.19	2.83	9.36	
Sys Resp (Zero)	0.04	0.02	0.03	0.00	0.05	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.19%	0.41%	-1.98%	2.57%	-0.78%	
Final Zero Bias	-0.14%	0.17%	-1.32%	1.81%	0.52%	
Zero Drift	0.05%	0.25%	0.66%	0.76%	1.30%	
Initial Upscale Bias	0.05%	-1.74%	0.25%	-1.90%	-1.14%	
Final Upscale Bias	0.05%	-1.16%	1.98%	-1.05%	0.26%	
Upscale Drift	0.00%	0.58%	1.74%	0.86%	1.40%	
Alternative Specification Abs Diff	Initial Zero	0.04	0.05	0.24	--	0.15
	Final Zero	0.03	0.02	0.16	--	0.10
	Initial Upscale	0.01	0.21	0.03	--	0.22
	Final Upscale	0.01	0.14	0.24	--	0.05
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-3	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	11.99	2.88	3.11	1.14	5.25	
Corrected Average	12.02	2.88	3.01	1.18	5.01	
Initial Zero	0.01	0.04	-0.13	0.19	0.15	
Final Zero	0.00	0.06	-0.27	0.29	0.10	
Avg. Zero	0.01	0.05	-0.20	0.24	0.13	
Initial UpScale	11.97	4.94	5.29	2.87	9.49	
Final UpScale	11.98	4.95	5.17	2.92	9.46	
Avg. UpScale	11.98	4.95	5.23	2.90	9.48	
Sys Resp (Zero)	0.04	0.02	0.03	0.00	0.05	
Sys Resp (Upscale)	11.97	5.08	5.00	3.19	9.42	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.14%	0.17%	-1.32%	1.81%	0.52%	
Final Zero Bias	-0.19%	0.33%	-2.48%	2.76%	0.26%	
Zero Drift	0.05%	0.17%	1.16%	0.95%	0.26%	
Initial Upscale Bias	0.00%	-1.16%	2.40%	-3.05%	0.36%	
Final Upscale Bias	0.05%	-1.07%	1.40%	-2.57%	0.21%	
Upscale Drift	0.05%	0.08%	0.99%	0.48%	0.16%	
Alternative Specification Abs Diff	Initial Zero	0.03	0.02	0.16	--	0.10
	Final Zero	0.04	0.04	0.30	--	0.05
	Initial Upscale	0.00	0.14	0.29	--	0.07
	Final Upscale	0.01	0.13	0.17	--	0.04
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

METERING SYSTEM CALIBRATION SHEET
EPA Reference Method 5
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0005

Filename: \\SERVER2\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.0\Current\{SAMP-CP-0005 Calibration 7-16-09.xls}Original (5 point)
 Make: ES Date: 07/16/09
 Model #: C-5000-XS Barometric Pressure: 29.12 (in. Hg)
 Serial #: 1418 Theoretical Critical Vacuum: 13.74 (in. Hg)

DRY GAS METER READINGS							
ΔH (in H ₂ O)	Time (min)	Volume			Initial Temps.		
		Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	
0.26	17.00	234.230	239.240	5.010	85.0	83.0	
0.57	12.00	239.240	244.490	5.250	85.0	84.0	
1.00	10.00	244.490	250.160	5.670	85.0	84.0	
1.80	10.00	250.160	257.480	7.320	87.0	85.0	
3.30	10.00	257.480	267.360	9.880	88.0	86.0	

Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature		
Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
85.0	83.0	40	0.2354	16.0	85.6	86.2	85.9
86.0	85.0	48	0.3491	16.0	86.4	86.5	86.5
87.0	85.0	55	0.4530	16.0	86.9	87.3	87.1
88.0	86.0	63	0.5840	16.0	87.3	87.8	87.6
89.0	86.0	73	0.7945	16.0	87.8	88.3	88.1

RESULTS				
DRY GAS METER		ORIFICE		
VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL
Vm(std) (cu ft)	Vm(std) (liters)	Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)
4.734	134.06	4.988	141.2	5.300
4.955	140.34	5.219	147.8	5.551
5.355	151.66	5.640	159.7	6.007
6.912	195.74	7.268	205.8	7.747
9.351	264.82	9.883	279.9	10.544

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in H ₂ O)	Value (mm H ₂ O)	Variation (in H ₂ O)
0.000	1.054	1.608	40.84	-0.086
-0.001	1.053	1.600	40.64	-0.094
-0.001	1.053	1.669	42.39	-0.025
-0.002	1.052	1.806	45.87	0.111
0.003	1.057	1.789	45.43	0.094
AVERAGE:	1.054	1.694	43.04	PASSED

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor $\Delta H@$, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 07/16/09

METERING SYSTEM CALIBRATION SHEET

EPA Reference Method 5

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0005

Filename: \\SERVER2\public\Shared\QAQC\Calibrations\PM-Equipment\W-5 Consoles\Calibration Sheet v4.0\Current\[SAMP-CP-0005 Calibration 7-16-09.xls]10-16-09 (3 point)

Make: ES
Model #: C-5000-XS
Serial #: 1418

Date: 10/16/09
Barometric Pressure: 29.15 (in. Hg)
Theoretical Critical Vacuum: 13.75 (in. Hg)

DRY GAS METER READINGS						
-H (in H ₂ O)	Time (min)	Volume			Initial Temps.	
		Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)
3.20	10.00	477.110	487.020	9.910	65.0	60.0
3.20	10.00	487.020	496.930	9.910	63.0	60.0
3.20	10.00	496.930	506.860	9.930	64.0	61.0

Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature		
Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
63.0	60.0	73	0.7945	16.0	63.0	63.0	63.0
65.0	62.0	73	0.7945	16.0	63.0	63.0	63.0
65.0	61.0	73	0.7945	16.0	63.0	63.0	63.0

RESULTS				
DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
9.841	278.69	10.127	286.8	10.300
9.831	278.43	10.127	286.8	10.300
9.847	278.85	10.127	286.8	10.300

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR -H@		
Variation (number)	Value (number)	Value (in H ₂ O)	Value (mm H ₂ O)	Variation (in H ₂ O)
0.000	1.029	1.736	44.10	0.002
0.001	1.030	1.733	44.02	-0.001
-0.001	1.028	1.733	44.02	-0.001
AVERAGE:	1.029	1.734	44.04	PASSED

LAST 5-PT:	1.054	1.694	PASSED	5-PT Date:
% DIFF:	2.4%	2.3%		07/16/09

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Appendix A, Method 5

10.3.2 Calibration After Use

After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)...Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration

If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 10/16/09

VISIBLE EMISSIONS EVALUATOR

This is to certify that

DARIN GRIMES

met the specifications of Federal Reference Method 9 and qualifies as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, NC. This certificate is valid for six months from date of issue.

374248

GERT NUMBER

4/22/2009

DATE OF SCHOOL

TULSA, OK

SCHOOL LOCATION

10/22/2009

CERTIFICATION EXP DATE

GRI748589

STUDENT ID NUMBER

Michael W. Sanford

MANAGER OF TRAINING SERVICES

APPENDIX E
FUEL ANALYSIS RECORDS

Client: Florida Power and Light
 Location: West County Energy Center
 Date: October 6, 2009
 Project #: bv-09-westcounty.fl-comp#1

Natural Gas - Fuel Analysis

Standardized to 68 deg F and 14.696 psia - EPA Standards

Gas Component		Mole (%)	Molecular ¹ Weight (lb/lb-mole)	Lbs Component per Lb-Mole of Gas	Wt. % of Component	Ideal Gross ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [HHV] (Btu/SCF)	Ideal Net ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [LHV] (Btu/SCF)
Methane	CH ₄	96.570	16.0430	15.49	93.04	994.85	960.72	895.75	865.03
Ethane	C ₂ H ₆	1.280	30.0700	0.38	2.31	1,743.15	22.31	1,594.41	20.41
Propane	C ₃ H ₈	0.121	44.0970	0.05	0.32	2,478.35	3.00	2,280.17	2.76
iso-Butane	iC ₄ H ₁₀	0.020	58.1230	0.01	0.07	3,203.11	0.64	2,955.38	0.59
n-Butane	nC ₄ H ₁₀	0.019	58.1230	0.01	0.07	3,213.35	0.61	2,965.62	0.56
Iso-Pentane	iC ₅ H ₁₂	0.007	72.1500	0.01	0.03	3,940.87	0.28	3,643.50	0.26
n-Pentane	nC ₅ H ₁₂	0.000	72.1500	0.00	0.00	3,948.75	0.00	3,648.32	0.00
Hexanes	C ₆ H ₁₄	0.018	86.1770	0.02	0.09	4,684.54	0.84	4,337.82	0.78
Heptanes	C ₇ H ₁₆	0.000	100.2040	0.00	0.00	5,419.94	0.00	5,023.77	0.00
Octanes	C ₈ H ₁₈	0.000	114.2310	0.00	0.00	6,155.14	0.00	5,709.23	0.00
Carbon Dioxide	CO ₂	0.799	44.0100	0.35	2.11	0.00	0.00	0.00	0.00
Nitrogen	N ₂	1.166	28.0134	0.33	1.96	0.00	0.00	0.00	0.00
Hydrogen Sulfide	H ₂ S	0.000	34.0800	0.00	0.00	627.54	0.00	578.00	0.00
Oxygen	O ₂	0.000	31.9988	0.00	0.00	0.00	0.00	0.00	0.00
Helium	He	0.000	4.0026	0.00	0.00	0.00	0.00	0.00	0.00
Hydrogen	H ₂	0.000	2.0159	0.00	0.00	319.34	0.00	269.82	0.00
Totals		100.000		16.65	100.00	dry	988.40	dry	890.39
						wet^{2,5}	965.61	wet^{2,5}	869.86

Characteristics of Fuel Gas	
Molecular Weight of gas =	16.652 lb/lb-mole
Btu per lb. of gas ⁴ =	22,865.208 gross (HHV)
Btu per lb. of gas ⁴ =	20,597.777 net (LHV)
Density of fuel gas ² =	0.0432 lb/cu. ft
Wt % VOC in fuel gas =	0.58 %
Specific Gravity ¹ =	0.5750

Component	Wt%
carbon	72.55
oxygen	1.54
hydrogen	23.95
nitrogen	1.96
helium	0.00
sulfur	0.00
Total	100.00

F-Factor (SCF dry exhaust per MMBtu [HHV]) = 8,648.59
 (Based on EPA RM-19) at 68 deg F and 14.696 psia

F-Factor Calculation:

$$F\text{-Factor} = 1,000,000 * ((3.64 * \%H) + (1.53 * \%C) + (0.57 * \%S) + (0.14 * \%N) - (0.46 * \%O)) / GCV$$

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of natural gas based on specific gravity multiplied by density of air at 68 deg F and 14.696 psia.

References:

- ¹ ASTM D 3588
- ² Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg
- ³ Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III
- ⁴ Introduction to Fluid Mechanics, 3rd ed. - William S. Janna
- ⁵ GPA Reference Bulletin 181-86, revised 1986, reprinted 1995



HOUSTON LABORATORIES
 8820 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-002A

Mars Sharief
 Air Hygiene
 5634 S. 122nd East Ave.
 Suite F
 Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name :	Unit 1 C w/DB and Unit 1B w/DB	Sample Of:	Gas Spot
Station Number :		Sample Date:	10/06/2009
Station Location :	Tulsa, Oklahoma	Sample Conditions:	N.G. Pres. , N.G. Temp.
Sample Point:		PO / Ref. No:	
		COC. No:	

ANALYTICAL DATA

Components	Mol %	Wt %	GPM at 14.696 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	PW	10/13/2009 2:14:17
Nitrogen	1.166	1.961				
Carbon Dioxide	0.799	2.112				
Methane	96.570	93.029				
Ethane	1.280	2.311	0.341			
Propane	0.121	0.320	0.033			
Iso Butane	0.020	0.070	0.007			
n-Butane	0.019	0.066	0.006			
Iso Pentane	0.007	0.030	0.003			
Hexanes Plus	0.018	0.101	0.008			
	<u>100.000</u>	<u>100.000</u>	<u>0.398</u>			
	C2 +	C3 +	iC5 +			
GPM TOTAL :	0.398	0.057	0.011			
Relative Density	Real Gas			0.5759		
Calculated Molecular Weight				16.65		
Compressibility Factor				0.9980		
Calculated Gross BTU per ft ³ @ 14.696 psia & 60°F						
Real Gas	Dry Basis	1006				
	Saturated Basis	988				
Comments :	valves ok ; Note Nitrogen. ; Insufficient Sample For Rerun. Cylinder Number 767					

[Signature]

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated



HOUSTON LABORATORIES
 8820 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-002A

Mars Sharief
 Air Hygiene
 5634 S. 122nd East Ave.
 Suite F
 Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name:	Unit 1 C w/DB and Unit 1B w/DB	Sample Of:	Gas
Station Number :		Sample Date:	10/06/2009
Location:	Tulsa, Oklahoma	Sample Condition:	
Sample Point:		PO / Ref. No:	

ANALYTICAL DATA

Test	Method	Result	Unit	Detection Limit	Lab Tech.	Date Analyzed
Total Sulfur By UV	ASTM-D-6667	NR	PPMW	1.0	EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	NR	Wt%.		EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	NR	gr/100 cu.ft.		EM	10/14/09

Comments: Cylinder Number: 767
 NR= No result (Insufficient sample)
 Sample On: 10/06/2009

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated.

Client: Florida Power and Light
 Location: West County Energy Center
 Date: October 7, 2009
 Project #: bv-09-westcounty.fl-comp#1

Natural Gas - Fuel Analysis

Standardized to 68 deg F and 14.696 psia - EPA Standards

Gas Component		Mole (%)	Molecular ¹ Weight (lb/lb-mole)	Lbs Component per Lb-Mole of Gas	Wt. % of Component	Ideal Gross ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [HHV] (Btu/SCF)	Ideal Net ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [LHV] (Btu/SCF)
Methane	CH ₄	97.194	16.0430	15.59	94.04	994.85	966.93	895.75	870.62
Ethane	C ₂ H ₆	1.224	30.0700	0.37	2.22	1,743.15	21.34	1,594.41	19.52
Propane	C ₃ H ₈	0.104	44.0970	0.05	0.28	2,478.35	2.58	2,280.17	2.37
iso-Butane	iC ₄ H ₁₀	0.013	58.1230	0.01	0.05	3,203.11	0.42	2,955.38	0.38
n-Butane	nC ₄ H ₁₀	0.014	58.1230	0.01	0.05	3,213.35	0.45	2,965.62	0.42
Iso-Pentane	iC ₅ H ₁₂	0.000	72.1500	0.00	0.00	3,940.87	0.00	3,643.50	0.00
n-Pentane	nC ₅ H ₁₂	0.000	72.1500	0.00	0.00	3,948.75	0.00	3,648.32	0.00
Hexanes	C ₆ H ₁₄	0.009	86.1770	0.01	0.05	4,684.54	0.42	4,337.82	0.39
Heptanes	C ₇ H ₁₆	0.000	100.2040	0.00	0.00	5,419.94	0.00	5,023.77	0.00
Octanes	C ₈ H ₁₈	0.000	114.2310	0.00	0.00	6,155.14	0.00	5,709.23	0.00
Carbon Dioxide	CO ₂	0.915	44.0100	0.40	2.43	0.00	0.00	0.00	0.00
Nitrogen	N ₂	0.527	28.0134	0.15	0.89	0.00	0.00	0.00	0.00
Hydrogen Sulfide	H ₂ S	0.000	34.0800	0.00	0.00	627.54	0.00	578.00	0.00
Oxygen	O ₂	0.000	31.9988	0.00	0.00	0.00	0.00	0.00	0.00
Helium	He	0.000	4.0026	0.00	0.00	0.00	0.00	0.00	0.00
Hydrogen	H ₂	0.000	2.0159	0.00	0.00	319.34	0.00	269.82	0.00
Totals		100.000		16.58	100.00	dry	992.13	dry	893.70
						wet^{2,5}	969.26	wet^{2,5}	873.09

Characteristics of Fuel Gas		
Molecular Weight of gas =	16.581	lb/lb-mole
Btu per lb. of gas ⁴ =	23,051.064	gross (HHV)
Btu per lb. of gas ⁴ =	20,764.042	net (LHV)
Density of fuel gas ² =	0.0431	lb/cu. ft
Wt % VOC in fuel gas =	0.42	%
Specific Gravity ¹ =	0.5725	

Component	Wt%
carbon	73.19
oxygen	1.77
hydrogen	24.16
nitrogen	0.89
helium	0.00
sulfur	0.00
Total	100.00

F-Factor (SCF dry exhaust per MMBtu [HHV]) = 8,642.48
 (Based on EPA RM-19) at 68 deg F and 14.696 psia

F-Factor Calculation:

$$F\text{-Factor} = 1,000,000 * ((3.64 * \%H) + (1.53 * \%C) + (0.57 * \%S) + (0.14 * \%N) - (0.46 * \%O)) / GCV$$

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of natural gas based on specific gravity multiplied by density of air at 68 deg F and 14.696 psia.

References:

¹ ASTM D 3588

² Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg

³ Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III

⁴ Introduction to Fluid Mechanics, 3rd ed. - William S. Janna

⁵ GPA Reference Bulletin 181-86, revised 1986, reprinted 1995



HOUSTON LABORATORIES

8820 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-003A

Mars Sharief
Air Hygiene
5634 S. 122nd East Ave.
Suite F
Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name :	Unit 1B w/oDB and Unit 1A w/DB	Sample Of:	Gas Spot
Station Number :		Sample Date:	10/07/2009
Station Location :	Tulsa, Oklahoma	Sample Conditions:	N.G. Pres. , N.G. Temp.
Sample Point:		PO / Ref. No:	
		COC. No:	

ANALYTICAL DATA

Components	Mol %	Wt %	GPM at 14.696 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	PW	10/13/2009 2:16:48
Nitrogen	0.527	0.890				
Carbon Dioxide	0.915	2.429				
Methane	97.194	94.038				
Ethane	1.224	2.220	0.327			
Propane	0.104	0.277	0.029			
Iso Butane	0.013	0.046	0.004			
n-Butane	0.014	0.049	0.004			
Hexanes Plus	0.009	0.051	0.004			
	<u>100.000</u>	<u>100.000</u>	<u>0.368</u>			
GPM TOTAL :	C2 + 0.368	C3 + 0.041	IC5 + 0.004			
Relative Density	Real Gas			0.5735		
Calculated Molecular Weight				16.58		
Compressibility Factor				0.9979		
Calculated Gross BTU per ft ³ @14.696 psia & 60°F						
Real Gas	Dry Basis	1009				
	Saturated Basis	992				

Comments :

Cylinder Number 3764

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated



HOUSTON LABORATORIES
 8820 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-003A

Mars Sharief
 Air Hygiene
 5634 S. 122nd East Ave.
 Suite F
 Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name:	Unit 1B w/oDB and Unit 1A w/DB	Sample Of:	Gas
Station Number :		Sample Date:	10/07/2009
Location:	Tulsa, Oklahoma	Sample Condition:	
Sample Point:		PO / Ref. No:	

ANALYTICAL DATA

Test	Method	Result	Unit	Detection Limit	Lab Tech.	Date Analyzed
Total Sulfur By UV	ASTM-D-6667	1.7	PPMW	1.0	EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	0.0002	Wt%.		EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	0.054	gr/100 cu.ft.		EM	10/14/09

Comments: Cylinder Number: 3764

Sample On: 10/07/2009

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated.

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD



Air Hygiene International, Inc.
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 (888) 461-8778
 www.airhygiene.com

Project Number:		bv-09-westcounty.fl-comp#1		Laboratory Analysis Requested:			
Person Taking Samples:			JRF		ASTM 6667 and GPA-2261 M		
Sample Number	Location	Date	Volume	Analysis Method			
				ASTM 6667	GPA 2261 M		
001175	Unit 1C w and w/o DB	10/5/2009		x	x		
000767	Unit 1C w/DB and Unit 1B w/DB	10/6/2009		x	x		
003764	Unit 1B w/oDB and Unit 1A w/DB	10/7/2009		x	x		
000152	Unit 1A w/o DB	10/8/2009		x	x		

[Signature]
 Relinquished by: (Signature)

10/12/09
 Date:

12:30
 Time:

Martin Cisneros
 Received by: (Signature)

10/13/09
 Date:

12:00
 Time:

 Relinquished by: (Signature)

 Date:

 Time:

 Received by: (Signature)

 Date:

 Time:

APPENDIX F
STRATIFICATION TEST DATA

Source Information	
Company	Florida Power and Light
Plant Name	West County Energy Center
Equipment	Mistubishi 501G
Location	Loxahatchee, Florida

Test Information	
Date	10/06/09
Project #	bv-09-westcounty.fl-comp#1
Unit Number	1B
Load	Base w/DB
Number of Ports Available	4
Number of Ports Used	4

Stack and Test Type	
<input type="radio"/> Isokinetic Traverse (Wet Chemistry Testing) <input type="radio"/> Velocity Traverse (Flow and Flow RATA Test) <input checked="" type="radio"/> Stratification Traverse (Compliance Test) <input checked="" type="checkbox"/> RM 20 <input type="radio"/> Stratification Traverse (RATA) <input type="checkbox"/> Part 60 <input type="checkbox"/> Part 75	Circular Stack

METHOD 1 - STRATIFICATION TEST FOR A CIRCULAR SOURCE

Company	Florida Power and Light	Date	10/06/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mitsubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	282.38	in.
Distance to Near Wall of Stack	(L _{nw})	19.00	in.
Diameter of Stack	(D)	263.38	in.
Area of Stack	(A _s)	378.35	ft ²

Distance from Disturbances to Port			
Distance Upstream	(A)	144.00	in.
Diameters Upstream	(A _D)	0.55	diameters
Distance Downstream	(B)	531.75	in.
Diameters Downstream	(B _D)	2.02	diameters

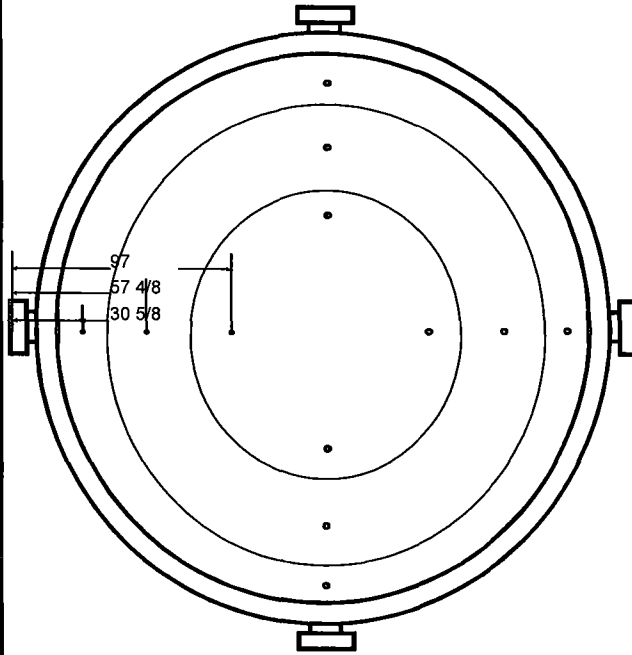
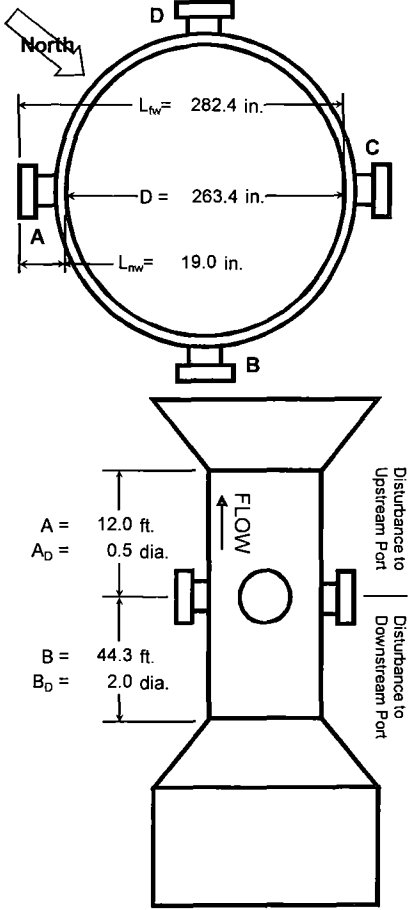
Number of Traverse Points Required					
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points		Minimum Number of Traverse Points	
Down (B _D)	Up (A _D)	Particulate	Velocity	Comp Stratification	
Stream	Stream	Points	Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	Alt 7E 8.1.2	3 points
6.00-6.99	1.50-1.74	16	12	12 points	
7.00-7.99	1.75-1.99	12	12	12 points	
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²	Minimum Number of Traverse Points	
Upstream Spec		24	16	RATA Stratification	
Downstream Spec		24	16	RATA Stratification	
Traverse Pts Required		24	16	Criteria	Points
				Part75/60	12 RM1 pts
				75 abrv (a)	3 points
				75 abrv (b)	6 points

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used				
4	Ports by	3	Pts / port	Stratification Traverse
12	Pts Used	12	Required	(Compliance Test)

Traverse Point Locations			
Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in.	in.
1	4.4%	11 5/8	30 5/8
2	14.6%	38 4/8	57 4/8
3	29.6%	78	97
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



STRATIFICATION TRAVERSE (COMPLIANCE TEST) RESULTS

Company	Florida Power and Light	Date	10/06/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	13:58:08	Run End	14:53:08

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%
D-3	3.00	13:58:08	14:01:08	12.08	0.76%	2.53	7.35%
D-2	3.00	14:01:08	14:04:08	12.06	0.60%	2.34	14.31%
D-1	3.00	14:04:08	14:07:08	12.11	1.01%	2.52	7.72%
C-3	8.00	14:07:08	14:15:08	12.00	0.10%	2.79	2.17%
C-2	3.00	14:15:08	14:18:08	11.93	0.49%	2.57	5.89%
C-1	3.00	14:18:08	14:21:08	11.89	0.82%	2.40	12.11%
B-3	7.00	14:21:08	14:28:08	11.99	0.01%	3.14	14.98%
B-2	3.00	14:28:08	14:31:08	11.85	1.15%	2.91	6.56%
B-1	3.00	14:31:08	14:34:08	11.86	1.07%	2.95	8.03%
A-3	13.00	14:34:08	14:47:08	12.03	0.35%	2.89	5.83%
A-2	3.00	14:47:08	14:50:08	12.03	0.35%	2.95	8.03%
A-1	3.00	14:50:08	14:53:08	12.03	0.35%	2.78	1.80%
Correct to	15	% O2	Average	11.99		2.73	

STRATIFICATION TRAVERSE (COMPLIANCE TEST) RESULTS

Company	Florida Power and Light	Date	10/06/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	7:20:07	Run End	14:53:08

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm@15%O2	%
D-3	3.00	7:20:07	14:01:08	12.08	0.76%	1.69	6.38%
D-2	3.00	14:01:08	14:04:08	12.06	0.60%	1.56	13.61%
D-1	3.00	14:04:08	14:07:08	12.11	1.01%	1.69	6.43%
C-3	6.00	14:07:08	14:15:08	12.00	0.10%	1.85	2.31%
C-2	3.00	14:15:08	14:18:08	11.93	0.49%	1.69	6.49%
C-1	3.00	14:18:08	14:21:08	11.89	0.82%	1.57	13.06%
B-3	7.00	14:21:08	14:28:08	11.99	0.01%	2.08	15.02%
B-2	3.00	14:28:08	14:31:08	11.85	1.15%	1.90	4.95%
B-1	3.00	14:31:08	14:34:08	11.86	1.07%	1.93	6.51%
A-3	13.00	14:34:08	14:47:08	12.03	0.35%	1.92	6.34%
A-2	3.00	14:47:08	14:50:08	12.03	0.35%	1.96	8.55%
A-1	3.00	14:50:08	14:53:08	12.03	0.35%	1.85	2.29%
Average				11.99		1.81	

STRAT TEST DETERMINED SAMPLE POINTS FOR CIRCULAR STACK

Company	Florida Power and Light	Date	10/06/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	7:20:07	Run End	14:53:08

40 CFR 60, Appendix A, Method 7E Criteria

Stratification Results		Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
Maximum Percent Difference	15.02 % for NO _x				
Maximum Pollutant Conc. Diff.	0.27 ppm@15%O ₂ for NO _x				
Maximum Diluent Conc. Diff.	0.14 % for O ₂				
Stack Diameter	263.38 in.		%	in.	in.

Stratification Conclusions		1			
Maximum % Diff.	Percent Diff. >10% Failed Stratification Test	2			
Maximum Conc. Diff.	Conc. Diff. ≤ 0.3% Passed 3A 8.1 Single Pt. Criteria	3			

Stack Diameter	D > 93.6 in.	Test Type	Use 6.5.6.3(a) points? 6.5.6(b)(2) alt. points could apply
Passed Strat. Test Under RM 7E 8.1.2 Single Pt. Criteria Sample from the point that most closely matches the average			

