2016 EMISSIONS PERFORMANCE TESTING AND CEMS RATA AT THE DESERT VIEW POWER, MECCA PLANT

PREPARED FOR:

DESERT VIEW POWER
62-300 GENE WELMAS DRIVE
MECCA, CALIFORNIA 92254-0758

FOR SUBMITTAL TO:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 COPLEY DRIVE
DIAMOND BAR, CALIFORNIA 91765-4178

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REPORT REVIEW AND CERTIFICATION

I certify that all work performed in the preparation and production of this report were performed by me or under my supervision and that all data presented are authentic.

Dave Wonderly
Project Manager

4/22/16
Date

I certify that I have reviewed this report, both in form and content, and that all data, calculations, and presentations are authentic, accurate, and complete.

Arlene Bell
Vice President, Analytical Services

4/22/16
Date

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1.0 INTRODUCTION

Delta Air Quality Services (Delta), an affiliate of Montrose Air Quality Services, LLC (Montrose), was contracted by Desert View Power, to conduct performance emissions testing at the Desert View Power Project located in Mecca, California. Testing was conducted on March 1 and 2, 2016. The Delta test team consisted of Dave Wonderly, Arlene Bell, Rik Dupont and Shannon Scrugham. Rick Kruzel of Desert View Power, coordinated plant operations and data retrieval during the test program. The South Coast Air Quality Management District (SCAQMD) was notified of the test date but did not send a representative.

The emissions tests included measurements on Unit 1 and Unit 2 for particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and hydrocarbons. Exhaust flow rate and moisture measurements were performed in conjunction with the testing. Relative Accuracy Test Audits (RATA) were conducted on the plant's continuous emissions monitoring system (CEMS).

The Desert View Power Facility met all emissions limits required by the U.S. Environmental Protection Agency Operating Permit NSR 4-4-11;SE 87-01 including amendments through August 14, 2003: 7th Amendment Title V permit to operate CB-OP 99-01 dated 8/1/2000. The plant CEMS met all RATA requirements of CFR 40 Appendix F.

Tables 1-1 and 1-2 summarize the results of the emissions tests and Tables 1-3 and 1-4 present the results of the RATA tests for Unit 1 and Unit 2.

TABLE 1-1
SUMMARY OF EMISSIONS RESULTS
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Parameter	Average Emission Results	Permit Limit	Comment
Total Solid Particulate:			
gr/dscf	0.0002	--	
gr/dscf @ 12% CO_2	0.0002	0.010	Pass
lb/hr (PM_{10})	0.13	3.9	Pass
Sulfur Dioxide:			
ppm @ 3% O_2	12.97	27	Pass
lb/hr	7.72	12	Pass
NO_x:			
ppm at 3% O_2	62.05	94	Pass
lb/hr	26.54	30	Pass
CO:			
ppm @ 3% O_2	0.12	231	Pass
lb/hr	0.03	13	Pass
Hydrocarbons:			
ppm @ 3% O_2	3.91		
lb/hr	0.58	5.9	Pass

Note: NO_x CO and SO_2 results are from RATA Runs 1, 2 and 3. Hydrocarbons are total non-methane hydrocarbons reported as methane. The EPA factor of 1.086 for SCAQMD Method 25.3 was used.

TABLE 1-2
SUMMARY OF EMISSIONS RESULTS
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Parameter	Average Emission Results	Permit Limit	Comment
Total Solid Particulate:			
gr/dscf	0.0002	--	
gr/dscf @ 12% CO_2	0.0002	0.010	Pass
lb/hr	0.16	3.9	Pass
Sulfur Dioxide:			
ppm @ 3% O_2	14.32	27	Pass
lb/hr	8.76	12	Pass
NO_x:			
ppm at 3% O_2	59.07	94	Pass
lb/hr	25.95	30	Pass
CO:			
ppm @ 3% O_2	0.12	231	Pass
lb/hr	0.03	13	Pass
Hydrocarbons:			
ppm @ 3% O_2	7.09		
lb/hr	1.08	5.9	Pass

Note: NO_x CO and SO_2 results are from RATA Runs 1, 2 and 3. Hydrocarbons are total non-methane hydrocarbons reported as methane. The EPA factor of 1.086 for SCAQMD Method 25.3 was used.

TABLE 1-3
RELATIVE ACCURACY RESULT SUMMARY
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

CEMS	RA	Limit	Comment
NO_x ppm	5.58%	20%	Pass
NO_x @ 3% O_2	5.20%	20%	Pass
NO_x lb/hr	8.61%	20%	Pass
O_2 dry	0.98%	20%	Pass
CO ppm(1)	-0.63	<5 ppm(1)	Pass
CO @ 3% O_2(1)	-1.00	<5 ppm(1)	Pass
CO lb/hr	0.81%	5%(2)	Pass
SO_2 ppm	13.25%	20%	Pass
SO_2 @ 3% O_2	13.35%	20%	Pass
SO_2 lb/hr	5.97%	20%	Pass

(1) PS 4A Criteria, average difference less than 5ppm.
(2) Of applicable standard

TABLE 1-4
RELATIVE ACCURACY RESULT SUMMARY
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

CEMS	RA	Limit	Comment
NO_x ppm	8.77%	20%	Pass
NO_x @ 3% O_2	7.49%	20%	Pass
NO_x lb/hr	2.88%	20%	Pass
O_2 dry	1.55%	20%	Pass
CO ppm(1)	-1.25	<5 ppm(1)	Pass
CO @ 3% O_2(1)	-1.75	<5 ppm(1)	Pass
CO lb/hr	1.41%	5%(2)	Pass
SO_2 ppm	9.36%	20%	Pass
SO_2 @ 3% O_2	8.72%	20%	Pass
SO_2 lb/hr	9.41%	20%	Pass

(1) PS 4A Criteria, average difference less than 5ppm.
(2) Of applicable standard

2.0 UNIT DESCRIPTION

The Desert View Power, plant consists of two 297 MMBtu/hour, circulating bed, biomass-fired boilers. The combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of NO_x emissions;
2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission);
3. A limestone injection system to limit emissions of SO_2;
4. A reverse air baghouse to control opacity and emissions of sulfates and particulate to very low levels;

The plant CEMS system for each unit includes measurements of NO_x, CO, O_2, O_2 wet, SO_2, CO_2, flow and opacity. It is an extractive system with a heated line extending from the probe to the CEMS unit. Table 2-1 presents the current CEMS configuration.

TABLE 2-1
CONTINUOUS EMISSION MONITOR SYSTEM
DESERT VIEW POWER
UNIT 1 and 2

Species	Manufacturer	Unit 1, Model/Serial Number	Unit 2, Model/Serial Number	Range
NO_x	CAI	ZRE/A3F4992T	ZRE/A3F4993T	100 and 500 ppm
CO	CAI	ZRE/A3F4992T	ZRE/A3F4993T	100 and 500 ppm
O_2 Dry	CAI	ZRE/A3F4992T	ZRE/A3F4993T	25%
SO_2	CAI	ZRE/A3F4992T	ZRE/A3F4993T	50 and 500 ppm
CO_2	CAI	ZRE/A3F4992T	ZRE/A3F4993T	20%
O_2 Wet	Thermox	WDG	WDG	25%
Flow	Dietrick Standard/Rosemont	0260938	--	Msdcfh
Opacity	Monitor Labs	Lighthawk 560	Lighthawk 560	100%
NO_2 Convertor	CAI	ZDL04001	ZDL04001	

2.1 TEST CONDITIONS

The tests were conducted at or near maximum steady state unit load conditions. Limestone injection rate, fuel combustion rate, ammonia injection rate, ash handling operations, excess air level, combustion air distribution, and combustor temperature were set to maintain stable unit operation. Pertinent operating conditions were recorded by Desert View Power personnel during the tests as presented in Table 2-2.

TABLE 2-2
AVERAGE DAILY UNIT DATA
DESERT VIEW POWER
MARCH 2016

Date	Unit No.	Net MW	Steam Flow klbm/hr	Boiler Input MMBtu/hr
3/1/2016	1	44.8	211.9	271.3
3/2/2016	2	44.6	210.7	269.7

2.2 SAMPLE LOCATIONS

Samples were collected at the inlet ducts to the stack. Desert View Power previously conducted three dimensional flow testing and stratification testing on the baghouse exhaust ducts on each unit. This testing was performed in accordance to SCAQMD Chapter X, Section 1 and 13 and was presented in the report titled "Stack Gas Stratification and Absence of Flow Disturbance Testing at Desert View Power" (R106E622.T) submitted to SCAQMD in October of 1994. A copy of the sample location certification report can be found in the appendices. The sample locations meet the requirements. All testing for both Unit 1 and 2 was conducted at the sample location presented in Figure 2-1.

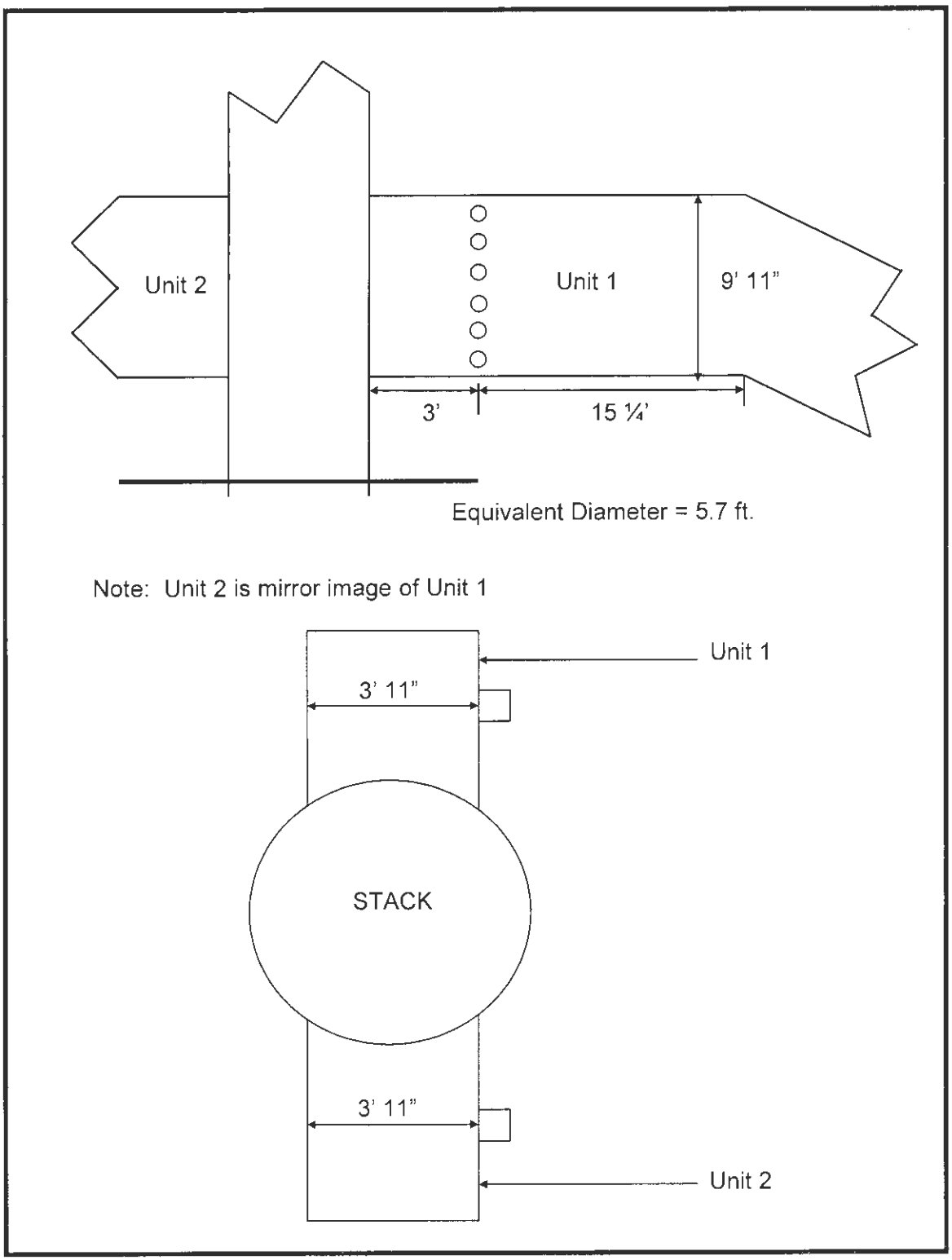

Figure 2-1. Schematic of the Desert View Power, Sample Location

3.0 TEST DESCRIPTIONS

The test procedures that were used are listed in Table 3-1. Tables 3-2 and 3-3 present the test schedule. The performance test runs for gaseous plant emissions were in some cases also used for RATA test runs. A minimum of nine reference method tests are required for all gaseous species relative accuracy (RA) determinations.

TABLE 3-1
TEST MATRIX PER UNIT
FOR DESERT VIEW POWER

Parameter	No. of Tests	Measurement Principle	Reference Method	Duration per Test
NO_x	9(1)	Chemiluminescence	EPA 7E	60/30 minutes
CO	9(1)	Non-Dispersive Infrared	Modified EPA 10	60/30 minutes
CO_2	9(1)	Non-Dispersive Infrared	EPA 3A	60/30 minutes
O_2	9(1)	Electrochemical	EPA 3A	60/30 minutes
PM	3	Gravimetric	EPA 5	120 minutes
SO_2	9(1)	Barium Thorin Titration	EPA 6	60/30 minutes
Hydrocarbons	2	GC/FID	SCAQMD 25.3	~60 minutes
Stack Gas Flow Rate	--	S-Type Pitot Traverse	EPA 2	--
Moisture	--	Condensation/Gravimetric	EPA 4	--

(1) Includes compliance and RATA test runs.

TABLE 3-2
TEST SCHEDULE
DESERT VIEW POWER, UNIT 1

Test No.	Date	Time	Test Parameter
1-RA-U1	3/1/2016	8:00	NO_x, CO,SO_2 & CO_2 RM data
2-RA-U1	3/1/2016	9:15	NO_x, CO,SO_2 & CO_2 RM data
3-RA-U1	3/1/2016	10:31	NO_x, CO,SO_2 & CO_2 RM data
4-RA-U1	3/1/2016	11:47	NO_x, CO,SO_2 & CO_2 RM data
5-RA-U1	3/1/2016	12:30	NO_x, CO,SO_2 & CO_2 RM data
6-RA-U1	3/1/2016	13:15	NO_x, CO,SO_2 & CO_2 RM data
7-RA-U1	3/1/2016	14:25	NO_x, CO,SO_2 & CO_2 RM data
8-RA-U1	3/1/2016	15:09	NO_x, CO,SO_2 & CO_2 RM data
9-RA-U1	3/1/2016	15:53	NO_x, CO,SO_2 & CO_2 RM data
1A-VOC-U1	3/1/2016	9:10	Hydrocarbon
1-PM-U1	3/1/2016	8:00	PM, RM data
2-PM-U1	3/1/2016	10:31	PM, RM data
3-PM-U1	3/1/2016	13:15	PM, RM data

9 CEMS runs for the RATA were performed. RATA runs 1, 2, and 3 were used for compliance.

TABLE 3-3
TEST SCHEDULE
DESERT VIEW POWER, UNIT 2

Test No.	Date	Time	Test Parameter
1-RA-U2	3/2/2016	8:35	NO_x, CO,SO_2 & CO_2 RM data
2-RA-U2	3/2/2016	9:50	NO_x, CO,SO_2 & CO_2 RM data
3-RA-U2	3/2/2016	11:03	NO_x, CO,SO_2 & CO_2 RM data
4-RA-U2	3/2/2016	12:17	NO_x, CO,SO_2 & CO_2 RM data
5-RA-U2	3/2/2016	13:00	NO_x, CO,SO_2 & CO_2 RM data
6-RA-U2	3/2/2016	13:43	NO_x, CO,SO_2 & CO_2 RM data
7-RA-U2	3/2/2016	14:26	NO_x, CO,SO_2 & CO_2 RM data
8-RA-U2	3/2/2016	15:09	NO_x, CO,SO_2 & CO_2 RM data
9-RA-U2	3/2/2016	15:53	NO_x, CO,SO_2 & CO_2 RM data
HC-U2	3/2/2016	10:20	Hydrocarbon
1-PM-U2	3/2/2016	8:35	Particulate
2-PM-U2	3/2/2016	11:03	Particulate
3-PM-U2	3/2/2016	13:36	Particulate

9 CEMS runs for the RATA were performed. RATA runs 1, 2, and 3 were used for compliance.

3.1 NO_x, CO, O_2, AND CO_2

NO_x, O_2, CO_2 and CO were measured according to EPA reference methods using Delta's continuous emissions monitoring system (CEM). NO_x, O_2, CO_2 and CO concentrations were determined using Delta's mobile emission measurement laboratory. The laboratory is housed in a truck outfitted to provide a clean, quiet, environmentally controlled base for the testing operations. The laboratory has lighting, electrical distribution, air conditioning and heating to support the test instruments and provide for optimal test performance.

Concentrations of these gaseous species were measured using an extractive sampling system consisting of a stainless steel probe to minimize reactions, a heat traced Teflon sample line connected to a thermo-electrically cooled sample dryer. Following the dryer, the sample is drawn into a Teflon lined pump where it is pressurized and then filtered for delivery to the gas analysis portion of the system. Gaseous samples were collected at a single point. Three 60-minute compliance tests were performed.

NO_x concentration was determined using a California Analytical Model 600. The analyzer full scale range was 100 ppm. The analyzer is equipped with a NO_2 - NO converter for the determination of total nitrogen oxides without interference from other nitrogen containing compounds.

Oxygen concentration was determined using a AMI electro-chemical cell analyzer (model #201). The analyzer full scale range was 20%. The cell contains an electrolytic fluid that reacts with oxygen to generate an electrical signal proportional to the concentration.

CO_2 was measured using a non-dispersive infrared analyzer manufactured by Horiba (model #PIR 2000). The analyzer full scale range was 20%.

CO was measured using a non-dispersive infrared/gas filter correlation analyzer manufactured by TECO (model 48i). The analyzer full scale range was 10 ppm.

The analyzers and sampling system were subjected to a variety of calibration and quality assurance procedures including leak checks, linearity and calibration error determinations before sampling, and system bias and drift determinations as part of each test run. Data are corrected for any observed bias or drift in accordance with the reference methods.

3.2 PARTICULATE

EPA method 5 was used to measure the particulate emissions from both the Desert View Power, units. The sampling system consists of a nozzle, glass probe, 250°F heated filter, two impingers containing DI water, an empty impinger, and a fourth impinger containing silica gel.

The analysis for particulate is summarized in Table 3-4. Gravimetric analysis was performed on the probe/nozzle wash and filter according to EPA and SCAQMD procedures.

TABLE 3-4
EPA METHOD 5 ANALYSES

	Sample Component	Analysis Procedure
1.	Probe and Nozzle (Front 1/2)	Evaporation/gravimetric
2.	Heated Filter (83 mm)	Dry/gravimetric

3.3 SULFUR DIOXIDE

Sulfur dioxide was measured according to EPA Method 6. Three runs were used to demonstrate compliance. A barium thorin titration of the hydrogen peroxide impinger samples yielded SO_2 concentrations for a minimum of nine relative accuracy tests. The sample system consisted of heated glass probe and filter connected by Teflon tubing to the glass sample train consisting of a series of hydrogen peroxide filled impingers. Prior to the titrimetric analysis, all SO_x samples were passed through an ion exchange resin. This removes interferences associated with ammonium (NH_4).

3.4 HYDROCARBONS

Samples for hydrocarbon analysis were collected in clean 6-liter Summa canisters and mini water impingers and analyzed according to SCAQMD 25.3. The samples were analyzed by AtmAA in Calabasas, CA using TCA/FID.

3.5 VELOCITY AND MOISTURE

Stack gas velocity and moisture content were determined by EPA Methods 2 and 4 during the particulate testing. Velocity traverses were performed during each set of compliance tests (NO_x, CO, SO_2 and hydrocarbons) and RATA test runs.

3.6 FUEL ANALYSIS

Daily fuel samples were collected by Desert View Power personnel. Composite daily fuel analysis was performed by SGS to determine higher heating value for heat rate calculations.

3.7 RATA TEST PROCEDURES

Relative accuracy tests were performed on NO_x, SO_2, CO and CO_2 sub-systems of each unit's CEMS. Relative accuracy was determined by comparing the CEMS data to the corresponding reference method (RM) data over nine test runs. Nine-30 minute minimum runs were performed on Units 1 and 2 for the NO_x, SO_2, CO, and CO_2. Relative accuracy is expressed in terms of the absolute value of the mean of the difference between the monitor value and the reference method value. It is reported in terms of a percentage of the mean reference method value. The computational procedure is summarized by the following equations:

$$\overline{RM} = \frac{1}{n}\sum_{i=1}^{n} RM_i$$

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

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

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}}$$

$$RA = \frac{|\overline{d}| + |CC|}{\overline{RM}} x100$$

where:

$\overline{RM}$ = mean value of the reference method

$\overline{d}$ = average difference between RM and CEMS (RM – CEMS)

$|\bar{d}|$ = absolute value of the difference between RM and CEMS

S_d = sample standard deviation of the difference between RM and CEMS

RA = Relative Accuracy

$t_{0.975}$ = t value at 95% confidence interval

n = number of valid tests

4.0 RESULTS

This section presents the results of the performance tests conducted at Desert View Power, during March of 2016. Test results are presented in the following sections:

4.1 Unit 1 Performance Tests and RATA Results

4.2 Unit 2 Performance Tests and RATA Results

4.3 Fuel Analysis Results

The test plan that was submitted is contained in Appendix A and quality assurance information in Appendix B. All supporting data sheets and plant data are included in Appendix C. Emissions calculations are presented in Appendix D. Laboratory reports are contained in Appendix E, and Delta instrument strip charts are in Appendix F. Chain of custody records are included in Appendix G.

4.1 UNIT 1 PERFORMANCE TESTS AND RATA RESULTS

Total solid particulate emissions for Unit 1 were 0.13 lb/hr. The results are presented in Table 4-1. This is below the permit limit of 3.9 lb/hr. Gaseous emissions results are presented in Tables 4-2, and 4-3. NO_x, CO, SO_2 and hydrocarbon emissions results were below established permit limits. Results from the hydrocarbon tests can be found in Appendix C.1.5.1 and C.1.5.2.

Tables 4-4 through 4-13 present the CEMS RATA for Unit 1. The results demonstrate that the CEMS for Unit 1 is in control as defined in CFR 40 Appendix F. The results of the RATA are presented in units of ppm dry, ppm @ 3% O_2, and lb/hr for NO_x, CO and SO_2. O_2 results are presented in concentration units of %.

TABLE 4-1
PARTICULATE EMISSIONS PERFORMANCE TEST
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Test No.	1-PM-U1	2-PM-U1	3-PM-U1	
Date:	3/1/2016	3/1/2016	3/1/2016	
Time:	800/1019	1031/1251	1315/1551	
O_2, %	9.1	9.1	9.1	9.1
CO_2, %	11.4	11.4	11.4	11.4
H_2O, %	13.4%	12.9%	12.5%	13.0%
Stack Temperature (°F)	350.0	356.6	358.3	355.0
Gas Flow:				
wacfm	159,546	159,230	155,798	158,191
dscfm	90,876	90,505	88,773	90,051
Isokinetic Ratio, %	98.9	101.0	101.0	100.3
Total Solid Particulate:				
Grain Loading, gr/dscf	0.00007	0.00019	0.00025	0.00017
Grain Loading @ 12% CO_2	0.00007	0.00020	0.00027	0.00018
lb/hr	0.052	0.145	0.193	0.13

TABLE 4-2
NO_x, CO, SO_x EMISSIONS PERFORMANCE TESTS
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Test No. Date: Time:	1-Compliance -U1 3/1/2016 800/900	2-Compliance-U1 3/1/2016 915/1015	3-Compliance-U1 3/1/2016 1031/1131	Average
O_2, %	9.1	9.2	9.0	9.1
CO_2, %	11.5	11.3	11.5	11.4
H_2O, %	13.01	13.56	12.98	13.19
Stack Temperature, °F	350	351	354	352
Gas Flow:				
wacfm	160,291	160,427	155,662	158,794
dscfm	91,788	91,146	88,698	90,544
NO_x, ppm	40.8	40.4	41.6	**40.9**
NO_x, ppm @ 3% O_2	61.6	61.8	62.7	**62.05**
NO_x, lb/hr	26.82	26.40	26.40	**26.54**
CO, ppm	0.09	0.07	0.07	**0.08**
CO, ppm @ 3% O_2	0.14	0.10	0.11	**0.12**
CO, lb/hr	0.04	0.03	0.03	**0.03**
SO_x, ppm	8.85	7.64	9.19	**8.56**
SO_x, ppm @ 3% O_2	13.37	11.67	13.87	**12.97**
SO_x, lb/hr	8.09	6.94	8.12	**7.72**

TABLE 4-3
HYDROCARBON EMISSIONS PERFORMANCE TEST
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Test No. Date: Time:	1A-HC-U1 3/1/2016 910/1000	1B-HC-U1 3/1/2016 910/1000	Average
O_2, %	9.11	9.11	9.11
CO_2, %	11.39	11.39	11.39
H_2O, %	13.43%	13.43%	13.43%
Gas Flow:			
wacfm	159,546	159,546	159,546
dscfm	90,876	90,876	90,876
EPA Correction Factor	1.086	1.086	1.086
TNMHC ppm	2.33	2.81	2.57
TNMHC ppm @ 3% O_2	3.54	4.27	3.91
TNMHC, lb/hr	0.53	0.64	0.58

Note: Flow rates from RATA Run 1

TABLE 4-4
RELATIVE ACCURACY TEST AUDIT SUMARY NO_x, PPM
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM NO_x, ppm dry	CEMS NO_x, ppm dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	40.8	42.8	-2.0	Y
2	3/1/2016	9:15	40.4	42.4	-2.0	Y
3	3/1/2016	10:31	41.6	43.1	-1.6	Y
4	3/1/2016	11:47	41.4	44.8	-3.4	Y
5	3/1/2016	12:30	43.0	44.3	-1.3	Y
6	3/1/2016	13:15	44.6	46.4	-1.8	y
7	3/1/2016	14:25	42.3	44.0	-1.7	Y
8	3/1/2016	15:09	43.5	45.0	-1.5	Y
9	3/1/2016	15:53	41.2	43.0	-1.7	Y

Ref. Method Average:	42.10	ppm
CEMS Average:	43.97	ppm
Average Difference:	-1.88	ppm
Number of Tests:	9	
Standard Deviation:	0.62	ppm
t Value:	2.306	
Confidence Coefficient:	0.47	ppm
Relative Accuracy:	5.58	% of Reference Method

TABLE 4-5
RELATIVE ACCURACY TEST AUDIT SUMARY NO_x, PPM @ 3% O_2
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM NO_x ppmc	CEMS NO_x ppmc	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	61.6	65.0	-3.4	Y
2	3/1/2016	9:15	61.8	64.8	-3.0	Y
3	3/1/2016	10:31	62.7	65.3	-2.6	Y
4	3/1/2016	11:47	64.3	68.4	-4.1	Y
5	3/1/2016	12:30	65.5	67.7	-2.2	Y
6	3/1/2016	13:15	67.6	70.4	-2.8	y
7	3/1/2016	14:25	64.3	67.0	-2.7	Y
8	3/1/2016	15:09	65.6	67.8	-2.2	Y
9	3/1/2016	15:53	62.9	65.6	-2.7	Y

Ref. Method Average:	64.03	ppmc
CEMS Average:	66.90	ppmc
Average Difference:	-2.87	ppmc
Number of Tests:	9	
Standard Deviation:	0.59	ppmc
t Value:	2.306	
Confidence Coefficient:	0.46	
Relative Accuracy:	5.20	% of Reference Method

TABLE 4-6
RELATIVE ACCURACY TEST AUDIT SUMMARY NO_x, LB/HR
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM NO_x lb/hr	CEMS NO_x lb/hr	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	26.82	25.89	0.93	Y
2	3/1/2016	9:15	26.40	25.26	1.14	Y
3	3/1/2016	10:31	26.40	24.99	1.41	Y
4	3/1/2016	11:47	26.64	25.81	0.83	Y
5	3/1/2016	12:30	27.93	24.97	2.96	Y
6	3/1/2016	13:15	28.48	26.06	2.42	y
7	3/1/2016	14:25	27.04	24.95	2.09	Y
8	3/1/2016	15:09	27.99	25.86	2.12	Y
9	3/1/2016	15:53	23.87	24.66	-0.79	Y

Ref. Method Average:	26.841	lb/hr
CEMS Average:	25.383	lb/hr
Average Difference:	1.458	lb/hr
Number of Tests:	9	
Standard Deviation:	1.111	lb/hr
t Value:	2.306	
Confidence Coefficient:	0.8540	
Relative Accuracy:	8.61	% of Reference Method

TABLE 4-7
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2, PPM
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM SO_2, ppm dry	CEMS SO_2, ppm dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	8.8	8.8	0.0	Y
2	3/1/2016	9:15	7.6	7.6	0.0	Y
3	3/1/2016	10:31	9.2	9.4	-0.2	Y
4	3/1/2016	11:47	8.8	10.0	-1.2	Y
5	3/1/2016	12:30	7.8	9.1	-1.3	Y
6	3/1/2016	13:15	8.2	9.3	-1.0	y
7	3/1/2016	14:25	7.5	8.3	-0.8	Y
8	3/1/2016	15:09	8.6	9.6	-1.0	Y
9	3/1/2016	15:53	8.0	8.7	-0.7	Y

Ref. Method Average:	8.28	ppm
CEMS Average:	8.98	ppm
Average Difference:	-0.70	ppm
Number of Tests:	9	
Standard Deviation:	0.51	ppm
t Value:	2.306	
Confidence Coefficient:	0.40	ppm
Relative Accuracy:	13.25	% of Reference Method

TABLE 4-8
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2, PPM @ 3% O_2
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM SO_2, ppm dry	CEMS SO_2, ppm dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	13.4	13.4	-0.1	Y
2	3/1/2016	9:15	11.7	11.7	0.0	Y
3	3/1/2016	10:31	13.9	14.2	-0.3	y
4	3/1/2016	11:47	13.6	15.5	-1.9	Y
5	3/1/2016	12:30	11.8	13.9	-2.0	Y
6	3/1/2016	13:15	12.5	14.0	-1.6	y
7	3/1/2016	14:25	11.4	12.7	-1.3	Y
8	3/1/2016	15:09	12.9	14.5	-1.6	Y
9	3/1/2016	15:53	12.2	13.2	-1.1	Y

Ref. Method Average:	12.60	ppmc
CEMS Average:	13.69	ppmc
Average Difference:	-1.09	ppmc
Number of Tests:	9	
Standard Deviation:	0.77	ppmc
t Value:	2.306	
Confidence Coefficient:	0.59	ppmc
Relative Accuracy:	13.35	% of Reference Method

TABLE 4-9
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2, LB/HR
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM SO_2 lb/hr	CEMS SO_2 lb/hr	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	8.09	7.46	0.64	Y
2	3/1/2016	9:15	6.94	6.33	0.61	Y
3	3/1/2016	10:31	8.12	7.56	0.57	Y
4	3/1/2016	11:47	7.87	8.04	-0.17	Y
5	3/1/2016	12:30	7.03	7.11	-0.08	Y
6	3/1/2016	13:15	7.30	7.23	0.08	y
7	3/1/2016	14:25	6.68	6.58	0.10	Y
8	3/1/2016	15:09	7.68	7.70	-0.02	Y
9	3/1/2016	15:53	6.42	6.92	-0.51	Y

Ref. Method Average:	7.35	lb/hr
CEMS Average:	7.21	lb/hr
Average Difference:	0.14	lb/hr
Number of Tests:	9	
Standard Deviation:	0.39	lb/hr
t Value:	2.306	
Confidence Coefficient:	0.30	ppmc
Relative Accuracy:	5.97	% of Reference Method

TABLE 4-10
RELATIVE ACCURACY TEST AUDIT SUMMARY CO PPM
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM CO, ppm dry	CEMS CO, ppm dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	0.1	0.0	0.1	Y
2	3/1/2016	9:15	0.1	0.0	0.1	Y
3	3/1/2016	10:31	0.1	0.1	0.0	Y
4	3/1/2016	11:47	0.1	0.4	-0.3	Y
5	3/1/2016	12:30	0.1	0.7	-0.6	Y
6	3/1/2016	13:15	0.1	1.0	-0.9	y
7	3/1/2016	14:25	0.1	1.1	-1.0	Y
8	3/1/2016	15:09	0.1	1.5	-1.4	Y
9	3/1/2016	15:53	0.1	1.6	-1.5	Y

Ref. Method Average:	0.08	ppm
CEMS Average:	0.71	ppm
Average Difference:	-0.63	(PS 4A Criteria: Avg. Diff. less than 5 ppm)
Number of Tests:	9	
Standard Deviation:	0.62	ppm
t Value:	2.306	
Confidence Coefficient:	0.48	ppm
Relative Accuracy:	N/A	% of Reference Method

TABLE 4-11
RELATIVE ACCURACY TEST AUDIT SUMMARY CO PPM @ 3% O_2
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM CO, ppm dry	CEMS CO, ppm dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	0.1	0.0	0.1	Y
2	3/1/2016	9:15	0.1	0.0	0.1	Y
3	3/1/2016	10:31	0.1	0.2	0.0	Y
4	3/1/2016	11:47	0.1	0.6	-0.4	Y
5	3/1/2016	12:30	0.1	1.5	-1.4	Y
6	3/1/2016	13:15	0.1	1.5	-1.4	y
7	3/1/2016	14:25	0.1	1.7	-1.6	Y
8	3/1/2016	15:09	0.1	2.3	-2.1	Y
9	3/1/2016	15:53	0.1	2.5	-2.3	Y

Ref. Method Average:	0.12	ppmc
CEMS Average:	1.12	ppmc
Average Difference:	-1.00	(PS 4A Criteria: Avg. Diff. less than 5 ppm)
Number of Tests:	9	
Standard Deviation:	0.96	ppmc
t Value:	2.306	
Confidence Coefficient:	0.74	ppmc
Relative Accuracy:	N/A	% of Reference Method

TABLE 4-12
RELATIVE ACCURACY TEST AUDIT SUMMARY CO, LB/HR
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM CO, lb/hr	CEMS CO, lb/hr	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	0.04	0.00	0.04	Y
2	3/1/2016	9:15	0.03	0.00	0.03	Y
3	3/1/2016	10:31	0.03	0.04	-0.01	Y
4	3/1/2016	11:47	0.03	0.13	-0.10	Y
5	3/1/2016	12:30	0.03	-0.01	0.03	Y
6	3/1/2016	13:15	0.03	0.33	-0.30	y
7	3/1/2016	14:25	0.04	0.39	-0.35	Y
8	3/1/2016	15:09	0.03	0.52	-0.49	Y
9	3/1/2016	15:53	0.03	0.56	-0.53	Y

Ref. Method Average:	0.03	lb/hr
CEMS Average:	0.22	lb/hr
Average Difference:	-0.19	lb/hr
Number of Tests:	9	
Standard Deviation:	0.233	
t Value:	2.306	
Confidence Coefficient:	0.179	
Applicable Standard:	45.0	lb/hr
Relative Accuracy:	N/A	% of Reference Method
Relative Accuracy:	0.81	% of Applicable Standard

TABLE 4-13
RELATIVE ACCURACY TEST AUDIT SUMMARY O_2, %
DESERT VIEW POWER, UNIT 1
MARCH 1, 2016

Run #	Date	Time	RM O_2, % dry	CEMS O_2, % dry	Difference	Use Data? (Y or N)
1	3/1/2016	8:00	9.05	9.16	-0.11	Y
2	3/1/2016	9:15	9.19	9.25	-0.07	Y
3	3/1/2016	10:31	9.04	9.13	-0.09	Y
4	3/1/2016	11:47	9.37	9.28	0.09	Y
5	3/1/2016	12:30	9.14	9.20	-0.06	Y
6	3/1/2016	13:15	9.09	9.13	-0.04	y
7	3/1/2016	14:25	9.12	9.18	-0.06	Y
8	3/1/2016	15:09	9.02	9.06	-0.04	Y
9	3/1/2016	15:53	9.16	9.20	-0.04	Y

Ref. Method Average:	9.13	
CEMS Average:	9.18	
Average Difference:	-0.05	
Number of Tests:	9	
Standard Deviation:	0.06	
t Value:	2.306	
Confidence Coefficient:	0.04	
Relative Accuracy:	0.98	% of Reference Method

4.2 UNIT 2 PERFORMANCE TESTS AND RATA RESULTS

The results of the total solid particulate testing are presented in Table 4-14. The total particulate result for Unit 2 is 0.16 lb/hr. This is below the permit limit of 3.9 lb/hr. Gaseous emissions results are presented in Tables 4-15, and 4-16. NO_x, CO, SO_2 and hydrocarbon emissions results were also below established permit limits.

Tables 4-14 through 4-26 present the CEMS RATA results for Unit 2. The results demonstrate that the CEMS for Unit 2 is in control as defined in CFR 40 Appendix F. The results of the RATA are presented in units of ppm dry, ppm @ 3% O_2 and lb/hr for NO_x, CO and SO_2. O_2 results are presented in concentration units of %.

TABLE 4-14
PARTICULATE EMISSIONS PERFORMANCE TESTS
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Test No.	1-PM-U2	2-PM-U2	3-PM-U2	
Date:	3/2/2016	3/2/2016	3/2/2016	
Time:	835/1045	1103/1323	1336/1546	
O_2, %	8.4	8.5	8.5	8.5
CO_2, %	12.1	12.1	12.0	12.1
H_2O, %	13.5%	12.1%	11.8%	12.5%
Stack Temperature, °F	342.1	344.9	352.2	346.4
Gas Flow:				
wacfm	151,892	151,964	152,407	152,088
dscfm	87,013	88,131	87,840	87,661
Isokinetic Ratio, %	97.4	97.4	102.0	99.0
Total Solid Particulate:				
Grain Loading gr/dscf	0.00018	0.00033	0.00014	0.00022
Grain Loading @ 12% CO_2	0.00018	0.00033	0.00014	0.00022
lb/hr	0.136	0.253	0.104	0.164

TABLE 4-15
NO_x, SO_x, & CO EMISSIONS PERFORMANCE TESTS
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Test No. Date: Time:	1-Compliance-U2 3/2/2016 920/1020	1-Compliance-U2 3/2/2016 1211/1311	1-Compliance-U2 3/2/2016 1325/1425	Average
O_2, %	8.3	8.4	8.4	8.4
CO_2, %	12.2	12.1	12.1	12.1
H_2O, %	13.61	13.45	11.70	12.92
Stack Temperature, °F	340	344	345	343
Gas Flow:				
wacfm	151,365	154,928	151,223	152,506
dscfm	86,694	88,528	88,095	87,772
NO_x, ppm	40.7	41.0	42.1	**41.3**
NO_x, ppm @ 3% O_2	58.1	58.8	60.4	**59.07**
NO_x, lb/hr	25.30	25.98	26.56	**25.95**
CO, ppm	0.09	0.08	0.08	**0.08**
CO, ppm @ 3% O_2	0.13	0.11	0.11	**0.12**
CO, lb/hr	0.03	0.03	0.03	**0.03**
SO_x, ppm	9.32	10.38	10.31	**10.00**
SO_x, ppm @ 3% O_2	13.29	14.90	14.79	**14.32**
SO_x, lb/hr	8.05	9.16	9.05	**8.76**

TABLE 4-16
HYDROCARBON EMISSIONS PERFORMANCE TEST
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Test No. Date: Time:	1A-HC-U2 3/2/2016 1020/1100	1B-HC-U2 3/2/2016 1020/1100	Average
O_2, %	8.37	8.37	8.37
CO_2, %	12.13	12.13	12.13
H_2O, %	13.47%	13.47%	13.47%
Gas Flow:			
wacfm	151,892	151,892	151,892
dscfm	87,013	87,013	87,013
EPA Correction Factor	1.086	1.086	1.086
TNMHC ppm	4.96	2.68	3.82
TNMHC ppm @ 3% O_2	7.09	3.83	5.46
TNMHC, lb/hr	1.08	0.58	0.83

Note: Flow rates from RATA Run 1, the higher of the two runs was used to demonstrate compliance since the difference of the individual results was >20% of the average result per SCAQMD Method 25.3

TABLE 4-17
RELATIVE ACCURACY TEST AUDIT SUMMARY NO_x, PPM
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM NO_x, ppm dry	CEMS NO_x, ppm dry	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	40.7	43.2	-2.5	Y
2	3/2/2016	9:50	41.0	43.4	-2.4	Y
3	3/2/2016	11:03	42.1	45.0	-3.0	Y
4	3/2/2016	12:17	42.3	45.0	-2.7	Y
5	3/2/2016	13:00	39.3	42.5	-3.2	Y
6	3/2/2016	13:43	41.4	44.9	-3.5	Y
7	3/2/2016	14:26	40.6	43.9	-3.3	Y
8	3/2/2016	15:09	38.1	41.8	-3.8	Y
9	3/2/2016	15:53	39.5	43.4	-3.9	Y

Ref. Method Average:	40.55	ppm
CEMS Average:	43.70	ppm
Average Difference:	-3.15	ppm
Number of Tests:	9	
Standard Deviation:	0.53	ppm
t Value:	2.306	
Confidence Coefficient:	0.41	ppm
Relative Accuracy:	8.77	% of Reference Method

TABLE 4-18
RELATIVE ACCURACY TEST AUDIT SUMMARY NO_x, PPM @ 3% O_2
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM NO_x ppmc	CEMS NO_x ppmc	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	58.1	61.0	-3.0	Y
2	3/2/2016	9:50	58.8	61.7	-2.9	Y
3	3/2/2016	11:03	60.4	63.6	-3.2	Y
4	3/2/2016	12:17	61.0	64.1	-3.2	Y
5	3/2/2016	13:00	57.3	61.2	-3.9	Y
6	3/2/2016	13:43	59.4	63.6	-4.2	Y
7	3/2/2016	14:26	58.8	62.9	-4.0	Y
8	3/2/2016	15:09	55.6	60.4	-4.8	Y
9	3/2/2016	15:53	57.2	62.1	-4.9	Y

Ref. Method Average:	58.51	ppmc
CEMS Average:	62.29	ppmc
Average Difference:	-3.78	ppmc
Number of Tests:	9	
Standard Deviation:	0.78	ppmc
t Value:	2.306	
Confidence Coefficient:	0.60	
Relative Accuracy:	7.49	% of Reference Method

TABLE 4-19
RELATIVE ACCURACY TEST AUDIT SUMMARY NO_x, LB/HR
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM NO_x lb/hr	CEMS NO_x lb/hr	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	25.30	25.19	0.11	Y
2	3/2/2016	9:50	25.98	25.63	0.35	Y
3	3/2/2016	11:03	26.56	25.65	0.90	Y
4	3/2/2016	12:17	26.86	25.86	1.01	Y
5	3/2/2016	13:00	25.26	24.88	0.38	Y
6	3/2/2016	13:43	27.06	26.25	0.81	Y
7	3/2/2016	14:26	26.01	25.59	0.42	Y
8	3/2/2016	15:09	24.63	24.88	-0.25	Y
9	3/2/2016	15:53	25.97	25.79	0.18	Y

Ref. Method Average:	25.959	lb/hr
CEMS Average:	25.525	lb/hr
Average Difference:	0.434	lb/hr
Number of Tests:	9	
Standard Deviation:	0.409	lb/hr
t Value:	2.306	
Confidence Coefficient:	0.3142	
Relative Accuracy:	2.88	% of Reference Method

TABLE 4-20
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2 PPM
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM SO_2, ppm dry	CEMS SO_2, ppm dry	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	9.3	8.9	0.4	Y
2	3/2/2016	9:50	10.4	10.2	0.2	Y
3	3/2/2016	11:03	10.3	10.8	-0.5	y
4	3/2/2016	12:17	9.7	9.4	0.3	Y
5	3/2/2016	13:00	8.0	8.4	-0.4	y
6	3/2/2016	13:43	11.4	11.9	-0.5	Y
7	3/2/2016	14:26	7.6	8.2	-0.6	Y
8	3/2/2016	15:09	8.3	9.5	-1.2	Y
9	3/2/2016	15:53	8.5	9.8	-1.3	Y

Ref. Method Average:	9.28	ppm
CEMS Average:	9.69	ppm
Average Difference:	-0.40	ppm
Number of Tests:	9	
Standard Deviation:	0.61	ppm
t Value:	2.306	
Confidence Coefficient:	0.47	ppm
Relative Accuracy:	9.36	% of Reference Method

TABLE 4-21
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2 PPM @ 3% O_2
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM SO_2, ppm dry	CEMS SO_2, ppm dry	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	13.3	12.7	0.6	Y
2	3/2/2016	9:50	14.9	14.5	0.4	Y
3	3/2/2016	11:03	14.8	15.3	-0.5	y
4	3/2/2016	12:17	14.0	13.4	0.6	y
5	3/2/2016	13:00	11.7	12.5	-0.7	y
6	3/2/2016	13:43	16.4	17.2	-0.9	Y
7	3/2/2016	14:26	10.9	11.6	-0.7	Y
8	3/2/2016	15:09	12.1	13.6	-1.5	Y
9	3/2/2016	15:53	12.3	14.0	-1.8	Y

Ref. Method Average:	13.39	ppmc
CEMS Average:	13.88	ppmc
Average Difference:	-0.49	ppmc
Number of Tests:	9	
Standard Deviation:	0.88	ppmc
t Value:	2.306	
Confidence Coefficient:	0.67	ppmc
Relative Accuracy:	8.72	% of Reference Method

TABLE 4-22
RELATIVE ACCURACY TEST AUDIT SUMMARY SO_2 LB/HR
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM SO_2 lb/hr	CEMS SO_2 lb/hr	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	8.05	7.25	0.81	Y
2	3/2/2016	9:50	9.16	8.39	0.77	Y
3	3/2/2016	11:03	9.05	8.56	0.50	y
4	3/2/2016	12:17	8.60	7.56	1.04	y
5	3/2/2016	13:00	7.20	6.87	0.33	y
6	3/2/2016	13:43	10.38	9.72	0.66	Y
7	3/2/2016	14:26	6.74	6.61	0.13	Y
8	3/2/2016	15:09	7.48	7.85	-0.37	Y
9	3/2/2016	15:53	7.75	8.12	-0.37	Y

Ref. Method Average:	8.27	lb/hr
CEMS Average:	7.88	lb/hr
Average Difference:	0.39	lb/hr
Number of Tests:	9	
Standard Deviation:	0.51	lb/hr
t Value:	2.306	
Confidence Coefficient:	0.39	ppmc
Relative Accuracy:	9.41	% of Reference Method

TABLE 4-23
RELATIVE ACCURACY TEST AUDIT SUMMARY CO, PPM
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM CO, ppm dry	CEMS CO, ppm dry	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	0.1	0.6	-0.5	Y
2	3/2/2016	9:50	0.1	0.4	-0.4	Y
3	3/2/2016	11:03	0.1	0.5	-0.5	Y
4	3/2/2016	12:17	0.1	0.6	-0.6	Y
5	3/2/2016	13:00	0.1	1.2	-1.1	Y
6	3/2/2016	13:43	0.1	1.9	-1.8	Y
7	3/2/2016	14:26	0.1	2.2	-2.1	Y
8	3/2/2016	15:09	0.1	2.3	-2.2	Y
9	3/2/2016	15:53	0.1	2.3	-2.2	Y

Ref. Method Average:	0.08	ppm
CEMS Average:	1.33	ppm
Average Difference:	-1.25	(PS 4A Criteria: Avg. Diff. less than 5 ppm)
Number of Tests:	9	
Standard Deviation:	0.80	ppm
t Value:	2.306	
Confidence Coefficient:	0.62	ppm
Relative Accuracy:	N/A	% of Reference Method

TABLE 4-24
RELATIVE ACCURACY TEST AUDIT SUMMARY CO, PPM @ 3% O_2
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM CO, ppm @ 3% O_2	CEMS CO, ppm @ 3% O_2	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	0.1	0.8	-0.7	Y
2	3/2/2016	9:50	0.1	0.6	-0.5	Y
3	3/2/2016	11:03	0.1	0.7	-0.6	Y
4	3/2/2016	12:17	0.1	0.9	-0.8	Y
5	3/2/2016	13:00	0.1	1.5	-1.4	Y
6	3/2/2016	13:43	0.1	2.6	-2.5	Y
7	3/2/2016	14:26	0.1	3.1	-3.0	Y
8	3/2/2016	15:09	0.1	3.3	-3.1	Y
9	3/2/2016	15:53	0.1	3.2	-3.1	Y

Ref. Method Average:	0.11	ppmc
CEMS Average:	1.86	ppmc
Average Difference:	-1.75	(PS 4A Criteria: Avg. Diff. less than 5 ppm)
Number of Tests:	9	
Standard Deviation:	1.17	ppmc
t Value:	2.306	
Confidence Coefficient:	0.90	ppmc
Relative Accuracy:	N/A	% of Reference Method

TABLE 4-25
RELATIVE ACCURACY TEST AUDIT SUMMARY CO LB/HR
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM CO, lb/hr	CEMS CO, lb/hr	Difference	Use Data? (=Y or N)
1	3/2/2016	8:35	0.03	0.21	-0.18	Y
2	3/2/2016	9:50	0.03	0.15	-0.12	Y
3	3/2/2016	11:03	0.03	0.16	-0.13	Y
4	3/2/2016	12:17	0.03	0.22	-0.20	Y
5	3/2/2016	13:00	0.03	-0.01	0.03	Y
6	3/2/2016	13:43	0.03	0.66	-0.63	Y
7	3/2/2016	14:26	0.02	0.72	-0.69	Y
8	3/2/2016	15:09	0.04	0.81	-0.78	Y
9	3/2/2016	15:53	0.04	0.81	-0.77	Y

Ref. Method Average:	0.03	lb/hr
CEMS Average:	0.42	lb/hr
Average Difference:	-0.39	lb/hr
Number of Tests:	9	
Standard Deviation:	0.325	
t Value:	2.306	
Confidence Coefficient:	0.250	
Applicable Standard:	45.0	lb/hr
Relative Accuracy:	N/A	% of Reference Method
Relative Accuracy:	1.41	% of Applicable Standard

TABLE 4-26
RELATIVE ACCURACY TEST AUDIT SUMMARY O_2, %
DESERT VIEW POWER, UNIT 2
MARCH 2, 2016

Run #	Date	Time	RM O_2, % dry	CEMS O_2, % dry	Difference	Use Data? (Y or N)
1	3/2/2016	8:35	8.34	8.25	0.10	Y
2	3/2/2016	9:50	8.43	8.34	0.09	Y
3	3/2/2016	11:03	8.42	8.28	0.14	Y
4	3/2/2016	12:17	8.49	8.35	0.13	Y
5	3/2/2016	13:00	8.64	8.51	0.12	Y
6	3/2/2016	13:43	8.42	8.30	0.13	Y
7	3/2/2016	14:26	8.54	8.42	0.12	Y
8	3/2/2016	15:09	8.65	8.53	0.12	Y
9	3/2/2016	15:53	8.53	8.41	0.12	Y

Ref. Method Average:	8.50	
CEMS Average:	8.38	
Average Difference:	0.12	
Number of Tests:	9	
Standard Deviation:	0.02	
t Value:	2.306	
Confidence Coefficient:	0.01	
Relative Accuracy:	1.55	% of Reference Method

4.3 FUEL ANALYSIS

Composite daily fuel sample analysis results are presented in Tables 4-27 and 4-28.

TABLE 4-27
COMPOSITE BIOMASS FUEL SAMPLE ANAYLSIS
DESERT VIEW POWER UNIT 1
MARCH 1, 2016

Sample Date:	3-1-2016 Wood
Reference temp, °F:	68
Moisture Total	30.29
Ash	11.12
Heating value, Btu/lb:	7,814
Sulfur	0.19
Carbon	46.52
Hydrogen	5.12
Nitrogen	0.94
Oxygen	36.11
F factor, dscf/MMBtu @ 0% O_2:	9,399
Ash content, lb/MMBtu:	14.230

TABLE 4-28
COMPOSITE BIOMASS FUEL SAMPLE ANAYLSIS
DESERT VIEW POWER UNIT 2
MARCH 2, 2016

Sample Date:	3-2-2016 Wood
Reference temp, °F:	68
Moisture Total	21.88
Ash	7.8
Heating value, Btu/lb:	8,064
Sulfur	0.16
Carbon	47.87
Hydrogen	5.36
Nitrogen	0.77
Oxygen	38.04
F factor, dscf/MMBtu @ 0% O_2:	9,357
Ash content, lb/MMBtu:	9.670

APPENDIX A TEST PLAN

TEST PLAN FOR EMISSIONS PERFORMANCE TESTING AT THE DESERT VIEW POWER PLANT

PREPARED FOR:

DESERT VIEW POWER
62-300 GENE WELMAS DR.
MECCA, CA. 92254-0758

FOR SUBMITTAL TO:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 COPLEY DRIVE
DIAMOND BAR, CALIFORNIA 91765-4178

PREPARED BY:

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DAVE WONDERLY

PRODUCTION DATE: **DECEMBER 30, 2015**

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1.0 INTRODUCTION

Delta Air Quality Services, Incorporated (Delta), an affiliate of Montrose Air Quality Services, LLC (Montrose), has been contracted by Desert View Power to conduct annual emissions compliance testing on two Fluid Bed Boilers, and a relative accuracy test audit (RATA) of the continuous emissions monitoring system (CEMS) at the Desert View Power Plant located in Mecca, California. Delta will conduct testing to comply with U.S. Environmental Protection Agency Operating Permit NSR 4-4-11;SE 87-01 including amendments through August 14, 2003: 7th Amendment Title V permit to operate CB-OP 99-01 dated 8/1/2000 and 40 CFR 60, Appendix F. This test plan presents the testing procedures, a description of the sample locations and a summary of quality assurance procedures.

Emissions tests will be performed on each Biomass fired boiler as specified in the permit for:

- Particulate
- NO_x, CO and SO_2
- Hydrocarbons

A relative accuracy test audit will be performed to satisfy the requirements of 40 CFR 60, Appendix F, as part of the quarterly CEMS testing. The Continuous Emissions Monitoring System (CEMS) Relative Accuracy Test Audit includes NO_x, CO and SO_2.

2.0 UNIT DESCRIPTION

The Desert View Power Plant consists of two 297 MMBtu/hour, circulating bed, biomass-fired boilers, and combined unit are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of NO_x emissions;
2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission);
3. A limestone injection system to limit emissions of SO_2;
4. A reverse air baghouse to restrict opacity and emissions of sulfates and particulate to very low levels.

The plant CEM system for each unit includes measurements of NO_x, CO, O_2, O_2 wet, SO_2, CO_2, flow and opacity. It is an extractive system with a heated line extending from the probe to the CEM unit. Table 2-1 presents the current CEMS configuration.

TABLE 2-1
CONTINUOUS EMISSION MONITOR SYSTEM
DESERT VIEW POWER PLANT

Species	Manufacturer	Model	Range
NO_x	CAI	ZRE-5 Multi Component Analyzer	100 and 500 ppm
CO	CAI	ZRE-5 Multi Component Analyzer	100 and 500 ppm
O_2 Dry	CAI	ZRE-5 Multi Component Analyzer	25%
SO_2	CAI	ZRE-5 Multi Component Analyzer	50 and 500 ppm
CO_2	CAI	ZRE-5 Multi Component Analyzer	20%
O_2 Wet	AMETEK	Thermox 2000	25%
Flow	Dietrick Standard	--	Msdcfh
Opacity	Monitor Labs	Lighthawk 560	100%

2.1 SAMPLE LOCATIONS

Samples will be collected from the transition ducts to the stack. Carnot Technical Services, Inc. conducted three dimensional flow testing and stratification testing on the transition exhaust ducts on each unit. This testing was conducted in accordance to SCAQMD chapter X section 1 and 13 and will be presented in the report titled "Stack Gas Stratification and Absence of Flow Disturbance Testing at Desert View Power Mecca Project" (R106E622.T) submitted to SCAQMD in October of 1994. The sample locations met all the requirements. Copies of the results from that report can be found in Appendix B .All testing for both Unit 1 and 2 will be done at the sample location presented in Figure 2-1.

2.2 UNIT OPERATION

The tests will be conducted at or near maximum steady state unit load conditions. Limestone injection rate, fuel combustion rate, ammonia injection rate, ash handling operations, excess air level, combustion air distribution, and combustion temperature will all be set to maintain stable unit operation. Pertinent operating conditions will be recorded by Desert View Power personnel during the tests. Full load will be defined as greater than 267 MMBtu/hr of total (biomass and natural gas) heat input to the boiler.

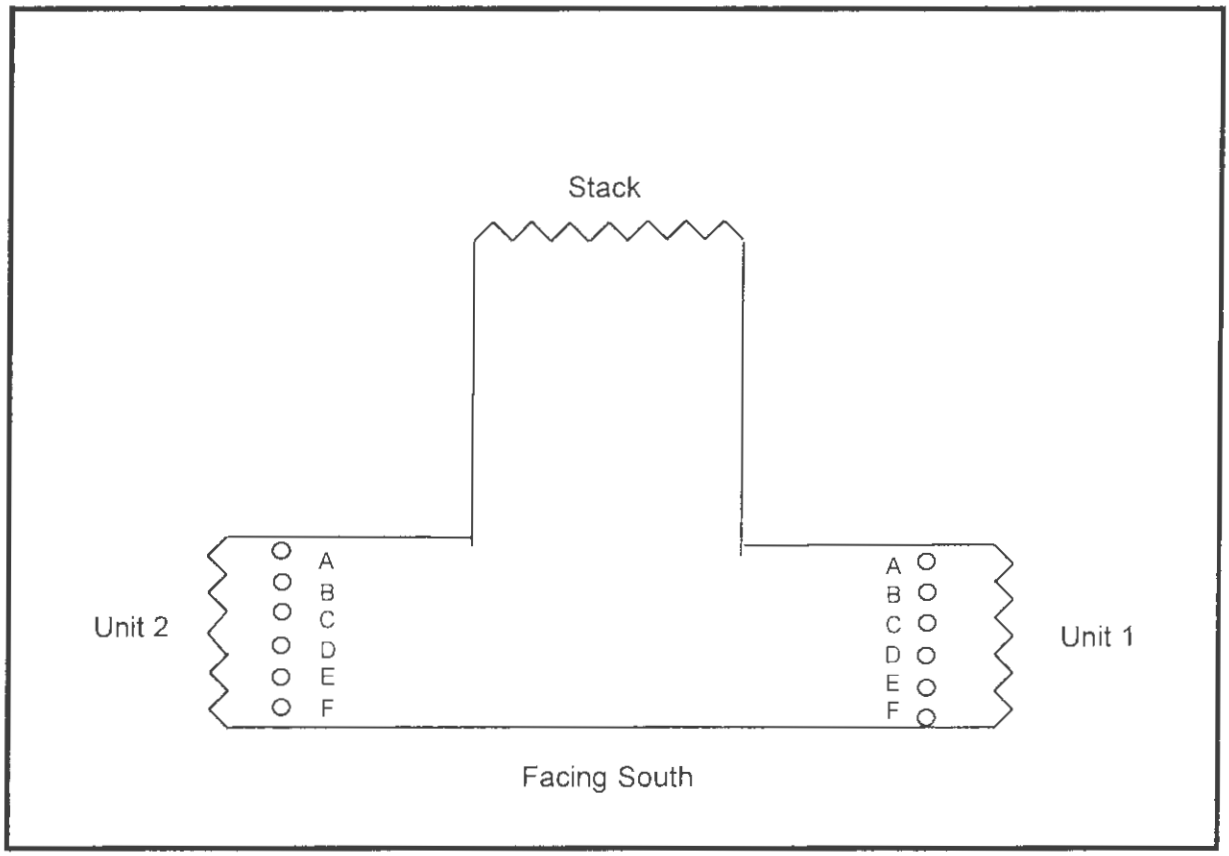

Figure 2-1 Desert View Power Sample Location

3.0 TEST PROCEDURES

The test procedures to be used are listed in Table 3-1. Part of the gaseous plant emissions performance testing data will be used for CEMS RATA determinations. A minimum of nine reference method tests are required for all gaseous species relative accuracy (RA) determinations.

TABLE 3-1
PROPOSED TEST MATRIX PER UNIT
FOR DESERT VIEW POWER MECCA PROJECT

Parameter	No. of Tests	Measurement Principle	Reference Method	Duration per Test
NO_x	9(1)	Chemiluminescence	EPA 7E	60/30 minutes
CO	9(1)	Non-Dispersive Infrared	EPA 10	60/30 minutes
O_2/CO_2	9(1)	Non-Dispersive Infrared	EPA 3A	60/30 minutes
PM	3	Gravimetric	EPA 5	90 minutes
SO_2	9(1)	Barium Thorin Titration	EPA 6	60/30 minutes
Hydrocarbons	2	GC/FID	SCAQMD 25.3	60 minute composite
Stack Gas Flow Rate	--	S-Type Pitot Traverse	EPA 2	--
Moisture	--	Condensation/Gravimetric	EPA 4	--

(1) Includes compliance and RATA test runs.

3.1 CONTINUOUS GASEOUS MEASUREMENTS

NO_x, O_2, CO_2 and CO will be measured according to EPA reference methods using Delta's continuous emissions monitoring system (CEM). NO_x, O_2, CO_2 and CO concentrations will be determined using Delta's mobile emission measurement laboratory. The laboratory is housed in an 18 foot trailer outfitted to provide a clean, quiet, environmentally controlled base for the testing operations. The laboratory has lighting, electrical distribution, air conditioning and heating to support the test instruments and provide for optimal test performance.

Concentrations of these gaseous species are measured using an extractive sampling system consisting of a heated stainless steel probe to minimize reactions, a heat traced Teflon sample line connected to a thermo-electrically cooled sample dryer. Following the dryer, the sample is drawn into a Teflon lined pump where it is pressurized and then filtered for delivery to the gas analysis portion of the system. Gaseous samples

will be collected at a single point. Three minimum 60-minute compliance tests will be performed.

NO_x concentration is determined using a California Analytical Instruments (CAI) chemiluminescence analyzer (model 600 Series). The analyzer has full scale ranges from 2.5 to 10,000 ppm. The analyzer is equipped with a vitreous carbon NO_2 - NO converter for the determination of total nitrogen oxides without interference from other nitrogen containing compounds.

Oxygen concentration is determined using a AMI electro-chemical cell analyzer (model # 201). The analyzer has three full scale ranges; 0-5%, 10%, and 25%. The cell contains an electrolytic fluid that reacts with oxygen to generate an electrical signal proportional to the concentration.

CO_2 is measured using a non-dispersive infrared analyzer manufactured by CAI (model # 100 Series). The analyzer has full scale ranges of 0-5%, 10%, 20% and 40%.

CO is measured using a non-dispersive infrared/gas filter correlation analyzer manufactured by TECO (model # 48i). The analyzer has user definable full scale ranges from of 0-10 to 0-10,000 ppm.

The analyzers and sampling system are subjected to a variety of calibration and quality assurance procedures including leak checks, linearity and calibration error determinations before sampling, and system bias and drift determinations as part of each test run. Data are corrected for any observed bias or drift in accordance with the reference methods.

3.2 PARTICULATE MEASUREMENTS

EPA method 5 sampling system will be used to measure the particulate emissions from both Desert View Power units. The sampling system consists of a nozzle, glass probe, 250°F heated filter, two impingers containing DI water, a third empty impinger and a fourth impinger containing silica gel.

The analysis for particulate is summarized in Table 3-2. Gravimetric Analysis will be performed on the probe/nozzle wash and filter.

TABLE 3-2
EPA METHOD 5 ANALYSES

	Sample Component	Analysis Procedure
1.	Probe and Nozzle (Front 1/2)	Evaporation/gravimetric
2.	Heated Filter (83 mm)	Bake/gravimetric

3.3 SULFUR DIOXIDE

Sulfur dioxide will be measured according to EPA Method 6. The first three runs will be 60 minutes and will be used to demonstrate compliance and as RATA runs. Subsequent RATA runs will consist of 30 minute tests per the Methods. A barium thorin titration of the hydrogen peroxide impinger samples will yield SO_2 concentrations for nine relative accuracy test runs. The sample system will consist of a heated glass probe connected to the impinger train with an un-heated Teflon sample line. All the unheated portion of the sample train will be recovered and analyzed. Prior to the titrimetric analysis, all SO_x samples will pass through an ion exchange resin. This removes interference associated with ammonium (NH_4^+). The Method 6 train will not include the IPA impinger, which is provided in the method as an option. The H_2O_2 will absorb both SO_2 and SO_3 (if any). SO_3 will be counted as SO_2.

3.4 HYDROCARBON

Samples for hydrocarbon analysis will be collected in clean 6-L Summa Canister and mini water impingers and analyzed according to SCAQMD 25.3. The samples will be analyzed by AtmAA inc. in Calabasas, CA using TCA/FID. Results will be reported as total non-methane hydrocarbons as carbon.

3.5 VELOCITY AND MOISTURE

Stack gas velocity and moisture content will be determined by EPA Methods 2 and 4 during the particulate test. Velocity traverses will be performed during each set of compliance tests (NO_x, CO, SO_2 and hydrocarbons) and for each RATA run.

3.6 FUEL ANALYSIS

Daily fuel samples will be collected by Desert View Power personnel. Delta Air Quality Services will send the samples out to be analyzed for higher heating value for heat rate calculations. Copies of the analysis will be included with the final report.

3.7 RELATIVE ACCURACY TEST AUDIT

Relative Accuracy tests will be performed for NO_x, SO_2, CO and O_2 on sub systems of each unit's CEMS. Relative accuracy is determined by comparing the CEMS data to the corresponding reference method (RM) data over nine to twelve test runs. Nine 30-minute minimum tests will be performed for the NO_x, SO_2, CO, and O_2 relative accuracy. Relative accuracy is expressed in terms of the absolute value of the mean of the difference between the monitor value and the reference method value. It is reported in terms of a percentage of the mean reference method value. The computational procedure is summarized by the following equations:

$$\overline{RM} = \frac{1}{n} \sum_{i=1}^{n} RM_1$$

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

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

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}} 1$$

$$RA = \frac{|\overline{d}| + |cc|}{\overline{RM}} x100$$

The RA will be determined for the monitoring systems in parts per million dry (ppm) and lb/hr.

3.8 TEST SCHEDULE

The scheduled test dates have been set for February 24-27, 2015 for compliance and RATA testing. A proposed test schedule for on-site testing activities is shown in Table 3-3. This schedule is based on the number of tests and the required sample times.

TABLE 3-3
ON-SITE TEST SCHEDULE
DESERT VIEW POWER

Date	Unit No.	Test No.	Type of Test
2/29/2016	1	--	Set-up
3/1/2016	1	1-3 PM 1-3 RA/Comp	Particulate Tests 1-3, CEMS RATA and Compliance NO_x, SO_2, CO &VOC Tests 1-3
3/2/2016	1	4-9 RA	CEMS RATA
3/3/2016	2	1-3 PM 1-3 RA/Comp	Particulate Tests 1-3, CEMS RATA and Compliance NO_x, SO_2, CO &VOC Tests 1-3
3/4/2016	2	4-9 RA	CEMS RATA

4.0 REPORTING

Delta will prepare a comprehensive emissions report that includes all raw data and calculations for the test program. The test format is presented in Table 4-1. The test report will be submitted within 45 days from completion of testing.

TABLE 4-1
REPORT FORMAT

Title page
Report Title
Prepared For
For Submittal To:
Author and reviewer names
Test Dates and Report Issue Date
Report Number

Review Page
Signatures of person who prepared the report and signature of person who reviewed the report

Table of Contents

Introduction and Summary
Identifies the client, source, reason for the test, test date(s), test personnel, client/source personnel, regulatory observers
Summarizes the results of the test, indicates applicable rules and pass/fail criteria and makes a statement regarding the test results
Outlines the organization of remainder of the report.
Table of analysis results

Unit Description
Describes the process which was tested
Describes any applicable control equipment
Test conditions

Test Description
Test methods, replicates, duration, calculations
Test locations
Test critique

Results
Re-states the results of the test and makes a statement regarding compliance with applicable regulations
Results tables with more detail on individual test runs and supporting data

Appendices
A. Measurement Procedures
B. Quality Assurance Data
   1. Certification
   2. Equipment Calibration
   3. Calibration Gas Certificate
C. Process Operating Data
D. Test and Laboratory Data
   1. Test Location
   2. Test Data (by type)
E. Calculations
F. Chain of Custody
G. Instrument Strip Charts

APPENDIX A QUALITY ASSURANCE AND CERTIFICATIONS

QUALITY ASSURANCE PROGRAM

Delta's operations include four major areas of focus which include sampling, sample analysis, equipment maintenance, calibration, data reduction, and reporting. Procedures are in place to ensure that work performed in each one of these areas is performed in a manner consistent with providing emissions test data that is of known quality and is legally defensible. This section provides details on the procedures that are followed to accomplish this assurance of data quality.

QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

Standard methods of assessing data quality such as precision, accuracy and completeness are used. Criteria for acceptable data are generally contained in the reference methods, however, for some projects other criteria are defined. Standard statistical techniques can be applied to assess the data as requested for specific programs. Statistical analysis is not generally included when reporting source test data unless the number of samples and sampling conditions are planned to provide meaningful statistical results.

Delta's quality assurance objectives for precision and accuracy are based on the Reference Methods or published precision and accuracy data.

Completeness is defined as the percentage of measurements which are judged to be valid as compared to the total number of measurements made. Delta's objective is to generate only valid data. For compliance tests, Delta's completeness goal is 100%. For this initial copy of the QAP, the methods which are listed in Delta's capabilities provide results which are available while still on the job site. It is expected that if all quality assurance requirements for a test are not satisfied, the test will be invalidated and repeated and the test program will remain 100% complete.

REPRESENTATIVENESS AND COMPARABILITY

The usefulness and validity of all data is contingent upon 1) the results being representative of the source being tested and 2) comparable with other results generated by Delta or another organization. Delta has adopted the objective is that all measurements be representative and comparable. These objectives will be met by performing tests while the process is operating under known and documented conditions, following published reference methods, using standard data reduction techniques and reporting formats, and proper training of personnel.

TRAINING

Training is an on-going process for all Delta personnel. Personnel completing any task will be properly trained before undertaking any task or be under the direct observation and supervision of someone properly trained. There are certain skills which all technical personnel are expected to acquire.

All source test personnel must review the applicable portions of the following technical documents before being involved in any capacity in any test program.

a) 40 CFR Part 60

b) SCAQMD Source Test Manual

c) Delta Quality Assurance Plan

d) EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III.

PROCEDURE SPECIFIC TRAINING

In addition to the general awareness training discussed previously, each person responsible for the performance of a test procedure is required to demonstrate proficiency in the method involved. This demonstration will be accomplished through 1) reading of the method, 2) reading of the manuals for the equipment being used, and 3) satisfactorily completing an oral or written exam regarding the above material. Information related to training for specific methods is provided below.

Continuous Monitoring of Emissions: EPA Methods 3A, 6C, 7E, 10, 20, SCAQMD Method 100.1
Understanding of the CEMS schematic drawing
Understanding of the sampling system
Leak check
Analyzer calibrations and adjustments
Sample system bias calibration check
Strip chart recorder operation and documentation
Stratification check
Corrections for sample system bias and analyzer drift

Sample Locations: EPA Method 1, SCAQMD Method 1.1
Identify sample locations
Determination of upstream and downstream diameters
Stack area calculations
Determine number and location of sample points
Perform cyclonic flow check and determine sample location acceptability.

Stack Gas Velocity and Volumetric Flow Rate: EPA Method 2, SCAQMD Method 2.1

Assemble pitot tube/thermocouple
Perform leak check
Record differential pressure
Record stack temperature
Record static pressure
Record barometric pressure
Calculate stack gas velocity and volumetric flow rate

Stack Gas Moisture Content: EPA Method 4, SCAQMD Method 4.1

Assemble sample train (probe, sample line, impingers, U-tube, gooseneck, vacuum line, meter, pump, etc.)

Record preliminary data: barometric pressure, reference temperature, ambient temperature.
Pre- and post-test leak check: < 0.02 cfm
Read and record: sample volume, delta H, meter temperatures (in/out), vacuum, impinger outlet temperature
Weigh impingers
Calculate % moisture

SAMPLING PROCEDURES

Delta maintains complete copies of federal, state, and local regulatory agency source test methods which serve as the final authority on sampling procedures. This Quality Assurance Plan does not attempt to re-state the source test methods which are available. Delta strives to follow the appropriate source test methods whenever possible. Source test methods are listed in all test plans for review by both clients and regulatory agencies.

The following steps are taken to ensure that the sampling procedures of the source test methods are followed:

Training of personnel, as discussed in Section 5,
Copies of reference methods are available to all personnel and are taken to every job site,
Appropriate selection of project managers
Quality assurance reviews of test programs

Occasionally, due to the sample location limitations or other factors, variations from the standard methods will be necessary. Any variations from the methods will be assessed to determine the effect which the variation will have on data quality. Whenever possible, variations will be included in the test plan and receive approval prior to implementation of the program. Any variations will be clearly documented in the source test report.

CHAIN-OF-CUSTODY PROCEDURES

DATA SHEET CHAIN-OF-CUSTODY

The program manager for each program is responsible for collection of data sheets from sampling personnel as they are completed. The program manager maintains possession of the data sheets or keeps them in locked storage. Upon return to the office, a copy of all field data sheets is made and placed in a locked file. The original field data sheets are used for report preparation and are kept with the final report. Data sheets, test plans, and reports are kept in files, organized by client and project.

A chain-of-custody form is kept at the project file location to log check-out and return of any data sheets or files.

Sample and Reagent Chain of Custody

Chain of Custody procedures begin prior to testing with the preparation of reagents and filters to be used in field testing. Delta personnel who have prepared the filters and reagents complete and sign a reagent chain of custody form which is transferred with the reagents to the field testing team. The field team member receiving the reagents records the transfer on this form. The reagent chain of custody form is included in the final source test report.

At the test site all samples collected are recorded on a chain of custody form as they are taken. This chain of custody form also includes the date, time, test number and a description of the samples and sample fractions. This form is signed by the field team member serving as the sample custodian. This form is left with the sample at all times; it is used to record transfer of the samples to Delta's in-house laboratory or to outside laboratories. Intermediate transfers to shipping agents are also recorded here. Transfers of test equipment between field team members are recorded on the sampling train data sheet.

CALIBRATION PROCEDURES AND FREQUENCY

All of Delta's major equipment components are calibrated according to the procedures established by EPA, CARB, and SCAQMD. When regulations differ, the stricter of the regulations will be followed. Table 9 summarizes the calibration procedures and intervals for the major equipment components.

DATA REDUCTION, VALIDATION, AND REPORTING

DATA REDUCTION

Data reduction generally occurs in two phases: First, preliminary data reduction occurs on the job site. On-site data reduction may be performed by sampling technicians or the project manager. Preliminary calculations may include velocity, moisture, stack flow, and continuous gaseous measurements. Draft test results are normally available prior to leaving the job site. Calculations are performed manually, with a calculator, or with a portable computer. Whenever possible, standard spreadsheets are used to reduce the data.

The second phase of data reduction occurs after the test team has left the job site. Final results are generated after the project manager has reviewed the data entry, calculations, and reporting units.

The standard calculations are available in the test methods

TABLE 1
MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS

Sampling Equipment	Calibration Frequency	Calibration Procedure	Acceptable Calibration Criteria
Continuous Analyzers	Before and After Each Test Day	3-point calibration error test	< 2% of analyzer range
Continuous Analyzers	Before and After Each Test Run	2-point sample system bias check	< 5% of analyzer range
Continuous Analyzers	After Each Test Run	2-point analyzer drift determination	< 3% of analyzer range
CEMS System	Beginning of Each Day	leak check	< 1 in. Hg decrease in 5 min. at > 20 in. Hg
Continuous Analyzers	Semi-Annually	3-point linearity	< 1% of analyzer range
NO_x Analyzer	Daily	NO_2 -> NO converter efficiency	> 90%
Differential Pressure Gauges (except for manometers)	Semi-Annually	Correction factor based on 5-point comparison to standard	+/- 5%
Differential Pressure Gauges (except for manometers)	Bi-Monthly	3-point comparison to standard, no correction factor	+/- 5%
Barometer	Semi-Annually	Adjusted to mercury-in-glass or National Weather Service Station	+/- 0.1 inches Hg
Dry Gas Meter	Semi-Annually	Calibration check at 4 flow rates using a NIST traceable standard	+/- 2%
Dry Gas Meter	Bi-Monthly	Calibration check at 2 flow rates using a NIST traceable standard	+/- 2% of semi-annual factor
Dry Gas Meter Orifice	Annually	4-point calibration for $\Delta H@$	--
Temperature Sensors	Semi-Annually	3-point calibration vs. NIST traceable standard	+/- 1.5%

DATA VALIDATION

All data, data entry, and calculations are double-checked by the originator and reviewed by a second person. Reviews can include re-calculation of results, data entry checks, and calculation of known and accepted data sets using the existing spreadsheet.

REPORTING

Delta promotes the use of a standard reporting format, when possible.

INTERNAL QUALITY ASSESSMENTS

INTEGRATED WET CHEMICAL SAMPLING EQUIPMENT QUALITY CONTROL

Major equipment maintenance schedules are provided. Additional quality control measures are performed on sampling equipment which includes:

wind-tunnel calibration of pitot tubes
3-point thermocouple/readout calibrations
bi-monthly meter calibration checks
pre- and post-test leak checks of sample systems

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) EQUIPMENT QUALITY CONTROL

Delta uses EPA Protocol gases to perform all QA/QC checks of the analyzers when available. On-site checks include 3-point calibration error (+/- 2% of span), 2-point sample system bias (+/- 5% of span), analyzer drift (+/- 3% of span). Semi-annual checks include analyzer linearity (+/- 1% of span) and NO_2 converter efficiency (> 90%).

PERFORMANCE AND SYSTEM AUDITS

The appropriate regulatory agency is notified of all Delta compliance tests. The regulatory agency is allowed the opportunity to perform side-by-side tests and/or observe the Delta setup and sampling. Delta cooperates fully in any pre-arranged regulatory agency audit.

Delta's approval under the South Coast Air Quality Management District (SCAQMD) Laboratory Approval Program (LAP) includes a review of quality assurance procedures, equipment type, maintenance, responsibilities, a laboratory audit, and an external audit of the sampling system which involves analysis and reporting of unknown samples.

EQUIPMENT MAINTENANCE

Delta performs routine and preventative maintenance on all major sampling equipment. These procedures are in addition to method specific requirements which are summarized earlier in this QAP. Table 2 summarizes the equipment maintenance schedule. This preventative maintenance schedule should minimize equipment failures and downtime in the field. On the occasion where equipment does break down in the field, Delta personnel have the necessary experience to perform on-site repairs of most problems.

TABLE 2
EQUIPMENT MAINTENANCE SCHEDULE

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Continuous Analyzers	1. Proper response to zero, span gas 2. Absence of malfunction	As required by the manufacturer	As recommended by the manufacturer
Mobile Laboratory Sample System	1. Absence of leaks 2. Pass system bias test	Dependent on sources sampled and use intervals	1. Change filters 2. Repair/change gas dryer 3. Check for contamination 4. Leak check
Pumps	1. Absence of leaks 2. Generates manufacturers required pressure, vacuum, and flow	Every 500 hours of operation or 6 months	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Sample Lines	1. Pass system bias test	After each test series	1. Flush with dry gas

SPECIFIC PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

The QA/QC procedures outlined in the previous sections of this document are provided to ensure data precision, accuracy, and completeness. It is the responsibility of each project team member to 1) complete all pertinent sections of the data sheets, 2) make comments, where appropriate, 3) notify project managers of sampling difficulties which may lead to invalid data, and 4) follow chain-of-custody procedures for all samples, data sheets, and documents.

Each test report is reviewed before release by one of Delta's designated Quality Assurance team members. Procedures, results, and data are reviewed to verify adherence to method requirements, that proper recording procedures are followed, and

that calculations are performed properly. These reviews are conducted independently from any project related data reduction and reporting activities.

QUALITY ASSURANCE REPORTS TO MANAGEMENT AND CORRECTIVE ACTIONS

A "Quality Assurance Incident Report" is completed when an incident occurs which may result in the generation of invalid data. The report originator will provide the report to the program manager upon completion to allow for immediate corrective action to maintain program completion. Following completion of the on-site portion of the program, the form is routed to the Quality Assurance Officer for review. Appropriate action to be taken may include, discussions with test personnel, modifications of QA/QC procedures, or additional training. Incidents reports are then filed in the client file and included with the source test report, if appropriate.

Original Quality Assurance records are maintained on-file. Periodic reviews are performed by the QA Officer to ensure that the records are up-to-date, complete, and maintained.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

February 3, 2015

Mr. James Ritchey
Delta Air Quality Services, Inc.
An Affiliate of Montrose Air Quality Services, Inc.
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Ritchey:

We completed our review of the general application you submitted for approval under the South Coast Air Quality Management District's Laboratory Approval Program (SCAQMD LAP). We are pleased to inform you that your firm is approved for the period beginning February 3, 2015, and ending January 31, 2016 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

SCAQMD Methods 1-4
SCAQMD Method 100.1
SCAQMD Methods 25.1 and 25.3 (Sampling)
SCAQMD Methods 5.1, 5.2, 5.3, and 6.1
SCAQMD Rule 1420/ 1420.1 – (Lead) Ambient Sampling
USEPA CTM-030 and ASTM D6522-00

Thank you for participating in the SCAQMD LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

Rudy Eden, Senior Manager
Laboratory Services &
Source Test Engineering

RE:GK/gk
Attachment

cc: Dipankar Sarkar

150203 LocationChange.doc

State of California

Air Resources Board

Approved Independent Contractor

Delta Air Quality Services, Incorporated

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2016, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 6, 8, 17, 20, 501
100 (CO, CO_2, NO_x, O_2, SO_2)

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

Delta Air Quality Services, Incorporated

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2016, for those test methods listed below:

U.S. EPA Source Test Methods 201A and 202
Visible Emissions Evaluation

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

APPENDIX B SAMPLE LOCATION VERIFICATION DATA

STACK GAS STRATIFICATION AND ABSENCE OF FLOW DISTURBANCE TESTING AT COLMAC MECCA PROJECT

Prepared For:

UC Operating Service
Mecca, California

For Submittal To:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Diamond Bar, California

Prepared By:

Edward J. Filadelfia

CARNOT
Tustin, California

JULY 1994

REVIEW AND CERTIFICATION

All work, calculations, and other activities and tasks performed and documented in this report were carried out under my direction and supervision.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

I have reviewed, technically and editorially, details, calculations, results, conclusions and other appropriate written material contained herein, and hereby certify that the presented material is authentic and accurate.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

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SECTION 1.0

INTRODUCTION

Carnot was contracted by UC Operating Service (UCOS) to determine the suitability of the alternate sample location accessible from the stack inlet duct. Tests were conducted to determine the level of stack gas stratification and flow disturbance. The tests were performed at this location to satisfy the requirements of alternate sample location CFR 40 Appendix A Method 1. The tests were performed using the standard methods in Chapter X of the SCAQMD's Source Test Manual.

The flow disturbance and gaseous stratification tests were performed on June 27-28, 1994. The test program was coordinated by Greg Deedon of UCOS and Edward Filadelfia of Carnot. The Carnot test team consisted of Edward Filadelfia, Dave Wonderly, and Chris Hone. Unit operation was established and maintained by UCOS personnel.

The results of the tests are summarized in Tables 1-1 and 1-2. These results show that the sample location meets the requirements of the SCAQMD and EPA by demonstrating that the stack gas stratification is less than 10% and the average resultant flow angle is less than 20 degrees with a standard deviation of less than 10 degrees.

A description of the unit is presented in Section 2.0. Test procedures and locations are presented in Section 3.0. Test results are presented in Section 4.0. Tests procedure descriptions, field data sheets, calculations, and control room data are included in the Appendices.

TABLE 1-1
SUMMARY OF GASEOUS STRATIFICATION
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 % Stratification	Unit 2 % Stratification	SCAQMD Limit, %
O_2, %	0.4%	1.0%	≤10

TABLE 1-2
SUMMARY OF FLOW DISTURBANCE MEASUREMENTS
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 Measured	Unit 2 Measured	SCAQMD Limit, %	EPA Limit, %
Average Resultant Angle, Degrees	5.6°	5.9°	≤20	≤20
Standard Deviation, Degrees	3.3°	4.0°	≤10	N/A

SECTION 2.0

UNIT DESCRIPTION

The Colmac Energy Plant consists of two 297 MMBtu/hour, circulating bed boilers, the combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of NO_x emissions.

2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission).

3. A limestone injection system to limit emissions of SO_2.

4. A reverse air baghouse to restrict opacity and emissions of sulfates and particulate to very low levels.

SECTION 3.0

TEST DESCRIPTION

3.1 TEST CONDITIONS

All tests were performed with the unit operating at full load. Tests were conducted while the unit was firing bio mass and operating under normal conditions. Unit operations were established by UCOS operators.

3.2 SAMPLE LOCATION

Measurements were made from Units 1 and 2 inlet ducts to the stack. A schematic of the Sample location is shown in Figure 3-1. Chapter X sampling consisted of 40 point traverse for stratification, and a 42 point traverse for flow disturbances.

3.3 TEST PROCEDURES

Tests were performed using methods from the SCAQMD's Source Test Manual. These methods are contained in Chapter X - Section 1 for disturbed flow and Section 13 for gaseous stratification. Table 3-1 presents the test methods used in this program. O_2 concentrations were measured using Carnot's mobile emission monitoring system. Flow angles were measured using a United Sensor 3D probe. A description of the Carnot's Continuous Emissions Monitoring System and the standard measurement procedures are presented in Appendix A. A summary of the procedures used for gaseous stratification and disturbed flow are presented below.

3.3.1 Gaseous Stratification

Chapter X (Non-Standard Methods and Techniques), Chapter 13 of the SCAQMD Source Test Manual defines gaseous stratification as the presence of a difference, in excess of 10 percent, between any two points in the same cross sectional plane. Stratification can be determined for either pollutant gases (e.g., NO_x) or diluent gases (e.g., O_2, CO_2) in units of concentration. For this test program, the O_2 concentration was used to measure the level of stack gas stratification.

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Rev. (October 14, 1994)

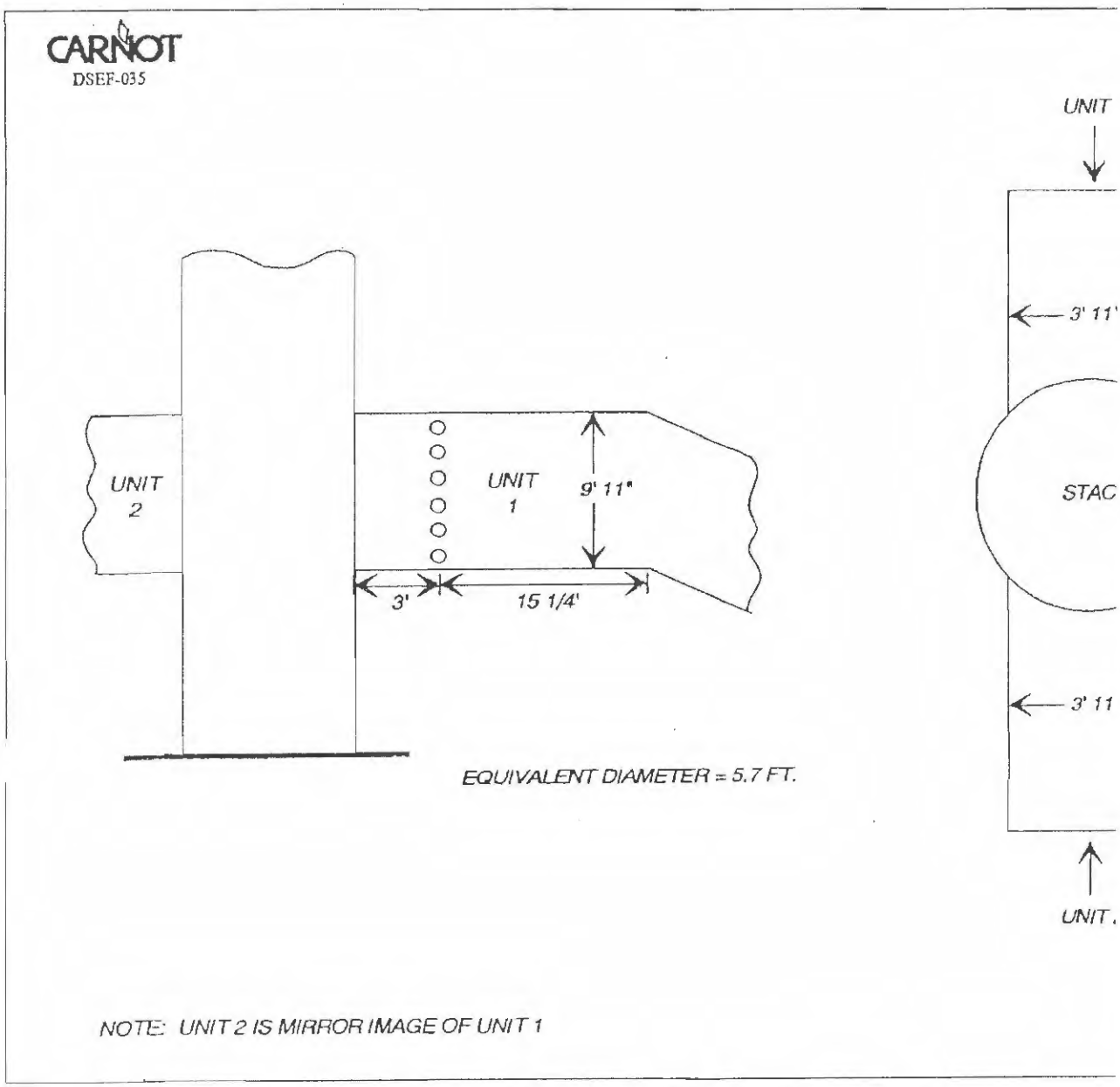


Figure 3-1. UCOS - Duct Sample Locations

Due to variations in process O_2 concentrations, two O_2 analyzers were used. The first O_2 analyzer was used as a reference point and located at the center of the duct. The second was located at 40 traverse points during the test. Gases were monitored for three minutes at each traverse point.

TABLE 3-1
TEST PROCEDURES
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Units	Measurement Principle	Reference Method	Comments
O_2	%	Electrochemical Call	EPA 3A	40 point traverse for gaseous stratification according to Chapter X, Section 13
Flow Angle	Degrees	3D probe for pitch and yaw	1.1	42 point traverse for disturbed flow according to Chapter X, Section 1

SECTION 4.0

RESULTS

4.1 GASEOUS STRATIFICATION

The results of the gaseous stratification tests are summarized in Table 4-1. The results show that the O_2 concentration stratification levels for both sample locations were below the limit of 10%.

TABLE 4-1
GASEOUS STRATIFICATION
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Percent Stratification
Unit 1 O_2, %	0.4%
Unit 2 O_2, %	1.0%

4.2 FLOW DISTURBANCE

The results of the flow disturbance measurements made with the 3-dimensional velocity probe are presented in Table 4-2. The results of these tests show that the average resultant flow angle was below the limit of 20 degrees with a standard deviation of less than 10 degrees for both sample locations.

TABLE 4-2
FLOW DISTURBANCE RESULTS
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 3D Probe	Unit 2 3D Probe
Avg. Yaw Angle, degrees	2.0	4.4
Avg. Pitch Angle, degrees	-0.4	-1.0
Avg. Resultant Angle, degrees	5.6	5.9
Standard Deviation, degrees	3.3	4.0

APPENDIX A
MEASUREMENT PROCEDURES

Continuous Emissions Monitoring System

Oxygen (O_2) by Continuous Analyzer

Three-Dimensional Velocity Testing

Continuous Emissions Monitoring System

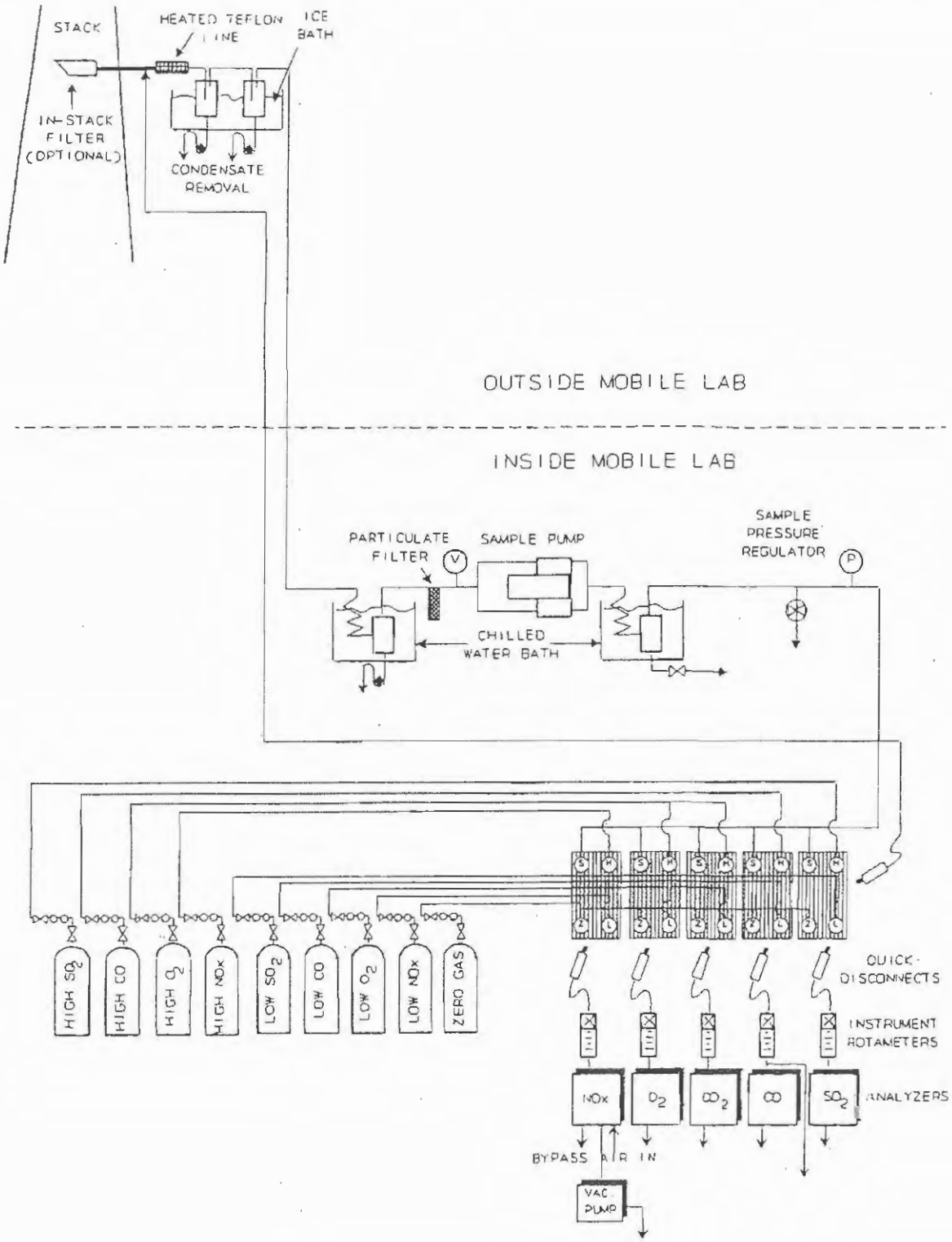
O_2, CO, CO_2, NO, NO_x and SO_2 are measured using an extractive continuous emissions monitoring (CEM) package, shown in the following figure. This package is comprised of three basic subsystems. They are: (1) the sample acquisition and conditioning system, (2) the calibration gas system, and (3) the analyzers themselves. This section presents a description of the sampling and calibration systems. Descriptions of the analyzers used in this program and the corresponding reference test methods follow. Information regarding quality assurance information on the system, including calibration routines and system performance data follows.

The sample acquisition and conditioning system contains components to extract a representative sample from the stack or flue, transport the sample to the analyzers, and remove moisture and particulate material from the sample. In addition to performing the tasks above, the system must preserve the measured species and deliver the sample for analysis intact. The sample acquisition system extracts the sample through a stainless steel probe. The probe is insulated or heated as necessary to avoid condensation. If the particulate loading in the stack is high, a sintered stainless steel filter is used on the end of the probe.

Where water soluble NO_2 and/or SO_2 are to be measured, the sample is drawn from the probe through a heated teflon sample line into an on-stack cooled (approximately 35-40°F) water removal trap. The trap consists of stainless steel flasks in a bath of ice and water. This design removes the water vapor by condensation. The contact between the sample and liquid water is minimized and the soluble NO_2 and SO_2 are conserved. This system meets the requirements of EPA Method 20. The sample is then drawn through a teflon transport line, particulate filter, secondary water removal and into the sample pump. The pump is a dual head, diaphragm pump. All sample-wetted components of the pump are stainless steel or teflon. The pressurized sample leaving the pump flows through a third condensate trap in a refrigerated water bath (≈38°F) for final moisture removal. A drain line and valve are provided to constantly expel any condensed moisture from the dryer at this point. After the dryer, the sample is directed into a distribution manifold. Excess sample is vented through a back-pressure regulator, maintaining a constant pressure of 5-6 psig to the analyzer rotameters.

The calibration system is comprised of two parts: the analyzer calibration, and the system bias check (dynamic calibration). The analyzer calibration equipment includes pressurized cylinders of certified span gas. The gases used are, as a minimum, certified to 1% by the manufacturer. Where necessary to comply with reference method requirements EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span, or sample gas directed to each analyzer is accomplished by operation of the sample/calibration selector fittings.

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is done either by attaching the calibration gas supply line to the probe top with flexible tubing or by actuation of a solenoid valve located at the sample conditioner inlet (probe exit). The span gas is exposed to the same elements as the sample and the system response is documented. The analyzer indications for the system calibration check must agree within 5% of the analyzer calibration. Values are adjusted and changes/repairs are made to the system to compensate for any difference in analyzer readings. Specific information on the analytical equipment and test methods used is provided in the following pages.



Schematic of CEM System

Method:	Oxygen (O_2) by Continuous Analyzer
Applicable Reference Methods:	EPA 3A, EPA 20, ARB 100, BA ST-14, SCAQMD 100 I
Principle:	A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of O_2 concentration.
Analyzer:	Teledyne Model 326A
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-10, 0-25 % O_2
Accuracy:	1 % of full scale
Output:	0-100 mV, linear
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% <7 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O_2 concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally, and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O_2 by volume.
Special Calibration Procedure:	The measurement cells used with the O_2 instrument have to be replaced on a regular basis. After extended use, the cell tend to produce a nonlinear response. Therefore, a three-point calibration is performed at the start of each test day to check for linearity. If the response is not linear ($\pm$ 2% of scale), the cell is replaced.

Method:	Three-Dimensional Velocity Testing
Applicable Ref. Method:	EPA Method 1, ANSI ASME PTC 11 - 1984
Applicability of Method:	When a sample location to be used for velocity or particulate tests does not meet the traditional Method 1 criteria of being at least two duct diameters downstream and one-half diameter upstream of any flow disturbance, this alternate method is used to evaluate the suitability of the location. A three-dimensional velocity probe is used to measure pitch and yaw angle at a minimum of 40 traverse points for round ducts and 42 points for rectangular ducts. If the average resultant angle is less than 20° and the standard deviation is less than 10°, the sample location is deemed acceptable. Velocity and particulate traverses are then performed at the same traverse points using standard Method 2 and 5 equipment and procedures.
Principle:	The instrument measures yaw and pitch angles of fluid flow, as well as total and static pressures.
Analyzer:	United Sensor Three-Dimensional Directional Probe
Sampling Procedure:	Each probe has five measuring holes in its tip. A centrally located pressure hole measures pressure P1, while two lateral pressure holes measure pressures P2 and P3. If the probe is rotated manually until P2 and P3 are identical as a readout on the manometer, the yaw angle of flow is then indicated by the number of degrees rotated. When the yaw angle has been determined, an additional differential pressure P4 - P5 is measured by pressure holes located above and below the total pressure (P1) hole. Pitch angle is determined by calculating (P4 - P5)/(P1 - P2) and using the calibration data for the individual probe and interpolating between the bracketing data. At any particular pitch angle, the velocity pressure coefficient (Pt - Ps)/(P1 -P2) can also be interpolated from the calibration data and Pt - Ps and Ps calculated. Note that this probe also allows for very accurate gas flow measurements, in addition to the EPA Method 1 procedures that allow it to be used for determination of flow angle.

Definitions:

P_1 = Total Pressure
P_2 = Static Pressure
P_3 = Static Pressure
P_4 = Pitch Pressure
P_5 = Pitch Pressure

$P_1 - P_2$ = Velocity Head Pressure

$\frac{P_4 - P_5}{P_1 - P_2}$ = Pitch angle calculated on calibration curve

Calculations:

Velocity (fps) in direction of flow

$$V_s = 2.90\ C_P\sqrt{\Delta P\ T_s}\ \sqrt{\left(\frac{29.92}{P_S}\right)\left(\frac{28.95}{MW_{wet}}\right)}$$

where:
C_P = Pitot Calibration factor
ΔP = Average velocity, head, iwg $(\overline{\sqrt{\Delta P}})^2$
T_S = Stack Temperature, °R
P_S = Stack Pressure (iwg)
MW_{wet} = Molecular weight, wet

Resultant angle:

$$R = \left|\frac{\cos^{-1}(\cos\phi_{Y,R}\cos\phi_{P,R})}{0.0175}\right|$$

where:
$\phi_{Y,R}$ = Yaw Angle in Radians
$\phi_{P,R}$ = Pitch Angle in Radians
R = Resultant Angle in Degrees

Pitch Angle Curve Fit Equation (Degrees)

$$\phi_P = A_1\left(\frac{P_4-P_5}{P_1-P_2}\right) + A_2\left(\frac{P_4-P_5}{P_1-P_2}\right)^2 - A_3\left(\frac{P_4-P_5}{P_1-P_2}\right)^3 - A_4\left(\frac{P_4-P_5}{P_1-P_2}\right)^4 + A_5\left(\frac{P_4-P_3}{P_1-P_2}\right)^5 + A_6\left(\frac{P_4-P_5}{P_1-P_2}\right)^6$$

Pitot coefficient curve fit equation (used to calculate corrected axial velocities)

$$\frac{P_t-P_s}{P_1-P_2} = B_1 + B_2\,\phi_P + B_3 + \phi_P + B_4\,\phi_P^3 + B_5\,\phi_P^4 + B_6\,\phi_P^5 + B_7\,\phi_P^6$$

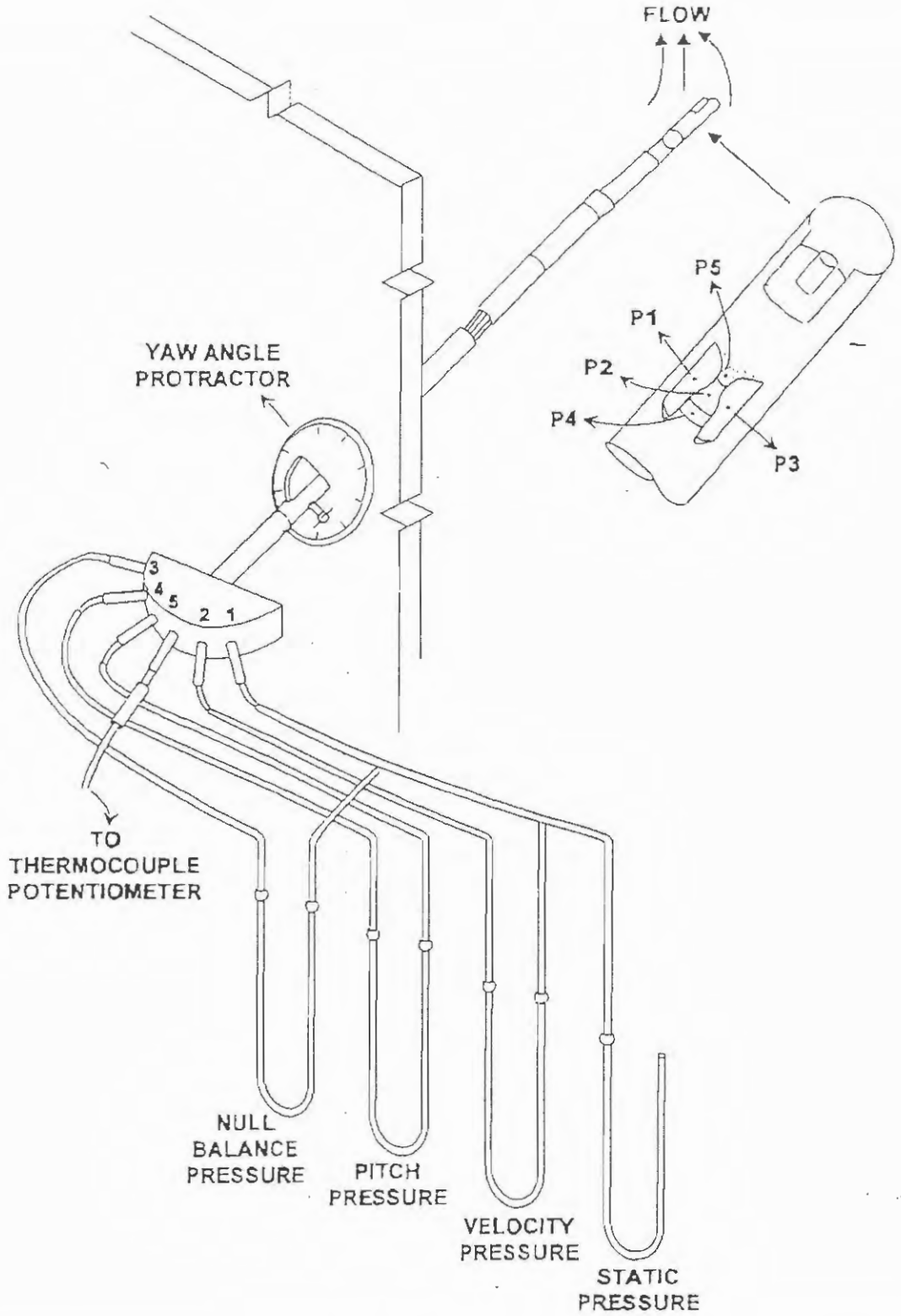


Figure Five Hole Probe

3-DIMENSIONAL VELOCITY PROBE CALIBRATION FACTORS

Probe	B-2455
A_1	63.09
A_2	23.69
A_3	24.505
A_4	33.312
A_5	7.5203
A_6	11.669
B_1	0.997
B_2	7×10^{-3}
B_3	3×10^{-5}
B_4	8×10^{-7}
B_5	1×10^{-9}
B_6	3×10^{-10}
B_7	3×10^{-2}

APPENDIX B
QUALITY ASSURANCE

Appendix B.1

Quality Assurance Program Summary

QUALITY ASSURANCE PROGRAM SUMMARY AND ARB CERTIFICATION

Carnot 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 Officer and encompasses seven major areas:

1. Development and use of an internal QA manual.
2. QA reviews of reports, laboratory work, and field testing.
3. Equipment calibration and maintenance.
4. Chain of custody.
5. Training.
6. Knowledge of current test methods.
7. Agency certification.

Each of these areas is discussed individually below.

Quality Assurance Manual. Carnot has prepared a QA Manual according to EPA guidelines. The manual serves to document and formalize all of Carnot's QA efforts. The manual is constantly updated, and each member of the Source Test Division is required to read and understand its contents. The manual includes details on the other six QA areas discussed below.

QA Reviews. Carnot's review procedure includes review of each source test report by the QA Officer, and spot check reviews of laboratory and field work.

The most important review is the one that takes place before a test program begins. The QA Officer works closely with Source Test Division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of any 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 emissions 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 California Air Resources Board (CARB). The schedule for maintenance and calibrations are given in Tables B-1 and B-2. Quality control checks are also conducted in the field for each test program. The following is a partial list of checks made as part of each CEM system test series.

- Sample acquisition and conditioning system leak check.
- 2-point analyzer calibrations (all analyzers)
- 3-point analyzer calibrations (analyzers with potential for linearity errors).
- Complete system calibration check ("dynamic calibration" through entire sample system).

- Periodic analyzer calibration checks (once per hour) are conducted at the start and end of each test run. Any change between pre- and post-test readings are recorded.

- All calibrations are conducted using gases certified by the manufacturer to be + 1% of label value (NBS traceable).

Calibration and CEM performance data are fully documented, and are included in each source test report.

Chain of Custody. Carnot 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, Carnot 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 Source Test Division personnel have access. Neither other Carnot employees nor cleaning crews have keys to this area.

Data sheets are copied immediately upon return from the field, and this first generation copy is placed in locked storage. Any notes made on original sheets are initialed and dated.

Training. Personnel training is essential to ensure quality testing. Carnot 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 Carnot'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 methods, it is essential that any qualified source tester keep abreast of new developments. Carnot subscribes to services which provide updates on EPA and CARB reference methods, and on EPA, CARB and SCAQMD rules and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Carnot personnel maintain membership in the Air and Waste Management Association, the Source Evaluation Society, and the ASME Environmental Control Division.

AGENCY CERTIFICATION

Carnot is certified by the CARB as an independent source test contractor for gaseous and particulate measurements. Carnot is certified by the SCAQMD as an independent source test contractor for gaseous and particulate measurements using SCAQMD Methods 1, 2, 3, 4, 5, 6, 7 and 100.1. Carnot also participates in EPA QA audit programs for Methods 5, 6 and 7.

TABLE B-1
SAMPLING INSTRUMENTS AND EQUIPMENT CALIBRATION SCHEDULE
As Specified by the CARB

Instrument Type	Frequency of Calibration	Standard of Comparison or Method of Calibration	Acceptance Limits
Orifice Meter (large)	12 months	Calibrated dry test meter	± 2% of volume measured
Dry Gas Meter	12 months or when repaired	Calibrated dry test meter	± 2% of volume measured
S-Type Pitot (for use with EPA-type sampling train	6 months	EPA Method 2	Cp constant (+5%) over working range; difference between average Cp for each leg must be less than 2%
Vacuum Gauges Pressure Gauges	6 months	Manometer	± 3%
Field Barometer	6 months	Mercury barometer	± 0.2" Hg
Temperature Measurement	6 months	NBS mercury thermometer or NBS calibrated platinum RTD	± 4°F for <400°F ± 1.5% for >400°F
Temperature Readout Devices	6 months	Precision potentiometer	± 2% full scale reading
Analytical Balance	12 months (cbeck prior to each use)	Should be performed by manufacturer or qualified laboratory	± 0.3 mg of stated weight
Probe Nozzles	12 Months	Nozzle diameter check micrometer	Range < ± 0.10 mm for three measurements
Continuous Analyzers	Depends upon use, frequency and performance	As specified by manufacturers operating manuals, EPA NBS gases and/or reference methods	Satisfy all limits specified in operating specifications

TABLE B-2
EQUIPMENT MAINTENANCE SCHEDULE
Based on Manufacturer's Specifications and Carnot Experience

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Pumps	1. Absence of leaks 2. Ability to draw manufacturer required vacuum and flow	Every 500 hours of operation or 6 months, whichever is less	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Flow Measuring Device	1. Free mechanical movement 2. Absence of malfunction	Every 500 hours of operation or 6 months, whichever is less After each test, if used in H_2S sampling or other corrosive atmospheres	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero, span gas	As required by the manufacturer	As recommended by manufacturer
Integrated Sampling Tanks	Absence of leaks	Depends on nature of use	1. Steam clean 2. Leak check
Mobile Van Sampling Systems	Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 4. Check for system contamination
Sampling Lines	Sample degradation less than 2%	After each test or test series	Blow filtered air through line until dry

Appendix B.2

ARB Certification

State of California
AIR RESOURCES BOARD

Executive Order G-94-028

Approval to Carnot
To Conduct Testing as an Independent Contractor

WHEREAS, the Air Resources Board (ARB), pursuant to Section 41512 of the California Health and Safety Code, has established the procedures contained in Section 91200-91220, Title 17, California Code of Regulations, to allow the use of independent testers for compliance tests required by the ARB; and

WHEREAS, pursuant to Sections 91200-91220, Title 17, California Code of Regulations, the Executive Officer has determined that Carnot meets the requirements of the ARB for conducting ARB Test Methods 1, 2, 3, 4, 5, 6, 8, 10, and 100 (NOx, O2) when the following conditions are met:

1. Carnot conducts ARB Test Method 100 for O2 using a Teledyne 326 analyzer with either a A5 or a B1 sensor, or a paramagnetic analyzer.

NOW, THEREFORE, BE IT ORDERED that Carnot is granted an approval, from the date of execution of this order, until June 30, 1995 to conduct the tests listed above, subject to compliance with Section 91200-91220, Title 17, California Code of Regulations.

BE IT FURTHER ORDERED that during the approved period the Executive Officer or his or her authorized representative may field audit one or more tests conducted pursuant to this order for each type of testing listed above.

Executed this 29TH day of JULY 1994, at Sacramento, California.

James J. Morgester, Chief
Compliance Division

STATE OF CALIFORNIA

AIR RESOURCES BOARD
2020 L STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

RECEIVED A-54
JUL 13 1994
CARNOT

PETE WILSON, Governor

July 8, 1994

Mr. Michael L. Schmitt
Carnot
15991 Red Hill Avenue, Suite 110
Tustin, California 92680

Dear Mr. Schmitt:

Testing Approval

We are pleased to inform you that we have renewed your approval to conduct the types of testing listed in the enclosed Executive Order. This approval is valid until June 30, 1995 during which time a field audit of your company's testing ability may be conducted. We have also enclosed a certificate of approval.

Should you have any questions or need further assistance, please contact Ms. Kathryn Gugeler at (916) 327-1521 or Mr. David Tribble at (916) 323-2217. All correspondence should be addressed to me at the post office box above.

Sincerely,

James J. Morgester, Chief
Compliance Division

Enclosures

cc: Mr. Ed Jeung
Department of Health Services
Air and Industrial Hygiene Laboratory
2151 Berkeley Way
Berkeley, California 94704

State of California

Air Resources Board

Approved Independent Contractor

Carnot

This is to certify that the company listed above has been app
by the Air Resources Board to conduct compliance testin
pursuant to Section 91207, Title 17, California Code of Regul
until June 30, 1995, for those test methods listed below

ARB Source Test Methods:
1, 2, 3, 4, 5, 6, 8, 10, 100(NOx, O2)

James J. Morgester, Chief
Compliance Division

Laura McKinney, Mana
Certification and Investigatior

Appendix B.3

Calibration Data

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: UCOS - Colmac DATE: 6/27/94

BY: GS

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999 %		
NOx	AAL3583	88.54	AAL1240	47.51
O_2	ALM045927	8.937	ALM05739	12.45
CO				
CO_2	ALM 045927	22.43	ALM05739	15.16
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE	0-25	—	—	0-100	—
SET TO HIGH STD (80-90% OF RANGE)	20.9	—	—	88.5	—
ACTUAL VALUE OF LOW STD	12.45	—	—	47.51	—
AS-FOUND LOW STD (50-60% OF RANGE)	12.33	—	—	48.9	—
DIFFERENCE IN % OF FULL SCALE	0.5	—	—	+1.3	—

% ERROR CALCULATION:

$$\frac{\text{(AS FOUND - ACTUAL VALUE OF SPAN)}}{\text{RANGE}} \times 100$$

ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: UCOS Colmac DATE: 6-28-94

BY: D.W.

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO				
NOx	AAL3583	88.54	AAL12400	47.51
O_2	ALM-045927	8.937	ALM-739	12.45
CO				
CO_2				
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE	0-25			0-100	
SET TO HIGH STD (80-90% OF RANGE)	20.74			88.5	
ACTUAL VALUE OF LOW STD	12.45			47.51	
AS-FOUND LOW STD (50-60% OF RANGE)	12.55			47.00	
DIFFERENCE IN % OF FULL SCALE	.5%			.5%	

% ERROR CALCULATION:

$$\frac{(\text{AS FOUND} - \text{ACTUAL VALUE OF SPAN})}{\text{RANGE}} \times 100$$

ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).

CARNOT
CEM PERFORMANCE DATA

CLIENT/LOCATION: UCGS-Colmac DATE: 6/28/94

BY: [illegible]

SYSTEM CONFIGURATION F600				
ANALYZERS IN SERVICE				
ANALYZERS:	O_2	CO_2	CO	NOx
MODEL:	Teledyne	PIR 2000	48	10S
SERIAL NO.:				

PROBE	MAIN	AUX	SAMPLE CONDITIONER	
LENGTH:	6'	4'	CONDENSER-VACUUM SIDE (CHECK FLOW):	✓
LINER MATERIAL:	SS	SS	CONDENSER-PRESSURE SIDE (CHECK FLOW):	✓
HEATED PROBE (Y/N):	no	no	CONDENSER TEMPERATURE:	40
HEATED LINE (Y/N):	yes	yes	FILTER CONDITION (COND. OR DATE LAST CHANGED):	5/24/94

SAMPLE LINE			SYSTEM LEAK CHECK	MAIN	AUX
LENGTH:	50'	50'	PRE-TEST (cfh):	0.0	0.0
LINER MATERIAL:	teflon	teflon	POST-TEST (cfh):		
SYSTEM BIAS LINE:	teflon	teflon	LEAK RATE (%) = POST-TEST (cfh) / SYSTEM FLOW RATE (cfm) x 60 x 100 = _____ %		

ON-STACK CONDITIONER		NOx CONVERSION EFFICIENCY	
IN SERVICE (Y/N):	yes	HIGH CAL NOx	
KNOCK-OUT CONDITION (CHECK FLOW):	✓	HIGH CAL NO (AS FOUND)	1
COOLANT:	ICE	LOW CAL NOx	
		LOW CAL NO (AS FOUND)	1

OPERATING CONDITIONS	
SAMPLE PRESSURE:	SYSTEM RESPONSE TIME CHECK
SAMPLE VACUUM:	UPSCALE: _____ sec.
NOx VACUUM:	DOWNSCALE: _____ sec.

Scott Specialty Gases, Inc.

A-60

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
CARNOT
RICK MADRIGAL
15991 RED HILL AVE
TUSTIN, CA 92680

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 1818
Project # 30380.003

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045739 Certification Date 03-15-94 Exp. Date 03-15-97
Cylinder Pressure+ 2000 PSIG

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
(CARBON DIOXIDE)	15.16 %	± 1 % NIST Traceable
(OXYGEN)	12.45 %	
(Nitrogen)	Balance Gas	

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type/Sample No.	Expiration Date	Cylinder Number	Concentration
GMIS	06-94	A018082	18.97 % CO2 IN N2
GMIS	06-94	A6513	12.45 % O2 IN N2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
CO2:Horiba / OPE-135C / 56553902	02-22-94	NDIR
O2:Horiba / OPE-335 / 850557042	02-25-94	Magnetopneumatic

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

Components — **First Triad Analysis** — **Second Triad Analysis** — **Calibration Curve**

Carbon Dioxide

First Triad Analysis — Date: 03-15-94 Response Units: mv
Z1= 0.00 R1= 97.0 T1= 85.9
R2= 97.0 Z2= 0.00 T2= 85.8
Z3= 0.00 T3= 85.8 R3= 97.0
Avg. Conc. of Cust Cyl. 15.16 %

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= Ax^3+Bx^2+Cx+D
A =0.000007988
B =0.0002062
C =0.1000
D =-0.0001333

Oxygen

First Triad Analysis — Date: 03-15-94 Response Units: mv
Z1= 0.00 R1= 94.1 T1= 49.8
R2= 94.1 Z2= 0.00 T2= 49.8
Z3= 0.00 T3= 49.8 R3= 94.1
Avg. Conc. of Cust Cyl. 12.45 %

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= $Ax+B$
A =0.2500
B =-0.004566

Third Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Special Notes:

ANALYST

Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
CARNOT
RICK MADRIGAL
15991 RED HILL AVE
SUITE 110
TUSTIN, CA 92680

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 1914
Project # 30667.009

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045927 Certification Date 03-30-94 Exp. Date 03-30-97
Cylinder Pressure+ 1900 PSIG

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
(CARBON DIOXIDE)	22.43 %	± 1 % NIST Traceable
(OXYGEN)	8.937 %	
(Nitrogen)	Balance Gas	

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type/Sample No.	Expiration Date	Cylinder Number	Concentration
CRM1675	06-94	ALM001136	14.08 % CO2/N2
GMIS	06-94	A10868	9.520 % O2/N2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
CO2:PIR2000-ACUBLEND	03-24-94	NDIR
O2:Horiba / OPE-335 / 850557042	03-30-94	Magnetopneumatic

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

Components — **First Triad Analysis** — **Second Triad Analysis** — **Calibration Curve**

Carbon Dioxide

First Triad Analysis — Date: 03-30-94 Response Units: mv

Z1= 0.00	R1= 72.9	T1= 92.2
R2= 72.9	Z2= 0.00	T2= 92.2
Z3= 0.00	T3= 92.2	R3= 72.9

Avg. Conc. of Cust Cyl. 22.43 %

Second Triad Analysis — Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= $Ax^4+Bx^3+Cx^2+DX+E$

A =-0.0000001942
B =-0.00001975
C =0.001882
D =0.08535
E =0.002942

Oxygen

First Triad Analysis — Date: 03-30-94 Response Units: mv

Z1= 0.00	R1= 95.3	T1= 89.4
R2= 95.3	Z2= 0.00	T2= 89.4
Z3= 0.00	T3= 89.3	R3= 95.3

Avg. Conc. of Cust Cyl. 8.937 %

Second Triad Analysis — Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= Ax + B

A =0.09999
B =0.0004275

Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

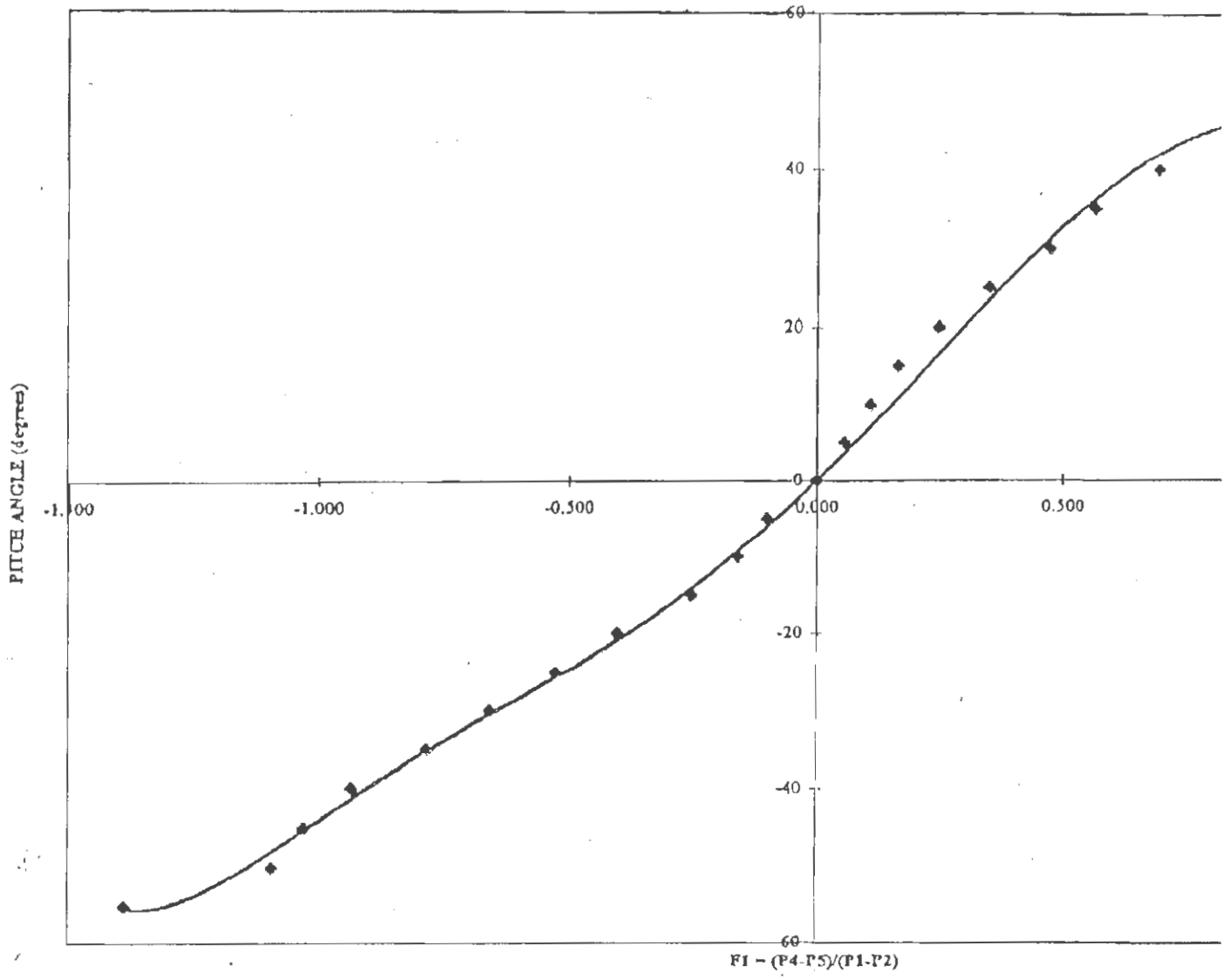
Second Triad Analysis — Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Concentration=

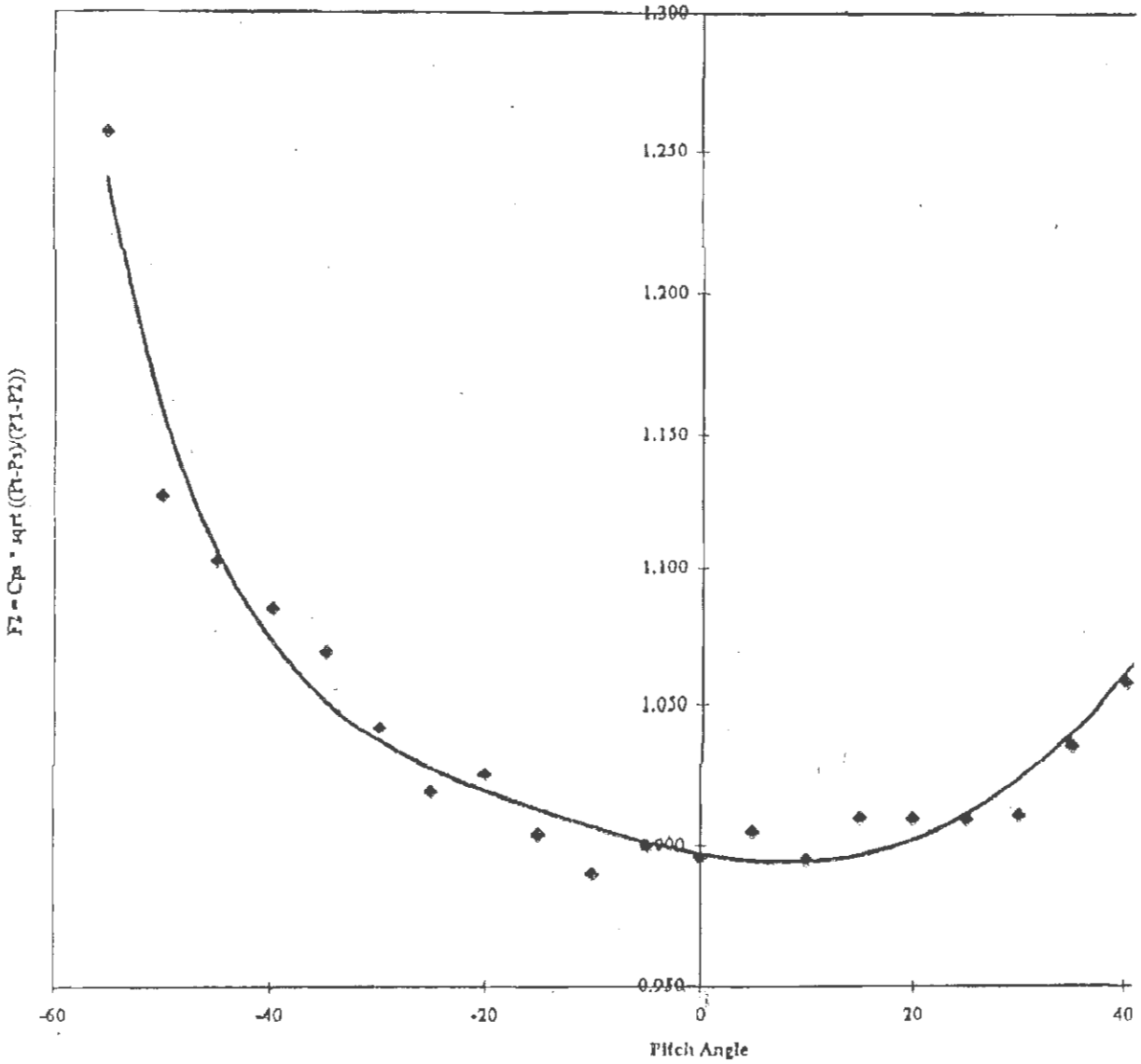
Analyst: [signature]

CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
PITCH ANGLE vs. F1
PROBE ID: B-2455



Pitch Angle = 63.09X + 23.69X^2 - 24.505X^3 - 33.312X^4 + 7.5203X^5 + 11.66

CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
F2 vs. PITCH ANGLE
PROBE ID: B-2455



$F2 = 0.997 - 0.0007X + 3E\text{-}5X^2 + 8E\text{-}7X^3 + 1E\text{-}9X^4 - 3E\text{-}10X^5 + 3E\text{-}12$

APPENDIX C
DATA SHEETS

Appendix C.1

Sample Locations

CARNOT

SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: UCES - Colmac DATA BY: EF

DATE: 6/27/94

TEST LOCATION: Unit 2 Duct

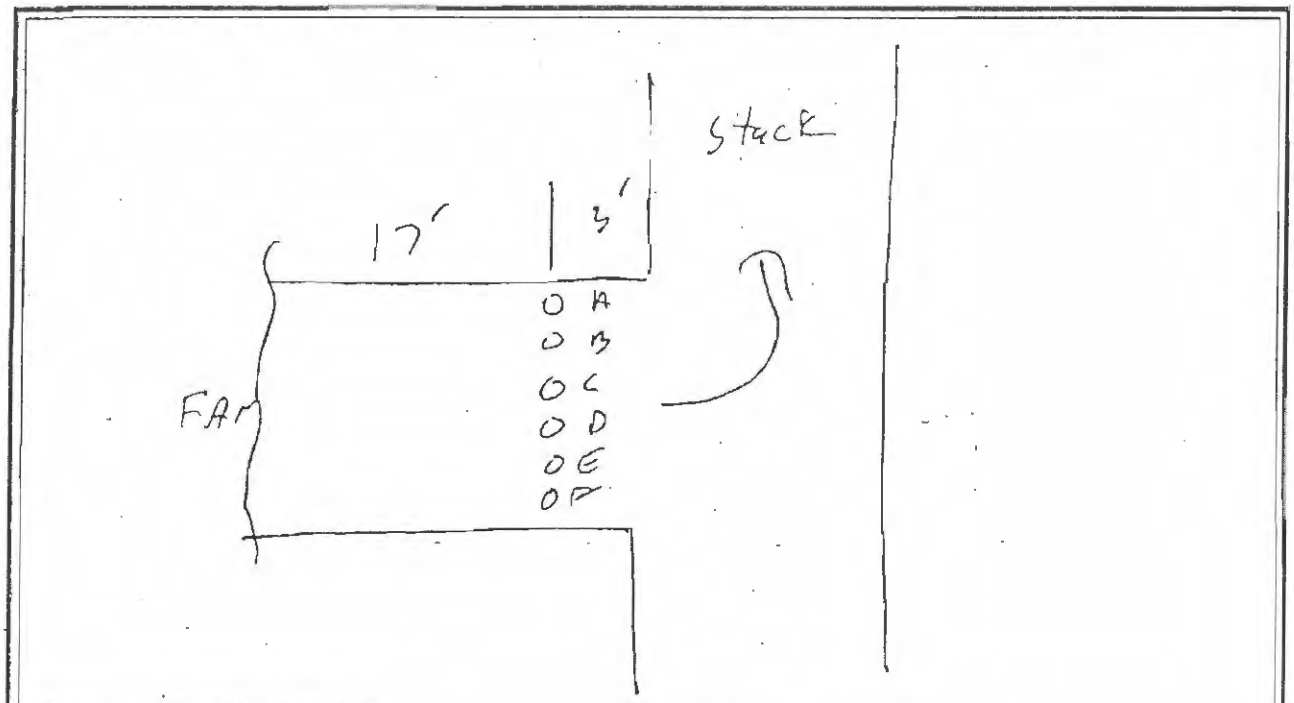


Diagram of Sampling Location

UPSTREAM DIST./DIA.: 17/

DOWNSTREAM DIST./DIA.: 3/

COUPLING LENGTH: 8"

NO. OF SAMPLING PTS.: 42

STACK DIMENSION: 47" x 119"

STACK AREA, FT²: 38.8

SAMPLE POINT	% OF DIAMETER	IN. FROM NEAR WALL	IN. FROM NOZZLE*
1		3.4	11.42
2		10.3	18.3
3		17.14	25.14
4		24.	32
5		30.86	38.86
6		37.7	45.71
7		44.5	52.57

*INCHES FROM WALL PLUS COUPLING LENGTH

CARNOT

Appendix C.2

CEM Data

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac
DATE: 6/28/99
OPERATOR: EP
TEST LOCATION: Unit 1 Outlet
TEST NUMBERS: 1-1- Start

AMBIENT TEMP., DB/WB: ~115
BAROMETRIC PRESSURE: 29.80
DUCT STATIC PRESSURE: -0.7
FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
		zero / Span	.3/12.2	.1/12.4								
1-1	1218 / 1221	A5	6.9	6.9								
	1221 / 1224	A4	7.2	7.1								
	1224 / 1227	A3	6.7	6.7								
	1227 / 1230	A2	7.0	7.2								
	1230 / 1233	A1	7.1	8.0								
	1236 / 1239	B5	6.5	6.5								
	1239 / 1242	B4	6.7	6.7								
	1242 / 1245	B3	6.9	6.6								
	1245 / 1248	B2	6.3	6.2								
	1248 / 1251	B1	6.5	6.5								

COMMENTS:

CARNOT

PMF-013

(2)

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmun

DATE: 6/28/94

OPERATOR: EP

TEST LOCATION: UNIT 1

TEST NUMBERS: 1-1 - Start

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	REF DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	1254/1257	C5	6.6	6.5								
	1257/1300	C4	6.3	6.2								
	1300/1303	C3	6.4	6.4								
	1303/1306	C2	6.9	6.8								
	1306/1309	C1	6.7	6.7								
	1312/1315	D5	6.7	6.6								
	1315/1318	D4	6.9	6.8								
	1318/1321	D3	6.7	6.7								
	1321/1324	D2	6.6	6.6								
	1324/1327	D1	6.7	6.7								

COMMENTS:

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/94

OPERATOR: SS

TEST LOCATION: Unit 2 Outlet

TEST NUMBERS: 1-1- Stroo

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			Rel O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
1-1	1330/1333	E-5	7.0	6.9								
	1333/1336	E-4	6.6	6.6								
	1336/1339	E-3	6.6	6.6								
	1339/1342	E-2	6.9	6.8								
	1342/1345	E-1	6.7	6.6								
	1348/1351	F-5	6.5	6.5								
	1351/1354	F-4	6.2	6.2								
	1354/1357	F-3	6.8	6.8								
	1357/1400	F-2	6.8	6.8								
	1400/1403	F-1	6.8	6.8								
	1400/1409	A-1	6.5	6.5								
	SYS	Zero/SPAN	.34/12.1	.1/12.1								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS-Colmac

DATE: 6/28/94

OPERATOR: EF

TEST LOCATION: 2-2-CEM

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ____% ____, DRY		
			O_2	REF O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	SYS	zero / span	.3 / 12.2	.1 / 12.4								
	933 / 936	F5	7.0	7.0								
	936 / 939	F4	6.4	6.5								
	939 / 942	F3	7.3	7.4								
	942 / 945	F2	7.0	7.0								
	945 / 948	F1	6.7	6.7								
	951 / 954	E5	6.5	6.5								
	954 / 957	E-4	6.7	6.8								
	957 / 1000	E-3	7.1	7.1								
	1000 / 1003	E-2	6.9	7.0								
	1003 / 1006	E-1	6.7	6.8								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/94

OPERATOR: EC

TEST LOCATION:

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ____% ____, DRY		
			O_2	Ref O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
2-2	1009/1012	D-5	6.9	7.0								
	1012/1015	D-4	6.3	6.4								
	1015/1018	D-3	7.2	7.2								
	1018/1021	D-2	7.7	7.7								
	1021/1024	D-1	7.0	7.0								
	1033/1036	C-5	6.5	6.4								
	1036/1039	C-4	6.6	6.6								
	1039/1042	C-3	6.5	6.6								
	1042/1045	C-2	6.4	6.4								
	1045/1048	C-1	7.4	7.5								

COMMENTS:

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/96

OPERATOR: [illegible]

TEST LOCATION: outlet #2

TEST NUMBERS: 2-2-ST

AMBIENT TEMP., DB/WB: 105

BAROMETRIC PRESSURE: 29.92

DUCT STATIC PRESSURE:

FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ____% ____, DRY		
			Ref O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	1051/1054	B-5	6.0	6.1				-				
	1054/1057	B-4	6.2	6.3								
	1057/1100	B-3	6.5	6.6								
	1100/1103	B-2	6.7	6.8								
	1103/1106	B-1	6.6	6.7								
	1109/1112	A-5	7.1	7.3								
	1112/1115	A-4	6.7	6.9								
	1115/1118	A-3	7.4	7.5								
	1118/1121	A-2	6.7	6.8								
	1121/1124	A-1	6.4	6.6								
	SYS	zero/span	.3/12.2	.1/12.4								

COMMENTS:

CARNOT

Appendix C.3

3D Flow Data

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Sample Location: Unit 1 outlet

Unit No: 1

Test No: 1-3-BD-traverse

Barometric Pressure (in Hg):

Static Pressure in Stack (iwg):

Date: 6-28-94

Data Taken By: Dave Worley

Test Description: 3-D traverse

Pitot I.D. No.:

Pre-Test Leak Check: o.k

Post-Test Leak Check: O.K

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	D	7	-10	.45	0	413
		6	-6	.47	0	413
		5	-5	.43	+.01	414
1215		4	0	.40	+.01	414
		3	-1	.39	+.01	416
		2	0	.34	+0	416
		1	0	.31	+.01	415
	~~B~~C	7	-10	.4	-.04	415
	~~B~~C	6	-10	.35	-.02	416
		5	-5	.37	-.00	416
		4	0	.35	0	417
		3	+5	.41	+.01	417
		2	+8	.4	+.02	417
		1	+10	.33	+.03	417
	B	7	-5	.58	0	416
		6	-10	.57	0	417
		5	-6	.48	0	417
		4	-8	.34	-.02	417
		3	0	.26	+.03	417
		2	+7	.26	+.03	417
		1	+8	.28	+.01	417

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

CARNOT
3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac
Date: 6-28
Sample Location: unit 1 outlet
Data Taken By: Dave W.
Unit No: 1
Test Description: 3-D traverse
Test No: 1-3-3D-traverse
Pitot I.D. No.:
Barometric Pressure (in Hg): 29.80
Pre-Test Leak Check
Static Pressure in Stack (iwg):
Post-Test Leak Check:

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	A	7	-10	.59	-.03	415
		6	-8	.48	-.03	416
		5	-6	.48	-.03	418
		4	0	.5	-.05	418
		3	0	.57	-.04	419
		2	0	.6	-.05	419
		1	0	.6	-.03	419
	E	7	~~+5~~	.57	.0	419
		6	-8	.55	0	420
		5	0	.56	0	420
		4	0	.6	0	420
		3	-3	.58	0	420
		2	-2	.6	+.03	420
		1	-2	.58	+.02	420
	C	7	-4	.5	-.01	418
		6	0	.6	-.03	418
		5	+2	.55	-.04	419
		4	0	.52	-.04	419
		3	0	.62	-.04	419
		2	0	.62	-.04	419
		1	0	.60	-.03	419

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

CARNOT
3-DIMENSIONAL VELOCITY DATA

Client/Location: UCCS
Date: 6-28-94
Sample Location: Unit 2 outlet
Data Taken By: D. W
Unit No: 2
Test Description: 3-D
Test No: 2-2-3D
Pitot I.D. No.:
Barometric Pressure (in Hg):
Pre-Test Leak Check
Static Pressure in Stack (iwg): -0.75
Post-Test Leak Check:

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
1035	A	7	-6	.55	-.05	439
		6	-9	.45	-.05	439
		5	-12	.45	-.05	439
		4	-3	.5	-.05	439
		3	-9	.6	-.04	439
		2	-8	.6	-.05	439
		1	-8	.55	-.00	440
	B	7	+5	.7	-.00	439
		6	-7	.65	0	439
		5	0	.57	0	439
		4	-1	.48	0	439
		3	-2	.72	0	439
		2	-3	.25	0	438
		1	-15	.27	-.02	438
	C	7	0	.41	-.01	437
		6	0	.42	-.02	436
		5	0	.37	-.01	437
		4	-2	.37	+.01	437
		3	-6	.36	+.02	437
		2	-7	.4	+.02	437
		1	-9	.36	+.02	437

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

CARNOT
3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac
Date: 6-27-94
Sample Location: Inlet
Data Taken By: Dave Wonderly
Unit No: 2
Test Description: 3-D
Test No: 2-2-3D-vel
Pitot I.D. No.:
Barometric Pressure (in Hg): 29.82
Pre-Test Leak Check: O.K.
Static Pressure in Stack (iwg):
Post-Test Leak Check: O.K

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	F 7		-7°	.55	-.05	
	6		-7°	.57	-.04	446
	5		-7°	.50	-.06	441
	4		-6°	.59	-.03	443
	3		-1	.66	-.03	441
	2		-8°	.60	0	442
	1		-10	.52	+.07	445
	E	7	-9°	.52	0	441
		6	-10°	.52	+.01	442
		5	-5°	.54	+.02	442
		4	-7°	.55	0	442
		3	-7°	.53	0	441
		2	-9°	.53	0	441
		1	-10°	.55	+.02	440
	D	7	0	.49	0	440
		6	+1	.45	+.02	438
		5	-2	.42	+.02	437
		4	0	.39	+.01	437
		3	0	.36	0	437
		2	-3°	.30	-.01	437
		1	+2	.25	0	437

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

APPENDIX D
CALCULATIONS

3D VELOCITY - DATA AND WORKSHEET

A-80

Client:	UCOS COLMAC
Unit:	# 1
Sample Location:	Outlet duct
Test No.:	1-1-3d
Probe ID No.:	B-2131
Unit Load:	
Test Date:	6/28/94
Time (Start/Stop):	0950/1145

Date:	
Data By:	EF
Baro. Pressure, in Hg.:	29.90
Static Pressure, in WG:	-0.78
Abs. Pressure, in Hg.:	29.84
Average O2, % dry:	6.70
Average CO2, % dry:	12.00
Moisture Content, %:	15.00
Molecular Weight, wet:	28.36

Sample Point		Yaw Angle deg.	Pitch P4-P5 in WG	Total P1-P2 in WG	Stack Temp. F	P4-P5/ P1-P2 in WG	Pitch Angle deg.	Pt-Ps/ P1-P2 in WG	Pt-Ps in WG	Result Angle deg.	Velocity uncorr.* fps	Velocity Axial fps
A	7	-10	-0.03	0.58	415	-0.05	-3.2	1.00	0.58	10.5	66.1	65.0
A	6	-8	-0.03	0.48	416	-0.06	-3.8	1.00	0.48	8.9	60.2	59.4
A	5	-6	-0.03	0.48	418	-0.06	-3.8	1.00	0.48	7.1	60.2	59.8
A	4	0	-0.05	0.50	418	-0.10	-6.1	1.00	0.50	6.1	61.5	61.2
A	3	0	-0.04	0.57	419	-0.07	-4.3	1.00	0.57	4.3	65.7	65.5
A	2	0	-0.05	0.60	419	-0.08	-5.1	1.00	0.60	5.1	67.4	67.2
A	1	0	-0.03	0.60	419	-0.05	-3.1	1.00	0.60	3.1	67.4	67.3
E	7	-5	0.00	0.53	419	0.00	0.0	1.00	0.53	5.0	63.2	63.0
E	6	-8	0.00	0.55	420	0.00	0.0	1.00	0.55	8.0	64.4	63.8
E	5	0	0.00	0.56	420	0.00	0.0	1.00	0.56	0.0	65.0	65.0
E	4	0	0.00	0.60	420	0.00	0.0	1.00	0.60	0.0	67.3	67.3
E	3	-3	0.00	0.58	420	0.00	0.0	1.00	0.58	3.0	66.2	66.1
E	2	-2	0.03	0.60	420	0.05	3.2	1.00	0.60	3.8	67.2	67.1
E	1	-2	0.02	0.58	420	0.03	2.2	1.00	0.58	3.0	66.1	66.0
F	7	-4	-0.01	0.50	418	-0.02	-1.3	1.00	0.50	4.2	61.4	61.2
F	6	0	-0.03	0.60	418	-0.05	-3.1	1.00	0.60	3.1	67.3	67.2
F	5	2	-0.04	0.55	419	-0.07	-4.5	1.00	0.55	4.9	64.5	64.3
F	4	0	-0.04	0.52	419	-0.08	-4.7	1.00	0.52	4.7	62.8	62.5
F	3	0	-0.04	0.62	419	-0.06	-4.0	1.00	0.62	4.0	68.5	68.3
F	2	0	-0.04	0.62	419	-0.06	-4.0	1.00	0.62	4.0	68.5	68.3
F	1	0	-0.03	0.60	419	-0.05	-3.1	1.00	0.60	3.1	67.4	67.3
D	7	-10	0.00	0.45	413	0.00	0.0	1.00	0.45	10.0	58.1	57.2
D	6	-6	0.01	0.47	413	0.02	1.4	1.00	0.47	6.2	59.3	59.0
D	5	-5	0.01	0.43	414	0.02	1.5	1.00	0.43	5.2	56.8	56.5
D	4	0	0.01	0.40	414	0.03	1.6	1.00	0.40	1.6	54.7	54.7
D	3	1	0.01	0.39	416	0.03	1.6	1.00	0.39	1.9	54.1	54.1
D	2	0	0.00	0.34	416	0.00	0.0	1.00	0.34	0.0	50.6	50.6
D	1	0	0.01	0.31	415	0.03	2.1	1.00	0.31	2.1	48.2	48.2
C	7	-10	-0.04	0.40	415	-0.10	-6.1	1.00	0.40	11.7	54.9	53.8
C	6	-10	-0.02	0.35	416	-0.06	-3.5	1.00	0.35	10.6	51.4	50.5
C	5	-5	0.00	0.37	416	0.00	0.0	1.00	0.37	5.0	52.7	52.5
C	4	0	0.00	0.35	417	0.00	0.0	1.00	0.35	0.0	51.3	51.3
C	3	5	0.01	0.41	417	0.02	1.6	1.00	0.41	5.2	55.5	55.3
C	2	8	0.02	0.40	417	0.05	3.2	1.00	0.40	8.6	54.8	54.2
C	1	10	0.03	0.33	417	0.09	5.9	0.99	0.33	11.6	49.8	48.7
B	7	-9	0.00	0.58	416	0.00	0.0	1.00	0.58	9.0	66.0	65.2
B	6	-10	0.00	0.57	417	0.00	0.0	1.00	0.57	10.0	65.5	64.5
B	5	-6	0.00	0.48	417	0.00	0.0	1.00	0.48	6.0	60.1	59.8
B	4	-8	0.02	0.34	417	0.06	3.8	0.99	0.34	8.8	50.5	49.9
B	3	0	0.03	0.26	417	0.12	7.6	0.99	0.26	7.6	44.2	43.8
B	2	7	0.03	0.26	417	0.12	7.6	0.99	0.26	10.3	44.2	43.5
B	1	8	0.01	0.28	417	0.04	2.3	1.00	0.28	8.3	45.9	45.4

RESULTS

0.48

Yaw Angle:	2.0 degrees	Stack Temperature:	417 F
Pitch Angle:	-0.4 degrees	Velocity*:	59.45 fps (feet per sec.)
Resultant Angle:	5.6 degrees	Axial Velocity:	59.08 fps
Standard Deviation:	3.3 degrees		

*velocity in the direction of flow

CARNOT
15991 Red Hill Ave., Suite 110
714-259-9520
FAX 714-259-0372

STRATIFICATION CHECK

Client: UCOS COLMAC
Project #: 1409-40950
Unit No: 1.0
Date: 6/28/94

Point	O_2 pt	Ref O_2	% Diff	Point	O_2 pt	Ref O_2	% Diff
A5	6.9	6.9	0.0%	D5	6.5	6.4	-1.6%
A4	7.2	7.1	-1.4%	D4	6.6	6.6	0.0%
A3	6.7	6.7	0.0%	D3	6.7	6.7	0.0%
A2	7.0	7.2	2.8%	D2	6.6	6.6	0.0%
A1	6.5	6.5	0.0%	D1	6.7	6.7	0.0%
B5	6.5	6.5	0.0%	E5	7.0	6.9	-1.4%
B4	6.7	6.7	0.0%	E4	6.6	6.6	0.0%
B3	6.7	6.6	-1.5%	E3	6.6	6.6	0.0%
B2	6.3	6.2	-1.6%	E2	6.9	6.8	-1.5%
B1	6.5	6.5	0.0%	E1	6.7	6.6	-1.5%
C5	6.6	6.5	-1.5%	F5	6.5	6.5	0.0%
C4	6.3	6.2	-1.6%	F4	6.2	6.2	0.0%
C3	6.4	6.4	0.0%	F3	6.8	6.8	0.0%
C2	6.9	6.8	-1.5%	F2	6.8	6.8	0.0%
C1	6.7	6.7	0.0%	F1	6.8	6.8	0.0%

O2 Stratification= -0.4%

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3D VELOCITY - DATA AND WORKSHEET

A-82

Client:	UCOS COLMAC	Date:	
Unit:	# 2	Data By:	EF
Sample Location:	Outlet duct	Baro. Pressure, in Hg.:	29.90
Test No.:	2-2-3d	Static Pressure, in WG:	-0.78
Probe ID No.:	B-2131	Abs. Pressure, in Hg.:	29.84
Unit Load:		Average O2, % dry:	6.70
Test Date:	6/28/94	Average CO2, % dry:	12.00
Time (Start/Stop):	0950/1145	Moisture Content, %:	15.00
		Molecular Weight, wet:	28.36

Sample Point		Yaw Angle deg.	Pitch P4-P5 in WG	Total P1-P2 in WG	Stack Temp. F	P4-P5/ P1-P2 in WG	Pitch Angle deg.	Pt-Ps/ P1-P2 in WG	Pt-Ps in WG	Result Angle deg.	Velocity uncorr.* fps	Velocity Axial fps
A	7	-6	-0.05	0.55	439	-0.09	-5.5	1.00	0.55	8.1	65.3	64.6
A	6	-9	-0.05	0.45	439	-0.11	-6.7	1.00	0.45	11.2	59.1	58.0
A	5	-12	-0.05	0.45	439	-0.11	-6.7	1.00	0.45	13.7	59.1	57.4
A	4	-3	-0.05	0.50	439	-0.10	-6.1	1.00	0.50	6.8	62.3	61.8
A	3	-9	-0.04	0.60	439	-0.07	-4.1	1.00	0.60	9.9	68.1	67.1
A	2	-8	-0.05	0.60	439	-0.08	-5.1	1.00	0.60	9.5	68.2	67.3
A	1	-8	0.00	0.55	440	0.00	0.0	1.00	0.55	8.0	65.2	64.5
B	7	5	0.00	0.70	439	0.00	0.0	1.00	0.70	5.0	73.5	73.2
B	6	-3	0.00	0.65	439	0.00	0.0	1.00	0.65	3.0	70.8	70.7
B	5	0	0.00	0.57	439	0.00	0.0	1.00	0.57	0.0	66.3	66.3
B	4	-1	0.00	0.48	439	0.00	0.0	1.00	0.48	1.0	60.9	60.8
B	3	-2	0.00	0.32	439	0.00	0.0	1.00	0.32	2.0	49.7	49.7
B	2	-3	0.00	0.25	438	0.00	0.0	1.00	0.25	3.0	43.9	43.8
B	1	-15	-0.02	0.27	438	-0.07	-4.5	1.00	0.27	15.7	45.7	44.0
C	7	0	-0.01	0.41	437	-0.02	-1.5	1.00	0.41	1.5	56.2	56.2
C	6	0	-0.02	0.42	436	-0.05	-2.9	1.00	0.42	2.9	56.9	56.8
C	5	0	-0.02	0.37	437	-0.05	-3.3	1.00	0.37	3.3	53.4	53.3
C	4	-2	-0.01	0.37	437	-0.03	-1.7	1.00	0.37	2.6	53.4	53.3
C	3	-6	0.02	0.36	437	0.06	3.6	0.99	0.36	7.0	52.6	52.2
C	2	-3	0.02	0.40	437	0.05	3.2	1.00	0.40	4.4	55.4	55.3
C	1	-9	0.02	0.36	437	0.06	3.6	0.99	0.36	9.7	52.6	51.8
F	7	-7	-0.05	0.55	440	-0.09	-5.5	1.00	0.55	8.9	65.3	64.5
F	6	-3	-0.04	0.53	440	-0.08	-4.6	1.00	0.53	5.5	64.1	63.8
F	5	-6	-0.06	0.50	441	-0.12	-7.2	1.00	0.50	9.4	62.4	61.5
F	4	-1	-0.03	0.59	443	-0.05	-3.1	1.00	0.59	3.3	67.7	67.6
F	3	-8	-0.03	0.66	441	-0.05	-2.8	1.00	0.66	8.5	71.5	70.7
F	2	-10	0.00	0.60	442	0.00	0.0	1.00	0.60	10.0	68.1	67.1
F	1	-9	0.07	0.52	445	0.13	8.9	0.99	0.52	12.6	63.4	61.9
E	7	-10	0.00	0.52	441	0.00	0.0	1.00	0.52	10.0	63.4	62.4
E	6	-5	0.01	0.52	442	0.02	1.2	1.00	0.52	5.1	63.4	63.2
E	5	-7	0.02	0.54	442	0.04	2.4	1.00	0.54	7.4	64.6	64.1
E	4	-3	0.00	0.55	441	0.00	0.0	1.00	0.55	3.0	65.2	65.1
E	3	-9	0.00	0.53	441	0.00	0.0	1.00	0.53	9.0	64.0	63.2
E	2	-10	0.00	0.53	441	0.00	0.0	1.00	0.53	10.0	64.0	63.0
E	1	0	0.02	0.55	440	0.04	2.3	1.00	0.55	2.3	65.1	65.1
D	7	1	0.00	0.49	440	0.00	0.0	1.00	0.49	1.0	61.5	61.5
D	6	-2	0.02	0.45	438	0.04	2.8	1.00	0.45	3.5	58.8	58.7
D	5	0	0.02	0.42	437	0.05	3.1	1.00	0.42	3.1	56.8	56.7
D	4	0	0.01	0.39	437	0.03	1.6	1.00	0.39	1.6	54.8	54.7
D	3	0	0.00	0.36	437	0.00	0.0	1.00	0.36	0.0	52.6	52.6
D	2	-3	-0.01	0.30	437	-0.03	-2.1	1.00	0.30	3.6	48.1	48.0
D	1	2	0.00	0.25	437	0.00	0.0	1.00	0.25	2.0	43.9	43.8

RESULTS

Yaw Angle:	4.4	degrees	Stack Temperature:	439	F
Pitch Angle:	-1.0	degrees	Velocity*:	60.18	fps (feet per sec.)
Resultant Angle:	5.9	degrees	Axial Velocity:	59.71	fps
Standard Deviation:	4.0	degrees			

*velocity in the direction of flow

CARNOT
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STRATIFICATION CHECK

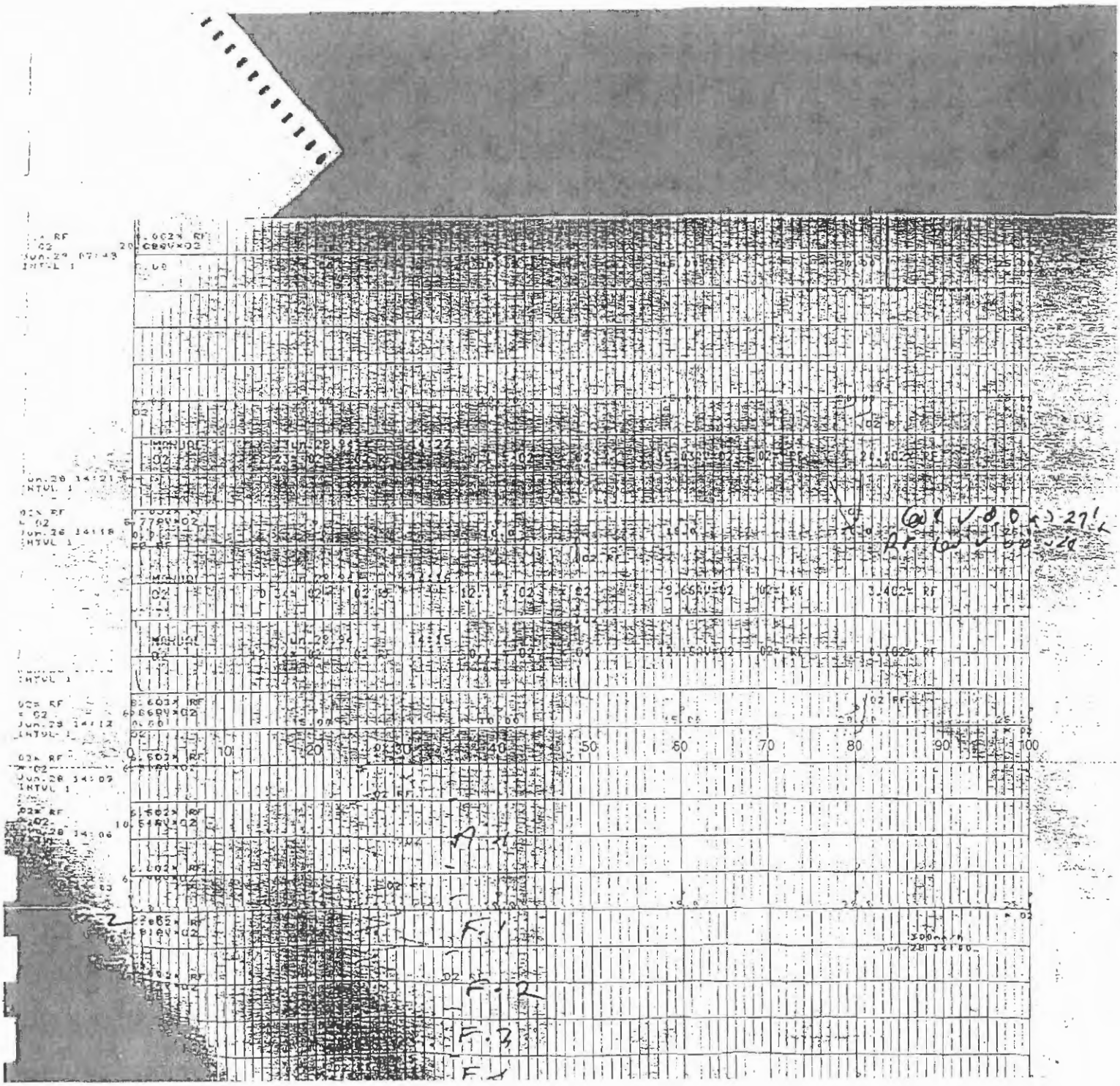
Client: UCOS COLMAC
Project #: 1409-40985
Unit No: 2
Date: 6/28/94

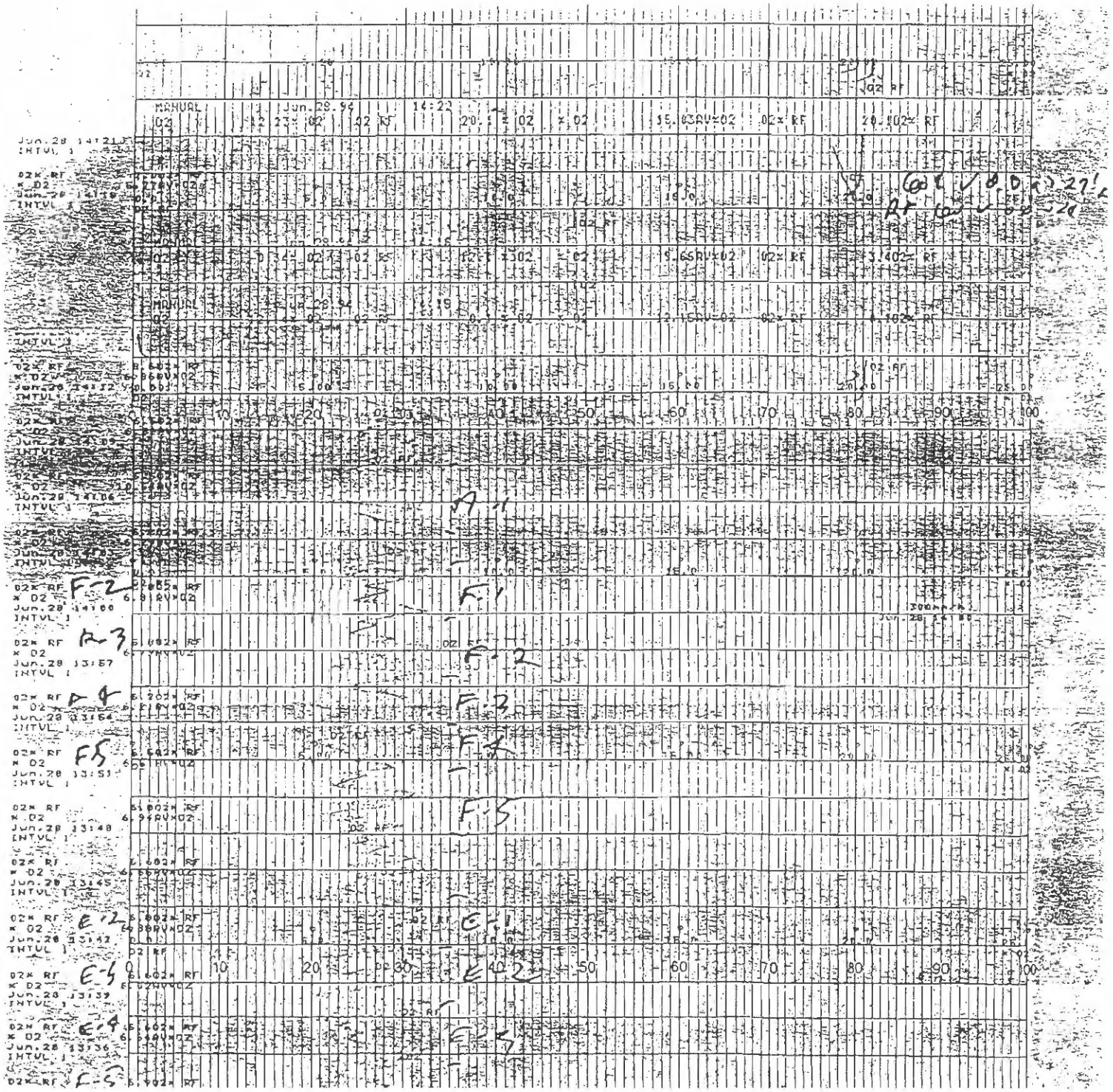
Point	O_2 pt	Ref O_2	% Diff	Point	O_2 pt	Ref O_2	% Diff
F5	7.0	7.0	0.0%	C5	6.5	6.4	-1.6%
F4	6.4	6.5	1.5%	C4	6.6	6.6	0.0%
F3	7.3	7.4	1.4%	C3	6.5	6.6	1.5%
F2	7.0	7.0	0.0%	C2	6.4	6.4	0.0%
F1	6.7	6.7	0.0%	C1	7.4	7.5	1.3%
E5	6.5	6.5	0.0%	B5	6.0	6.1	1.6%
E4	6.7	6.8	1.5%	B4	6.2	6.3	1.6%
E3	7.1	7.1	0.0%	B3	6.5	6.6	1.5%
E2	6.9	7.0	1.4%	B2	6.7	6.8	1.5%
E1	6.7	6.8	1.5%	B1	6.6	6.7	1.5%
D5	6.9	7.0	1.4%	A5	7.1	7.3	2.7%
D4	6.3	6.4	1.6%	A4	6.7	6.9	2.9%
D3	7.2	7.2	0.0%	A3	7.4	7.5	1.3%
D2	7.7	7.7	0.0%	A2	6.7	6.8	1.5%
D1	7.0	7.0	0.0%	A1	6.4	6.6	3.0%

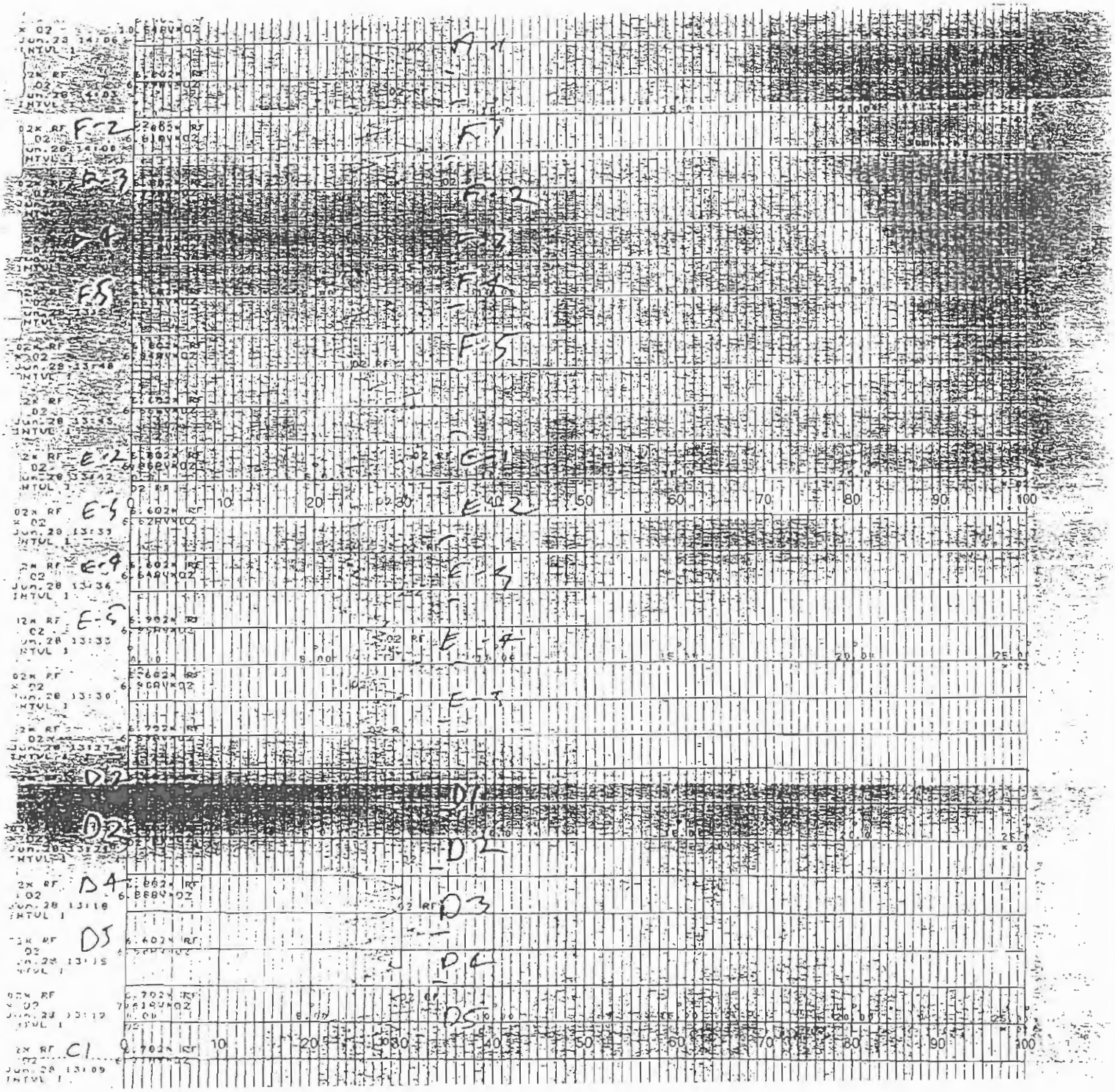
O2 Stratification= 1.0%

CARNOT
15991 Red Hill Ave. Suite 110
Tustin, California 92680
714-259-9520
FAX 714-259-0372

APPENDIX E
STRIP CHARTS






F-2
F-3
F-4
F-5
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E-5
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D4
D5
C1
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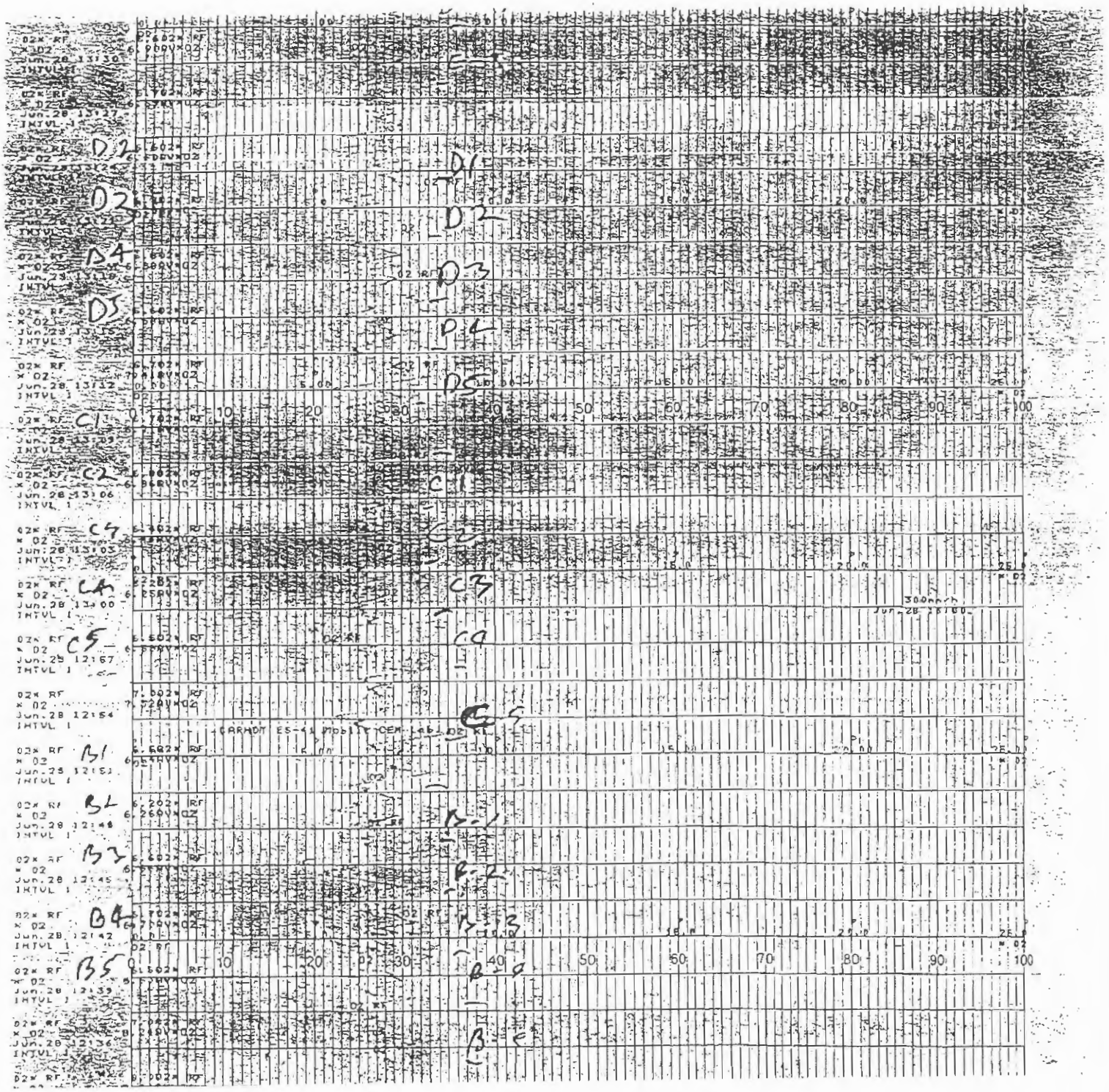
50
60
70
80
90
100


D2
D1
D2
D4
D3
D5
D4
D5
C1
C2
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C4
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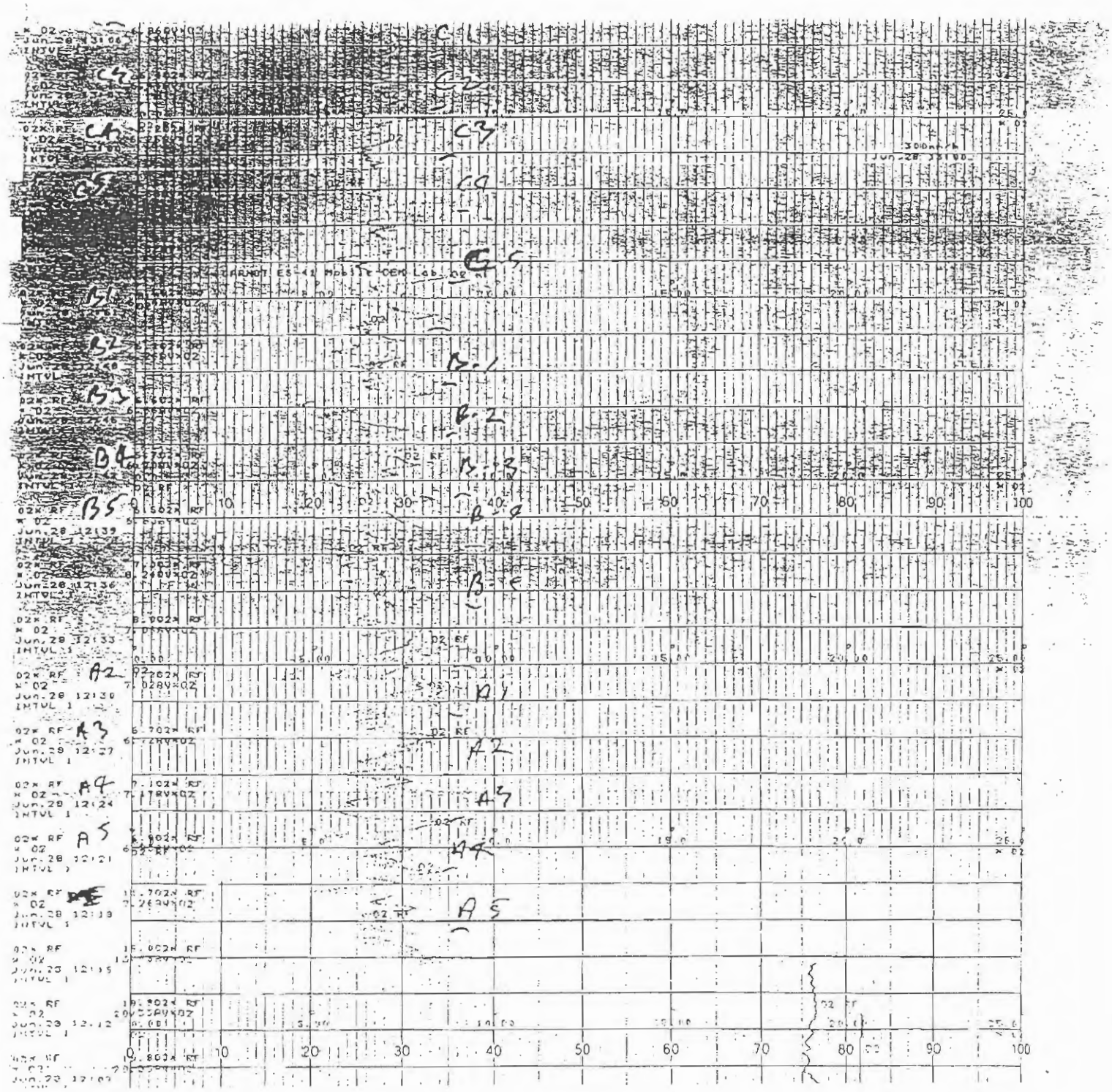
B3
B5
B4
B5
B3


CARNOT ES-41 Mobile CEM Lab
C1
C2
C3
C4
C5
C6
B1
B2
B3
B4
B5
B6
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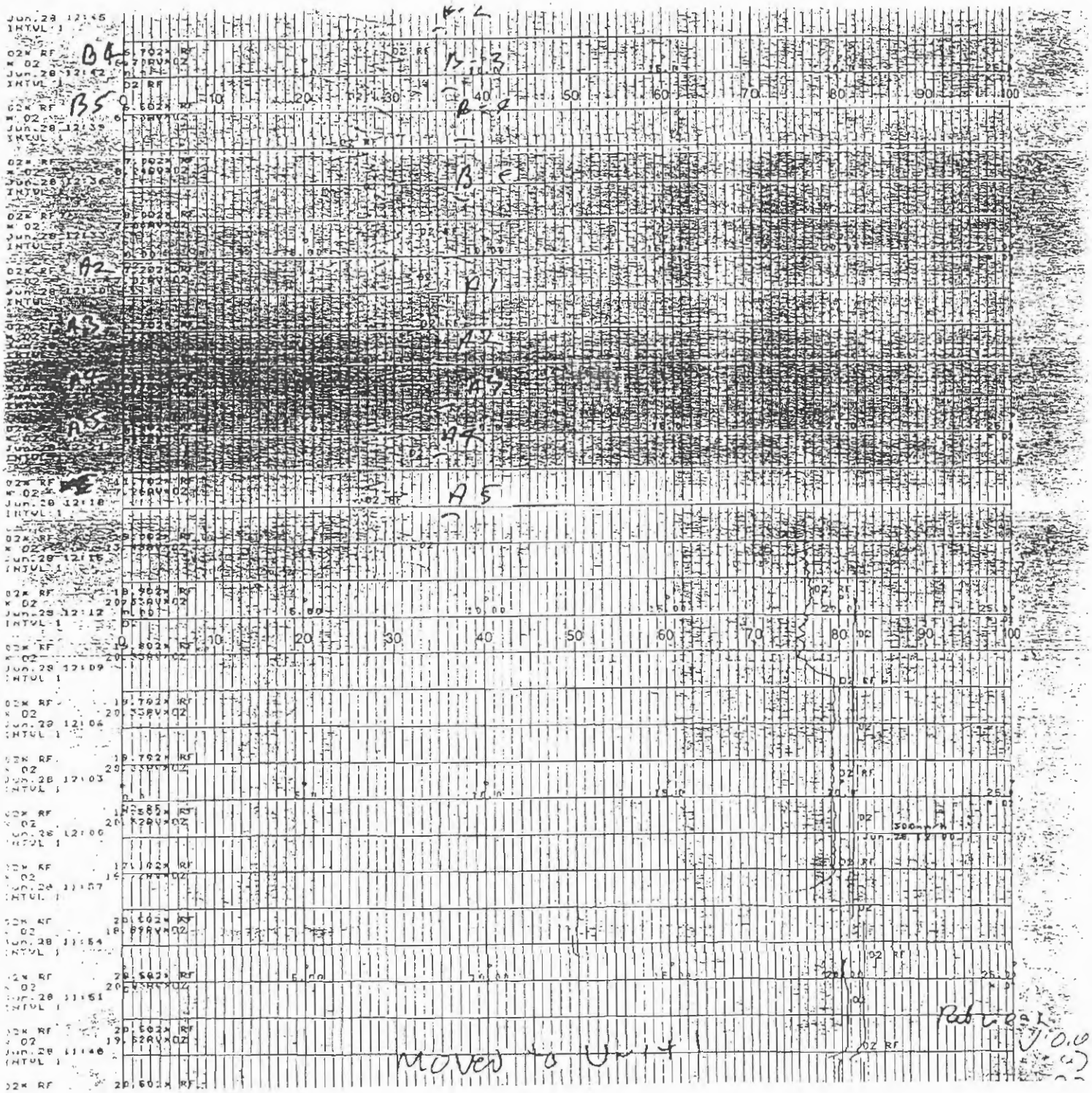
A2
A3
A4
A5
0
10
20
30
40
50
60
70
80
90
100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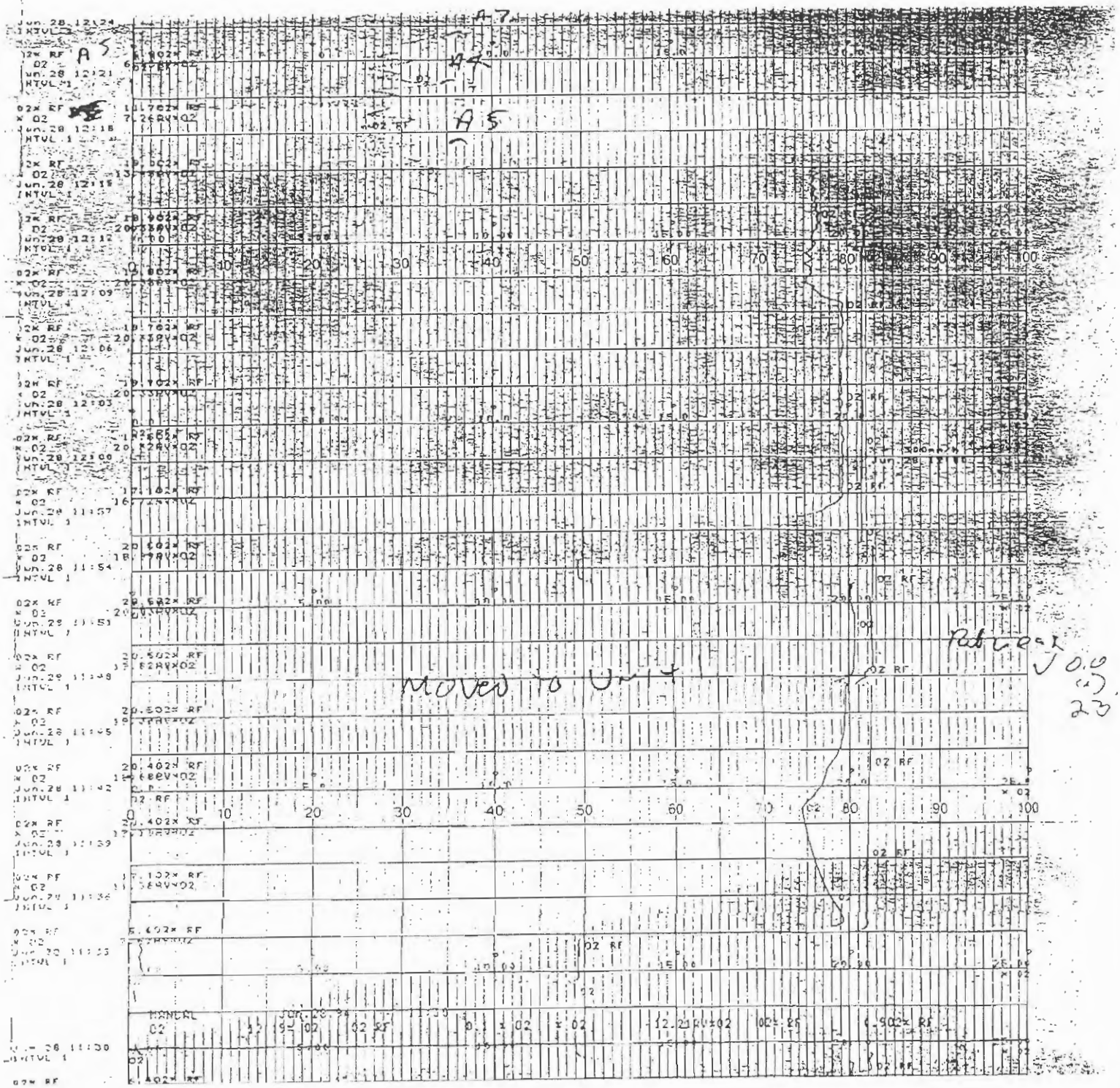
A4
A5
MOVED TO UNIT


A7
A4
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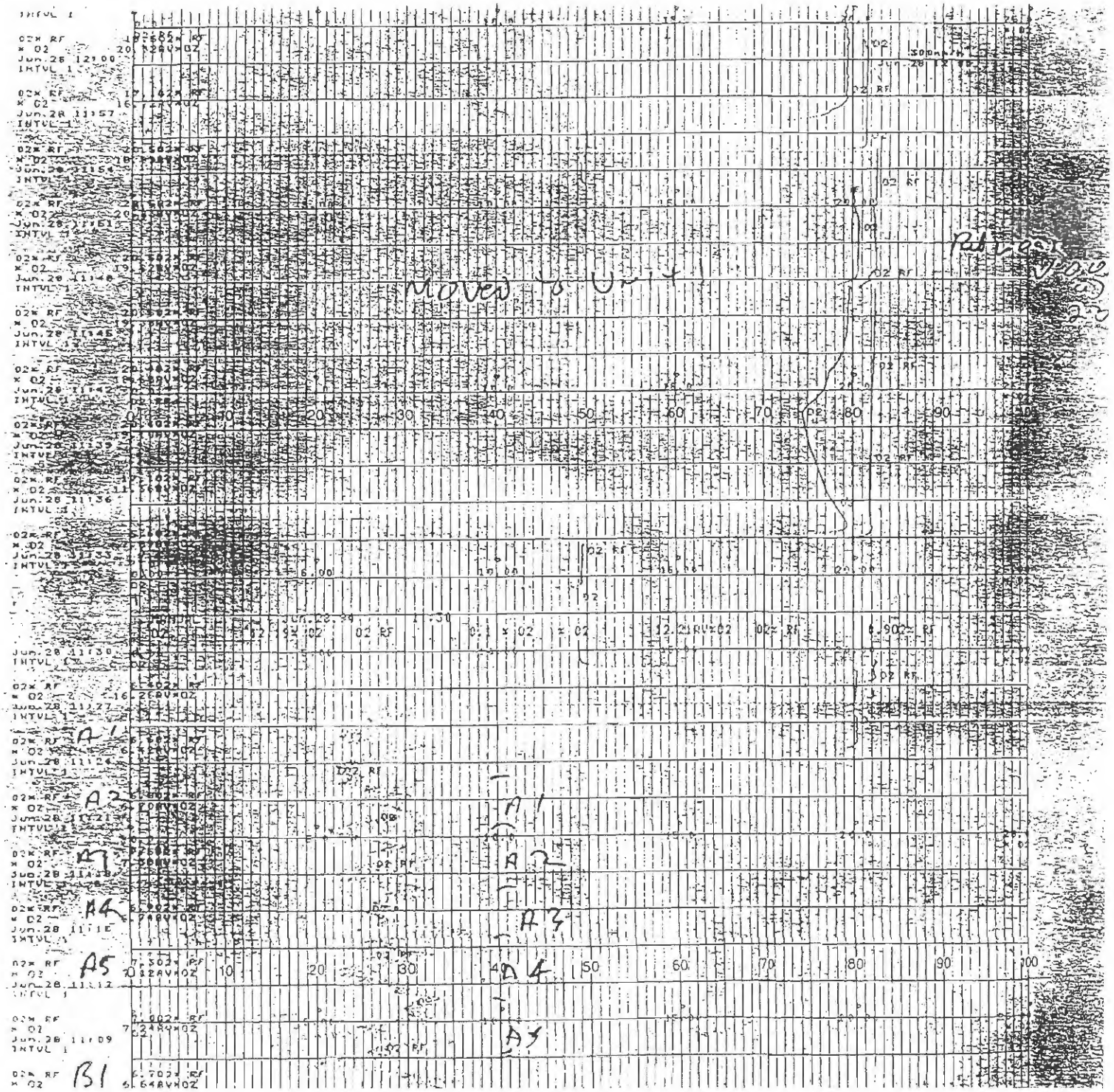
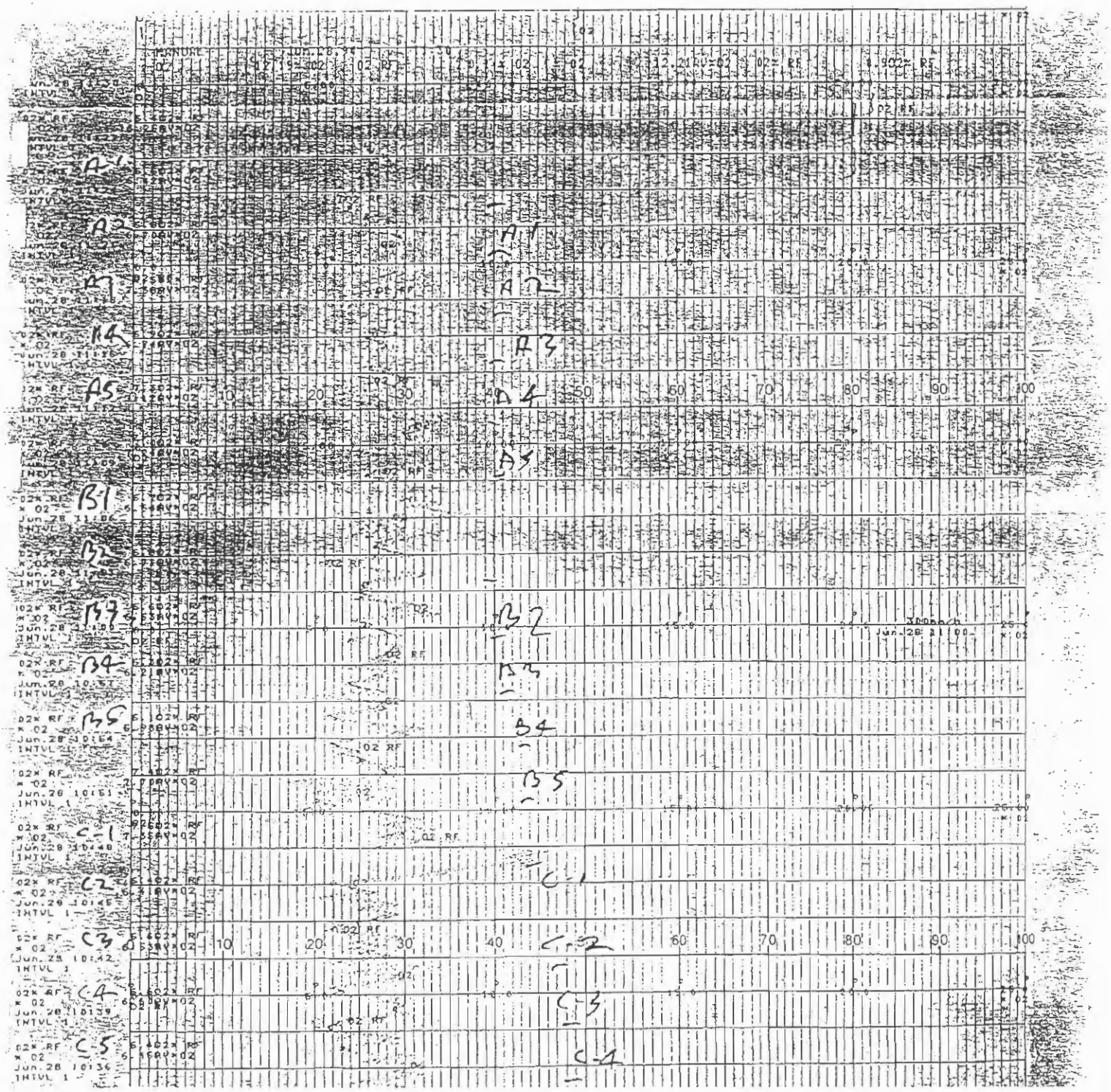
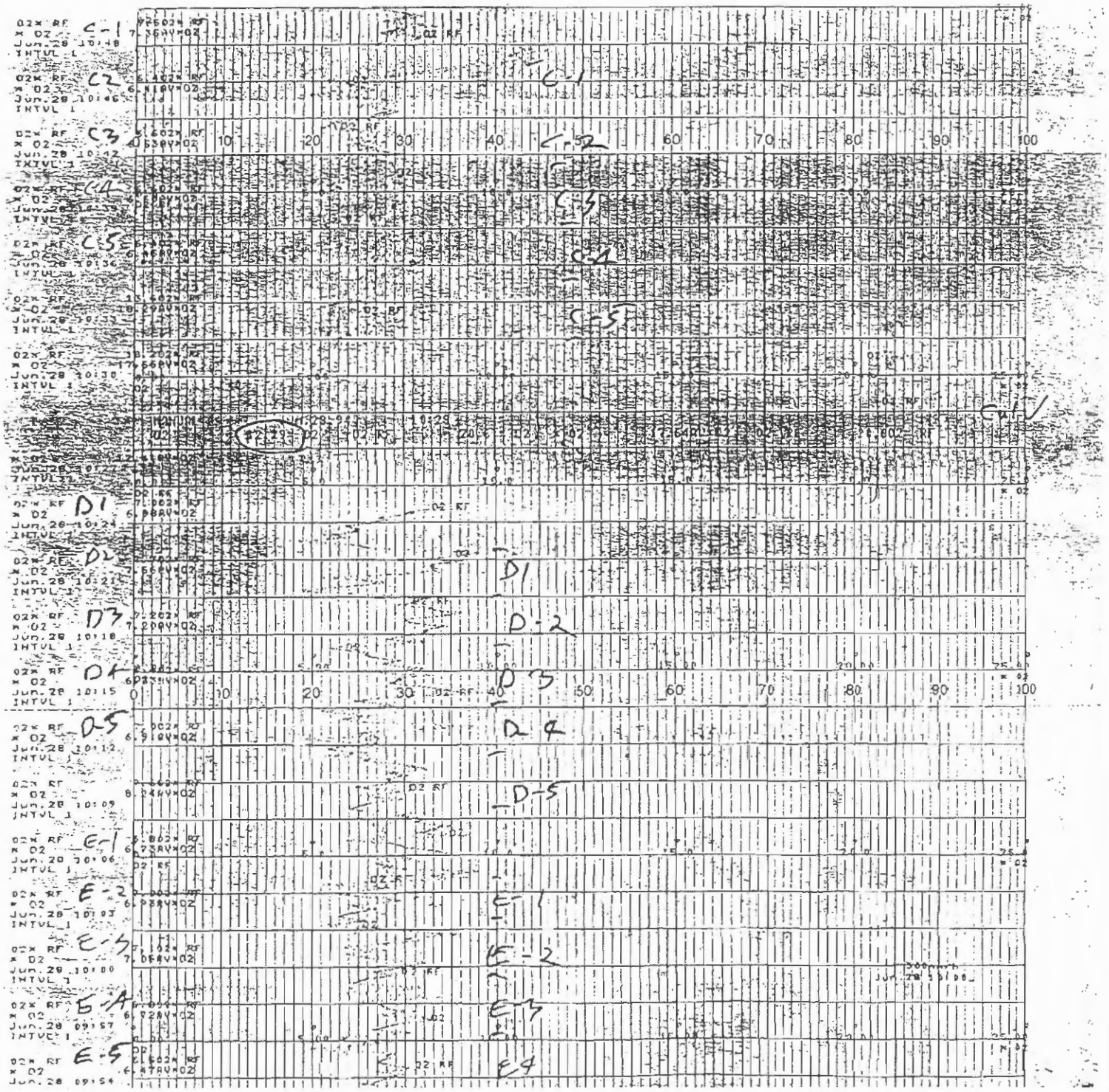
A5
MOVED TO UNIT
Pat Leak
0.0
23
0
10
20
30
40
50
60
70
80
90
100


Moved to Unit
A1
A2
A3
A4
A5
B1


A1
A2
A3
A4
A5
B1
B2
B3
B4
B5
C1
C2
C3
C4
C5
10
20
30
40
50
60
70
80
90
100


C-1
C2
C3
C4
C5
D1
D2
D3
D4
D5
E-1
E-2
E-3
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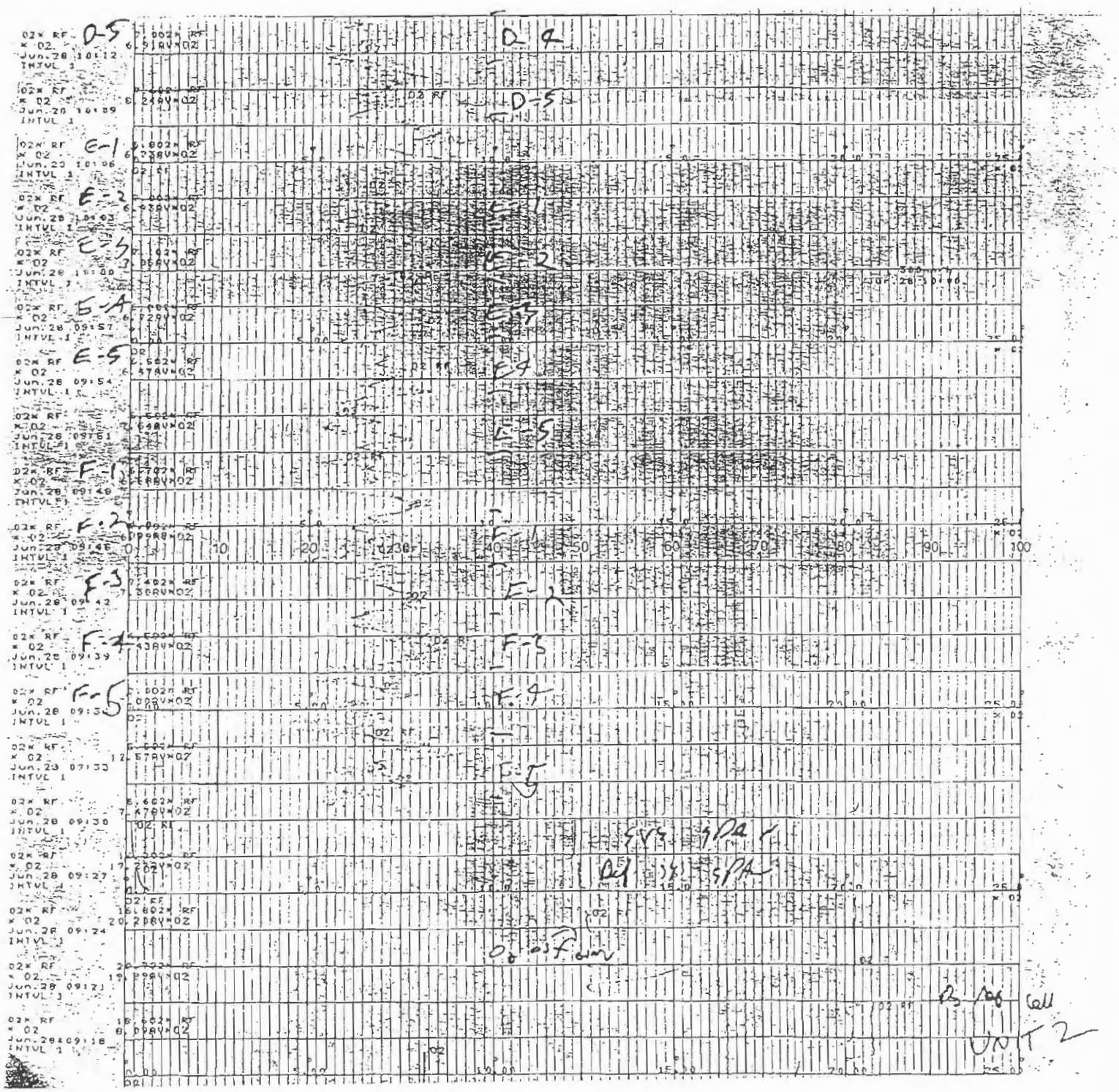
50
60
70
80
90
100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D-5
E-1
E-2
E-3
E-4
E-5
F-1
F-2
F-3
F-4
F-5
F-4
F-5
Cell
UNIT 2

END OF DOCUMENT

APPENDIX B QUALITY ASSURANCE

QUALITY ASSURANCE PROGRAM

Delta's operations include four major areas of focus which include sampling, sample analysis, equipment maintenance, calibration, data reduction, and reporting. Procedures are in place to ensure that work performed in each one of these areas is performed in a manner consistent with providing emissions test data that is of known quality and is legally defensible. This section provides details on the procedures that are followed to accomplish this assurance of data quality.

QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

Standard methods of assessing data quality such as precision, accuracy and completeness are used. Criteria for acceptable data are generally contained in the reference methods, however, for some projects other criteria are defined. Standard statistical techniques can be applied to assess the data as requested for specific programs. Statistical analysis is not generally included when reporting source test data unless the number of samples and sampling conditions are planned to provide meaningful statistical results.

Delta's quality assurance objectives for precision and accuracy are based on the Reference Methods or published precision and accuracy data.

Completeness is defined as the percentage of measurements which are judged to be valid as compared to the total number of measurements made. Delta's objective is to generate only valid data. For compliance tests, Delta's completeness goal is 100%. For this initial copy of the QAP, the methods which are listed in Delta's capabilities provide results which are available while still on the job site. It is expected that if all quality assurance requirements for a test are not satisfied, the test will be invalidated and repeated and the test program will remain 100% complete.

REPRESENTATIVENESS AND COMPARABILITY

The usefulness and validity of all data is contingent upon 1) the results being representative of the source being tested and 2) comparable with other results generated by Delta or another organization. Delta has adopted the objective is that all measurements be representative and comparable. These objectives will be met by performing tests while the process is operating under known and documented conditions, following published reference methods, using standard data reduction techniques and reporting formats, and proper training of personnel.

TRAINING

Training is an on-going process for all Delta personnel. Personnel completing any task will be properly trained before undertaking any task or be under the direct observation and supervision of someone properly trained. There are certain skills which all technical personnel are expected to acquire.

All source test personnel must review the applicable portions of the following technical documents before being involved in any capacity in any test program.

a) 40 CFR Part 60

b) SCAQMD Source Test Manual

c) Delta Quality Assurance Plan

d) EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III.

PROCEDURE SPECIFIC TRAINING

In addition to the general awareness training discussed previously, each person responsible for the performance of a test procedure is required to demonstrate proficiency in the method involved. This demonstration will be accomplished through 1) reading of the method, 2) reading of the manuals for the equipment being used, and 3) satisfactorily completing an oral or written exam regarding the above material. Information related to training for specific methods is provided below.

A. Continuous Monitoring of Emissions: EPA Methods 3A, 6C, 7E, 10, 20, SCAQMD Method 100.1
   1. Understanding of the CEMS schematic drawing
   2. Understanding of the sampling system
   3. Leak check
   4. Analyzer calibrations and adjustments
   5. Sample system bias calibration check
   6. Strip chart recorder operation and documentation
   7. Stratification check
   8. Corrections for sample system bias and analyzer drift

B. Sample Locations: EPA Method 1, SCAQMD Method 1.1
   1. Identify sample locations
   2. Determination of upstream and downstream diameters
   3. Stack area calculations
   4. Determine number and location of sample points
   5. Perform cyclonic flow check and determine sample location acceptability.

C. Stack Gas Velocity and Volumetric Flow Rate: EPA Method 2, SCAQMD Method 2.1

   1. Assemble pitot tube/thermocouple
   2. Perform leak check
   3. Record differential pressure
   4. Record stack temperature
   5. Record static pressure
   6. Record barometric pressure
   7. Calculate stack gas velocity and volumetric flow rate

D. Stack Gas Moisture Content: EPA Method 4, SCAQMD Method 4.1

1. Assemble sample train (probe, sample line, impingers, U-tube, gooseneck, vacuum line, meter, pump, etc.)
2. Record preliminary data: barometric pressure, reference temperature, ambient temperature.
3. Pre- and post-test leak check: < 0.02 cfm
4. Read and record: sample volume, delta H, meter temperatures (in/out), vacuum, impinger outlet temperature
5. Weigh impingers
6. Calculate % moisture

SAMPLING PROCEDURES

Delta maintains complete copies of federal, state, and local regulatory agency source test methods which serve as the final authority on sampling procedures. This Quality Assurance Plan does not attempt to re-state the source test methods which are available. Delta strives to follow the appropriate source test methods whenever possible. Source test methods are listed in all test plans for review by both clients and regulatory agencies.

The following steps are taken to ensure that the sampling procedures of the source test methods are followed:

1. Training of personnel, as discussed in Section 5,
2. Copies of reference methods are available to all personnel and are taken to every job site,
3. Appropriate selection of project managers
4. Quality assurance reviews of test programs

Occasionally, due to the sample location limitations or other factors, variations from the standard methods will be necessary. Any variations from the methods will be assessed to determine the effect which the variation will have on data quality. Whenever possible, variations will be included in the test plan and receive approval prior to implementation of the program. Any variations will be clearly documented in the source test report.

CHAIN-OF-CUSTODY PROCEDURES

DATA SHEET CHAIN-OF-CUSTODY

The program manager for each program is responsible for collection of data sheets from sampling personnel as they are completed. The program manager maintains possession of the data sheets or keeps them in locked storage. Upon return to the office, a copy of all field data sheets is made and placed in a locked file. The original field data sheets are used for report preparation and are kept with the final report. Data sheets, test plans, and reports are kept in files, organized by client and project.

A chain-of-custody form is kept at the project file location to log check-out and return of any data sheets or files.

Sample and Reagent Chain of Custody

Chain of Custody procedures begin prior to testing with the preparation of reagents and filters to be used in field testing. Delta personnel who have prepared the filters and reagents complete and sign a reagent chain of custody form which is transferred with the reagents to the field testing team. The field team member receiving the reagents records the transfer on this form. The reagent chain of custody form is included in the final source test report.

At the test site all samples collected are recorded on a chain of custody form as they are taken. This chain of custody form also includes the date, time, test number and a description of the samples and sample fractions. This form is signed by the field team member serving as the sample custodian. This form is left with the sample at all times; it is used to record transfer of the samples to Delta's in-house laboratory or to outside laboratories. Intermediate transfers to shipping agents are also recorded here. Transfers of test equipment between field team members are recorded on the sampling train data sheet.

CALIBRATION PROCEDURES AND FREQUENCY

All of Delta's major equipment components are calibrated according to the procedures established by EPA, CARB, and SCAQMD. When regulations differ, the stricter of the regulations will be followed. Table 9 summarizes the calibration procedures and intervals for the major equipment components.

DATA REDUCTION, VALIDATION, AND REPORTING

DATA REDUCTION

Data reduction generally occurs in two phases: First, preliminary data reduction occurs on the job site. On-site data reduction may be performed by sampling technicians or the project manager. Preliminary calculations may include velocity, moisture, stack flow, and continuous gaseous measurements. Draft test results are normally available prior to leaving the job site. Calculations are performed manually, with a calculator, or with a portable computer. Whenever possible, standard spreadsheets are used to reduce the data.

The second phase of data reduction occurs after the test team has left the job site. Final results are generated after the project manager has reviewed the data entry, calculations, and reporting units.

The standard calculations are available in the test methods

TABLE 1
MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS

Sampling Equipment	Calibration Frequency	Calibration Procedure	Acceptable Calibration Criteria
Continuous Analyzers	Before and After Each Test Day	3-point calibration error test	< 2% of analyzer range
Continuous Analyzers	Before and After Each Test Run	2-point sample system bias check	< 5% of analyzer range
Continuous Analyzers	After Each Test Run	2-point analyzer drift determination	< 3% of analyzer range
CEMS System	Beginning of Each Day	leak check	< 1 in. Hg decrease in 5 min. at > 20 in. Hg
Continuous Analyzers	Semi-Annually	3-point linearity	< 1% of analyzer range
NO_x Analyzer	Daily	NO_2 -> NO converter efficiency	> 90%
Differential Pressure Gauges (except for manometers)	Semi-Annually	Correction factor based on 5-point comparison to standard	+/- 5%
Differential Pressure Gauges (except for manometers)	Bi-Monthly	3-point comparison to standard, no correction factor	+/- 5%
Barometer	Semi-Annually	Adjusted to mercury-in-glass or National Weather Service Station	+/- 0.1 inches Hg
Dry Gas Meter	Semi-Annually	Calibration check at 4 flow rates using a NIST traceable standard	+/- 2%
Dry Gas Meter	Bi-Monthly	Calibration check at 2 flow rates using a NIST traceable standard	+/- 2% of semi-annual factor
Dry Gas Meter Orifice	Annually	4-point calibration for $\Delta H@$	--
Temperature Sensors	Semi-Annually	3-point calibration vs. NIST traceable standard	+/- 1.5%

DATA VALIDATION

All data, data entry, and calculations are double-checked by the originator and reviewed by a second person. Reviews can include re-calculation of results, data entry checks, and calculation of known and accepted data sets using the existing spreadsheet.

REPORTING

Delta promotes the use of a standard reporting format, when possible.

INTERNAL QUALITY ASSESSMENTS

INTEGRATED WET CHEMICAL SAMPLING EQUIPMENT QUALITY CONTROL

Major equipment maintenance schedules are provided. Additional quality control measures are performed on sampling equipment which includes:

- wind-tunnel calibration of pitot tubes
- 3-point thermocouple/readout calibrations
- bi-monthly meter calibration checks
- pre- and post-test leak checks of sample systems

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) EQUIPMENT QUALITY CONTROL

Delta uses EPA Protocol gases to perform all QA/QC checks of the analyzers when available. On-site checks include 3-point calibration error (+/- 2% of span), 2-point sample system bias (+/- 5% of span), analyzer drift (+/- 3% of span). Semi-annual checks include analyzer linearity (+/- 1% of span) and NO_2 converter efficiency (> 90%).

PERFORMANCE AND SYSTEM AUDITS

The appropriate regulatory agency is notified of all Delta compliance tests. The regulatory agency is allowed the opportunity to perform side-by-side tests and/or observe the Delta setup and sampling. Delta cooperates fully in any pre-arranged regulatory agency audit.

Delta's approval under the South Coast Air Quality Management District (SCAQMD) Laboratory Approval Program (LAP) includes a review of quality assurance procedures, equipment type, maintenance, responsibilities, a laboratory audit, and an external audit of the sampling system which involves analysis and reporting of unknown samples.

EQUIPMENT MAINTENANCE

Delta performs routine and preventative maintenance on all major sampling equipment. These procedures are in addition to method specific requirements which are summarized earlier in this QAP. Table 2 summarizes the equipment maintenance schedule. This preventative maintenance schedule should minimize equipment failures and downtime in the field. On the occasion where equipment does break down in the field, Delta personnel have the necessary experience to perform on-site repairs of most problems.

TABLE 2
EQUIPMENT MAINTENANCE SCHEDULE

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Continuous Analyzers	1. Proper response to zero, span gas 2. Absence of malfunction	As required by the manufacturer	As recommended by the manufacturer
Mobile Laboratory Sample System	1. Absence of leaks 2. Pass system bias test	Dependent on sources sampled and use intervals	1. Change filters 2. Repair/change gas dryer 3. Check for contamination 4. Leak check
Pumps	1. Absence of leaks 2. Generates manufacturers required pressure, vacuum, and flow	Every 500 hours of operation or 6 months	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Sample Lines	1. Pass system bias test	After each test series	1. Flush with dry gas

SPECIFIC PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

The QA/QC procedures outlined in the previous sections of this document are provided to ensure data precision, accuracy, and completeness. It is the responsibility of each project team member to 1) complete all pertinent sections of the data sheets, 2) make comments, where appropriate, 3) notify project managers of sampling difficulties which may lead to invalid data, and 4) follow chain-of-custody procedures for all samples, data sheets, and documents.

Each test report is reviewed before release by one of Delta's designated Quality Assurance team members. Procedures, results, and data are reviewed to verify adherence to method requirements, that proper recording procedures are followed, and that calculations are performed properly. These reviews are conducted independently from any project related data reduction and reporting activities.

QUALITY ASSURANCE REPORTS TO MANAGEMENT AND CORRECTIVE ACTIONS

A "Quality Assurance Incident Report" is completed when an incident occurs which may result in the generation of invalid data. The report originator will provide the report to the program manager upon completion to allow for immediate corrective action to maintain program completion. Following completion of the on-site portion of the program, the form is routed to the Quality Assurance Officer for review. Appropriate action to be taken may include, discussions with test personnel, modifications of QA/QC procedures, or additional training. Incidents reports are then filed in the client file and included with the source test report, if appropriate.

Original Quality Assurance records are maintained on-file. Periodic reviews are performed by the QA Officer to ensure that the records are up-to-date, complete, and maintained.

State of California

Air Resources Board

Approved Independent Contractor

Delta Air Quality Services, Incorporated

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2016, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 6, 8, 17, 20, 501
100 (CO, CO_2, NO_x, O_2, SO_2)

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

Delta Air Quality Services, Incorporated

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2016, for those test methods listed below:

U.S. EPA Source Test Methods 201A and 202
Visible Emissions Evaluation

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

January 28, 2016

Mr. James Ritchey
Delta Air Quality Services, Inc.
An Affiliate of Montrose Air Quality Services, Inc.
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Ritchey:

We completed our review of the renewal application you submitted for approval under the South Coast Air Quality Management District's Laboratory Approval Program (SCAQMD LAP). We are pleased to inform you that your firm is approved for the period beginning January 31, 2016, and ending January 31, 2017 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

SCAQMD Methods 1-4
SCAQMD Method 100.1
SCAQMD Methods 25.1 and 25.3 (Sampling)
SCAQMD Methods 5.1, 5.2, 5.3, and 6.1
SCAQMD Rule 1420/ 1420.1 – (Lead) Ambient Sampling
USEPA CTM-030 and ASTM D6522-00

Thank you for participating in the SCAQMD LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

Rudy Eden, Senior Manager
Laboratory Services &
Source Test Engineering

RE:GK/gk
Attachment

cc: Dipankar Sarkar

160128 LapRenewal.doc

Barometric Pressure Determination

Date: 03/01/16

Time: 8:00

Data By: DW

Reference: http://forecast.weather.gov/MapClick.php?CityName=Orange&s

Reference Barometer ID	Palm Springs, Jacqueline Cochran Regional Airport (KTRM)
Reference Barometer Location	33.85°N 116.55°W (Elev. 682 ft)
Reference Barometer Other Info.	
Reference Barometer Indication, corrected to sea level	30.06
Reference Barometer Reference Elevation	**682**
Reference Barometer Actual Pressure	29.38
	0.00
Test Barometer Location/Site	**0.00**
Location/Site Elevation	**-127**
Location/Site Barometric Pressure	30.19
Sampling Location Height (above/below site elevation)	**20**
Sampling Location Barometric Pressure	**30.17**

Barometric Pressure Determination

Date: 03/01/16

Time: 8:00

Data By: DW

Reference: http://forecast.weather.gov/MapClick.php?CityName=Orange&

Reference Barometer ID	Palm Springs, Jacqueline Cochran Regional Airport (KTRM)
Reference Barometer Location	33.85°N 116.55°W (Elev. 682 ft)
Reference Barometer Other Info.	
Reference Barometer Indication, corrected to sea level	29.95
Reference Barometer Reference Elevation	**682**
Reference Barometer Actual Pressure	29.27
	0.00
Test Barometer Location/Site	**0.00**
Location/Site Elevation	**-127**
Location/Site Barometric Pressure	30.08
Sampling Location Height (above/below site elevation)	**20**
Sampling Location Barometric Pressure	**30.06**

NO2 to NO Converter Efficiency Test

				Cylinder #
Analyzer Manufacturer:	CAI	NO Cal Gas Value:	93.0	CC149361
Analyzer Model:	600 Series	NO2 Cal Gas Value:	45.8	CC230245
Analyzer Serial Number:	S03003	Performed By:	DW	
Date:	3/1/2016	CEMS ID#:	3-CEMS	

GAS	ANALYZER MODE	ANALYZER RESPONSE	CAL CORRECTED	LABEL
Zero	NOx	0.1	--	--
Zero	NO	0.1	--	--
NO	NO	92.9	--	--
NO	NOx	93.1	--	--
NO2	NO	0.3	0.2	C_1
NO2	NOx	41.5	41.4	C_2

		Label	Requirement
Abs. Value C_o-C_1:	45.6	D_1	--
Abs. Value C_2-C_1:	41.2	D_2	--
C_1/C_2	0%	D_3	< 5%
CE = D_2/D_1 * 100%:	90.4%	--	> 90%

Cal Error

DELTA
SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 1

DATE: 3/1/2016
BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999		
O_2	CC168052	10.63	CC179518	18.97
CO_2	CC168052	10.5	CC179518	18.62
NO_x	CC106193	47.5	CC149361	93
CO	CC326082	4.72	CC326019	8.81

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Range	20	20	100	10		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.07	0.02	0.10	0.00		--
Error (% of scale)	0.3%	0.1%	0.1%	0.0%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	18.95	18.63	93.07	8.81		--
Error (% of scale)	-0.1%	0.1%	0.1%	0.0%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.70	10.42	47.25	4.77		--
Error (% of scale)	0.3%	-0.4%	-0.2%	0.5%		PASS
Linearity at Mid Point	0.2%	-0.5%	-0.3%	0.51%		

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Range	20	20	100	10		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.036	0.005	0.098	0.052		--
Error (% of scale)	0.2%	0.0%	0.1%	0.5%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	19.033	18.437	93.349	8.787		--
Error (% of scale)	0.3%	-0.9%	0.3%	-0.2%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.621	10.278	47.795	4.786		--
Error (% of scale)	0.0%	-1.1%	0.3%	0.7%		PASS
Linearity at Mid Point	-0.3%	-0.6%	0.1%	0.5%		

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

DELTA
EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power

DATE: 3/1/2016
BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999		
O_2	CC168052	10.63	CC179518	18.97
CO_2	CC168052	10.5	CC179518	18.62
NO_x	CC106193	47.5	CC149361	93
CO	CC326082	4.72	CC326019	8.81

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Span	18.97	18.62	93	8.81		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.067	0.016	0.095	0.001		--
Error (% of cal span)	0.4%	0.1%	0.1%	0.0%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	18.951	18.634	93.073	8.808		--
Error (% of cal span)	-0.1%	0.1%	0.1%	0.0%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.695	10.421	47.254	4.77		--
Error (% of cal span)	0.3%	-0.4%	-0.3%	0.6%		PASS

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Span	18.97	18.62	93	8.81		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.036	0.005	0.098	0.052		--
Error (% of cal span)	0.2%	0.0%	0.1%	0.6%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	19.033	18.437	93.349	8.787		--
Error (% of cal span)	0.3%	-1.0%	0.4%	-0.3%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.621	10.278	47.795	4.786		--
Error (% of cal span)	0.0%	-1.2%	0.3%	0.7%		PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

NO2 to NO Converter Efficiency Test

				Cylinder #
Analyzer Manufacturer:	CAI	NO Cal Gas Value:	93.0	CC149361
Analyzer Model:	600 Series	NO2 Cal Gas Value:	45.8	CC230245
Analyzer Serial Number:	S03003	Performed By:	DW	
Date:	3/2/2016	CEMS ID#:	3-CEMS	

GAS	ANALYZER MODE	ANALYZER RESPONSE	CAL CORRECTED	LABEL
Zero	NOx	0.1	--	--
Zero	NO	0.1	--	--
NO	NO	93.0	--	--
NO	NOx	92.8	--	--
NO2	NO	0.1	0.1	C_1
NO2	NOx	41.4	41.5	C_2

		Label	Requirement
Abs. Value C_o-C_1:	45.7	D_1	--
Abs. Value C_2-C_1:	41.4	D_2	--
C_1/C_2	0%	D_3	< 5%
CE = D_2/D_1 * 100%:	90.5%	--	> 90%

DELTA
SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/2/2016
BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999		
O_2	CC168052	10.63	CC179518	18.97
CO_2	CC168052	10.5	CC179518	18.62
NO_x	CC106193	47.5	CC149361	93
CO	CC326082	4.72	CC326019	8.81

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Range	20	20	100	10		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.06	0.02	0.11	0.01		--
Error (% of scale)	0.3%	0.1%	0.1%	0.1%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	18.96	18.65	92.85	8.80		--
Error (% of scale)	0.0%	0.2%	-0.2%	-0.1%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.72	10.44	47.51	4.74		--
Error (% of scale)	0.4%	-0.3%	0.0%	0.2%		PASS
Linearity at Mid Point	0.3%	-0.4%	0.0%	0.16%		

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Range	20	20	100	10		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.036	0.009	0.131	0.083		--
Error (% of scale)	0.2%	0.0%	0.1%	0.8%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	19.011	18.428	93.221	8.833		--
Error (% of scale)	0.2%	-1.0%	0.2%	0.2%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.611	10.327	47.743	4.824		--
Error (% of scale)	-0.1%	-0.9%	0.2%	1.0%		PASS
Linearity at Mid Point	-0.3%	-0.3%	0.1%	0.5%		

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

DELTA
EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/2/2016
BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999		
O_2	CC168052	10.63	CC179518	18.97
CO_2	CC168052	10.5	CC179518	18.62
NO_x	CC106193	47.5	CC149361	93
CO	CC326082	4.72	CC326019	8.81

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Span	18.97	18.62	93	8.81		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.06	0.017	0.109	0.013		--
Error (% of cal span)	0.3%	0.1%	0.1%	0.1%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	18.962	18.651	92.847	8.799		--
Error (% of cal span)	0.0%	0.2%	-0.2%	-0.1%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.716	10.439	47.511	4.736		--
Error (% of cal span)	0.5%	-0.3%	0.0%	0.2%		PASS

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2	NO_x	CO		
Analyzer Span	18.97	18.62	93	8.81		
Zero Gas Value	0	0	0	0		--
Analyzer Reads	0.036	0.009	0.131	0.083		--
Error (% of cal span)	0.2%	0.0%	0.1%	0.9%		PASS
High Gas Value	18.97	18.62	93	8.81		--
Analyzer Reads	19.011	18.428	93.221	8.833		--
Error (% of cal span)	0.2%	-1.0%	0.2%	0.3%		PASS
Mid Gas Value	10.63	10.5	47.5	4.72		--
Analyzer Reads	10.611	10.327	47.743	4.824		--
Error (% of cal span)	-0.1%	-0.9%	0.3%	1.2%		PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

PRAXAIR

Praxair
5700 South Alameda Street
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PGVPID: F22015

DocNumber: 000078819

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Delta Air Quality Services, Inc.
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Order Number: 30768172
Customer P. O. Number: 05455570
Customer Reference Number:

Fill Date: 4/6/2015
Part Number: NI CD10.5O6E-AS
Lot Number: 109509605
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu ft.

O2 10.63
CO2 10.50
CC168052
EXP 04/13/23
F22015

Certified Concentration:

Expiration Date:	4/13/2023	NIST Traceable
Cylinder Number:	CC168052	Analytical Uncertainty:
10.50 %	CARBON DIOXIDE	± 0.4 %
10.63 %	OXYGEN	± 0.4 %
Balance	NITROGEN	

Certifcation Information: *Certification Date:* 4/13/2015 *Term:* 96 Months *Expiration Date:* 4/13/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 responses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 10.5 %
Certified Concentration: 10.50 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 3/27/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA15063
Ref. Std. Conc: 9.95%
Ref. Std. Traceable to SRM # : 1674b
SRM Sample # : 7-H-07
SRM Cylinder # : FF10631

First Analysis Data:							Date:	4/13/2015
Z:	0	R:	9.95	C:	10.5	Conc:	10.5	
R:	9.95	Z:	0	C:	10.5	Conc:	10.5	
Z:	0	C:	10.5	R:	9.95	Conc:	10.5	
UOM:	%			Mean Test Assay:			10.5 %	

Second Analysis Data:							Date:	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:			0 %	

2. Component: OXYGEN

Requested Concentration: 10.5 %
Certified Concentration: 10.63 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 3/30/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA16022
Ref. Std. Conc: 19.90%
Ref. Std. Traceable to SRM # : 2659a
SRM Sample # : 71-E-19
SRM Cylinder # : FF22331

First Analysis Data:							Date:	4/13/2015
Z:	0	R:	19.9	C:	10.63	Conc:	10.63	
R:	19.9	Z:	0	C:	10.63	Conc:	10.63	
Z:	0	C:	10.63	R:	19.9	Conc:	10.63	
UOM:	%			Mean Test Assay:			10.63 %	

Second Analysis Data:							Date:	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:			0 %	

Analyzed by: Ying Yu

Certified by: Jack Fu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

4-30-15

PRAXAIR

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Los Angeles, CA 90058
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PGVPID: F22015

DocNumber: 000078105

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Delta Air Quality Services, Inc.
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Order Number: 30508359
Customer P. O. Number: 05417091
Customer Reference Number:

Fill Date: 3/11/2015
Part Number: NI CD1902E-AS
Lot Number: 109507010
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

O2 18.97
CO2 18.62
CC179518
Exp 03/20/23
F22015

Certified Concentration:

Expiration Date:	3/20/2023	NIST Traceable
Cylinder Number:	CC179518	Analytical Uncertainty:
18.62 %	CARBON DIOXIDE	± 0.2 %
18.97 %	OXYGEN	± 0.3 %
Balance	NITROGEN	

Certifcation Information: *Certification Date:* 3/20/2015 *Term:* 96 Months *Expiration Date:* 3/20/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 responses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 19 %
Certified Concentration: 18.62 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 2/27/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC158146
Ref. Std. Conc: 19.79%
Ref. Std. Traceable to SRM # : 2745
SRM Sample # : 9-C-36
SRM Cylinder # : CAL016135

First Analysis Data:				Date: 3/20/2015
Z: 0	R: 19.71	C: 18.54	Conc:	18.609
R: 19.72	Z: 0	C: 18.55	Conc:	18.619
Z: 0	C: 18.55	R: 19.72	Conc:	18.619
UOM: %		Mean Test Assay:		18.616 %

Second Analysis Data:				Date:
Z: 0	R: 0	C: 0	Conc:	0
R: 0	Z: 0	C: 0	Conc:	0
Z: 0	C: 0	R: 0	Conc:	0
UOM: %		Mean Test Assay:		0 %

2. Component: OXYGEN

Requested Concentration: 19 %
Certified Concentration: 18.97 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 3/2/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA16022
Ref. Std. Conc: 19.90%
Ref. Std. Traceable to SRM # : 2659a
SRM Sample # : 71-E-19
SRM Cylinder # : FF22331

First Analysis Data:				Date: 3/20/2015
Z: 0	R: 19.9	C: 18.97	Conc:	18.976
R: 19.88	Z: 0	C: 18.95	Conc:	18.956
Z: 0	C: 18.97	R: 19.9	Conc:	18.976
UOM: %		Mean Test Assay:		18.97 %

Second Analysis Data:				Date:
Z: 0	R: 0	C: 0	Conc:	0
R: 0	Z: 0	C: 0	Conc:	0
Z: 0	C: 0	R: 0	Conc:	0
UOM: %		Mean Test Assay:		0 %

Analyzed by: Xing Yu

Certified by: Jack Fu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

10-27-15 gb

PRAXAIR

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Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000086684

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

DELTA AIR QUALITY
1631 E ST ANDREWS PLACE
SANTA ANA CA 927050

Praxair Order Number: 33103648
Customer P. O. Number: GARY
Customer Reference Number:

Fill Date: 11/9/2015
Part Number: NI NO47.5MZE-AS
Lot Number: 109531312
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu ft

NOX 47.5
CC106193
EXP 11/23/18
F22015

Certified Concentration:

Expiration Date:		11/23/2018	NIST Traceable
Cylinder Number:		CC106193	Analytical Uncertainty:
47.5	ppm	NITRIC OXIDE (as NOx)	± 0.7 %
	Balance	NITROGEN	

NO = 47.4 ppm

NO for Reference Only

Certification Information: *Certification Date:* 11/23/2015 *Term:* 36 Months *Expiration Date:* 11/23/2018

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: NITRIC OXIDE (as NOx)

Requested Concentration	47.5 ppm
Certified Concentration	47.5 ppm
Instrument Used	Thermo Electron 42i-LS S/N 1030645077
Analytical Method	Chemiluminescence
Last Multipoint Calibration	10/27/2015

Reference Standard Type	GMIS
Ref. Std. Cylinder #	CC418379
Ref. Std. Conc	50.3 ppm
Ref. Std. Traceable to SRM #	vs. 1683b
SRM Sample #	45-V-42
SRM Cylinder #	CAL017897

First Analysis Data: Date: 11/16/2015

Z:	0	R:	50.3	C:	47.5	Conc:	47.5
R:	50.3	Z:	0	C:	47.5	Conc:	47.5
Z:	0	C:	47.5	R:	50.3	Conc:	47.5

UOM: ppm Mean Test Assay: 47.5 ppm

Second Analysis Data: Date: 11/23/2015

Z:	0	R:	50.3	C:	47.4	Conc:	47.4
R:	50.3	Z:	0	C:	47.4	Conc:	47.4
Z:	0	C:	47.4	R:	50.3	Conc:	47.4

UOM: ppm Mean Test Assay: 47.4 ppm

Analyzed by: Matthew Angerer

Certified by: Henry Koung

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

1-8-16 gb

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel (323) 585-2154 Fax (714) 542-6689
PGVPID: F22013

DocNumber: 000057962

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Delta Air Quality Services, Inc.
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Order Number: 24729605
Customer P. O. Number: 04549918
Customer Reference Number:

Fill Date: 8/22/2013
Part Number: NI NO90MZ2E -AS
Lot Number: 109320401
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

NOX 93.0
CC149361
EXP09/04/21
F22013

Certified Concentration:

Expiration Date:	9/4/2021		NIST Traceable
Cylinder Number:	CC149361		Analytical Uncertainty:
93.0	ppm	NITRIC OXIDE (as NOx)	± 0.6 %
	Balance	NITROGEN	

NO = 92.9 ppm

NO for Reference Only

Certification Information: *Certification Date:* 9/4/2013 *Term:* 96 Months *Expiration Date:* 9/4/2021

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: NITRIC OXIDE (as NOx)

Requested Concentration	90 ppm
Certified Concentration	93.0 ppm
Instrument Used	Thermo Electron 42i S/N 0726024320
Analytical Method	Chemiluminescence
Last Multipoint Calibration	8/22/2013

Reference Standard Type	GMIS
Ref. Std. Cylinder #	CC103139
Ref. Std. Conc	99.6 ppm
Ref. Std. Traceable to SRM #	vs. 1684b
SRM Sample #	44-S-81
SRM Cylinder #	CAL015454

First Analysis Data: Date: 8/28/2013

Z:	0	R:	99.6	C:	93.3	Conc:	93.3
R:	99.6	Z:	0	C:	93.5	Conc:	93.5
Z:	0	C:	93.1	R:	99.6	Conc:	93.1

UOM: ppm Mean Test Assay: 93.3 ppm

Second Analysis Data: Date: 9/4/2013

Z:	0	R:	99.6	C:	92.6	Conc:	92.6
R:	99.6	Z:	0	C:	92.8	Conc:	92.8
Z:	0	C:	92.7	R:	99.6	Conc:	92.7

UOM: ppm Mean Test Assay: 92.7 ppm

Analyzed by: Nelson Ma
Nelson Ma

Certified by: Nassim Haddad
Nassim Haddad

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

9-2-15

PRAXAIR

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Los Angeles, CA 90058
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PGVPID: F22013

DocNumber: 000052502

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Delta Air Quality Services, Inc.
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Order Number: 23177434
Customer P. O. Number: 04326926
Customer Reference Number:

Fill Date: 3/20/2013
Part Number: NI CO8.5ME-AS
Lot Number: 109307807
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft

CO8.81
CC326019
EXP 04/13/21
F22013

Certified Concentration:

Expiration Date:	4/13/2021		NIST Traceable
Cylinder Number:	CC326019		Analytical Uncertainty:
8.81	ppm	CARBON MONOXIDE	± 1 %
	Balance	NITROGEN	

Certification Information: *Certification Date:* 4/13/2013 *Term:* 96 Months *Expiration Date:* 4/13/2021

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1. The certification expiration date was assigned using the May 2012 revision of the EPA Traceability Protocol document.Do Not Use this Standard if Pressure is less than 150 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component:** CARBON MONOXIDE

Requested Concentration: 8.5 ppm
Certified Concentration: 8.81 ppm
Instrument Used: Horiba VIA-510 S/N 576876015
Analytical Method: NDIR
Last Multipoint Calibration: 3/20/2013

Reference Standard Type: GMIS
Ref. Std. Cylinder #: SA6687
Ref. Std. Conc. 10.2 ppm
Ref. Std. Traceable to SRM #: 1677c
SRM Sample #: 5-I-42
SRM Cylinder #: XF 002143B

First Analysis Data:						Date:	4/12/2013
Z:	0	R:	84	C:	72.9	Conc:	8.85
R:	84.9	Z:	0	C:	73	Conc:	8.77
Z:	0	C:	72.9	R:	84.3	Conc:	8.82
UOM:	ppm			Mean Test Assay:			8.81 ppm

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm			Mean Test Assay:			0 ppm

Analyzed by: Shameela Jiffrey

Certified by: Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

8-24-13 36

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000079839

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Delta Air Quality Services, Inc.
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Order Number: 30996622
Customer P. O. Number: 05492907
Customer Reference Number:

Fill Date: 5/5/2015
Part Number: NI CO4.7ME-AS
Lot Number: 109512509
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft

CO 4.72
CC326082
Exp 05/11/23
F22015

Certified Concentration:

Expiration Date:	5/11/2023		NIST Traceable
Cylinder Number:	CC326082		Analytical Uncertainty:
4.72	ppm	CARBON MONOXIDE	± 1.1 %
	Balance	NITROGEN	

Certification Information: *Certification Date:* 5/11/2015 *Term:* 96 Months *Expiration Date:* 5/11/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON MONOXIDE

Requested Concentration: 4.7 ppm
Certified Concentration: 4.72 ppm
Instrument Used: Horiba VIA-510 S/N 576876015
Analytical Method: NDIR
Last Multipoint Calibration: 4/23/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC130322
Ref. Std. Conc: 10.15 ppm
Ref. Std. Traceable to SRM # : 1677c
SRM Sample # : 5-J-42
SRM Cylinder # : CAL015337

First Analysis Data:						Date:	5/11/2015
Z:	0	R:	81.9	C:	38.2	Conc:	4.728
R:	82.1	Z:	0	C:	38.1	Conc:	4.716
Z:	0	C:	38	R:	82	Conc:	4.704
UOM:	ppm			Mean Test Assay:			4.716 ppm

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm			Mean Test Assay:			0 ppm

Analyzed by: Ying Yu

Certified by: Jack Fu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

7-10-15

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22013

DocNumber: 000057602

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Custo1

Delta Air Quality
1845 N. Case St.
Orange, CA 92865

A
50

Praxair Order Number: 24457892
Customer P. O Number: 04510559
Customer Reference Number:

Fill Date: 12/20/2012
Part Number: EV AINX45ME-AS
Lot Number: 109235605
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu ft

NO2 45.8 Air
CC230245
EXP 08/09/16

Certified Concentration:

Expiration Date:	8/9/2016		NIST Traceable
Cylinder Number:	CC230245		Analytical Uncertainty:
45.8	ppm	NITROGEN DIOXIDE (as NOx)	± 0.7 %
Balance		AIR	

NO = 1 ppm

NO for Reference Only

Certification Information: *Certification Date:* 8/9/2013 *Term:* 36 Months *Expiration Date.* 8/9/2016

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Last certified concentration was 45.8 ppm NO2 on 01/21/2013

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate,*

1. Component: NITROGEN DIOXIDE (as NOx)

Requested Concentration:	45 ppm
Certified Concentration	45.8 ppm
Instrument Used:	Thermo Electron 42i S/N 072602432C
Analytical Method	Chemiluminescence
Last Multipoint Calibration	7/22/2013

Reference Standard Type.	GMIS
Ref Std. Cylinder #	CC362460
Ref Std Conc.	50.0 ppm
Ref Std Traceable to SRM #	1683b
SRM Sample #	45-U-37
SRM Cylinder #	CAL015617

First Analysis Data: Date: 8/9/2013

Z:	0	R:	49.5	C:	45.4	Conc:	45.859
R:	49.5	Z:	0	C:	45.5	Conc:	45.96
Z:	0	C:	45.4	R:	49.5	Conc:	45.859

UOM: ppm Mean Test Assay: 45.892 ppm

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: ppm Mean Test Assay: 0 ppm

Analyzed by: R. Kaywood Rolonda Kaywood

Certified by: Jack Fu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

8-29-13 gb

DELTA AIR QUALITY SERVICES
NOZZLE CALIBRATION LOG

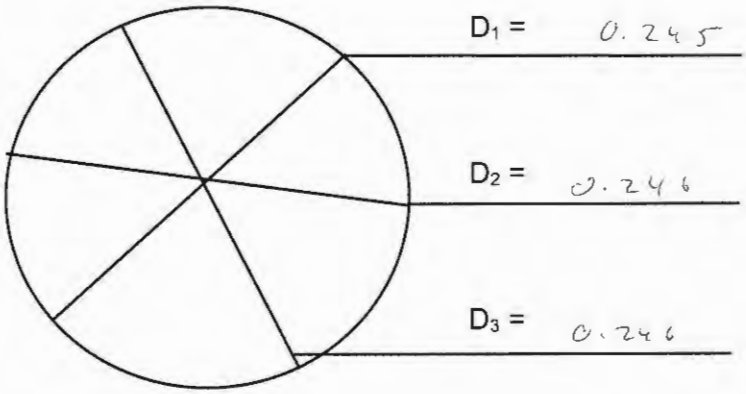
Nozzle #	Date	Performed By	D_1	D_2	D_3	Average D_n	Status
29	1/6/16	SS	0.242	0.244	0.243	0.243	-
55	1/6/16	SS	0.246	0.245	0.246	0.246	-

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

NOZZLE CALIBRATION DATA

Nozzle I.D.	55	Date	3-1-2016
Material	SS	By	AW
Configuration (L or Hook)			



Maximum Difference D_i - D_j = 0.001 (must be 0.004" or less)

Average Dn = 0.246

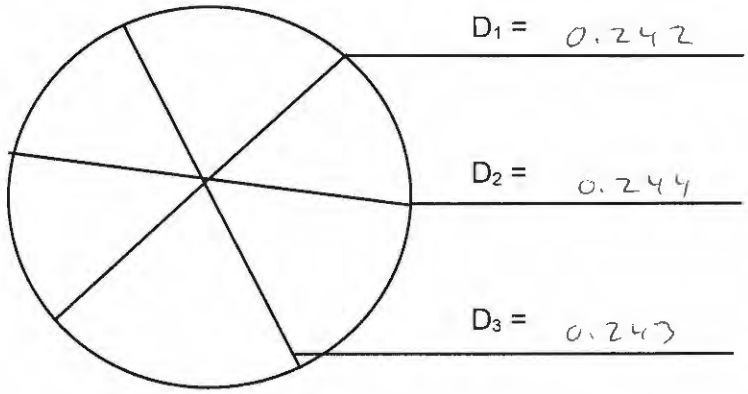
Note: Measure three diameters with micrometer

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

NOZZLE CALIBRATION DATA

Nozzle I.D. #29	Date 3-1-2016
Material SS	By DW
Configuration (L or Hook)	

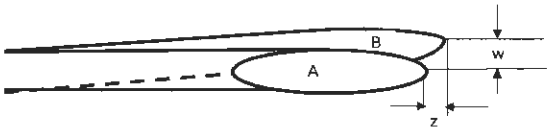


Maximum Difference D_i - D_j = .002 (must be 0.004" or less)

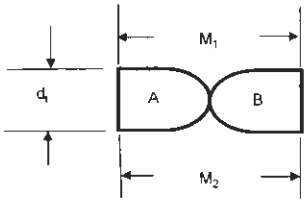
Average Dn = 0.243

Note: Measure three diameters with micrometer

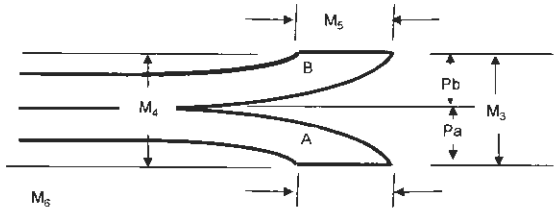
S Type Pitot Tube Dimensional Calibration Record



Side View



End View



Top View

Acceptability Criteria			z < 1/8"	w < 1/32"	Yes	"3/16" < Dt < 3/8"	n/a	n/a	n/a	n/a	n/a	n/a	10 degrees	5 degrees	1.05 Dt < P < 1.5 Dt	
Pitot ID	Date	Calibrated By	Side View, Impact openings Properly aligned, z < 1/8"	Side View, Impact openings Properly aligned, w < 1/32"	Pa = Pb	Tubing Diameter, dt	M1	M2	M3	M4	M5	M6	Average Face Opening Plane Angle, offset from perpendicular to transverse axis	Average Face Opening Plane Frontal Angle from parallel to Longitudinal Axis	Ratio of P/Dt	Status
038	1/5/16	SS	Y	Y	Y	0.375	0.934	0.935	0.947	0.938	0.362	0.382	-0.1	0.7	1.2	Pass
072	1/5/16	SS	Y	Y	Y	0.375	0.954	0.953	0.955	0.954	0.404	0.403	0.1	0.1	1.3	Pass
089	1/5/16	SS	Y	Y	Y	0.375	0.946	0.933	0.948	0.943	0.389	0.399	1.0	0.4	1.3	Pass

Notes: Reference - Type-S Pitot Tube Calibration Study, Robert F. Vollaro, October 15, 1975
If tube is not visibly deformed, then average face angles to tube axes is presumed to represent each of the individual face angles to the axis

Reference "A Type-S Pitot Tube Calibration Study, Robert F. Vollaro, October 15, 1975
If tube is not visibly deformed it is assumed that Pa = Pb = .5 x avg. of M1 M2, and that average face opening plane angles represent individual angles to tube axis

SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename C:\Users\Dave Wonderly\Information\Calibrations\Meters\6-wcs\2016\[Semi-Annual Meter Calibration - 6-WCS 1-8-16.xls]WC
File Modified From. APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #: 2010.00
ID #: 6WCS
Date: 1/8/2016
Bar. Pressure: 29.87 (in. Hg)
Performed By: g bridge
Meter Serial #: 894082

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.14	26.00	182.400	187.750	5.350	66.0	62.0	67.0	63.0	33	0.1553	25.0	61.0	61.0	61.0
0.14	26.00	187.750	193.110	5.360	67.0	63.0	68.0	65.0	33	0.1553	25.0	61.0	62.0	61.5
0.14	26.00	193.110	198.503	5.393	68.0	65.0	70.0	68.0	33	0.1553	25.0	62.0	62.0	62.0
0.62	12.00	198.503	203.940	5.437	70.0	68.0	70.0	69.0	48	0.3465	21.0	62.0	62.0	62.0
0.62	12.00	203.940	209.375	5.435	70.0	69.0	71.0	69.0	48	0.3465	21.0	62.0	62.0	62.0
0.62	12.00	209.375	214.838	5.463	71.0	69.0	71.0	69.0	48	0.3465	21.0	62.0	62.0	62.0
1.90	7.00	214.838	220.300	5.462	71.0	69.0	72.0	69.0	63	0.5888	18.0	62.0	63.0	62.5
1.90	7.00	220.300	225.755	5.455	72.0	69.0	72.0	69.0	63	0.5888	18.0	63.0	63.0	63.0
1.90	7.00	225.755	231.238	5.483	72.0	69.0	73.0	69.0	63	0.5888	16.0	63.0	63.0	63.0
3.60	5.00	231.238	236.550	5.312	73.0	69.0	74.0	70.0	73	0.8202	16.0	63.0	64.0	63.5
3.60	5.00	236.550	241.875	5.325	74.0	70.0	74.0	70.0	73	0.8202	16.0	64.0	64.0	64.0
3.60	5.00	241.875	247.232	5.357	74.0	70.0	75.0	71.0	73	0.8202	16.0	64.0	64.0	64.0

DRY GAS METER		ORIFICE			DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR	Individual Run	Individual Orifice	Orifice Average	Orifice Average
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)	Y Value (number)	dH@ Value (in H2O)	0.95 < Y < 1.05?	Ymax - Ymin < 0.010?	0.98 < Y/Yd < 1.02?	dH@ - dH@ av < 0.155?
5.376	152.3	5.284	149.6	5.225	0.983	1.923	Pass			
5.374	152.2	5.281	149.6	5.227	0.983	1.920	Pass			
5.386	152.5	5.279	149.5	5.230	0.980	1.913	Pass			
				Average	**0.982**	**1.919**		**Pass**	**Pass**	**Pass**
5.421	153.5	5.436	153.9	5.385	1.003	1.695	Pass			
5.414	153.3	5.436	153.9	5.385	1.004	1.693	Pass			
5.439	154.0	5.436	153.9	5.385	0.999	1.693	Pass			
				Average	**1.002**	**1.694**		**Pass**	**Pass**	**Pass**
5.453	154.4	5.386	152.5	5.341	0.988	1.799	Pass			
5.443	154.2	5.383	152.5	5.343	0.989	1.801	Pass			
5.469	154.9	5.383	152.5	5.343	0.984	1.801	Pass			
				Average	**0.987**	**1.800**		**Pass**	**Pass**	**Pass**
5.313	150.5	5.354	151.6	5.319	1.008	1.758	Pass			
5.321	150.7	5.351	151.5	5.322	1.006	1.758	Pass			
5.348	151.4	5.351	151.5	5.322	1.001	1.757	Pass			
				Average	**1.005**	**1.758**		**Pass**	**Pass**	**Pass**

Average Yd: 0.994 dH@: 1.793

Q @ dH = 1: 0.560

SIGNED: Signature on File Date: 1/8/2016

IMPORTANT **For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.**
IMPORTANT **The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).**

SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\5-wcs\2016\[Semi-Annual Meter Calibration 5-Wcs- 1-29-16.xls]W(
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #: 954628.00
ID #: 5 wcs
Date: 1/29/2016
Bar. Pressure: 30.03 (in. Hg)
Performed By: G> Bridge

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.13	26.00	772.400	777.760	5.360	60.0	68.0	70.0	68.0	33	0.1553	23.0	66.0	66.0	66.0
0.13	26.00	777.760	783.155	5.395	70.0	68.0	73.0	70.0	33	0.1553	23.0	66.0	66.0	66.0
0.13	26.00	783.155	788.569	5.414	73.0	70.0	74.0	71.0	33	0.1553	23.0	66.0	66.0	66.0
0.63	12.00	788.569	794.035	5.466	74.0	71.0	74.0	71.0	48	0.3465	19.0	66.0	66.0	66.0
0.63	12.00	794.035	799.485	5.450	74.0	71.0	75.0	71.0	48	0.3465	19.0	66.0	66.0	66.0
0.63	12.00	799.485	804.958	5.473	75.0	71.0	75.0	72.0	48	0.3465	19.0	66.0	66.0	66.0
1.90	7.00	804.958	810.435	5.477	75.0	72.0	76.0	72.0	63	0.5888	16.0	66.0	66.0	66.0
1.90	7.00	810.435	815.890	5.455	76.0	72.0	78.0	73.0	63	0.5888	16.0	66.0	66.0	66.0
1.90	7.00	815.890	821.354	5.464	78.0	73.0	78.0	73.0	63	0.5888	16.0	66.0	66.0	66.0
3.50	5.00	821.354	826.670	5.316	78.0	73.0	81.0	74.0	73	0.8202	14.0	66.0	66.0	66.0
3.50	5.00	826.670	832.015	5.345	81.0	74.0	83.0	74.0	73	0.8202	14.0	66.0	66.0	66.0
3.50	5.00	832.015	837.358	5.343	83.0	74.0	85.0	75.0	73	0.8202	14.0	66.0	66.0	66.0

DRY GAS METER		ORIFICE			DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR				
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)	Y Value (number)	dH@ Value (in H2O)	Individual Run 0.95 < Y < 1.05?	Individual Orifice Ymax - Ymin < 0.010?	Orifice Average 0.98 < Y/Yd < 1.02?	Orifice Average dH@ - dH@ av < 0.155?
5.395	152.8	5.287	149.7	5.250	0.980	1.775	**Pass**			
5.391	152.7	5.287	149.7	5.250	0.981	1.772	**Pass**			
5.393	152.7	5.287	149.7	5.250	0.980	1.767	**Pass**			
				Average	**0.980**	**1.771**		**Pass**	**Pass**	**Pass**
5.446	154.2	5.444	154.2	5.406	1.000	1.718	**Pass**			
5.427	153.7	5.444	154.2	5.406	1.003	1.718	**Pass**			
5.445	154.2	5.444	154.2	5.406	1.000	1.717	**Pass**			
				Average	**1.001**	**1.718**		**Pass**	**Pass**	**Pass**
5.461	154.7	5.397	152.8	5.359	0.988	1.791	**Pass**			
5.429	153.7	5.397	152.8	5.359	0.994	1.789	**Pass**			
5.430	153.8	5.397	152.8	5.359	0.994	1.788	**Pass**			
				Average	**0.992**	**1.789**		**Pass**	**Pass**	**Pass**
5.294	149.9	5.370	152.1	5.332	1.014	1.696	**Pass**			
5.308	150.3	5.370	152.1	5.332	1.012	1.694	**Pass**			
5.294	149.9	5.370	152.1	5.332	1.014	1.692	**Pass**			
				Average	**1.013**	**1.694**		**Pass**	**Pass**	**Pass**

Average Yd: 0.997 **dH@: 1.743**

Q @ dH = 1: 0.568

SIGNED: Signature on File

Date: 1/29/2016

B.3-22

TEMPERATURE SYSTEM CALIBRATION
S TYPE 1" ROUND

#38

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #38	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
OIL	3WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	3WCS	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	3WCS	33	33	33	33	32	32	32	32	1	0.2%	Pass
OIL	5WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	5WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	5WCS	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	6WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	6WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	6WCS	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	7WCS	355	355	355	355	360	360	360	360	5	0.6%	Pass
WATER	7WCS	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	7WCS	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	12WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	12WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	12WCS	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	14WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	14WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	14WCS	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	17WCS	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	17WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	17WCS	30	30	30	30	32	32	32	32	2	0.4%	Pass
OIL	18WCS	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	18WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	18WCS	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	19WCS	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	19WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	19WCS	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	PTC-9	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-9	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-9	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	PTC-10	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-10	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-10	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-11	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-11	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-11	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	PTC-12	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-12	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-12	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	PTC-13	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-13	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-13	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	PTC-14	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-14	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-14	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-15	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-15	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-15	33	33	33	33	32	32	32	32	1	0.2%	Pass
OIL	PTC-16	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-16	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-16	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-20	356	356	356	356	360	360	360	360	4	0.5%	Pass
WATER	PTC-20	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-20	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-21	356	356	356	356	360	360	360	360	4	0.5%	Pass
WATER	PTC-21	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-21	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-22	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-22	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-22	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-23	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-23	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-23	31	31	31	31	32	32	32	32	1	0.2%	Pass

TEMPERATURE SYSTEM CALIBRATION
S TYPE 1" ROUND

#38

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #38	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
OIL	PTC-24	357	357	357	357	360	360	360	360	3	0.4%	Pass
WATER	PTC-24	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-24	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-28	356	356	356	356	360	360	360	360	4	0.5%	Pass
WATER	PTC-28	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-28	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-31	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-31	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-31	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-32	358	358	358	358	360	360	360	360	2	0.2%	Pass
WATER	PTC-32	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-32	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-33	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-33	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-33	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-34	356	356	356	356	360	360	360	360	4	0.5%	Pass
WATER	PTC-34	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-34	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-35	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-35	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-35	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	PTC-38	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-38	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-38	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-1	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-1	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-1	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-3	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	TRO-3	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-3	32	32	32	32	32	32	32	32	0	0.0%	Pass
OIL	TRO-4	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	TRO-4	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	TRO-4	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-5	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-5	209	209	209	209	212	212	212	212	3	0.4%	Pass
ICE	TRO-5	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-6	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	TRO-6	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-6	33	33	33	33	32	32	32	32	1	0.2%	Pass
OIL	TRO-11	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	TRO-11	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-11	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-13	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	TRO-13	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-13	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-16	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	TRO-16	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-16	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-18	355	355	355	355	360	360	360	360	5	0.6%	Pass
WATER	TRO-18	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-18	31	31	31	31	32	32	32	32	1	0.2%	Pass
OIL	TRO-19	356	356	356	356	360	360	360	360	4	0.5%	Pass
WATER	TRO-19	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-19	33	33	33	33	32	32	32	32	1	0.2%	Pass

TEMPERATURE SYSTEM CALIBRATION
S TYPE METHOD 5

#72

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #72	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
OIL	3WCS	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	3WCS	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	3WCS	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	5WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	5WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	5WCS	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	6WCS	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	6WCS	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	6WCS	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	7WCS	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	7WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	7WCS	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	12WCS	365	365	365	365	360	360	360	360	5	0.6%	Pass
WATER	12WCS	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	12WCS	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	14WCS	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	14WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	14WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	17WCS	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	17WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	17WCS	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	18WCS	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	18WCS	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	18WCS	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	19WCS	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	19WCS	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	19WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-9	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	PTC-9	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-9	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-10	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-10	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-10	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-11	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	PTC-11	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-11	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-12	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	PTC-12	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-12	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-13	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-13	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-13	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-14	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-14	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-14	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-15	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-15	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-15	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	PTC-16	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-16	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-16	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-20	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-20	214	214	214	214	212	212	212	212	2	0.3%	Pass
ICE	PTC-20	34	34	34	34	33	33	33	33	1	0.2%	Pass
OIL	PTC-21	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	PTC-21	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-21	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-22	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-22	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-22	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-23	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-23	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-23	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-24	361	361	361	361	360	360	360	360	1	0.1%	Pass

TEMPERATURE SYSTEM CALIBRATION
S TYPE METHOD 5

#72

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #72	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
WATER	PTC-24	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-24	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-28	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	PTC-28	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-28	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	PTC-31	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-31	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-31	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	PTC-32	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-32	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-32	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-33	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-33	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-33	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-34	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-34	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-34	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-35	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-35	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-35	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-38	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	PTC-38	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-38	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-1	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-1	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	TRO-1	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	TRO-3	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-3	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-3	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-4	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-4	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-4	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	TRO-5	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	TRO-5	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-5	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-6	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-6	214	214	214	214	212	212	212	212	2	0.3%	Pass
ICE	TRO-6	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-11	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	TRO-11	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-11	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	TRO-13	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-13	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-13	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	TRO-16	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	TRO-16	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-16	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	TRO-18	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	TRO-18	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-18	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-19	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-19	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-19	32	32	32	32	33	33	33	33	1	0.2%	Pass

Calibrated by: Mike Miller, Sean Donovan, Danny Avila, Mike Edmonson
Date: 1/6/2016

TEMPERATURE SYSTEM CALIBRATION
S TYPE METHOD 5

#89

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #89	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
OIL	3WCS	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	3WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	3WCS	34	34	34	34	33	33	33	33	1	0.2%	Pass
OIL	5WCS	358	358	358	358	360	360	360	360	2	0.2%	Pass
WATER	5WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	5WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	6WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	6WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	6WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	7WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	7WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	7WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	12WCS	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	12WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	12WCS	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	14WCS	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	14WCS	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	14WCS	27	27	27	27	33	33	33	33	6	1.2%	Pass
OIL	17WCS	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	17WCS	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	17WCS	28	28	28	28	33	33	33	33	5	1.0%	Pass
OIL	18WCS	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	18WCS	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	18WCS	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	19WCS	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	19WCS	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	19WCS	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-9	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-9	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-9	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	PTC-10	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	PTC-10	214	214	214	214	212	212	212	212	2	0.3%	Pass
ICE	PTC-10	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	PTC-11	360	360	360	360	360	360	360	360	0	0.0%	Pass
WATER	PTC-11	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-11	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-12	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	PTC-12	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-12	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-13	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-13	214	214	214	214	212	212	212	212	2	0.3%	Pass
ICE	PTC-13	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-14	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-14	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-14	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-15	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	PTC-15	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-15	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-16	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-16	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-16	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-20	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-20	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-20	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-21	365	365	365	365	360	360	360	360	5	0.6%	Pass
WATER	PTC-21	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-21	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-22	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-22	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	PTC-22	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-23	358	358	358	358	360	360	360	360	2	0.2%	Pass
WATER	PTC-23	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	PTC-23	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	PTC-24	354	354	354	354	360	360	360	360	6	0.7%	Pass

TEMPERATURE SYSTEM CALIBRATION
S TYPE METHOD 5

#89

Reference Thermometer I.D.: T1 F95-195 T2 F95-195 T3 F95-195

T/C I.D. #89	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
WATER	PTC-24	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-24	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	PTC-28	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	PTC-28	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	PTC-28	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	PTC-31	357	357	357	357	360	360	360	360	3	0.4%	Pass
WATER	PTC-31	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-31	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-32	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	PTC-32	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-32	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	PTC-33	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-33	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-33	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	PTC-34	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-34	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-34	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	PTC-35	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-35	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-35	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	PTC-38	359	359	359	359	360	360	360	360	1	0.1%	Pass
WATER	PTC-38	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	PTC-38	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	TRO-1	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	TRO-1	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	TRO-1	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	TRO-3	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	TRO-3	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	TRO-3	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-4	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	TRO-4	211	211	211	211	212	212	212	212	1	0.1%	Pass
ICE	TRO-4	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-5	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	TRO-5	210	210	210	210	212	212	212	212	2	0.3%	Pass
ICE	TRO-5	31	31	31	31	33	33	33	33	2	0.4%	Pass
OIL	TRO-6	364	364	364	364	360	360	360	360	4	0.5%	Pass
WATER	TRO-6	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-6	32	32	32	32	33	33	33	33	1	0.2%	Pass
OIL	TRO-11	363	363	363	363	360	360	360	360	3	0.4%	Pass
WATER	TRO-11	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-11	30	30	30	30	33	33	33	33	3	0.6%	Pass
OIL	TRO-13	362	362	362	362	360	360	360	360	2	0.2%	Pass
WATER	TRO-13	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-13	29	29	29	29	33	33	33	33	4	0.8%	Pass
OIL	TRO-16	361	361	361	361	360	360	360	360	1	0.1%	Pass
WATER	TRO-16	215	215	215	215	212	212	212	212	3	0.4%	Pass
ICE	TRO-16	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	TRO-18	357	357	357	357	360	360	360	360	3	0.4%	Pass
WATER	TRO-18	213	213	213	213	212	212	212	212	1	0.1%	Pass
ICE	TRO-18	33	33	33	33	33	33	33	33	0	0.0%	Pass
OIL	TRO-19	358	358	358	358	360	360	360	360	2	0.2%	Pass
WATER	TRO-19	212	212	212	212	212	212	212	212	0	0.0%	Pass
ICE	TRO-19	31	31	31	31	33	33	33	33	2	0.4%	Pass

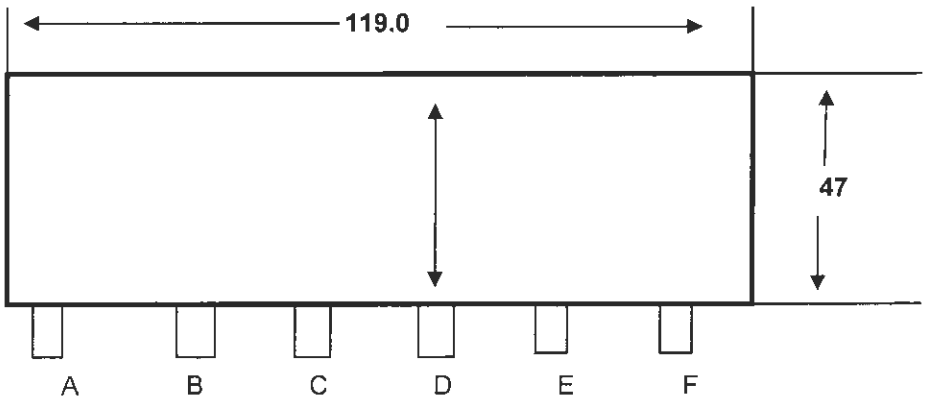
Calibrated by: Mike Miller, Sean Donovan, Danny Avila, Mike Edmonson
Date: 1/6/2016

APPENDIX C FIELD AND PLANT OPERATING DATA

Method 1

Client: Desert View Power Date: 3/1/2016

Sample Location: Unit 1-2 Prepared By: Dave Wonderly



H (in.)	**119.0**
W (in.)	**47.0**
Nipple length	**13.0**
Distance between points	**9.40**
Stack Area (ft^2)	**38.84**

Point No.	Sample Point Inches from nozzle	
1	4.7	17.7
2	14.1	27.1
3	23.5	36.5
4	32.9	45.9
5	42.3	55.3

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 1-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.75 X ΔP: 1.8*
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: ✓

AMBIENT TEMPERATURE: 80°
BAROMETRIC PRESSURE: 30.17
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG 83-2853
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER ~~MM~~ SS
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	936.1	693.8	242.3
2	DI-H2O	783.3	758.7	24.6
3	Empty	716.6	710.1	6.5
4	Silica Gel	996.4	968.3	28.1
Total:				301.5

Point	Time	Meter Volume, ft³	ΔP in. H2O	ΔH in. H2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O2 %	Pstatic in. H2O
A 5	0800	178.800	1.0	1.75	348	255	258	57	72	71	5.0		+0.52
4	0804	181.805	0.90	1.60	347	261	260	53	75	72	5.0		
3	0808	184.810	0.90	1.60	348	260	261	52	76	73	5.0		
2	0812	187.820	0.95	1.66	349	261	260	52	76	73	5.0		
1	0816	191.800	0.95	1.66	349	263	261	51	84	75	5.0		
END	0820	193.810		2.10									
B 5	0822	193.810	1.20	~~1.2~~	~~2.1~~ 349	264	268	51	85	75	5.0		
4	0826	197.450	1.20	2.10	348	255	261	54	87	76	5.0		
3	0830	200.650	0.78	1.40	348	251	263	53	88	77	5.0		
2	0834	203.755	0.78	1.40	348	251	262	53	88	77	5.0		
1	0838	206.445	0.70	1.26	351	255	260	54	89	82	5.0		
C END	0842	209.200											
5	0844	209.200	0.95	1.71	350	251	259	56	89	82	5.0		
4	0848	212.300	0.98	1.76	351	250	260	55	91	83	5.0		
3	0852	215.585	0.80	1.44	349	251	259	57	91	83	5.0		
2	0856	218.800	0.90	1.62	349	253	260	57	92	83	5.0		
1	0900	222.000	0.88	1.58	349	250	255	57	92	84	5.0		
Average	0904 END	224.995											

Comments: * CHANGED FACTOR TO 1.8 [illegible] 3/1/16

C.12-2

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 1-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.8 X ΔP: 1.85 **
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 85
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG 83-2853
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: 0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SEE Page 1
SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test = Difference
1	DI-H2O		
2	DI-H2O		
3	Empty		
4	Silica Gel		
		SEE Page 1	
Total:			

Point	Time	Meter Volume, ft³	ΔP in. H2O	ΔH in. H2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O2 %	Pstatic in. H2O
D 5	0915	224.795	1.2	2.2	350	252	260	56	86	84	5.0		+.52
4	0919	227.980	1.1	1.98	350	253	261	57	87	84	5.0		
3	0923	231.100	0.85	1.53	351	254	260	57	88	85	5.0		
** 2	0927	234.050	0.80	1.48	351	255	261	57	88	85	5.0		
1	0931	236.950	0.80	1.48	351	250	258	58	90	84	5.0		
E END	0935	239.840											
5	0937	239.840	1.2	2.22	351	251	257	58	90	84	5.0		
4	0941	243.240	1.2	2.22	351	250	255	58	90	87	5.0		
* 3	0945	246.750	1.1	2.04	351	251	256	59	90	87	5.0		
2	0949	250.200	1.1	2.04	352	253	260	60	91	88	5.0		
1	0953	253.510	1.2	2.22	352	251	259	60	91	88	5.0		
F END	0957	256.960											
5	0959	256.960	1.10	1.98	351	251	260	60	91	88	5.0		
4	1003	260.300	0.90	1.62	352	250	262	60	91	88	5.0		
3	1007	263.455	0.92	1.66	352	251	260	60	91	88	5.0		
2	1011	266.450	0.95	1.71	252	250	267	60	92	88	5.0		
1	1015	269.550	1.00	1.80	251	251	260	60	92	88	5.0		
Average:	1019	272.535											

EN

Comments: ** CHANGED FACTOR TO 1.85 [illegible] 3/1/16

C.1.2-3

Page 2 of 2

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 2-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.85 X ΔP: 1.79 *
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: ✓

AMBIENT TEMPERATURE: 85°
BAROMETRIC PRESSURE: 30.17
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2854
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM SS
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	970.0	758.0	212.0
2	DI-H2O	793.0	741.9	51.1
3	Empty	673.4	670.9	2.5
4	Silica Gel	932.2	911.8 75	20.4
Total:				286.0

Point	Time	Meter Volume, ft³	ΔP in. H2O	ΔH in. H2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O2 %	Pstatic in. H2O
F 5	1031	272.715	1.10	2.04	353	252	251	60	90	89	5.0		-.54
4	1035	276.100	0.90	1.66	353	255	249	60	90	88	5.0		
* 3	1039	279.180	0.90	1.62	353	251	250	60	91	89	5.0		
2	1043	282.400	0.93	1.67	353	251	249	60	91	89	5.0		
1	1047	285.290	0.80	1.79	355	255	255	55	95	94	5.0		
E END	1051	288.535											
** 5	1053	288.535	1.20	2.18	354	255	263	58	95	93	5.0		
4	1057	292.100	1.20	2.18	355	251	260	58	95	93	5.0		
3	1061	295.450	1.10	2.00	357	252	259	58	98	93	5.0		
2	1065	298.900	1.00	1.82	357	251	260	58	98	93	5.0		
1	1069	302.200	1.00	1.82	357	251	260	58	98	93	5.0		
D END	1103	305.320											
5	1105	305.320	1.20	2.18	355	258	260	58	98	93	5.0		
4	1109	308.800	1.10	2.00	356	259	261	58	98	93	5.0		
3	1123	312.200	0.90	1.64	356	261	261	54	99	94	5.0		
2	1127	315.455	0.80	1.46	355	260	260	54	99	94	5.0		
1	1131	318.200	0.78	1.42	355	261	260	54	99	94	5.0		
Average (EW)	1135	321.100											

Comments: * CHANGED FACTOR TO 1.79
** 1.82

C-1.2-4

Page 1 of 2

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 2-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.82 X ΔP: 1.79
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 90
BAROMETRIC PRESSURE: 30.17
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2854
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test = Difference
1	DI-H2O		
2	DI-H2O		
3	Empty		
4	Silica Gel		
		SEE Page 1	
Total:			

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
C 5	1147	321.100	1.10	2.00	358	257	240	59	99	95	5.0		1.54
4	1151	324.240	0.83	1.51	356	258	245	59	99	96	5.0		
★ 3	1155	327.235	0.83	~~1.51~~ 1.49	356	258	248	59	99	96	5.0		
2	1159	330.340	0.90	1.61	355	259	260	59	98	96	5.0		
1	1203	333.350	0.92	1.65	356	260	260	60	99	97	5.0		
BEND	1207	336.490											
5	1209	336.490	1.2	2.15	360	261	261	59	99	97	5.0		
4	1213	339.955	1.10	1.97	359	260	261	55	100	96	5.0		
3	1217	343.400	0.70	1.25	360	261	260	55	100	96	5.0		
2	1221	346.190	0.70	1.25	360	262	261	55	100	97	5.0		
1	1225	349.000	0.68	1.22	358	260	260	58	100	97	5.0		
BEND	1229	351.630											
5	1231	351.630	1.0	1.79	359	261	261	59	100	97	5.0		
4	1235	354.900	1.1	1.97	358	254	245	57	101	97	5.0		
3	1239	358.215	0.85	1.52	359	254	248	57	101	97	5.0		
2	1243	361.210	1.0	1.79	359	254	249	59	101	98	5.0		
1	1247	364.415	1.0	1.79	360	255	256	60	101	98	5.0		
Average:	1251	367.615											

Comments: ★ Changed Factor 1.79 mcf 3/1/16

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C.1.2-5

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 3-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.79 X ΔP: 1.9
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: ✓

AMBIENT TEMPERATURE: 90
BAROMETRIC PRESSURE: 30.17
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG 83-2855 2856
PRE-TEST LEAK RATE: : <0.05 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM SS
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	927.8	697.1	230.7
2	DI-H2O	768.7	747.5	21.2
3	Empty	719.9	716.6	3.3
4	Silica Gel	1018.6	996.4	22.2
Total:				277.4

Point	Time	Meter Volume, ft³	ΔP in. H2O	ΔH in. H2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O2 %	Pstatic in. H2O
A 5	1315	368.015	1.0	1.79	359	260	259	60	99	99	5.0		-.54
4	1319	371.410	0.80	1.43	358	261	259	55	100	99	5.0		
3	1323	374.400	0.82	1.47	358	260	259	55	100	99	5.0		
2	1327	377.425	0.93	1.66	359	261	260	55	102	101	5.0		
1	1331	380.600	1.00	1.79	359	260	259	55	102	101	5.0		
END	1335	383.880											
B 5	1337	383.880	1.10	2.09	359	260	260	55	102	101	5.0		
4	1341	387.000	0.78	1.48	357	261	261	55	102	101	5.0		
3	1345	390.000	0.75	1.43	357	260	260	55	102	101	5.0		
2	1349	393.100	0.75	1.43	358	261	260	55	102	101	5.0		
1	1353	396.100	0.72	1.37	359	261	260	55	102	101	5.0		
END	1357	399.400											
C 5	1425	399.400	1.10	2.09	359	250	261	58	99	97	5.0		
4	1429	403.00	0.83	1.58	359	251	260	58	100	97	5.0		
3	1433	406.055	0.80	1.52	359	250	261	58	100	97	5.0		
2	1437	409.060	0.83	1.58	359	251	260	58	99	97	5.0		
1	1441	412.070	0.90	1.71	359	255	261	58	99	97	5.0		
Average:	1445	415.225											

Comments: * change Factor (again) To 1.9 +9% [illegible] 3/1/16

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C.1.2-6

Delta
Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3 - 1 - 2016
RUN NO: 3-PM Unit 1
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.9 X ΔP:
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 90
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG ~~83-2855~~ 2856
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: : .0005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	= Difference
1	DI-H2O			
2	DI-H2O			
3	Empty			
4	Silica Gel			
	SEE Page 1			
Total:				

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
D 5	1447	415.225	1.10	2.09	358	255	261	59	99	97	6.0		0.54
4	1451	418.820	1.10	2.09	359	256	261	57	99	97	6.0		
3	1455	422.240	0.90	1.71	358	256	263	57	99	97	6.0		
2	1459	425.570	0.80	1.52	358	258	265	57	99	97	6.0		
1	1503	428.600	0.80	1.52	359	259	261	58	99	97	6.0		
END	1507	431.540											
E 5	1509	431.540	1.0	1.90	356	261	263	60	99	97	6.0		
4	1513	434.800	1.0	1.90	358	260	261	58	100	97	6.0		
3	1517	437.950	1.1	2.09	359	261	260	59	100	97	6.0		
2	1521	440.100	1.1	2.09	360	261	259	59	100	97	6.0		
1	1525	444.820	1.0	1.90	359	262	260	58	100	98	6.0		
END	1529	448.145											
C 5	1531	448.145	1.0	1.90	358	263	264	58	99	97	6.0		
4	1535	451.500	0.88	1.67	357	263	252	60	99	96	6.0		
3	1539	454.570	0.84	1.60	357	260	253	60	99	96	6.0		
2	1543	457.500	0.90	1.71	358	261	255	60	99	96	6.0		
1	1547	460.515	1.10	2.09	358	261	255	60	99	96	6.0		
Average:	1551	463.950											

Comments:

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C.1.8.7

1-PM-U1

	dP	(dP)^.5	dH	Ts	Tm	
5	1.000	1.000	1.75	348	72	71
4	0.900	0.949	1.60	347	75	72
3	0.900	0.949	1.60	348	76	73
2	0.950	0.975	1.66	349	76	73
1	0.950	0.975	1.66	349	84	75
5	1.200	1.095	2.10	349	85	75
4	1.200	1.095	2.10	348	87	76
3	0.780	0.883	1.40	348	88	77
2	0.780	0.883	1.40	348	88	77
1	0.700	0.837	1.26	351	89	82
5	0.950	0.975	1.71	350	89	82
4	0.980	0.990	1.76	351	91	83
3	0.800	0.894	1.44	349	91	83
2	0.900	0.949	1.62	349	92	83
1	0.880	0.938	1.58	349	92	84
5	1.200	1.095	2.20	350	86	84
4	1.100	1.049	1.98	350	87	84
3	0.850	0.922	1.53	351	88	85
2	0.800	0.894	1.48	351	88	85
1	0.800	0.894	1.48	351	90	84
5	1.200	1.095	2.22	351	90	84
4	1.200	1.095	2.22	351	90	87
3	1.100	1.049	2.04	351	90	87
2	1.100	1.049	2.04	352	91	88
1	1.200	1.095	2.22	352	91	88
5	1.100	1.049	1.98	351	91	88
4	0.900	0.949	1.62	352	91	88
3	0.920	0.959	1.66	352	91	88
2	0.950	0.975	1.71	352	92	88
1	1.000	1.000	1.80	351	92	88
Average		0.9707	1.761	350.0	84.8	
			Meter Vol	Imp	Imp	
Delta P (iwg)		0.971	178.800	936.1	693.8	242.3
Meter Pressure (iwg)		1.761	272.535	783.3	758.7	24.6
Stack Temperature (F)		350.033	93.735	716.6	710.1	6.5
Meter Temperature (F)		84.750		996.4	968.3	28.1
Meter Volume (acf)		93.735				0.0
Liquid Volume (ml)		301.500				301.5

2-PM-U1

	dP	(dP)^.5	dH	Ts	Tm	
5	1.10	1.049	2.04	353	90	88
4	0.90	0.949	1.66	353	90	88
3	0.90	0.949	1.62	353	91	89
2	0.93	0.964	1.67	353	91	89
1	1.00	1.000	1.79	355	95	94
5	1.20	1.095	2.18	354	95	93
4	1.20	1.095	2.18	355	95	93
3	1.10	1.049	2.00	357	98	93
2	1.00	1.000	1.82	357	98	93
1	1.00	1.000	1.82	357	98	93
5	1.20	1.095	2.18	355	98	93
4	1.10	1.049	2.00	356	98	93
3	0.90	0.949	1.64	356	99	94
2	0.80	0.894	1.46	355	99	94
1	0.78	0.883	1.42	355	99	94
5	1.10	1.049	2.00	358	99	95
4	0.83	0.911	1.51	356	99	96
3	0.83	0.911	1.49	356	99	96
2	0.90	0.949	1.61	355	98	96
1	0.92	0.959	1.65	356	99	97
5	1.20	1.095	2.15	360	99	97
4	1.10	1.049	1.97	359	100	96
3	0.70	0.837	1.25	360	100	96
2	0.70	0.837	1.25	360	100	97
1	0.68	0.825	1.22	358	100	97
5	1.00	1.000	1.79	359	100	97
4	1.10	1.049	1.97	358	101	97
3	0.85	0.922	1.52	359	101	97
2	1.00	1.000	1.79	359	101	98
1	1.00	1.000	1.79	360	101	98
Average		0.9612	1.748	356.6	96.0	
			Meter Vol	Imp	Imp	
Delta P (iwg)		0.961	272.715	970.0	758	212.0
Meter Pressure (iwg)		1.748	367.615	793.0	741.9	51.1
Stack Temperature (F		356.567	94.900	673.4	670.9	2.5
Meter Temperature (F)		96.033		932.2	911.8	20.4
Meter Volume (acf)		94.900				0.0
Liquid Volume (ml)		286.000				286.0

3-PM-U1

	dP	(dP)^.5	dH	Ts	Tm	
5	1.00	1.000	1.79	359	99	99
4	0.80	0.894	1.43	358	100	99
3	0.82	0.906	1.47	358	100	99
2	0.93	0.964	1.66	359	102	101
1	1.00	1.000	1.79	359	102	101
5	1.10	1.049	2.09	359	102	101
4	0.78	0.883	1.48	357	102	101
3	0.75	0.866	1.43	357	102	101
2	0.75	0.866	1.43	358	102	101
1	0.72	0.849	1.37	359	102	101
5	1.10	1.049	2.09	359	99	97
4	0.83	0.911	1.58	358	100	97
3	0.80	0.894	1.52	359	100	97
2	0.83	0.911	1.58	359	99	97
1	0.90	0.949	1.71	359	99	97
5	1.10	1.049	2.09	358	99	97
4	1.10	1.049	2.09	359	99	97
3	0.90	0.949	1.71	358	99	97
2	0.80	0.894	1.52	358	99	97
1	0.80	0.894	1.52	359	99	97
5	1.00	1.000	1.90	356	99	97
4	1.00	1.000	1.90	358	100	97
3	1.10	1.049	2.09	359	100	97
2	1.10	1.049	2.09	360	100	97
1	1.00	1.000	1.90	359	100	98
5	1.00	1.000	1.90	358	99	97
4	0.88	0.938	1.67	357	99	96
3	0.84	0.917	1.60	357	99	96
2	0.90	0.949	1.71	358	99	96
1	1.10	1.049	2.09	358	99	96
Average		0.9200	1.740	358.3	99.0	
			Meter Vo	Imp	Imp	
Delta P (iwg)		0.920	368.015	923.8	693.1	230.7
Meter Pressure (iwg)		1.740	463.95	768.7	747.5	21.2
Stack Temperature (F		358.300	95.935	719.9	716.6	3.3
Meter Temperature (F		99.000		1018.6	996.4	22.2
Meter Volume (acf)		95.935				0.0
Liquid Volume (ml)		277.4				277.4

Date	Time	O2 %	CO2 %	NOx ppm	CO ppm	
3/1/2016	7:15	18.944	18.892	91.489	6.971	
3/1/2016	7:16	18.952	18.904	92.587	8.855	
3/1/2016	7:17	18.951	18.769	92.85	8.832	
3/1/2016	7:18	18.951	18.627	93.001	8.813	
3/1/2016	7:19	18.951	18.634	93.073	8.808	High
3/1/2016	7:20	15.067	13.637	57.569	8.506	
3/1/2016	7:21	10.723	10.441	44.873	5.673	
3/1/2016	7:22	10.695	10.433	47.128	4.739	
3/1/2016	7:23	10.695	10.421	47.254	4.77	Mid
3/1/2016	7:24	6.502	5.211	13.504	3.924	
3/1/2016	7:25	0.13	0.035	0.12	0.554	
3/1/2016	7:26	0.067	0.016	0.095	0.001	Zero
3/1/2016	7:27	0.06	0.01	0.109	-0.002	NO Mode Zero
3/1/2016	7:28	0.06	0.015	76.503	0.004	
3/1/2016	7:29	0.06	0.01	92.941	0.002	NO Mode High
3/1/2016	7:30	0.046	0.013	24.06	0.001	
3/1/2016	7:31	0.036	0.009	0.309	0.002	NO2 Gas NO Mode
3/1/2016	7:32	0.036	0.014	34.954	-0.011	
3/1/2016	7:33	0.036	0.011	40.422	0.014	
3/1/2016	7:34	0.036	0.01	40.758	-0.001	
3/1/2016	7:35	0.036	0.011	41.209	0.005	
3/1/2016	7:36	0.093	0.227	41.502	-0.001	NO2 Gas NOx Mode
3/1/2016	7:37	8.417	11.39	42.685	0.073	
3/1/2016	7:38	8.924	11.493	46.714	0.114	
3/1/2016	7:39	9.102	11.277	42.021	0.104	
3/1/2016	7:40	10.155	10.319	21.135	0.13	
3/1/2016	7:41	10.721	10.394	0.85	0.073	
3/1/2016	7:42	10.721	10.384	0.777	0.013	O2 CO2 Bias
3/1/2016	7:43	3.737	2.723	0.705	0.452	
3/1/2016	7:44	0.077	0.039	0.632	3.735	
3/1/2016	7:45	0.06	0.029	0.58	4.763	CO Bias
3/1/2016	7:46	0.06	0.023	35.965	3.993	
3/1/2016	7:47	0.038	0.021	47.736	0.848	NOx Bias
3/1/2016	7:48	5.446	8.546	48.568	0.339	
3/1/2016	7:49	8.74	11.606	43.43	0.194	
3/1/2016	7:50	8.52	11.877	43.232	0.139	
3/1/2016	7:51	8.19	12.208	47.42	0.131	
3/1/2016	7:52	8.691	11.664	40.887	0.123	
3/1/2016	7:53	9.583	10.79	29.742	0.135	
3/1/2016	7:54	10.13	10.339	27.629	0.166	
3/1/2016	7:55	9.216	11.232	37.922	0.162	
3/1/2016	7:56	9.122	11.31	41.634	0.146	
3/1/2016	7:57	9.156	11.279	39.338	0.125	
3/1/2016	7:58	9.146	11.248	37.465	0.148	
3/1/2016	7:59	9.409	11.029	37.255	0.152	
3/1/2016	8:00	9.292	11.07	38.39	0.124	
3/1/2016	8:01	9.564	10.936	38.79	0.132	
3/1/2016	8:02	9.14	11.284	40.339	0.131	
3/1/2016	8:03	9.301	11.078	36.611	0.121	

3/1/2016	8:04	9.342	11.114	39.814	0.145
3/1/2016	8:05	8.953	11.467	46.423	0.132
3/1/2016	8:06	8.75	11.672	49.227	0.114
3/1/2016	8:07	8.905	11.506	43.213	0.108
3/1/2016	8:08	9.675	10.722	32.751	0.115
3/1/2016	8:09	9.409	11.009	31.37	0.139
3/1/2016	8:10	9.654	10.829	34.486	0.152
3/1/2016	8:11	9.028	11.398	39.461	0.156
3/1/2016	8:12	9.382	11.036	38.173	0.138
3/1/2016	8:13	9.5	10.922	38.162	0.141
3/1/2016	8:14	8.809	11.651	47.892	0.139
3/1/2016	8:15	8.852	11.567	49.146	0.119
3/1/2016	8:16	9.118	11.274	41.29	0.116
3/1/2016	8:17	8.88	11.592	42.826	0.132
3/1/2016	8:18	8.674	11.753	45.182	0.135
3/1/2016	8:19	8.746	11.651	42.319	0.142
3/1/2016	8:20	9.059	11.322	37.174	0.136
3/1/2016	8:21	9.518	10.924	32.07	0.158
3/1/2016	8:22	9.4	11.004	35.577	0.141
3/1/2016	8:23	9.774	10.67	33.686	0.134
3/1/2016	8:24	9.799	10.686	37.427	0.139
3/1/2016	8:25	9.065	11.405	47.068	0.158
3/1/2016	8:26	9.144	11.246	46.246	0.135
3/1/2016	8:27	8.73	11.741	46.622	0.138
3/1/2016	8:28	9.012	11.381	40.952	0.161
3/1/2016	8:29	9.103	11.279	40.409	0.136
3/1/2016	8:30	9.258	11.216	38.392	0.133
3/1/2016	8:31	8.775	11.657	42.223	0.146
3/1/2016	8:32	8.879	11.531	44.053	0.145
3/1/2016	8:33	8.605	11.848	49.156	0.14
3/1/2016	8:34	9.042	11.289	42.249	0.128
3/1/2016	8:35	8.937	11.525	41.557	0.142
3/1/2016	8:36	8.663	11.835	40.345	0.152
3/1/2016	8:37	8.015	12.37	51.196	0.139
3/1/2016	8:38	8.774	11.561	43.684	0.121
3/1/2016	8:39	9.755	10.627	29.092	0.145
3/1/2016	8:40	9.998	10.464	25.357	0.151
3/1/2016	8:41	9.745	10.771	30.948	0.144
3/1/2016	8:42	8.966	11.473	42.501	0.148
3/1/2016	8:43	8.914	11.445	44.42	0.142
3/1/2016	8:44	9.699	10.635	36.57	0.136
3/1/2016	8:45	9.666	10.781	32.351	0.149
3/1/2016	8:46	8.962	11.43	39.879	0.155
3/1/2016	8:47	8.937	11.45	41.043	0.148
3/1/2016	8:48	9.333	11.043	39.205	0.147
3/1/2016	8:49	9.287	11.069	40.312	0.15
3/1/2016	8:50	9.45	10.952	39.844	0.149
3/1/2016	8:51	9.661	10.788	36.643	0.147
3/1/2016	8:52	8.761	11.67	46.332	0.138
3/1/2016	8:53	8.81	11.572	48.001	0.129
3/1/2016	8:54	8.501	11.915	53.98	0.115
3/1/2016	8:55	8.663	11.655	50.237	0.112

3/1/2016	8:56	8.919	11.481	44.041	0.113	
3/1/2016	8:57	9.142	11.204	39.531	0.111	
3/1/2016	8:58	9.06	11.432	40.979	0.134	
3/1/2016	8:59	8.704	11.657	42.584	0.124	
3/1/2016	9:00	8.82	11.567	39.961	0.13	
Run 1 Average		9.12	11.30	40.86	0.14	
3/1/2016	9:01	9.978	10.067	9.113	0.116	
3/1/2016	9:02	10.671	10.34	0.171	0.078	O2 CO2 Bias
3/1/2016	9:03	3.123	2.277	0.17	0.595	
3/1/2016	9:04	0.071	0.044	0.152	3.909	
3/1/2016	9:05	0.06	0.034	0.148	4.789	CO Bias
3/1/2016	9:06	0.594	0.586	30.719	4.127	
3/1/2016	9:07	0.041	0.022	47.267	0.878	NOx Bias
3/1/2016	9:08	0.038	0.013	10.658	0.086	
3/1/2016	9:09	0.035	0.014	0.134	0.019	Zero
3/1/2016	9:10	7.922	8.98	38.561	0.985	
3/1/2016	9:11	10.741	10.381	47.678	4.307	
3/1/2016	9:12	10.754	10.377	47.696	4.761	Span
3/1/2016	9:13	10.583	10.536	48.316	4.79	
3/1/2016	9:14	8.026	12.458	55.879	2.958	
3/1/2016	9:15	8.102	12.254	55.829	0.236	
3/1/2016	9:16	8.576	11.763	45.796	0.094	
3/1/2016	9:17	9.682	10.684	28.137	0.107	
3/1/2016	9:18	9.563	10.88	26.509	0.143	
3/1/2016	9:19	9.484	10.96	30.287	0.154	
3/1/2016	9:20	9.084	11.349	40.032	0.129	
3/1/2016	9:21	9.162	11.221	41.302	0.147	
3/1/2016	9:22	9.344	11.018	40.55	0.137	
3/1/2016	9:23	10.013	10.423	29.239	0.143	
3/1/2016	9:24	10.004	10.432	29.644	0.15	
3/1/2016	9:25	9.475	10.954	36.649	0.131	
3/1/2016	9:26	9.366	11.091	42.982	0.144	
3/1/2016	9:27	9.082	11.297	47.848	0.135	
3/1/2016	9:28	9.2	11.259	46.128	0.136	
3/1/2016	9:29	9.045	11.33	46.366	0.147	
3/1/2016	9:30	9.329	11.089	40.35	0.141	
3/1/2016	9:31	8.367	12.028	48.789	0.152	
3/1/2016	9:32	8.928	11.361	40.862	0.14	
3/1/2016	9:33	9.239	11.204	37.908	0.152	
3/1/2016	9:34	9.63	10.728	30.528	0.158	
3/1/2016	9:35	8.984	11.479	40.38	0.145	
3/1/2016	9:36	8.765	11.599	42.993	0.157	
3/1/2016	9:37	9.003	11.31	42.174	0.144	
3/1/2016	9:38	9.291	11.073	36.375	0.155	
3/1/2016	9:39	9.317	11.05	37.074	0.151	
3/1/2016	9:40	9.554	10.839	36.008	0.148	
3/1/2016	9:41	9.754	10.614	35.499	0.146	
3/1/2016	9:42	9.405	11.022	38.095	0.159	
3/1/2016	9:43	9.302	11.139	43.757	0.164	
3/1/2016	9:44	8.777	11.644	51.886	0.139	
3/1/2016	9:45	8.318	12.017	56.308	0.14	

3/1/2016	9:46	8.639	11.679	50.555	0.107	
3/1/2016	9:47	9.913	10.449	33.895	0.125	
3/1/2016	9:48	9.872	10.565	29.712	0.158	
3/1/2016	9:49	9.883	10.569	30.127	0.161	
3/1/2016	9:50	9.556	10.83	35.977	0.153	
3/1/2016	9:51	9.426	11.067	42.853	0.145	
3/1/2016	9:52	9.101	11.267	48.467	0.147	
3/1/2016	9:53	9.198	11.182	48.253	0.12	
3/1/2016	9:54	8.722	11.717	49.852	0.136	
3/1/2016	9:55	8.451	11.804	51.979	0.149	
3/1/2016	9:56	8.832	11.441	45.522	0.155	
3/1/2016	9:57	9.67	10.614	33.877	0.162	
3/1/2016	9:58	10.023	10.366	31.309	0.164	
3/1/2016	9:59	9.483	10.834	31.013	0.178	
3/1/2016	10:00	9.973	10.467	31.071	0.179	
3/1/2016	10:01	9.33	10.995	38.833	0.149	
3/1/2016	10:02	8.672	11.7	49.976	0.153	
3/1/2016	10:03	8.868	11.449	44.331	0.151	
3/1/2016	10:04	8.946	11.377	43.988	0.144	
3/1/2016	10:05	8.854	11.497	47.553	0.133	
3/1/2016	10:06	8.764	11.55	44.858	0.139	
3/1/2016	10:07	9.075	11.237	42.387	0.134	
3/1/2016	10:08	9.456	10.912	39.282	0.144	
3/1/2016	10:09	9.189	11.199	38.038	0.137	
3/1/2016	10:10	8.641	11.738	46.021	0.143	
3/1/2016	10:11	8.206	12.131	56.099	0.133	
3/1/2016	10:12	8.473	11.84	56.867	0.12	
3/1/2016	10:13	9.531	10.658	32.529	0.126	
3/1/2016	10:14	10.148	10.307	22.753	0.142	
3/1/2016	10:15	9.878	10.511	26.036	0.169	
Run 2 Average		9.23	11.15	40.24	0.14	
3/1/2016	10:16	9.854	10.052	13.291	0.177	
3/1/2016	10:17	10.671	10.309	0.175	0.081	
3/1/2016	10:18	10.671	10.313	0.16	0.073	O2 CO2 Bias
3/1/2016	10:19	3.538	2.488	0.154	0.548	
3/1/2016	10:20	0.073	0.045	0.138	3.835	
3/1/2016	10:21	0.06	0.034	0.128	4.814	CO Bias
3/1/2016	10:22	0.041	0.027	27.353	3.847	
3/1/2016	10:23	0.036	0.023	47.203	0.515	NOx Bias
3/1/2016	10:24	0.041	0.009	10.938	0.037	
3/1/2016	10:25	0.036	0.011	0.117	0.025	Zero
3/1/2016	10:26	7.338	8.235	35.633	0.529	
3/1/2016	10:27	10.698	10.349	47.665	3.849	
3/1/2016	10:28	10.72	10.366	47.671	4.805	Span
3/1/2016	10:29	10.198	10.7	48.166	4.731	
3/1/2016	10:30	9.273	11.114	40.023	2.216	
3/1/2016	10:31	8.717	11.516	45.74	0.169	
3/1/2016	10:32	9.064	11.293	42.47	0.102	
3/1/2016	10:33	8.793	11.504	43.551	0.116	
3/1/2016	10:34	8.754	11.538	45.975	0.125	
3/1/2016	10:35	9.054	11.228	40.223	0.124	

3/1/2016	10:36	9.185	11.091	38.233	0.127
3/1/2016	10:37	9.37	10.949	38.185	0.146
3/1/2016	10:38	8.8	11.545	45.016	0.143
3/1/2016	10:39	8.491	11.816	48.083	0.13
3/1/2016	10:40	8.896	11.356	44.902	0.129
3/1/2016	10:41	8.91	11.377	42.458	0.132
3/1/2016	10:42	9.342	10.849	34.01	0.152
3/1/2016	10:43	9.856	10.419	27.932	0.165
3/1/2016	10:44	9.686	10.718	32.189	0.175
3/1/2016	10:45	8.762	11.523	42.558	0.16
3/1/2016	10:46	8.641	11.646	46.924	0.158
3/1/2016	10:47	9	11.23	41.617	0.151
3/1/2016	10:48	8.882	11.413	46.891	0.16
3/1/2016	10:49	9.138	11.082	41.502	0.151
3/1/2016	10:50	9.262	11.05	35.572	0.158
3/1/2016	10:51	9.562	10.78	32.655	0.158
3/1/2016	10:52	8.311	12.06	53.774	0.173
3/1/2016	10:53	8.586	11.601	50.477	0.132
3/1/2016	10:54	9.274	11.039	38.722	0.132
3/1/2016	10:55	9.545	10.799	34.735	0.14
3/1/2016	10:56	8.47	11.875	48.12	0.132
3/1/2016	10:57	8.241	12.019	55.164	0.128
3/1/2016	10:58	8.71	11.516	46.721	0.124
3/1/2016	10:59	8.606	11.643	50.085	0.125
3/1/2016	11:00	8.946	11.278	40.453	0.137
3/1/2016	11:01	9.539	10.668	31.568	0.163
3/1/2016	11:02	9.358	11.011	34.985	0.163
3/1/2016	11:03	9.279	11.021	31.966	0.156
3/1/2016	11:04	8.624	11.643	42.1	0.153
3/1/2016	11:05	8.776	11.507	44.516	0.137
3/1/2016	11:06	8.224	12.065	52.891	0.148
3/1/2016	11:07	8.929	11.232	43.219	0.143
3/1/2016	11:08	9.733	10.62	28.535	0.156
3/1/2016	11:09	9.958	10.386	24.201	0.161
3/1/2016	11:10	9.636	10.607	29.065	0.165
3/1/2016	11:11	9.36	11.022	35.018	0.164
3/1/2016	11:12	9.754	10.583	32.484	0.173
3/1/2016	11:13	9.658	10.67	35.996	0.154
3/1/2016	11:14	9.248	11.048	42.58	0.17
3/1/2016	11:15	9.297	11.087	45.02	0.161
3/1/2016	11:16	9.209	11.083	44.389	0.147
3/1/2016	11:17	8.806	11.511	48.726	0.126
3/1/2016	11:18	9.378	10.953	38.009	0.131
3/1/2016	11:19	8.401	11.975	51.284	0.119
3/1/2016	11:20	8.393	11.897	51.901	0.125
3/1/2016	11:21	8.747	11.489	47.583	0.123
3/1/2016	11:22	9.133	11.16	40.408	0.132
3/1/2016	11:23	9.423	10.876	33.397	0.14
3/1/2016	11:24	9.221	11.057	37.166	0.136
3/1/2016	11:25	9.537	10.769	34.492	0.157
3/1/2016	11:26	8.913	11.399	42.069	0.156
3/1/2016	11:27	8.555	11.694	50.314	0.138

3/1/2016	11:28	8.891	11.341	43.288	0.138	
3/1/2016	11:29	9.278	10.993	38.474	0.133	
3/1/2016	11:30	8.725	11.545	43.722	0.135	
3/1/2016	11:31	8.412	11.834	51.877	0.144	
Run 3 Average		9.04	11.25	41.34	0.14	
3/1/2016	11:32	9.016	10.509	35.478	0.124	
3/1/2016	11:33	9.462	10.743	37.811	0.119	
3/1/2016	11:34	10.565	10.292	0.283	0.11	
3/1/2016	11:35	10.573	10.3	0.159	0.065	O2 CO2 Bias
3/1/2016	11:36	3.088	2.107	0.146	0.599	
3/1/2016	11:37	0.068	0.045	0.128	3.932	
3/1/2016	11:38	0.054	0.033	0.122	4.773	CO Bias
3/1/2016	11:39	0.04	0.027	28.372	4.309	
3/1/2016	11:40	0.036	0.025	47.255	1.006	NOx Bias
3/1/2016	11:41	0.041	0.011	13.469	0.042	
3/1/2016	11:42	0.036	0.007	0.122	0.033	Zero
3/1/2016	11:43	7.742	9.041	39.204	0.761	
3/1/2016	11:44	10.614	10.34	47.63	4.004	
3/1/2016	11:45	10.621	10.348	47.61	4.759	Span
3/1/2016	11:46	9.924	10.544	37.72	4.013	
3/1/2016	11:47	9.14	11.061	40.475	0.726	
3/1/2016	11:48	9.503	10.777	39.433	0.128	
3/1/2016	11:49	8.99	11.177	44.989	0.136	
3/1/2016	11:50	9.067	11.174	42.373	0.15	
3/1/2016	11:51	8.444	11.767	50.356	0.157	
3/1/2016	11:52	8.884	11.263	45.039	0.148	
3/1/2016	11:53	9.299	10.878	36.252	0.142	
3/1/2016	11:54	8.728	11.51	41.463	0.159	
3/1/2016	11:55	8.55	11.633	47.437	0.155	
3/1/2016	11:56	8.74	11.375	47.732	0.144	
3/1/2016	11:57	8.939	11.243	46.573	0.141	
3/1/2016	11:58	9.306	10.871	42.986	0.144	
3/1/2016	11:59	8.957	11.206	44.875	0.147	
3/1/2016	12:00	8.674	11.588	47.097	0.173	
3/1/2016	12:01	8.888	11.25	42.51	0.161	
3/1/2016	12:02	8.985	11.234	39.561	0.147	
3/1/2016	12:03	9.192	10.948	37.04	0.152	
3/1/2016	12:04	8.945	11.285	41.379	0.154	
3/1/2016	12:05	8.63	11.604	46.72	0.159	
3/1/2016	12:06	8.069	12.168	58.196	0.156	
3/1/2016	12:07	7.382	12.802	70.952	0.13	
3/1/2016	12:08	9.426	10.681	41.539	0.115	
3/1/2016	12:09	11.216	9.033	16.962	0.146	
3/1/2016	12:10	11.569	8.824	12.946	0.211	
3/1/2016	12:11	10.564	9.804	21.179	0.236	
3/1/2016	12:12	10.978	9.28	21.283	0.205	
3/1/2016	12:13	10.481	9.946	29.05	0.216	
3/1/2016	12:14	10.2	10.009	34.191	0.193	
3/1/2016	12:15	9.964	10.361	42.147	0.189	
3/1/2016	12:16	9.07	11.117	53.403	0.185	
3/1/2016	12:17	9.598	10.546	46.756	0.181	

Run 4 Average		9.31	10.91	41.08	0.16	
3/1/2016	12:18	10.06	9.869	11.466	0.173	
3/1/2016	12:19	10.522	10.247	0.177	0.114	O2 CO2 Bias
3/1/2016	12:20	4.827	4.074	0.15	0.345	
3/1/2016	12:21	0.075	0.045	0.141	3.346	
3/1/2016	12:22	0.053	0.035	0.125	4.788	CO Bias
3/1/2016	12:23	0.038	0.025	29.533	4.291	
3/1/2016	12:24	0.036	0.024	46.978	0.921	NOx Bias
3/1/2016	12:25	0.04	0.012	11.301	0.044	
3/1/2016	12:26	0.036	0.009	0.107	0.021	Zero
3/1/2016	12:27	8.01	9.017	40.209	0.719	
3/1/2016	12:28	10.61	10.301	47.752	4.378	
3/1/2016	12:29	10.621	10.307	47.755	4.721	Span
3/1/2016	12:30	9.296	11.136	46.778	2.84	
3/1/2016	12:31	9.259	10.892	34.951	0.181	
3/1/2016	12:32	9.328	10.846	34.216	0.14	
3/1/2016	12:33	9.407	10.755	35.741	0.152	
3/1/2016	12:34	8.517	11.671	49.777	0.165	
3/1/2016	12:35	8.693	11.465	43.936	0.158	
3/1/2016	12:36	9.067	11.039	39.153	0.162	
3/1/2016	12:37	9.303	10.824	38.432	0.174	
3/1/2016	12:38	9.61	10.568	31.149	0.184	
3/1/2016	12:39	9.37	10.858	35.898	0.184	
3/1/2016	12:40	9.118	11.07	45.597	0.189	
3/1/2016	12:41	8.818	11.322	50.458	0.15	
3/1/2016	12:42	9.123	11.036	45.418	0.155	
3/1/2016	12:43	9.405	10.828	38.653	0.188	
3/1/2016	12:44	8.975	11.266	44.02	0.172	
3/1/2016	12:45	8.808	11.357	49.407	0.154	
3/1/2016	12:46	9.342	10.832	41.532	0.151	
3/1/2016	12:47	9.44	10.806	40.766	0.162	
3/1/2016	12:48	8.413	11.79	55.821	0.166	
3/1/2016	12:49	8.718	11.425	50.889	0.149	
3/1/2016	12:50	9.056	11.106	42.607	0.173	
3/1/2016	12:51	9.319	10.866	37.933	0.168	
3/1/2016	12:52	9.511	10.653	36.96	0.166	
3/1/2016	12:53	9.172	11.129	40.718	0.154	
3/1/2016	12:54	9.03	11.198	45.736	0.156	
3/1/2016	12:55	8.953	11.274	46.181	0.162	
3/1/2016	12:56	9.055	11.103	44.487	0.16	
3/1/2016	12:57	9.407	10.842	37.14	0.178	
3/1/2016	12:58	9.318	10.943	38.738	0.18	
3/1/2016	12:59	8.497	11.684	49.841	0.15	
3/1/2016	13:00	8.288	11.907	53.087	0.14	
Run 5 Average		9.08	11.11	42.64	0.16	
3/1/2016	13:01	9.642	10.133	16.7	0.144	
3/1/2016	13:02	10.572	10.223	0.199	0.073	O2 CO2 Bias
3/1/2016	13:03	6.28	5.386	0.156	0.323	
3/1/2016	13:04	0.086	0.048	0.149	3.928	
3/1/2016	13:05	0.051	0.035	0.145	4.779	CO Bias
3/1/2016	13:06	0.038	0.029	31.457	3.644	

3/1/2016	13:07	0.036	0.025	47.163	0.275	
3/1/2016	13:08	0.039	0.014	17.49	0.043	
3/1/2016	13:09	0.036	0.012	0.124	0.049	Zero
3/1/2016	13:10	7.833	8.887	38.768	1.259	
3/1/2016	13:11	10.641	10.292	47.635	4.601	
3/1/2016	13:12	10.645	10.289	47.627	4.753	Span
3/1/2016	13:13	9.298	11.227	48.61	3.667	
3/1/2016	13:14	8.362	11.826	54.62	0.309	
3/1/2016	13:15	8.544	11.565	50.468	0.127	
3/1/2016	13:16	9.144	11.019	40.642	0.151	
3/1/2016	13:17	9.106	11.049	38.188	0.15	
3/1/2016	13:18	8.705	11.503	42.906	0.166	
3/1/2016	13:19	9.043	11.095	44.892	0.161	
3/1/2016	13:20	8.584	11.571	51.868	0.143	
3/1/2016	13:21	8.336	11.776	52.164	0.147	
3/1/2016	13:22	9.021	11.066	40.111	0.166	
3/1/2016	13:23	9.083	11.075	37.055	0.169	
3/1/2016	13:24	9.259	10.881	35.335	0.155	
3/1/2016	13:25	9.258	10.933	33.296	0.149	
3/1/2016	13:26	9.529	10.668	33.662	0.172	
3/1/2016	13:27	9.181	10.989	41.43	0.163	
3/1/2016	13:28	9.615	10.585	39.03	0.153	
3/1/2016	13:29	9.584	10.645	37.48	0.165	
3/1/2016	13:30	9.098	11.095	43.167	0.184	
3/1/2016	13:31	9.444	10.788	43.167	0.173	
3/1/2016	13:32	8.919	11.218	48.308	0.165	
3/1/2016	13:33	9.28	11.023	42.291	0.149	
3/1/2016	13:34	7.96	12.235	61.658	0.153	
3/1/2016	13:35	8.486	11.543	56.465	0.146	
3/1/2016	13:36	9.68	10.526	40.469	0.15	
3/1/2016	13:37	8.984	11.283	46.614	0.166	
3/1/2016	13:38	8.447	11.733	53.376	0.155	
3/1/2016	13:39	9.247	10.946	45.77	0.141	
3/1/2016	13:40	9.227	10.909	45.805	0.142	
3/1/2016	13:41	8.647	11.614	53.571	0.152	
3/1/2016	13:42	8.742	11.372	52.192	0.151	
3/1/2016	13:43	8.882	11.227	46.335	0.148	
3/1/2016	13:44	9.457	10.723	38.683	0.147	
3/1/2016	13:45	9.234	10.931	42.964	0.182	
Run 6 Average		9.04	11.13	44.30	0.16	
3/1/2016	13:46	10.425	10.15	8.566	0.142	
3/1/2016	13:47	10.551	10.223	0.17	0.09	O2 CO2 Bias
3/1/2016	13:48	6.714	5.636	0.714	0.252	
3/1/2016	13:49	0.093	0.053	0.15	3.842	
3/1/2016	13:50	0.054	0.032	0.14	4.781	CO Bias
3/1/2016	13:51	0.036	0.023	31.729	3.641	
3/1/2016	13:52	0.036	0.024	47.23	0.23	NOx Bias
3/1/2016	13:53	0.04	0.012	11.598	0.042	
3/1/2016	13:54	0.035	0.008	0.118	0.023	Zero
3/1/2016	13:55	3.944	5.098	20.925	0.305	
3/1/2016	13:56	10.614	10.283	47.605	3.951	

3/1/2016	13:57	10.645	10.294	47.635	4.783	Span
3/1/2016	13:58	10.157	10.487	44.223	4.378	
3/1/2016	13:59	9.075	11.179	41.325	0.734	
3/1/2016	14:00	8.612	11.563	49.191	0.127	
3/1/2016	14:01	9.04	11.089	44.474	0.12	
3/1/2016	14:02	9.051	11.224	45.104	0.139	
3/1/2016	14:03	7.953	12.232	61.502	0.132	
3/1/2016	14:04	8.608	11.4	49.609	0.123	
3/1/2016	14:05	10.408	9.741	30.788	0.135	
3/1/2016	14:06	10.962	9.412	21.917	0.189	
3/1/2016	14:07	9.656	10.658	34.059	0.166	
3/1/2016	14:08	9.043	11.273	45.148	0.146	
3/1/2016	14:09	8.481	11.619	53.053	0.152	
3/1/2016	14:10	9.413	10.822	44.437	0.136	
3/1/2016	14:11	8.592	11.593	52.429	0.146	
3/1/2016	14:12	9.207	10.9	44.602	0.151	
3/1/2016	14:13	9.116	11.076	45.42	0.137	
3/1/2016	14:14	9.306	10.942	42.94	0.166	
3/1/2016	14:15	9.428	10.773	39.16	0.164	
3/1/2016	14:16	9.216	11.055	36.845	0.156	
3/1/2016	14:17	9.355	10.744	38.245	0.168	
3/1/2016	14:18	9.43	10.803	39.449	0.172	
3/1/2016	14:19	9.244	10.912	37.38	0.198	
3/1/2016	14:20	9.117	11.009	43.02	0.199	
3/1/2016	14:21	8.74	11.405	47.968	0.208	
3/1/2016	14:22	8.473	11.606	50.47	0.205	
3/1/2016	14:23	8.596	11.512	49.156	0.196	
3/1/2016	14:24	9.119	10.996	40.14	0.186	
3/1/2016	14:25	8.784	11.331	41.116	0.173	
3/1/2016	14:26	8.712	11.436	43.106	0.192	
3/1/2016	14:27	9.023	11.119	41.018	0.165	
3/1/2016	14:28	8.491	11.672	48.203	0.189	
3/1/2016	14:29	8.394	11.665	51.106	0.151	
3/1/2016	14:30	9.008	11.15	41.135	0.166	
3/1/2016	14:31	9.115	10.972	40.162	0.164	
3/1/2016	14:32	9.034	11.212	42.514	0.176	
3/1/2016	14:33	9.126	11.017	41.078	0.167	
3/1/2016	14:34	9.566	10.62	30.559	0.167	
3/1/2016	14:35	9.539	10.643	35.174	0.17	
3/1/2016	14:36	9.515	10.741	35.11	0.194	
3/1/2016	14:37	8.994	11.212	45.522	0.181	
3/1/2016	14:38	8.936	11.161	47.653	0.157	
3/1/2016	14:39	9.522	10.667	39.73	0.156	
3/1/2016	14:40	9.396	10.821	40.85	0.169	
3/1/2016	14:41	9.308	10.904	41.252	0.148	
3/1/2016	14:42	9.592	10.582	38.841	0.181	
3/1/2016	14:43	9.387	10.809	41.732	0.195	
3/1/2016	14:44	9.317	10.898	42.039	0.168	
3/1/2016	14:45	9.083	11.087	44.106	0.175	
3/1/2016	14:46	8.762	11.46	46.515	0.17	
3/1/2016	14:47	8.375	11.815	50.548	0.161	
3/1/2016	14:48	8.815	11.311	46.692	0.136	

3/1/2016	14:49	9.296	10.834	40.915	0.146	
3/1/2016	14:50	9.293	10.932	41.469	0.19	
3/1/2016	14:51	9.714	10.47	33.084	0.179	
3/1/2016	14:52	9.619	10.599	34.37	0.175	
3/1/2016	14:53	9.256	11.035	40.315	0.164	
3/1/2016	14:54	8.834	11.341	45.474	0.161	
3/1/2016	14:55	8.179	12.032	58.761	0.172	
Run 7 Average		9.11	11.07	42.30	0.17	
3/1/2016	14:56	9.255	10.303	26.729	0.163	
3/1/2016	14:57	10.583	10.224	0.203	0.089	O2 CO2 Bias
3/1/2016	14:58	4.666	3.626	0.156	0.693	
3/1/2016	14:59	0.072	0.045	0.139	4.356	
3/1/2016	15:00	0.046	0.031	0.131	4.798	CO Bias
3/1/2016	15:01	0.037	0.026	27.942	3.915	
3/1/2016	15:02	0.035	0.027	47.139	0.584	NOx Bias
3/1/2016	15:03	0.04	0.011	16.775	0.237	
3/1/2016	15:04	0.035	0.01	0.111	0.061	Zero
3/1/2016	15:05	6.203	7.383	31.166	0.883	
3/1/2016	15:06	10.639	10.281	47.694	4.496	
3/1/2016	15:07	10.665	10.285	47.694	4.773	Span
3/1/2016	15:08	9.913	10.665	42.498	3.43	
3/1/2016	15:09	9.403	10.807	38.398	0.253	
3/1/2016	15:10	9.074	11.131	42.215	0.169	
3/1/2016	15:11	9.179	11.007	40.899	0.131	
3/1/2016	15:12	8.637	11.512	51.958	0.137	
3/1/2016	15:13	8.933	11.151	48.457	0.149	
3/1/2016	15:14	9.915	10.286	32.851	0.159	
3/1/2016	15:15	9.324	10.911	36.212	0.17	
3/1/2016	15:16	8.335	11.843	51.349	0.183	
3/1/2016	15:17	8.299	11.821	52.286	0.16	
3/1/2016	15:18	8.462	11.655	49.958	0.157	
3/1/2016	15:19	9.72	10.461	33.028	0.15	
3/1/2016	15:20	9.231	10.95	33.892	0.181	
3/1/2016	15:21	8.927	11.231	37.055	0.177	
3/1/2016	15:22	9.605	10.648	34.273	0.161	
3/1/2016	15:23	9.294	10.924	36.745	0.182	
3/1/2016	15:24	8.247	12.004	53.428	0.192	
3/1/2016	15:25	8.466	11.661	52.046	0.152	
3/1/2016	15:26	8.563	11.564	49.791	0.174	
3/1/2016	15:27	8.602	11.573	46.981	0.155	
3/1/2016	15:28	9.169	10.953	39.568	0.159	
3/1/2016	15:29	9.079	11.168	42.079	0.156	
3/1/2016	15:30	9.013	11.131	42.598	0.158	
3/1/2016	15:31	9.036	11.1	44.957	0.163	
3/1/2016	15:32	8.867	11.305	45.284	0.161	
3/1/2016	15:33	9.148	10.984	39.57	0.153	
3/1/2016	15:34	8.925	11.235	39.504	0.175	
3/1/2016	15:35	9.373	10.729	34.811	0.175	
3/1/2016	15:36	9.63	10.634	35.234	0.169	
3/1/2016	15:37	8.936	11.187	40.937	0.191	
3/1/2016	15:38	8.489	11.695	53.805	0.158	

3/1/2016	15:39	8.57	11.526	53.58	0.161	
Run 8 Average		8.97	11.20	43.18	0.16	
3/1/2016	15:40	9.918	9.893	11.96	0.143	
3/1/2016	15:41	10.546	10.231	0.174	0.085	O2 CO2 Bias
3/1/2016	15:42	3.799	2.901	0.145	0.876	
3/1/2016	15:43	0.067	0.04	0.128	4.472	
3/1/2016	15:44	0.041	0.029	0.118	4.753	CO Bias
3/1/2016	15:45	0.036	0.028	33.402	3.557	
3/1/2016	15:46	0.035	0.022	47.047	0.312	NOx Bias
3/1/2016	15:47	0.036	0.011	9.057	0.053	
3/1/2016	15:48	0.035	0.01	0.115	0.034	Zero
3/1/2016	15:49	8.295	9.302	42.501	1.537	
3/1/2016	15:50	10.617	10.292	47.71	4.646	
3/1/2016	15:51	10.62	10.292	47.639	4.776	Span
3/1/2016	15:52	9.381	11.129	47.348	3.329	
3/1/2016	15:53	9.066	11.004	46.138	0.242	
3/1/2016	15:54	9.221	10.849	36.543	0.163	
3/1/2016	15:55	9.572	10.524	34.412	0.17	
3/1/2016	15:56	9.072	11.12	40.717	0.173	
3/1/2016	15:57	9.098	11.049	40.849	0.164	
3/1/2016	15:58	9.34	10.735	36.91	0.174	
3/1/2016	15:59	8.944	11.144	40.927	0.197	
3/1/2016	16:00	9.377	10.762	38.422	0.184	
3/1/2016	16:01	9.012	11.125	44.796	0.163	
3/1/2016	16:02	9.457	10.628	40.214	0.164	
3/1/2016	16:03	9.529	10.638	37.554	0.172	
3/1/2016	16:04	8.85	11.354	44.672	0.18	
3/1/2016	16:05	8.235	11.833	53.754	0.162	
3/1/2016	16:06	9.197	10.883	43.774	0.181	
3/1/2016	16:07	9.065	11.036	43.777	0.194	
3/1/2016	16:08	9.478	10.638	36.927	0.197	
3/1/2016	16:09	8.752	11.416	45.54	0.185	
3/1/2016	16:10	9.018	11.131	39.105	0.19	
3/1/2016	16:11	8.555	11.535	46.862	0.179	
3/1/2016	16:12	8.463	11.647	47.083	0.172	
3/1/2016	16:13	8.385	11.736	49.217	0.153	
3/1/2016	16:14	8.74	11.327	42.209	0.161	
3/1/2016	16:15	9.004	11.066	39.748	0.176	
3/1/2016	16:16	9.63	10.548	32.493	0.2	
3/1/2016	16:17	9.298	10.803	34.095	0.215	
3/1/2016	16:18	9.959	10.124	30.528	0.19	
3/1/2016	16:19	8.982	11.204	45.46	0.209	
3/1/2016	16:20	9.077	11.033	40.916	0.177	
3/1/2016	16:21	9.111	11.023	42.627	0.192	
3/1/2016	16:22	9.03	11.046	42.015	0.193	
3/1/2016	16:23	9.427	10.694	37.937	0.194	
Run 9 Average		9.10	11.02	41.00	0.18	
3/1/2016	16:24	10.062	9.817	7.605	0.162	
3/1/2016	16:25	10.546	10.229	0.161	0.095	O2 CO2 Bias
3/1/2016	16:26	3.713	2.762	0.148	0.937	
3/1/2016	16:27	0.067	0.039	0.125	4.537	

3/1/2016	16:28	0.041	0.033	0.118	4.792	CO Bias
3/1/2016	16:29	0.036	0.023	23.47	4.231	
3/1/2016	16:30	0.036	0.023	47.219	0.711	
3/1/2016	16:31	0.036	0.021	47.34	0.451	
3/1/2016	16:32	0.038	0.009	12.592	0.4	
3/1/2016	16:33	0.035	0.005	0.112	0.128	
3/1/2016	16:34	0.036	0.005	0.098	0.052	Zero
3/1/2016	16:35	8.066	9.165	40.641	1.423	
3/1/2016	16:36	10.612	10.27	47.704	4.645	
3/1/2016	16:37	10.621	10.278	47.795	4.786	Span
3/1/2016	16:38	10.621	10.275	47.892	4.774	
3/1/2016	16:39	15.175	15.113	66.918	5.137	
3/1/2016	16:40	19.003	18.394	93.121	8.442	
3/1/2016	16:41	19.033	18.437	93.349	8.787	High
3/1/2016	16:42	19.009	18.362	93.017	8.83	

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit 1
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: +.52
Start: 0800 Stop: ~~08~~ 0900

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.10	349	C 5	0.95	349	E 5	1.1	348
4	0.92	349	4	0.96	351	4	1.1	349
3	0.93	348	3	0.80	351	3	1.2	350
2	0.95	349	2	0.92	349	2	1.2	351
1	0.97	347	1	0.89	350	1	1.3	350
B 5	1.20	348	D 5	1.2	349	F 5	1.0	351
4	1.10	349	4	1.1	351	4	0.91	350
3	0.80	351	3	0.93	351	3	0.90	349
2	0.81	351	2	0.87	351	2	0.96	351
1	0.78	350	1	0.81	350	1	0.95	351
Heated Line Temp. °F								
Chiller Temp. °C								

MOISTURE DATA FOR TEST RUNS 1 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0800	252.125	1.0	73	72	56	3.0	#1	3% H_2O_2	875.0	737.9	
0818	259.700	1.0	80	75	51	3.0	#2	3% H_2O_2	701.4	699.9	
0830	266.700	1.0	84	78	52	3.0	#3	Empty	633.4	633.3	
0845	275.105	1.0	86	79	52	3.0	#4	Silica Gel	937.6	926.5	
0900	284.100						Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.1.4-3

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit /
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: 30.17 TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: 2 LEAK CHECK PRE- ✓ POST- ✓

Run #: 2 Ps: 0.52
Start: 0915 Stop: 1015

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.1	349	C 5	0.93	351	E 5	1.2	351
4	0.87	350	4	0.85	351	4	1.2	350
3	0.85	351	3	0.80	352	3	1.1	352
2	0.92	352	2	1.00	352	2	1.1	350
1	1.20	350	1	0.97	352	1	1.2	350
B 5	1.3	349	D 5	1.2	350	F 5	1.0	351
4	1.1	351	4	1.1	351	4	0.88	352
3	0.86	351	3	0.86	352	3	0.85	351
2	0.72	350	2	0.84	353	2	0.90	350
1	0.75	350	1	0.83	355	1	1.10	349
Heated Line Temp. °F								
Chiller Temp. °C								

MOISTURE DATA FOR TEST RUNS 2 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0915	285.200	1.0	83	83	59	~~3.0~~	#1	3% H_2O_2	855.9	709.3	
0930	293.000	1.0	88	86	57	3.0	#2	3% H_2O_2	684.1	682.5	
0945	301.600	1.0	88	86	59	3.0	#3	Empty	616.1	616.0	
1000	310.450	1.0	89	87	59	3.0	#4	Silica Gel	978.3	967.8	
1015	318.900						Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 3 Ps: +.54
Start: 1031 Stop: 1131

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.0	353	C 5	0.87	354	E 5	1.1	354
4	0.86	353	4	0.85	355	4	1.0	355
3	0.80	353	3	0.80	355	3	1.0	355
2	0.90	354	2	0.90	353	2	1.0	355
1	1.0	353	1	0.89	354	1	1.1	355
B 5	1.1	354	D 5	1.1	355	F 5	1.1	353
4	1.0	353	4	1.0	355	4	0.91	354
3	0.93	354	3	0.91	355	3	0.88	354
2	0.60	354	2	0.88	354	2	0.89	354
1	0.62	354	1	0.82	353	1	0.97	353
17.7								
22.4								
Heated Line Temp. °F								
Chiller Temp. °C								

MOISTURE DATA FOR TEST RUNS 3 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1031	319.800	1.0	88	87	59	3.0	#1	3% H_2O_2	884.6	742.0	
1046	331.000	1.0	89	88	58	3.0	#2	3% H_2O_2	703.7	700.9	
1101	336.400	1.0	93	91	59	3.0	#3	Empty	635.6	632.7	
1116	345.100	1.0	94	92	60	3.0	#4	Silica Gel	944.3	937.6	
1131	353.600						Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.1.4-5

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 1
PERFORMED BY: Rik Dupont
TEST DATE: 3- 1 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL:
LEAK CHECK PRE- ✓ POST- ✓

Run #: 4 Ps: -.54
Start: 1147 Stop: 1217

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.91	353	C 5	1.0	356	E 5	1.2	354
4	0.82	353	4	0.82	355	4	1.1	355
3	0.80	354	3	0.80	355	3	1.0	355
2	0.90	354	2	0.90	356	2	1.1	355
1	1.10	351	1	0.92	356	1	1.2	356
B 5	1.10	353	D 5	1.2	356	F 5	0.95	356
4	1.00	354	4	1.1	355	4	0.88	356
3	0.78	355	3	0.90	356	3	0.93	356
2	0.65	354	2	0.78	356	2	0.95	354
1	0.75	353	1	0.75	355	1	1.00	355
Heated Line Temp. °F								
Chiller Temp. °C								

MOISTURE DATA FOR TEST RUNS 4 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1147	354.300	2.5	94	93	60	6.0	#1	3% H_2O_2	807.9	694.0	
1202	367.255	2.5	96	94	60	6.0	#2	3% H_2O_2	726.6	722.4	
1217	380.600						#3	Empty	616.3	615.8	
							#4	Silica Gel	985.4	978.2	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.1.4-6

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 5 Ps: 0.54
Start: 1230 Stop: 1300

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.0	359	C 5	1.0	356	E 5	1.1	358
4	~~1.93~~	358	4	0.82	356	4	1.0	358
3	0.85	359	3	0.82	357	3	1.0	358
2	1.0	358	2	0.91	357	2	1.1	359
1	1.0	359	1	0.96	356	1	1.1	359
B 5	1.2	356	D 5	1.2	358	F 5	0.98	356
4	1.1	357	4	1.0	358	4	0.95	356
3	1.0	356	3	0.85	359	3	0.89	358
2	0.71	356	2	0.80	357	2	0.99	359
1	0.70	355	1	0.75	357	1	0.95	359
Heated Line Temp. °F		300						
Chiller Temp. °C		-10						

MOISTURE DATA FOR TEST RUNS 5 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1230	381.550	2.5	96	94	60	5.0	#1	3% H_2O_2	794.6	686.0 884.6	
1245	394.355	2.5	98	96	59	5.0	#2	3% H_2O_2	711.6	705.3	
1300	407.900						#3	Empty	632.3	631.2	
							#4	Silica Gel	950.9	944.3	
							Total	Line rinse		50	

Pre-Test Leak Check: .0005 CFM @ 15 in. Hg., Post-Test Leak Check: .0005 CFM @ 15 in. Hg

6.1.4-7

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 6 Ps: +.54
Start: 1315 Stop: 1345

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.0	359	C 5	0.88	356	E 5	1.1	357
4	0.81	360	4	0.80	355	4	1.0	358
3	0.82	360	3	0.83	355	3	1.1	358
2	0.93	359	2	0.90	356	2	1.2	358
1	1.0	360	1	0.95	355	1	1.0	358
B 5	1.0	356	D 5	1.1	357	F 5	1.1	360
4	1.1	355	4	0.99	358	4	0.80	359
3	0.81	356	3	0.89	359	3	0.83	359
2	0.69	355	2	0.85	360	2	0.91	359
1	0.72	355	1	0.79	355	1	0.90	358
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 6 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T imp	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1315	408.700	2.5	99	99	60	6.0	#1	3% H_2O_2	819.5	709.5	
1335	427.600	2.5	99	98	60	6.0	#2	3% H_2O_2	679.5	673.0	
1345	435.680						#3	Empty	616.2	616.3	
							#4	Silica Gel	994.7	985.3	
							Total	Line rinse		50	

Pre-Test Leak Check: ~~0.005~~ CFM @ 15 in. Hg., Post-Test Leak Check: ~~0.005~~ 0.010 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit
PERFORMED BY: Rik Dupont TEST DATE: 3- 1 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 7 Ps: +.54
Start: 1425 Stop: 1455

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.0	359	C 5	1.0	360	E 5	1.1	360
4	0.83	360	4	0.83	360	4	1.0	360
3	0.82	360	3	0.80	358	3	1.2	359
2	0.93	361	2	0.83	358	2	1.1	359
1	1.10	360	1	0.90	358	1	1.0	358
B 5	1.10	359	D 5	1.20	358	F 5	1.10	359
4	0.77	358	4	1.00	359	4	0.85	358
3	0.76	358	3	0.90	359	3	0.83	358
2	0.75	360	2	0.83	360	2	0.90	359
1	0.72	360	1	0.85	358	1	1.00	360
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 1 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T imp	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1425	442.550	2.5	99	99	59	5.0	#1	3% H_2O_2	806.9	695.4	
1440	455.90	2.5	98	97	58	5.0	#2	3% H_2O_2	731.0	725.0	
1455	469.250						#3	Empty	632.6	631.4	
							#4	Silica Gel	958.9	950.9	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit
PERFORMED BY: Rik Dupont
TEST DATE: 3- 1 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 8 Ps: +.54
Start: 1509 Stop: 1539

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	1.0	358	C 5	1.0	357	E 5	1.0	359
4	0.88	357	4	0.85	359	4	1.0	359
3	0.87	359	3	0.82	359	3	.98	358
2	0.90	358	2	0.90	360	2	1.1	360
1	1.10	358	1	1.00	360	1	1.0	360
B 5	1.20	357	D 5	1.1	360	F 5	0.98	356
4	1.00	358	4	1.0	361	4	0.87	356
3	0.82	358	3	.87	359	3	0.85	357
2	0.70	357	2	0.83	358	2	0.91	357
1	0.75	358	1	0.80	357	1	1.00	356
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS _____ THROUGH _____

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1509	470.210	2.5	95	95	60	6.0	#1	3% H_2O_2	813.4	702.7	
1524	483.200	2.5	96	95	60	6.0	#2	3% H_2O_2	677.9	672.8	
1539	495.900						#3	Empty	616.2	615.2	
							#4	Silica Gel	1001.8	994.7	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.1.4-10

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 1
PERFORMED BY: Rik Dupont
TEST DATE: 3- 1 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 9 Ps: +.54
Start: 1553 Stop: 1623

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.95	358	C 5	0.90	359	E 5	1.10	358
4	0.82	358	4	0.88	358	4	1.00	358
3	0.83	359	3	0.80	357	3	1.10	359
2	0.93	360	2	0.88	357	2	1.10	359
1	1.0	360	1	0.93	356	1	1.00	357
B 5	1.20	359	D 5	1.10	357	F 5	1.0	356
4	1.10	358	4	1.10	357	4	0.85	357
3	0.80	359	3	0.99	358	3	0.80	357
2	0.68	357	2	0.83	356	2	0.94	358
1	0.72	357	1	0.78	355	1	1.10	356
Heated Line Temp. °F		300						
Chiller Temp. °C		~10						

MOISTURE DATA FOR TEST RUNS 9 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1553	496.620	2.5	96	94	60	5.0	#1	3% H_2O_2	819.5	698.9	
1608	510.610	2.5	97	95	59	5.0	#2	3% H_2O_2	728.0	721.3	
1623	523.120						#3	Empty	634.4	631.0	
							#4	Silica Gel	965.4	958.9	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

DELTA AIR QUALITY SERVICES
NOZZLE CALIBRATION LOG

Nozzle #	Date	Performed By	D_1	D_2	D_3	Average D_n	Status
29	1/6/15	SS	0.242	0.244	0.243	0.243	-
55	1/6/15	SS	0.246	0.245	0.246	0.246	-

C.1.5-2

SCAQMD METHOD 25.3
EVACUATED CANISTER SAMPLING DATA

Client/Facility: Desert View Power Date: 3-1-2016

Unit/Location: Unit 1 stack breaching Performed By: Rik Dupont

Probe Material SS Probe Length 4'

Connecting Tubing Material Teflon Connecting Tubing Length 12"

Barometric Pressure 30.17 Ambient Temperature 75

Test No.		1A-VOC-U1		1B-VOC-U1			
Vial ID		D30		D31			
Canister ID		00139		00288			
		Time	Vacuum	Time	Vacuum	Time	Vacuum
Pre-Test Leak Check	Start	821	20	821	21		
Pre-Test Leak Check	Stop	831	20	831	21		
Sample Collection	Start	0910	30"	0910	28"		
		0925	22"	0925	20"		
		0940	18"	0940	15"		
		0955 ~~0958~~	12" ~~15"~~	~~0958~~	10"		
Sample Collection	Stop	1000	10"	0950	10"		
Post -Test Leak Check	Start	1005	7	1005	6		
Post-Test Leak Check	Stop	1015	7	1015	6		
Line Rinse Volume							

Comments:

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 8:01	40.44	61.09	18.67	7.9	11.93	5.07	0	15.11 <56>	2.81 <56>	11.75	9.05	3866	0.00	0.00
3/1/2016 8:02	42.25	64.86	25.56	8.28	12.71	6.97	0	15.35 <56>	3.68 <56>	11.56	9.24	5067	0.00	0.00
3/1/2016 8:03	41.13	63.2	24.73	7.72	11.86	6.46	0	15.36 <56>	3.66 <56>	11.54	9.25	5036	0.00	0.00
3/1/2016 8:04	37.5	58.88	22.09	7.11	11.16	5.83	0	15.70 <56>	3.59 <56>	11.32	9.5	4934	0.00	0.00
3/1/2016 8:05	45.88	69.25	28.26	8.52	12.86	7.3	0	15.09 <56>	3.75 <56>	11.76	9.04	5159	0.00	0.00
3/1/2016 8:06	50.43	74.85	31.47	9	13.36	7.81	0	14.84 <56>	3.80 <56>	11.96	8.84	5227	0.00	0.00
3/1/2016 8:07	49.09	73.47	29.88	9.14	13.68	7.74	0	14.97 <56>	3.70 <56>	11.86	8.94	5098	0.00	0.00
3/1/2016 8:08	39.78	63.01	23.01	7.55	11.96	6.08	0	15.84 <56>	3.52 <56>	11.21	9.6	4845	0.00	0.00
3/1/2016 8:09	33.9	53.23	20.07	6.6	10.36	5.44	0	15.70 <56>	3.60 <56>	11.35	9.5	4959	0.00	0.00
3/1/2016 8:10	32.61	52.21	19.1	6.4	10.25	5.22	0	16.01 <56>	3.57 <56>	11.1	9.72	4907	0.00	0.00
3/1/2016 8:11	40.08	61.06	24.66	7.82	11.91	6.69	0	15.23 <56>	3.75 <56>	11.68	9.15	5154	0.00	0.00
3/1/2016 8:12	40.88	63.41	24.55	7.62	11.82	6.37	0	15.51 <56>	3.66 <56>	11.44	9.36	5031	0.00	0.00
3/1/2016 8:13	39.47	61.92	23.59	7.02	11.01	5.84	0	15.69 <56>	3.64 <56>	11.33	9.49	5006	0.00	0.00
3/1/2016 8:14	45.23	68.09	28.16	8.28	12.47	7.17	0	15.05 <56>	3.79 <56>	11.81	9.01	5214	0.00	0.00
3/1/2016 8:15	50.11	74.81	31.4	9.44	14.09	8.23	0	14.93 <56>	3.81 <56>	11.88	8.91	5249	0.00	0.00
3/1/2016 8:16	48.83	73.7	30.04	9.05	13.66	7.75	0	15.09 <56>	3.74 <56>	11.74	9.04	5153	0.00	0.00
3/1/2016 8:17	42.09	63.9	25.63	8.03	12.19	6.8	0	15.18 <56>	3.71 <56>	11.71	9.11	5100	0.00	0.00
3/1/2016 8:18	46.19	68.33	29.01	9.3	13.76	8.13	0	14.79 <56>	3.82 <56>	11.99	8.8	5260	0.00	0.00
3/1/2016 8:19	45.53	66.86	28.65	9.71	14.26	8.5	0	14.68 <56>	3.83 <56>	12.06	8.71	5270	0.00	0.00
3/1/2016 8:20	42.98	64.54	25.82	9.03	13.56	7.55	0	15.02 <56>	3.66 <56>	11.79	8.98	5032	0.00	0.00
3/1/2016 8:21	34.65	54.99	19.86	7	11.11	5.58	0	15.87 <56>	3.49 <56>	11.22	9.62	4800	0.00	0.00
3/1/2016 8:22	37.68	58.19	22.33	7.57	11.69	6.24	0	15.44 <56>	3.61 <56>	11.47	9.31	4964	0.00	0.00
3/1/2016 8:23	34.99	56.48	19.85	6.59	10.64	5.2	0	16.14 <56>	3.45 <56>	11.03	9.81	4752	0.00	0.00
3/1/2016 8:24	35.84	58.64	20.49	6.15	10.06	4.89	0	16.36 <56>	3.48 <56>	10.9	9.96	4788	0.00	0.00
3/1/2016 8:25	44.72	68.3	27.59	8.02	12.25	6.88	0	15.27 <56>	3.76 <56>	11.63	9.18	5168	0.00	0.00
3/1/2016 8:26	50.5	76.87	31.28	8.65	13.17	7.45	0	15.22 <56>	3.77 <56>	11.65	9.14	5188	0.00	0.00
3/1/2016 8:27	46.9	70.13	29.17	8.06	12.05	6.98	0	14.95 <56>	3.79 <56>	11.88	8.93	5210	0.00	0.00
3/1/2016 8:28	46.77	69.94	28.82	9.11	13.62	7.81	0	14.95 <56>	3.75 <56>	11.84	8.93	5161	0.00	0.00
3/1/2016 8:29	45.14	67.9	27.43	8.58	12.91	7.25	0	15.04 <56>	3.70 <56>	11.78	9	5089	0.00	0.00
3/1/2016 8:30	39.02	60.47	23.13	7.74	12	6.38	0	15.50 <56>	3.61 <56>	11.45	9.35	4965	0.00	0.00
3/1/2016 8:31	42.23	62.84	26.37	8.97	13.35	7.79	0	14.88 <56>	3.80 <56>	11.94	8.87	5231	0.00	0.00
3/1/2016 8:32	44.37	66.08	27.31	9.43	14.04	8.07	0	14.89 <56>	3.75 <56>	11.9	8.88	5155	0.00	0.00
3/1/2016 8:33	46.79	68.99	29.13	10.09	14.88	8.74	0	14.74 <56>	3.79 <56>	12.05	8.76	5214	0.00	0.00
3/1/2016 8:34	52.36	77.2	32.3	11.6	17.1	9.96	0	14.74 <56>	3.75 <56>	11.99	8.76	5167	0.00	0.00
3/1/2016 8:35	40.79	62.19	24.27	9.57	14.59	7.92	0	15.25 <56>	3.62 <56>	11.68	9.16	4984	0.00	0.00
3/1/2016 8:36	42.42	63.12	26.28	10.1	15.03	8.71	0	14.88 <56>	3.77 <56>	11.94	8.87	5190	0.00	0.00
3/1/2016 8:37	49.91	69.25	33.33	13.42	18.62	12.47	0	13.88 <56>	4.06 <56>	12.78	8	5593	0.00	0.00
3/1/2016 8:38	50.88	73.75	31.3	12.44	18.03	10.65	0	14.49 <56>	3.74 <56>	12.2	8.55	5153	0.00	0.00
3/1/2016 8:39	36.39	58	20.05	8.56	13.64	6.56	0	15.94 <56>	3.35 <56>	11.16	9.67	4614	0.00	0.00
3/1/2016 8:40	27.73	45.66	15.11	6.94	11.43	5.26	0	16.47 <56>	3.32 <56>	10.83	10.03	4564	0.00	0.00
3/1/2016 8:41	27.53	45.13	15.39	7.19	11.79	5.59	0	16.39 <56>	3.40 <56>	10.9	9.98	4683	0.00	0.00
3/1/2016 8:42	39.61	60.19	24.13	9.39	14.27	7.96	0	15.20 <56>	3.71 <56>	11.71	9.12	5103	0.00	0.00
3/1/2016 8:43	45.89	68.8	28.2	10.35	15.52	8.85	0	14.99 <56>	3.74 <56>	11.84	8.96	5147	0.00	0.00
3/1/2016 8:44	44.62	70.62	25.83	9.01	14.26	7.26	0	15.83 <56>	3.52 <56>	11.22	9.59	4848	0.00	0.00
3/1/2016 8:45	33.37	54.01	19.23	6.55	10.6	5.25	0	16.18 <56>	3.51 <56>	11.03	9.84	4827	0.00	0.00
3/1/2016 8:46	39.45	59.64	24.57	8.35	12.62	7.23	0	15.12 <56>	3.79 <56>	11.75	9.06	5216	0.00	0.00
3/1/2016 8:47	41.42	62.67	25.48	8.6	13.01	7.36	0	15.13 <56>	3.74 <56>	11.75	9.07	5152	0.00	0.00
3/1/2016 8:48	43.17	66.62	25.89	8.54	13.18	7.13	0	15.43 <56>	3.65 <56>	11.5	9.3	5023	0.00	0.00
3/1/2016 8:49	42.22	65.26	25.08	8.38	12.95	6.93	0	15.46 <56>	3.62 <56>	11.51	9.32	4976	0.00	[illegible]
3/1/2016 8:50	40.36	63.48	23.63	8.29	13.04	6.75	0	15.73 <56>	3.56 <56>	11.32	9.52	4904	0.00	[illegible]
3/1/2016 8:51	40.48	64.81	23.45	8.3	13.29	6.69	0	16.01 <56>	3.53 <56>	11.12	9.72	4852	0.00	[illegible]
3/1/2016 8:52	42.66	64.28	26.59	9.24	13.92	8.01	0	15.07 <56>	3.79 <56>	11.82	9.02	5221	0.00	[illegible]
3/1/2016 8:53	48.68	72.25	30.63	10.62	15.76	9.3	0	14.84 <56>	3.83 <56>	11.95	8.84	5271	0.00	[illegible]
3/1/2016 8:54	52.58	76.77	33.45	11.15	16.28	9.87	0	14.60 <56>	3.87 <56>	12.16	8.64	5329	0.00	[illegible]
3/1/2016 8:55	57.7	83.7	36.76	12.54	18.19	11.12	0	14.51 <56>	3.88 <56>	12.2	8.56	5337	0.00	[illegible]
3/1/2016 8:56	49.29	73.96	29.78	10.85	16.28	9.12	0	15.00 <56>	3.68 <56>	11.82	8.97	5061	0.00	[illegible]
3/1/2016 8:57	43.79	66.15	26.3	9.85	14.88	8.23	0	15.11 <56>	3.66 <56>	11.74	9.05	5030	0.00	0.00
3/1/2016 8:58	38.37	59.57	22.59	8.97	13.93	7.35	0	15.52 <56>	3.58 <56>	11.47	9.37	4931	0.00	0.00
3/1/2016 8:59	47.89	69.98	30.11	11.6	16.95	10.15	0	14.61 <56>	3.83 <56>	12.12	8.65	5267	0.00	0.00
3/1/2016 9:00	43.22	64.04	26.45	11.06	16.39	9.42	0	14.82 <56>	3.73 <56>	11.96	8.82	5127	0.00	0.00

C.16-2

Average	**42.78**	**65.03**	**25.89**	**8.85**	**13.44**	**7.46**	**0.00**		**11.65**	**9.16**	**5047.03**	**0.00**	**0.00**

Flow	kdscfh	5047.03
O2	% dry	9.16
CO2	% dry	11.65
NOx	ppm dry	42.78
NOx	ppm @ 3% O2	65.03
NOx	lb/hr	25.89
SO2	ppm dry	8.85
SO2	ppm @ 3% O2	13.44
SO2	lb/hr	7.46
CO	ppm dry	0.00
CO	ppm @ 3% O2	0.00
CO	lb/hr	0.00

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 9:16	53.82	77.38	33.26	11.24	16.16	9.66	0	14.38 <56>	3.76 <56>	12.31	8.45	5176	0.00	0.00
3/1/2016 9:17	37.11	58.47	20.76	8.32	13.11	6.47	0	15.76 <56>	3.40 <56>	11.27	9.54	4685	0.00	0.00
3/1/2016 9:18	29.09	46.08	16.36	7.04	11.15	5.51	0	15.84 <56>	3.42 <56>	11.23	9.6	4710	0.00	0.00
3/1/2016 9:19	29.16	46.07	16.68	7.03	11.11	5.6	0	15.80 <56>	3.48 <56>	11.27	9.57	4792	0.00	0.00
3/1/2016 9:20	35.88	55.08	21.29	8.11	12.45	6.69	0	15.35 <56>	3.61 <56>	11.6	9.24	4969	0.00	0.00
3/1/2016 9:21	43.88	67.02	26.01	9.09	13.88	7.5	0	15.27 <56>	3.61 <56>	11.62	9.18	4964	0.00	0.00
3/1/2016 9:22	44.63	68.69	26.01	8.8	13.54	7.13	0	15.39 <56>	3.55 <56>	11.52	9.27	4881	0.00	0.00
3/1/2016 9:23	34.06	55.98	18.68	6.71	11.03	5.12	0	16.44 <56>	3.34 <56>	10.83	10.01	4594	0.00	0.00
3/1/2016 9:24	31	50.68	17.42	6.15	10.05	4.81	0	16.35 <56>	3.42 <56>	10.89	9.95	4706	0.00	0.00
3/1/2016 9:25	36.21	57.06	21.35	7.01	11.05	5.75	0	15.76 <56>	3.59 <56>	11.29	9.54	4939	0.00	0.00
3/1/2016 9:26	40.04	62.87	23.9	7.34	11.53	6.1	0	15.70 <56>	3.63 <56>	11.34	9.5	5000	0.00	0.00
3/1/2016 9:27	49.19	74.56	30.44	8.75	13.26	7.53	0	15.16 <56>	3.77 <56>	11.71	9.09	5184	0.00	0.00
3/1/2016 9:28	47.49	73.41	28.51	8.13	12.57	6.79	0	15.46 <56>	3.65 <56>	11.5	9.32	5029	0.00	0.00
3/1/2016 9:29	50.3	75.6	30.72	8.87	13.33	7.54	0	15.03 <56>	3.72 <56>	11.77	8.99	5115	0.00	0.00
3/1/2016 9:30	43.01	67.18	25.41	7.66	11.96	6.3	0	15.62 <56>	3.60 <56>	11.39	9.44	4949	0.00	0.00
3/1/2016 9:31	47.96	69.18	30.82	9.32	13.44	8.33	0	14.42 <56>	3.91 <56>	12.3	8.49	5382	0.00	0.00
3/1/2016 9:32	49.5	72.87	30.5	9.96	14.66	8.54	0	14.72 <56>	3.75 <56>	12	8.74	5161	0.00	0.00
3/1/2016 9:33	37.38	58.13	21.45	6.89	10.72	5.5	0	15.55 <56>	3.49 <56>	11.44	9.39	4806	0.00	0.00
3/1/2016 9:34	38.04	59.73	21.85	7.4	11.62	5.91	0	15.70 <56>	3.50 <56>	11.28	9.5	4812	0.00	0.00
3/1/2016 9:35	35.58	54.48	21.18	6.85	10.49	5.67	0	15.31 <56>	3.62 <56>	11.62	9.21	4987	0.00	0.00
3/1/2016 9:36	44.43	65.62	27.44	8.83	13.04	7.59	0	14.77 <56>	3.76 <56>	11.99	8.78	5174	0.00	0.00
3/1/2016 9:37	46.16	69.09	27.89	8.73	13.07	7.34	0	14.97 <56>	3.68 <56>	11.82	8.94	5060	0.00	0.00
3/1/2016 9:38	40.48	62.46	23.49	6.91	10.66	5.58	0	15.43 <56>	3.53 <56>	11.49	9.3	4861	0.00	0.00
3/1/2016 9:39	37.38	57.93	21.69	6.24	9.67	5.04	0	15.50 <56>	3.53 <56>	11.46	9.35	4861	0.00	0.00
3/1/2016 9:40	39.16	61.65	22.45	6.1	9.6	4.87	0	15.74 <56>	3.49 <56>	11.26	9.53	4802	0.00	0.00
3/1/2016 9:41	38.13	60.78	21.75	5.65	9.01	4.48	0	15.94 <56>	3.47 <56>	11.14	9.67	4778	0.00	0.00
3/1/2016 9:42	38.12	60.28	22.03	5.46	8.63	4.39	0	15.81 <56>	3.52 <56>	11.25	9.58	4841	0.00	0.00
3/1/2016 9:43	41.34	64.4	24.48	6.26	9.75	5.16	0	15.58 <56>	3.61 <56>	11.4	9.41	4961	0.00	0.00
3/1/2016 9:44	49.81	74.49	30.89	7.5	11.22	6.47	0	14.95 <56>	3.78 <56>	11.87	8.93	5195	0.00	0.00
3/1/2016 9:45	59.82	84.85	39.39	9.65	13.69	8.84	0	14.18 <56>	4.01 <56>	12.47	8.28	5515	0.00	0.00
3/1/2016 9:46	56.58	81.81	35.15	8.93	12.91	7.72	0	14.46 <56>	3.78 <56>	12.21	8.52	5203	0.00	0.00
3/1/2016 9:47	42.97	69.17	23.68	6.67	10.74	5.11	0	16.10 <56>	3.35 <56>	11	9.78	4615	0.00	0.00
3/1/2016 9:48	32.91	53.26	18.25	5.23	8.46	4.04	0	16.18 <56>	3.38 <56>	10.98	9.84	4645	0.00	0.00
3/1/2016 9:49	30.86	50.26	17.25	5.2	8.47	4.04	0	16.29 <56>	3.40 <56>	10.9	9.91	4683	0.00	0.00
3/1/2016 9:50	35.18	55.43	20.52	5.5	8.67	4.46	0	15.76 <56>	3.55 <56>	11.27	9.54	4885	0.00	0.00
3/1/2016 9:51	38.13	60.35	22.36	5.66	8.96	4.62	0	15.83 <56>	3.57 <56>	11.23	9.59	4911	0.00	0.00
3/1/2016 9:52	49.62	74.95	30.54	7.18	10.85	6.15	0	15.11 <56>	3.75 <56>	11.71	9.05	5156	0.00	0.00
3/1/2016 9:53	51.67	78.85	31.23	6.9	10.53	5.8	0	15.26 <56>	3.68 <56>	11.6	9.17	5062	0.00	0.00
3/1/2016 9:54	50.69	75.74	31.3	7.12	10.64	6.12	0	14.94 <56>	3.76 <56>	11.86	8.92	5172	0.00	0.00
3/1/2016 9:55	55.09	78.95	35.38	9.08	13.01	8.11	0	14.33 <56>	3.91 <56>	12.32	8.41	5379	0.00	0.00
3/1/2016 9:56	50.91	75.69	30.57	8.21	12.21	6.86	0	14.87 <56>	3.66 <56>	11.89	8.86	5030	0.00	0.00
3/1/2016 9:57	42.88	67.57	24.06	7.04	11.09	5.49	0	15.76 <56>	3.41 <56>	11.21	9.54	4699	0.00	0.00
3/1/2016 9:58	32.86	54.61	17.83	5.5	9.14	4.15	0	16.62 <56>	3.30 <56>	10.7	10.13	4544	0.00	0.00
3/1/2016 9:59	31.23	49.12	18.06	5.68	8.93	4.57	0	15.73 <56>	3.52 <56>	11.29	9.52	4843	0.00	0.00
3/1/2016 10:00	30.97	51.47	17.11	5.58	9.27	4.29	0	16.62 <56>	3.36 <56>	10.68	10.13	4628	0.00	0.00
3/1/2016 10:01	38.64	59.63	23.39	6.86	10.59	5.78	0	15.43 <56>	3.69 <56>	11.48	9.3	5071	0.00	0.00
3/1/2016 10:02	47.04	69.99	29.33	8.04	11.96	6.97	0	14.88 <56>	3.79 <56>	11.91	8.87	5222	0.00	0.00
3/1/2016 10:03	50.05	74.53	31.12	8.82	13.13	7.63	0	14.89 <56>	3.78 <56>	11.87	8.88	5208	0.00	0.00
3/1/2016 10:04	45.94	68.81	28.02	7.9	11.83	6.7	0	14.98 <56>	3.71 <56>	11.81	8.95	5108	0.00	0.0
3/1/2016 10:05	45.99	68.72	27.95	8.2	12.25	6.93	0	14.94 <56>	3.70 <56>	11.85	8.92	5090	0.00	0.0
3/1/2016 10:06	49.51	73.18	30.32	9.12	13.48	7.77	0	14.78 <56>	3.73 <56>	11.97	8.79	5129	0.00	0.
3/1/2016 10:07	45.89	69.44	26.97	8.55	12.94	6.99	0	15.13 <56>	3.58 <56>	11.69	9.07	4923	0.00	0.
3/1/2016 10:08	41.62	65.24	23.64	7.83	12.27	6.19	0	15.67 <56>	3.46 <56>	11.31	9.48	4757	0.00	0.
3/1/2016 10:09	41.93	64.42	24.67	8.29	12.74	6.79	0	15.36 <56>	3.58 <56>	11.53	9.25	4928	0.00	0.
3/1/2016 10:10	43.1	63.55	26.69	9.24	13.62	7.96	0	14.74 <56>	3.77 <56>	12.02	8.76	5186	0.00	0.
3/1/2016 10:11	52.54	74.64	33.6	10.94	15.54	9.73	0	14.21 <56>	3.89 <56>	12.47	8.3	5357	0.00	0.
3/1/2016 10:12	59.77	86.63	36.57	11.46	16.61	9.76	0	14.49 <56>	3.72 <56>	12.2	8.55	5125	0.00	0.00
3/1/2016 10:13	50.8	77.32	29.04	9.95	15.14	7.91	0	15.22 <56>	3.48 <56>	11.56	9.14	4788	0.00	0.00
3/1/2016 10:14	25.53	43.23	13.33	5.63	9.53	4.09	0	16.93 <56>	3.18 <56>	10.52	10.33	4373	0.00	0.00
3/1/2016 10:15	24.62	40.14	13.58	6.29	10.25	4.83	0	16.30 <56>	3.36 <56>	10.9	9.92	4621	0.00	0.00

Average	**42.39**	**64.81**	**25.26**	**7.64**	**11.69**	**6.33**	**0.00**	**11.54**	**9.25**	**4953.83**	**0.00**	**0.00**

Flow	kdscfh	4953.83
O2	% dry	9.25
CO2	% dry	11.54
NOx	ppm dry	42.39
NOx	ppm @ 3% O2	64.81
NOx	lb/hr	25.26
SO2	ppm dry	7.64
SO2	ppm @ 3% O2	11.69
SO2	lb/hr	6.33
CO	ppm dry	0.00
CO	ppm @ 3% O2	0.00
CO	lb/hr	0.00

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 10:31	47.16	69.25	28.64	10.03	14.73	8.47	0	14.68 <56>	3.70 <56>	12.06	8.71	5086	0.00	0.00
3/1/2016 10:32	44.4	67.81	25.74	9.24	14.11	7.45	0	15.27 <56>	3.53 <56>	11.59	9.18	4856	0.00	0.00
3/1/2016 10:33	46.5	68.96	27.78	10.34	15.33	8.59	0	14.83 <56>	3.64 <56>	11.92	8.83	5004	0.00	0.00
3/1/2016 10:34	46.49	69.17	27.44	10.24	15.24	8.41	0	14.88 <56>	3.59 <56>	11.91	8.87	4944	0.00	0.00
3/1/2016 10:35	43.87	66.44	25.37	9.82	14.87	7.9	0	15.14 <56>	3.52 <56>	11.69	9.08	4844	0.00	0.00
3/1/2016 10:36	41.24	62.99	23.6	9.69	14.8	7.72	0.07	15.27 <56>	3.48 <56>	11.6	9.18	4794	0.11	0.02
3/1/2016 10:37	40.02	62.84	22.53	9.25	14.52	7.25	0.03	15.70 <56>	3.43 <56>	11.31	9.5	4716	0.05	0.01
3/1/2016 10:38	42.43	63.88	25.12	10.07	15.16	8.29	0.03	15.05 <56>	3.60 <56>	11.79	9.01	4958	0.05	0.01
3/1/2016 10:39	47.02	68.65	28.7	11.21	16.37	9.52	0	14.60 <56>	3.72 <56>	12.14	8.64	5113	0.00	0.00
3/1/2016 10:40	51.43	76.59	30.42	11.58	17.24	9.53	0.07	14.89 <56>	3.60 <56>	11.86	8.88	4955	0.10	0.03
3/1/2016 10:41	45.15	68.2	26.12	10.52	15.89	8.47	0.01	15.11 <56>	3.52 <56>	11.75	9.05	4845	0.02	0.00
3/1/2016 10:42	42.34	64.56	24.36	10.3	15.7	8.25	0.05	15.25 <56>	3.50 <56>	11.57	9.16	4820	0.08	0.02
3/1/2016 10:43	28.25	46.39	15.13	7.03	11.54	5.24	0	16.42 <56>	3.26 <56>	10.83	10	4485	0.00	0.00
3/1/2016 10:44	30.12	49.19	16.53	6.97	11.38	5.32	0.08	16.33 <56>	3.34 <56>	10.88	9.94	4596	0.13	0.03
3/1/2016 10:45	40.93	61.26	24.82	9.51	14.23	8.02	0.05	14.97 <56>	3.69 <56>	11.84	8.94	5079	0.07	0.02
3/1/2016 10:46	47.13	69.78	28.65	10.17	15.06	8.6	0.11	14.81 <56>	3.70 <56>	11.96	8.81	5091	0.16	0.04
3/1/2016 10:47	49.85	74.42	29.64	10.54	15.74	8.72	0.13	14.93 <56>	3.62 <56>	11.82	8.91	4981	0.19	0.05
3/1/2016 10:48	44.29	66.85	25.93	9.56	14.43	7.79	0.15	15.09 <56>	3.56 <56>	11.76	9.04	4904	0.23	0.05
3/1/2016 10:49	47.91	72.8	27.84	10.04	15.26	8.12	0.12	15.20 <56>	3.54 <56>	11.65	9.12	4867	0.18	0.04
3/1/2016 10:50	39.58	61.02	22.63	8.84	13.63	7.03	0.07	15.42 <56>	3.48 <56>	11.5	9.29	4788	0.11	0.02
3/1/2016 10:51	35.5	56.59	19.88	7.97	12.7	6.21	0.13	15.94 <56>	3.41 <56>	11.12	9.67	4690	0.21	0.04
3/1/2016 10:52	43.95	64.43	27.14	10.25	15.03	8.81	0.15	14.66 <56>	3.76 <56>	12.14	8.69	5172	0.22	0.06
3/1/2016 10:53	57.05	82.22	35.09	12.44	17.93	10.65	0.12	14.41 <56>	3.74 <56>	12.24	8.48	5152	0.17	0.04
3/1/2016 10:54	44.24	68.86	24.63	9.21	14.34	7.13	0.07	15.57 <56>	3.39 <56>	11.4	9.4	4663	0.11	0.02
3/1/2016 10:55	37.36	59.44	20.82	8.45	13.44	6.55	0.12	15.91 <56>	3.39 <56>	11.16	9.65	4667	0.19	0.04
3/1/2016 10:56	42.94	63.11	26.48	10.87	15.97	9.33	0.05	14.70 <56>	3.75 <56>	12.07	8.72	5165	0.07	0.02
3/1/2016 10:57	56.92	80.73	36.18	13.72	19.46	12.13	0.09	14.18 <56>	3.87 <56>	12.47	8.28	5324	0.13	0.03
3/1/2016 10:58	53.85	78.94	32.63	12.28	18	10.35	0.19	14.66 <56>	3.69 <56>	12.06	8.69	5075	0.28	0.07
3/1/2016 10:59	48.53	71.5	24.65	11.65	17.16	8.23	0.06	14.73 <56>	3.09 <56>	12.05	8.75	4255	0.09	0.02
3/1/2016 11:00														
3/1/2016 11:01	35.73	57.67	14.12	8.9	14.37	4.89	0	16.14 <56>	2.41 <56>	10.98	9.81	3310	0.00	0.00
3/1/2016 11:02	32.18	51.16	17.52	8.25	13.12	6.25	0	15.90 <56>	3.31 <56>	11.21	9.64	4560	0.00	0.00
3/1/2016 11:03	36.04	55.95	20.47	9.68	15.03	7.65	0.06	15.52 <56>	3.46 <56>	11.43	9.37	4758	0.09	0.02
3/1/2016 11:04	39.18	57.91	23.54	10.87	16.07	9.09	0.13	14.78 <56>	3.66 <56>	12	8.79	5032	0.19	0.05
3/1/2016 11:05	44.96	67.01	26.69	11.57	17.24	9.56	0.1	14.90 <56>	3.61 <56>	11.88	8.89	4972	0.15	0.04
3/1/2016 11:06	51.34	73.46	31.69	12.3	17.6	10.56	0.16	14.31 <56>	3.76 <56>	12.4	8.39	5170	0.23	0.06
3/1/2016 11:07	54.87	80.64	32.13	12.4	18.22	10.1	0.1	14.70 <56>	3.56 <56>	12	8.72	4904	0.15	0.04
3/1/2016 11:08	33.79	54.74	17.79	8.06	13.06	5.9	0.04	16.20 <56>	3.20 <56>	10.99	9.85	4410	0.06	0.01
3/1/2016 11:09	28.76	46.93	15.39	7.83	12.78	5.83	0.06	16.32 <56>	3.26 <56>	10.86	9.93	4481	0.10	0.02
3/1/2016 11:10	29.02	46.05	16.12	7.71	12.23	5.96	0.06	15.87 <56>	3.38 <56>	11.22	9.62	4652	0.10	0.02
3/1/2016 11:11	31.53	50.08	17.48	7.76	12.33	5.98	0.12	15.88 <56>	3.37 <56>	11.22	9.63	4643	0.19	0.04
3/1/2016 11:12	35.17	56.61	19.32	7.67	12.35	5.86	0.07	16.10 <56>	3.34 <56>	11.03	9.78	4602	0.11	0.02
3/1/2016 11:13	36.94	59.14	20.61	7.2	11.53	5.59	0.09	16.01 <56>	3.40 <56>	11.1	9.72	4673	0.14	0.03
3/1/2016 11:14	41.26	63.72	24	7.76	11.98	6.28	0.1	15.44 <56>	3.54 <56>	11.52	9.31	4873	0.15	0.04
3/1/2016 11:15	44.66	69.76	25.65	7.53	11.76	6.02	0.13	15.62 <56>	3.50 <56>	11.38	9.44	4810	0.20	0.05
3/1/2016 11:16	48.66	74.19	28.75	8.52	12.99	7	0.12	15.25 <56>	3.60 <56>	11.62	9.16	4949	0.18	0.04
3/1/2016 11:17	48.72	72.98	28.93	8.7	13.03	7.19	0.08	14.98 <56>	3.61 <56>	11.87	8.95	4974	0.12	0.03
3/1/2016 11:18	45.78	71.07	26.32	8.03	12.47	6.42	0.18	15.52 <56>	3.50 <56>	11.42	9.37	4816	0.28	(
3/1/2016 11:19	45.17	66.38	27.4	8.64	12.7	7.29	0.19	14.70 <56>	3.69 <56>	12.11	8.72	5081	0.28	(
3/1/2016 11:20	53.63	77.11	32.91	10.54	15.15	9	0.21	14.38 <56>	3.74 <56>	12.32	8.45	5140	0.30	[illegible]
3/1/2016 11:21	53.41	78.17	31.4	10.51	15.38	8.6	0.27	14.64 <56>	3.58 <56>	12.09	8.67	4924	0.40	[illegible]
3/1/2016 11:22	45.29	69.05	25.34	8.49	12.94	6.61	0.27	15.25 <56>	3.41 <56>	11.63	9.16	4687	0.41	[illegible]
3/1/2016 11:23	38.09	59.6	20.83	7.36	11.52	5.6	0.17	15.65 <56>	3.33 <56>	11.34	9.46	4581	0.27	[illegible]
3/1/2016 11:24	36.98	57.21	20.51	7.41	11.46	5.72	0.21	15.47 <56>	3.38 <56>	11.48	9.33	4646	0.32	[illegible]
3/1/2016 11:25	35.81	56.78	19.74	6.98	11.07	5.35	0.12	15.85 <56>	3.36 <56>	11.19	9.61	4618	0.19	[illegible]
3/1/2016 11:26	40.74	61.96	23.58	7.46	11.35	6.01	0.26	15.21 <56>	3.52 <56>	11.67	9.13	4847	0.40	[illegible]
3/1/2016 11:27	50.76	74.23	30.44	9.2	13.45	7.68	0.2	14.62 <56>	3.65 <56>	12.12	8.66	5023	0.29	0.07
3/1/2016 11:28	47.75	71.53	27.6	8.73	13.08	7.02	0.23	14.98 <56>	3.52 <56>	11.82	8.95	4841	0.34	0.08
3/1/2016 11:29	42.78	66.36	23.92	7.57	11.74	5.89	0.29	15.51 <56>	3.40 <56>	11.43	9.36	4684	0.45	0.10
3/1/2016 11:30	41.54	62.02	24.42	8.17	12.2	6.68	0.19	14.93 <56>	3.58 <56>	11.87	8.91	4925	0.28	0.07

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3/1/2016 11:31		50.28	72.88	30.27	9.37	13.58	7.85	0.29	14.49 <56>	3.66 <56>	12.22	8.55	5043		
Average		**43.12**	**65.32**	**24.99**	**9.38**	**14.22**	**7.56**	**0.11**			**11.66**	**9.13**	**4825.30**	**0.16**	**0.04**

Flow	kdscfh	4825.30
O2	% dry	9.13
CO2	% dry	11.66
NOx	ppm dry	43.12
NOx	ppm @ 3% O2	65.32
NOx	lb/hr	24.99
SO2	ppm dry	9.38
SO2	ppm @ 3% O2	14.22
SO2	lb/hr	7.56
CO	ppm dry	0.11
CO	ppm @ 3% O2	0.16
CO	lb/hr	0.04

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 11:48	39.39	63.46	21.51	8.1	13.05	6.15	0.34	16.11 <56>	3.32 <56>	11	9.79	4574	0.55	0.11
3/1/2016 11:49	48.2	72.69	28.38	10.09	15.22	8.27	0.31	15.08 <56>	3.58 <56>	11.74	9.03	4932	0.47	0.11
3/1/2016 11:50	42.22	65.32	24.15	9.1	14.08	7.24	0.27	15.47 <56>	3.48 <56>	11.46	9.33	4791	0.42	0.09
3/1/2016 11:51	48.94	71.4	29.56	11.56	16.86	9.71	0.41	14.59 <56>	3.68 <56>	12.13	8.63	5059	0.60	0.15
3/1/2016 11:52	51.9	77.16	30.24	12.68	18.85	10.28	0.48	14.87 <56>	3.55 <56>	11.86	8.86	4880	0.71	0.17
3/1/2016 11:53	43.47	67.02	24.4	9.88	15.23	7.72	0.22	15.42 <56>	3.42 <56>	11.46	9.29	4702	0.34	0.08
3/1/2016 11:54	37.9	57.25	21.89	9.52	14.38	7.65	0.4	15.11 <56>	3.52 <56>	11.74	9.05	4838	0.60	0.14
3/1/2016 11:55	46.65	68.5	27.59	11.66	17.12	9.59	0.4	14.68 <56>	3.60 <56>	12.04	8.71	4953	0.59	0.14
3/1/2016 11:56	53.64	78.44	31.67	12.52	18.31	10.29	0.35	14.62 <56>	3.59 <56>	12.05	8.66	4946	0.51	0.13
3/1/2016 11:57	48.61	73.43	27.41	11.04	16.68	8.66	0.27	15.11 <56>	3.43 <56>	11.7	9.05	4723	0.41	0.09
3/1/2016 11:58	47.88	74.46	26.37	10.4	16.17	7.97	0.4	15.55 <56>	3.35 <56>	11.39	9.39	4614	0.62	0.13
3/1/2016 11:59	42.61	64.91	24.19	10.18	15.51	8.04	0.29	15.23 <56>	3.46 <56>	11.63	9.15	4755	0.44	0.10
3/1/2016 12:00	43.16	65.42	24.51	10.21	15.47	8.07	0.4	15.16 <56>	3.46 <56>	11.69	9.09	4756	0.61	0.14
3/1/2016 12:01	50.29	74.7	29.16	12	17.83	9.68	0.39	14.85 <56>	3.53 <56>	11.89	8.85	4857	0.58	0.14
3/1/2016 12:02	39.54	60.39	22.3	9.56	14.6	7.5	0.36	15.27 <56>	3.43 <56>	11.61	9.18	4725	0.55	0.12
3/1/2016 12:03	43.11	65.23	24.52	10.9	16.49	8.63	0.3	15.13 <56>	3.46 <56>	11.67	9.07	4764	0.45	0.10
3/1/2016 12:04	40.16	61.65	22.52	9.75	14.97	7.61	0.32	15.35 <56>	3.41 <56>	11.56	9.24	4696	0.49	0.11
3/1/2016 12:05	43.49	64.66	25.63	10.68	15.88	8.76	0.34	14.87 <56>	3.59 <56>	11.92	8.86	4937	0.51	0.12
3/1/2016 12:06	55.07	78.3	34.2	13.24	18.82	11.44	0.41	14.22 <56>	3.78 <56>	12.44	8.31	5202	0.58	0.15
3/1/2016 12:07	70.96	94.44	46.76	17.15	22.82	15.72	0.59	13.31 <56>	4.01 <56>	13.28	7.45	5520	0.79	0.24
3/1/2016 12:08	63.65	95.58	34.43	14.69	22.06	11.06	0.51	15.02 <56>	3.29 <56>	11.67	8.98	4531	0.77	0.17
3/1/2016 12:09	26.58	48.2	12.25	6.6	11.97	4.23	0.28	18.14 <56>	2.80 <56>	9.75	11.03	3859	0.51	0.08
3/1/2016 12:10													0.00	0.00
3/1/2016 12:11													0.00	0.00
3/1/2016 12:12	24.29	42.88	12.75	5.31	9.37	3.88	0.33	17.65 <56>	3.19 <56>	10.02	10.76	4396	0.58	0.11
3/1/2016 12:13	24.04	42.95	12.62	4.24		3.1	0.34	17.86 <56>	3.20 <56>	10	10.88	4397	0.61	0.11
3/1/2016 12:14	34.38	57.09	19.39	5.99	9.95	4.7	0.64	16.60 <56>	3.43 <56>	10.67	10.12	4723	1.06	0.22
3/1/2016 12:15	37.45	63.6	20.82	5.59	9.49	4.32	0.4	16.98 <56>	3.38 <56>	10.49	10.36	4656	0.68	0.14
3/1/2016 12:16	53.45	81.7	32.63	9.11	13.93	7.74	0.47	15.29 <56>	3.72 <56>	11.57	9.19	5114	0.72	0.17
3/1/2016 12:17	53.41	84.53	30.81	8.83	13.97	7.09	0.55	15.83 <56>	3.51 <56>	11.16	9.59	4832	0.87	0.19
Average	**44.80**	**68.41**	**25.81**	**10.02**	**15.52**	**8.04**	**0.38**			**11.49**	**9.28**	**4776.14**	**0.55**	**0.13**

Flow	kdscfh	4776.14
O2	% dry	9.28
CO2	% dry	11.49
NOx	ppm dry	44.80
NOx	ppm @ 3% O2	68.41
NOx	lb/hr	25.81
SO2	ppm dry	10.02
SO2	ppm @ 3% O2	15.52
SO2	lb/hr	8.04
CO	ppm dry	0.38
CO	ppm @ 3% O2	0.55
CO	lb/hr	0.13

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 12:30	47.55	72.25	26.26	10.5	15.96	8.07	0.51	15.20 <56>	3.36 <56>	11.64	9.12	4626	1.44	-0.01
3/1/2016 12:31	41.18	63.38	22.56	9.82	15.11	7.49	0.61	15.39 <56>	3.33 <56>	11.47	9.27	4589	1.57	-0.01
3/1/2016 12:32	36.91	57.96	19.92	8.99	14.12	6.75	0.63	15.70 <56>	3.28 <56>	11.28	9.5	4520	1.28	-0.01
3/1/2016 12:33	36.26	56.59	19.98	8.74	13.64	6.7	0.58	15.61 <56>	3.35 <56>	11.32	9.43	4615	1.55	-0.01
3/1/2016 12:34	46.79	69.45	27.27	10.8	16.03	8.76	0.54	14.84 <56>	3.55 <56>	11.92	8.84	4882	1.5	-0.01
3/1/2016 12:35	45.97	68.34	26.24	10.57	15.71	8.39	0.69	14.87 <56>	3.47 <56>	11.87	8.86	4781	1.36	-0.01
3/1/2016 12:36	45.7	68.97	25.7	10.23	15.44	8	0.57	15.09 <56>	3.42 <56>	11.67	9.04	4710	1.5	-0.01
3/1/2016 12:37	42.66	66	23.15	9.6	14.85	7.25	0.63	15.47 <56>	3.30 <56>	11.41	9.33	4546	1.37	-0.01
3/1/2016 12:38	34.88	55.9	18.43	7.71	12.36	5.67	0.6	16.03 <56>	3.22 <56>	11.05	9.73	4425	1.34	-0.01
3/1/2016 12:39	33.52	53.1	18.17	7.47	11.83	5.63	0.64	15.84 <56>	3.30 <56>	11.19	9.6	4541	1.35	-0.01
3/1/2016 12:40	42.14	65.48	23.6	8.56	13.3	6.67	0.65	15.54 <56>	3.41 <56>	11.41	9.38	4690	1.49	-0.01
3/1/2016 12:41	52.79	78.35	31.12	10.73	15.93	8.8	0.7	14.84 <56>	3.59 <56>	11.89	8.84	4937	1.64	-0.01
3/1/2016 12:42	49.29	75.09	27.88	9.55	14.55	7.51	0.76	15.23 <56>	3.44 <56>	11.6	9.15	4737	1.43	-0.01
3/1/2016 12:43	42.79	67.13	23.58	8.61	13.51	6.6	0.65	15.69 <56>	3.35 <56>	11.27	9.49	4616	1.53	-0.01
3/1/2016 12:44	43.63	66.58	24.91	8.87	13.54	7.05	0.74	15.26 <56>	3.48 <56>	11.6	9.17	4783	1.49	-0.01
3/1/2016 12:45	50.44	74.8	29.51	10.34	15.33	8.42	0.78	14.83 <56>	3.56 <56>	11.9	8.83	4901	1.76	-0.01
3/1/2016 12:46	48.46	74.65	27.02	9.44	14.54	7.32	0.85	15.40 <56>	3.39 <56>	11.45	9.28	4671	1.43	-0.01
3/1/2016 12:47	42.12	66.37	23.24	8.22	12.95	6.31	0.8	15.76 <56>	3.36 <56>	11.22	9.54	4622	1.67	-0.01
3/1/2016 12:48	51.86	76.4	30.66	10.39	15.31	8.55	0.78	14.73 <56>	3.60 <56>	12.02	8.75	4952	1.43	-0.01
3/1/2016 12:49	53.39	78.59	31.18	10.68	15.72	8.68	0.78	14.72 <56>	3.55 <56>	11.97	8.74	4891	1.37	-0.01
3/1/2016 12:50	47.79	72.74	26.86	8.99	13.68	7.03	0.77	15.22 <56>	3.42 <56>	11.61	9.14	4707	1.32	-0.01
3/1/2016 12:51	42.89	66.18	23.54	8.43	13.01	6.44	0.78	15.43 <56>	3.34 <56>	11.44	9.3	4597	1.56	-0.01
3/1/2016 12:52	39.36	61.59	21.55	7.34	11.48	5.59	0.77	15.65 <56>	3.33 <56>	11.31	9.46	4586	1.51	-0.01
3/1/2016 12:53	40.51	63.44	22.1	7.53	11.79	5.72	0.74	15.66 <56>	3.32 <56>	11.3	9.47	4570	1.3	-0.01
3/1/2016 12:54	43.92	67.19	24.77	8.39	12.84	6.58	0.93	15.30 <56>	3.43 <56>	11.59	9.2	4724	1.64	-0.01
3/1/2016 12:55	48.43	72.97	27.74	8.93	13.46	7.12	0.8	15.07 <56>	3.49 <56>	11.72	9.02	4798	1.57	-0.01
3/1/2016 12:56	52.92	78.68	30.57	9.33	13.87	7.5	0.75	14.87 <56>	3.52 <56>	11.86	8.86	4838	1.68	-0.01
3/1/2016 12:57	38.67	61.15	20.94	7.16	11.32	5.39	0.81	15.81 <56>	3.30 <56>	11.21	9.58	4535	1.29	-0.01
3/1/2016 12:58	37.82	59.44	20.96	7.14	11.22	5.5	0.66	15.72 <56>	3.37 <56>	11.29	9.51	4641	1.45	-0.01
3/1/2016 12:59	49.42	72.1	29.57	9.28	13.54	7.73	0.77	14.59 <56>	3.64 <56>	12.11	8.63	5012	1.78	-0.01
3/1/2016 13:00	51.47	74.12	31.23	10.18	14.66	8.59	0.79	14.40 <56>	3.69 <56>	12.26	8.47	5082		
Average	**44.34**	**67.70**	**24.97**	**9.08**	**13.86**	**7.11**	**0.71**			**11.55**	**9.20**	**4701.43**	**1.49**	**-0.01**

Flow	kdscfh	4701.43
O2	% dry	9.20
CO2	% dry	11.55
NOx	ppm dry	44.34
NOx	ppm @ 3% O2	67.70
NOx	lb/hr	24.97
SO2	ppm dry	9.08
SO2	ppm @ 3% O2	13.86
SO2	lb/hr	7.11
CO	ppm dry	0.71
CO	ppm @ 3% O2	1.49
CO	lb/hr	-0.01

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 13:16	47.44	72.27	26.13	9.11	13.88	6.98	0.79	15.23 <56>	3.35 <56>	11.56	9.15	4614	1.20	0.26
3/1/2016 13:17	41.2	62.92	22.75	8.75	13.36	6.72	0.87	15.27 <56>	3.36 <56>	11.54	9.18	4625	1.33	0.29
3/1/2016 13:18	41.7	62.36	23.61	9.26	13.85	7.29	0.88	14.95 <56>	3.45 <56>	11.81	8.93	4742	1.32	0.30
3/1/2016 13:19	43.89	66.98	24.36	9.32	14.22	7.2	0.92	15.26 <56>	3.38 <56>	11.55	9.17	4648	1.40	0.31
3/1/2016 13:20	51.56	76.09	30.09	9.92	14.64	8.05	0.89	14.76 <56>	3.55 <56>	11.94	8.77	4888	1.31	0.32
3/1/2016 13:21	54.65	78.51	32.34	10.81	15.53	8.9	0.99	14.37 <56>	3.60 <56>	12.25	8.44	4957	1.42	0.36
3/1/2016 13:22	51.24	76.24	28.74	10.14	15.09	7.91	0.97	14.88 <56>	3.41 <56>	11.79	8.87	4698	1.44	0.33
3/1/2016 13:23	39.69	60.93	21.64	8.39	12.88	6.36	0.79	15.35 <56>	3.32 <56>	11.5	9.24	4566	1.21	0.26
3/1/2016 13:24	36.55	56.5	19.82	8.11	12.54	6.12	0.99	15.46 <56>	3.30 <56>	11.41	9.32	4541	1.53	0.33
3/1/2016 13:25	36.08	56.36	19.47	7.65	11.95	5.74	0.94	15.62 <56>	3.29 <56>	11.31	9.44	4521	1.47	0.31
3/1/2016 13:26	35.33	55.92	19.05	7.4	11.71	5.55	0.95	15.83 <56>	3.28 <56>	11.15	9.59	4517	1.50	0.31
3/1/2016 13:27	39.73	61.15	22.03	7.81	12.02	6.02	0.95	15.39 <56>	3.37 <56>	11.48	9.27	4644	1.46	0.32
3/1/2016 13:28	41.81	66.17	22.71	7.57	11.98	5.72	1.07	15.83 <56>	3.31 <56>	11.14	9.59	4549	1.69	0.35
3/1/2016 13:29	40.15	64	21.91	6.93	11.05	5.26	0.74	15.94 <56>	3.32 <56>	11.1	9.67	4571	1.18	0.25
3/1/2016 13:30	41.68	64.1	23.44	7.61	11.7	5.95	1.01	15.38 <56>	3.42 <56>	11.49	9.26	4711	1.55	0.35
3/1/2016 13:31	46.06	72.32	25.42	8.3	13.03	6.37	0.98	15.70 <56>	3.36 <56>	11.22	9.5	4623	1.54	0.33
3/1/2016 13:32	49.04	73.7	28.3	8.55	12.85	6.86	1.03	15.03 <56>	3.51 <56>	11.76	8.99	4833	1.55	0.36
3/1/2016 13:33	45.36	71.04	25.24	7.85	12.29	6.08	0.94	15.66 <56>	3.39 <56>	11.27	9.47	4660	1.47	0.32
3/1/2016 13:34	55.2	77.8	34.39	11.13	15.69	9.65	1	14.09 <56>	3.79 <56>	12.55	8.2	5219	1.41	0.38
3/1/2016 13:35	64.53	91.67	38.51	12.95	18.4	10.75	1.07	14.21 <56>	3.63 <56>	12.37	8.3	4999	1.52	0.39
3/1/2016 13:36	48.79	77.7	25.54	8.49	13.52	6.18	1	15.93 <56>	3.19 <56>	11.08	9.66	4385	1.59	0.32
3/1/2016 13:37	44.91	69.18	24.73	8.48	13.06	6.5	1.06	15.40 <56>	3.35 <56>	11.48	9.28	4613	1.63	0.36
3/1/2016 13:38	50.97	74	29.74	10.72	15.56	8.7	1.12	14.52 <56>	3.55 <56>	12.15	8.57	4888	1.63	0.40
3/1/2016 13:39	51.34	78.88	28.13	10.4	15.98	7.93	1.03	15.36 <56>	3.33 <56>	11.45	9.25	4589	1.58	0.34
3/1/2016 13:40	51.02	78.12	28.23	10.03	15.36	7.72	1	15.31 <56>	3.37 <56>	11.51	9.21	4635	1.53	0.34
3/1/2016 13:41	48.28	72.44	27.49	10.02	15.03	7.94	1.03	15.00 <56>	3.47 <56>	11.79	8.97	4770	1.55	0.36
3/1/2016 13:42	59.33	86.91	34.59	12.39	18.15	10.05	1.13	14.65 <56>	3.55 <56>	11.99	8.68	4883	1.66	0.40
3/1/2016 13:43	52.91	78.73	29.87	11.18	16.64	8.78	0.99	14.88 <56>	3.44 <56>	11.82	8.87	4729	1.47	0.34
3/1/2016 13:44	41.99	66.4	22.22	9.07	14.34	6.68	1.07	15.81 <56>	3.22 <56>	11.17	9.58	4433		
3/1/2016 13:45	39.67	62.4	21.27	9.26	14.57	6.91	1.09	15.73 <56>	3.26 <56>	11.2	9.52	4492		
Average	**46.40**	**70.39**	**26.06**	**9.25**	**14.03**	**7.23**	**0.98**			**11.59**	**9.13**	**4684.77**	**1.47**	**0.33**

Flow	kdscfh	4684.77
O2	% dry	9.13
CO2	% dry	11.59
NOx	ppm dry	46.40
NOx	ppm @ 3% O2	70.39
NOx	lb/hr	26.06
SO2	ppm dry	9.25
SO2	ppm @ 3% O2	14.03
SO2	lb/hr	7.23
CO	ppm dry	0.98
CO	ppm @ 3% O2	1.47
CO	lb/hr	0.33

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 14:26	40.06	59.81	22.95	8.85	13.21	7.05	1.12	14.93 <56>	3.49 <56>	11.78	8.91	4798	1.67	0.39
3/1/2016 14:27	46.83	70.68	26.66	9.82	14.82	7.78	1.12	15.09 <56>	3.47 <56>	11.61	9.04	4769	1.69	0.39
3/1/2016 14:28	46.97	68.8	27.7	9.62	14.09	7.89	1.03	14.65 <56>	3.59 <56>	12	8.68	4939	1.51	0.37
3/1/2016 14:29	52.92	75.36	32.03	11.15	15.88	9.39	1.16	14.24 <56>	3.68 <56>	12.32	8.33	5070	1.65	0.43
3/1/2016 14:30	46.46	70.18	25.83	9.29	14.03	7.19	1.21	15.11 <56>	3.38 <56>	11.62	9.05	4657	1.83	0.41
3/1/2016 14:31	45.97	69.26	25.66	9.17	13.82	7.12	1.05	15.07 <56>	3.40 <56>	11.66	9.02	4675	1.58	0.36
3/1/2016 14:32	38.91	59.94	21.29	8.25	12.71	6.28	1.04	15.40 <56>	3.33 <56>	11.44	9.28	4582	1.60	0.35
3/1/2016 14:33	46.9	70.96	26.19	9.4	14.22	7.3	1.06	15.13 <56>	3.40 <56>	11.59	9.07	4677	1.60	0.36
3/1/2016 14:34	36.11	56.95	19.37	7.85	12.38	5.86	1.01	15.77 <56>	3.26 <56>	11.15	9.55	4492	1.59	0.33
3/1/2016 14:35	33.28	52.76	17.87	7.24	11.48	5.41	0.96	15.85 <56>	3.27 <56>	11.11	9.61	4497	1.52	0.31
3/1/2016 14:36	34.65	55.58	18.63	7.13	11.44	5.33	0.96	16.04 <56>	3.27 <56>	11	9.74	4503	1.54	0.31
3/1/2016 14:37	44.45	67.37	25.57	8.86	13.43	7.09	1.06	15.16 <56>	3.50 <56>	11.6	9.09	4818	1.61	0.37
3/1/2016 14:38	50.73	75.42	29.62	9.58	14.24	7.78	1	14.87 <56>	3.55 <56>	11.8	8.86	4891	1.49	0.36
3/1/2016 14:39	45.93	72.18	25.12	8.32	13.08	6.33	1.07	15.72 <56>	3.33 <56>	11.18	9.51	4581	1.68	0.36
3/1/2016 14:40	42.16	66.26	23.21	7.73	12.15	5.92	1.13	15.72 <56>	3.35 <56>	11.2	9.51	4612	1.78	0.38
3/1/2016 14:41	41.37	64.67	22.99	7.86	12.29	6.08	1.18	15.63 <56>	3.38 <56>	11.27	9.45	4654	1.84	0.40
3/1/2016 14:42	44.03	69.26	24.39	8.29	13.04	6.39	1.12	15.73 <56>	3.37 <56>	11.17	9.52	4639	1.76	0.38
3/1/2016 14:43	42.37	66.18	23.72	7.49	11.7	5.83	1.07	15.62 <56>	3.41 <56>	11.27	9.44	4690	1.67	0.36
3/1/2016 14:44	43.34	67.75	24.24	7.65	11.96	5.95	1.15	15.63 <56>	3.40 <56>	11.28	9.45	4685	1.80	0.39
3/1/2016 14:45	45.23	69.26	25.9	7.66	11.73	6.1	1.28	15.31 <56>	3.49 <56>	11.52	9.21	4796	1.96	0.45
3/1/2016 14:46	45.73	68.5	26.96	7.85	11.76	6.44	1.1	14.98 <56>	3.59 <56>	11.75	8.95	4938	1.65	0.39
3/1/2016 14:47	50.96	73.62	30.92	9.01	13.02	7.61	1.25	14.45 <56>	3.69 <56>	12.18	8.51	5083	1.81	0.46
3/1/2016 14:48	52.96	77.9	31.06	9.77	14.37	7.97	1.28	14.71 <56>	3.57 <56>	11.92	8.73	4913	1.88	0.46
3/1/2016 14:49	47.02	72.12	26.1	8.23	12.62	6.36	1.09	15.34 <56>	3.38 <56>	11.46	9.23	4649	1.67	0.37
3/1/2016 14:50	39.73	62.33	21.57	6.86	10.76	5.18	1.21	15.69 <56>	3.31 <56>	11.27	9.49	4548	1.90	0.40
3/1/2016 14:51	40.2	64.13	21.75	7.1	11.33	5.34	1.21	15.95 <56>	3.29 <56>	11.02	9.68	4531	1.93	0.40
3/1/2016 14:52	35.66	56.89	19.35	6.36	10.15	4.8	1.13	15.95 <56>	3.30 <56>	11.05	9.68	4545	1.80	0.37
3/1/2016 14:53	38.31	60.1	21.34	6.45	10.12	5	1.3	15.69 <56>	3.39 <56>	11.27	9.49	4666	2.04	0.44
3/1/2016 14:54	47.05	70.24	27.89	8.25	12.32	6.81	1.23	14.93 <56>	3.61 <56>	11.78	8.91	4966	1.84	0.44
3/1/2016 14:55	53.01	76.28	32.68	9.01	12.96	7.73	1.38	14.39 <56>	3.75 <56>	12.26	8.46	5163	1.99	0.52
Average	**43.98**	**67.02**	**24.95**	**8.34**	**12.70**	**6.58**	**1.13**			**11.52**	**9.18**	**4734.23**	**1.73**	**0.39**

Flow	kdscfh	4734.23
O2	% dry	9.18
CO2	% dry	11.52
NOx	ppm dry	43.98
NOx	ppm @ 3% O2	67.02
NOx	lb/hr	24.95
SO2	ppm dry	8.34
SO2	ppm @ 3% O2	12.70
SO2	lb/hr	6.58
CO	ppm dry	1.13
CO	ppm @ 3% O2	1.73
CO	lb/hr	0.39

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 15:10	42.53	65.29	24.02	8.86	13.6	6.96	1.47	15.35 <56>	3.44 <56>	11.47	9.24	4730	2.26	0.51
3/1/2016 15:11	43.51	67.14	24.63	9.05	13.97	7.13	1.4	15.43 <56>	3.45 <56>	11.42	9.3	4741	2.16	0.48
3/1/2016 15:12	48.17	71.14	28.5	10.13	14.96	8.34	1.57	14.77 <56>	3.60 <56>	11.91	8.78	4956	2.32	0.57
3/1/2016 15:13	54.66	81.47	31.6	10.35	15.43	8.33	1.54	14.90 <56>	3.52 <56>	11.76	8.89	4843	2.30	0.54
3/1/2016 15:14	42.9	69.56	22.7	7.82	12.68	5.76	1.36	16.21 <56>	3.22 <56>	10.81	9.86	4433	2.21	0.44
3/1/2016 15:15	34.17	54.66	18.72	6.81	10.89	5.19	1.31	16.00 <56>	3.34 <56>	11.05	9.71	4590	2.10	0.44
3/1/2016 15:16	44.96	65.11	27.48	9.86	14.28	8.39	1.53	14.48 <56>	3.72 <56>	12.15	8.54	5120	2.22	0.57
3/1/2016 15:17	57.55	82.08	35.47	11.88	16.94	10.19	1.68	14.26 <56>	3.75 <56>	12.29	8.35	5162	2.40	0.63
3/1/2016 15:18	51.94	75.4	30.62	10.34	15.01	8.48	1.54	14.52 <56>	3.59 <56>	12.09	8.57	4938	2.24	0.55
3/1/2016 15:19	43.86	69.6	23.59	8.64	13.71	6.47	1.49	15.87 <56>	3.27 <56>	11.03	9.62	4505	2.36	0.49
3/1/2016 15:20	36.78	56.66	20.55	8.27	12.74	6.43	1.55	15.40 <56>	3.40 <56>	11.44	9.28	4680	2.39	0.53
3/1/2016 15:21	35.29	53.17	20.11	8.5	12.81	6.74	1.56	15.07 <56>	3.47 <56>	11.68	9.02	4773	2.35	0.54
3/1/2016 15:22	38.28	61.29	20.54	7.96	12.74	5.94	1.5	16.01 <56>	3.27 <56>	10.99	9.72	4495	2.40	0.49
3/1/2016 15:23	36.81	57.1	20.83	7.77	12.05	6.12	1.52	15.51 <56>	3.44 <56>	11.35	9.36	4740	2.36	0.52
3/1/2016 15:24	45.25	65.74	27.48	10.56	15.34	8.92	1.54	14.53 <56>	3.70 <56>	12.13	8.58	5086	2.24	0.57
3/1/2016 15:25	58.31	83.57	35.57	13.31	19.08	11.3	1.66	14.33 <56>	3.71 <56>	12.22	8.41	5110	2.38	0.62
3/1/2016 15:26	52.53	76.26	31.12	11.68	16.96	9.63	1.47	14.52 <56>	3.61 <56>	12.09	8.57	4962	2.13	0.53
3/1/2016 15:27	51.34	75.27	29.72	11.4	16.71	9.18	1.51	14.66 <56>	3.52 <56>	11.97	8.69	4849	2.21	0.53
3/1/2016 15:28	45.25	68.47	25.11	10.57	15.99	8.16	1.59	15.13 <56>	3.38 <56>	11.57	9.07	4648	2.41	0.54
3/1/2016 15:29	39.8	61.9	21.68	9.07	14.11	6.87	1.37	15.55 <56>	3.32 <56>	11.33	9.39	4563	2.13	0.45
3/1/2016 15:30	45.94	69.22	26.22	10.39	15.65	8.25	1.57	15.07 <56>	3.47 <56>	11.63	9.02	4780	2.37	0.55
3/1/2016 15:31	48.13	72.09	27.58	10.67	15.98	8.51	1.51	14.98 <56>	3.49 <56>	11.69	8.95	4800	2.26	0.53
3/1/2016 15:32	46.2	70.38	25.93	9.98	15.2	7.79	1.39	15.23 <56>	3.42 <56>	11.56	9.15	4701	2.12	0.47
3/1/2016 15:33	44.06	67.35	24.82	9.85	15.06	7.72	1.49	15.29 <56>	3.43 <56>	11.49	9.19	4718	2.28	0.51
3/1/2016 15:34	40.73	61.68	23.14	9.1	13.78	7.19	1.38	15.14 <56>	3.46 <56>	11.6	9.08	4759	2.09	0.48
3/1/2016 15:35	39.8	61.31	22.13	9.16	14.11	7.09	1.44	15.40 <56>	3.38 <56>	11.37	9.28	4658	2.22	0.49
3/1/2016 15:36	33.05	53.93	17.64	7.18	11.72	5.33	1.37	16.32 <56>	3.25 <56>	10.79	9.93	4470	2.24	0.45
3/1/2016 15:37	42.77	64.12	25.28	8.83	13.24	7.26	1.54	14.99 <56>	3.60 <56>	11.72	8.96	4951	2.31	0.55
3/1/2016 15:38	48.35	71.23	28.95	9.68	14.26	8.06	1.53	14.73 <56>	3.64 <56>	11.94	8.75	5015	2.25	0.56
3/1/2016 15:39	56.65	82.37	34.12	10.97	15.95	9.19	1.54	14.54 <56>	3.67 <56>	12.05	8.59	5045	2.24	0.56
Average	**44.99**	**67.82**	**25.86**	**9.62**	**14.50**	**7.70**	**1.50**			**11.62**	**9.06**	**4794.03**	**2.26**	**0.52**

Flow	kdscfh	4794.03
O2	% dry	9.06
CO2	% dry	11.62
NOx	ppm dry	44.99
NOx	ppm @ 3% O2	67.82
NOx	lb/hr	25.86
SO2	ppm dry	9.62
SO2	ppm @ 3% O2	14.50
SO2	lb/hr	7.70
CO	ppm dry	1.50
CO	ppm @ 3% O2	2.26
CO	lb/hr	0.52

CeDAR 1-Minute Data

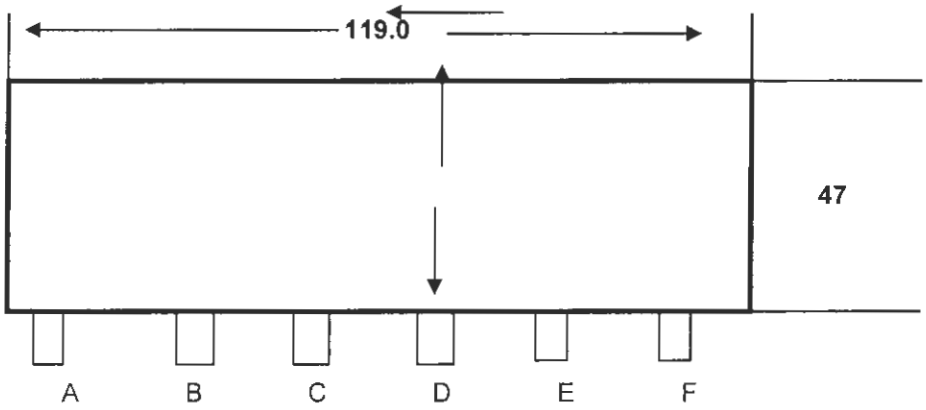
Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/1/2016 15:54	44.76	68.48	25.82	7.88	12.06	6.32	1.62	15.30 <56>	3.51 <56>	11.47	9.2	4832		
3/1/2016 15:55	37.61	58.8	21.13	7.18	11.22	5.61	1.46	15.63 <56>	3.42 <56>	11.19	9.45	4706	2.28	0.50
3/1/2016 15:56	38.08	59.53	21.5	7.28	11.38	5.72	1.53	15.63 <56>	3.44 <56>	11.27	9.45	4729	2.39	0.53
3/1/2016 15:57	41.63	64.29	23.79	7.96	12.29	6.33	1.64	15.44 <56>	3.48 <56>	11.36	9.31	4786	2.53	0.57
3/1/2016 15:58	43.03	66.17	24.81	9.01	13.86	7.23	1.66	15.38 <56>	3.51 <56>	11.36	9.26	4829	2.55	0.58
3/1/2016 15:59	39.42	60	22.89	8.63	13.14	6.97	1.64	15.22 <56>	3.53 <56>	11.54	9.14	4863	2.50	0.58
3/1/2016 16:00	41.63	64.69	23.58	8.68	13.49	6.84	1.68	15.54 <56>	3.45 <56>	11.26	9.38	4745	2.61	0.58
3/1/2016 16:01	44	67.72	25.03	8.79	13.53	6.96	1.57	15.39 <56>	3.46 <56>	11.43	9.27	4765	2.42	0.54
3/1/2016 16:02	45.07	70.15	25.47	8.82	13.73	6.94	1.64	15.57 <56>	3.44 <56>	11.24	9.4	4734	2.55	0.56
3/1/2016 16:03	39.03	62.38	21.58	7.42	11.86	5.71	1.7	15.98 <56>	3.37 <56>	11.01	9.7	4631	2.72	0.57
3/1/2016 16:04	41.81	63.69	24.69	8.53	12.99	7.01	1.74	15.23 <56>	3.60 <56>	11.54	9.15	4947	2.65	0.63
3/1/2016 16:05	53.06	75.26	33.06	11.72	16.62	10.16	1.7	14.18 <56>	3.79 <56>	12.34	8.28	5219	2.41	0.64
3/1/2016 16:06	51.25	78.27	29.05	10.24	15.64	8.07	1.53	15.27 <56>	3.45 <56>	11.44	9.18	4747	2.34	0.53
3/1/2016 16:07	45.54	69.43	25.98	8.12	12.38	6.44	1.58	15.25 <56>	3.47 <56>	11.51	9.16	4778	2.41	0.55
3/1/2016 16:08	43.34	67.28	24.42	7.93	12.31	6.22	1.59	15.52 <56>	3.43 <56>	11.25	9.37	4720	2.47	0.55
3/1/2016 16:09	43.42	65.87	25.04	8.73	13.24	7	1.58	15.17 <56>	3.51 <56>	11.59	9.1	4830	2.40	0.55
3/1/2016 16:10	41.03	62.77	23.45	9.01	13.78	7.16	1.76	15.30 <56>	3.48 <56>	11.46	9.2	4787	2.69	0.61
3/1/2016 16:11	48.31	70.25	29.38	10.67	15.52	9.03	1.63	14.54 <56>	3.70 <56>	12.02	8.59	5094	2.37	0.60
3/1/2016 16:12	48.45	70.45	29.18	10.57	15.37	8.86	1.7	14.54 <56>	3.67 <56>	12.04	8.59	5044	2.47	0.62
3/1/2016 16:13	50.7	73.42	30.25	10.49	15.19	8.71	1.63	14.48 <56>	3.63 <56>	12.08	8.54	4998	2.36	0.59
3/1/2016 16:14	47.2	69.37	27.5	9.45	13.89	7.66	1.58	14.70 <56>	3.55 <56>	11.89	8.72	4881	2.32	0.56
3/1/2016 16:15	44.39	66.49	25.1	8.77	13.14	6.9	1.58	14.98 <56>	3.44 <56>	11.67	8.95	4737	2.37	0.54
3/1/2016 16:16	34.98	56.51	18.48	7.01	11.32	5.15	1.62	16.16 <56>	3.22 <56>	10.87	9.82	4425	2.62	0.52
3/1/2016 16:17	35.08	54.75	19.39	7.06	11.02	5.43	1.57	15.61 <56>	3.36 <56>	11.25	9.43	4630	2.45	0.53
3/1/2016 16:18	34.67	55.66	18.79	7.31	11.74	5.51	1.62	16.05 <56>	3.30 <56>	10.86	9.75	4539	2.60	0.53
3/1/2016 16:19	40.6	63.42	22.9	8.2	12.81	6.43	1.54	15.62 <56>	3.43 <56>	11.27	9.44	4724	2.41	0.53
3/1/2016 16:20	44.21	67.41	25.55	9.22	14.06	7.41	1.51	15.25 <56>	3.52 <56>	11.48	9.16	4841	2.30	0.53
3/1/2016 16:21	43.45	66.47	24.97	8.85	13.54	7.08	1.5	15.30 <56>	3.50 <56>	11.46	9.2	4813	2.29	0.52
3/1/2016 16:22	44.86	68.4	25.7	8.9	13.57	7.09	1.58	15.25 <56>	3.49 <56>	11.48	9.16	4798	2.41	0.55
3/1/2016 16:23	38.42	60.81	21.3	7.41	11.73	5.72	1.43	15.83 <56>	3.37 <56>	11.09	9.59	4644	2.26	0.48
Average	**42.97**	**65.61**	**24.66**	**8.66**	**13.21**	**6.92**	**1.60**			**11.46**	**9.20**	**4793.87**	**2.45**	**0.56**

Flow	kdscfh	4793.87
O2	% dry	9.20
CO2	% dry	11.46
NOx	ppm dry	42.97
NOx	ppm @ 3% O2	65.61
NOx	lb/hr	24.66
SO2	ppm dry	8.66
SO2	ppm @ 3% O2	13.21
SO2	lb/hr	6.92
CO	ppm dry	1.60
CO	ppm @ 3% O2	2.45
CO	lb/hr	0.56

Method 1

Client: Desert View Power Date: 3/2/2016

Sample Location: Unit 1-2 Prepared By: Dave Wonderly



H (in.)	**119.0**
W (in.)	**47.0**
Nipple length	**13.0**
Distance between points	**9.40**
Stack Area (ft^2)	**38.84**

Point No.	Sample Point Inches from nozzle	
1	4.7	17.7
2	14.1	27.1
3	23.5	36.5
4	32.9	45.9
5	42.3	55.3

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 1-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.74 X ΔP: 1.84
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight:

AMBIENT TEMPERATURE: 85°
BAROMETRIC PRESSURE: 30.06
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2857
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER ~~MM~~ SS
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	931.6	692.7	238.9
2	DI-H2O	777.1	759.5	17.6
3	Empty	713.0	712.7	0.3
4	Silica Gel	927.7	906.2	21.5
Total:				278.3

Point	Time	Meter Volume, ft³	ΔP in. H2O	ΔH in. H2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O2 %	Pstatic in. H2O
* 5	0835	470.570	0.75	~~1.30~~ 1.31	340	251	260	60	78	77	5		0.50
4	0839	473.450	0.75	1.31	340	256	251	51	82	74	5		
3	0843	476.050	0.78	1.36	340	254	255	50	84	78	5		
2	0847	478.725	0.80	1.39	340	255	256	50	84	78	5		
1	0851	481.150	0.95	1.65	339	255	245	51	85	80	5		
BEND	0855	484.235											
5	0857	484.235	1.00	1.74	339	251	251	55	85	80	5		
4	0901	487.220	1.00	1.74	339	254	245	52	85	82	5		
3	0905	490.280	0.96	1.67	339	251	245	52	86	83	5		
* 2	0909	493.250	0.70	1.26	340	250	251	52	86	83	5		
1	0913	495.770	0.70	1.26	340	250	255	52	86	83	5		
BEND	0917	498.340			~~3~~								
5	0919	498.340	0.75	1.35	340	255	260	52	88	84	5		
4	0923	501.050	0.68	1.22	340	251	246	54	87	83	5		
3	0927	503.700	0.72	1.30	340	254	245	54	87	83	5		
2	0931	506.300	0.78	1.40	339	255	245	54	86	82	5		
1	0935	508.900	0.80	1.44	339	256	251	54	86	82			
Average	0939	511.850											

Comments: * Changed Factor to 1.8 [illegible] 3/2/16

C.2.2-2

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Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 1-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.8 X ΔP: *1.86
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 90°
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2857
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	= Difference
1	DI-H2O			
2	DI-H2O			
3	Empty			
4	Silica Gel			
		SEE Page 1		
Total:				

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
D 5	0941	511.850	0.85	1.53	340	255	260	55	87	83	5		+.50
4	0945	514.600	0.92	1.62	340	260	255	55	89	86	5		
3	0949	517.510	0.83	1.49	343	261	256	56	89	86	5		
* 2	0953	520.350	0.78	1.45	345	261	256	56	89	86	5		
1	0957	523.200	0.75	1.40	344	256	247	55	90	87	5		
END	1001	529.850											
E 5	1003	529.850	1.1	2.05	344	258	252	55	90	87	5		
4	1007	529.123	1.0	~~1.91~~ 1.86	344	260	253	55	91	88	5		
3	1011	532.221	.95	~~1.78~~ 1.77	345	254	254	55	92	89	5		
2	1015	535.350	1.0	1.86	346	259	246	57	93	89	5		
1	1019	538.240	1.1	2.05	345	259	247	57	93	89	5		
END	1023	541.265											
F 5	1025	541.265	1.0	1.86	346	260	241	57	93	89	5		
4	1029	544.400	1.1	2.05	346	263	246	57	93	90	5		
3	1033	547.575	1.1	2.05	347	259	247	58	95	92	5		
2	1037	550.825	1.2	2.23	347	258	246	58	95	92	5		
1	1041	554.085	1.0	1.86	347	258	246	59	95	92	5		
Average:	1045	557.435											

Comments: * Changed Factor To 1.86 [signature] 3/2/16

C.2.2-3

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Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 2-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 1.86 X ΔP: *
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: ✓

AMBIENT TEMPERATURE: 90°
BAROMETRIC PRESSURE: 30.06
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG 83-2855
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	946.7	728.3	218.4
2	DI-H2O	726.0	714.9	11.1
3	Empty	675.1	672.5	2.6
4	Silica Gel	927.8	905.0	22.8
Total:				255.2

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
A 5	1103	558.700	0.72	1.34	344	254	260	60	95	94	3.0		1.50
4	1107	561.100	0.75	1.40	345	255	259	60	95	93	3.0		
3	1111	563.900	0.75	1.40	346	256	258	59	96	93	3.0		
2	1115	566.650	0.80	1.50	345	256	259	52	98	94	3.0		
1	1119	569.350	0.80	1.50	346	255	249	52	98	94	3.0		
END	1123	572.230											
B 5	1125	572.230	0.82	1.58	345	260	260	51	98	94	3.0		
* 4	1129	575.410	0.82	1.53	345	259	260	51	100	94	3.0		
3	1133	578.000	0.80	1.50	345	260	261	51	100	94	3.0		
* * 2	1137	581.800	0.73	1.53	344	261	259	53	101	96	3.0		
1	1141	584.610	0.75	1.58	344	261	250	53	101	94	3.0		
END	1145	587.400											
C 5	1147	587.400	0.75	1.58	346	261	261	53	101	97	3.0		
4	1151	588.600	0.75	1.58	344	259	258	53	101	97	3.0		
3	1155	591.490	0.78	1.64	345	260	261	55	101	97	3.0		
2	1159	594.000	0.73	1.53	345	255	265	56	101	97	3.0		
1	1203	597.215	0.73	1.53	346	250	255	56	101	98	3.0		
Average	1207	600.100											

Comments: Changed Factor TO 2.05 [illegible] 3/2/16
& Dry Tech TO 2.10 [illegible] 3/2/16

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C.2.2-4

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 2-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= ~~1.86~~ X ΔP: 2.15
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 90
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 89 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 55 SS
NOZZLE DIAMETER: 0.246
FILTER NO/TYPE: FG 83-2855
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test = Difference
1	DI-H2O		
2	DI-H2O		
3	Empty		
4	Silica Gel		
		SEE Page 1	
Total:			

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
S 5	1217	600.100	0.85	1.79	344	255	247	59	101	99	4.0		+.50
* 4	1221	603.550	0.95	2.04	345	260	261	58	101	99	4.0		
3	1225	606.630	0.82	1.76	345	255	247	57	101	99	4.0		
2	1229	609.635	0.80	1.73	345	256	250	55	101	99	4.0		
1	1233	612.815	0.75	1.61	344	259	250	58	103	99	4.0		
END	1237	615.515											
E 5	1239	615.515	1.2	2.58	345	251	250	58	104	99	4.0		
4	1243	618.595	1.2	2.58	344	251	249	57	104	99	4.0		
3	1247	622.370	1.1	2.37	344	250	251	57	104	99	4.0		
2	1251	625.835	1.2	2.58	345	255	260	57	104	100	4.0		
1	1255	629.605	1.0	2.15	346	256	261	57	104	100	4.0		
END	1259	633.180											
S 5	1303	633.180	1.0	2.15	346	251	250	57	104	100	4.0		
4	1307	636.690	1.1	2.37	346	255	251	58	104	100	4.0		
3	1311	640.095	1.2	2.58	348	256	257	59	104	100	4.0		
2	1315	643.735	1.2	2.58	347	255	256	59	104	100	4.0		
1	1319	647.500	1.1	2.37	346	255	256	59	104	100	4.0		
Average	1323	650.920											

Comments:

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Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 3-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 2.15 X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: ✓

AMBIENT TEMPERATURE: 95
BAROMETRIC PRESSURE: 30.01
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2858
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : CFM@ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST:
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	Difference
1	DI-H2O	920.9	698.7	222.2
2	DI-H2O	781.1	767.8	13.3
3	Empty	713.0	711.8	1.2
4	Silica Gel	944.9	927.7	17.2
Total:				253.9

Point	Time	Meter Volume, ft³	ΔP in. H₂O	ΔH in. H₂O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O₂ %	Pstatic in. H₂O
A 5	1336	655.585	0.80	1.72	351	251	246	59	103	101	4		-.50
4	1340	658.810	0.72	1.55	351	251	249	60	100	99	4		
3	1344	661.570	0.72	1.55	350	250	249	59	100	99	4		
2	1348	664.525	0.90	1.94	351	251	250	60	100	98	4		
1	1352	667.950	1.0	2.15	351	251	249	58	100	98	4		
END	1356	670.950											
B 5	1358	670.950	1.10	2.31	351	255	251	57	99	97	4		
4	1402	674.540	1.00	2.10	352	260	247	58	101	99	4		
3	1406	678.000	0.85	1.76	352	261	248	58	101	99	4		
2	1410	680.830	0.68	1.43	352	258	258	58	101	98	4		
1	1414	683.700	0.73	1.53	352	257	258	58	101	98	4		
END	1418	686.425											
C 5	1420	686.425	0.80	1.68	351	260	261	58	101	98	4		
4	1424	689.500	0.75	1.58	351	261	265	57	101	98	4		
3	1428	692.470	0.75	1.58	352	259	255	57	101	98	4		
2	1432	695.585	0.73	1.53	352	259	255	58	101	99	4		
1	1436	698.500	0.78	1.64	352	259	258	59	101	99	4		
Average:	1440	701.445											

Comments: * Changed Factor to 2.1 mg/m 3/2/16

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C.d.p.6

Delta Air Quality Services, Incorporated

WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3 - 2 - 2016
RUN NO: 3-PM Unit 2
OPERATOR: Shannon Scrugham
METER BOX NO: 5-WCS
METER ΔH@: 1.743
METER Yd: 0.997
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= 2.1 X ΔP: → 1.95
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight:

AMBIENT TEMPERATURE: 90
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 13%
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: # 72 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: # 29 SS
NOZZLE DIAMETER: 0.243
FILTER NO/TYPE: FG 83-2858
PRE-TEST LEAK RATE: : CFM@ in. Hg.
POST-TEST LEAK RATE: : .0005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER MM
SAMPLE CUSTODIAN DW

Imp. #	Contents	Post-Test	Pre-Test	= Difference
1	DI-H2O			
2	DI-H2O			
3	Empty			
4	Silica Gel			
Total:				

Point	Time	Meter Volume, ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F	Imp. Out Temp, °F	Meter Temp, °F In	Meter Temp, °F Out	Vacuum in. Hg.	O_2 %	Pstatic in. H_2O
D 5	1442	701.445	0.80	1.68	352	251	251	60	100	98	5		+.50
4	1446	704.585	0.80	1.68	352	250	251	59	101	98	5		
3	1450	707.490	0.78	1.64	352	249	251	59	101	98	5		
2	1454	710.490	0.73	1.53	351	250	260	59	100	97	5		
1	1458	713.370	0.73	1.53	351	251	258	59	100	97	5		
END	1502	716.290											
E 5	1504	716.290	1.10	2.31	353	250	250	59	100	97	5		
4	1508	719.820	1.10	2.31	353	253	247	59	101	99	5		
3	1512	723.330	1.0	2.10	354	253	248	59	101	98	5		
2	1516	726.870	1.0	2.10	354	255	256	59	101	98	5		
* 1	1520	730.500	1.0	1.95	354	255	251	59	101	98	5		
END	1524	733.485											
F 5	1526	733.485	1.0	1.95	354	254	256	59	101	98	5		
4	1530	736.350	1.1	2.15	355	255	256	59	101	98	5		
3	1534	739.380	1.2	2.34	353	251	256	59	100	97	5		
2	1538	742.800	1.2	2.34	353	251	256	59	100	97	5		
1	1542	746.110	1.0	1.95	353	250	255	59	100	97	5		
Average	1546	749.475											

Comments: * Changed Factor To 1.95 [signature] 3/2/16

Pg 2 of 2

C.P.7

1-PM-U2

	dP	(dP)^.5	dH	Ts	Tm	
5	0.750	0.866	1.31	340	78	77
4	0.750	0.866	1.31	340	82	74
3	0.780	0.883	1.36	340	84	78
2	0.800	0.894	1.39	340	84	78
1	0.950	0.975	1.65	339	85	80
5	1.000	1.000	1.74	339	85	80
4	1.000	1.000	1.74	339	85	82
3	0.960	0.980	1.67	339	86	83
2	0.700	0.837	1.26	340	86	83
1	0.700	0.837	1.26	340	86	83
5	0.750	0.866	1.35	340	88	84
4	0.680	0.825	1.22	340	87	83
3	0.720	0.849	1.30	340	87	83
2	0.780	0.883	1.40	339	86	82
1	0.800	0.894	1.44	339	86	82
5	0.850	0.922	1.53	340	87	83
4	0.920	0.959	1.62	340	89	86
3	0.830	0.911	1.49	343	89	86
2	0.780	0.883	1.45	345	89	86
1	0.750	0.866	1.50	344	90	87
5	1.100	1.049	2.05	344	90	87
4	1.000	1.000	1.86	344	91	88
3	0.950	0.975	1.77	345	92	89
2	1.000	1.000	1.86	346	93	89
1	1.100	1.049	2.05	345	93	89
5	1.000	1.000	1.86	346	93	89
4	1.100	1.049	2.05	346	93	90
3	1.100	1.049	2.05	347	95	92
2	1.200	1.095	2.23	347	95	92
1	1.000	1.000	1.86	347	95	92

Average	0.8874	1.621	342.1	86.4	
		Meter Vol	Imp	Imp	
Delta P (iwg)	0.887	470.570	931.6	692.7	238.9
Meter Pressure (iwg)	1.621	557.435	777.1	759.5	17.6
Stack Temperature (F)	342.100	86.865	713.0	712.7	0.3
Meter Temperature (F)	86.433		927.7	906.2	21.5
Meter Volume (acf)	86.865				0.0
Liquid Volume (ml)	278.300				278.3

2-PM-U2

	dP	(dP)^.5	dH	Ts	Tm	
5	0.72	0.849	1.34	344	95	94
4	0.75	0.866	1.40	345	95	93
3	0.75	0.866	1.40	346	96	93
2	0.80	0.894	1.50	345	98	94
1	0.80	0.894	1.50	346	98	94
5	0.82	0.906	1.53	345	98	94
4	0.82	0.906	1.53	345	100	94
3	0.80	0.894	1.50	345	100	94
2	0.73	0.854	1.53	344	101	96
1	0.75	0.866	1.58	344	101	96
5	0.75	0.866	1.58	346	101	97
4	0.75	0.866	1.58	344	101	97
3	0.78	0.883	1.64	345	101	97
2	0.73	0.854	1.53	345	101	97
1	0.73	0.854	1.53	340	101	98
5	0.85	0.922	1.79	344	101	99
4	0.95	0.975	2.04	345	101	99
3	0.82	0.906	1.76	345	101	99
2	0.80	0.894	1.73	345	101	99
1	0.75	0.866	1.61	344	103	99
5	1.20	1.095	2.58	345	104	99
4	1.20	1.095	2.58	344	104	99
3	1.10	1.049	2.37	344	104	99
2	1.20	1.095	2.58	345	104	100
1	1.00	1.000	2.15	346	104	100
5	1.00	1.000	2.15	346	104	100
4	1.10	1.049	2.37	346	104	100
3	1.20	1.095	2.58	348	104	100
2	1.20	1.095	2.58	347	104	100
1	1.10	1.049	2.37	345	104	100

Average	0.8902	1.864	344.9	99.2	
		Meter Vol	Imp	Imp	
Delta P (iwg)	0.890	558.7	946.7	728.3	218.4
Meter Pressure (iwg)	1.864	650.920	726.0	714.9	11.1
Stack Temperature (F	344.933	92.220	675.4	672.5	2.9
Meter Temperature (F)	99.233		927.8	905	22.8
Meter Volume (acf)	92.220				0.0
Liquid Volume (ml)	255.200				255.2

3-PM-U2

	dP	(dP)^.5	dH	Ts	Tm	
5	0.80	0.894	1.72	351	103	101
4	0.72	0.849	1.55	351	100	99
3	0.72	0.849	1.55	350	100	99
2	0.90	0.949	1.94	351	100	98
1	1.00	1.000	2.15	351	100	98
5	1.10	1.049	2.31	351	99	97
4	1.00	1.000	2.10	352	101	99
3	0.85	0.922	1.76	352	101	99
2	0.68	0.825	1.43	352	101	98
1	0.73	0.854	1.53	352	101	98
5	0.80	0.894	1.68	351	101	98
4	0.75	0.866	1.58	351	101	98
3	0.75	0.866	1.58	352	101	98
2	0.73	0.854	1.53	352	101	99
1	0.78	0.883	1.64	352	101	99
5	0.80	0.894	1.68	352	100	98
4	0.80	0.894	1.68	352	101	98
3	0.78	0.883	1.64	352	101	98
2	0.73	0.854	1.53	351	100	97
1	0.73	0.854	1.53	351	100	97
5	1.10	1.049	2.31	353	100	97
4	1.10	1.049	2.31	353	101	99
3	1.00	1.000	2.10	354	101	98
2	1.00	1.000	2.10	354	101	98
1	1.00	1.000	1.95	354	101	98
5	1.00	1.000	1.95	354	101	98
4	1.10	1.049	2.15	355	101	98
3	1.20	1.095	2.34	353	100	97
2	1.20	1.095	2.34	353	100	97
1	1.00	1.000	1.95	353	100	97

Average	0.8881	1.854	352.2	99.4	
		Meter Vo	Imp	Imp	
Delta P (iwg)	0.888	655.585	920.9	698.7	222.2
Meter Pressure (iwg)	1.854	749.475	781.1	767.8	13.3
Stack Temperature (F	352.167	93.890	713.0	711.8	1.2
Meter Temperature (F	99.367		944.9	927.7	17.2
Meter Volume (acf)	93.890				0.0
Liquid Volume (ml)	253.9				253.9

Date	Time	O2 %	CO2 %	NOx ppm	CO ppm	
3/2/2016	7:07	18.962	18.537	93.367	8.732	
3/2/2016	7:08	18.962	18.535	93.416	8.847	
3/2/2016	7:09	18.943	18.558	93.055	8.884	
3/2/2016	7:10	18.942	18.645	92.846	8.81	
3/2/2016	7:11	18.962	18.651	92.847	8.799	High
3/2/2016	7:12	17.099	15.62	76.974	8.756	
3/2/2016	7:13	10.774	10.442	45.68	6.422	
3/2/2016	7:14	10.708	10.44	47.447	4.739	
3/2/2016	7:15	10.716	10.439	47.511	4.736	Mid
3/2/2016	7:16	3.688	2.444	10.391	3.76	
3/2/2016	7:17	0.084	0.016	0.133	0.447	
3/2/2016	7:18	0.06	0.017	0.109	0.013	Zero
3/2/2016	7:19	0.06	0.009	0.112	0.011	
3/2/2016	7:20	0.053	0.014	0.086	0.016	NO Mode Zero
3/2/2016	7:21	0.035	0.015	77.173	0.011	
3/2/2016	7:22	0.035	0.012	93.167	0.001	
3/2/2016	7:23	0.035	0.009	93.019	0.016	NO Mode High
3/2/2016	7:24	0.035	0.009	18.478	0.004	
3/2/2016	7:25	0.035	0.009	0.14	0.007	NO2 Gas NO Mode
3/2/2016	7:26	0.036	0.014	32.553	0.01	
3/2/2016	7:27	0.036	0.015	40.481	0.019	
3/2/2016	7:28	0.036	0.011	40.82	0.023	
3/2/2016	7:29	0.036	0.008	41.075	0.015	
3/2/2016	7:30	0.035	0.012	41.268	-0.002	
3/2/2016	7:31	0.036	0.01	41.444	0.012	NO2 Gas NOx Mode
3/2/2016	7:32	0.036	0.011	10.577	0.013	
3/2/2016	7:33	0.036	0.01	2.281	0.006	
3/2/2016	7:34	8.078	0.063	2.333	0.014	
3/2/2016	7:35	20.944	0.056	2.986	0.277	
3/2/2016	7:36	20.991	0.058	2.211	0.619	
3/2/2016	7:37	20.991	0.062	1.864	0.643	
3/2/2016	7:38	20.991	0.061	1.609	0.641	
3/2/2016	7:39	20.991	0.063	1.445	0.634	
3/2/2016	7:40	20.991	0.054	1.305	0.644	
3/2/2016	7:41	20.981	0.057	1.23	0.646	
3/2/2016	7:42	20.967	0.058	1.189	0.666	
3/2/2016	7:43	20.966	0.056	1.05	0.683	
3/2/2016	7:44	20.966	0.057	0.973	0.677	
3/2/2016	7:45	20.966	0.063	0.909	0.671	
3/2/2016	7:46	20.966	0.059	0.847	0.695	
3/2/2016	7:47	18.632	3.293	6.873	0.665	
3/2/2016	7:48	7.984	12.589	42.49	0.436	
3/2/2016	7:49	7.365	13.121	48.596	0.162	
3/2/2016	7:50	7.425	12.979	50.674	0.143	
3/2/2016	7:51	8.374	11.913	39.947	0.133	
3/2/2016	7:52	8.363	12.074	36.068	0.147	
3/2/2016	7:53	9.129	11.214	31.471	0.149	
3/2/2016	7:54	8.163	12.389	38.025	0.148	
3/2/2016	7:55	9.534	10.407	15.181	0.128	

3/2/2016	7:56	10.633	10.402	0.546	0.07	
3/2/2016	7:57	10.647	10.408	0.521	0.041	O2 CO2 Bias
3/2/2016	7:58	10.315	9.476	0.513	0.035	
3/2/2016	7:59	0.496	0.083	0.52	1.276	
3/2/2016	8:00	0.067	0.031	0.505	4.467	
3/2/2016	8:01	0.06	0.026	0.479	4.747	CO Bias
3/2/2016	8:02	0.053	0.022	31.468	4.155	
3/2/2016	8:03	0.036	0.02	47.6	0.962	Nox Bias
3/2/2016	8:04	0.545	1.727	47.456	0.413	
3/2/2016	8:05	7.207	12.947	42.185	0.312	
3/2/2016	8:06	7.739	12.571	40.437	0.163	
3/2/2016	8:07	8.71	11.72	32.67	0.131	
3/2/2016	8:08	8.067	12.302	40.57	0.152	
3/2/2016	8:09	8.182	12.24	39.747	0.133	
3/2/2016	8:10	8.548	11.915	36.959	0.138	
3/2/2016	8:11	8.135	12.325	40.434	0.151	
3/2/2016	8:12	8.141	12.223	43.952	0.145	
3/2/2016	8:13	8.745	11.173	36.324	0.146	
3/2/2016	8:14	9.223	11.651	32.069	0.168	
3/2/2016	8:15	8.499	11.912	34.879	0.172	
3/2/2016	8:16	8.314	12.078	36.082	0.167	
3/2/2016	8:17	8.859	11.484	33.89	0.15	
3/2/2016	8:18	8.53	11.94	36.889	0.159	
3/2/2016	8:19	8.331	12.11	35.774	0.159	
3/2/2016	8:20	8.18	12.349	38.537	0.154	
3/2/2016	8:21	7.502	12.922	45.284	0.145	
3/2/2016	8:22	7.658	12.737	47.659	0.15	
3/2/2016	8:23	8.419	11.975	39.881	0.151	
3/2/2016	8:24	7.775	12.628	42.524	0.159	
3/2/2016	8:25	7.562	12.815	45.263	0.159	
3/2/2016	8:26	7.973	12.489	46.087	0.136	
3/2/2016	8:27	7.948	12.424	46.213	0.158	
3/2/2016	8:28	7.953	12.509	42.962	0.14	
3/2/2016	8:29	7.548	12.89	43.704	0.146	
3/2/2016	8:30	8.011	12.357	42.18	0.148	
3/2/2016	8:31	8.259	12.106	45.156	0.136	
3/2/2016	8:32	8.376	12.036	43.032	0.119	
3/2/2016	8:33	9.136	11.196	36.094	0.139	
3/2/2016	8:34	8.666	11.8	40.753	0.156	
3/2/2016	8:35	8.826	11.594	37.258	0.156	
3/2/2016	8:36	8.727	11.806	36.144	0.149	
3/2/2016	8:37	7.748	12.729	46.709	0.152	
3/2/2016	8:38	7.417	12.979	50.29	0.137	
3/2/2016	8:39	7.269	13.111	55.479	0.11	
3/2/2016	8:40	7.995	12.371	48.067	0.135	
3/2/2016	8:41	8.411	11.986	38.547	0.13	
3/2/2016	8:42	8.436	12.062	34.945	0.129	
3/2/2016	8:43	7.425	13.012	46.028	0.143	
3/2/2016	8:44	7.983	12.327	48.453	0.14	
3/2/2016	8:45	8.113	12.335	40.363	0.126	
3/2/2016	8:46	8.331	12.169	36.474	0.15	
3/2/2016	8:47	7.977	12.497	38.669	0.156	

3/2/2016	8:48	7.468	12.911	42.828	0.145	
3/2/2016	8:49	8.011	12.395	42.545	0.129	
3/2/2016	8:50	8.33	12.07	40.597	0.136	
3/2/2016	8:51	8.392	12.07	38.692	0.157	
3/2/2016	8:52	8.197	12.195	40.969	0.165	
3/2/2016	8:53	8.261	12.191	40.928	0.162	
3/2/2016	8:54	8.286	12.145	43.44	0.164	
3/2/2016	8:55	7.409	13.135	51.689	0.165	
3/2/2016	8:56	7.164	13.151	54.652	0.147	
3/2/2016	8:57	8.245	12.155	42.847	0.138	
3/2/2016	8:58	8.242	12.173	43.627	0.156	
3/2/2016	8:59	8.398	11.949	40.833	0.162	
3/2/2016	9:00	8.757	11.634	35.561	0.156	
3/2/2016	9:01	8.299	12.172	38.8	0.155	
3/2/2016	9:02	8.042	12.384	42.469	0.141	
3/2/2016	9:03	8.599	11.756	37.263	0.153	
3/2/2016	9:04	9.131	11.321	32.769	0.16	
3/2/2016	9:05	7.814	12.627	47.408	0.156	
3/2/2016	9:06	8.246	12.085	45.527	0.14	
3/2/2016	9:07	7.832	12.59	43.702	0.144	
3/2/2016	9:08	7.931	12.467	41.657	0.152	
3/2/2016	9:09	8.086	12.269	40.899	0.129	
3/2/2016	9:10	8.761	11.635	34.956	0.158	
3/2/2016	9:11	8.264	12.193	38.727	0.173	
3/2/2016	9:12	8.367	12.059	41.276	0.134	
3/2/2016	9:13	8.546	11.783	38.509	0.131	
3/2/2016	9:14	8.916	11.465	34.492	0.149	
3/2/2016	9:15	8.966	11.44	32.065	0.167	
3/2/2016	9:16	9.08	11.255	33.342	0.167	
3/2/2016	9:17	8.702	11.76	36.447	0.188	
3/2/2016	9:18	8.373	12.038	39.814	0.172	
3/2/2016	9:19	8.021	12.372	41.494	0.161	
3/2/2016	9:20	8.197	12.156	42.546	0.157	
3/2/2016	9:21	8.635	11.675	39.591	0.182	
3/2/2016	9:22	9.355	11.05	34.433	0.161	
3/2/2016	9:23	8.713	11.732	38.37	0.168	
3/2/2016	9:24	9.04	11.333	35.597	0.188	
3/2/2016	9:25	8.679	11.762	38.778	0.171	
3/2/2016	9:26	7.903	12.485	42.728	0.175	
3/2/2016	9:27	8.019	12.26	43.507	0.165	
3/2/2016	9:28	8.78	11.501	39.97	0.161	
3/2/2016	9:29	8.681	11.662	38.535	0.166	
3/2/2016	9:30	8.98	11.326	36.925	0.158	
3/2/2016	9:31	9.49	10.901	34.131	0.185	
3/2/2016	9:32	8.116	12.23	43.286	0.192	
3/2/2016	9:33	9.283	11.032	35.972	0.188	
3/2/2016	9:34	9.326	10.974	34.432	0.19	
3/2/2016	9:35	8.64	11.778	41.415	0.19	
Run 1 Average		8.35	12.05	40.69	0.16	
3/2/2016	9:36	8.834	10.78	29.479	0.204	
3/2/2016	9:37	10.57	10.339	0.289	0.132	
3/2/2016	9:38	10.595	10.331	0.245	0.094	O2 CO2 Bias

3/2/2016	9:39	3.233	2.199	0.245	0.58	
3/2/2016	9:40	0.069	0.044	0.246	3.873	
3/2/2016	9:41	0.052	0.034	0.236	4.791	CO Bias
3/2/2016	9:42	0.039	0.025	30.464	3.979	
3/2/2016	9:43	0.036	0.023	47.149	0.228	NOx Bias
3/2/2016	9:44	0.057	0.011	12.091	0.038	
3/2/2016	9:45	0.035	0.011	0.157	0.041	Zero
3/2/2016	9:46	7.594	8.021	39.264	1.459	
3/2/2016	9:47	10.667	10.36	47.509	4.717	
3/2/2016	9:48	10.693	10.357	47.515	4.798	Span
3/2/2016	9:49	9.085	11.71	42.456	3.53	
3/2/2016	9:50	7.639	12.717	47.381	0.199	
3/2/2016	9:51	7.779	12.472	47.777	0.144	
3/2/2016	9:52	8.196	12.11	42.568	0.149	
3/2/2016	9:53	8.625	11.576	40.205	0.166	
3/2/2016	9:54	9.008	11.289	33.753	0.161	
3/2/2016	9:55	8.592	11.794	36.899	0.178	
3/2/2016	9:56	8.594	11.652	37.686	0.176	
3/2/2016	9:57	9.34	10.964	33.671	0.17	
3/2/2016	9:58	8.437	11.95	40.974	0.183	
3/2/2016	9:59	8.034	12.247	44.225	0.163	
3/2/2016	10:00	8.61	11.581	42.714	0.169	
3/2/2016	10:01	9.114	11.249	36.98	0.199	
3/2/2016	10:02	8.779	11.525	37.619	0.195	
3/2/2016	10:03	8.499	11.853	39.38	0.177	
3/2/2016	10:04	7.884	12.466	42.521	0.19	
3/2/2016	10:05	8.357	11.876	41.543	0.172	
3/2/2016	10:06	8.816	11.485	36.03	0.169	
3/2/2016	10:07	9.023	11.293	32.443	0.215	
3/2/2016	10:08	8.421	12.007	37.618	0.225	
3/2/2016	10:09	7.573	12.751	47.037	0.197	
3/2/2016	10:10	7.788	12.432	46.489	0.155	
3/2/2016	10:11	7.888	12.359	43.144	0.173	
3/2/2016	10:12	8.277	12.015	39.918	0.159	
3/2/2016	10:13	8.068	12.226	43.196	0.174	
3/2/2016	10:14	8.56	11.654	38.51	0.145	
3/2/2016	10:15	8.486	11.811	41.137	0.17	
3/2/2016	10:16	8.371	11.845	43.176	0.154	
3/2/2016	10:17	8.894	11.357	41.275	0.156	
3/2/2016	10:18	8.592	11.661	44.331	0.164	
3/2/2016	10:19	8.445	11.795	43.972	0.161	
3/2/2016	10:20	8.885	11.332	37.118	0.166	
3/2/2016	10:21	8.854	11.402	34.456	0.209	
3/2/2016	10:22	8.657	11.581	36.546	0.2	
3/2/2016	10:23	8.145	12.166	41.528	0.184	
3/2/2016	10:24	7.568	12.644	50.064	0.174	
3/2/2016	10:25	8.539	11.651	44.449	0.156	
3/2/2016	10:26	8.949	11.261	38.395	0.157	
3/2/2016	10:27	8.439	11.874	44.072	0.165	
3/2/2016	10:28	8.359	11.898	42.798	0.161	
3/2/2016	10:29	8.517	11.759	40.94	0.149	

3/2/2016	10:30	8.23	12.035	44.407	0.158	
3/2/2016	10:31	8.204	12.062	45.411	0.157	
3/2/2016	10:32	8.246	11.954	43.796	0.161	
3/2/2016	10:33	8.27	12.067	44.618	0.162	
3/2/2016	10:34	7.65	12.652	49.523	0.138	
3/2/2016	10:35	7.81	12.418	44.146	0.16	
3/2/2016	10:36	8.002	12.234	40.769	0.156	
3/2/2016	10:37	8.675	11.541	33.986	0.162	
3/2/2016	10:38	8.759	11.43	32.769	0.18	
3/2/2016	10:39	8.787	11.532	32.089	0.172	
3/2/2016	10:40	8.138	12.178	41.652	0.185	
3/2/2016	10:41	8.198	12.043	40.101	0.167	
3/2/2016	10:42	7.993	12.287	45.515	0.178	
3/2/2016	10:43	7.757	12.481	49.893	0.147	
3/2/2016	10:44	7.653	12.619	48.276	0.155	
3/2/2016	10:45	7.875	12.359	47.136	0.133	
3/2/2016	10:46	8.59	11.634	38.638	0.168	
3/2/2016	10:47	8.293	12.03	40.707	0.184	
3/2/2016	10:48	8.485	11.705	38.642	0.165	
3/2/2016	10:49	9.649	10.645	28.505	0.168	
3/2/2016	10:50	9.476	10.853	30.989	0.2	
Run 2 Average		8.41	11.86	40.81	0.17	
3/2/2016	10:51	9.965	9.972	9.468	0.175	
3/2/2016	10:52	10.598	10.306	0.201	0.09	O2 CO2 Bias
3/2/2016	10:53	5.092	4.176	0.181	0.541	
3/2/2016	10:54	0.078	0.049	0.178	4.297	
3/2/2016	10:55	0.052	0.033	0.176	4.805	CO Bias
3/2/2016	10:56	0.038	0.026	33.235	3.546	
3/2/2016	10:57	0.036	0.024	47.409	0.337	NOx Bias
3/2/2016	10:58	0.041	0.01	9.748	0.056	CO Zero
3/2/2016	10:59	0.035	0.01	0.14	1.216	O2 CO2 NOx Zero
3/2/2016	11:00	7.731	8.823	38.045	4.635	
3/2/2016	11:01	10.64	10.345	47.583	4.794	Span
3/2/2016	11:02	9.67	11.117	47.17	4.516	
3/2/2016	11:03	8.177	12.108	44.118	0.805	
3/2/2016	11:04	8.038	12.361	48.488	0.124	
3/2/2016	11:05	7.995	12.231	50.722	0.14	
3/2/2016	11:06	8.573	11.69	45.827	0.122	
3/2/2016	11:07	9.046	11.32	38.358	0.146	
3/2/2016	11:08	8.199	12.161	43.082	0.152	
3/2/2016	11:09	8.426	11.848	41.717	0.145	
3/2/2016	11:10	8.612	11.636	42.94	0.137	
3/2/2016	11:11	8.298	12.08	46.766	0.158	
3/2/2016	11:12	7.945	12.402	53.021	0.149	
3/2/2016	11:13	8.299	11.998	43.033	0.145	
3/2/2016	11:14	7.976	12.338	43.236	0.175	
3/2/2016	11:15	7.593	12.693	52.145	0.165	
3/2/2016	11:16	8.251	12.03	44.976	0.175	
3/2/2016	11:17	8.057	12.273	46.374	0.173	
3/2/2016	11:18	8.174	12.167	41.794	0.146	
3/2/2016	11:19	8.154	12.22	45.008	0.158	

3/2/2016	11:20	7.36	13.019	50.36	0.133	
3/2/2016	11:21	7.164	13.149	53.254	0.144	
3/2/2016	11:22	8.013	12.109	43.943	0.139	
3/2/2016	11:23	8.808	11.488	30.639	0.162	
3/2/2016	11:24	9.787	10.486	19.393	0.198	
3/2/2016	11:25	10.503	9.909	17.176	0.249	
3/2/2016	11:26	9.37	11.094	29.375	0.223	
3/2/2016	11:27	8.659	11.691	37.436	0.181	
3/2/2016	11:28	8.858	11.448	35.448	0.192	
3/2/2016	11:29	8.518	11.833	38.897	0.189	
3/2/2016	11:30	8.986	11.32	34.793	0.185	
3/2/2016	11:31	9.024	11.281	34.966	0.173	
3/2/2016	11:32	8.194	12.238	44.993	0.169	
3/2/2016	11:33	7.957	12.342	50.55	0.153	
3/2/2016	11:34	8.415	11.866	45.993	0.172	
3/2/2016	11:35	8.41	11.844	45.868	0.151	
3/2/2016	11:36	8.413	11.953	44.956	0.15	
3/2/2016	11:37	7.875	12.413	46.012	0.167	
3/2/2016	11:38	8.05	12.238	43.014	0.149	
3/2/2016	11:39	8.177	12.081	41.975	0.173	
3/2/2016	11:40	8.71	11.574	36.89	0.167	
3/2/2016	11:41	8.049	12.206	43.894	0.193	
3/2/2016	11:42	8.079	12.218	47.299	0.162	
3/2/2016	11:43	8.346	11.893	45.384	0.165	
3/2/2016	11:44	8.596	11.687	42.746	0.163	
3/2/2016	11:45	8.056	12.268	45.994	0.188	
3/2/2016	11:46	7.555	12.674	50.607	0.163	
3/2/2016	11:47	8.041	12.214	47.703	0.154	
3/2/2016	11:48	8.159	12.095	43.693	0.182	
3/2/2016	11:49	8.303	12.01	38.714	0.182	
3/2/2016	11:50	8.679	11.45	36.535	0.174	
3/2/2016	11:51	9.448	10.863	29.386	0.171	
3/2/2016	11:52	9.301	11.004	30.35	0.197	
3/2/2016	11:53	8.393	11.999	37.29	0.195	
3/2/2016	11:54	8.307	11.887	39.79	0.189	
3/2/2016	11:55	8.546	11.71	40.199	0.185	
3/2/2016	11:56	8.668	11.622	40.425	0.18	
3/2/2016	11:57	8.382	11.912	44.43	0.186	
3/2/2016	11:58	8.647	11.635	41.446	0.185	
3/2/2016	11:59	8.144	12.164	45.801	0.185	
3/2/2016	12:00	7.965	12.233	48.646	0.16	
3/2/2016	12:01	8.881	11.33	38.845	0.163	
3/2/2016	12:02	8.311	12.035	43.696	0.2	
3/2/2016	12:03	7.95	12.32	44.32	0.179	
Run 3 Average		8.39	11.90	42.01	0.17	
3/2/2016	12:04	9.023	10.592	25.896	0.187	
3/2/2016	12:05	10.569	10.293	0.219	0.127	
3/2/2016	12:06	10.576	10.294	0.179	0.092	O2 CO2 Bias
3/2/2016	12:07	3.772	2.743	0.171	0.918	
3/2/2016	12:08	0.07	0.048	0.151	4.598	
3/2/2016	12:09	0.047	0.035	0.15	4.828	CO Bias

3/2/2016	12:10	0.038	0.029	31.764	2.967	
3/2/2016	12:11	0.036	0.026	47.375	0.114	NOx Bias
3/2/2016	12:12	0.04	0.014	11.774	0.065	CO Zero
3/2/2016	12:13	0.036	0.01	0.123	1.324	O2 CO2 NOx Zero
3/2/2016	12:14	8.283	9.377	40.871	4.285	
3/2/2016	12:15	10.624	10.309	47.563	4.825	Span
3/2/2016	12:16	8.751	11.741	48.181	3.17	
3/2/2016	12:17	8.871	11.469	36.826	0.223	
3/2/2016	12:18	8.445	11.78	37.566	0.183	
3/2/2016	12:19	8.803	11.463	37.32	0.188	
3/2/2016	12:20	8.319	11.968	44.56	0.164	
3/2/2016	12:21	8.196	12.093	43.789	0.165	
3/2/2016	12:22	8.443	11.79	44.442	0.167	
3/2/2016	12:23	8.597	11.626	40.855	0.152	
3/2/2016	12:24	9.083	11.18	34.212	0.173	
3/2/2016	12:25	9.277	10.993	33.737	0.179	
3/2/2016	12:26	8.495	11.796	40.685	0.192	
3/2/2016	12:27	7.961	12.324	47.338	0.163	
3/2/2016	12:28	8.183	12.01	49.92	0.148	
3/2/2016	12:29	8.84	11.408	43.023	0.165	
3/2/2016	12:30	8.936	11.302	42.29	0.158	
3/2/2016	12:31	8.676	11.656	42.462	0.17	
3/2/2016	12:32	8.296	11.998	45.646	0.169	
3/2/2016	12:33	8.188	12.015	44.866	0.169	
3/2/2016	12:34	8.18	12.112	45.164	0.173	
3/2/2016	12:35	8.041	12.186	48.463	0.142	
3/2/2016	12:36	8.539	11.744	40.541	0.164	
3/2/2016	12:37	8.453	11.813	41.008	0.173	
3/2/2016	12:38	8.195	12.1	43.222	0.171	
3/2/2016	12:39	8.016	12.208	45.817	0.173	
3/2/2016	12:40	8.853	11.338	37.452	0.175	
3/2/2016	12:41	8.506	11.821	38.059	0.184	
3/2/2016	12:42	8.304	11.944	36.923	0.171	
3/2/2016	12:43	8.18	12.064	40.616	0.174	
3/2/2016	12:44	8.424	11.761	41.277	0.196	
3/2/2016	12:45	8.258	11.925	43.799	0.181	
3/2/2016	12:46	8.23	11.98	45.071	0.182	
3/2/2016	12:47	8.612	11.601	42.081	0.187	
Run 4 Average		8.45	11.80	42.07	0.17	
3/2/2016	12:48	9.913	9.966	9.826	0.17	
3/2/2016	12:49	10.573	10.255	0.189	0.113	O2 CO2 Bias
3/2/2016	12:50	3.786	2.826	0.178	0.908	
3/2/2016	12:51	0.069	0.047	0.169	4.595	
3/2/2016	12:52	0.044	0.033	0.151	4.857	CO Bias
3/2/2016	12:53	0.036	0.029	28.982	3.145	
3/2/2016	12:54	0.036	0.024	47.123	0.13	NOx Bias
3/2/2016	12:55	0.038	0.013	14.638	0.071	CO Zero
3/2/2016	12:56	0.036	0.009	0.126	1.636	O2 CO2 NOx Zero
3/2/2016	12:57	8.736	9.065	36.217	4.756	
3/2/2016	12:58	10.624	10.282	47.755	4.811	Span
3/2/2016	12:59	9.164	11.486	45.209	3.624	

3/2/2016	13:00	8.371	11.76	42.004	0.28	
3/2/2016	13:01	8.427	11.909	43.209	0.144	
3/2/2016	13:02	8.409	11.815	40.015	0.17	
3/2/2016	13:03	8.594	11.532	37.366	0.167	
3/2/2016	13:04	9.406	10.841	31.406	0.168	
3/2/2016	13:05	9.131	11.063	32.335	0.185	
3/2/2016	13:06	8.768	11.584	38.056	0.21	
3/2/2016	13:07	7.814	12.389	44.789	0.181	
3/2/2016	13:08	7.986	12.131	45.591	0.173	
3/2/2016	13:09	8.711	11.526	40.7	0.198	
3/2/2016	13:10	8.302	11.933	43.452	0.163	
3/2/2016	13:11	8.294	11.912	42.914	0.193	
3/2/2016	13:12	8.056	12.142	43.324	0.17	
3/2/2016	13:13	8.059	12.22	45.009	0.171	
3/2/2016	13:14	7.734	12.478	45.753	0.173	
3/2/2016	13:15	8.068	12.047	42.207	0.173	
3/2/2016	13:16	8.796	11.356	37.334	0.181	
3/2/2016	13:17	9.232	10.992	34.104	0.168	
3/2/2016	13:18	9.242	11.033	31.871	0.177	
3/2/2016	13:19	8.712	11.565	38.194	0.195	
3/2/2016	13:20	8.483	11.677	41.046	0.18	
3/2/2016	13:21	8.631	11.603	40.377	0.174	
3/2/2016	13:22	8.129	12.148	45.117	0.168	
3/2/2016	13:23	8.417	11.753	43.429	0.167	
3/2/2016	13:24	8.65	11.535	38.049	0.183	
3/2/2016	13:25	8.107	12.138	41.152	0.195	
3/2/2016	13:26	8.645	11.474	35.578	0.163	
3/2/2016	13:27	8.64	11.596	36.968	0.179	
3/2/2016	13:28	8.907	11.247	33.885	0.188	
3/2/2016	13:29	9.778	10.411	27.452	0.194	
3/2/2016	13:30	9.551	10.664	29.536	0.187	
Run 5 Average		8.59	11.62	39.01	0.18	
3/2/2016	13:31	9.961	9.91	9.133	0.17	
3/2/2016	13:32	10.548	10.262	0.178	0.099	O2 CO2 Compliance
3/2/2016	13:33	3.823	2.904	0.155	0.871	
3/2/2016	13:34	0.069	0.042	0.148	4.557	CO Bias
3/2/2016	13:35	0.043	0.03	0.146	4.812	CO Bias
3/2/2016	13:36	0.036	0.029	29.334	2.814	
3/2/2016	13:37	0.035	0.028	47.175	0.09	NOx Bias
3/2/2016	13:38	0.037	0.015	11.424	0.067	CO Zero
3/2/2016	13:39	0.036	0.008	0.127	1.363	O2 CO2 NOx Zero
3/2/2016	13:40	6.979	8.275	35.98	4.685	
3/2/2016	13:41	10.59	10.308	47.685	4.815	Span
3/2/2016	13:42	9.866	10.626	35.175	3.418	
3/2/2016	13:43	9.325	10.855	31.085	0.267	
3/2/2016	13:44	9.4	10.921	33.332	0.176	
3/2/2016	13:45	8.098	12.179	42.419	0.155	
3/2/2016	13:46	7.453	12.78	47.99	0.161	
3/2/2016	13:47	7.576	12.605	47.712	0.135	
3/2/2016	13:48	7.754	12.379	46.874	0.135	
3/2/2016	13:49	8.461	11.7	41.513	0.16	

3/2/2016	13:50	7.627	12.643	49.327	0.171	
3/2/2016	13:51	7.041	13.148	57.099	0.174	
3/2/2016	13:52	8.205	11.884	44.569	0.148	
3/2/2016	13:53	8.799	11.356	36.873	0.148	
3/2/2016	13:54	9.164	11.017	34.138	0.185	
3/2/2016	13:55	8.672	11.53	38.255	0.202	
3/2/2016	13:56	8.556	11.589	38.678	0.202	
3/2/2016	13:57	8.991	11.14	34.932	0.188	
3/2/2016	13:58	8.825	11.361	32.881	0.21	
3/2/2016	13:59	8.997	11.194	33.122	0.205	
3/2/2016	14:00	8.507	11.692	38.537	0.191	
3/2/2016	14:01	7.894	12.306	46.026	0.193	
3/2/2016	14:02	8.643	11.502	41.18	0.147	
3/2/2016	14:03	8.374	11.812	39.729	0.163	
3/2/2016	14:04	8.666	11.449	38.85	0.167	
3/2/2016	14:05	8.96	11.304	39.177	0.175	
3/2/2016	14:06	8.338	11.831	40.472	0.173	
3/2/2016	14:07	8.698	11.538	40.346	0.165	
3/2/2016	14:08	7.33	12.922	53.882	0.151	
3/2/2016	14:09	8.11	12.013	46.205	0.142	
3/2/2016	14:10	8.602	11.576	38.316	0.163	
3/2/2016	14:11	8.976	11.147	34.539	0.176	
3/2/2016	14:12	8.473	11.817	36.392	0.195	
3/2/2016	14:13	7.789	12.457	41.058	0.17	
Run 6 Average		8.37	11.83	41.15	0.17	
3/2/2016	14:14	9.909	10.524	10.94	0.146	
3/2/2016	14:15	10.541	10.252	0.184	0.098	O2 CO2 Bias
3/2/2016	14:16	3.846	2.899	0.154	0.878	
3/2/2016	14:17	0.068	0.05	0.155	4.541	
3/2/2016	14:18	0.043	0.036	0.146	4.837	CO Bias
3/2/2016	14:19	0.036	0.033	20.628	3.068	
3/2/2016	14:20	0.035	0.025	47.122	0.116	NOx Bias
3/2/2016	14:21	0.038	0.01	19.798	0.06	CO Zero
3/2/2016	14:22	0.035	0.011	0.125	1.54	O2 CO2 NOx Zero
3/2/2016	14:23	8.651	8.876	35.116	4.757	
3/2/2016	14:24	10.591	10.285	47.713	4.8	Span
3/2/2016	14:25	9.848	10.684	40.3	4.187	
3/2/2016	14:26	9.122	11.14	35.832	0.495	
3/2/2016	14:27	8.863	11.34	38.083	0.163	
3/2/2016	14:28	9.102	11.198	36.223	0.172	
3/2/2016	14:29	8.333	11.814	41.959	0.176	
3/2/2016	14:30	8.819	11.394	41.054	0.161	
3/2/2016	14:31	8.179	12.058	45.371	0.168	
3/2/2016	14:32	8.678	11.486	38.971	0.156	
3/2/2016	14:33	8.871	11.354	38.976	0.17	
3/2/2016	14:34	8.296	11.954	44.769	0.163	
3/2/2016	14:35	8.513	11.683	41.543	0.155	
3/2/2016	14:36	8.157	12.095	43.189	0.172	
3/2/2016	14:37	7.548	12.746	48.211	0.154	
3/2/2016	14:38	7.425	12.722	53.354	0.136	
3/2/2016	14:39	8.308	11.886	42.046	0.16	

3/2/2016	14:40	8.311	11.908	38.565	0.162	
3/2/2016	14:41	8.11	12.077	38.542	0.152	
3/2/2016	14:42	9.006	11.176	35.766	0.149	
3/2/2016	14:43	8.271	11.975	43.081	0.163	
3/2/2016	14:44	8.739	11.445	39.707	0.164	
3/2/2016	14:45	9.225	10.996	35.135	0.169	
3/2/2016	14:46	8.893	11.391	36.908	0.168	
3/2/2016	14:47	8.833	11.371	36.246	0.183	
3/2/2016	14:48	8.663	11.611	37.896	0.177	
3/2/2016	14:49	7.514	12.757	48.675	0.174	
3/2/2016	14:50	7.713	12.434	47.359	0.148	
3/2/2016	14:51	8.35	11.783	41.841	0.143	
3/2/2016	14:52	9.442	10.757	30.395	0.176	
3/2/2016	14:53	8.741	11.562	30.377	0.184	
3/2/2016	14:54	8.163	12.05	37.978	0.19	
3/2/2016	14:55	8.798	11.404	36.275	0.152	
3/2/2016	14:56	8.444	11.713	40.072	0.162	
Run 7 Average		8.48	11.74	40.29	0.16	
3/2/2016	14:57	9.801	10.014	10.71	0.143	
3/2/2016	14:58	10.537	10.251	0.189	0.104	O2 CO2 Bias
3/2/2016	14:59	6.326	5.378	0.161	0.31	
3/2/2016	15:00	0.087	0.05	0.15	3.985	
3/2/2016	15:01	0.047	0.033	0.144	4.829	CO Bias
3/2/2016	15:02	0.037	0.027	30.879	3.671	
3/2/2016	15:03	0.036	0.025	47.053	0.277	NOx Bias
3/2/2016	15:04	0.039	0.015	10.399	0.076	CO Zero
3/2/2016	15:05	0.036	0.01	0.121	0.643	O2 CO2 Bias
3/2/2016	15:06	7.751	8.813	38.592	4.444	
3/2/2016	15:07	10.586	10.304	47.761	4.813	Span
3/2/2016	15:08	8.761	11.655	39.416	3.257	
3/2/2016	15:09	8.561	11.639	34.944	0.238	
3/2/2016	15:10	7.838	12.363	39.947	0.155	
3/2/2016	15:11	7.748	12.481	44.534	0.154	
3/2/2016	15:12	7.767	12.379	44.796	0.183	
3/2/2016	15:13	8.68	11.454	36.25	0.166	
3/2/2016	15:14	8.948	11.224	32.088	0.171	
3/2/2016	15:15	8.986	11.308	31.618	0.197	
3/2/2016	15:16	8.527	11.63	37.672	0.189	
3/2/2016	15:17	8.751	11.437	36.045	0.186	
3/2/2016	15:18	9.165	11	33.561	0.178	
3/2/2016	15:19	8.968	11.324	33.301	0.212	
3/2/2016	15:20	8.21	12.013	42.547	0.181	
3/2/2016	15:21	8.556	11.578	41.123	0.184	
3/2/2016	15:22	8.88	11.249	35.599	0.195	
3/2/2016	15:23	9.201	11.042	35.073	0.19	
3/2/2016	15:24	9.257	11.016	33.545	0.194	
3/2/2016	15:25	8.658	11.576	33.312	0.18	
3/2/2016	15:26	8.132	12.041	38.036	0.189	
3/2/2016	15:27	7.883	12.316	40.399	0.182	
3/2/2016	15:28	7.977	12.266	42.539	0.182	
3/2/2016	15:29	7.825	12.36	43.841	0.158	

3/2/2016	15:30	7.576	12.626	46.406	0.183	
3/2/2016	15:31	8.792	11.328	37.403	0.166	
3/2/2016	15:32	9.557	10.671	33.962	0.19	
3/2/2016	15:33	9.087	11.095	36.597	0.198	
3/2/2016	15:34	8.862	11.409	38.605	0.193	
3/2/2016	15:35	8.604	11.634	37.191	0.182	
3/2/2016	15:36	8.645	11.623	38.951	0.19	
3/2/2016	15:37	8.449	11.767	38.268	0.179	
3/2/2016	15:38	8.836	11.301	37.295	0.201	
3/2/2016	15:39	9.107	11.206	34.733	0.194	
Run 8 Average		8.58	11.62	37.84	0.18	
3/2/2016	15:40	7.522	11.506	44.354	0.169	
3/2/2016	15:41	9.027	11.074	25.628	0.126	
3/2/2016	15:42	10.545	10.28	0.223	0.077	O2 CO2 Bias
3/2/2016	15:43	4.595	3.66	0.173	0.701	
3/2/2016	15:44	0.071	0.05	0.162	4.459	
3/2/2016	15:45	0.042	0.036	0.144	4.841	CO Bias
3/2/2016	15:46	0.036	0.029	28.696	3.036	
3/2/2016	15:47	0.036	0.025	47.314	0.12	NOx Bias
3/2/2016	15:48	0.038	0.012	13.198	0.066	CO Zero
3/2/2016	15:49	0.036	0.01	0.124	1.515	O2 CO2 NOx Zero
3/2/2016	15:50	7.495	8.657	37.353	4.737	
3/2/2016	15:51	10.594	10.318	47.694	4.823	Span
3/2/2016	15:52	8.731	11.854	46.042	3.219	
3/2/2016	15:53	8.058	12.208	42.133	0.238	
3/2/2016	15:54	8.515	11.633	37.182	0.172	
3/2/2016	15:55	8.854	11.329	34.946	0.165	
3/2/2016	15:56	8.966	11.347	35.381	0.167	
3/2/2016	15:57	8.984	11.339	35.679	0.187	
3/2/2016	15:58	8.758	11.462	38.868	0.183	
3/2/2016	15:59	8.567	11.731	41.374	0.185	
3/2/2016	16:00	8.644	11.626	39.811	0.184	
3/2/2016	16:01	8.237	11.922	42.294	0.178	
3/2/2016	16:02	8.351	11.879	40.813	0.162	
3/2/2016	16:03	8.346	11.952	42.215	0.188	
3/2/2016	16:04	8.115	12.057	43.754	0.178	
3/2/2016	16:05	8.514	11.712	38.61	0.183	
3/2/2016	16:06	8.111	12.132	40.409	0.189	
3/2/2016	16:07	8.607	11.668	39.565	0.167	
3/2/2016	16:08	8.28	11.924	41.063	0.174	
3/2/2016	16:09	8.41	11.816	38.706	0.172	
3/2/2016	16:10	8.368	11.886	38.56	0.18	
3/2/2016	16:11	8.943	11.265	34.01	0.18	
3/2/2016	16:12	9.112	11.094	34.5	0.182	
3/2/2016	16:13	8.854	11.465	38.755	0.191	
3/2/2016	16:14	8.509	11.785	39.789	0.185	
3/2/2016	16:15	8.163	12.133	41.596	0.176	
3/2/2016	16:16	8.115	12.138	42.875	0.183	
3/2/2016	16:17	7.724	12.534	48.081	0.184	
3/2/2016	16:18	7.557	12.65	49.616	0.167	
3/2/2016	16:19	8.637	11.665	38.606	0.168	

3/2/2016	16:20	8.556	11.643	36.858	0.2	
3/2/2016	16:21	8.592	11.633	34.538	0.184	
3/2/2016	16:22	8.796	11.435	35.131	0.184	
3/2/2016	16:23	8.383	11.986	36.875	0.178	
Run 9 Average		8.49	11.76	39.35	0.18	
3/2/2016	16:24	9.935	10.562	10.983	0.101	
3/2/2016	16:25	10.573	10.283	0.189	0.08	O2 CO2 Bias
3/2/2016	16:26	6.65	5.736	0.66	0.282	
3/2/2016	16:27	0.391	0.486	1.626	3.806	
3/2/2016	16:28	0.129	0.112	0.525	4.652	
3/2/2016	16:29	0.036	0.028	0.13	4.822	CO Bias
3/2/2016	16:30	0.035	0.026	30.333	3.197	
3/2/2016	16:31	0.035	0.024	47.165	0.146	NOx Bias
3/2/2016	16:32	0.04	0.008	8.163	0.083	CO Zero
3/2/2016	16:33	0.036	0.009	0.131	0.829	O2 CO2 NOx Zero
3/2/2016	16:34	7.256	7.684	29.859	4.543	
3/2/2016	16:35	10.611	10.327	47.743	4.824	Span
3/2/2016	16:36	14.655	15.047	73.118	5.59	
3/2/2016	16:37	18.987	18.415	93.339	8.752	
3/2/2016	16:38	19.011	18.428	93.221	8.833	High
3/2/2016	16:39	18.993	18.395	92.257	8.844	

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont TEST DATE: 3- 2 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: +.50
Start: 0835 Stop: 0935 0855

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.73	339	C 5	0.75	339	E 5	1.0	340
4	0.72	340	4	0.70	340	4	1.1	340
3	0.75	340	3	0.71	340	3	1.1	340
2	0.78	340	2	0.77	341	2	1.2	339
1	0.92	339	1	0.80	340	1	1.1	339
B 5	0.98	339	D 5	0.90	339	F 5	0.98	339
4	0.99	340	4	0.86	340	4	0.99	340
3	0.95	340	3	0.83	340	3	1.00	341
2	0.71	339	2	0.78	339	2	1.00	341
1	0.70	338	1	0.75	338	1	1.10	340
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 1 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0835	525.130	1.0	80	79	55	30	#1	3% H_2O_2	860.6	708.2	
0850	533.800	1.0	84	82	55	30	#2	3% H_2O_2	674.4	671.4	
0905	543.780	1.0	85	82	55	30	#3	Empty	620.8	619.9	
0920	551.700	1.0	88	86	54	30	#4	Silica Gel	954.7	945.8	
0935	560.620						Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.4-2

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 2 Ps: +.50
Start: 950 Stop: 1050

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.73	344	C 5	0.72	345	E 5	1.1	343
4	0.74	345	4	0.72	345	4	1.0	344
3	0.83	346	3	0.75	346	3	0.95	345
2	0.98	346	2	1.0	346	2	1.0	346
1	0.96	345	1	1.1	346	1	1.1	345
B 5	1.1	346	D 5	0.85	344	F 5	1.0	339
4	1.0	346	4	0.91	345	4	1.1	340
3	0.92	346	3	0.82	345	3	1.2	341
2	0.70	345	2	0.76	346	2	1.2	341
1	0.75	345	1	0.73	346	1	1.1	340
Heated Line Temp. °F		300						
Chiller Temp. °C		~1.0						

MOISTURE DATA FOR TEST RUNS 6 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0950	561.240	1.0	88	86	60	3.0	#1	3% H_2O_2	844.8	689.3	
1005	570.022	1.0	90	89	52	3.0	#2	3% H_2O_2	746.4	747.0	
1020	578.550	1.0	91	89	52	3.0	#3	Empty	634.4	634.6	
1035	588.550	1.0	93	90	54	3.0	#4	Silica Gel	971.0	965.4	
1050	597.340						Total	Line rinse		50	

Pre-Test Leak Check: ≤0.005 CFM @ 15 in. Hg., Post-Test Leak Check: ≤0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 3 Ps: +.50
Start: 1103 Stop: 1203

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.62	344	C 5	0.76	344	E 5	1.2	344
4	0.67	345	4	0.75	344	4	1.2	345
3	0.75	346	3	0.77	345	3	1.1	345
2	0.98	346	2	0.73	345	2	1.2	346
1	0.92	344	1	0.72	344	1	1.0	346
B 5	1.1	344	D 5	0.85	345	F 5	0.99	345
4	1.0	345	4	0.95	346	4	0.98	345
3	0.90	345	3	0.82	346	3	1.00	345
2	0.62	346	2	0.80	344	2	1.00	344
1	0.63	345	1	0.75	344	1	0.99	346
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 3 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1103	597.760	1.0	93	90	59	3.0	#1	3% H_2O_2	840.3	704.9	
1118	607.100	1.0	94	91	57	3.0	#2	3% H_2O_2	692.6	689.1	
1133	617.600	1.0	94	91	57	3.0	#3	Empty	619.0	618.6	
1148	625.000	1.0	94	94	58	3.0	#4	Silica Gel	963.5	954.7	
1203	634.330						Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.4-5

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 4 Ps: 0.50
Start: 1217 Stop: 1247

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.65	345	C 5	0.75	345	E 5	1.2	344
4	0.73	346	4	0.72	345	4	1.1	344
3	0.78	346	3	0.76	346	3	1.2	345
2	0.90	346	2	0.74	346	2	1.2	346
1	0.80	345	1	0.72	345	1	1.0	346
B 5	1.1	344	D 5	0.85	344	F 5	1.0	344
4	1.0	345	4	0.95	345	4	1.1	344
3	0.94	346	3	0.92	345	3	1.0	345
2	0.70	345	2	0.80	346	2	1.1	346
1	0.63	345	1	0.75	344	1	1.0	346
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 4 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1217	634.900	2.5	96	93	59	5.0	#1	3% H_2O_2	809.3 ~~733.7~~	694.5 ~~729.0~~	15
1232	646.890	2.5	97	94	57	5.0	#2	3% H_2O_2	733.7	729.0	
1247	660.100						#3	Empty	634.8	634.4	
							#4	Silica Gel	976.1	971.0	
							Total	Line rinse		50	

Pre-Test Leak Check <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.4-6

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 5 Ps: -.50
Start: 1300 Stop: 1330

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.73	345	C 5	0.83	345	E 5	1.2	346
4	0.75	346	4	0.81	346	4	1.1	346
3	0.84	346	3	0.79	346	3	1.0	347
2	0.92	345	2	0.75	345	2	1.1	347
1	1.00	345	1	0.77	345	1	1.2	345
B 5	1.20	345	D 5	0.94	345	F 5	1.0	344
4	1.10	345	4	0.99	346	4	1.0	345
3	0.92	345	3	0.92	345	3	1.1	346
2	0.65	344	2	0.79	344	2	1.2	346
1	0.65	344	1	0.70	344	1	1.1	345
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 5 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1300	660.800	2.5	101	101	60	5.0	#1	3% H_2O_2	829.5	717.7	
1315	674.000	2.5	102	101	60	5.0	#2	3% H_2O_2	679.2	674.5	
1330	687.245						#3	Empty	619.3	618.6	
							#4	Silica Gel	970.3	963.5	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 6 Ps: +.50
Start: 1343 Stop: 1413

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.80	349	C 5	0.83	348	E 5	1.1	349
4	0.72	351	4	0.75	349	4	1.2	351
3	0.78	352	3	0.75	350	3	1.2	350
2	0.91	352	2	0.79	350	2	1.1	350
1	0.98	351	1	0.84	349	1	1.1	350
B 5	1.2	349	D 5	1.0	350	F 5	1.0	344
4	1.2	350	4	1.1	350	4	1.1	345
3	1.0	351	3	0.98	351	3	1.1	346
2	0.73	351	2	0.91	350	2	1.1	346
1	0.74	351	1	0.81	350	1	1.2	348
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 6 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1343	687.850	2.5	100	98	60	50	#1	3% H_2O_2	805.2	691.7	
1358	701.840	2.5	103	100	60	50	#2	3% H_2O_2	730.5	725.5	
1413	715.090						#3	Empty	632.6	631.3	
							#4	Silica Gel	982.2	976.1	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.4-8

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont TEST DATE: 3- 2 -2016
BAR. PRESSURE: TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS TC ID: # 38
DP INDICATOR TYPE: 0-10" Mano. PITOT TUBE ID: # 38 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 7 Ps: -.50
Start: 1426 Stop: 1456

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.81	352	C 5	0.80	352	E 5	1.10	349
4	0.83	352	4	0.73	352	4	1.10	349
3	0.83	352	3	0.72	352	3	1.20	351
2	0.90	351	2	0.77	352	2	1.0	352
1	0.78	350	1	0.83	352	1	1.1	351
B 5	1.1	350	D 5	0.98	351	F 5	1.0	350
4	1.0	351	4	1.00	351	4	1.0	351
3	0.98	350	3	0.96	351	3	1.1	352
2	0.73	351	2	0.81	350	2	1.2	350
1	0.70	350	1	0.70	349	1	1.0	350
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 7 THROUGH

METER ID: 6-WCS METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1426	716.215	2.5	100	99	60	5	#1	3% H_2O_2	815.9	705.4	
1441	729.900	2.5	101	99	58	5	#2	3% H_2O_2	705.5	699.1	
1456	743.580						#3	Empty	619.5	618.7	
							#4	Silica Gel	976.7	970.3	
							Total	Line rinse		50	

Pre-Test Leak Check: <.005 CFM @ 15 in. Hg., Post-Test Leak Check: <.005 CFM @ 15 in. Hg

C.d.4-9

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- —

Run #: 8 Ps: 4.50
Start: 1509 Stop: 1539

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.74	351	C 5	0.83	351	E 5	1.10	353
4	0.78	352	4	0.82	351	4	1.10	353
3	0.83	352	3	0.80	350	3	1.00	353
2	0.97	352	2	0.89	350	2	1.00	352
1	1.00	351	1	0.85	349	1	1.0	353
B 5	1.2	350	D 5	0.98	349	F 5	1.00	352
4	1.2	351	4	0.95	349	4	0.99	353
3	1.1	350	3	0.84	350	3	1.10	359
2	0.72	351	2	0.76	350	2	1.20	353
1	0.70	350	1	0.73	350	1	1.20	352
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 8 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1509	744.335	2.5	100	100	60	5.0	#1	3% H_2O_2	805.0	682.5	
1524	757.910	2.5	103	100	60	5.0	#2	3% H_2O_2	732.5	726.8	
1539	771.925						#3	Empty	632.5	631.5	
							#4	Silica Gel	987.9	982.2	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.4-10

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit 2
PERFORMED BY: Rik Dupont
TEST DATE: 3- 2 -2016
BAR. PRESSURE:
TC READOUT ID: 6-WCS
DP INDICATOR ID: 6-WCS
TC ID: #- 38
DP INDICATOR TYPE: 0-10" Mano.
PITOT TUBE ID: # 38
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 9 Ps: +.50
Start: 1553 Stop: 1623

Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F	Sample Point	Vel. Head in. H_2O	Temp, °F
A 5	0.95	352	C 5	0.790	353	E 5	1.2	353
4	0.86	352	4	0.900	353	4	1.2	353
3	0.91	352	3	0.83	353	3	1.1	354
2	1.00	351	2	0.95	352	2	1.1	352
1	0.90	351	1	0.90	350	1	1.0	352
B 5	1.2	350	D 5	1.1	353	F 5	1.1	350
4	1.2	351	4	1.0	354	4	1.0	351
3	1.0	352	3	1.0	354	3	1.0	351
2	0.73	353	2	0.90	353	2	1.1	351
1	0.72	353	1	0.70	352	1	1.0	351
Heated Line Temp. °F		300						
Chiller Temp. °C		-1.0						

MOISTURE DATA FOR TEST RUNS 9 THROUGH

METER ID: 6-WCS
METER Yd: 0.997

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1553	772,460	2.5	98	98	56	5	#1	3% H_2O_2	818.8	709.5	
1603	782,000	2.5	100	99	56	5	#2	3% H_2O_2	692.3	686.8	
1613	790,493	2.5	101	98	56	5	#3	Empty	619.9	618.8	
1623	799,480						#4	Silica Gel	982.5	976.6	
							Total	Line rinse		50	

Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

C.2.5-2

SCAQMD METHOD 25.3
EVACUATED CANISTER SAMPLING DATA

Client/Facility: Desert View Power Date: 3-2-2016

Unit/Location: Unit 2 stack breaching Performed By: Rik Dupont

Probe Material SS Probe Length 4'

Connecting Tubing Material Teflon Connecting Tubing Length 12"

Barometric Pressure 30.01 Ambient Temperature

Test No.		1A-VOC-U2		1B-VOC-U2			
Vial ID		D32		D33			
Canister ID		00166		00133			
		Time	Vacuum	Time	Vacuum	Time	Vacuum
Pre-Test Leak Check	Start	835	20	835	23		
Pre-Test Leak Check	Stop	845	20	845	23		
Sample Collection	Start	1020	28"	1020	30"		
		1035	20"	1035	24		
		1050	12"	1050	18		
		11'					
Sample Collection	Stop	1100	10"	1100	14"		
Post -Test Leak Check	Start	1103	9	1103	10		
Post-Test Leak Check	Stop	1113	9	1113	10		
Line Rinse Volume							

Comments:

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 8:36	37	54.47	20.42	7.78	11.45	5.97	0.61	14.72 <56>	3.36 <56>	11.95	8.74	4822	0.90	0.20
3/2/2016 8:37	46.22	62.68	26.67	10.78	14.62	8.66	0.83	13.56 <56>	3.51 <56>	12.95	7.7	4834	1.13	0.29
3/2/2016 8:38	52.64	69.28	30.74	13.23	17.41	10.75	0.7	13.16 <56>	3.56 <56>	13.32	7.3	4892	0.92	0.25
3/2/2016 8:39	60.17	78.22	35.98	15.41	20.03	12.82	0.74	13.00 <56>	3.64 <56>	13.46	7.13	5009	0.96	0.27
3/2/2016 8:40	52.4	71.65	30.5	12.09	16.53	9.79	0.72	13.67 <56>	3.54 <56>	12.79	7.81	4875	0.98	0.26
3/2/2016 8:41	43.83	62.32	25.2	10.1	14.36	8.08	0.64	14.22 <56>	3.50 <56>	12.33	8.31	4816	0.91	0.22
3/2/2016 8:42	37.37	53.43	20.67	8.4	12.01	6.46	0.46	14.30 <56>	3.37 <56>	12.26	8.38	4633	0.66	0.15
3/2/2016 8:43	45.37	59.89	26.84	10.43	13.77	8.59	0.69	13.20 <56>	3.60 <56>	13.3	7.34	4956	0.91	0.25
3/2/2016 8:44	51.99	70.88	30.57	10.85	14.79	8.88	0.64	13.63 <56>	3.58 <56>	12.82	7.77	4925	0.87	0.23
3/2/2016 8:45	45.15	62.7	26.37	9.41	13.07	7.65	0.58	13.89 <56>	3.56 <56>	12.62	8.01	4893	0.81	0.21
3/2/2016 8:46	38.03	53.94	20.85	8.14	11.55	6.21	0.44	14.18 <56>	3.34 <56>	12.4	8.28	4593	0.62	0.15
3/2/2016 8:47	41.08	56.74	23.3	9.21	12.72	7.27	0.68	13.81 <56>	3.45 <56>	12.72	7.94	4750	0.94	0.23
3/2/2016 8:48	45.64	60.07	26.74	10.49	13.81	8.55	0.69	13.16 <56>	3.57 <56>	13.33	7.3	4907	0.91	0.25
3/2/2016 8:49	44.93	61.82	26.27	9.88	13.59	8.04	0.63	13.76 <56>	3.56 <56>	12.73	7.89	4897	0.87	0.22
3/2/2016 8:50	43.18	60.86	25.11	8.54	12.04	6.91	0.65	14.09 <56>	3.54 <56>	12.44	8.2	4870	0.92	0.23
3/2/2016 8:51	41.87	59.48	23.87	8	11.37	6.35	0.58	14.21 <56>	3.47 <56>	12.34	8.3	4775	0.82	0.20
3/2/2016 8:52	43.49	60.53	25.33	8.34	11.61	6.76	0.58	13.92 <56>	3.55 <56>	12.58	8.04	4879	0.81	0.21
3/2/2016 8:53	42.13	59.19	24.38	7.94	11.16	6.39	0.65	14.05 <56>	3.52 <56>	12.48	8.16	4848	0.91	0.23
3/2/2016 8:54	46.22	64.94	26.26	8.62	12.11	6.81	0.53	14.05 <56>	3.46 <56>	12.47	8.16	4759	0.74	0.18
3/2/2016 8:55	51.11	68.07	29.03	11.17	14.88	8.83	0.69	13.32 <56>	3.46 <56>	13.21	7.46	4757	0.92	0.24
3/2/2016 8:56	57.94	74.24	35.15	14.43	18.49	12.18	0.65	12.81 <56>	3.69 <56>	13.65	6.93	5081	0.83	0.24
3/2/2016 8:57	49.22	68.78	27.87	11.18	15.62	8.81	0.59	13.97 <56>	3.45 <56>	12.52	8.09	4742	0.82	0.20
3/2/2016 8:58	47.05	66	27.33	10.23	14.35	8.27	0.71	14.03 <56>	3.54 <56>	12.5	8.14	4865	1.00	0.25
3/2/2016 8:59	43.06	60.93	25.22	9.28	13.13	7.56	0.54	14.15 <56>	3.56 <56>	12.39	8.25	4905	0.76	0.19
3/2/2016 9:00	40.42	58.87	23.21	8.31	12.1	6.64	0.57	14.56 <56>	3.49 <56>	12.01	8.61	4809	0.83	0.20
3/2/2016 9:01	38.8	54.95	22.09	8.04	11.39	6.37	0.59	14.16 <56>	3.46 <56>	12.41	8.26	4768	0.84	0.20
3/2/2016 9:02	45.64	63.13	26.51	9.58	13.25	7.74	0.72	13.83 <56>	3.54 <56>	12.68	7.96	4866	1.00	0.25
3/2/2016 9:03	40.93	58.94	24.04	8.73	12.57	7.13	0.59	14.40 <56>	3.58 <56>	12.16	8.47	4920	0.85	0.21
3/2/2016 9:04	34.58	52.32	19.18	6.53	9.88	5.04	0.44	15.13 <56>	3.38 <56>	11.61	9.07	4645	0.67	0.15
3/2/2016 9:05	48.01	65.35	27.86	9	12.25	7.27	0.6	13.61 <56>	3.53 <56>	12.9	7.75	4861		
3/2/2016 9:06	50.67	70.75	30.33	10.06	14.05	8.38	0.59	13.96 <56>	3.64 <56>	12.51	8.08	5014		
3/2/2016 9:07	45.23	61.76	26.43	9.49	12.96	7.71	0.65	13.65 <56>	3.56 <56>	12.87	7.79	4894		
3/2/2016 9:08	45.92	62.79	26.92	11.18	15.29	9.12	0.55	13.67 <56>	3.57 <56>	12.81	7.81	4910		
3/2/2016 9:09	44.16	60.95	25.62	10.87	15	8.77	0.54	13.80 <56>	3.53 <56>	12.69	7.93	4859		
3/2/2016 9:10	39.23	57.37	22.6	9.66	14.13	7.74	0.54	14.62 <56>	3.51 <56>	11.97	8.66	4826		
3/2/2016 9:11	39.15	55.22	22.98	9.78	13.8	7.99	0.55	14.11 <56>	3.57 <56>	12.46	8.21	4916		
3/2/2016 9:12	42.56	60.41	24.19	10.49	14.89	8.29	0.49	14.20 <56>	3.46 <56>	12.35	8.29	4760		
3/2/2016 9:13	42.54	60.87	25.57	10.49	15.01	8.77	0.49	14.31 <56>	3.66 <56>	12.22	8.39	5034		
3/2/2016 9:14	37.84	55.89	21.96	8.42	12.44	6.8	0.48	14.77 <56>	3.53 <56>	11.86	8.78	4862		
3/2/2016 9:15	34.65	51.6	20.15	7.57	11.27	6.12	0.45	14.89 <56>	3.54 <56>	11.77	8.88	4871		
3/2/2016 9:16	35.73	53.3	21.18	7.36	10.98	6.07	0.46	14.92 <56>	3.61 <56>	11.73	8.9	4964		
3/2/2016 9:17	37.8	55.32	21.58	7.61	11.14	6.04	0.53	14.64 <56>	3.48 <56>	12	8.67	4782		
3/2/2016 9:18	41.04	58.4	23.89	8.57	12.19	6.94	0.6	14.23 <56>	3.54 <56>	12.33	8.32	4875		
3/2/2016 9:19	45.27	62.38	26.72	9.87	13.6	8.1	0.45	13.78 <56>	3.59 <56>	12.72	7.91	4943		
3/2/2016 9:20	44.49	61.97	26.28	10.07	14.03	8.27	0.63	13.93 <56>	3.60 <56>	12.56	8.05	4947		
3/2/2016 9:21	43.28	62.43	26.25	8.93	12.88	7.54	0.56	14.42 <56>	3.69 <56>	12.14	8.49	5080		
3/2/2016 9:22	36.96	56.89	21.37	6.26	9.63	5.04	0.35	15.39 <56>	3.52 <56>	11.39	9.27	4843		
3/2/2016 9:23	38.52	56.47	22.49	6.1	8.94	4.96	0.35	14.66 <56>	3.55 <56>	11.99	8.69	4891		
3/2/2016 9:24	39.82	59.4	23.17	6.53	9.74	5.29	0.51	14.92 <56>	3.54 <56>	11.73	8.9	4874		
3/2/2016 9:25	38.68	56.57	22.17	5.74	8.39	4.58	0.54	14.62 <56>	3.49 <56>	12.01	8.66	4800		
3/2/2016 9:26	44.99	61.66	26.39	8.69	11.91	7.09	0.54	13.71 <56>	3.57 <56>	12.79	7.84	4914		
3/2/2016 9:27	46.7	64.11	28.67	9.64	13.23	8.23	0.58	13.73 <56>	3.74 <56>	12.73	7.86	5142		
3/2/2016 9:28	43.27	63.07	25.6	7.25	10.57	5.97	0.47	14.58 <56>	3.60 <56>	11.98	8.62	4956		
3/2/2016 9:29	41.24	59.87	24.15	6.65	9.65	5.42	0.66	14.52 <56>	3.56 <56>	12.05	8.57	4905		
3/2/2016 9:30	40.34	59.97	24.24	6.25	9.29	5.23	0.35	14.87 <56>	3.66 <56>	11.76	8.86	5034		
3/2/2016 9:31	36.54	56.97	20.82	4.75	7.80 <56>	3.77	0.4	15.59 <56>	3.47 <56>	11.25	9.42	4772		
3/2/2016 9:32	43.07	60.18	26.16	6.6	9.22	5.58	0.43	13.97 <56>	3.70 <56>	12.55	8.09	5088		
3/2/2016 9:33	40.09	61.23	23.72	6.43	9.82	5.29	0.48	15.27 <56>	3.60 <56>	11.45	9.18	4955		
3/2/2016 9:34	37.82	57.76	22.48	5.11	7.8	4.23	0.36	15.27 <56>	3.62 <56>	11.45	9.18	4979		
3/2/2016 9:35	41.66	61.07	23.83	5.87	8.61	4.67	0.33	14.66 <56>	3.48 <56>	11.97	8.69	4792	0.48	0.11
													0.00	0.00
Average	**43.25**	**61.02**	**25.19**	**8.94**	**12.65**	**7.25**	**0.56**			**12.39**	**8.25**	**4873.90**	**0.83**	**0.21**

Flow	kdscfh	4873.90
O2	% dry	8.25
CO2	% dry	12.39
NOx	ppm dry	43.25
NOx	ppm @ 3% O2	61.02
NOx	lb/hr	25.19
SO2	ppm dry	8.94
SO2	ppm @ 3% O2	12.65
SO2	lb/hr	7.25
CO	ppm dry	0.56
CO	ppm @ 3% O2	0.83
CO	lb/hr	0.21

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 9:51	51.34	69.25	30.76	11.06	14.92	9.22	0.52	13.49 <56>	3.65 <56>	12.94	7.63	5019	0.70	0.19
3/2/2016 9:52	46.09	64.5	26.92	9.51	13.31	7.73	0.47	14.00 <56>	3.56 <56>	12.48	8.11	4892	0.66	0.17
3/2/2016 9:53	44.67	64.07	27.4	9.01	12.92	7.69	0.48	14.34 <56>	3.73 <56>	12.15	8.42	5138	0.69	0.18
3/2/2016 9:54	36.47	54.54	21.51	6.53	9.76	5.36	0.45	14.95 <56>	3.59 <56>	11.7	8.93	4941	0.67	0.16
3/2/2016 9:55	36.83	53.6	20.87	6.53	9.5	5.15	0.43	14.55 <56>	3.45 <56>	12.06	8.6	4746	0.63	0.15
3/2/2016 9:56	41.26	59.23	24.79	8.08	11.6	6.75	0.43	14.35 <56>	3.66 <56>	12.14	8.43	5032	0.62	0.16
3/2/2016 9:57	36.37	55.93	21.54	6.35	9.77	5.23	0.3	15.38 <56>	3.61 <56>	11.39	9.26	4961	0.46	0.11
3/2/2016 9:58	39.86	57.26	22.79	6.78	9.74	5.39	0.49	14.37 <56>	3.48 <56>	12.21	8.44	4789	0.70	0.17
3/2/2016 9:59	46.31	64.01	27.63	9.41	13.01	7.81	0.58	13.82 <56>	3.63 <56>	12.64	7.95	4997	0.80	0.21
3/2/2016 10:00	48.45	69.16	29.77	9.68	13.82	8.28	0.54	14.27 <56>	3.74 <56>	12.17	8.36	5147	0.77	0.20
3/2/2016 10:01	39.12	59.39	22.69	6.44	9.78	5.2	0.42	15.18 <56>	3.53 <56>	11.55	9.11	4858	0.64	0.15
3/2/2016 10:02	40.31	59.05	23.8	6.9	10.11	5.67	0.43	14.65 <56>	3.59 <56>	11.93	8.68	4945	0.63	0.15
3/2/2016 10:03	40.27	57.99	23.47	7.08	10.2	5.74	0.48	14.40 <56>	3.55 <56>	12.15	8.47	4882	0.69	0.17
3/2/2016 10:04	44.45	60.83	25.55	9.43	12.9	7.54	0.45	13.69 <56>	3.50 <56>	12.77	7.82	4814	0.62	0.16
3/2/2016 10:05	45.96	64.63	27.73	10.37	14.58	8.71	0.45	14.06 <56>	3.67 <56>	12.39	8.17	5054	0.63	0.17
3/2/2016 10:06	40.2	58.93	24.18	7.97	11.68	6.67	0.42	14.66 <56>	3.66 <56>	11.92	8.69	5038	0.62	0.15
3/2/2016 10:07	34.33	51.21	20.33	6.01	8.96	4.95	0.43	14.92 <56>	3.61 <56>	11.72	8.9	4961	0.64	0.16
3/2/2016 10:08	37.06	53.33	20.86	6.89	9.91	5.4	0.46	14.39 <56>	3.43 <56>	12.19	8.46	4715	0.66	0.16
3/2/2016 10:09	47	62.74	27.73	11.09	14.8	9.1	0.49	13.35 <56>	3.59 <56>	13.09	7.49	4942	0.65	0.18
3/2/2016 10:10	51.04	68.85	30.57	12.72	17.16	10.6	0.5	13.49 <56>	3.65 <56>	12.92	7.63	5016	0.67	0.18
3/2/2016 10:11	48.03	65.38	28.8	11.31	15.4	9.44	0.51	13.61 <56>	3.65 <56>	12.83	7.75	5023	0.69	0.19
3/2/2016 10:12	41.98	59.31	24.19	9.59	13.55	7.69	0.34	14.13 <56>	3.51 <56>	12.38	8.23	4827	0.48	0.12
3/2/2016 10:13	42.76	59.47	25.08	9.81	13.64	8	0.45	13.91 <56>	3.57 <56>	12.57	8.03	4912	0.63	0.16
3/2/2016 10:14	42.49	60.89	25.57	9.37	13.43	7.85	0.41	14.33 <56>	3.66 <56>	12.18	8.41	5041	0.59	0.15
3/2/2016 10:15	43.74	62.89	25.05	9.24	13.28	7.36	0.46	14.38 <56>	3.49 <56>	12.14	8.45	4797	0.66	0.16
3/2/2016 10:16	46.3	65.62	28.15	10.12	14.34	8.56	0.4	14.17 <56>	3.70 <56>	12.31	8.27	5092	0.57	0.15
3/2/2016 10:17	43.02	63.91	25.56	8.4	12.48	6.94	0.43	14.85 <56>	3.62 <56>	11.76	8.85	4976	0.64	0.16
3/2/2016 10:18	46.13	66.86	27.69	8.8	12.75	7.35	0.34	14.49 <56>	3.65 <56>	12.04	8.55	5028	0.49	0.12
3/2/2016 10:19	47.56	68.11	28.19	9.63	13.79	7.94	0.49	14.32 <56>	3.61 <56>	12.2	8.4	4965	0.70	0.18
3/2/2016 10:20	42.66	63.16	25.27	8.98	13.3	7.4	0.26	14.81 <56>	3.61 <56>	11.79	8.81	4962		
3/2/2016 10:21	36.22	53.67	21.53	7.55	11.19	6.24	0.32	14.82 <56>	3.62 <56>	11.8	8.82	4978		
3/2/2016 10:22	37.67	54.73	22.23	7.95	11.55	6.53	0.3	14.53 <56>	3.59 <56>	12.03	8.58	4942		
3/2/2016 10:23	42.71	60.06	24.75	9.39	13.2	7.57	0.4	14.06 <56>	3.53 <56>	12.46	8.17	4854		
3/2/2016 10:24	50.49	67.45	31.47	12.56	16.78	10.89	0.47	13.36 <56>	3.79 <56>	13.08	7.5	5220		
3/2/2016 10:25	49.24	70.68	29.19	11.1	15.93	9.16	0.38	14.35 <56>	3.61 <56>	12.15	8.43	4966		
3/2/2016 10:26	43.99	65.18	25.82	9.26	13.72	7.56	0.36	14.82 <56>	3.57 <56>	11.77	8.82	4916		
3/2/2016 10:27	45.28	65.12	26.36	9.98	14.36	8.09	0.37	14.39 <56>	3.54 <56>	12.18	8.46	4878		
3/2/2016 10:28	45.39	64.59	26.95	10.46	14.88	8.64	0.43	14.23 <56>	3.61 <56>	12.3	8.32	4974		
3/2/2016 10:29	43.74	62.99	25.7	10.4	14.98	8.5	0.47	14.40 <56>	3.58 <56>	12.13	8.47	4922		
3/2/2016 10:30	44.83	62.99	26.1	11.23	15.78	9.1	0.44	14.05 <56>	3.54 <56>	12.45	8.16	4876		
3/2/2016 10:31	49.11	69	29.12	12.63	17.75	10.42	0.47	14.05 <56>	3.61 <56>	12.45	8.16	4967		
3/2/2016 10:32	48.44	67.85	29.81	12.3	17.23	10.53	0.39	14.01 <56>	3.75 <56>	12.48	8.12	5155		
3/2/2016 10:33	43.61	62	25.04	11.09	15.77	8.86	0.32	14.22 <56>	3.49 <56>	12.34	8.31	4809		
3/2/2016 10:34	52.01	70.21	30.34	14.17	19.13	11.5	0.55	13.50 <56>	3.55 <56>	12.98	7.64	4886		
3/2/2016 10:35	48.53	65.86	28.65	14.27	19.37	11.72	0.56	13.57 <56>	3.59 <56>	12.88	7.71	4945		
3/2/2016 10:36	44.31	61.01	26.18	12.97	17.86	10.66	0.51	13.77 <56>	3.60 <56>	12.69	7.9	4948		
3/2/2016 10:37	39.69	57.48	23.35	11.47	16.61	9.39	0.42	14.48 <56>	3.58 <56>	12.05	8.54	4928		
3/2/2016 10:38	35.38	51.49	20.99	10.15	14.77	8.38	0.43	14.55 <56>	3.61 <56>	12	8.6	4970		
3/2/2016 10:39	33.79	50.03	19.41	9.28	13.74	7.42	0.34	14.81 <56>	3.50 <56>	11.84	8.81	4812		
3/2/2016 10:40	39.48	55.43	22.81	10.95	15.37	8.8	0.42	14.04 <56>	3.52 <56>	12.5	8.15	4839		
3/2/2016 10:41	43.8	61.35	25.92	12.64	17.7	10.41	0.39	14.01 <56>	3.60 <56>	12.48	8.12	4956		
3/2/2016 10:42	44.79	61.96	26.27	12.6	17.43	10.28	0.53	13.83 <56>	3.57 <56>	12.65	7.96	4912		
3/2/2016 10:43	53.37	72.21	31.86	15.54	21.03	12.91	0.49	13.53 <56>	3.63 <56>	12.93	7.67	5001		
3/2/2016 10:44	50.77	68.33	29.32	15.98	21.51	12.84	0.57	13.46 <56>	3.52 <56>	13.01	7.6	4837		
3/2/2016 10:45	52.78	71.85	31.6	16.77	22.83	13.97	0.56	13.61 <56>	3.64 <56>	12.83	7.75	5015		
3/2/2016 10:46	43.75	62.9	25.78	13.64	19.61	11.18	0.42	14.38 <56>	3.59 <56>	12.13	8.45	4936		
3/2/2016 10:47	39.34	55.84	22.53	11.84	16.81	9.43	0.46	14.20 <56>	3.49 <56>	12.35	8.29	4797		
3/2/2016 10:48	44.47	63.18	27.14	13.58	19.29	11.53	0.4	14.21 <56>	3.71 <56>	12.28	8.3	5112		
3/2/2016 10:49	33.49	52.96	19.48	9.5	15.02	7.69	0.42	15.81 <56>	3.54 <56>	11.07	9.58	4873		
3/2/2016 10:50	31.12	48.57	17.95	8	12.48	6.42	0.3	15.61 <56>	3.51 <56>	11.25	9.43	4831	0.47	0.11
													0.00	0.00
Average	**43.39**	**61.68**	**25.63**	**10.21**	**14.47**	**8.39**	**0.44**			**12.27**	**8.34**	**4942.75**	**0.62**	**0.15**

Flow	kdscfh	4942.75
O2	% dry	8.34
CO2	% dry	12.27
NOx	ppm dry	43.39
NOx	ppm @ 3% O2	61.68
NOx	lb/hr	25.63
SO2	ppm dry	10.21
SO2	ppm @ 3% O2	14.47
SO2	lb/hr	8.39
CO	ppm dry	0.44
CO	ppm @ 3% O2	0.62
CO	lb/hr	0.15

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 11:04	48.27	67.08	27.05	11.65	16.19	9.08	0.42	13.90 <56>	3.41 <56>	12.63	8.02	4694	0.58	0.14
3/2/2016 11:05	54.87	74.75	31.95	14.59	19.88	11.82	0.54	13.62 <56>	3.54 <56>	12.82	7.76	4878	0.74	0.19
3/2/2016 11:06	50.72	72.75	29.14	12.28	17.61	9.82	0.54	14.34 <56>	3.50 <56>	12.2	8.42	4813	0.77	0.19
3/2/2016 11:07	42.43	63.72	23.69	10	15.02	7.77	0.44	15.02 <56>	3.40 <56>	11.68	8.98	4677	0.66	0.15
3/2/2016 11:08	43.5	61.07	24.47	11.26	15.81	8.81	0.46	14.04 <56>	3.42 <56>	12.53	8.15	4711	0.65	0.16
3/2/2016 11:09	45.69	64.96	26.46	12.94	18.4	10.42	0.47	14.22 <56>	3.52 <56>	12.31	8.31	4850	0.67	0.17
3/2/2016 11:10	46.35	66.37	26.66	11.88	17.01	9.51	0.45	14.32 <56>	3.50 <56>	12.2	8.4	4818	0.84	0.16
3/2/2016 11:11	47.44	67.39	26.77	12.05	17.12	9.46	0.49	14.21 <56>	3.43 <56>	12.37	8.3	4726	0.70	0.17
3/2/2016 11:12	54.25	74.47	30.62	13.9	19.08	10.91	0.41	13.73 <56>	3.44 <56>	12.78	7.86	4727	0.56	0.14
3/2/2016 11:13	50.13	70.6	28.56	13.39	18.86	10.61	0.55	14.08 <56>	3.47 <56>	12.43	8.19	4772	0.77	0.19
3/2/2016 11:14	47.14	64.56	26.61	12.86	17.61	10.1	0.41	13.70 <56>	3.44 <56>	12.78	7.83	4729	0.56	0.14
3/2/2016 11:15	54.06	71.95	31.55	15.25	20.3	12.38	0.54	13.31 <56>	3.55 <56>	13.16	7.45	4888	0.72	0.19
3/2/2016 11:16	49.46	69.06	28.57	13.33	18.61	10.71	0.55	13.96 <56>	3.52 <56>	12.51	8.08	4839	0.77	0.19
3/2/2016 11:17	47.87	66.37	27.59	11.8	16.36	9.46	0.6	13.87 <56>	3.51 <56>	12.67	7.99	4827	0.83	0.21
3/2/2016 11:18	44.82	62.48	25.58	11.56	16.12	9.18	0.52	13.94 <56>	3.47 <56>	12.57	8.06	4781	0.72	0.18
3/2/2016 11:19	45.84	64	25.7	11.59	16.18	9.04	0.6	13.96 <56>	3.41 <56>	12.55	8.08	4696	0.84	0.20
3/2/2016 11:20	53.02	69.73	30.14	14.36	18.89	11.36	0.65	13.15 <56>	3.46 <56>	13.34	7.29	4761	0.85	0.22
3/2/2016 11:21	55.29	71.41	32.08	16.11	20.81	13.01	0.69	12.91 <56>	3.53 <56>	13.56	7.04	4860	0.89	0.24
3/2/2016 11:22	53.76	72.68	33.03	15.09	20.4	12.9	0.6	13.52 <56>	3.74 <56>	12.87	7.66	5147	0.81	0.22
3/2/2016 11:23	36.3	53.09	20.92	9.84	14.39	7.89	0.46	14.62 <56>	3.51 <56>	11.96	8.66	4828	0.67	0.16
3/2/2016 11:24	22.04	34.88	12.67	6.9	10.92	5.52	0.53	15.83 <56>	3.50 <56>	11.06	9.59	4815	0.84	0.19
3/2/2016 11:25	17.91	30.62	9.94	4.97		3.84	0.43	17.10 <56>	3.38 <56>	10.29	10.43	4650	0.74	0.15
3/2/2016 11:26	27.2	42.15	14.93	6.1	9.45	4.66	0.47	15.50 <56>	3.34 <56>	11.36	9.35	4599	0.73	0.16
3/2/2016 11:27	38.54	55.9	21.94	9.47	13.74	7.5	0.49	14.51 <56>	3.46 <56>	12.08	8.56	4768	0.71	0.17
3/2/2016 11:28	39.08	57.81	22.2	10.12	14.97	8	0.51	14.79 <56>	3.46 <56>	11.84	8.8	4758	0.75	0.18
3/2/2016 11:29													0.00	0.00
3/2/2016 11:30													0.00	0.00
3/2/2016 11:31	38.43	57.13	20.94	9.63	14.32	7.3	0.47	14.87 <56>	3.32 <56>	11.77	8.86	4565	0.70	0.16
3/2/2016 11:32	43.27	61.08	23.55	11.43	16.14	8.66	0.51	14.12 <56>	3.31 <56>	12.46	8.22	4559	0.72	0.17
3/2/2016 11:33	53.31	72.9	30	14.64	20.02	11.46	0.66	13.67 <56>	3.42 <56>	12.8	7.81	4713		
3/2/2016 11:34	51.03	72.32	28.57	13.46	19.08	10.49	0.53	14.17 <56>	3.41 <56>	12.34	8.27	4690		
3/2/2016 11:35	49.36	70.01	27.91	12.44	17.64	9.79	0.47	14.18 <56>	3.44 <56>	12.35	8.28	4736		
3/2/2016 11:36	47.28	67.54	26	11.76	16.8	9	0.43	14.29 <56>	3.35 <56>	12.27	8.37	4606		
3/2/2016 11:37	50.44	68.61	29	13.72	18.66	10.98	0.59	13.60 <56>	3.50 <56>	12.88	7.74	4816		
3/2/2016 11:38	45.59	62.97	25.86	12.17	16.81	9.6	0.61	13.81 <56>	3.45 <56>	12.68	7.94	4751		
3/2/2016 11:39	43.94	61.45	24.79	10.92	15.27	8.57	0.6	13.98 <56>	3.43 <56>	12.55	8.1	4726		
3/2/2016 11:40	41.24	60.11	22.77	9.63	14.04	7.4	0.49	14.58 <56>	3.36 <56>	12.01	8.62	4624		
3/2/2016 11:41	45.85	63.38	26.59	10.53	14.55	8.5	0.53	13.82 <56>	3.53 <56>	12.69	7.95	4858		
3/2/2016 11:42	47.72	66.42	27.65	10.55	14.68	8.51	0.62	13.92 <56>	3.53 <56>	12.6	8.04	4854		
3/2/2016 11:43	50.36	71.04	29.27	11.12	15.69	8.99	0.61	14.11 <56>	3.54 <56>	12.39	8.21	4868		
3/2/2016 11:44	44.91	65.04	25.58	8.92	12.92	7.07	0.49	14.48 <56>	3.47 <56>	12.09	8.54	4771		
3/2/2016 11:45	48.21	67.05	26.63	9.4	13.07	7.22	0.56	13.91 <56>	3.36 <56>	12.61	8.03	4626		
3/2/2016 11:46	53.76	71.39	31.53	12.34	16.39	10.07	0.6	13.28 <56>	3.57 <56>	13.18	7.42	4913		
3/2/2016 11:47	52.11	71.75	29.8	11.3	15.56	8.99	0.53	13.77 <56>	3.48 <56>	12.69	7.9	4790		
3/2/2016 11:48	47.64	66.41	27.36	9.92	13.83	7.93	0.53	13.94 <56>	3.50 <56>	12.56	8.06	4810		
3/2/2016 11:49	40.46	57.3	22.31	8.76	12.41	6.72	0.6	14.16 <56>	3.36 <56>	12.36	8.26	4618		
3/2/2016 11:50	43.15	61.84	25.85	9.36	13.41	7.8	0.57	14.33 <56>	3.65 <56>	12.16	8.41	5017		
3/2/2016 11:51	32.47	50.37	18.35	5.86	9.09	4.61	0.59	15.51 <56>	3.44 <56>	11.29	9.36	4733		
3/2/2016 11:52	31.91	48.9	17.89	5.38	8.25	4.2	0.55	15.33 <56>	3.41 <56>	11.44	9.22	4696		
3/2/2016 11:53	37.14	53.23	20.41	6.73	9.65	5.15	0.52	14.33 <56>	3.35 <56>	12.25	8.41	4603		
3/2/2016 11:54	43.25	60.58	25.13	9.16	12.83	7.4	0.6	14.01 <56>	3.54 <56>	12.47	8.12	4866		
3/2/2016 11:55	44.27	63.65	25.2	8.74	12.57	6.92	0.55	14.38 <56>	3.46 <56>	12.16	8.45	4768		
3/2/2016 11:56	41.3	60.15	23.56	7.8	11.36	6.19	0.57	14.56 <56>	3.47 <56>	12.02	8.61	4778		
3/2/2016 11:57	45.59	64.87	25.45	8.24	11.72	6.4	0.57	14.23 <56>	3.40 <56>	12.31	8.32	4676		
3/2/2016 11:58	44.35	64.7	25.01	8.85	12.91	6.94	0.63	14.59 <56>	3.43 <56>	12.01	8.63	4723		
3/2/2016 11:59	48.72	67.97	26.94	9.53	13.3	7.33	0.65	13.95 <56>	3.37 <56>	12.54	8.07	4632		
3/2/2016 12:00	53.19	72.68	31.67	11.68	15.96	9.68	0.71	13.66 <56>	3.62 <56>	12.78	7.8	4988		
3/2/2016 12:01	44.47	65.19	25.65	9.05	13.27	7.26	0.59	14.66 <56>	3.51 <56>	11.88	8.69	4831		
3/2/2016 12:02	44.33	62.98	24.27	8.74	12.42	6.66	0.59	14.21 <56>	3.33 <56>	12.35	8.3	4585		
3/2/2016 12:03	47.68	65.45	27.57	10.83	14.87	8.71	0.73	13.73 <56>	3.52 <56>	12.74	7.86	4843	1.00	0.26
													0.00	0.00
Average	**45.05**	**63.56**	**25.65**	**10.79**	**15.32**	**8.56**	**0.55**			**12.35**	**8.28**	**4762.84**	**0.66**	**0.16**

Flow	kdscfh	4762.84
O2	% dry	8.28
CO2	% dry	12.35
NOx	ppm dry	45.05
NOx	ppm @ 3% O2	63.56
NOx	lb/hr	25.65
SO2	ppm dry	10.79
SO2	ppm @ 3% O2	15.32
SO2	lb/hr	8.56
CO	ppm dry	0.55
CO	ppm @ 3% O2	0.66
CO	lb/hr	0.16

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 12:18	41.37	58.68	24.22	9.05	12.84	7.37	0.63	14.18 <56>	3.56 <56>	12.29	8.28	4904	0.89	0.22
3/2/2016 12:19	38.78	57.04	21.97	7.68	11.3	6.05	0.63	14.71 <56>	3.45 <56>	11.88	8.73	4745	0.93	0.22
3/2/2016 12:20	46.13	65.12	26.48	9.51	13.43	7.59	0.74	14.12 <56>	3.49 <56>	12.38	8.22	4808	1.04	0.26
3/2/2016 12:21	46.49	65.17	26.5	9.72	13.62	7.71	0.57	14.02 <56>	3.47 <56>	12.49	8.13	4775	0.80	0.20
3/2/2016 12:22	47.31	67.42	27.22	9.59	13.67	7.68	0.59	14.25 <56>	3.50 <56>	12.24	8.34	4819	0.84	0.21
3/2/2016 12:23	45.9	66.1	26.41	8.96	12.9	7.17	0.56	14.40 <56>	3.50 <56>	12.1	8.47	4819	0.81	0.20
3/2/2016 12:24	37.43	56.35	21.53	6.87	10.34	5.5	0.56	15.05 <56>	3.50 <56>	11.61	9.01	4819	0.84	0.20
3/2/2016 12:25	36.09	55.17	20.27	5.88	8.99	4.59	0.53	15.29 <56>	3.42 <56>	11.44	9.19	4704	0.81	0.18
3/2/2016 12:26	41.55	59.74	23.84	7.48	10.75	5.97	0.6	14.38 <56>	3.49 <56>	12.16	8.45	4805	0.86	0.21
3/2/2016 12:27	47.43	65.16	27.13	9.46	13	7.53	0.74	13.74 <56>	3.48 <56>	12.72	7.87	4791	1.02	0.26
3/2/2016 12:28	54.75	76.15	32.07	11.58	16.11	9.44	0.68	13.91 <56>	3.57 <56>	12.52	8.03	4907	0.95	0.24
3/2/2016 12:29	47.75	70.17	27.53	8.99	13.21	7.21	0.61	14.70 <56>	3.51 <56>	11.86	8.72	4829	0.90	0.21
3/2/2016 12:30	44.57	65.99	25.43	7.88	11.67	6.26	0.51	14.81 <56>	3.47 <56>	11.78	8.81	4780	0.76	0.18
3/2/2016 12:31	43.58	63.58	24.23	8.06	11.76	6.23	0.61	14.59 <56>	3.38 <56>	11.99	8.63	4657	0.89	0.21
3/2/2016 12:32	47.56	67.19	27.15	9.47	13.38	7.52	0.73	14.13 <56>	3.48 <56>	12.37	8.23	4782	1.03	0.25
3/2/2016 12:33	49.76	69.15	29.56	10.81	15.02	8.93	0.61	13.90 <56>	3.62 <56>	12.55	8.02	4976	0.85	0.22
3/2/2016 12:34	46.59	65.15	26.31	9.67	13.52	7.6	0.65	13.98 <56>	3.44 <56>	12.49	8.1	4730	0.91	0.22
3/2/2016 12:35	53.27	73.41	31.26	11.56	15.93	9.44	0.69	13.78 <56>	3.57 <56>	12.65	7.91	4915	0.95	0.25
3/2/2016 12:36	44.22	63.63	25.24	9.31	13.4	7.39	0.58	14.39 <56>	3.47 <56>	12.13	8.46	4780	0.83	0.20
3/2/2016 12:37	42.37	60.48	24.09	9.37	13.38	7.41	0.57	14.27 <56>	3.46 <56>	12.25	8.36	4762	0.81	0.20
3/2/2016 12:38	45.91	64.25	25.82	11.18	15.65	8.75	0.74	14.00 <56>	3.42 <56>	12.47	8.11	4710	1.04	0.25
3/2/2016 12:39	48.94	67.23	29.22	12.07	16.58	10.03	0.67	13.74 <56>	3.63 <56>	12.69	7.87	5001	0.92	0.24
3/2/2016 12:40	42.73	62.69	24.54	9.52	13.97	7.61	0.63	14.67 <56>	3.50 <56>	11.87	8.7	4810	0.92	0.22
3/2/2016 12:41	40.85	58.83	22.87	8.86	12.76	6.9	0.61	14.40 <56>	3.41 <56>	12.14	8.47	4689	0.88	0.21
3/2/2016 12:42	40.24	56.63	23.21	9.77	13.75	7.84	0.63	14.07 <56>	3.51 <56>	12.38	8.18	4832	0.89	0.22
3/2/2016 12:43	41.34	57.95	24.1	9.89	13.86	8.02	0.66	14.02 <56>	3.55 <56>	12.46	8.13	4882	0.93	0.23
3/2/2016 12:44	43.26	61.55	24.69	9.55	13.59	7.58	0.71	14.23 <56>	3.47 <56>	12.25	8.32	4781	1.01	0.25
3/2/2016 12:45	48.86	68.65	28.13	10.59	14.88	8.48	0.65	14.05 <56>	3.50 <56>	12.39	8.16	4823	0.91	0.23
3/2/2016 12:46	47.88	67.17	27.3	11	15.43	8.73	0.65	14.03 <56>	3.47 <56>	12.42	8.14	4776	0.91	0.23
3/2/2016 12:47	46.74	67.64	27.36	10.1	14.62	8.23	0.69	14.47 <56>	3.56 <56>	12.06	8.53	4903	1.00	0.25
Average	**44.99**	**64.11**	**25.86**	**9.45**	**13.44**	**7.56**	**0.63**			**12.23**	**8.35**	**4810.47**	**0.90**	**0.22**

Flow	kdscfh	4810.47
O2	% dry	8.35
CO2	% dry	12.23
NOx	ppm dry	44.99
NOx	ppm @ 3% O2	64.11
NOx	lb/hr	25.86
SO2	ppm dry	9.45
SO2	ppm @ 3% O2	13.44
SO2	lb/hr	7.56
CO	ppm dry	0.63
CO	ppm @ 3% O2	0.90
CO	lb/hr	0.22

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 13:01	43.74	62.84	25.13	8.09	11.62	6.47	0.88	14.37 <56>	3.50 <56>	12.18	8.44	4812	1.44	-0.01
3/2/2016 13:02	44.31	63.1	25.39	9.51	13.54	7.58	0.94	14.24 <56>	3.49 <56>	12.25	8.33	4800	1.57	-0.01
3/2/2016 13:03	42.55	61.13	25.76	9.9	14.22	8.34	0.96	14.37 <56>	3.69 <56>	12.11	8.44	5071	1.28	0.00
3/2/2016 13:04	36.23	56	20.3	7.85	12.13	6.12	0.93	15.46 <56>	3.41 <56>	11.28	9.32	4694	1.55	-0.01
3/2/2016 13:05	36.89	55.49	21.82	7.95	11.96	6.54	0.96	15.04 <56>	3.60 <56>	11.58	9	4954	1.5	-0.01
3/2/2016 13:06	36.37	53.76	20.52	6.89	10.18	5.41	0.94	14.78 <56>	3.43 <56>	11.86	8.79	4725	1.36	-0.01
3/2/2016 13:07	47.64	64.7	28.13	11.23	15.25	9.23	1.07	13.58 <56>	3.59 <56>	12.85	7.72	4946	1.5	-0.01
3/2/2016 13:08	50.14	68.83	30.55	11.81	16.21	10.01	1.08	13.73 <56>	3.71 <56>	12.67	7.86	5103	1.37	0.00
3/2/2016 13:09	42.71	62.77	24.59	8.79	12.92	7.04	1.01	14.70 <56>	3.50 <56>	11.9	8.72	4822	1.34	0.00
3/2/2016 13:10	47.14	66.65	27.24	9.53	13.47	7.66	0.99	14.14 <56>	3.52 <56>	12.34	8.24	4840	1.35	-0.01
3/2/2016 13:11	47.08	66.51	27.63	9.49	13.41	7.75	1.15	14.13 <56>	3.57 <56>	12.35	8.23	4916	1.49	-0.01
3/2/2016 13:12	46.69	64.64	27.54	10.02	13.87	8.22	1.21	13.84 <56>	3.59 <56>	12.59	7.97	4940	1.64	-0.01
3/2/2016 13:13	47.01	65.38	26.88	10.49	14.59	8.35	1.12	13.91 <56>	3.48 <56>	12.56	8.03	4790	1.43	-0.01
3/2/2016 13:14	50.63	68.35	29.58	11.97	16.16	9.73	1.25	13.50 <56>	3.56 <56>	12.91	7.64	4894	1.53	-0.01
3/2/2016 13:15	47.97	66.15	29.33	11.19	15.43	9.52	1.33	13.79 <56>	3.72 <56>	12.6	7.92	5121	1.49	-0.01
3/2/2016 13:16	42.5	62.15	24.86	8.91	13.03	7.25	1.2	14.62 <56>	3.56 <56>	11.87	8.66	4900	1.76	-0.01
3/2/2016 13:17	37.83	57.58	22.12	7.57	11.52	6.16	1.28	15.22 <56>	3.56 <56>	11.45	9.14	4898	1.43	-0.01
3/2/2016 13:18	34.94	53.36	20	6.26	9.56	4.98	1.21	15.27 <56>	3.48 <56>	11.44	9.18	4794	1.67	-0.01
3/2/2016 13:19	39.43	57.76	22.84	7.29	10.68	5.87	1.36	14.65 <56>	3.53 <56>	11.91	8.68	4851	1.43	-0.01
3/2/2016 13:20	45.01	64.2	27.28	8.72	12.44	7.35	1.37	14.26 <56>	3.69 <56>	12.18	8.35	5077	1.37	0.00
3/2/2016 13:21	43.27	62.82	25.03	7.53	10.93	6.06	1.41	14.52 <56>	3.52 <56>	12	8.57	4845	1.32	0.00
3/2/2016 13:22	46.82	65.53	27.38	8.65	12.11	7.04	1.37	14.00 <56>	3.56 <56>	12.47	8.11	4898	1.56	-0.01
3/2/2016 13:23	47.54	67.64	27.56	9.02	12.83	7.27	1.25	14.23 <56>	3.53 <56>	12.21	8.32	4855	1.51	-0.01
3/2/2016 13:24	43.17	62.62	25.64	7.96	11.55	6.58	1.41	14.51 <56>	3.61 <56>	11.98	8.56	4974	1.3	0.00
3/2/2016 13:25	44.03	61.38	25.68	7.63	10.64	6.19	1.45	13.94 <56>	3.55 <56>	12.51	8.06	4886	1.64	-0.01
3/2/2016 13:26	40.82	59.02	24.42	7.44	10.76	6.19	1.49	14.46 <56>	3.64 <56>	12	8.52	5011	1.57	-0.01
3/2/2016 13:27	39.87	58.07	23.35	6.27	9.13	5.11	1.36	14.56 <56>	3.57 <56>	11.96	8.61	4906	1.68	-0.01
3/2/2016 13:28	38.09	56.44	22.65	6.25	9.26	5.17	1.39	14.82 <56>	3.62 <56>	11.73	8.82	4980	1.29	0.00
3/2/2016 13:29	32.14	51.32	18.51	4.71		3.77	1.48	15.97 <56>	3.51 <56>	10.89	9.69	4824	1.45	-0.01
3/2/2016 13:30	32.1	50.31	18.67	3.86		3.12	1.45	15.67 <56>	3.54 <56>	11.13	9.48	4873	1.78	-0.01
Average	**42.49**	**61.22**	**24.88**	**8.43**	**12.48**	**6.87**	**1.21**			**12.06**	**8.51**	**4900.00**	**1.49**	**-0.01**

Flow	kdscfh	4900.00
O2	% dry	8.51
CO2	% dry	12.06
NOx	ppm dry	42.49
NOx	ppm @ 3% O2	61.22
NOx	lb/hr	24.88
SO2	ppm dry	8.43
SO2	ppm @ 3% O2	12.48
SO2	lb/hr	6.87
CO	ppm dry	1.21
CO	ppm @ 3% O2	1.49
CO	lb/hr	-0.01

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 13:44	34.27	53.34	18.89	4.08	7.78 <56>	3.13	1.66	15.57 <56>	3.35 <56>	11.25	9.4	4616	2.58	0.56
3/2/2016 13:45	44.41	61.91	25.31	7.14	9.95	5.66	1.77	13.94 <56>	3.47 <56>	12.53	8.06	4773	2.47	0.61
3/2/2016 13:46	50.86	67.39	30.67	10.03	13.29	8.42	1.77	13.25 <56>	3.67 <56>	13.17	7.39	5051	2.35	0.65
3/2/2016 13:47	51.37	68.62	30.35	11.11	14.84	9.13	1.81	13.36 <56>	3.60 <56>	13.04	7.5	4948	2.42	0.65
3/2/2016 13:48	52.19	70.51	31.5	11.51	15.55	9.67	1.8	13.51 <56>	3.67 <56>	12.88	7.65	5056	2.43	0.66
3/2/2016 13:49	46	65.77	26.21	9.37	13.4	7.43	1.7	14.30 <56>	3.47 <56>	12.16	8.38	4772	2.43	0.59
3/2/2016 13:50	50.75	68.35	28.68	11.27	15.18	8.86	1.78	13.47 <56>	3.44 <56>	12.97	7.61	4733	2.40	0.61
3/2/2016 13:51	60.84	78.18	36.95	16.78	21.56	14.18	1.9	12.85 <56>	3.70 <56>	13.54	6.97	5087	2.44	0.70
3/2/2016 13:52	52.54	73.3	32.13	13.74	19.17	11.69	1.73	13.95 <56>	3.72 <56>	12.42	8.07	5122	2.41	0.64
3/2/2016 13:53	41.07	60.36	24.13	9.69	14.24	7.92	1.79	14.70 <56>	3.58 <56>	11.83	8.72	4921	2.63	0.64
3/2/2016 13:54	38.07	57.8	21.69	8.38	12.72	6.64	1.76	15.18 <56>	3.47 <56>	11.47	9.11	4772	2.67	0.61
3/2/2016 13:55	41.44	60.5	23.77	9.87	14.41	7.88	1.75	14.60 <56>	3.49 <56>	11.93	8.64	4804	2.56	0.61
3/2/2016 13:56	42.57	61.4	25.34	11.6	16.73	9.61	1.89	14.42 <56>	3.62 <56>	12.06	8.49	4985	2.73	0.68
3/2/2016 13:57	40.29	60.1	23.68	10.81	16.12	8.84	1.75	14.92 <56>	3.58 <56>	11.65	8.9	4922	2.61	0.63
3/2/2016 13:58	36.69	54.14	21.44	9.94	14.67	8.08	1.82	14.76 <56>	3.56 <56>	11.8	8.77	4895	2.69	0.65
3/2/2016 13:59	35.86	53.71	20.52	9.32	13.96	7.42	1.88	14.98 <56>	3.48 <56>	11.62	8.95	4794	2.82	0.65
3/2/2016 14:00	39.93	57.36	22.77	11.18	16.06	8.87	1.92	14.37 <56>	3.47 <56>	12.11	8.44	4776	2.76	0.67
3/2/2016 14:01	48.65	66.68	28.94	15.25	20.9	12.62	1.99	13.71 <56>	3.62 <56>	12.7	7.84	4982	2.73	0.72
3/2/2016 14:02	47.54	68.9	27.76	14.15	20.51	11.5	1.91	14.49 <56>	3.55 <56>	11.98	8.55	4891	2.77	0.68
3/2/2016 14:03	43.13	61.32	25.23	12.47	17.73	10.15	1.85	14.22 <56>	3.56 <56>	12.24	8.31	4899	2.63	0.66
3/2/2016 14:04	43.84	63.44	26.15	12.94	18.72	10.74	1.89	14.47 <56>	3.63 <56>	11.99	8.53	4997	2.73	0.69
3/2/2016 14:05	41.84	62.52	23.09	11.18	16.7	8.59	1.91	14.94 <56>	3.36 <56>	11.67	8.92	4623	2.85	0.64
3/2/2016 14:06	44.99	63.61	26.45	13.11	18.54	10.72	2.01	14.14 <56>	3.58 <56>	12.3	8.24	4924	2.84	0.72
3/2/2016 14:07	44.2	64.64	24.64	13.1	19.16	10.16	1.96	14.62 <56>	3.39 <56>	11.91	8.66	4670	2.87	0.67
3/2/2016 14:08	54.41	71.56	32.32	18.51	24.34	15.3	2.05	13.15 <56>	3.62 <56>	13.27	7.29	4975	2.70	0.74
3/2/2016 14:09	53.08	73.71	31.71	17.48	24.27	14.53	2.08	13.89 <56>	3.64 <56>	12.5	8.01	5004	2.89	0.76
3/2/2016 14:10	43.85	63.35	25.15	13.26	19.16	10.58	1.93	14.45 <56>	3.49 <56>	12.03	8.51	4804	2.79	0.67
3/2/2016 14:11	41.41	61.46	24.52	13.36	19.83	11	1.97	14.84 <56>	3.60 <56>	11.68	8.84	4959	2.92	0.71
3/2/2016 14:12	37.69	54.28	21.41	11.88	17.11	9.39	1.99	14.40 <56>	3.46 <56>	12.14	8.47	4759		
3/2/2016 14:13	44.18	60.09	26.02	15.68	21.33	12.85	2	13.60 <56>	3.58 <56>	12.83	7.74	4933		
Average	**44.93**	**63.61**	**26.25**	**11.94**	**17.25**	**9.72**	**1.87**			**12.26**	**8.30**	**4881.57**	**2.65**	**0.66**

Flow	kdscfh	4881.57
O2	% dry	8.30
CO2	% dry	12.26
NOx	ppm dry	44.93
NOx	ppm @ 3% O2	63.61
NOx	lb/hr	26.25
SO2	ppm dry	11.94
SO2	ppm @ 3% O2	17.25
SO2	lb/hr	9.72
CO	ppm dry	1.87
CO	ppm @ 3% O2	2.65
CO	lb/hr	0.66

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 14:26	38.36	58.14	22.41	8.33	12.63	6.77	2.01	15.16 <56>	3.56 <56>	11.52	9.09	4894	3.05	0.71
3/2/2016 14:27	41.56	61.43	24.81	8.49	12.55	7.05	2.08	14.78 <56>	3.63 <56>	11.79	8.79	5000	3.07	0.76
3/2/2016 14:28	38.08	58.66	21.01	7.43	11.45	5.7	1.99	15.40 <56>	3.36 <56>	11.34	9.28	4621	3.07	0.67
3/2/2016 14:29														0.00
3/2/2016 14:30														0.00
3/2/2016 14:31	49.09	68.86	27.95	9.13	12.81	7.23	2.07	14.03 <56>	3.47 <56>	12.44	8.14	4769	2.90	0.72
3/2/2016 14:32	45.81	66.5	27.31	9.89	14.36	8.2	2.17	14.52 <56>	3.63 <56>	11.99	8.57	4993	3.15	0.79
3/2/2016 14:33	43.05	63.63	24.86	7.77	11.48	6.24	2.15	14.78 <56>	3.52 <56>	11.78	8.79	4837	3.18	0.76
3/2/2016 14:34	46.28	65.49	26.51	8.28	11.72	6.6	2.11	14.15 <56>	3.49 <56>	12.33	8.25	4798	2.99	0.74
3/2/2016 14:35	46.52	66.67	27.34	8.86	12.7	7.25	2.11	14.33 <56>	3.58 <56>	12.14	8.41	4923	3.02	0.75
3/2/2016 14:36	46.01	64.34	26.42	8.46	11.83	6.76	2.15	13.98 <56>	3.50 <56>	12.47	8.1	4810	3.01	0.75
3/2/2016 14:37	49.72	66.62	27.92	10.18	13.64	7.95	2.29	13.40 <56>	3.42 <56>	13.03	7.54	4704	3.07	0.78
3/2/2016 14:38	58.34	76.67	35.77	13.43	17.65	11.46	2.19	13.14 <56>	3.73 <56>	13.22	7.28	5135	2.88	0.82
3/2/2016 14:39	49	69.06	28.09	9.68	13.64	7.72	2.17	14.09 <56>	3.49 <56>	12.34	8.2	4802	3.06	0.76
3/2/2016 14:40	43.54	61.46	25.08	9.25	13.06	7.41	2.24	14.12 <56>	3.51 <56>	12.34	8.22	4824	3.16	0.79
3/2/2016 14:41	42.66	59.1	25.05	9.95	13.79	8.13	2.25	13.85 <56>	3.57 <56>	12.56	7.98	4918	3.12	0.80
3/2/2016 14:42	39.13	58.32	22.77	7.97	11.88	6.45	2.03	14.90 <56>	3.54 <56>	11.67	8.89	4874	3.03	0.72
3/2/2016 14:43	45.96	64.68	26.79	8.33	11.72	6.75	2.17	14.07 <56>	3.55 <56>	12.38	8.18	4882	3.05	0.77
3/2/2016 14:44	44.97	65.6	26.59	7.99	11.66	6.57	2.16	14.59 <56>	3.60 <56>	11.93	8.63	4953	3.15	0.78
3/2/2016 14:45	40.2	61.19	23.15	6.04	9.19	4.84	2.18	15.22 <56>	3.50 <56>	11.45	9.14	4823	3.32	0.76
3/2/2016 14:46	40.21	59.68	23.75	5.78	8.58	4.75	2.04	14.84 <56>	3.60 <56>	11.75	8.84	4947	3.03	0.73
3/2/2016 14:47	39.71	58.36	23.24	5.47	8.04	4.45	2.16	14.70 <56>	3.56 <56>	11.84	8.72	4901	3.17	0.77
3/2/2016 14:48	41.1	59.96	23.44	5.58	8.14	4.43	2.17	14.59 <56>	3.47 <56>	11.95	8.63	4778	3.17	0.75
3/2/2016 14:49	50.17	66.82	29.07	8.32	11.08	6.71	2.3	13.32 <56>	3.53 <56>	13.1	7.46	4854	3.06	0.81
3/2/2016 14:50	53.55	71.85	31.81	10.04	13.47	8.3	2.32	13.42 <56>	3.62 <56>	12.95	7.56	4975	3.11	0.84
3/2/2016 14:51	48.9	68.87	29.67	8.63	12.15	7.29	2.24	14.08 <56>	3.69 <56>	12.32	8.19	5083	3.15	0.83
3/2/2016 14:52	34.93	54.18	20.01	5.89	9.14	4.7	2.15	15.51 <56>	3.49 <56>	11.23	9.36	4799	3.33	0.75
3/2/2016 14:53	33.57	49.46	18.76	5.37	7.91	4.18	2.19	14.73 <56>	3.40 <56>	11.86	8.75	4681	3.23	0.74
3/2/2016 14:54	39.77	55.7	23.74	7.22	10.11	6	2.33	14.01 <56>	3.63 <56>	12.43	8.12	5000	3.26	0.85
3/2/2016 14:55	40.07	58.98	23.12	6.44	9.48	5.17	2.19	14.72 <56>	3.51 <56>	11.83	8.74	4832	3.22	0.77
3/2/2016 14:56	43.63	62.23	26.33	6.77	9.66	5.68	2.22	14.26 <56>	3.67 <56>	12.2	8.35	5055		
Average	**43.94**	**62.87**	**25.59**	**8.15**	**11.64**	**6.61**	**2.16**			**12.14**	**8.42**	**4871.79**	3.11	**0.72**

Flow	kdscfh	4871.79
O2	% dry	8.42
CO2	% dry	12.14
NOx	ppm dry	43.94
NOx	ppm @ 3% O2	62.87
NOx	lb/hr	25.59
SO2	ppm dry	8.15
SO2	ppm @ 3% O2	11.64
SO2	lb/hr	6.61
CO	ppm dry	2.16
CO	ppm @ 3% O2	3.11
CO	lb/hr	0.72

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 15:10	43.69	59.7	26.38	10.31	14.09	8.66	2.33	13.66 <56>	3.67 <56>	12.75	7.8	5057	3.18	0.86
3/2/2016 15:11	46.8	63.56	27.27	11.46	15.56	9.29	2.24	13.58 <56>	3.55 <56>	12.83	7.72	4880	3.04	0.79
3/2/2016 15:12	49.83	67.47	30.46	12.55	16.99	10.67	2.31	13.54 <56>	3.72 <56>	12.83	7.68	5120	3.13	0.86
3/2/2016 15:13	43.33	63.06	25.96	9.65	14.04	8.04	2.3	14.55 <56>	3.65 <56>	11.92	8.6	5018	3.35	0.84
3/2/2016 15:14	36.18	53.88	21.64	7.64	11.38	6.36	2.1	14.89 <56>	3.64 <56>	11.67	8.88	5011	3.13	0.76
3/2/2016 15:15	33.76	50.74	19.45	6.94	10.43	5.56	2.16	15.03 <56>	3.51 <56>	11.62	8.99	4825	3.25	0.76
3/2/2016 15:16	40.98	58.92	24.8	8.91	12.81	7.5	2.32	14.38 <56>	3.68 <56>	12.08	8.45	5068	3.34	0.85
3/2/2016 15:17	40.22	58.96	23.82	8.57	12.56	7.06	2.3	14.66 <56>	3.61 <56>	11.85	8.69	4961	3.37	0.83
3/2/2016 15:18	38.52	58.33	23	7.87	11.92	6.54	2.27	15.14 <56>	3.63 <56>	11.46	9.08	5001	3.44	0.82
3/2/2016 15:19	35.78	53.68	20.13	6.83	10.25	5.35	2.22	15.00 <56>	3.42 <56>	11.64	8.97	4713	3.33	0.76
3/2/2016 15:20	44.69	62.94	27.33	10.01	14.1	8.52	2.35	14.08 <56>	3.72 <56>	12.37	8.19	5122	3.31	0.87
3/2/2016 15:21	46.66	67.19	27.8	9.44	13.59	7.83	2.23	14.40 <56>	3.63 <56>	12.03	8.47	4991	3.21	0.81
3/2/2016 15:22	40.89	60.49	24.6	7.64	11.3	6.4	2.26	14.79 <56>	3.66 <56>	11.72	8.8	5040	3.34	0.83
3/2/2016 15:23	38.6	59.05	22.66	6.64	10.16	5.42	2.2	15.30 <56>	3.57 <56>	11.38	9.2	4917	3.37	0.79
3/2/2016 15:24	36.45	55.91	20.87	6.48	9.94	5.16	2.19	15.34 <56>	3.49 <56>	11.37	9.23	4796	3.36	0.76
3/2/2016 15:25	37.65	54.79	21.67	7.63	11.1	6.11	2.19	14.55 <56>	3.50 <56>	11.96	8.6	4821	3.19	0.77
3/2/2016 15:26	41.52	57.79	24.98	9.86	13.72	8.25	2.3	13.92 <56>	3.66 <56>	12.48	8.04	5039	3.20	0.84
3/2/2016 15:27	44.01	60.23	26.62	10.42	14.26	8.77	2.24	13.69 <56>	3.68 <56>	12.72	7.82	5066	3.07	0.82
3/2/2016 15:28	45.88	63.42	26.89	11.36	15.7	9.26	2.31	13.82 <56>	3.57 <56>	12.6	7.95	4910	3.19	0.82
3/2/2016 15:29	48.57	66.11	28.61	12.34	16.8	10.11	2.35	13.61 <56>	3.59 <56>	12.77	7.75	4934	3.20	0.84
3/2/2016 15:30	50.61	67.71	31.27	14.1	18.86	12.12	2.31	13.38 <56>	3.76 <56>	13.02	7.52	5176	3.09	0.87
3/2/2016 15:31	43.89	64.29	26.31	10.93	16.01	9.12	2.28	14.65 <56>	3.65 <56>	11.83	8.68	5022	3.34	0.83
3/2/2016 15:32	37.98	59.58	22.35	7.81	12.25	6.39	2.19	15.69 <56>	3.58 <56>	11.09	9.49	4928	3.44	0.78
3/2/2016 15:33	40.22	60.45	24.35	8.5	12.77	7.16	2.18	15.03 <56>	3.69 <56>	11.57	8.99	5072	3.28	0.80
3/2/2016 15:34	41.8	61.89	24.46	9.67	14.32	7.87	2.19	14.81 <56>	3.56 <56>	11.77	8.81	4902	3.24	0.78
3/2/2016 15:35	41.63	60.34	24.47	10.35	15	8.46	2.25	14.49 <56>	3.58 <56>	12.02	8.55	4923	3.26	0.80
3/2/2016 15:36	42.33	61.7	25.16	10.15	14.8	8.39	2.24	14.58 <56>	3.62 <56>	11.96	8.62	4979	3.27	0.81
3/2/2016 15:37	41.69	59.6	25.66	10.58	15.13	9.06	2.28	14.30 <56>	3.75 <56>	12.17	8.38	5156	3.26	0.85
3/2/2016 15:38	42.91	63.06	25.89	10.84	15.93	9.1	2.3	14.70 <56>	3.67 <56>	11.81	8.72	5053	3.38	0.84
3/2/2016 15:39	38.26	57.99	21.47	8.97	13.6	7	2.15	15.16 <56>	3.42 <56>	11.52	9.09	4701	3.26	0.73
Average	**41.84**	**60.43**	**24.88**	**9.48**	**13.65**	**7.85**	**2.25**			**12.03**	**8.53**	**4973.40**	**3.26**	**0.81**

Flow	kdscfh	4973.40
O2	% dry	8.53
CO2	% dry	12.03
NOx	ppm dry	41.84
NOx	ppm @ 3% O2	60.43
NOx	lb/hr	24.88
SO2	ppm dry	9.48
SO2	ppm @ 3% O2	13.65
SO2	lb/hr	7.85
CO	ppm dry	2.25
CO	ppm @ 3% O2	3.26
CO	lb/hr	0.81

CeDAR 1-Minute Data

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) NOx ppm @3% O2 1-Min	(Boiler 1) NOx lb/hr 1-Min Avg	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 ppm @3% O2 1-Min	(Boiler 1) SO2 lb/hr 1-Min Avg	(Boiler 1) CO ppm 1-Min	(Boiler 1) CO ppm @3% O2 1 Min	(Boiler 1) CO lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	Stack Flow kdscf/hr 1-Min	Calculated CO @ 3% O2	Calculated CO lb/hr
3/2/2016 15:54	43.04	61.63	26.41	14.59	20.89	12.45	2.32	14.32 <56>	3.73 <56>	12.13	8.4	5139		
3/2/2016 15:55	39.21	57.77	23.91	10.45	15.4	8.87	2.23	14.73 <56>	3.71 <56>	11.8	8.75	5108	3.29	0.83
3/2/2016 15:56	38.58	57.89	22.83	9.41	14.12	7.75	2.16	15.00 <56>	3.60 <56>	11.63	8.97	4957	3.24	0.78
3/2/2016 15:57	37.21	55.83	21.63	8.35	12.53	6.75	2.17	15.00 <56>	3.54 <56>	11.65	8.97	4868	3.26	0.77
3/2/2016 15:58	43.05	63.06	25.87	9.97	14.6	8.33	2.17	14.65 <56>	3.66 <56>	11.89	8.68	5033	3.18	0.79
3/2/2016 15:59	44.28	64.13	26.5	9.71	14.06	8.09	2.29	14.48 <56>	3.64 <56>	12.04	8.54	5013	3.32	0.83
3/2/2016 16:00	43.85	63.81	25.05	10.23	14.89	8.13	2.27	14.55 <56>	3.48 <56>	11.99	8.6	4785	3.30	0.79
3/2/2016 16:01	48.14	67.37	29.73	12.21	17.09	10.49	2.33	14.00 <56>	3.76 <56>	12.41	8.11	5173	3.26	0.88
3/2/2016 16:02	45.78	64.99	27.63	10.33	14.66	8.67	2.29	14.20 <56>	3.67 <56>	12.27	8.29	5055	3.25	0.84
3/2/2016 16:03	43.42	61.83	25.51	9.72	13.84	7.95	2.3	14.24 <56>	3.58 <56>	12.25	8.33	4921	3.28	0.82
3/2/2016 16:04	50.35	69.97	31.41	11.83	16.44	10.27	2.32	13.90 <56>	3.80 <56>	12.51	8.02	5226	3.22	0.88
3/2/2016 16:05	43.1	61.97	25.1	9.47	13.62	7.67	2.27	14.38 <56>	3.54 <56>	12.11	8.45	4877	3.26	0.80
3/2/2016 16:06	44.24	61.63	27.22	10.93	15.23	9.36	2.3	13.93 <56>	3.74 <56>	12.51	8.05	5153	3.20	0.86
3/2/2016 16:07	41.73	60.68	23.96	9.36	13.61	7.48	2.26	14.54 <56>	3.49 <56>	12	8.59	4809	3.29	0.79
3/2/2016 16:08	45.87	64.65	27.69	10.93	15.41	9.18	2.36	14.09 <56>	3.67 <56>	12.35	8.2	5057	3.33	0.87
3/2/2016 16:09	44.18	62.91	26.19	9.58	13.64	7.9	2.25	14.24 <56>	3.61 <56>	12.23	8.33	4965	3.20	0.81
3/2/2016 16:10	41.31	58.69	24.69	9.3	13.21	7.73	2.38	14.21 <56>	3.64 <56>	12.26	8.3	5007	3.38	0.87
3/2/2016 16:11	39.37	58.43	23.13	7.91	11.74	6.47	2.1	14.84 <56>	3.58 <56>	11.71	8.84	4921	3.12	0.75
3/2/2016 16:12	39.11	58.78	23.49	7.16	10.76	5.98	2.25	15.03 <56>	3.66 <56>	11.57	8.99	5030	3.38	0.82
3/2/2016 16:13	39.85	59.05	23.19	6.99	10.36	5.66	2.13	14.82 <56>	3.54 <56>	11.81	8.82	4875	3.16	0.75
3/2/2016 16:14	43.68	62.8	25.79	8.73	12.55	7.17	2.27	14.38 <56>	3.59 <56>	12.13	8.45	4945	3.26	0.82
3/2/2016 16:15	44.72	62.54	26.12	9.38	13.12	7.62	2.17	13.98 <56>	3.56 <56>	12.47	8.1	4893	3.03	0.77
3/2/2016 16:16	47.27	65.8	27.55	10.48	14.59	8.5	2.37	13.92 <56>	3.55 <56>	12.51	8.04	4882	3.30	0.84
3/2/2016 16:17	52.37	70.64	30.78	11.54	15.57	9.44	2.3	13.49 <56>	3.58 <56>	12.91	7.63	4923	3.10	0.82
3/2/2016 16:18	54.75	72.81	33.49	12.9	17.16	10.98	2.29	13.30 <56>	3.72 <56>	13.09	7.44	5124	3.05	0.85
3/2/2016 16:19	43.28	62.93	24.36	9.57	13.92	7.49	2.19	14.54 <56>	3.43 <56>	11.97	8.59	4714	3.18	0.75
3/2/2016 16:20	43.69	62.71	26.22	9.76	14.01	8.15	2.29	14.35 <56>	3.65 <56>	12.12	8.43	5027	3.29	0.84
3/2/2016 16:21	39.08	56.28	23.59	7.92	11.41	6.65	2.2	14.40 <56>	3.67 <56>	12.08	8.47	5056	3.17	0.81
3/2/2016 16:22	37.61	55.14	22.22	7.29	10.69	5.99	2.22	14.66 <56>	3.60 <56>	11.87	8.69	4948	3.25	0.80
3/2/2016 16:23	40.33	57.57	22.57	8.35	11.92	6.5	2.24	14.27 <56>	3.41 <56>	12.25	8.36	4687	3.20	0.76
Average	**43.42**	**62.14**	**25.79**	**9.81**	**14.03**	**8.12**	**2.26**			**12.15**	**8.41**	**4972.37**	**3.23**	**0.81**

Flow	kdscfh	4972.37
O2	% dry	8.41
CO2	% dry	12.15
NOx	ppm dry	43.42
NOx	ppm @ 3% O2	62.14
NOx	lb/hr	25.79
SO2	ppm dry	9.81
SO2	ppm @ 3% O2	14.03
SO2	lb/hr	8.12
CO	ppm dry	2.26
CO	ppm @ 3% O2	3.23
CO	lb/hr	0.81

APPENDIX D CALCULATIONS

GENERAL EMISSION CALCULATIONS

I. Stack Gas Velocity

A. Stack gas molecular weight, lb/lb-mole

$$MW_{dry} = 0.44 * \%CO_2 + 0.32 * \%O_2 + 0.28 * \%N_2$$

$$MW_{wet} = MW_{dry} * (1 - B_{wo}) + 18 * B_{wo}$$

B. Absolute stack pressure, iwg

$$Ps = Pbar + \frac{Psg}{13.6}$$

C. Stack gas velocity, ft/sec

$$V_s = 2.9 * C_p * \sqrt{\Delta P} * \sqrt{T_s} * \sqrt{\frac{29.92 * 28.95}{P_s * MW_{wet}}}$$

II. Moisture

A. Sample gas volume, dscf

$$V_{mstd} = 0.03342 * V_m * (P_{bar} + \frac{\Delta H}{13.6}) * \frac{T_{ref}}{T_m} * Y_d$$

B. Water vapor volume, scf

$$V_{wstd} = 0.0472 * V_{lc} * \frac{T_{ref}}{528\ ^oR}$$

C. Moisture content, dimensionless

$$B_{wo} = \frac{V_{wstd}}{(V_{mstd} + V_{wstd})}$$

III. Stack gas volumetric flow rate

A. Actual stack gas volumetric flow rate, wacfm

$$Q = V_s * A_s * 60$$

B. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q * (1 - B_{wo}) * \frac{T_{ref}}{T_s} * \frac{P_s}{29.92}$$

IV. Gaseous Mass Emission Rates, lb/hr

$$M = \frac{ppm * MW_i * Q_{sd} * 60}{SV * 10^6}$$

V. Emission Rates, lb/MMBtu

$$\frac{lb}{MMBtu} = \frac{ppm * MW_i * F}{SV * 10^6} * \frac{20.9}{20.9 - \%O_2}$$

6. Percent Isokinetic

$$I = \frac{17.32 \ x \ T_s \ (V_m \ std)}{(1 - Bwo)0 \ x \ V_s \ x \ Ps \ x \ Dn^2} \ x \ \frac{528 \circ R}{T_{ref}}$$

7. Particulate emissions

a) Grain loading, gr/dscf

$C = 0.01543 \ (M_n/V_{m\ std})$

b) Grain loading at 3% O_2, gr/dscf

$C_{3\%}\ O_2 = C \ (12/\%\ CO_2)$

c) Mass emissions, lb/hr

M = C x Qsd x (60 min/hr)/(7000 gr/lb)

d) Particulate emission factor

$$lb / 10^6 \ Btu = C \ x \ \frac{1 \ lb}{7000 gr} \ x \ F \ x \ \frac{20..9}{20.9 - \%O_2}$$

Nomenclature:

A_s	= stack area, ft^2
B_{wo}	= flue gas moisture content, dimensionless
$C_{12\%CO2}$	= particulate grain loading, gr/dscf corrected to 3% O_2
C	= particulate grain loading, gr/dscf
C_p	= pitot calibration factor, dimensionless
Dn	= nozzle diameter, in.
F	= fuel F-Factor, dscf/MMBtu @ 0% O_2
H	= orifice differential pressure, iwg
I	= % isokinetics
M_n	= mass of collected particulate, mg
M_i	= mass emission rate of specie i, lb/hr
MW	= molecular weight of flue gas, lb/lb-mole
M_{wi}	= molecular weight of specie i:
	SO_2: 64
	NO_x: 46
	CO: 28
	HC: 16
0	= sample time, min.
ΔP	= average velocity head, iwg = $(\sqrt{\Delta P})^2$
P_{bar}	= barometric pressure, inches Hg
P_s	= stack absolute pressure, inches Hg
P_{sg}	= stack static pressure, iwb
Q	= wet stack flow rate at actual conditions, wacfm
Q_{sd}	= dry standard stack flow rate, dscfm
SV	= specific molar volume of an ideal gas at standard conditions, ft^3/lb-mole
T_m	= meter temperature, °R
T_{ref}	= reference temperature, °R
T_s	= stack temperature, °R
V_s	= stack gas velocity, ft/sec
V_{lc}	= volume of liquid collected in impingers, ml
V_m	= uncorrected dry meter volume, dcf
V_{mstd}	= dry meter volume at standard conditions, dscf
V_{wstd}	= volume of water vapor at standard conditions, scf
Y_d	= meter calibration coefficient

EPA METHOD 5 SOURCE TEST

DATA AND WORKSHEET

Client	Desert View Power Parameter			Full Load
Loaction	Mecca	Fuel		Biomass
Unit	1	Data By		DW
Test Number	1-PM-U1	2-PM-U1	3-PM-U1	Average
Reference Temperature, F	68	68	68	
Test Date	3/1/2016	3/1/2016	3/1/2016	
Sample Train	5-WCS	5-WCS	5-WCS	-
Pitot Factor	0.840	0.840	0.840	-
Meter Calibration Factor	0.997	0.997	0.997	-
Stack Area (sq ft)	38.84	38.84	38.84	-
Sample Time (Min)	120	120	120	120
Barometric Pressure (in Hg)	30.17	30.17	30.17	30.17
Nozzle Diam (in)	0.246	0.243	0.246	0.245
Start/Stop Time	800/1019	1031/1251	1315/1551	-
Stack Pressure (iwg)	0.52	0.54	0.54	0.53
Delta P (iwg)	0.971	0.9612	0.9200	0.9506
Meter Pressure (iwg)	1.761	1.748	1.740	1.750
Stack Temperature (F)	350.0	356.6	358.3	355.0
Meter Temperature (F)	84.8	96.0	99.0	93.3
Meter Volume (acf)	93.735	94.900	95.935	94.857
Liquid Volume (ml)	301.5	286.0	277.4	288.3
Stack O2 (%)	9.11	9.12	9.09	9.1
Stack CO2 (%)	11.39	11.39	11.44	11.4
Standard Sample Volume (SCF	91.722	90.975	91.477	91.392
Moisture Fraction	0.134	0.129	0.125	0.130
Molecular Weight (wet)	28.55	28.61	28.67	28.61
Stack Gas Velocity (ft/sec)	68.46	68.33	66.85	67.88
Stack Flow Rate (wacfm)	159,546	159,230	155,798	158,191
Stack Flow Rate (dscfm)	90,876	90,505	88,773	90,051
Isokinetic Ratio (%)	98.94	100.99	101.02	100.31
Analysis				
Filter mg	0.00	0.00	0.00	0.00
Probe/Nozzle mg	0.40	1.10	1.50	1.00
Particulate Catch, mg	0.40	1.10	1.50	1.00
Particulate Emissions				
Grain Loading gr/dscf	0.00007	0.00019	0.00025	0.00017
Grain Loading @ 12% CO2	0.00007	0.00020	0.00027	0.00018
Part emission lb/hr	0.052	0.145	0.193	0.13

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	1-RA-U1	
Date:	3/1/2016	
Start Time:	8:00	
Station:	Desert View Power	
Unit:	#1	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	875.0	737.9	137.1
2/H2O	701.4	699.9	1.5
3/Empty	633.4	633.3	0.1
4/S.G.	937.6	926.5	11.1
Rinse		50.0	-50.0
Total			99.8

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	252.125	73	72
		80	75
Stop	284.100	84	78
		86	79
Total	31.975		78.4

Summary

Sample Volume:	31.502	dscf
H_2O Volume :	4.711	scf
Moisture Content:	13.0	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.100	1.0488	349	72.76
4	0.920	0.9592	349	66.54
3	0.930	0.9644	348	66.86
2	0.950	0.9747	349	67.61
1	0.970	0.9849	347	68.24
5	1.200	1.0954	348	75.94
4	1.100	1.0488	349	72.76
3	0.800	0.8944	351	62.12
2	0.810	0.9000	351	62.51
1	0.780	0.8832	350	61.30
5	0.950	0.9747	349	67.61
4	0.960	0.9798	351	68.05
3	0.800	0.8944	351	62.12
2	0.920	0.9592	349	66.54
1	0.890	0.9434	350	65.48
5	1.200	1.0954	349	75.99
4	1.100	1.0488	351	72.85
3	0.930	0.9644	351	66.98
2	0.870	0.9327	351	64.78
1	0.810	0.9000	350	62.47
5	1.100	1.0488	348	72.71
4	1.100	1.0488	349	72.76
3	1.200	1.0954	350	76.04
2	1.200	1.0954	351	76.08
1	1.300	1.1402	350	79.14
5	1.000	1.0000	351	69.46
4	0.910	0.9539	350	66.22
3	0.900	0.9487	349	65.81
2	0.960	0.9798	351	68.05
1	0.950	0.9747	351	67.70
Average	0.9822	0.9911	349.8	68.78

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Analyzer Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.07	0.02	0.10	0.00
Pre Test Span Direct	10.70	10.42	47.25	4.77
Pre-test Zero	0.06	0.03	0.78	0.01
Pre-test Span	10.72	10.38	47.74	4.76
0-60 min	9.12	11.30	40.86	0.14
Post-test Zero	0.06	0.03	0.17	0.08
Post-test Span	10.67	10.34	47.27	4.79
Post Test Zero Direct	0.04	0.01	0.13	0.02
Post Test Span Direct	10.75	10.38	47.70	4.76
Average	9.12	11.30	40.86	0.14
Corr. Results	9.05	11.45	40.79	0.09
	Cal Error <2%, Bias <5%, Drift <3%			
Calibrtion Error	0.3%	-0.4%	-0.3%	0.6%
Pre-Test Zero Bias	0.0%	0.1%	0.7%	0.1%
Pre-Test Span Bias	0.1%	-0.2%	0.5%	-0.1%
Post-Test Zero Bias	0.1%	0.1%	0.0%	0.7%
Post-Test Span Bias	-0.4%	-0.2%	-0.5%	0.3%
Zero Drift	0.0%	0.0%	-0.7%	0.7%
Span Drift	-0.3%	-0.2%	-0.5%	0.3%

TEST SUMMARY

O_2:	9.051	% dry
	7.874	% wet
CO_2:	11.454	% dry
	9.964	% wet
NO_x:	40.788	ppm dry
	35.482	ppm wet
	26.818	lb/hr
SO_2:	8.847622	ppm dry
SO2:	8.094	lb/hr
CO:	0.09	ppm dry
	0.08	ppm wet
	0.036	lb/hr
H_2O:	13.0	%
MW:	28.61	lb/lb-mole
Flow:	160,291	wacfm
	91.79	mdscfm
	5507.26	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5507.26	5047.03	460.23	8.4%
O_2	% dry	9.05	9.2	-0.11	-1.2%
CO_2	% dry	11.45	11.7	-0.20	-1.7%
NO_x	ppm dry	40.79	42.8	-1.99	-4.9%
NO_x	ppm @ 3% O_2	61.62	65.0	-3.41	-5.5%
NO_x	lb/hr	26.82	25.89	0.93	3.5%
SO_2	ppm dry	8.85	8.85	0.00	0.0%
SO_2	ppm @ 3% O_2	13.37	13.44	-0.07	-0.5%
SO_2	lb/hr	8.09	7.455	0.638	7.9%
CO	ppm dry	0.09	0.00	0.09	
CO	ppm @ 3% O_2	0.14	0.00	0.14	
CO	lb/hr	0.036	0.000	0.04	

SOx Titration Summary

	81/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	506	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.66	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	2-RA-U1
Date:	3/1/2016
Start Time:	9:15
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	855.9	709.3	146.6
2/H2O	684.1	682.5	1.6
3/Empty	616.1	616.0	0.1
4/S.G.	978.3	967.8	10.5
Rinse		50.0	-50.0
Total			108.8

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	285.200	83	83
		88	86
Stop	318.900	88	86
		89	87
Total	33.700		86.3

Summary

Sample Volume:	32.723	dscf
H_2O Volume :	5.135	scf
Moisture Content:	13.6	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.100	1.0488	349	72.86
4	0.870	0.9327	350	64.83
3	0.850	0.9220	351	64.12
2	0.920	0.9592	352	66.75
1	1.200	1.0954	350	76.14
5	1.300	1.1402	349	79.20
4	1.100	1.0488	351	72.95
3	0.860	0.9274	351	64.50
2	0.720	0.8485	350	58.98
1	0.750	0.8660	350	60.20
5	0.930	0.9644	351	67.07
4	0.850	0.9220	351	64.12
3	0.800	0.8944	352	62.25
2	1.000	1.0000	352	69.59
1	0.970	0.9849	352	68.54
5	1.200	1.0954	350	76.14
4	1.100	1.0488	351	72.95
3	0.860	0.9274	352	64.54
2	0.840	0.9165	353	63.82
1	0.830	0.9110	355	63.52
5	1.200	1.0954	351	76.19
4	1.200	1.0954	350	76.14
3	1.100	1.0488	352	72.99
2	1.100	1.0488	350	72.90
1	1.200	1.0954	350	76.14
5	1.000	1.0000	351	69.55
4	0.880	0.9381	352	65.29
3	0.850	0.9220	351	64.12
2	0.900	0.9487	350	65.94
1	1.100	1.0488	349	72.86
Average	0.9798	0.9898	350.9	68.84

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Analyzer Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.13	0.02
Pre Test Span Direct	10.75	10.38	47.70	4.76
Pre-test Zero	0.06	0.03	0.17	0.08
Pre-test Span	10.67	10.34	47.27	4.79
0-60 min	9.23	11.15	40.24	0.14
Post-test Zero	0.06	0.03	0.16	0.07
Post-test Span	10.67	10.31	47.20	4.81
Post Test Zero Direct	0.04	0.01	0.12	0.03
Post Test Span Direct	10.72	10.37	47.67	4.81
Average	9.23	11.15	40.24	0.14
Corr. Results	9.19	11.34	40.44	0.07
	Cal Error <2%	Bias <5%, Drift <3%		
Calibrtion Error	0.7%	-0.7%	0.2%	0.5%
Pre-Test Zero Bias	0.1%	0.1%	0.0%	0.7%
Pre-Test Span Bias	-0.4%	-0.2%	-0.5%	0.3%
Post-Test Zero Bias	0.1%	0.1%	0.0%	0.5%
Post-Test Span Bias	-0.3%	-0.3%	-0.5%	0.1%
Zero Drift	0.0%	0.0%	0.0%	-0.1%
Span Drift	0.0%	-0.1%	-0.1%	0.3%

TEST SUMMARY

O_2:	9.187	% dry
	7.941	% wet
CO_2:	11.337	% dry
	9.799	% wet
NO_x:	40.442	ppm dry
	34.956	ppm wet
	26.405	lb/hr
SO_2:	7.639745	ppm dry
	6.940	lb/hr
CO:	0.07	ppm dry
	0.06	ppm wet
	0.027	lb/hr
H_2O:	13.6	%
MW:	28.53	lb/lb-mole
Flow:	160,427	wacfm
	91.146	mdscfm
	5468.79	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5468.79	4953.83	514.95	9.4%
O_2	% dry	9.19	9.3	-0.07	-0.7%
CO_2	% dry	11.34	11.5	-0.20	-1.8%
NO_x	ppm dry	40.44	42.4	-1.95	-4.8%
NO_x	ppm @ 3% O_2	61.80	64.8	-3.01	-4.9%
NO_x	lb/hr	26.40	25.3	1.14	4.3%
SO_2	ppm dry	7.64	7.64	0.00	0.0%
SO_2	ppm @ 3% O_2	11.67	11.69	-0.01	-0.1%
SO_2	lb/hr	6.940	6.330	0.610	8.8%
CO	ppm dry	0.07	0.00	0.07	
CO	ppm @ 3% O_2	0.10	0.00	0.10	
CO	lb/hr	0.027	0.000		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	439	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.75	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	3-RA-U1
Date:	3/1/2016
Start Time:	10:31
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	884.6	742.0	142.6
2/H2O	703.7	700.9	2.8
3/Empty	633.6	632.7	0.9
4/S.G.	944.3	937.6	6.7
Rinse		50.0	-50.0
Total			103.0

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	319.800	88	87
		89	88
Stop	353.600	93	91
		94	92
Total	33.800		90.3

Summary

Sample Volume:	32.582	dscf
H_2O Volume :	4.862	scf
Moisture Content:	13.0	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.000	1.0000	353	69.54
4	0.860	0.9274	353	64.49
3	0.800	0.8944	353	62.19
2	0.900	0.9487	354	66.01
1	1.000	1.0000	353	69.54
5	1.100	1.0488	354	72.97
4	1.000	1.0000	353	69.54
3	0.930	0.9644	354	67.10
2	0.600	0.7746	354	53.90
1	0.620	0.7874	354	54.79
5	0.870	0.9327	354	64.90
4	0.850	0.9220	355	64.19
3	0.800	0.8944	355	62.27
2	0.900	0.9487	353	65.97
1	0.890	0.9434	354	65.64
5	1.100	1.0488	355	73.02
4	1.000	1.0000	355	69.62
3	0.910	0.9539	355	66.41
2	0.880	0.9381	354	65.27
1	0.820	0.9055	353	62.97
5	1.100	1.0488	354	72.97
4	1.000	1.0000	355	69.62
3	1.000	1.0000	355	69.62
2	1.000	1.0000	355	69.62
1	1.100	1.0488	355	73.02
5	1.100	1.0488	353	72.93
4	0.910	0.9539	354	66.37
3	0.880	0.9381	354	65.27
2	0.890	0.9434	354	65.64
1	0.970	0.9849	353	68.49
Average	0.9216	0.9600	354.0	66.80

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.03
Pre Test Span Direct	10.72	10.37	47.67	4.81
Pre-test Zero	0.06	0.03	0.16	0.07
Pre-test Span	10.67	10.31	47.20	4.81
0-60 min	9.04	11.25	41.34	0.14
Post-test Zero	0.05	0.03	0.16	0.07
Post-test Span	10.57	10.30	47.26	4.77
Post Test Zero Direct	0.04	0.01	0.12	0.03
Post Test Span Direct	10.62	10.35	47.61	4.76
Average	9.04	11.25	41.34	0.14
Corr. Results	9.04	11.46	41.56	0.07
	Cal Error <2%, Bias <5%, Drift <3%			
Calibrtion Error	0.5%	-0.7%	0.2%	1.0%
Pre-Test Zero Bias	0.1%	0.1%	0.0%	0.5%
Pre-Test Span Bias	-0.3%	-0.3%	-0.5%	0.1%
Post-Test Zero Bias	0.1%	0.1%	0.0%	0.4%
Post-Test Span Bias	-0.3%	-0.3%	-0.4%	0.2%
Zero Drift	0.0%	0.0%	0.0%	-0.1%
Span Drift	-0.5%	-0.1%	0.1%	-0.5%

TEST SUMMARY

O_2:	9.040	% dry
	7.867	% wet
CO_2:	11.464	% dry
	9.976	% wet
NO_x:	41.558	ppm dry
	36.162	ppm wet
	26.404	lb/hr
SO_2:	9.1911057	ppm dry
	8.125	lb/hr
CO:	0.07	ppm dry
	0.07	ppm wet
	0.029	lb/hr
H_2O:	13.0	%
MW:	28.61	lb/lb-mole
Flow:	155,662	wacfm
	88.70	mdscfm
	5321.85	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5321.85	4825	496.55	9.3%
O_2	% dry	9.04	9.1	-0.09	-1.0%
CO_2	% dry	11.46	11.7	-0.20	-1.7%
NO_x	ppm dry	41.56	43.1	-1.56	-3.8%
NO_x	ppm @ 3% O_2	62.72	65.3	-2.60	-4.1%
NO_x	lb/hr	26.40	24.99	1.41	5.4%
SO_2	ppm dry	9.19	9.38	-0.19	-2.1%
SO_2	ppm @ 3% O_2	13.87	14.22	-0.34	-2.5%
SO_2	lb/hr	8.125	7.559	0.566	7.0%
CO	ppm dry	0.07	0.11	-0.03	
CO	ppm @ 3% O_2	0.11	0.16	-0.05	
CO	lb/hr	0.029	0.037	-0.01	

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	468	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	3.09	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	4-RA-U1	
Date:	3/1/2016	
Start Time:	11:47	
Station:	Desert View Power	
Unit:	#1	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.54	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	807.9	694.0	113.9
2/H2O	726.6	722.4	4.2
3/Empty	616.3	615.8	0.5
4/S.G.	985.4	978.2	7.2
Rinse		50.0	-50.0
Total			75.8

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	354.300	93	93
		96	94
Stop	380.600		
Total	26.300		94.0

Summary

Sample Volume:	25.272	dscf
H_2O Volume :	3.578	scf
Moisture Content:	12.4	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.910	0.9539	353	66.29
4	0.820	0.9055	353	62.92
3	0.800	0.8944	354	62.19
2	0.900	0.9487	354	65.96
1	1.100	1.0488	351	72.79
5	1.100	1.0488	353	72.88
4	1.000	1.0000	354	69.53
3	0.780	0.8832	355	61.44
2	0.680	0.8246	354	57.34
1	0.750	0.8660	353	60.18
5	1.000	1.0000	356	69.61
4	0.820	0.9055	355	63.00
3	0.800	0.8944	355	62.23
2	0.800	0.8944	356	62.27
1	0.920	0.9592	356	66.77
5	1.200	1.0954	356	76.26
4	1.100	1.0488	355	72.97
3	0.900	0.9487	356	66.04
2	0.780	0.8832	356	61.48
1	0.750	0.8660	355	60.25
5	1.200	1.0954	354	76.17
4	1.100	1.0488	355	72.97
3	1.000	1.0000	355	69.57
2	1.100	1.0488	355	72.97
1	1.200	1.0954	356	76.26
5	0.950	0.9747	356	67.85
4	0.880	0.9381	356	65.30
3	0.930	0.9644	356	67.13
2	0.950	0.9747	356	67.85
1	1.000	1.0000	355	69.57
Average	0.9351	0.9670	354.8	67.27

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.03
Pre Test Span Direct	10.62	10.35	47.61	4.76
Pre-test Zero	0.05	0.03	0.16	0.07
Pre-test Span	10.57	10.30	47.26	4.77
0-30 min	9.31	10.91	41.08	0.16
Post-test Zero	0.05	0.04	0.18	0.11
Post-test Span	10.52	10.25	46.98	4.79
Post Test Zero Direct	0.04	0.01	0.11	0.02
Post Test Span Direct	10.62	10.31	47.76	4.72
Average	9.31	10.91	41.08	0.16
Corr. Results	9.37	11.15	41.39	0.07
	Cal Error <2%, Bias <5% Drift <3%			
Calibrtion Error	0.0%	-0.8%	0.1%	0.4%
Pre-Test Zero Bias	0.1%	0.1%	0.0%	0.4%
Pre-Test Span Bias	-0.3%	-0.3%	-0.4%	0.2%
Post-Test Zero Bias	0.1%	0.1%	0.1%	1.1%
Post-Test Span Bias	-0.5%	-0.3%	-0.8%	0.8%
Zero Drift	0.0%	0.0%	0.0%	0.6%
Span Drift	-0.3%	-0.3%	-0.3%	0.2%

TEST SUMMARY

O_2:	9.374	% dry
	8.212	% wet
CO_2:	11.155	% dry
	9.771	% wet
NO_x:	41.393	ppm dry
	36.260	ppm wet
	26.638	lb/hr
SO_2:	8.7880052	ppm dry
	7.868	lb/hr
CO:	0.07	ppm dry
	0.06	ppm wet
	0.029	lb/hr
H_2O:	12.4	%
MW:	28.65	lb/lb-mole
Flow:	156,762	wacfm
	89.84	mdscfm
	5390.33	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5390.33	4776.14	614.19	11.4%
O_2	% dry	9.37	9.3	0.09	1.0%
CO_2	% dry	11.15	11.5	-0.33	-3.0%
NO_x	ppm dry	41.39	44.8	-3.41	-8.2%
NO_x	ppm @ 3% O_2	64.29	68.4	-4.12	-6.4%
NO_x	lb/hr	26.64	25.8093	0.83	3.1%
SO_2	ppm dry	8.79	10.02	-1.23	-14.0%
SO_2	ppm @ 3% O_2	13.65	15.52	-1.87	-13.7%
SO_2	lb/hr	7.868	8.039	-0.171	-2.2%
CO	ppm dry	0.07	0.38	-0.31	
CO	ppm @ 3% O_2	0.11	0.55	-0.44	
CO	lb/hr	0.029	0.125		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	429	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.50	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	5-RA-U1
Date:	3/1/2016
Start Time:	12:30
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	794.6	686.0	108.6
2/H2O	711.6	705.3	6.3
3/Empty	632.3	631.2	1.1
4/S.G.	950.9	944.3	6.6
Rinse		50.0	-50.0
Total			72.6

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	381.550	96	94
		98	96
Stop	407.800		
Total	26.250		96.0

Summary

Sample Volume:	25.103	dscf
H_2O Volume :	3.427	scf
Moisture Content:	12.0	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.000	1.0000	359	69.65
4	0.930	0.9644	358	67.13
3	0.850	0.9220	359	64.22
2	1.000	1.0000	358	69.61
1	1.000	1.0000	359	69.65
5	1.200	1.0954	356	76.16
4	1.100	1.0488	357	72.96
3	1.000	1.0000	356	69.53
2	0.710	0.8426	356	58.58
1	0.700	0.8367	355	58.13
5	1.000	1.0000	356	69.53
4	0.820	0.9055	356	62.96
3	0.820	0.9055	357	63.00
2	0.910	0.9539	357	66.36
1	0.900	0.9487	356	65.96
5	1.200	1.0954	358	76.26
4	1.000	1.0000	358	69.61
3	0.850	0.9220	359	64.22
2	0.800	0.8944	357	62.22
1	0.750	0.8660	357	60.25
5	1.100	1.0488	358	73.01
4	1.000	1.0000	358	69.61
3	1.000	1.0000	358	69.61
2	1.100	1.0488	359	73.05
1	1.100	1.0488	359	73.05
5	0.980	0.9899	356	68.83
4	0.950	0.9747	356	67.77
3	0.890	0.9434	358	65.67
2	0.990	0.9950	359	69.30
1	0.950	0.9747	359	67.89
Average	0.9490	0.9742	357.5	67.79

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.11	0.02
Pre Test Span Direct	10.62	10.31	47.76	4.72
Pre-test Zero	0.05	0.04	0.18	0.11
Pre-test Span	10.52	10.25	46.98	4.79
0-30 min	9.08	11.11	42.64	0.16
Post-test Zero	0.05	0.04	0.20	0.07
Post-test Span	10.57	10.22	47.16	4.78
Post Test Zero Direct	0.04	0.01	0.12	0.05
Post Test Span Direct	10.65	10.29	47.63	4.75
Average	9.08	11.11	42.64	0.16
Corr. Results	9.14	11.40	43.01	0.07
	Cal Error <2%, Bias <5%, Drift <3%			
Calibrtion Error	0.0%	-1.0%	0.3%	0.0%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	1.1%
Pre-Test Span Bias	-0.5%	-0.3%	-0.8%	0.8%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Post-Test Span Bias	-0.4%	-0.4%	-0.5%	0.3%
Zero Drift	0.0%	0.0%	0.0%	-0.5%
Span Drift	0.3%	-0.1%	0.2%	-0.1%

TEST SUMMARY

O_2:	9.141	% dry
	8.043	% wet
CO_2:	11.403	% dry
	10.033	% wet
NO_x:	43.013	ppm dry
	37.846	ppm wet
	27.928	lb/hr
SO_2:	7.7810405	ppm dry
	7.029	lb/hr
CO:	0.07	ppm dry
	0.06	ppm wet
	0.026	lb/hr
H_2O:	12.0	%
MW:	28.73	lb/lb-mole
Flow:	157,987	wacfm
	90.64	mdscfm
	5438.57	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5438.57	4701.43	737.14	13.6%
O_2	% dry	9.14	9.2	-0.06	-0.7%
CO_2	% dry	11.40	11.6	-0.15	-1.3%
NO_x	ppm dry	43.01	44.3	-1.32	-3.1%
NO_x	ppm @ 3% O_2	65.48	67.7	-2.22	-3.4%
NO_x	lb/hr	27.93	24.9660	2.96	10.6%
SO_2	ppm dry	7.78	9.08	-1.30	-16.7%
SO_2	ppm @ 3% O_2	11.85	13.86	-2.02	-17.1%
SO_2	lb/hr	7.029	7.107	-0.078	-1.1%
CO	ppm dry	0.07	0.71	-0.64	
CO	ppm @ 3% O_2	0.10	1.49	-1.38	
CO	lb/hr	0.026	-0.006	0.03	

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	385	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.45	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	6-RA-U1
Date:	3/1/2016
Start Time:	13:15
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	819.5	709.5	110.0
2/H2O	679.5	673.2	6.3
3/Empty	616.2	616.3	-0.1
4/S.G.	994.7	985.3	9.4
Rinse		50.0	-50.0
Total			75.6

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	408.700	99	98
		99	98
Stop	435.680		
Total	26.980		98.5

Summary

Sample Volume:	25.686	dscf
H_2O Volume :	3.568	scf
Moisture Content:	12.2	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.000	1.0000	359	69.68
4	0.810	0.9000	360	62.75
3	0.820	0.9055	360	63.13
2	0.930	0.9644	359	67.19
1	1.000	1.0000	360	69.72
5	1.000	1.0000	356	69.55
4	1.100	1.0488	355	72.90
3	0.810	0.9000	356	62.59
2	0.690	0.8307	355	57.74
1	0.720	0.8485	355	58.98
5	0.880	0.9381	356	65.24
4	0.800	0.8944	355	62.17
3	0.830	0.9110	355	63.32
2	0.900	0.9487	356	65.98
1	0.950	0.9747	355	67.75
5	1.100	1.0488	357	72.99
4	0.990	0.9950	358	69.29
3	0.890	0.9434	359	65.73
2	0.850	0.9220	360	64.28
1	0.790	0.8888	355	61.78
5	1.100	1.0488	357	72.99
4	1.000	1.0000	358	69.64
3	1.100	1.0488	358	73.03
2	1.200	1.0954	358	76.28
1	1.000	1.0000	358	69.64
5	1.100	1.0488	360	73.12
4	0.800	0.8944	359	62.32
3	0.830	0.9110	359	63.48
2	0.910	0.9539	359	66.47
1	0.900	0.9487	358	66.06
Average	0.9224	0.9604	357.5	66.86

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.05
Pre Test Span Direct	10.65	10.29	47.63	4.75
Pre-test Zero	0.05	0.04	0.20	0.07
Pre-test Span	10.57	10.22	47.16	4.78
0-30 min	9.04	11.13	44.30	0.16
Post-test Zero	0.05	0.03	0.17	0.09
Post-test Span	10.55	10.22	47.23	4.78
Post Test Zero Direct	0.04	0.01	0.12	0.02
Post Test Span Direct	10.65	10.29	47.64	4.78
Average	9.04	11.13	44.30	0.16
Corr. Results	9.09	11.44	44.57	0.08
Cal Error <2%, Bias <5%, Drift <3%				
Calibrtion Error	0.1%	-1.1%	0.1%	0.3%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Pre-Test Span Bias	-0.4%	-0.4%	-0.5%	0.3%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.8%
Post-Test Span Bias	-0.5%	-0.4%	-0.4%	0.0%
Zero Drift	0.0%	0.0%	0.0%	0.2%
Span Drift	-0.1%	0.0%	0.1%	0.0%

TEST SUMMARY

O_2:	9.090	% dry
	7.982	% wet
CO_2:	11.439	% dry
	10.044	% wet
NO_x:	44.570	ppm dry
	39.133	ppm wet
	28.479	lb/hr
SO_2:	8.2167013	ppm dry
	7.305	lb/hr
CO:	0.08	ppm dry
	0.07	ppm wet
	0.030	lb/hr
H_2O:	12.2	%
MW:	28.71	lb/lb-mole
Flow:	155,811	wacfm
	89.20	mdscfm
	5352.08	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5352.08	4684.77	667.32	12.5%
O_2	% dry	9.09	9.1	-0.04	-0.5%
CO_2	% dry	11.44	11.6	-0.16	-1.4%
NO_x	ppm dry	44.57	46.4	-1.83	-4.1%
NO_x	ppm @ 3% O_2	67.56	70.4	-2.84	-4.2%
NO_x	lb/hr	28.48	26.0587	2.42	8.5%
SO_2	ppm dry	8.22	9.25	-1.04	-12.6%
SO_2	ppm @ 3% O_2	12.45	14.03	-1.57	-12.6%
SO_2	lb/hr	7.305	7.229	0.076	1.0%
CO	ppm dry	0.08	0.98	-0.90	
CO	ppm @ 3% O_2	0.12	1.47	-1.35	
CO	lb/hr	0.030	0.331		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	389	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.62	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	7-RA-U1	
Date:	3/1/2016	
Start Time:	14:25	
Station:	Desert View Power	
Unit:	#1	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	806.9	695.4	111.5
2/H2O	731.0	725.0	6.0
3/Empty	632.6	631.4	1.2
4/S.G.	958.9	950.9	8.0
Rinse		50.0	-50.0
Total			76.7

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	442.550	99	99
		98	97
Stop	469.250		
Total	26.700		98.3

Summary

Sample Volume:	25.430	dscf
H_2O Volume :	3.620	scf
Moisture Content:	12.5	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.000	1.0000	359	69.73
4	0.830	0.9110	360	63.57
3	0.820	0.9055	360	63.18
2	0.930	0.9644	361	67.33
1	1.100	1.0488	360	73.18
5	1.100	1.0488	359	73.14
4	0.770	0.8775	358	61.15
3	0.760	0.8718	358	60.75
2	0.750	0.8660	360	60.43
1	0.720	0.8485	360	59.21
5	1.000	1.0000	360	69.77
4	0.830	0.9110	360	63.57
3	0.800	0.8944	358	62.33
2	0.830	0.9110	358	63.49
1	0.900	0.9487	358	66.11
5	1.200	1.0954	358	76.34
4	1.000	1.0000	359	69.73
3	0.900	0.9487	359	66.15
2	0.830	0.9110	360	63.57
1	0.850	0.9220	358	64.25
5	1.100	1.0488	360	73.18
4	1.000	1.0000	360	69.77
3	1.200	1.0954	359	76.39
2	1.100	1.0488	359	73.14
1	1.000	1.0000	358	69.69
5	1.100	1.0488	359	73.14
4	0.850	0.9220	358	64.25
3	0.830	0.9110	358	63.49
2	0.900	0.9487	359	66.15
1	1.000	1.0000	360	69.77
Average	0.9285	0.9636	359.1	67.20

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.02
Pre Test Span Direct	10.65	10.29	47.64	4.78
Pre-test Zero	0.05	0.03	0.17	0.09
Pre-test Span	10.55	10.22	47.23	4.78
0-30 min	9.11	11.07	42.30	0.17
Post-test Zero	0.04	0.01	0.11	0.06
Post-test Span	10.67	10.29	47.69	4.77
Post Test Zero Direct	0.05	0.03	0.20	0.09
Post Test Span Direct	10.58	10.22	47.14	4.80
Average	9.11	11.07	42.30	0.17
Corr. Results	9.12	11.34	42.32	0.09
Cal Error <2%. Bias <5%. Drift <3%				
Calibrtion Error	0.1%	-1.1%	0.1%	0.7%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.8%
Pre-Test Span Bias	-0.5%	-0.4%	-0.4%	0.0%
Post-Test Zero Bias	-0.1%	-0.1%	-0.1%	-0.3%
Post-Test Span Bias	0.4%	0.3%	0.6%	-0.3%
Zero Drift	-0.1%	-0.1%	-0.1%	-0.3%
Span Drift	0.6%	0.3%	0.5%	-0.1%

TEST SUMMARY

O_2:	9.119	% dry
	7.983	% wet
CO_2:	11.341	% dry
	9.928	% wet
NO_x:	42.320	ppm dry
	37.046	ppm wet
	27.043	lb/hr
SO_2:	7.5098543	ppm dry
	6.677	lb/hr
CO:	0.09	ppm dry
	0.08	ppm wet
	0.037	lb/hr
H_2O:	12.5	%
MW:	28.66	lb/lb-mole
Flow:	156,601	wacfm
	89.21	mdscfm
	5352.56	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5352.56	4734.23	618.33	11.6%
O_2	% dry	9.12	9.2	-0.06	-0.7%
CO_2	% dry	11.34	11.5	-0.18	-1.6%
NO_x	ppm dry	42.32	44.0	-1.66	-3.9%
NO_x	ppm @ 3% O_2	64.30	67.0	-2.72	-4.2%
NO_x	lb/hr	27.04	24.9520	2.09	7.7%
SO_2	ppm dry	7.51	8.34	-0.83	-11.0%
SO_2	ppm @ 3% O_2	11.41	12.70	-1.29	-11.3%
SO_2	lb/hr	6.677	6.577	0.100	1.5%
CO	ppm dry	0.09	1.13	-1.04	
CO	ppm @ 3% O_2	0.14	1.73	-1.59	
CO	lb/hr	0.037	0.390		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	425	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.17	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	8-RA-U1
Date:	3/1/2016
Start Time:	15:09
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	813.6	702.7	110.9
2/H2O	677.9	672.8	5.1
3/Empty	616.2	615.2	1.0
4/S.G.	1001.8	994.7	7.1
Rinse		50.0	-50.0
Total			74.1

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	470.210	95	95
		96	95
Stop	495.900		
Total	25.690		95.3

Summary

Sample Volume:	24.601	dscf
H_2O Volume :	3.498	scf
Moisture Content:	12.4	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.000	1.0000	358	69.66
4	0.880	0.9381	357	65.31
3	0.870	0.9327	359	65.02
2	0.900	0.9487	358	66.09
1	1.100	1.0488	358	73.06
5	1.200	1.0954	357	76.27
4	1.000	1.0000	358	69.66
3	0.820	0.9055	358	63.08
2	0.700	0.8367	357	58.25
1	0.750	0.8660	358	60.33
5	1.000	1.0000	357	69.62
4	0.850	0.9220	359	64.27
3	0.820	0.9055	359	63.12
2	0.900	0.9487	360	66.17
1	1.000	1.0000	360	69.75
5	1.100	1.0488	360	73.15
4	1.000	1.0000	361	69.79
3	0.870	0.9327	359	65.02
2	0.830	0.9110	358	63.47
1	0.800	0.8944	357	62.27
5	1.100	1.0488	359	73.11
4	1.100	1.0488	359	73.11
3	0.980	0.9899	358	68.96
2	1.100	1.0488	360	73.15
1	1.000	1.0000	360	69.75
5	0.980	0.9899	356	68.88
4	0.870	0.9327	356	64.90
3	0.850	0.9220	357	64.19
2	0.910	0.9539	357	66.42
1	1.000	1.0000	356	69.58
Average	0.9390	0.9690	358.2	67.51

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.11	0.06
Pre Test Span Direct	10.67	10.29	47.69	4.77
Pre-test Zero	0.05	0.03	0.20	0.09
Pre-test Span	10.58	10.22	47.14	4.80
0-30 min	8.97	11.20	43.18	0.16
Post-test Zero	0.04	0.03	0.17	0.09
Post-test Span	10.55	10.23	47.05	4.75
Post Test Zero Direct	0.04	0.01	0.12	0.03
Post Test Span Direct	10.62	10.29	47.64	4.78
Average	8.97	11.20	43.18	0.16
Corr. Results	9.02	11.50	43.54	0.08
Cal Error <2%, Bias <5%; Drift <3%				
Calibrtion Error	0.2%	-1.2%	0.2%	0.6%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Pre-Test Span Bias	-0.4%	-0.3%	-0.6%	0.3%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.6%
Post-Test Span Bias	-0.4%	-0.3%	-0.6%	-0.3%
Zero Drift	0.0%	0.0%	0.0%	0.0%
Span Drift	-0.2%	0.0%	-0.1%	-0.5%

TEST SUMMARY

O_2:	9.017	% dry
	7.895	% wet
CO_2:	11.501	% dry
	10.069	% wet
NO_x:	43.536	ppm dry
	38.117	ppm wet
	27.987	lb/hr
SO_2:	8.5859828	ppm dry
	7.679	lb/hr
CO:	0.08	ppm dry
	0.07	ppm wet
	0.030	lb/hr
H_2O:	12.4	%
MW:	28.68	lb/lb-mole
Flow:	157,337	wacfm
	89.74	mdscfm
	5384.49	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5384.49	4794.03	590.46	11.0%
O_2	% dry	9.02	9.1	-0.04	-0.5%
CO_2	% dry	11.50	11.6	-0.12	-1.0%
NO_x	ppm dry	43.54	45.0	-1.45	-3.3%
NO_x	ppm @ 3% O_2	65.58	67.8	-2.24	-3.4%
NO_x	lb/hr	27.99	25.8617	2.12	7.6%
SO_2	ppm dry	8.59	9.62	-1.04	-12.1%
SO_2	ppm @ 3% O_2	12.93	14.50	-1.56	-12.1%
SO_2	lb/hr	7.679	7.697	-0.018	-0.2%
CO	ppm dry	0.08	1.50	-1.42	
CO	ppm @ 3% O_2	0.12	2.26	-2.15	
CO	lb/hr	0.030	0.522		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	400	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	2.55	

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	9-RA-U1
Date:	3/1/2016
Start Time:	15:53
Station:	Desert View Power
Unit:	#1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.17	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.0	iwg
Pstack:	0.52	iwg
Pstack:	30.21	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl	End	Start	Diff.
1/H2O	819.5	698.9	120.6
2/H2O	728.0	721.3	6.7
3/Empty	634.4	631.0	3.4
4/S.G.	965.4	958.9	6.5
Rinse		50.0	-50.0
Total			87.2

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	496.620	96	94
		97	95
Stop	523.120		
Total	26.500		95.5

Summary

Sample Volume:	25.365	dscf
H_2O Volume :	4.116	scf
Moisture Content:	14.0	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.950	0.9747	358	68.14
4	0.820	0.9055	358	63.31
3	0.830	0.9110	359	63.73
2	0.930	0.9644	360	67.51
1	1.000	1.0000	360	70.00
5	1.200	1.0954	359	76.64
4	1.100	1.0488	358	73.33
3	0.800	0.8944	359	62.57
2	0.680	0.8246	357	57.62
1	0.720	0.8485	357	59.29
5	0.900	0.9487	359	66.37
4	0.880	0.9381	358	65.59
3	0.800	0.8944	357	62.50
2	0.880	0.9381	357	65.55
1	0.930	0.9644	356	67.34
5	1.100	1.0488	357	73.28
4	1.100	1.0488	357	73.28
3	0.990	0.9950	358	69.56
2	0.830	0.9110	356	63.62
1	0.780	0.8832	355	61.63
5	1.100	1.0488		54.99
4	1.000	1.0000		52.43
3	1.100	1.0488		54.99
2	1.100	1.0488		54.99
1	1.000	1.0000		52.43
5	1.000	1.0000		52.43
4	0.850	0.9220		48.34
3	0.800	0.8944		46.89
2	0.940	0.9695		50.83
1	1.100	1.0488		54.99
Average	0.9357	0.9673	357.8	61.81

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.03
Pre Test Span Direct	10.62	10.29	47.64	4.78
Pre-test Zero	0.04	0.03	0.17	0.09
Pre-test Span	10.55	10.23	47.05	4.75
0-30 min	9.10	11.02	41.00	0.18
Post-test Zero	0.04	0.03	0.16	0.10
Post-test Span	10.55	10.23	47.34	4.79
Post Test Zero Direct	0.04	0.01	0.10	0.05
Post Test Span Direct	10.62	10.28	47.80	4.79
Average	9.10	11.02	41.00	0.18
Corr. Results	9.16	11.32	41.25	0.09
Cal Error <2%, Bias <5%, Drift <3%				
Calibrtion Error	-0.1%	-1.1%	0.1%	0.6%
Pre-Test Zero Bias	0.0%	0.1%	0.1%	0.6%
Pre-Test Span Bias	-0.4%	-0.3%	-0.6%	-0.3%
Post-Test Zero Bias	0.0%	0.2%	0.1%	0.5%
Post-Test Span Bias	-0.4%	-0.3%	-0.5%	0.1%
Zero Drift	0.0%	0.0%	0.0%	0.1%
Span Drift	0.0%	0.0%	0.3%	0.4%

TEST SUMMARY

O_2:	9.163	% dry
	7.883	% wet
CO_2:	11.315	% dry
	9.735	% wet
NO_x:	41.247	ppm dry
	35.488	ppm wet
	23.867	lb/hr
SO_2:	7.9687276	ppm dry
	6.415	lb/hr
CO:	0.09	ppm dry
	0.08	ppm wet
	0.032	lb/hr
H_2O:	14.0	%
MW:	28.48	lb/lb-mole
Flow:	144,033	wacfm
	80.78	mdscfm
	4846.64	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	4846.64	4793.87	52.77	1.1%
O_2	% dry	9.16	9.2	-0.04	-0.4%
CO_2	% dry	11.32	11.5	-0.14	-1.3%
NO_x	ppm dry	41.25	43.0	-1.72	-4.2%
NO_x	ppm @ 3% O_2	62.90	65.6	-2.70	-4.3%
NO_x	lb/hr	23.87	24.66	-0.79	-3.3%
SO_2	ppm dry	7.97	8.66	-0.69	-8.7%
SO_2	ppm @ 3% O_2	12.15	13.21	-1.06	-8.7%
SO_2	lb/hr	6.415	6.922	-0.507	-7.9%
CO	ppm dry	0.09	1.60	-1.51	
CO	ppm @ 3% O_2	0.14	2.45	-2.31	
CO	lb/hr	0.032	0.559		

SOx Titration Summary

	B1/2	Probe
N BaCl2	0.0097561	
Total VOL (ml)	498	
Aliquot VOL (ml)	20	
Titrant VOL (ml)	1.96	

MOBILE EMISSION LABORATORY
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: Desert View Power
Unit: 1
Location: Mecca

Condition: ---
Load: > 90%
Date 3/1/2016

	O2%	CO2%				
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
	O2%	CO2%				
As Found	10.695	10.421				
Linearity	0.3%	-0.4%			<2%	Pass
3/1/2016	O2%	CO2%				
1pm-cem-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.07	0.02				
Pre test Direct Span	10.70	10.42				
System Zero	0.06	0.03				
System Span	10.72	10.38				
Average	9.17	11.22				
System Zero	0.06	0.03				
System Span	10.67	10.31				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.72	10.37				
Corrected Conc.	9.11	11.39				
System Bias Check						
Zero Pre-test	0.30%	0.15%			< 5%	PASS
Zero Post-test	0.30%	0.17%			< 5%	PASS
Span Pre-test	0.45%	-0.58%			< 5%	PASS
Span Post-test	0.20%	-0.93%			<5%	PASS
3/1/2016	O2%	CO2%				
2-CEM-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.04	0.01				
Pre test Direct Span	10.72	10.37				
System Zero	0.06	0.03				
System Span	10.67	10.31				
Raw concentration	9.12	11.13				
System Zero	0.05	0.04				
System Span	10.57	10.22				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.65	10.29				
Corrected Conc.	9.12	11.39				
System Bias Check						
Zero Pre-test	0.30%	0.17%			< 5%	PASS
Zero Post-test	0.26%	0.18%			< 5%	PASS
Span Pre-test	0.20%	-0.93%			< 5%	PASS
Span Post-test	-0.29%	-1.39%			<5%	PASS
3/10/2015	O2%	CO2%				
3-CEM-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.04	0.01				
Pre test Direct Span	10.65	10.29				
System Zero	0.05	0.04				
System Span	10.57	10.22				
Raw concentration	9.04	11.14				
System Zero	0.04	0.03				
System Span	10.55	10.23				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.62	10.29				
Corrected Conc	9.09	11.44				
System Bias Check						
Zero Pre-test	0.26%	0.18%			< 5%	PASS
Zero Post-test	0.21%	0.15%			< 5%	PASS
Span Pre-test	-0.29%	-1.39%			< 5%	PASS
Span Post-test	-0.42%	-1.35%			<5%	PASS

SCAQMD 25.3 SOURCE TEST

DATA AND WORKSHEET

Client	Desert View Powe	Parameter	>90%
Loaction	Mecca	Fuel	Biomass/coke
Unit	1	Data By	DW
Test Number	1A-HC-U1	1B-HC-U1	Average
Reference Temperature, F	68	68	
Test Date	3/1/2016	3/1/2016	
Sample Time (Min)	~60	~60	~60
Barometric Pressure (in Hg)	30.17	30.17	30.17
Start/Stop Time	910/1000	910/1000	
Stack O2 (%)	9.11	9.11	9.1
Stack CO2 (%)	11.39	11.39	11.4
Stack H2O (%)	13.4%	13.4%	13.4%
Stack Flow Rate (wacfm)	159,546	159,546	159,546
Stack Flow Rate (dscfm)	90,876	90,876	90,876
Laboraotory Results			
Vial-Organic Carbon as Methane	0.53	1.08	0.81
SC-TGNMO ppm	1.62	1.51	1.57
TGNMO EPA Correction Factor	1.086	1.086	
TGNMO ppm	2.3	2.8	2.57
TGNMO ppm @ 3% O2	3.54	4.27	3.91
TGNMO lb/hr	0.53	0.64	0.58

EPA METHOD 5 SOURCE TEST

DATA AND WORKSHEET

Client	Desert View Power Parameter			Full Load
Loaction	Mecca	Fuel		Biomass
Unit	2	Data By		DW
Test Number	1-PM-U2	2-PM-U2	3-PM-U2	Average
Reference Temperature, F	68	68	68	
Test Date	3/2/2016	3/2/2016	3/2/2016	
Sample Train	5-WCS	5-WCS	5-WCS	-
Pitot Factor	0.840	0.840	0.840	-
Meter Calibration Factor	0.997	0.997	0.997	-
Stack Area (sq ft)	38.84	38.84	38.84	-
Sample Time (Min)	120	120	120	120
Barometric Pressure (in Hg)	30.06	30.06	30.06	30.06
Nozzle Diam (in)	0.243	0.246	0.243	0.244
Start/Stop Time	835/1045	1103/1323	1336/1546	-
Stack Pressure (iwg)	0.50	0.50	0.50	0.50
Delta P (iwg)	0.887	0.8902	0.8881	0.8886
Meter Pressure (iwg)	1.621	1.864	1.854	1.779
Stack Temperature (F)	342.1	344.9	352.2	346.4
Meter Temperature (F)	86.4	99.2	99.4	95.0
Meter Volume (acf)	86.865	92.220	93.890	90.992
Liquid Volume (ml)	278.3	255.2	253.9	262.5
Stack O2 (%)	8.37	8.49	8.53	8.5
Stack CO2 (%)	12.13	12.06	12.00	12.1
Standard Sample Volume (SCF	84.402	87.606	89.169	87.059
Moisture Fraction	0.135	0.121	0.118	0.125
Molecular Weight (wet)	28.62	28.79	28.81	28.74
Stack Gas Velocity (ft/sec)	65.18	65.21	65.40	65.26
Stack Flow Rate (wacfm)	151,892	151,964	152,407	152,088
Stack Flow Rate (dscfm)	87,013	88,131	87,840	87,661
Isokinetic Ratio (%)	97.45	97.44	101.98	98.96
Analysis				
Filter mg	0.00	0.40	0.00	0.13
Probe/Nozzle mg	1.00	1.50	0.80	1.10
Particulate Catch, mg	1.00	1.90	0.80	1.23
Particulate Emissions				
Grain Loading gr/dscf	0.00018	0.00033	0.00014	0.00022
Grain Loading @ 12% CO2	0.00018	0.00033	0.00014	0.00022
Part emission lb/hr	0.136	0.253	0.104	0.164

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	1-RA-U2
Date:	3/2/2016
Start Time:	8:35
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.50	iwg
Pstack:	30.04	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	860.6	708.2	152.4
2/H2O	674.4	671.4	3.0
3/Empty	620.8	619.9	0.9
4/S.G.	954.7	945.8	8.9
Rinse		50.0	-50.0
Total			115.2

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	525.130	80	79
		84	82
Stop	560.620	85	82
		88	86
Total	35.490		83.3

Summary

Sample Volume:	34.525	dscf
H_2O Volume :	5.437	scf
Moisture Content:	13.6	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.730	0.8544	339	59.06
4	0.720	0.8485	340	58.69
3	0.750	0.8660	340	59.90
2	0.780	0.8832	340	61.08
1	0.920	0.9592	339	66.30
5	0.980	0.9899	339	68.43
4	0.990	0.9950	340	68.82
3	0.950	0.9747	340	67.41
2	0.710	0.8426	339	58.24
1	0.700	0.8367	338	57.79
5	0.750	0.8660	339	59.86
4	0.700	0.8367	340	57.87
3	0.710	0.8426	340	58.28
2	0.770	0.8775	341	60.73
1	0.800	0.8944	340	61.86
5	0.900	0.9487	339	65.57
4	0.860	0.9274	340	64.14
3	0.830	0.9110	340	63.01
2	0.780	0.8832	339	61.05
1	0.750	0.8660	338	59.82
5	1.000	1.0000	340	69.16
4	1.100	1.0488	340	72.54
3	1.100	1.0488	340	72.54
2	1.200	1.0954	339	75.72
1	1.100	1.0488	339	72.49
5	0.980	0.9899	339	68.43
4	0.990	0.9950	340	68.82
3	1.000	1.0000	341	69.21
2	1.000	1.0000	341	69.21
1	1.100	1.0488	340	72.54
Average	0.8823	0.9393	339.6	64.95

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Analyzer Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.06	0.02	0.11	0.01
Pre Test Span Direct	10.72	10.44	47.51	4.74
Pre-test Zero	0.06	0.03	0.52	0.04
Pre-test Span	10.65	10.41	47.60	4.75
0-60 min	8.35	12.05	40.69	0.16
Post-test Zero	0.05	0.03	0.25	0.09
Post-test Span	10.60	10.33	47.15	4.79
Post Test Zero Direct	0.04	0.01	0.16	0.04
Post Test Span Direct	10.69	10.36	47.52	4.80
Average	8.35	12.05	40.69	0.16
Corr. Results	8.34	12.21	40.74	0.09
Cal Error <2%, Bias <5%; Drift <3%				
Calibration Error	0.5%	-0.3%	0.0%	0.2%
Pre-Test Zero Bias	0.0%	0.0%	0.4%	0.3%
Pre-Test Span Bias	-0.4%	-0.2%	0.1%	0.1%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.6%
Post-Test Span Bias	-0.5%	-0.1%	-0.4%	-0.1%
Zero Drift	0.0%	0.0%	-0.3%	0.6%
Span Drift	-0.3%	-0.4%	-0.5%	0.5%

TEST SUMMARY

O_2:	8.342	% dry
CO_2:	12.208	% dry
NO_x:	40.740	ppm dry
	25.300	lb/hr
SO_2:	9.3226218	ppm dry
SO2:	8.055	lb/hr
CO:	0.09	ppm dry
	0.034	lb/hr
H_2O:	13.6	%
MW:	28.62	lb/lb-mole
Flow:	151,365	wacfm
	86.69	mdscfm
	5201.65	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5201.65	4873.90	327.75	6.3%
O_2	% dry	8.34	8.2	0.10	1.2%
CO_2	% dry	12.21	12.4	-0.18	-1.5%
NO_x	ppm dry	40.74	43.2	-2.51	-6.2%
NO_x	ppm @ 3% O_2	58.07	61.0	-2.95	-5.1%
NO_x	lb/hr	25.30	25.19	0.11	0.4%
SO_2	ppm dry	9.32	8.94	0.38	4.1%
SO_2	ppm @ 3% O_2	13.29	12.65	0.64	4.8%
SO_2	lb/hr	8.05	7.246	0.809	10.0%
CO	ppm dry	0.09	0.56	-0.47	
CO	ppm @ 3% O_2	0.13	0.83	-0.70	
CO	lb/hr	0.034	0.209		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	444
Aliquot VOL (ml)	20
Titrant VOL (ml)	3.47

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	2-RA-U2	
Date:	3/2/2016	
Start Time:	9:50	
Station:	Desert View Power	
Unit:	Unit 2	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	844.8	689.3	155.5
2/H2O	746.4	743.0	3.4
3/Empty	634.4	634.6	-0.2
4/S.G.	971.0	965.4	5.6
Rinse		50.0	-50.0
Total			114.3

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	561.240	88	86
		90	89
Stop	597.340	91	89
		93	90
Total	36.100		89.5

Summary

Sample Volume:	34.719	dscf
H_2O Volume :	5.395	scf
Moisture Content:	13.4	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.730	0.8544	344	59.18
4	0.740	0.8602	345	59.63
3	0.830	0.9110	346	63.19
2	0.980	0.9899	346	68.66
1	0.960	0.9798	345	67.91
5	1.100	1.0488	346	72.74
4	1.000	1.0000	346	69.36
3	0.920	0.9592	346	66.52
2	0.700	0.8367	345	57.99
1	0.750	0.8660	345	60.03
5	0.720	0.8485	345	58.81
4	0.720	0.8485	345	58.81
3	0.750	0.8660	346	60.06
2	1.000	1.0000	346	69.36
1	1.100	1.0488	346	72.74
5	0.850	0.9220	344	63.86
4	0.910	0.9539	345	66.12
3	0.820	0.9055	345	62.77
2	0.760	0.8718	346	60.46
1	0.730	0.8544	346	59.26
5	1.100	1.0488	343	72.61
4	1.000	1.0000	344	69.27
3	0.950	0.9747	345	67.56
2	1.000	1.0000	346	69.36
1	1.100	1.0488	345	72.70
5	1.000	1.0000	339	69.05
4	1.100	1.0488	340	72.47
3	1.200	1.0954	341	75.74
2	1.200	1.0954	341	75.74
1	1.100	1.0488	340	72.47
Average	0.9207	0.9595	344.4	66.48

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Analyzer Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.16	0.04
Pre Test Span Direct	10.69	10.36	47.52	4.80
Pre-test Zero	0.05	0.03	0.25	0.09
Pre-test Span	10.60	10.33	47.15	4.79
0-60 min	8.41	11.86	40.81	0.17
Post-test Zero	0.05	0.03	0.20	0.09
Post-test Span	10.60	10.31	47.41	4.81
Post Test Zero Direct	0.04	0.01	0.14	0.06
Post Test Span Direct	10.64	10.35	47.58	4.79
Average	8.41	11.86	40.81	0.17
Corr. Results	8.43	12.07	40.97	0.08
Cal Error <2%, Bias <5%; Drift <3%				
Calibrtion Error	0.3%	-0.8%	0.0%	0.9%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.6%
Pre-Test Span Bias	-0.5%	-0.1%	-0.4%	-0.1%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.4%
Post-Test Span Bias	-0.2%	-0.2%	-0.2%	0.1%
Zero Drift	0.0%	0.0%	0.0%	0.0%
Span Drift	0.0%	-0.1%	0.3%	0.2%

TEST SUMMARY

O_2:	8.427	% dry
CO_2:	12.074	% dry
NO_x:	40.972	ppm dry
	25.982	lb/hr
SO_2:	10.37902	ppm dry
	9.157	lb/hr
CO:	0.08	ppm dry
	0.030	lb/hr
H_2O:	13.4	%
MW:	28.62	lb/lb-mole
Flow:	154,928	wacfm
	88.53	mdscfm
	5311.68	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5311.68	4942.75	368.93	6.9%
O_2	% dry	8.43	8.3	0.09	1.1%
CO_2	% dry	12.07	12.3	-0.20	-1.6%
NO_x	ppm dry	40.97	43.4	-2.42	-5.9%
NO_x	ppm @ 3% O_2	58.80	61.7	-2.88	-4.9%
NO_x	lb/hr	25.98	25.6	0.35	1.3%
SO_2	ppm dry	10.38	10.21	0.17	1.7%
SO_2	ppm @ 3% O_2	14.90	14.47	0.43	2.9%
SO_2	lb/hr	9.157	8.389	0.768	8.4%
CO	ppm dry	0.08	0.44	-0.36	
CO	ppm @ 3% O_2	0.11	0.62	-0.50	
CO	lb/hr	0.030	0.155		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	470
Aliquot VOL (ml)	20
Titrant VOL (ml)	3.67

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	3-RA-U2
Date:	3/2/2016
Start Time:	11:03
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	1.0	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	840.3	704.9	135.4
2/H2O	692.6	689.1	3.5
3/Empty	619.0	618.6	0.4
4/S.G.	963.5	954.7	8.8
Rinse		50.0	-50.0
Total			98.1

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	597.760	93	90
		94	91
Stop	634.330	94	91
		96	94
Total	36.570		92.9

Summary

Sample Volume:	34.957	dscf
H_2O Volume :	4.630	scf
Moisture Content:	11.7	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.620	0.7874	344	54.33
4	0.670	0.8185	345	56.51
3	0.750	0.8660	346	59.83
2	0.980	0.9899	346	68.39
1	0.920	0.9592	344	66.18
5	1.100	1.0488	344	72.37
4	1.000	1.0000	345	69.04
3	0.900	0.9487	345	65.50
2	0.620	0.7874	346	54.40
1	0.630	0.7937	345	54.80
5	0.760	0.8718	344	60.15
4	0.750	0.8660	344	59.76
3	0.770	0.8775	345	60.59
2	0.730	0.8544	345	58.99
1	0.720	0.8485	344	58.55
5	0.850	0.9220	345	63.65
4	0.950	0.9747	346	67.34
3	0.820	0.9055	346	62.56
2	0.800	0.8944	344	61.72
1	0.750	0.8660	344	59.76
5	1.200	1.0954	344	75.59
4	1.200	1.0954	345	75.63
3	1.100	1.0488	345	72.41
2	1.200	1.0954	346	75.68
1	1.000	1.0000	346	69.09
5	0.990	0.9950	345	68.70
4	0.980	0.9899	345	68.35
3	1.000	1.0000	345	69.04
2	1.000	1.0000	346	69.09
1	0.990	0.9950	346	68.74
Average	0.8833	0.9399	345.0	64.89

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.14	0.06
Pre Test Span Direct	10.64	10.35	47.58	4.79
Pre-test Zero	0.05	0.03	0.20	0.09
Pre-test Span	10.60	10.31	47.41	4.81
0-60 min	8.39	11.90	42.01	0.17
Post-test Zero	0.05	0.04	0.18	0.09
Post-test Span	10.58	10.29	47.38	4.83
Post Test Zero Direct	0.04	0.01	0.12	0.07
Post Test Span Direct	10.62	10.31	47.56	4.83
Average	8.39	11.90	42.01	0.17
Corr. Results	8.42	12.14	42.08	0.08
Cal Error <2% Bias <5%; Drift <3%				
Calibrtion Error	0.1%	-0.8%	0.1%	0.8%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.4%
Pre-Test Span Bias	-0.2%	-0.2%	-0.2%	0.1%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Post-Test Span Bias	-0.3%	-0.1%	-0.2%	0.0%
Zero Drift	0.0%	0.0%	0.0%	0.0%
Span Drift	-0.1%	-0.1%	0.0%	0.3%

TEST SUMMARY

O_2:	8.419	% dry
CO_2:	12.141	% dry
NO_x:	42.084	ppm dry
	26.557	lb/hr
SO_2:	10.312141	ppm dry
	9.054	lb/hr
CO:	0.08	ppm dry
	0.030	lb/hr
H_2O:	11.7	%
MW:	28.84	lb/lb-mole
Flow:	151,223	wacfm
	88.09	mdscfm
	5285.68	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5285.68	4762.84	522.84	9.9%
O_2	% dry	8.42	8.3	0.14	1.7%
CO_2	% dry	12.14	12.3	-0.21	-1.7%
NO_x	ppm dry	42.08	45.0	-2.96	-7.0%
NO_x	ppm @ 3% O_2	60.35	63.6	-3.20	-5.3%
NO_x	lb/hr	26.56	25.6531	0.90	3.4%
SO_2	ppm dry	10.31	10.79	-0.48	-4.6%
SO_2	ppm @ 3% O_2	14.79	15.32	-0.53	-3.6%
SO_2	lb/hr	9.054	8.556	0.498	5.5%
CO	ppm dry	0.08	0.55	-0.47	
CO	ppm @ 3% O_2	0.11	0.66	-0.55	
CO	lb/hr	0.030	0.163	-0.13	

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	425
Aliquot VOL (ml)	20
Titrant VOL (ml)	4.06

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	4-RA-U2
Date:	3/2/2016
Start Time:	12:17
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl	End	Start	Diff.
1/H2O	800.3	694.5	105.8
2/H2O	733.7	729.0	4.7
3/Empty	634.8	634.4	0.4
4/S.G.	976.1	971.0	5.1
Rinse		50.0	-50.0
Total			66.0

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	634.900	96	93
		97	94
Stop	660.100		
Total	25.200		95.0

Summary

Sample Volume:	24.084	dscf
H_2O Volume :	3.115	scf
Moisture Content:	11.5	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.650	0.8062	345	55.64
4	0.730	0.8544	346	59.01
3	0.780	0.8832	346	60.99
2	0.900	0.9487	346	65.52
1	0.800	0.8944	345	61.73
5	1.100	1.0488	344	72.34
4	1.000	1.0000	345	69.02
3	0.940	0.9695	346	66.96
2	0.700	0.8367	345	57.74
1	0.630	0.7937	345	54.78
5	0.750	0.8660	345	59.77
4	0.720	0.8485	345	58.56
3	0.760	0.8718	346	60.21
2	0.740	0.8602	346	59.41
1	0.720	0.8485	345	58.56
5	0.850	0.9220	344	63.59
4	0.950	0.9747	345	67.27
3	0.820	0.9055	345	62.50
2	0.800	0.8944	346	61.77
1	0.750	0.8660	344	59.73
5	1.200	1.0954	344	75.56
4	1.100	1.0488	344	72.34
3	1.200	1.0954	345	75.61
2	1.200	1.0954	346	75.65
1	1.000	1.0000	346	69.06
5	1.000	1.0000	344	68.97
4	1.100	1.0488	344	72.34
3	1.000	1.0000	345	69.02
2	1.100	1.0488	346	72.43
1	1.000	1.0000	346	69.06
Average	0.8915	0.9442	345.1	65.17

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.07
Pre Test Span Direct	10.62	10.31	47.56	4.83
Pre-test Zero	0.05	0.04	0.18	0.09
Pre-test Span	10.58	10.29	47.38	4.83
0-30 min	8.45	11.80	42.07	0.17
Post-test Zero	0.04	0.03	0.19	0.11
Post-test Span	10.57	10.26	47.12	4.86
Post Test Zero Direct	0.04	0.01	0.13	0.07
Post Test Span Direct	10.62	10.28	47.76	4.81
Average	8.45	11.80	42.07	0.17
Corr. Results	8.49	12.06	42.28	0.07
Cal Error <2%. Bias <5%; Drift <3%				
Calibrtion Error	0.0%	-1.0%	0.1%	1.2%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Pre-Test Span Bias	-0.3%	-0.1%	-0.2%	0.0%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.5%
Post-Test Span Bias	-0.3%	-0.1%	-0.7%	0.5%
Zero Drift	0.0%	0.0%	0.0%	0.2%
Span Drift	0.0%	-0.2%	-0.3%	0.3%

TEST SUMMARY

O_2:	8.486	% dry
CO_2:	12.064	% dry
NO_x:	42.277	ppm dry
	26.863	lb/hr
SO_2:	9.7313315	ppm dry
	8.603	lb/hr
CO:	0.07	ppm dry
	0.027	lb/hr
H_2O:	11.5	%
MW:	28.86	lb/lb-mole
Flow:	151,877	wacfm
	88.70	mdscfm
	5322.27	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5322.27	4810.47	511.81	9.6%
O_2	% dry	8.49	8.4	0.13	1.6%
CO_2	% dry	12.06	12.2	-0.17	-1.4%
NO_x	ppm dry	42.28	45.0	-2.71	-6.4%
NO_x	ppm @ 3% O_2	60.96	64.1	-3.15	-5.2%
NO_x	lb/hr	26.86	25.8560	1.01	3.7%
SO_2	ppm dry	9.73	9.45	0.28	2.9%
SO_2	ppm @ 3% O_2	14.03	13.44	0.59	4.2%
SO_2	lb/hr	8.603	7.559	1.044	12.1%
CO	ppm dry	0.07	0.63	-0.57	
CO	ppm @ 3% O_2	0.10	0.90	-0.80	
CO	lb/hr	0.027	0.222		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	405
Aliquot VOL (ml)	20
Titrant VOL (ml)	2.77

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	5-RA-U2	
Date:	3/2/2016	
Start Time:	13:00	
Station:	Desert View Power	
Unit:	Unit 2	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack.	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	829.5	717.7	111.8
2/H2O	679.2	674.5	4.7
3/Empty	619.3	618.6	0.7
4/S.G.	970.3	963.5	6.8
Rinse		50.0	-50.0
Total			74.0

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	660.800	101	101
		102	101
Stop	687.245		
Total	26.445		101.3

Summary

Sample Volume:	24.992	dscf
H_2O Volume :	3.493	scf
Moisture Content:	12.3	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.730	0.8544	345	59.09
4	0.750	0.8660	346	59.93
3	0.840	0.9165	346	63.42
2	0.920	0.9592	345	66.33
1	1.000	1.0000	345	69.16
5	1.200	1.0954	345	75.76
4	1.100	1.0488	345	72.53
3	0.920	0.9592	345	66.33
2	0.650	0.8062	344	55.72
1	0.650	0.8062	344	55.72
5	0.830	0.9110	345	63.01
4	0.810	0.9000	346	62.28
3	0.790	0.8888	346	61.51
2	0.750	0.8660	345	59.89
1	0.770	0.8775	345	60.69
5	0.940	0.9695	345	67.05
4	0.990	0.9950	346	68.85
3	0.920	0.9592	345	66.33
2	0.790	0.8888	344	61.43
1	0.700	0.8367	344	57.83
5	1.200	1.0954	346	75.81
4	1.100	1.0488	346	72.58
3	1.000	1.0000	347	69.24
2	1.100	1.0488	347	72.62
1	1.200	1.0954	345	75.76
5	1.000	1.0000	344	69.11
4	1.000	1.0000	345	69.16
3	1.100	1.0488	346	72.58
2	1.200	1.0954	346	75.81
1	1.100	1.0488	345	72.53
Average	0.9271	0.9629	345.3	66.60

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.13	0.07
Pre Test Span Direct	10.62	10.28	47.76	4.81
Pre-test Zero	0.04	0.03	0.19	0.11
Pre-test Span	10.57	10.26	47.12	4.86
0-30 min	8.59	11.62	39.01	0.18
Post-test Zero	0.04	0.03	0.18	0.10
Post-test Span	10.55	10.26	47.18	4.81
Post Test Zero Direct	0.04	0.01	0.13	0.07
Post Test Span Direct	10.59	10.31	47.69	4.82
Average	8.59	11.62	39.01	0.18
Corr. Results	8.64	11.90	39.27	0.07
Cal Error <2%, Bias <5%; Drift <3%				
Calibration Error	0.0%	-1.2%	0.3%	1.0%
Pre-Test Zero Bias	0.0%	0.1%	0.1%	0.5%
Pre-Test Span Bias	-0.3%	-0.1%	-0.7%	0.5%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.4%
Post-Test Span Bias	-0.2%	-0.2%	-0.5%	0.0%
Zero Drift	0.0%	0.0%	0.0%	-0.2%
Span Drift	-0.1%	0.0%	0.1%	-0.5%

TEST SUMMARY

O_2:	8.638	% dry
CO_2:	11.902	% dry
NO_x:	39.266	ppm dry
	25.261	lb/hr
SO_2:	8.0397508	ppm dry
	7.196	lb/hr
CO:	0.07	ppm dry
	0.028	lb/hr
H_2O:	12.3	%
MW:	28.75	lb/lb-mole
Flow:	155,211	wacfm
	89.81	mdscfm
	5388.54	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5388.54	4900.00	488.54	9.1%
O_2	% dry	8.64	8.5	0.12	1.4%
CO_2	% dry	11.90	12.1	-0.16	-1.3%
NO_x	ppm dry	39.27	42.5	-3.22	-8.2%
NO_x	ppm @ 3% O_2	57.32	61.2	-3.90	-6.8%
NO_x	lb/hr	25.26	24.8793	0.38	1.5%
SO_2	ppm dry	8.04	8.43	-0.39	-4.8%
SO_2	ppm @ 3% O_2	11.74	12.48	-0.74	-6.3%
SO_2	lb/hr	7.196	6.869	0.327	4.5%
CO	ppm dry	0.07	1.21	-1.14	
CO	ppm @ 3% O_2	0.10	1.49	-1.38	
CO	lb/hr	0.028	-0.005	0.03	

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	420
Aliquot VOL (ml)	20
Titrant VOL (ml)	2.29

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	6-RA-U2
Date:	3/2/2016
Start Time:	13:43
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	805.2	691.7	113.5
2/H2O	730.5	725.5	5.0
3/Empty	632.6	631.3	1.3
4/S.G.	982.2	976.1	6.1
Rinse		50.0	-50.0
Total			75.9

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	687.850	100	98
		103	100
Stop	715.090		
Total	27.240		100.3

Summary

Sample Volume:	25.790	dscf
H_2O Volume :	3.582	scf
Moisture Content:	12.2	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.800	0.8944	349	61.98
4	0.720	0.8485	351	58.87
3	0.780	0.8832	352	61.31
2	0.910	0.9539	352	66.22
1	0.980	0.9899	351	68.68
5	1.200	1.0954	349	75.91
4	1.200	1.0954	350	75.95
3	1.000	1.0000	351	69.38
2	0.730	0.8544	351	59.28
1	0.740	0.8602	351	59.68
5	0.830	0.9110	348	63.09
4	0.750	0.8660	349	60.01
3	0.750	0.8660	350	60.05
2	0.790	0.8888	350	61.63
1	0.840	0.9165	349	63.51
5	1.000	1.0000	350	69.34
4	1.100	1.0488	350	72.72
3	0.980	0.9899	351	68.68
2	0.910	0.9539	350	66.14
1	0.810	0.9000	350	62.40
5	1.100	1.0488	349	72.68
4	1.200	1.0954	351	76.00
3	1.200	1.0954	350	75.95
2	1.100	1.0488	350	72.72
1	1.100	1.0488	350	72.72
5	1.000	1.0000	344	69.08
4	1.100	1.0488	345	72.50
3	1.100	1.0488	346	72.54
2	1.100	1.0488	346	72.54
1	1.200	1.0954	348	75.86
Average	0.9601	0.9799	349.4	67.91

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.13	0.07
Pre Test Span Direct	10.59	10.31	47.69	4.82
Pre-test Zero	0.04	0.03	0.18	0.10
Pre-test Span	10.55	10.26	47.18	4.81
0-30 min	8.37	11.83	41.15	0.17
Post-test Zero	0.04	0.04	0.18	0.10
Post-test Span	10.54	10.25	47.12	4.84
Post Test Zero Direct	0.04	0.01	0.13	0.06
Post Test Span Direct	10.59	10.29	47.71	4.80
Average	8.37	11.83	41.15	0.17
Corr. Results	8.42	12.11	41.43	0.07
Cal Error <2%, Bias <5%, Drift <3%				
Calibrtion Error	-0.2%	-1.0%	0.2%	1.1%
Pre-Test Zero Bias	0.0%	0.1%	0.1%	0.4%
Pre-Test Span Bias	-0.2%	-0.2%	-0.5%	0.0%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.4%
Post-Test Span Bias	-0.3%	-0.2%	-0.6%	0.4%
Zero Drift	0.0%	0.0%	0.0%	0.0%
Span Drift	0.0%	-0.1%	-0.1%	0.3%

TEST SUMMARY

O_2:	8.425	% dry
CO_2:	12.112	% dry
NO_x:	41.431	ppm dry
	27.058	lb/hr
SO_2:	11.421591	ppm dry
	10.378	lb/hr
CO:	0.07	ppm dry
	0.029	lb/hr
H_2O:	12.2	%
MW:	28.78	lb/lb-mole
Flow:	158,267	wacfm
	91.17	mdscfm
	5470.41	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5470.41	4881.57	588.84	10.8%
O_2	% dry	8.42	8.3	0.13	1.5%
CO_2	% dry	12.11	12.3	-0.14	-1.2%
NO_x	ppm dry	41.43	44.9	-3.50	-8.5%
NO_x	ppm @ 3% O_2	59.45	63.6	-4.16	-7.0%
NO_x	lb/hr	27.06	26.2473	0.81	3.0%
SO_2	ppm dry	11.42	11.94	-0.52	-4.5%
SO_2	ppm @ 3% O_2	16.39	17.25	-0.86	-5.2%
SO_2	lb/hr	10.378	9.719	0.660	6.4%
CO	ppm dry	0.07	1.87	-1.80	
CO	ppm @ 3% O_2	0.10	2.65	-2.54	
CO	lb/hr	0.029	0.660		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	404
Aliquot VOL (ml)	20
Titrant VOL (ml)	3.49

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	7-RA-U2
Date:	3/2/2016
Start Time:	14:26
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl	End	Start	Diff.
1/H2O	815.9	705.4	110.5
2/H2O	705.5	699.1	6.4
3/Empty	619.5	618.7	0.8
4/S.G.	976.7	970.3	6.4
Rinse		50.0	-50.0
Total			74.1

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	716.215	100	99
		101	99
Stop	743.580		
Total	27.365		99.8

Summary

Sample Volume:	25.931	dscf
H_2O Volume :	3.498	scf
Moisture Content:	11.9	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.810	0.9000	352	62.45
4	0.830	0.9110	352	63.21
3	0.830	0.9110	352	63.21
2	0.900	0.9487	351	65.78
1	0.780	0.8832	350	61.20
5	1.100	1.0488	350	72.68
4	1.000	1.0000	351	69.34
3	0.980	0.9899	350	68.60
2	0.730	0.8544	351	59.25
1	0.700	0.8367	350	57.98
5	0.800	0.8944	352	62.06
4	0.730	0.8544	352	59.28
3	0.720	0.8485	352	58.87
2	0.770	0.8775	352	60.88
1	0.830	0.9110	352	63.21
5	0.980	0.9899	351	68.64
4	1.000	1.0000	351	69.34
3	0.960	0.9798	351	67.94
2	0.810	0.9000	350	62.37
1	0.700	0.8367	349	57.94
5	1.100	1.0488	349	72.64
4	1.100	1.0488	349	72.64
3	1.200	1.0954	351	75.96
2	1.000	1.0000	352	69.38
1	1.100	1.0488	351	72.73
5	1.000	1.0000	350	69.30
4	1.000	1.0000	351	69.34
3	1.100	1.0488	352	72.77
2	1.200	1.0954	350	75.91
1	1.000	1.0000	350	69.30
Average	0.9192	0.9587	350.9	66.47

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.13	0.06
Pre Test Span Direct	10.59	10.29	47.71	4.80
Pre-test Zero	0.04	0.04	0.18	0.10
Pre-test Span	10.54	10.25	47.12	4.84
0-30 min	8.48	11.74	40.29	0.16
Post-test Zero	0.05	0.03	0.19	0.10
Post-test Span	10.54	10.25	47.05	4.83
Post Test Zero Direct	0.04	0.01	0.12	0.08
Post Test Span Direct	10.59	10.30	47.76	4.81
Average	8.48	11.74	40.29	0.16
Corr. Results	8.54	12.03	40.61	0.06
Cal Error <2%. Bias <5%; Drift <3%				
Calibrtion Error	-0.2%	-1.2%	0.2%	0.9%
Pre-Test Zero Bias	0.0%	0.1%	0.1%	0.4%
Pre-Test Span Bias	-0.3%	-0.2%	-0.6%	0.4%
Post-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Post-Test Span Bias	-0.3%	-0.3%	-0.6%	0.2%
Zero Drift	0.0%	0.0%	0.0%	0.1%
Span Drift	0.0%	0.0%	-0.1%	-0.1%

TEST SUMMARY

O_2:	8.541	% dry
CO_2:	12.028	% dry
NO_x:	40.611	ppm dry
	26.007	lb/hr
SO_2:	7.5601721	ppm dry
	6.736	lb/hr
CO:	0.06	ppm dry
	0.025	lb/hr
H_2O:	11.9	%
MW:	28.81	lb/lb-mole
Flow:	154,913	wacfm
	89.40	mdscfm
	5364.02	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5364.02	4871.79	492.23	9.2%
O_2	% dry	8.54	8.4	0.12	1.4%
CO_2	% dry	12.03	12.1	-0.11	-1.0%
NO_x	ppm dry	40.61	43.9	-3.33	-8.2%
NO_x	ppm @ 3% O_2	58.82	62.9	-4.05	-6.9%
NO_x	lb/hr	26.01	25.5871	0.42	1.6%
SO_2	ppm dry	7.56	8.15	-0.59	-7.8%
SO_2	ppm @ 3% O_2	10.95	11.64	-0.69	-6.3%
SO_2	lb/hr	6.736	6.609	0.127	1.9%
CO	ppm dry	0.06	2.16	-2.10	
CO	ppm @ 3% O_2	0.09	3.11	-3.02	
CO	lb/hr	0.025	0.715		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	408
Aliquot VOL (ml)	20
Titrant VOL (ml)	2.30

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	8-RA-U2	
Date:	3/2/2016	
Start Time:	15:09	
Station:	Desert View Power	
Unit:	Unit 2	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	805.0	692.5	112.5
2/H2O	732.5	726.8	5.7
3/Empty	632.5	631.5	1.0
4/S.G.	987.9	982.2	5.7
Rinse		50.0	-50.0
Total			74.9

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	744.335	100	100
		103	100
Stop	771.925		
Total	27.590		100.8

Summary

Sample Volume:	26.098	dscf
H_2O Volume :	3.535	scf
Moisture Content:	11.9	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.740	0.8602	351	59.67
4	0.780	0.8832	352	61.30
3	0.830	0.9110	352	63.24
2	0.970	0.9849	352	68.36
1	1.000	1.0000	351	69.37
5	1.200	1.0954	350	75.94
4	1.200	1.0954	351	75.99
3	1.100	1.0488	350	72.71
2	0.720	0.8485	351	58.86
1	0.700	0.8367	350	58.00
5	0.830	0.9110	351	63.20
4	0.820	0.9055	351	62.81
3	0.800	0.8944	350	62.01
2	0.890	0.9434	350	65.40
1	0.850	0.9220	349	63.87
5	0.980	0.9899	349	68.58
4	0.950	0.9747	349	67.53
3	0.840	0.9165	350	63.54
2	0.760	0.8718	350	60.44
1	0.730	0.8544	350	59.23
5	1.100	1.0488	353	72.84
4	1.100	1.0488	353	72.84
3	1.000	1.0000	353	69.45
2	1.000	1.0000	352	69.41
1	1.000	1.0000	353	69.45
5	1.000	1.0000	352	69.41
4	0.990	0.9950	353	69.10
3	1.100	1.0488	353	72.84
2	1.200	1.0954	353	76.08
1	1.200	1.0954	352	76.03
Average	0.9396	0.9693	351.2	67.25

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.08
Pre Test Span Direct	10.59	10.30	47.76	4.81
Pre-test Zero	0.05	0.03	0.19	0.10
Pre-test Span	10.54	10.25	47.05	4.83
0-30 min	8.58	11.62	37.84	0.18
Post-test Zero	0.04	0.04	0.22	0.08
Post-test Span	10.55	10.28	47.31	4.84
Post Test Zero Direct	0.04	0.01	0.12	0.07
Post Test Span Direct	10.59	10.32	47.69	4.82
Average	8.58	11.62	37.84	0.18
Corr. Results	8.65	11.89	38.05	0.09
Cal Error <2%, Bias <5%; Drift <3%				
Calibrtion Error	-0.2%	-1.1%	0.3%	1.1%
Pre-Test Zero Bias	0.1%	0.1%	0.1%	0.3%
Pre-Test Span Bias	-0.3%	-0.3%	-0.8%	0.2%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.1%
Post-Test Span Bias	-0.3%	-0.2%	-0.4%	0.2%
Zero Drift	0.0%	0.0%	0.0%	-0.3%
Span Drift	0.0%	0.2%	0.3%	0.1%

TEST SUMMARY

O_2:	8.646	% dry
CO_2:	11.894	% dry
NO_x:	38.054	ppm dry
	24.631	lb/hr
SO_2:	8.3114559	ppm dry
	7.485	lb/hr
CO:	0.09	ppm dry
	0.036	lb/hr
H_2O:	11.9	%
MW:	28.79	lb/lb-mole
Flow:	156,721	wacfm
	90.36	mdscfm
	5421.58	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5421.58	4973.40	448.18	8.3%
O_2	% dry	8.65	8.5	0.12	1.4%
CO_2	% dry	11.89	12.0	-0.13	-1.1%
NO_x	ppm dry	38.05	41.8	-3.79	-10.0%
NO_x	ppm @ 3% O_2	55.59	60.4	-4.84	-8.7%
NO_x	lb/hr	24.63	24.8777	-0.25	-1.0%
SO_2	ppm dry	8.31	9.48	-1.17	-14.1%
SO_2	ppm @ 3% O_2	12.14	13.65	-1.50	-12.4%
SO_2	lb/hr	7.485	7.851	-0.366	-4.9%
CO	ppm dry	0.09	2.25	-2.16	
CO	ppm @ 3% O_2	0.14	3.26	-3.12	
CO	lb/hr	0.036	0.814		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	404
Aliquot VOL (ml)	20
Titrant VOL (ml)	2.57

DELTA
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION
GENERAL

Test:	9-RA-U2
Date:	3/2/2016
Start Time:	15:53
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.06	"Hg
Meter No.	6-WCS	
Meter Y_d	0.9940	
Meter Pressure:	2.5	iwg
Pstack:	0.50	iwg
Pstack:	30.09	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft^2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	818.8	709.5	109.3
2/H2O	692.3	686.8	5.5
3/Empty	619.9	618.8	1.1
4/S.G.	985.5	976.6	8.9
Rinse		50.0	-50.0
Total			74.8

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	772.460	98	98
		100	99
Stop	799.480	101	98
Total	27.020		99.0

Summary

Sample Volume:	25.639	dscf
H_2O Volume :	3.531	scf
Moisture Content:	12.1	%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	0.850	0.9220	352	64.00
4	0.860	0.9274	352	64.38
3	0.910	0.9539	352	66.22
2	1.000	1.0000	351	69.38
1	0.900	0.9487	351	65.82
5	1.200	1.0954	350	75.95
4	1.200	1.0954	351	76.00
3	1.000	1.0000	352	69.42
2	0.930	0.9644	353	66.99
1	0.720	0.8485	353	58.94
5	0.780	0.8832	353	61.35
4	0.800	0.8944	353	62.13
3	0.830	0.9110	353	63.28
2	0.950	0.9747	352	67.66
1	0.900	0.9487	350	65.78
5	1.100	1.0488	353	72.85
4	1.000	1.0000	354	69.50
3	1.000	1.0000	354	69.50
2	0.900	0.9487	353	65.90
1	0.700	0.8367	352	58.08
5	1.200	1.0954	353	76.09
4	1.200	1.0954	353	76.09
3	1.100	1.0488	354	72.90
2	1.100	1.0488	352	72.81
1	1.000	1.0000	352	69.42
5	1.100	1.0488	350	72.72
4	1.000	1.0000	351	69.38
3	1.000	1.0000	351	69.38
2	1.100	1.0488	351	72.76
1	1.000	1.0000	351	69.38
Average	0.9727	0.9863	352.1	68.47

METHOD 3A, 6C, 7E DATA

	O_2	CO_2	NO_x	CO
Span	18.97	18.62	93.00	8.81
Actual Span Value	10.63	10.5	47.5	4.72
Pre Test Zero Direct	0.04	0.01	0.12	0.07
Pre Test Span Direct	10.59	10.32	47.69	4.82
Pre-test Zero	0.04	0.04	0.22	0.08
Pre-test Span	10.55	10.28	47.31	4.84
0-30 min	8.49	11.76	39.35	0.18
Post-test Zero	0.04	0.03	0.19	0.08
Post-test Span	10.57	10.28	47.17	4.82
Post Test Zero Direct	0.04	0.01	0.13	0.08
Post Test Span Direct	10.61	10.33	47.74	4.82
Average	8.49	11.76	39.35	0.18
Corr. Results	8.53	12.02	39.53	0.10
Cal Error <2%. Bias <5%; Drift <3%				
Calibrtion Error	-0.2%	-1.0%	0.2%	1.2%
Pre-Test Zero Bias	0.0%	0.1%	0.1%	0.1%
Pre-Test Span Bias	-0.3%	-0.2%	-0.4%	0.2%
Post-Test Zero Bias	0.0%	0.1%	0.1%	0.0%
Post-Test Span Bias	-0.2%	-0.2%	-0.6%	0.0%
Zero Drift	0.0%	0.0%	0.0%	0.0%
Span Drift	0.1%	0.0%	-0.2%	-0.2%

TEST SUMMARY

O_2:	8.535	% dry
CO_2:	12.016	% dry
NO_x:	39.531	ppm dry
	25.971	lb/hr
SO_2:	8.4775789	ppm dry
	7.749	lb/hr
CO:	0.10	ppm dry
	0.040	lb/hr
H_2O:	12.1	%
MW:	28.78	lb/lb-mole
Flow:	159,559	wacfm
	91.72	mdscfm
	5503.01	kdscfh

RELATIVE ACCURACY DATA

Parameter	Units	Ref. Meth	CEMS	Diff.	Diff. %
Flow	kdscfh	5503.01	4972.37	530.64	9.6%
O_2	% dry	8.53	8.4	0.12	1.4%
CO_2	% dry	12.02	12.2	-0.13	-1.1%
NO_x	ppm dry	39.53	43.4	-3.88	-9.8%
NO_x	ppm @ 3% O_2	57.23	62.1	-4.92	-8.6%
NO_x	lb/hr	25.97	25.79	0.18	0.7%
SO_2	ppm dry	8.48	9.81	-1.33	-15.7%
SO_2	ppm @ 3% O_2	12.27	14.03	-1.76	-14.4%
SO_2	lb/hr	7.749	8.122	-0.373	-4.8%
CO	ppm dry	0.10	2.26	-2.16	
CO	ppm @ 3% O_2	0.14	3.23	-3.09	
CO	lb/hr	0.040	0.814		

SOx Titration Summary

	B1/2
N BaCl2	0.0098425
Total VOL (ml)	408
Aliquot VOL (ml)	20
Titrant VOL (ml)	2.55

MOBILE EMISSION LABORATORY
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: Desert View Power
Unit: Unit 2
Location: Mecca

Condition: ----
Load: > 90%
Date 3/2/2016

	O2%	CO2%				
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
	O2%	CO2%				
As Found	10.716	10.439				
Linearity	0.4%	-0.3%			<2%	Pass
3/2/2016 810/	O2%	CO2%				
1pm-cem-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.06	0.02				
Pre test Direct Span	10.72	10.44				
System Zero	0.06	0.03				
System Span	10.65	10.41				
Average	8.38	11.96				
System Zero	0.05	0.03				
System Span	10.60	10.31				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.64	10.35				
Corrected Conc.	8.37	12.13				
System Bias Check						
Zero Pre-test	0.30%	0.13%			< 5%	PASS
Zero Post-test	0.26%	0.17%			< 5%	PASS
Span Pre-test	0.08%	-0.46%			< 5%	PASS
Span Post-test	-0.16%	-0.97%			<5%	PASS
3/2/2016 1103/1323	O2%	CO2%				
2-CEM-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.04	0.01				
Pre test Direct Span	10.64	10.35				
System Zero	0.05	0.03				
System Span	10.60	10.31				
Raw concentration	8.46	11.81				
System Zero	0.04	0.03				
System Span	10.55	10.26				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.59	10.31				
Corrected Conc.	8.49	12.06				
System Bias Check						
Zero Pre-test	0.26%	0.17%			< 5%	PASS
Zero Post-test	0.22%	0.15%			< 5%	PASS
Span Pre-test	-0.16%	-0.97%			< 5%	PASS
Span Post-test	-0.41%	-1.19%			<5%	PASS
3/2/2016 1336/1546	O2%	CO2%				
3-CEM-U1						
Analyzer Range:	20	20				
Span Value:	10.63	10.50				
Pre test Direct Zero	0.04	0.01				
Pre test Direct Span	10.59	10.31				
System Zero	0.04	0.03				
System Span	10.55	10.26				
Raw concentration	8.48	11.73				
System Zero	0.04	0.04				
System Span	10.55	10.28				
Post test Direct Zero	0.04	0.01				
Post test Direct Span	10.59	10.32				
Corrected Conc.	8.53	12.00				
System Bias Check						
Zero Pre-test	0.22%	0.15%			< 5%	PASS
Zero Post-test	0.21%	0.18%			< 5%	PASS
Span Pre-test	-0.41%	-1.19%			< 5%	PASS
Span Post-test	-0.43%	-1.10%			<5%	PASS

SCAQMD 25.3 SOURCE TEST

DATA AND WORKSHEET

Client.....	Colmac	Parameter.....	>90%
Loaction.....	Mecca	Fuel.....	Biomass/coke
Unit	1	Data By.....	DW
Test Number.....	1A-HC-U2	1B-HC-U2	Average
Reference Temperature, F.....	68	68	
Test Date.....	3/2/2016	3/2/2016	
Sample Time (Min).....	~60	~60	~60
Barometric Pressure (in Hg).....	30.06	30.06	30.06
Start/Stop Time.....	1020/1100	1020/1100	
Stack O2 (%).....	8.37	8.37	8.4
Stack CO2 (%).....	12.13	12.13	12.1
Stack H2O (%).....	13.5%	13.5%	13.5%
Stack Flow Rate (wacfm).....	151,892	151,892	151,892
Stack Flow Rate (dscfm).....	87,013	87,013	87,013
Laboraotory Results			
Vial-Organic Carbon as Methane..	3.02	0.69	1.86
SC-TGNMO ppm.....	1.55	1.78	1.67
TGNMO EPA Correction Factor...	1.086	1.086	
TGNMO ppm.....	5.0	2.7	3.82
TGNMO ppm @ 3% O2.....	7.09	3.83	5.46
TGNMO lb/hr.....	1.08	0.58	0.83

APPENDIX E LABORATORY REPORTS

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 1-PM-u1

Acetone Blank mg/ml 0.0017

Sample Date 3/1/16
Data Analysis Date 3/7/16
Analyst Initials JG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83-2853	0.3482	0.3496	0.0	—	—	0.0
2. Probe and Nozzle Wash (Acetone)	826	28.6379	28.6374	0.5	0.1	74/74	0.4
Acetone Blank	827	31.3493	31.3489	0.4	—	235/235	

Total Particulate = 0.4 mg

Method of Sample Prep/Notes

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 2-PM-W1

Acetone Blank mg/ml 0.0017

Sample Date 3/1/16
Data Analysis Date 3/7/16
Analyst Initials SG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83-2854	0.3530	0.3531	0.0	—	—	0.0
2. Probe and Nozzle Wash (Acetone)	828	28.8254	28.8240	1.4	0.3	156/156	1.1

Total Particulate = 1.1 mg

Method of Sample Prep/Notes

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 3-PM-U1

Acetone Blank mg/ml 0.0017

Sample Date 3/1/16
Data Analysis Date 3/7/16
Analyst Initials JG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83-2856	0.3520	0.3521	0.0	—	—	0.0
2. Probe and Nozzle Wash (Acetone)	829	27.7755	27.7738	1.7	0.2	129/129	1.5

Total Particulate = 1.5 mg

Method of Sample Prep/Notes

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 1-PM-U2 Acetone Blank mg/ml 0.0017

Sample Date 3/2/16
Data Analysis Date 3/7/16
Analyst Initials JG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83 - 2857	0.3487	0.3493	0.0	—	—	0.0
2. Probe and Nozzle Wash (Acetone)	830	29.2837	29.2825	1.2	0.2	~~106~~ 116 / ~~106~~ 116 JG	1.0

Total Particulate = 1.0 mg

Method of Sample Prep/Notes

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 2-PM-U2 Acetone Blank mg/ml 0.0017

Sample Date 3/2/16
Data Analysis Date 3/7/16
Analyst Initials JG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83-2855	0.3530	0.3526	0.4	—	—	0.4
2. Probe and Nozzle Wash (Acetone)	831	29.8079	29.8062	1.7	0.2	110/110	1.5

Total Particulate = 1.9 mg

Method of Sample Prep/Notes

Delta Air Quality Services, Incorporated

MONTROSE AIR QUALITY SERVICES

PARTICULATE
EPA METHOD 5

Project #
Client/Location Desert View Power
Sample Location Mecca
Test # 3-PM-U2 Acetone Blank mg/ml 0.0017

Sample Date 3/2/16
Data Analysis Date 3/7/16
Analyst Initials JG

Item	Number	Final Weight (g)	Tare Weight (g)	Gain Weight (mg)	Blank Correction (mg)	Aliquot Correction (ml/ml)	Net Gain (mg/Sample)
1. Glass Fiber Filter	83-2858	0.3506	0.3506	0.0	—	—	0.0
2. Probe and Nozzle Wash (Acetone)	832	29.4859	29.4849	1.0	0.2	136/136	0.8

Total Particulate = 0.8 mg

Method of Sample Prep/Notes

Delta

SULFATE TITRATION

Project #
Client/Location: Desert View
Sample Location: Unit 1
Titrant Used: 0.01 $BaCl_2$

Sample Date: 3/4/16
Analysis Date: 3/4/16
Analyst Initials: [illegible]

Test Number	Sample Description	Total Vol (ml) (TV)	V_{recon}	V_{evap}	Aliquot Vol (ml) (Va)	Titrant Vol (ml) (Vt)	X-Blank Vol (ml)	Comments	mg/ Sample
Blank (V_{bl}): 3% H_2O_2 + 80ml IPA DI H20 + 80ml IPA						0.08/0.08 0.08/0.07	0.08 0.08	One w/ sample One w/ solv	
Standardization: 15 ml DI H_2O + 80 ml IPA + 5 ml 0.02 N H_2SO_4					5	10.32 10.34	10.25	$N = \frac{(.02)(V_o)}{V_1} = 0.009756$ 1	
Audit Sample: 5 ml 1000 SO_4 + 15 ml DI H_2O +80 ml IPA (5mg)					5	10.29 10.31	10.22	95.8 % Recovery 4.79mg	
1-Sox	Inj Cold	506			20	2.75 2.72	2.66		
2-Sox	Inj Cold	437			20	2.82 2.83	2.75		
3-Sox	Inj Cold	468			20	3.18 3.16	3.09		
4-Sox	Inj Cold	429			20	2.58 2.57	2.50		
5-Sox	Inj Cold	385			20	2.52 2.53	2.45		
6-Sox	Inj Cold	387			20	2.70 2.71	2.62		
7-Sox	Inj Cold	425			20	2.24 2.25	2.17		
8-Sox	Inj Cold	400			20	2.62 2.64	2.55		
9-Sox	Inj Cold	498			20	2.04 2.03	1.96		

EPA Audit in mg/dscm: $\frac{(32.03)(N)(Vt - Vbl)(100)}{(Va)(0.021)}$

SO_x, ppm = $\frac{(0.804)(N)(Vt - Vbl)(TV)(Tref)}{(Vmstd)(Va)}$

mg $H_2SO_4 \bullet 2H_2O$ = (Vt-Vbl) (N) (67) (TV/V_{evap}) (V_{recon}/V_a)

Method of Sample Prep/Notes

Delta

SULFATE TITRATION

Project #
Client/Location DVP
Sample Location Unit 2
Titrant Used 0.01 $BaCl_2$

Sample Date 3/2/16
Analysis Date 3/2/16
Analyst Initials

Test Number	Sample Description	Total Vol (ml) (TV)	V_{recon}	V_{evap}	Aliquot Vol (ml) (Va)	Titrant Vol (ml) (Vt)	X-Blank Vol (ml)	Comments	mg/ Sample
Blank (V_{bl}): 3% H_2O_2 + 80ml IPA DI H20 + 80ml IPA						0.05/0.04 0.05/0.05	0.05 0.05	Use w/sample use w/std.	
Standardization: 15 ml DI H_2O + 80 ml IPA + 5 ml 0.02 N H_2SO_4					5	10.19 10.22	10.16	$N = \frac{(.02)(V_a)}{V_t} = 0.0098425$	
Audit Sample: 5 ml 1000 SO_4 + 15 ml DI H_2O +80 ml IPA (1mg/L)					5	10.22 10.21	10.17	4.80/500 96.0% Recovery	
1-SCx	Ig Cold	444			20	3.54 3.50	3.47		
2-SCx	Ig Cold	470			20	3.72 3.71	3.67		
3-SCx	Ig Cold	425			20	4.11 4.10	4.06		
4-SCx	Ig Cold	405			20	2.80 2.81	2.77		
5-SCx	Ig Cold	420			20	2.32 2.35	2.29		
6-SCx	Ig Cold	404			20	3.53 3.54	3.49		
7-SCx	Ig Cold	408			20	2.35 2.34	2.30		
8-SCx	Ig Cold	404			20	2.62 2.61	2.57		
9-SCx	Ig Cold	408			20	2.59 2.60	2.55		

EPA Audit in mg/dscm $\frac{(32.03)(N)(Vt - Vbl)(100)}{(Va)(0.021)}$

SO_x, ppm = $\frac{(0.804)(N)(Vt - Vbl)(TV)(Tref)}{(Vmstd)(Va)}$

mg $H_2SO_4 \bullet 2H_2O$ = (Vt-Vbl) (N) (67) (TV/V_{evap}) (V_{recon}/V_a)

Method of Sample Prep/Notes

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

March 15, 2016

LTR/088/16

David Wonderly
Delta Air Quality
1631 E. St. Andrew Place
Santa Ana, CA 92705

RE: Desert View Power

Dear David:

Please find enclosed the laboratory analysis report, quality assurance summary, and the original chain of custody form for two M25.3 SUMMA canister/impinger samples received on March 3, 2016.

The M25.3 canister samples were analyzed for TGNMO, methane, ethane, carbon monoxide, carbon dioxide, and oxygen. The water vials were analyzed for TOC. Also enclosed is a data package for M25.3

Sincerely,

AtmAA, Inc.

Brian W. Fung
President

Encl.
BWF/krm

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Organic Carbon Analysis in Water Impinger and Methane & TGNMO Analysis in SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: March 9, 2016
Client: Delta Air Quality
Source Location : Desert View Power
Source ID: Unit 1 & 2 Stack Breaching

Date Received: March 3, 2016
Date Analyzed: March 3, - 8, 2016

Methane, ethane and total gaseous non-methane organics were measured by flame ionization detection/total combustion analysis (FID/TCA). Organic carbon in water vial samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.

Lab No.	ID	Canister Carbon Monoxide	Canister Methane	Canister Ethane	Canister TGNMO	Impinger Carbon	Impinger Volume	Canister Oxygen	Canister Carbon Dioxide	P_1	P2
	Unit 1			(concentration, ppmv)			(ml)	(%v)	(%v)		
10636-7	1A-VOC-(139)	<1	<1	<1	1.62	---	---	8.79	10.4	495	820
	Impinger D30	---	---	---	---	0.53	3.21	---	---	--	--
10636-8	1B-VOC-(288)	<1	28.3	<1	1.51	---	---	8.59	10.6	415	821
	Impinger D31	---	---	---	---	1.08	3.12	---	---	--	--
	Unit 2										
10636-9	1A-VOC-(166)	<1	<1	<1	1.55	---	---	8.99	11.2	460	824
	Impinger D32	---	---	---	---	3.02	3.17	---	---	--	--
10636-10	1B-VOC-(133)	<1	<1	<1	1.78	---	---	8.91	11.3	454	820
	Impinger D33	---	---	---	---	0.69	3.09	---	---	--	--

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.
** Note - Impinger sample results are not field blank corrected. The field blank (impinger D34) contained 0.31 ug carbon, corresponding to 0.19 ppm carbon for a 3.30 liter sample.*
P_1 and P_2 are initial and final pressures measured in mm Hg.

Brian W. Fung
President

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Source ID: Unit 1 & 2 Stack Breaching
Date Received: March 3, 2016
Date Analyzed: March 3, - 8, 2016

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
	25.3				
Carbon monoxide	1A-VOC-(139)	<1	<1	---	---
	1B-VOC-(288)	<1	<1	---	---
	1A-VOC-(166)	<1	<1	---	---
	1B-VOC-(133)	<1	<1	---	---
Methane	1A-VOC-(139)	<1	<1	---	---
	1B-VOC-(288)	28.9	27.7	28.3	2.1
	1A-VOC-(166)	<1	<1	---	---
	1B-VOC-(133)	<1	<1	---	---
Ethane	1A-VOC-(139)	<1	<1	---	---
	1B-VOC-(288)	<1	<1	---	---
	1A-VOC-(166)	<1	<1	---	---
	1B-VOC-(133)	<1	<1	---	---
TGNMO	1A-VOC-(139)	1.55	1.68	1.62	4.0
	1B-VOC-(288)	1.46	1.55	1.51	3.0
	1A-VOC-(166)	1.56	1.54	1.55	0.65
	1B-VOC-(133)	1.80	1.76	1.78	1.1
		(Concentration in %v)			
Oxygen	1A-VOC-(139)	8.99	8.60	8.79	2.3
Carbon Dioxide	1A-VOC-(139)	10.4	10.5	10.4	0.34

		Repeat Analysis Run #1	Repeat Analysis Run #2	Repeat Analysis Run #3	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)				
Impinger TOC	Impinger D30	0.51	0.49	0.60	0.53	13
	Impinger D31	1.06	1.10	1.08	1.08	0.0
	Impinger D32	3.03	3.14	2.88	3.02	4.5
	Impinger D33	0.62	0.90	0.56	0.69	19

A set of four SUMMA canister/impinger samples, laboratory number 10636-(7 - 10), was analyzed for CO, methane, ethane, total gaseous non-methane organics (TGNMO), TOC, O2 and CO2. Agreement between repeat analysis is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 5 repeat measurements from the sample set of 4 SUMMA canister/impinger samples is 4.5%.

Date: March 9, 2016

AtmAA, Inc.

Laboratory Analysis Data Package

Client:	Delta Air Quality
Project:	Desert View Power
Location:	Meeca
Sample Location:	Unit 1 & 2 Stack Breaching
Date Received:	March 3, 2016
Date Analyzed:	March 3, - 8, 2016
Lab No.:	10636-(7 - 10)
	M25.3

CLIENT Delta

DATE 3/3/16

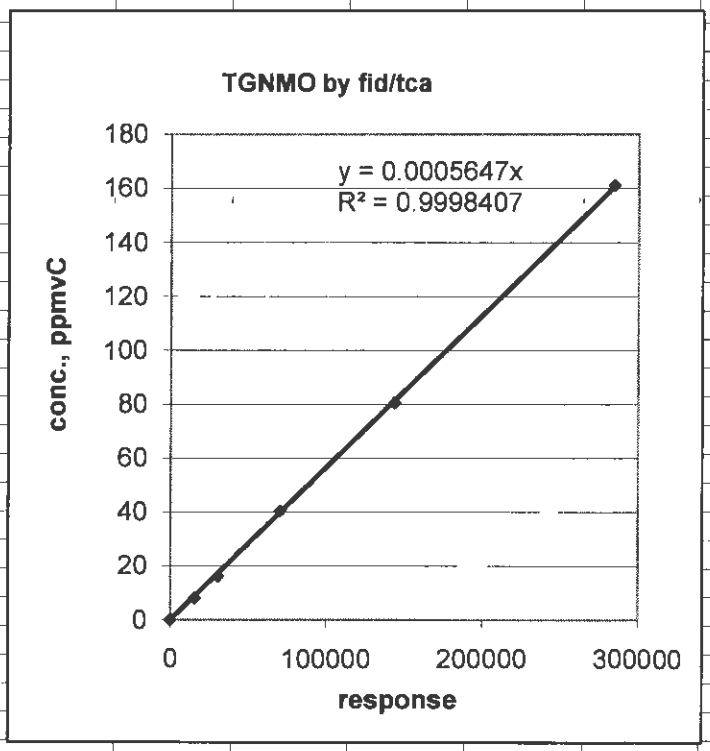
LAB #	SAMPLE ID	CAN/TANK	Trap	P1	P2
106367		139	D30	495	820
-8		288	D31	415	821
-9		166	D32	460	824
-10		133	D33	454	820
-11	blk		D34		

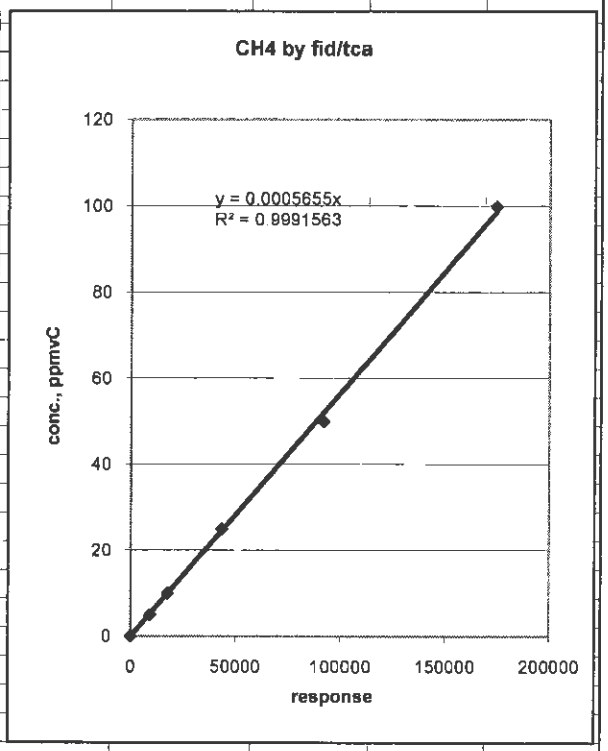
P atm = 740

Samples Pressurized with: N_2

10636-7-10 253

3/2/16		n2 bkg			3950	3787	3136	3993	4424	4411
tca1	chart				avg bkg	b1	b2			
CC137629				20x		10x		4x		2x
co	177024	101	9530	5.05	17735	10.1	43773	25.25	92607	50.5
ch4	174566	99.8	9436	4.99	17822	9.98	43531	24.95	92060	49.9
co2	709754	398	40344	19.9	76056	39.8	178906	99.5	371151	199
tgnmo	288625	161.2	19521	8.06	34497	16.12	74385	40.3	148171	80.6
c2	140993	79.2	7833	3.96	16190	7.92	35321	19.8	71953	39.6
FF18628		low prax		2x						
co										
ch4		4.01		2.01						
co2										
tgnmo		3.00		1.50						
c2		4.00		2.00						
tgnmo	0	ch4								
0	0	0	0							
15571	8.06	9436	4.99							
30547	16.12	17822	9.98							
70435	40.3	43531	24.95							
144221	80.6	92060	49.9							
284675	161.2	174566	99.8							





10636-7-10 253

	A	B	C	D	E	F	G	H	I	J
1			Date:	3/7/2016						
2		co2 %		3.55						
3		area co2	bkg	8324	8320	9492				
4							bkg avg	8712		
5			Client:	Delta						
6				Direct TGNMO						
7										CO2bkg 1
8				N2 bkg	3591	3709	3650			3.55
9										8712
10				tgnmo	rf	ch4	rf			
11				161.2		99.8				from
12		cc119017		290505	0.000563	174459	0.000567			CO2bkg 1
13				289920		177464				
14							ch4	% co2	co2 bkg	tgnmo
15	dil	p1	p2	lab#	ch4	tgnmo	ppm			ppm
16	1.8	495	820	10636-7		9564	0.00	3.52	8638	1.55
17	1.8	495	820	10636-7		9640	0.00	3.52	8638	1.68
18	1.5	415	821	10636-8	17164	9612	28.89	3.56	8737	1.46
19	1.5	415	821	10636-8	16470	9665	27.72	3.56	8737	1.55
20	1.8	460	824	10636-9		9375	0.00	3.47	8516	1.56
21	1.8	460	824	10636-9		9366	0.00	3.47	8516	1.54
22	1.8	454	820	10636-10		9550	0.00	3.49	8565	1.80
23	1.8	454	820	10636-10		9526	0.00	3.49	8565	1.76
24							#DIV/0!		#VALUE!	#VALUE!
25							#DIV/0!		0	#DIV/0!
26							#DIV/0!		0	#DIV/0!
27							#DIV/0!		0	#DIV/0!
28					area	response factor				
29			ethane	79.2	143332	0.000553				
30			co	101	173421					
31				rf	0.000582			Ethane		
32	dil	p1	p2	lab#	area	conc	area	conc		
33	1.8	495	820	10636-7		0.000		0.000		
34	1.8	495	820	10636-7		0.000		0.000		
35	1.5	415	821	10636-8		0.000		0.000		
36	1.5	415	821	10636-8		0.000		0.000		
37	1.8	460	824	10636-9		0.000		0.000		
38	1.8	460	824	10636-9		0.000		0.000		
39	1.8	454	820	10636-10		0.000		0.000		
40	1.8	454	820	10636-10		0.000		0.000		

10636-7-10 253

following are calculation formulas using sample 10636-7 as an example:								
			FOR 25.3 CANISTER					
	CH4	=	G12*E16*C16/B16*A16					
	TGNMO	=	E12*(F16-I16)*C16/B16*A16					
	Ethane	=	F29*G33*C33/B33*A33					
	CO2 bkg	=	J9*H16/J8					

low level recovery

	date	3/7/2016	3/7/2016
	time	10:10:37	16:34:45
	3-point		
	rf tgnmo	0.0005647	
area	n2 bkg	3591	3709
area	ff18628/2	6272	6361
area	net	2681	2652
ppmv	conc	1.51	1.50
ppmv	theo	1.50	1.50
recovery	%R	101	100
	ethane		
area	net	3409	3531
ppmv	conc	1.93	1.99
ppmv	theo	2.00	2.00
recovery	%R	96.3	99.7

QC run before after

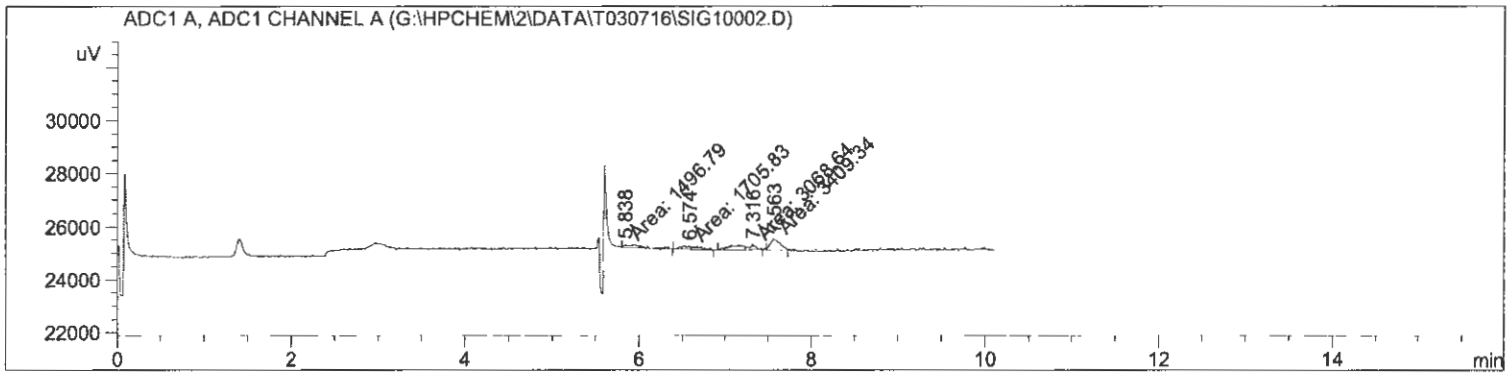
		BEFORE			AFTER		
	date:	3/7/2016			3/7/2016		
	time:	10:10:37			16:34:45		
	tgnmo						
ff18628							
theoretical		1.50			1.50		
actual		1.51			1.5		
% difference		0.67			0.0		
	ethane						
theoretical		2.00			2.00		
actual		1.93			1.99		
% difference		3.5			0.50		

Data File G:\HPCHEM\2\DATA\T030716\SIG10002.D
Sample Name: Audit Std

Audit Std
E.3-12
ff 186028/2

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 10:10:37 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 3/7/2016 10:07:43 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	5.838	MM	0.2143	1496.78784	116.39880	15.46172
2	6.574	MM	0.2153	1705.83435	132.02916	17.62116
3	7.316	MM	0.2835	3068.63916	180.37468	31.69884
4	7.563	MM	0.1302	3409.34253	436.48651	35.21828
Totals :				9680.60388	865.28915	

tgnmo 6272
C2

==========

*** End of Report ***

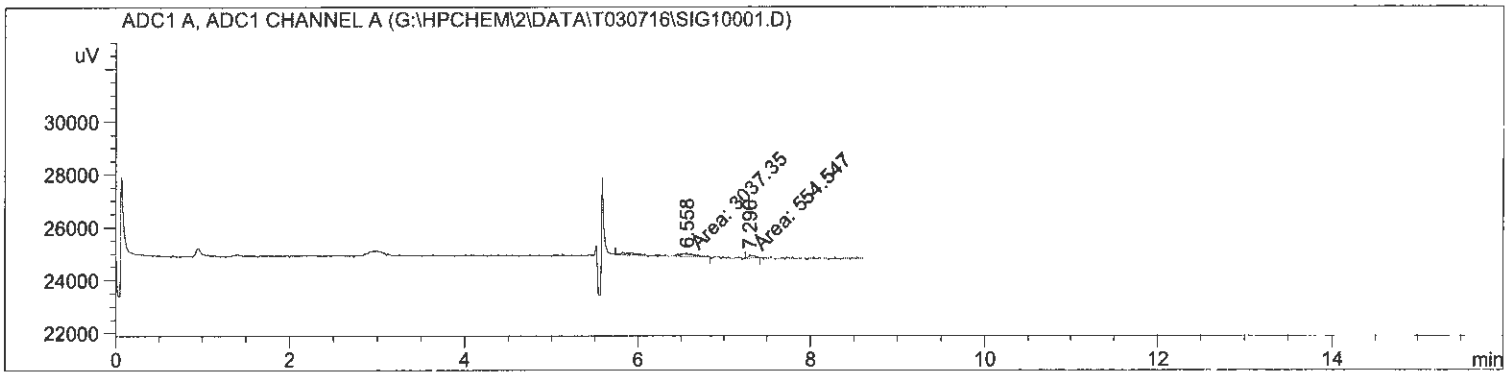
Data File G:\HPCHEM\2\DATA\T030716\SIG10001.D
Sample Name: N2

N E.3-13

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 9:55:28 AM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 11/16/2005 11:03:38 AM
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	6.558	MM	0.3896	3037.34692	129.93222	84.56114
2	7.296	MM	0.0676	554.54742	136.79175	15.43886

Totals : 3591.89435 266.72397

==========

*** End of Report ***

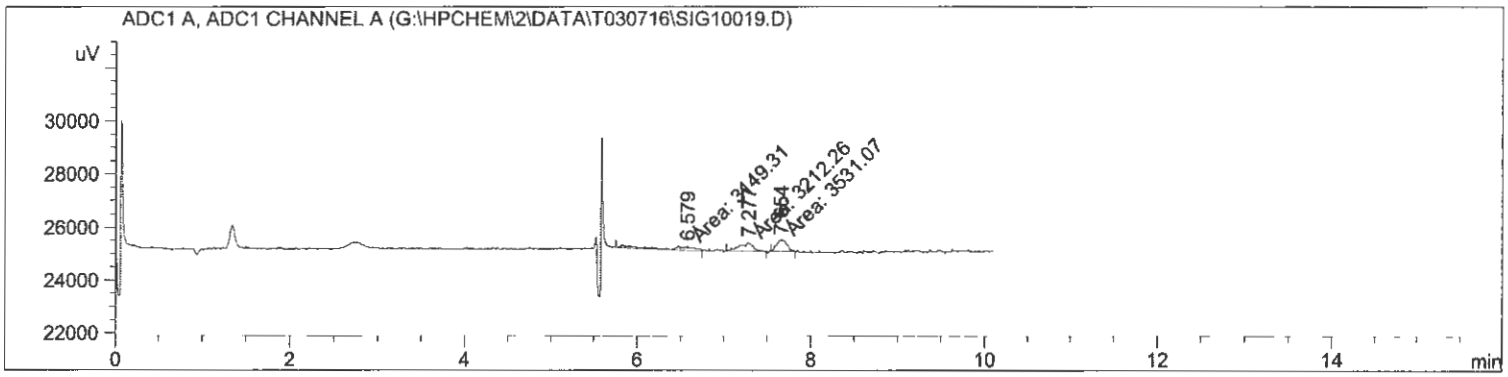
Data File G:\HPCHEM\2\DATA\T030716\SIG10019.D
Sample Name: Audit Std

Audit Std
ff 180-24/2
E3-14

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 4:34:45 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 3/7/2016 4:13:29 PM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	6.579	MM	0.3553	3149.30737	147.71329	31.83485
2	7.277	MM	0.1683	3212.26221	318.05212	32.47123
3	7.654	MM	0.1406	3531.07227	418.70956	35.69393

) tgNMO 6361
C2

Totals : 9892.64185 884.47498

==========

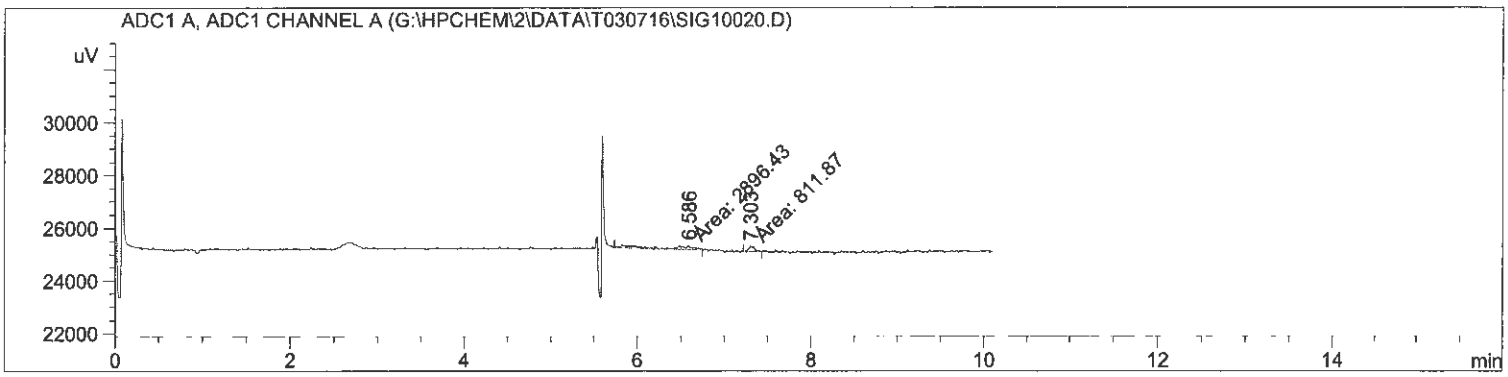
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T030716\SIG10020.D
Sample Name: N2

E.3-15

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 4:48:27 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 3/7/2016 4:13:29 PM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	6.586	MM	0.3376	2896.42969	143.00322	78.10668
2	7.303	MM	0.0728	811.86987	185.92601	21.89332

Totals : 3708.29956 328.92923

==========

*** End of Report ***

precision

3/7/2016			PRECISION			
repeat injection precision						
			N2 bkg			
cc137629			3650			
	TGNMO					
Inj. #	conc.	area	rf	%diff from		
				mean		
1	161.2	290505	0.000562	0.10		
2	161.2	289920	0.000563	0.10		
		mean	0.000563			

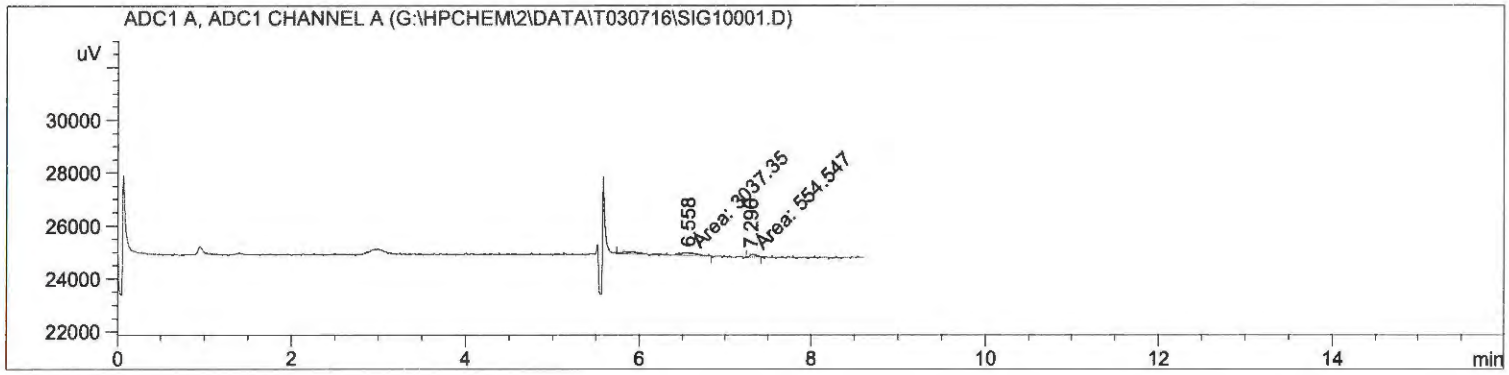
Data File G:\HPCHEM\2\DATA\T030716\SIG10001.D
Sample Name: N2

N2 E.3-17

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 9:55:28 AM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 11/16/2005 11:03:38 AM
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	6.558	MM	0.3896	3037.34692	129.93222	84.56114
2	7.296	MM	0.0676	554.54742	136.79175	15.43886

Totals : 3591.89435 266.72397

==========

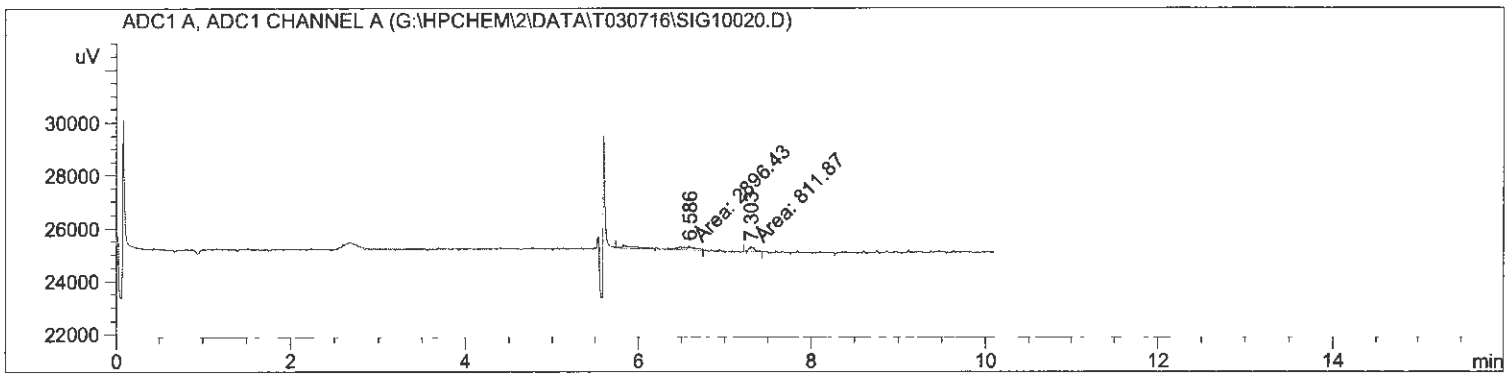
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T030716\SIG10020.D
Sample Name: N2

E.3-18

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 4:48:27 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 3/7/2016 4:13:29 PM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	6.586	MM	0.3376	2896.42969	143.00322	78.10668
2	7.303	MM	0.0728	811.86987	185.92601	21.89332

Totals : 3708.29956 328.92923

==========

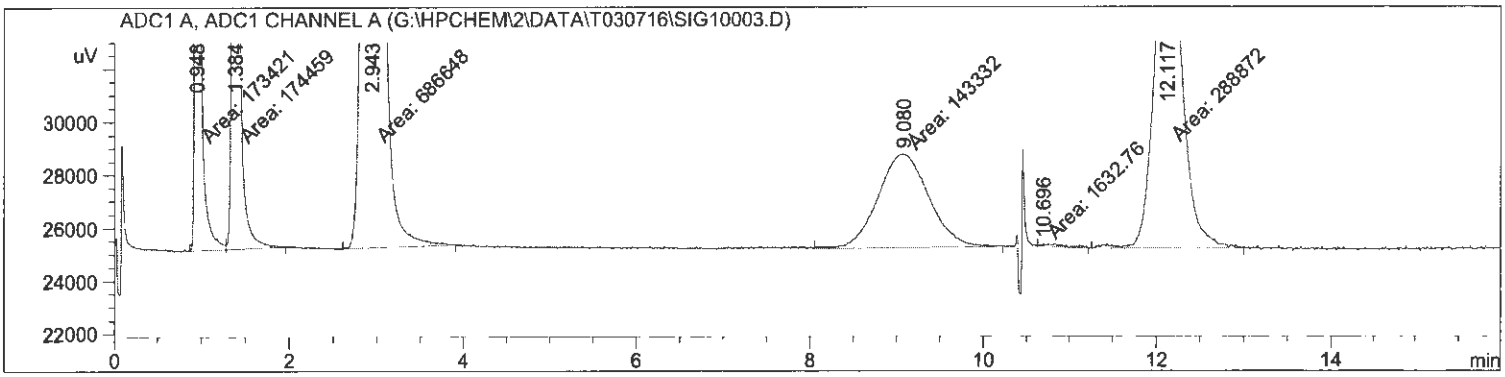
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T030716\SIG10003.D
Sample Name: Std

E.3-19 tl
bugm

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 10:24:57 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



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Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %	
1	0.948	MF	0.0562	1.73421e5	5.14459e4	11.81051	CO
2	1.384	FM	0.0815	1.74459e5	3.56955e4	11.88117	CH_4
3	2.943	MM	0.2081	6.86648e5	5.49960e4	46.76276	CO_2
4	9.080	MM	0.6764	1.43332e5	3531.99121	9.76134	C_2
5	10.696	MM	0.2688	1632.75977	101.22126	0.11120	) tgnmo 290505
6	12.117	MM	0.3380	2.88872e5	1.42448e4	19.67302	

Totals : 1.46837e6 1.60015e5

==========

*** End of Report ***

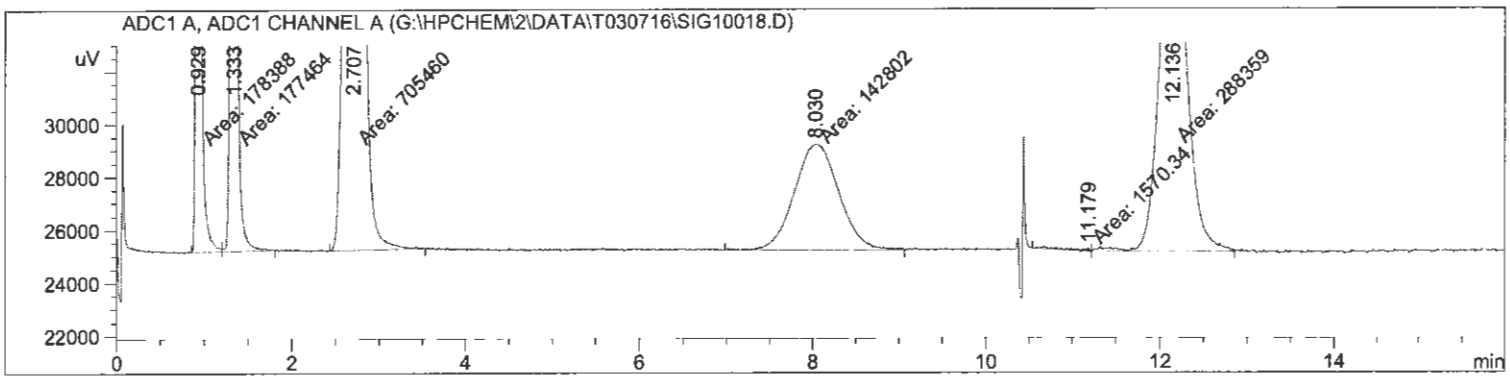
Data File G:\HPCHEM\2\DATA\T030716\SIG10018.D
Sample Name: Std

E.3-20

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 3:52:49 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	0.929	MF	0.0528	1.78388e5	5.62930e4	11.93997
2	1.333	FM	0.0743	1.77464e5	3.98248e4	11.87808
3	2.707	MM	0.1831	7.05460e5	6.42035e4	47.21818
4	8.030	MM	0.5951	1.42802e5	3999.10669	9.55807
5	11.179	MM	0.2679	1570.33618	97.69292	0.10511
6	12.136	MM	0.3461	2.88359e5	1.38879e4	19.30060

) tgNmc 259929

Totals : 1.49404e6 1.78306e5

==========

*** End of Report ***

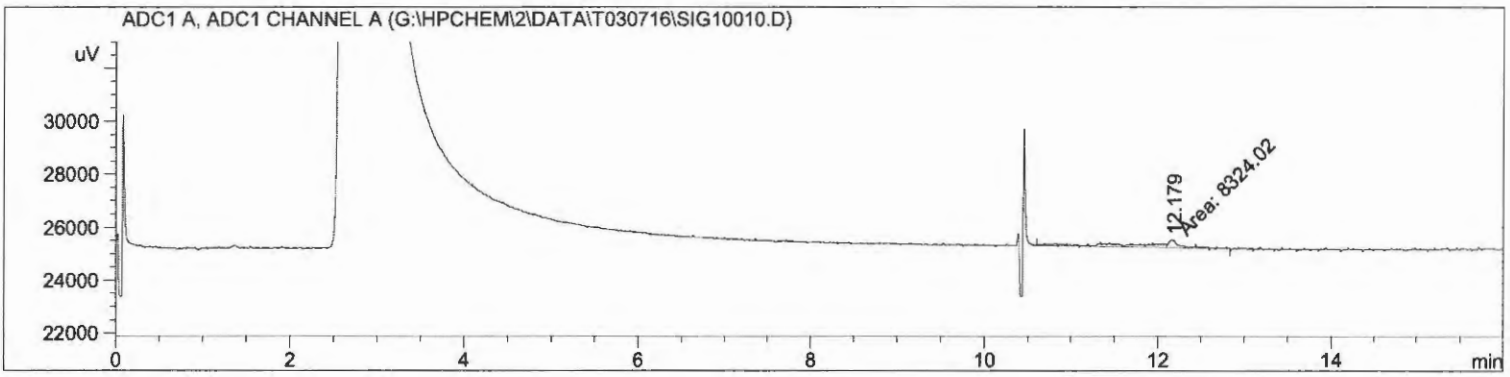
Data File G:\HPCHEM\2\DATA\T030716\SIG10010.D
Sample Name: 3.55% co2bkg 2

E.3-21

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 12:56:43 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.179	MM	0.4702	8324.01660	295.02731	1.000e2

Totals : 8324.01660 295.02731

==========

*** End of Report ***

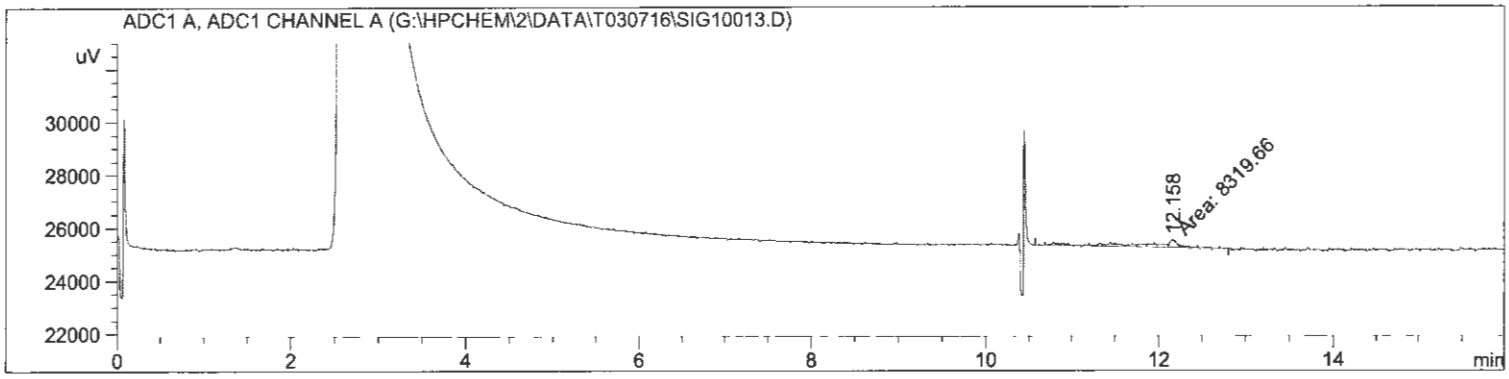
Data File G:\HPCHEM\2\DATA\T030716\SIG10013.D
Sample Name: 3.55% co2bkg 3

E.3-22

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 2:00:04 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.158	MM	0.4890	8319.65820	283.55283	1.000e2

Totals : 8319.65820 283.55283

==========

*** End of Report ***

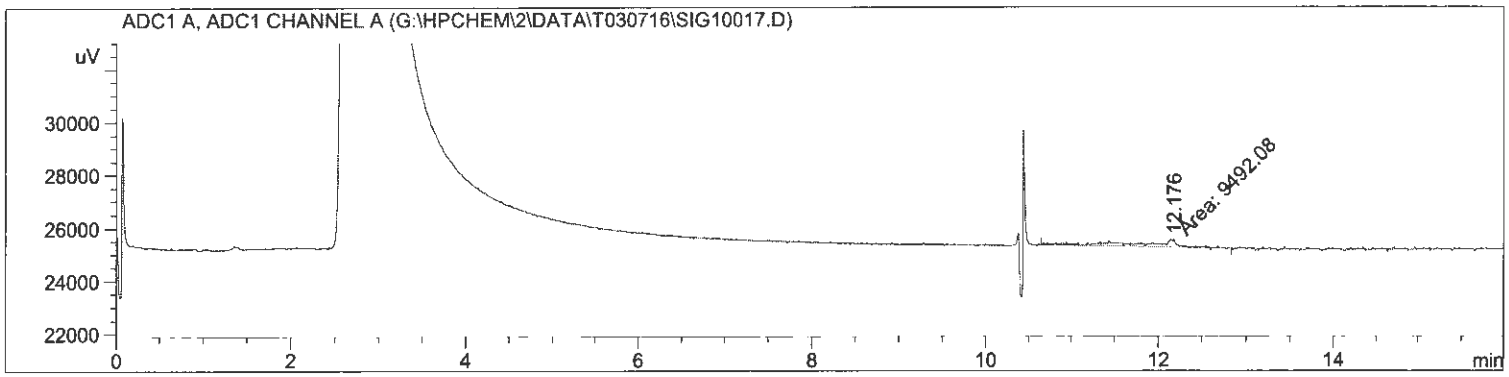
Data File G:\HPCHEM\2\DATA\T030716\SIG10017.D
Sample Name: 3.55% co2bkg 4

E.3-23

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 3:32:29 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.176	MM	0.5439	9492.08301	290.86621	1.000e2

Totals : 9492.08301 290.86621

==========

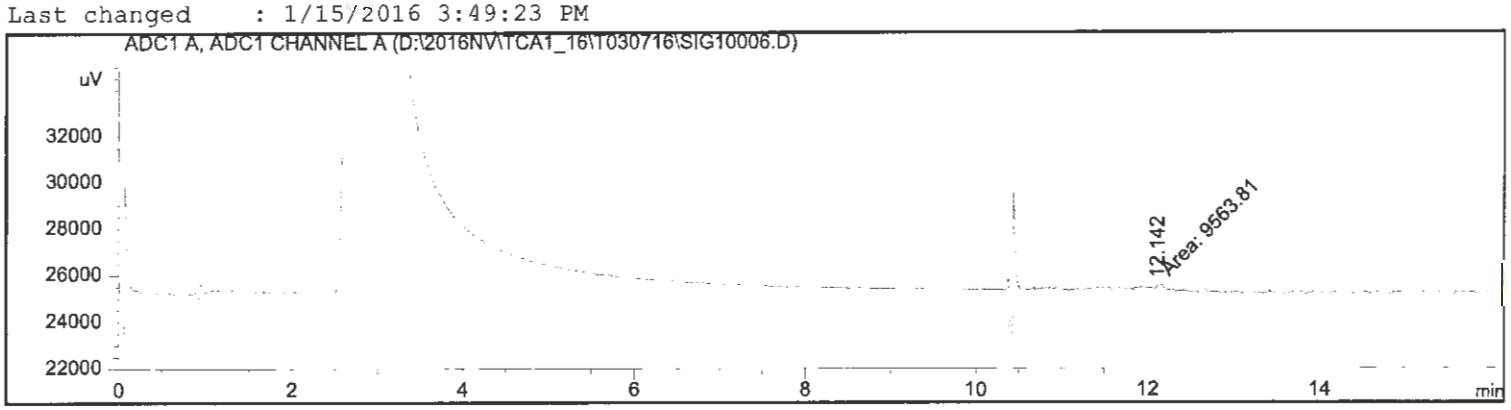
*** End of Report ***

Data File D:\2016NV\TCA1_16\T030716\SIG10006.D
Sample Name: 10636-7

E.3-24

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 11:29:41 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\TCA.M
Last changed : 1/15/2016 3:49:23 PM



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.142	MM	0.5078	9563.81152	313.91827	1.000e2

Totals : 9563.81152 313.91827

==========

*** End of Report ***

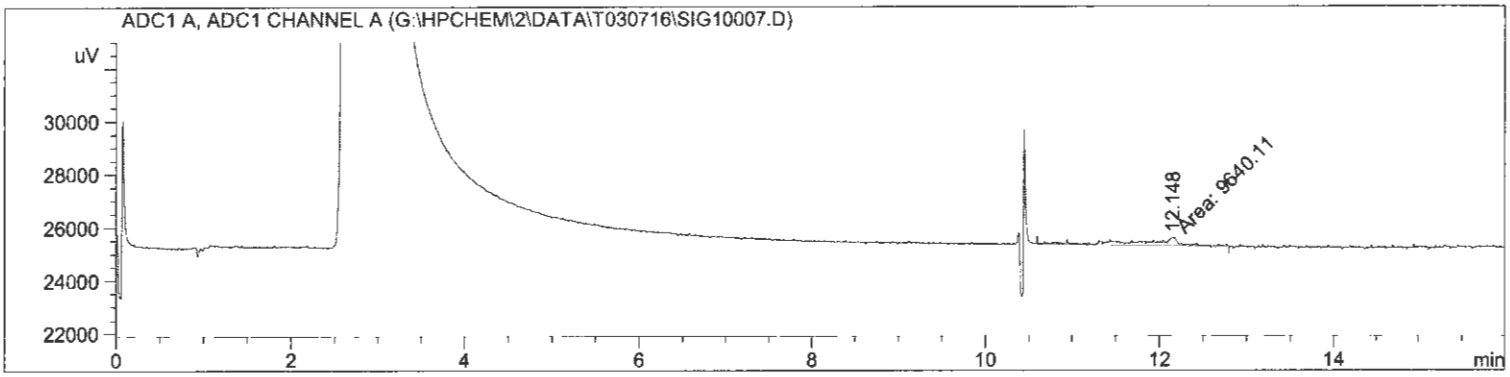
Data File G:\HPCHEM\2\DATA\T030716\SIG10007.D
Sample Name: 10636-7 r2

E.3-25

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 11:51:53 AM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.148	MM	0.5322	9640.11328	301.87106	1.000e2

Totals : 9640.11328 301.87106

==========

*** End of Report ***

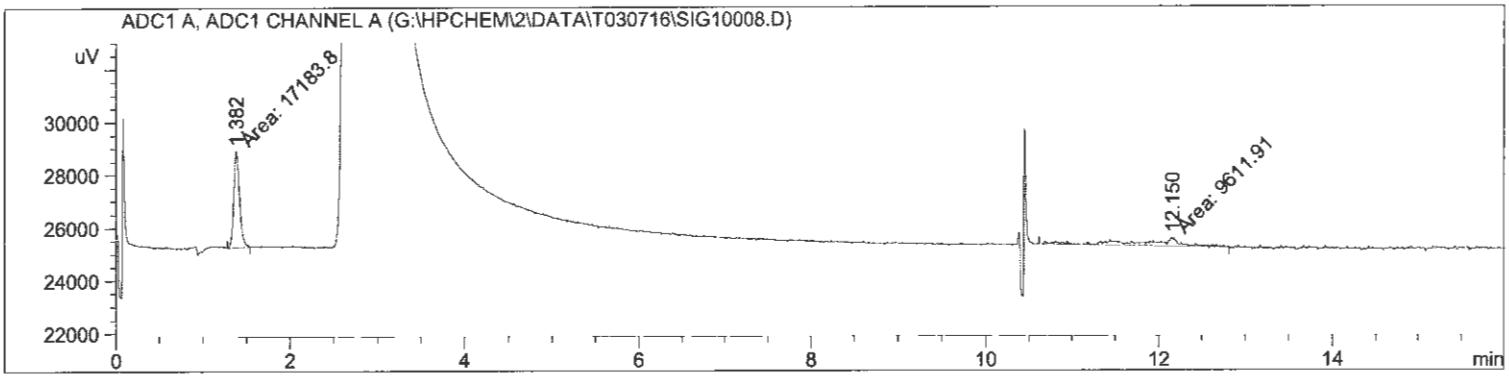
Data File G:\HPCHEM\2\DATA\T030716\SIG10008.D
Sample Name: 10636-8

E.3-26

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 12:14:59 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	1.382	MM	0.0785	1.71838e4	3647.42676	64.12895
2	12.150	MM	0.5493	9611.91211	291.64899	35.87105

Totals : 2.67957e4 3939.07574

==========

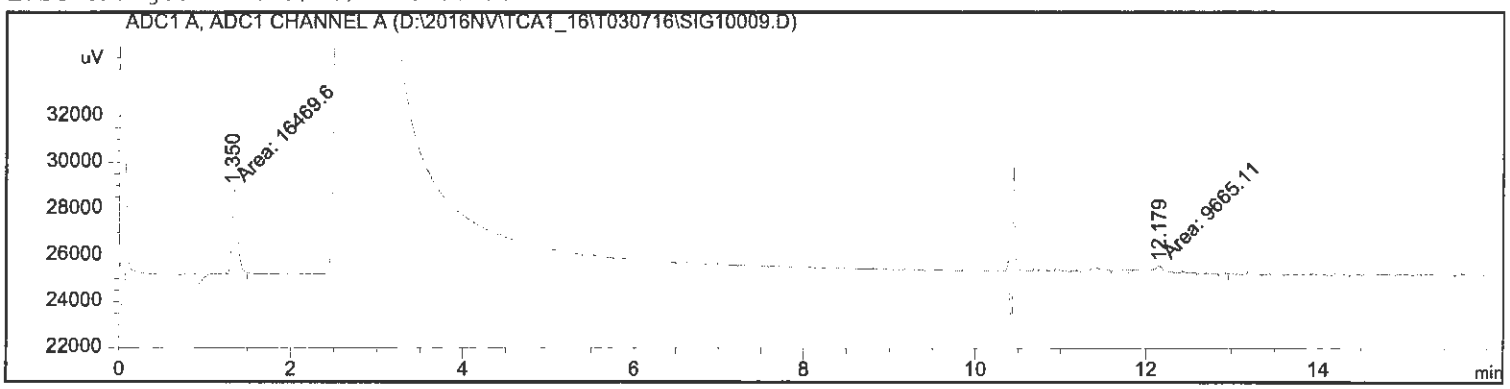
*** End of Report ***

Data File D:\2016NV\TCA1_16\T030716\SIG10009.D
Sample Name: 10636-8 12

E.3-27

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 12:35:16 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\TCA.M
Last changed : 1/15/2016 3:49:23 PM



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	1.350	MM	0.0754	1.64696e4	3642.19727	63.01813
2	12.179	MM	0.5497	9665.10742	293.05627	36.98187

Totals : 2.61347e4 3935.25354

==========

*** End of Report ***

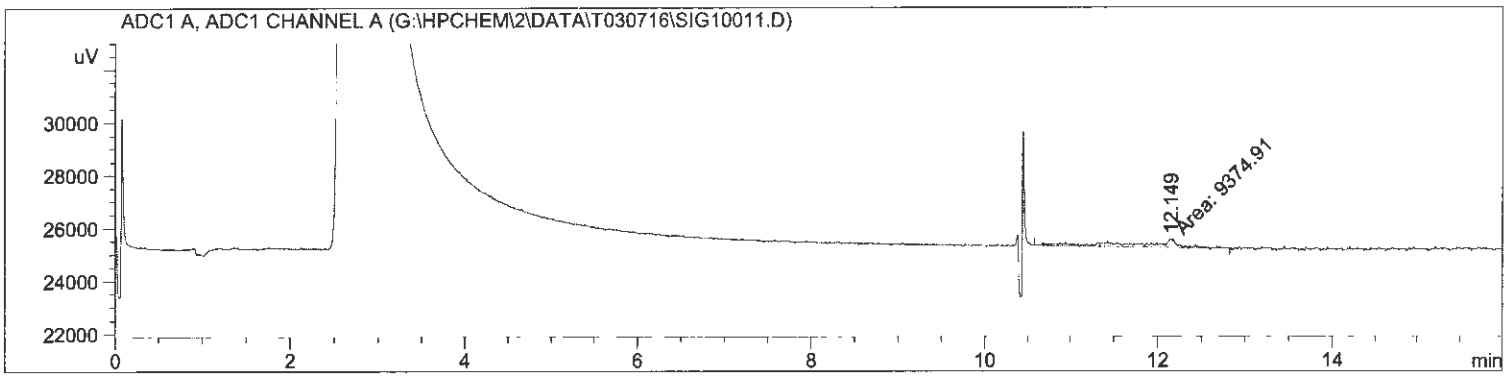
Data File G:\HPCHEM\2\DATA\T030716\SIG10011.D
Sample Name: 10636-9

E.3-28

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 1:17:57 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.149	MM	0.5147	9374.91016	303.55313	1.000e2

Totals : 9374.91016 303.55313

==========

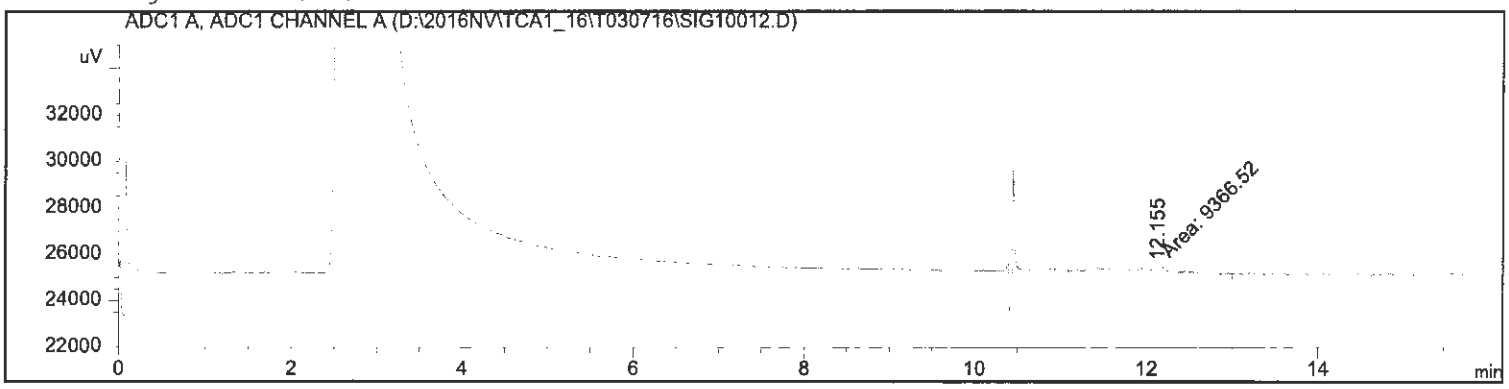
*** End of Report ***

Data File D:\2016NV\TCA1_16\T030716\SIG10012.D
Sample Name: 10636-9 r2

E.3-29

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 1:38:31 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\TCA.M
Last changed : 1/15/2016 3:49:23 PM



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.155	MM	0.5405	9366.52246	288.81723	1.000e2
Totals :				9366.52246	288.81723	

==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T030716\SIG10015.D
Sample Name: 10636-10

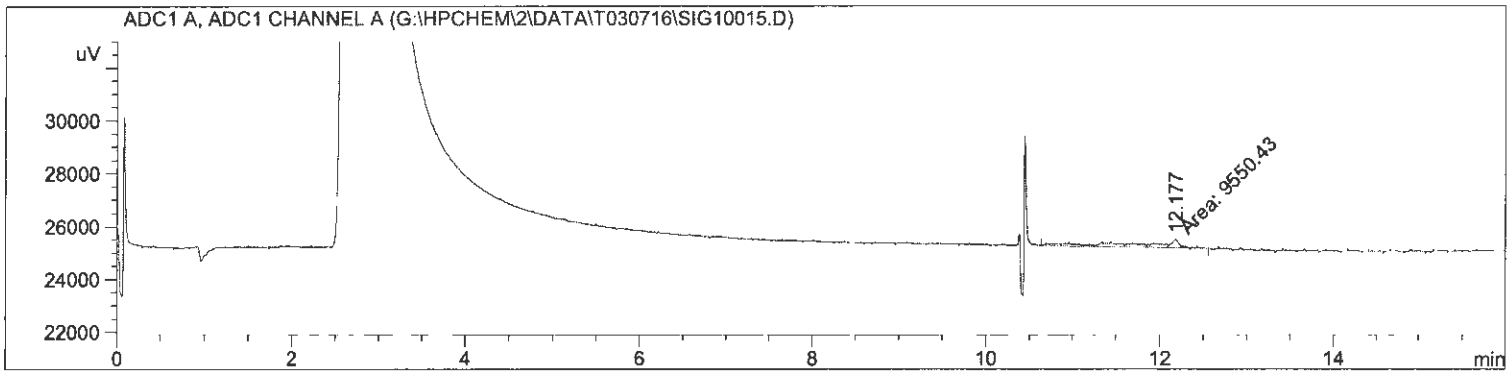
r1

E.3-30

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 2:48:53 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.177	MM	0.4655	9550.42969	341.96631	1.000e2

Totals : 9550.42969 341.96631

==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T030716\SIG10016.D
Sample Name: 10636-10

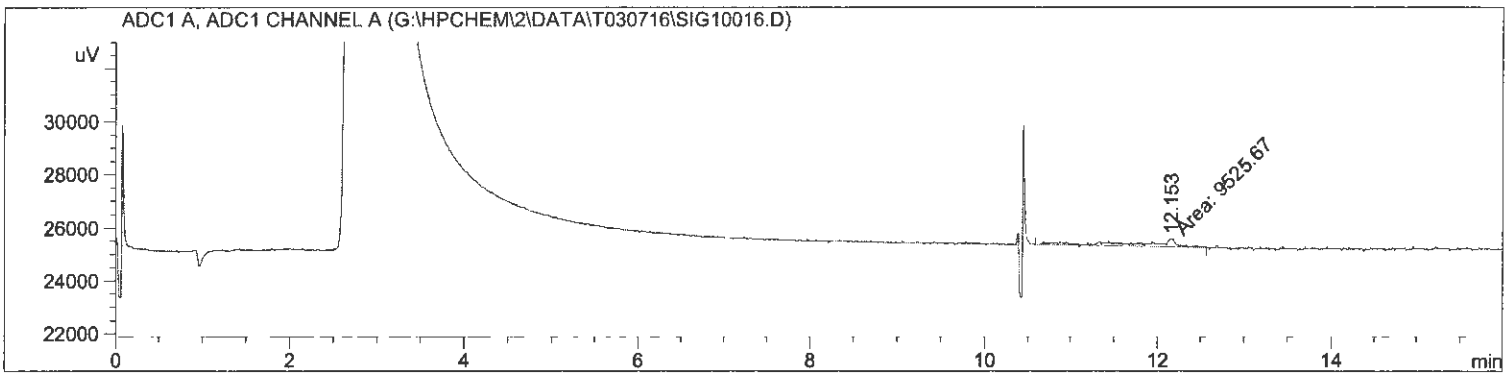
r2

E.3-31

==========

Acq. Operator : msp
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 3/7/2016 3:10:41 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 3/7/2016 10:22:00 AM by msp
(modified after loading)
Analysis Method : G:\HPCHEM\METHOD\TCA1L.M
Last changed : 11/19/2015 4:37:13 PM
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	12.153	MM	0.5518	9525.66895	287.70825	1.000e2

Totals : 9525.66895 287.70825

==========

*** End of Report ***

10636-7-10 253

		date	3/4/2016				
				PERMS			
		client	Delta				
					rf		AVG
			ch4	40.01	0.000493	0.000496	0.000495
			co2	39.92	0.00033	0.000333	0.000332
			o2	21.5	#DIV/0!	#DIV/0!	#DIV/0!
			n2	76.6	#DIV/0!	#DIV/0!	#DIV/0!
		STD	ch4	co2	o2	n2	
			81135	120916			
		lab no.	80588	119797			
	1.00	10636-7	0	18954			
	1.00	10636-7	0	19083			
	1.00	10636-8	0	16114			
	1.00	10636-9	0	18806			
	1.00	10636-10	0	18937			
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
	1.00						
				uncorr to			
				p2/p1	%	Dil	
				conc.			
sample vol	total vol		ch4	co2	conc	factor	
20	36	10636-7	0.000	6.29	3.49	1.80	
20	36	10636-7	0.000	6.33	3.52	1.80	
20	30	10636-8	0.000	5.34	3.56	1.50	
20	36	10636-9	0.000	6.24	3.47	1.80	
20	36	10636-10	0.000	6.28	3.49	1.80	

10636-7-10 253

			date	2/22/2016				
					PERMS			
			client	Delta				
				avg area		rf		AVG
				ch4	40.01	0.000493	0.000496	0.000495
				co2	39.92	0.00033	0.000333	0.000332
				o2	21.5	0.001325	0.001324	0.001325
				n2	76.6	0.001244	0.001238	0.001241
			STD	ch4	co2	o2	n2	
				81135	120916	16223	61551	
p1	p2		lab no.	80588	119797	16237	61863	
495	820	1.66	10636-7	0	18954	4522		
495	820	1.66	10636-7	0	19083	4341		
415	821	1.98	10636-8	0	16114	3631		
460	824	1.79	10636-9	0	18806	4179		
454	820	1.81	10636-10	0	18937	4114		
		#DIV/0!	0	0	0			
		#DIV/0!	0	0	0			
		#DIV/0!	0	0	0			
		#DIV/0!	0	0	0			
		#DIV/0!	0	0	0			
		#DIV/0!	0					
		#DIV/0!						
		1.00						
		1.00						
		1.00						
		1.00						
					corr to	see		
					p2/p1	Ar/O2		
						sheet		
					conc.			
				ch4	co2	o2	n2	
			10636-7	0.000	10.41	9.92	0.00	
			10636-7	0.000	10.49	9.53	0.00	
			10636-8	0.000	10.57	9.52	0.00	
			10636-9	0.000	11.17	9.92	0.00	
			10636-10	0.000	11.34	9.84	0.00	
			0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
			0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

10636-7-10 253

Oxygen calculation from reported (measured) values:						
1) selection of: dilution by a third substance, assumes O2 and argon are at the same relative						
proportion as in ambient air.						
2) selection of: consumption - combustion, assumes O2 is consumed, argon is not.						
					Assumption	
					dilution	consumption
o2	ar	sum				combustion
20.95	0.93	21.88				by
	%ar	4.250457			dilution	subtraction
	%o2	95.74954			by relative	of argon
	sum	100			fraction	in air
		21.88*x=20.95				-0.93
		x=20.95/21.88		O2 + Argon	O2	O2
relative fraction		x=	0.957495	measured	calculated	calculated
				%	%	%
		10636-7		9.92	9.50	8.99
		10636-7		9.53	9.12	8.60
		10636-8		9.52	9.11	8.59
		10636-9		9.92	9.50	8.99
		10636-10		9.84	9.42	8.91

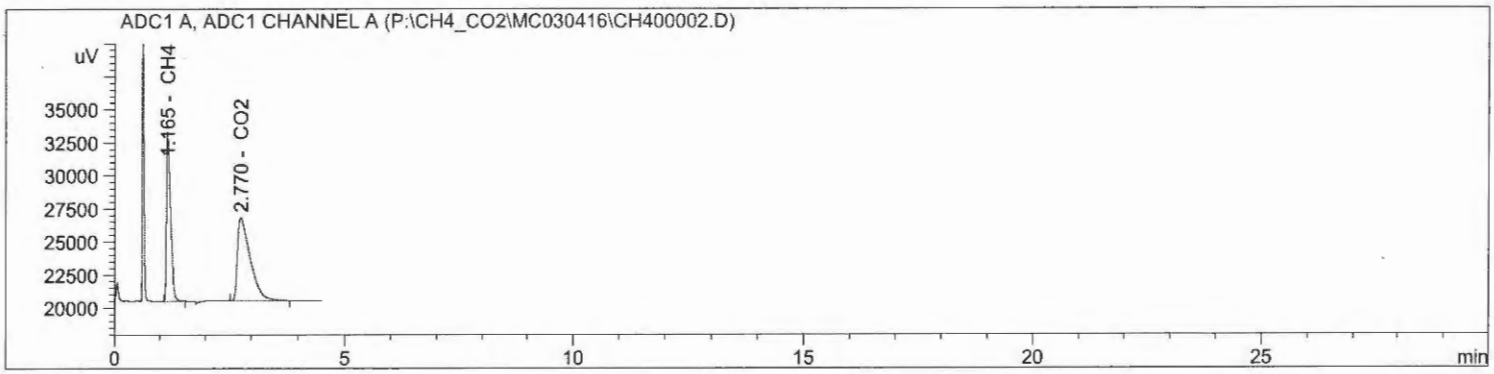
Methane & Carbon Dioxide by TCD/GC

Data File P:\CH4_CO2\MC030416\CH400002.D
Sample Name: std

E.3-36
begin std

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 10:33:00 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.165	BB	8.11353e4	4.98388e-4	40.43683		CH4
2.770	BB	1.20916e5	3.38011e-4	40.87078		CO2

Totals : 81.30760

==========

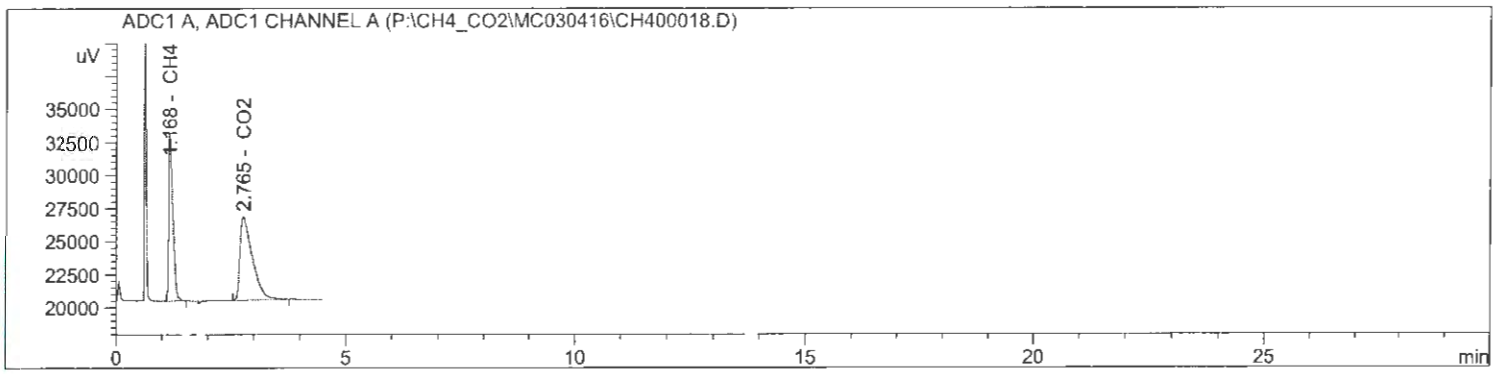
*** End of Report ***

Data File P:\CH4_CO2\MC030416\CH400018.D
Sample Name: Std

End Std E.3.37

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 12:32:47 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.168	BB	8.05882e4	4.98388e-4	40.16416		CH4
2.765	BB	1.19797e5	3.38011e-4	40.49276		CO2

Totals : 80.65691

==========

*** End of Report ***

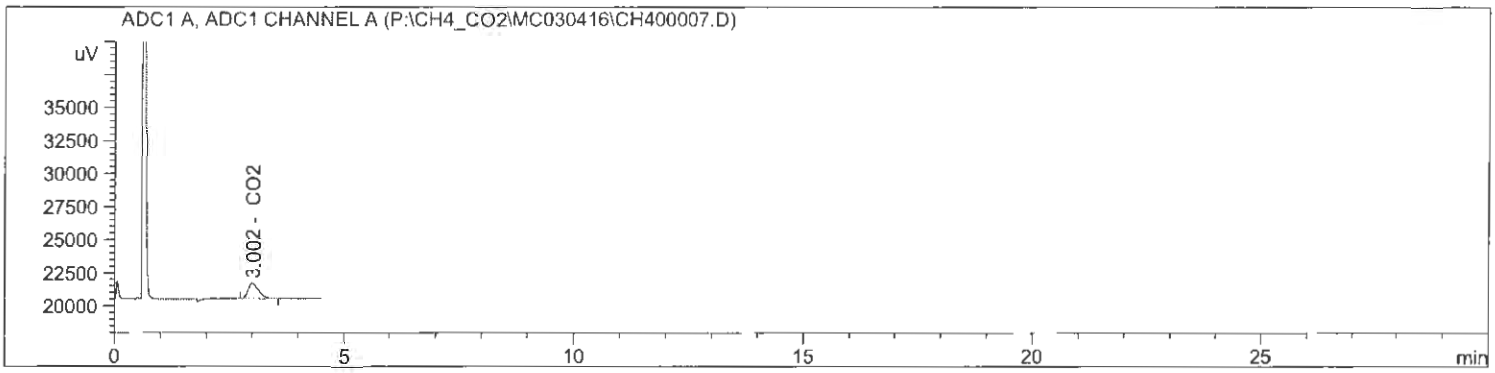
Data File P:\CH4_CO2\MC030416\CH400007.D
Sample Name: 10636-7

E.3-38

r1

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 11:08:30 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.282		-	-	-		CH4
3.002	BB	1.89543e4	3.38011e-4	6.40676		CO2

Totals : 6.40676

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

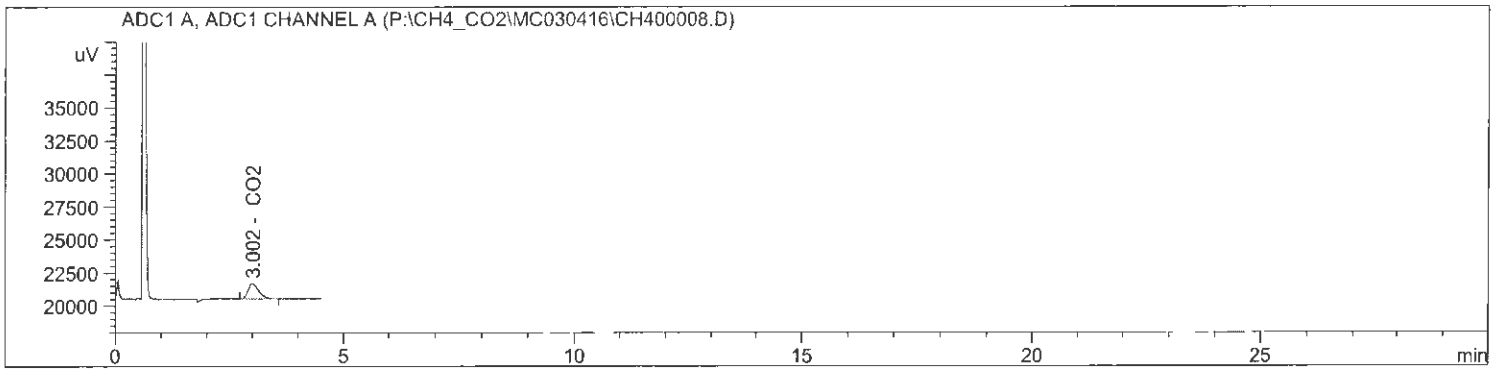
*** End of Report ***

Data File P:\CH4_CO2\MC030416\CH400008.D
Sample Name: 10636-7 K2

E.3-39

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 11:14:00 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.282		-	-	-		CH4
3.002	BB	1.90834e4	3.38011e-4	6.45041		CO2

Totals : 6.45041

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

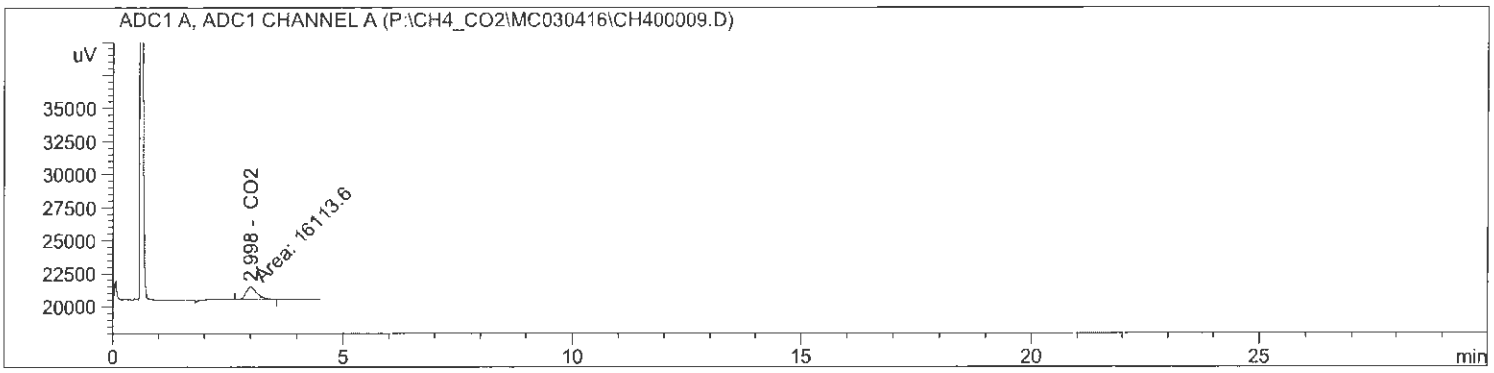
*** End of Report ***

Data File P:\CH4_CO2\MC030416\CH400009.D
Sample Name: 10636-8

E.3-40

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 11:21:37 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.282		-	-	-		CH4
2.998	MM	1.61136e4	3.38011e-4	5.44657		CO2

Totals : 5.44657

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

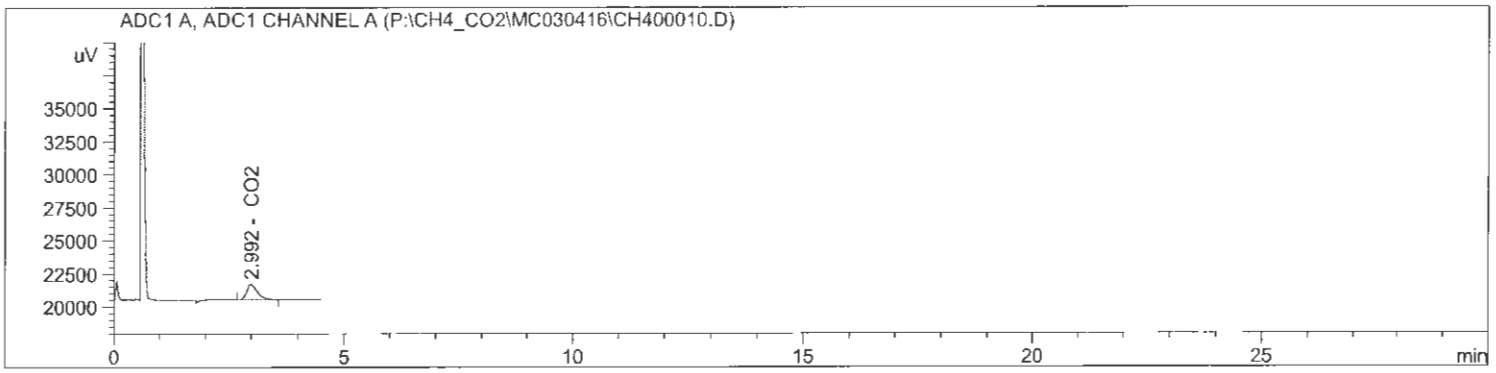
*** End of Report ***

Data File P:\CH4_CO2\MC030416\CH400010.D
Sample Name: 10636-9

E.3-41

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 11:28:21 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.282		-	-	-		CH4
2.992	BB	1.88058e4	3.38011e-4	6.35657		CO2

Totals : 6.35657

1 Warnings or Errors :

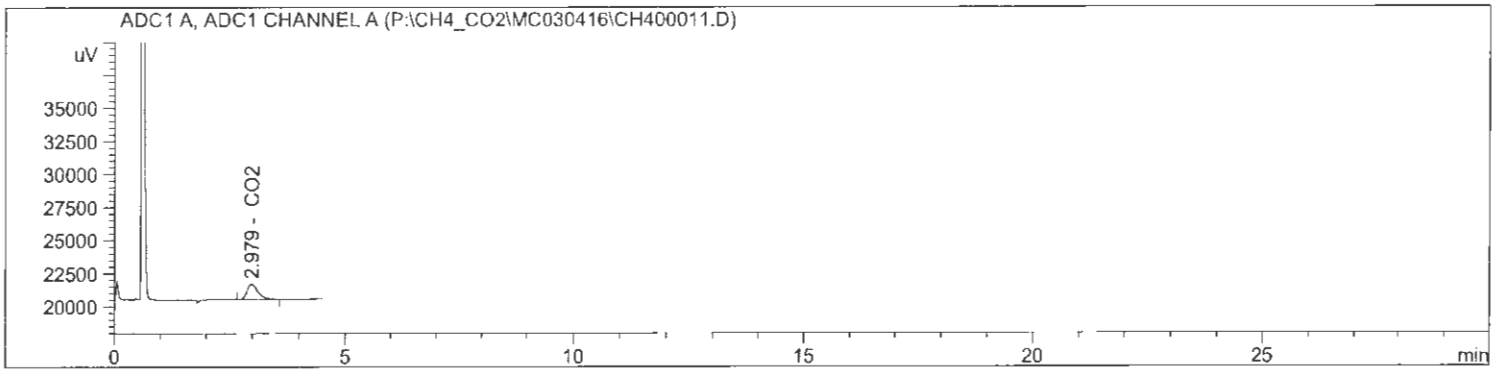
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

==========

Acq. Operator :
Acq. Instrument : CH4CO2 Location : -
Injection Date : 3/4/2016 11:36:18 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2



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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
1.282		-	-	-		CH4
2.979	BB	1.89370e4	3.38011e-4	6.40090		CO2

Totals : 6.40090

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Oxygen & Nitrogen by TCD/GC

Data File P:\O2_N2\ON030416\O2_N2005.D
Sample Name: std

begin E.3-44

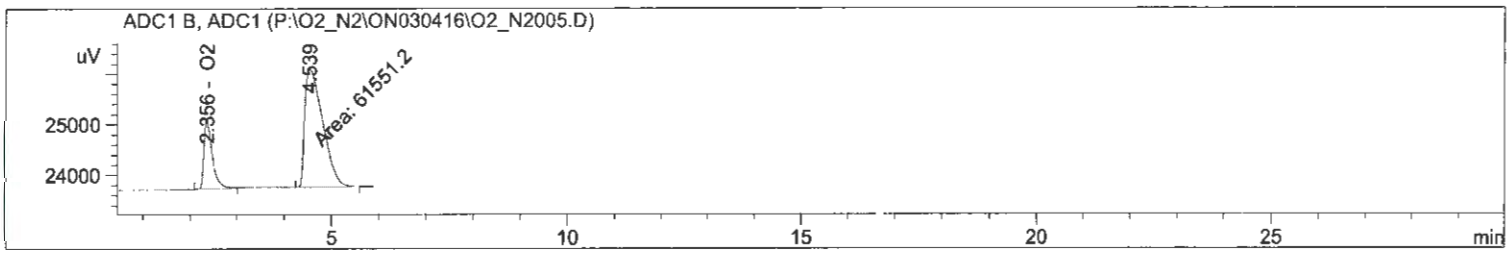
==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:01:32 AM
Inj Volume : Manually

Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.356	BB	1.62229e4	1.25937e-3	20.43070		O2
3.900		-	-	-		N2

Totals : 20.43070

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Data File P:\O2_N2\ON030416\O2_N2017.D
Sample Name: Std

End E.5.45

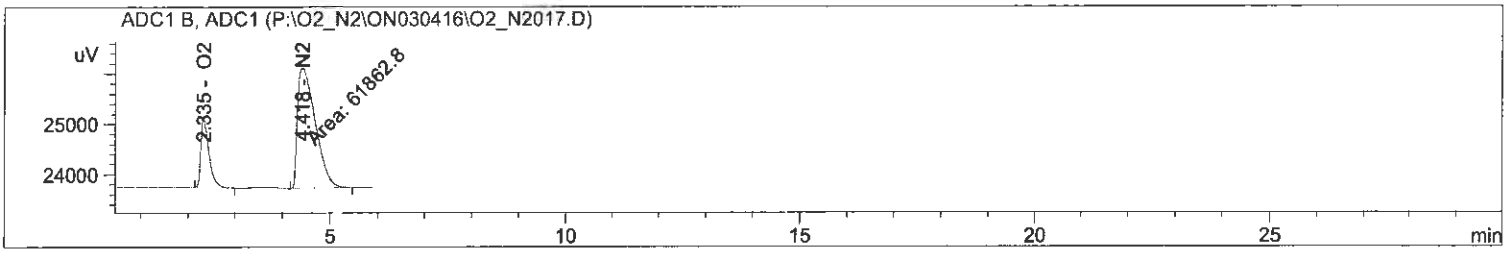
==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 12:32:31 PM
Inj Volume : Manually

Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.335	BB	1.62374e4	1.25937e-3	20.44901		O2
4.418	MM	6.18628e4	1.19675e-3	74.03406		N2

Totals : 94.48307

==========

*** End of Report ***

Data File P:\O2_N2\ON030416\O2_N2006.D
Sample Name: 10636-7 r1

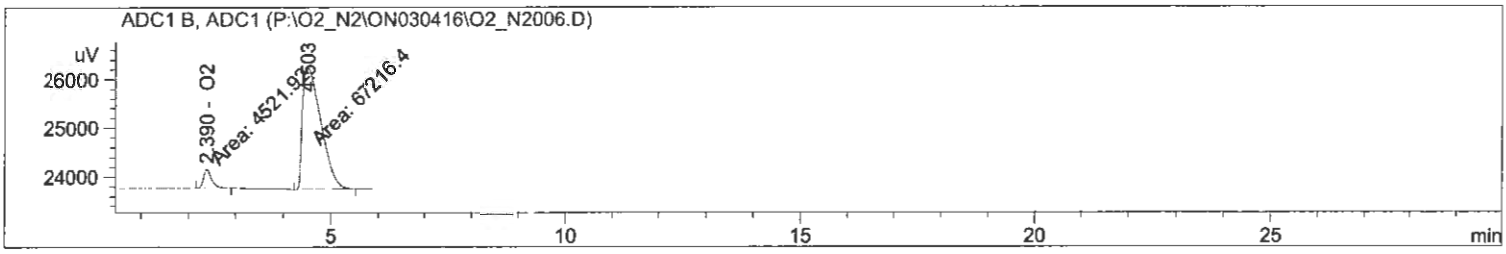
==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:08:11 AM
Inj Volume : Manually

Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.390	MM	4521.91650	1.25937e-3	5.69478		O2
3.900		-	-	-		N2

Totals : 5.69478

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Data File P:\O2_N2\ON030416\O2_N2007.D
Sample Name: 10636-7 r2

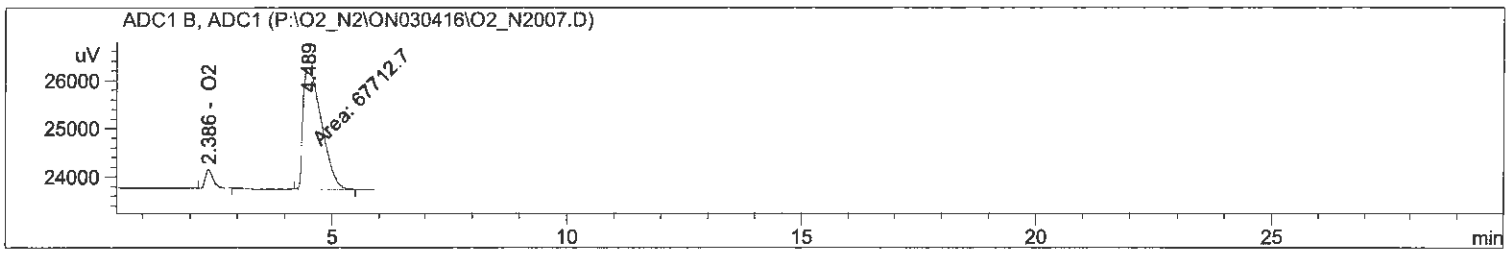
E.3-47

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:14:24 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.386	BB	4340.90332	1.25937e-3	5.46682		O2
3.900		-	-	-		N2

Totals : 5.46682

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Data File P:\O2_N2\ON030416\O2_N2008.D
Sample Name: 10636-8

E.3-48

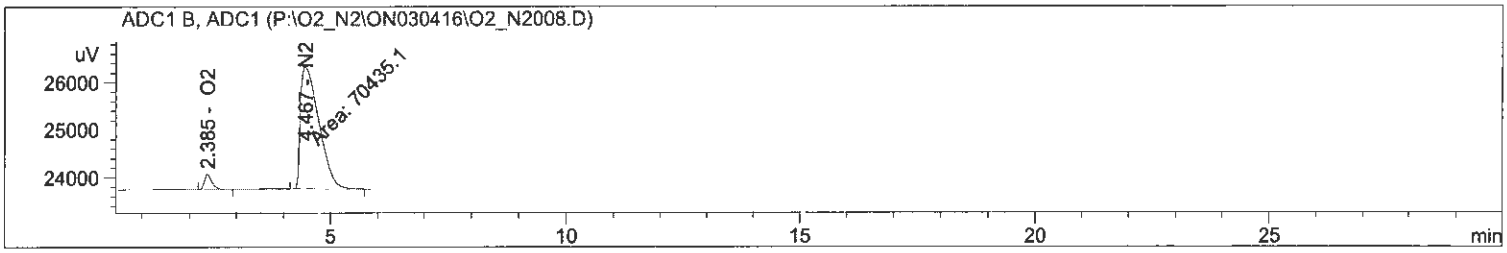
==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:21:05 AM
Inj Volume : Manually

Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.385	BB	3631.30664	1.25937e-3	4.57317		O2
4.467	MM	7.04351e4	1.19675e-3	84.29286		N2

Totals : 88.86603

==========

*** End of Report ***

Data File P:\O2_N2\ON030416\O2_N2009.D
Sample Name: 10636-9

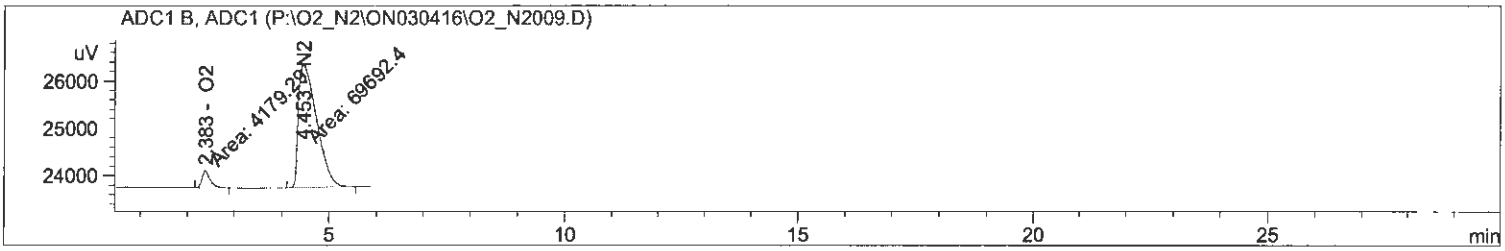
E.3-49

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:28:04 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.383	MM	4179.28906	1.25937e-3	5.26329		O2
4.453	MM	6.96924e4	1.19675e-3	83.40405		N2

Totals : 88.66734

==========

*** End of Report ***

Data File P:\O2_N2\ON030416\O2_N2010.D
Sample Name: 10636-10

E.3-50

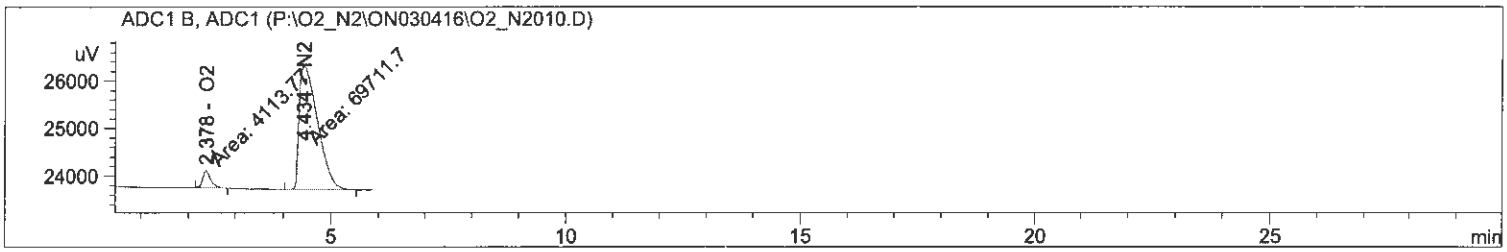
==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 3/4/2016 11:36:01 AM
Inj Volume : Manually

Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 1/13/2016 12:28:52 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2

Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========



==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

RetTime [min]	Type	Area [uV*s]	Amt/Area	Amount Percent(%)	Grp	Name
2.378	MM	4113.77295	1.25937e-3	5.18078		O2
4.434	MM	6.97117e4	1.19675e-3	83.42721		N2

Totals : 88.60799

==========

*** End of Report ***

TOC in WATER ANALYSIS
CHROMATOGRAMS
for M25.3 samples

Water Vial TGNMO — **ppmV, (C) = [(Axd-B) x slope) x V / L] / 12 x 24.45**

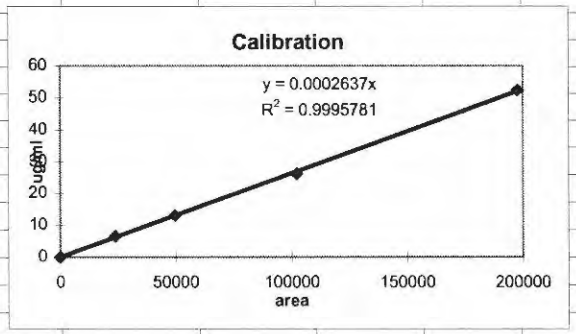
A	d			L					C				V
								Not blank-corr.					
		mmHg	Can vol.	Air Vol	OC	Lab. No.	Vial No.	ug carbon	ug/L	ppmV**	ppmV			Sample
Area	**dil fac**	**Can P1**	**in L**	**in L**	**ug/ml C**	**10636**		**OC**	OC as C	OC as C	**Mean**	Std Dev.	**%CV**	**ml**
5379	1	403	6.24	3.31	0.26	7	D30	0.82	0.25	0.51	**0.53**	0.06	**11.49**	**3.21**
5338	1	403	6.24	3.31	0.25	7		0.79	0.24	0.49				**3.21**
5558	1	403	6.24	3.31	0.30	7		0.97	0.29	0.60				**3.21**
6494	1	401	6.24	3.29	0.55	8	D31	1.72	0.52	1.06	**1.08**	0.02	**1.54**	**3.12**
6559	1	401	6.24	3.29	0.57	8		1.77	0.54	1.10				**3.12**
6532	1	401	6.24	3.29	0.56	8		1.75	0.53	1.08				**3.12**
10283	1	403	6.24	3.31	1.55	9	D32	4.92	1.49	3.03	**3.02**	0.13	**4.23**	**3.17**
10491	1	403	6.24	3.31	1.61	9		5.10	1.54	3.14				**3.17**
9998	1	403	6.24	3.31	1.48	9		4.68	1.42	2.88				**3.17**
5632	1	401	6.24	3.29	0.32	10	D33	1.00	0.30	0.62	**0.69**	0.18	**25.94**	**3.09**
6182	1	401	6.24	3.29	0.47	10		1.45	0.44	0.90				**3.09**
5517	1	401	6.24	3.29	0.29	10		0.91	0.28	0.56				**3.09**
4817	1		6.24	3.30	0.11	11		0.31	0.09	0.19				**2.88**

H2O

Standard Injections

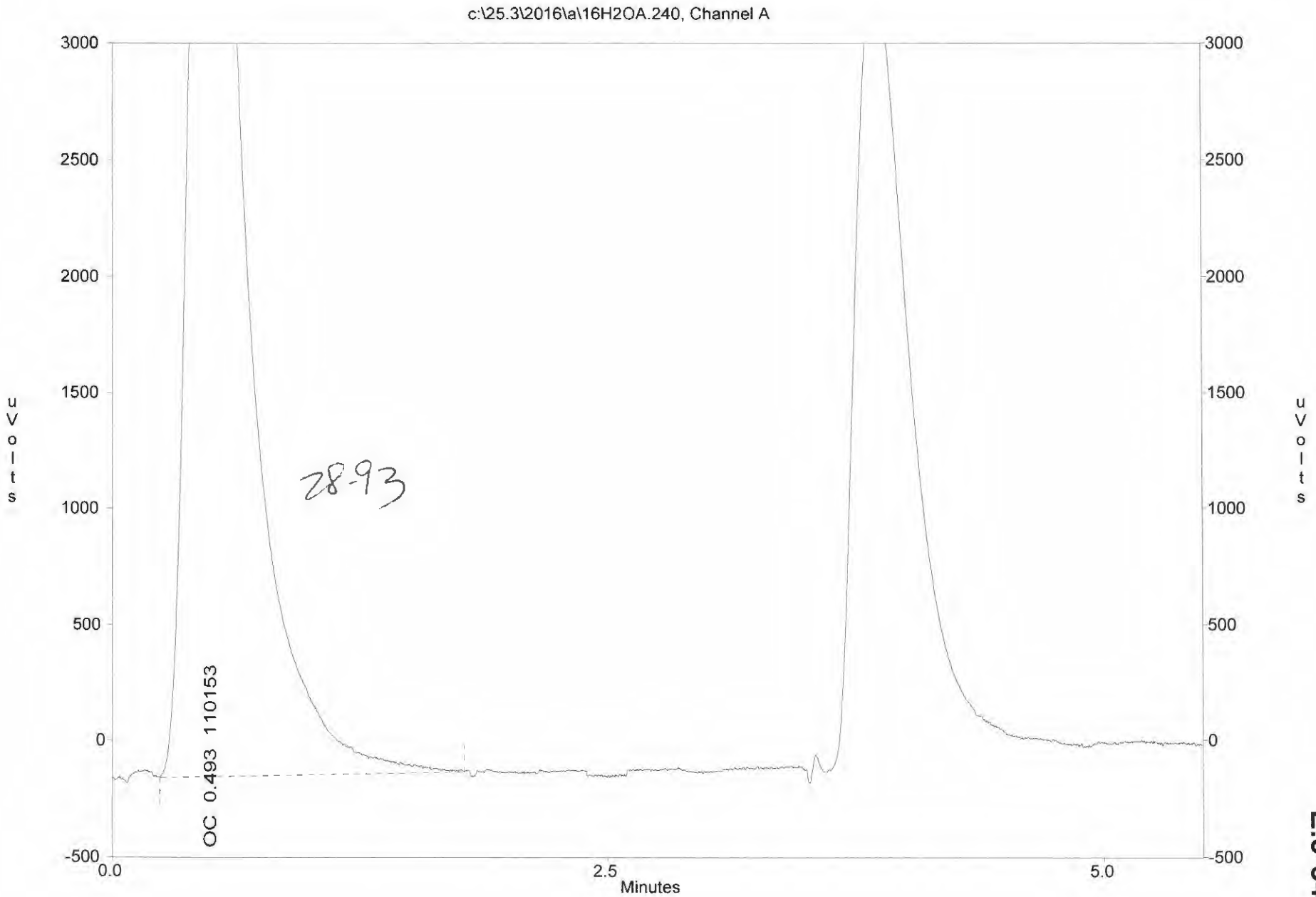
4407	**B**	Original Calibration		currently	calc.	Recovery
4223		Area	ug/ml C	Measured	ug/ml C	%
4591		0	0		-	-
		23772	6.56			
3647		49739	13.12			
3485		102260	26.24			
3393		197695	52.47			
3562			28.93	110153	29.08	100.52
4055			28.93	107461	28.37	98.06
3867		End	28.93	112398	29.67	102.57
3671						
3826						
3044						
3199						
3618						

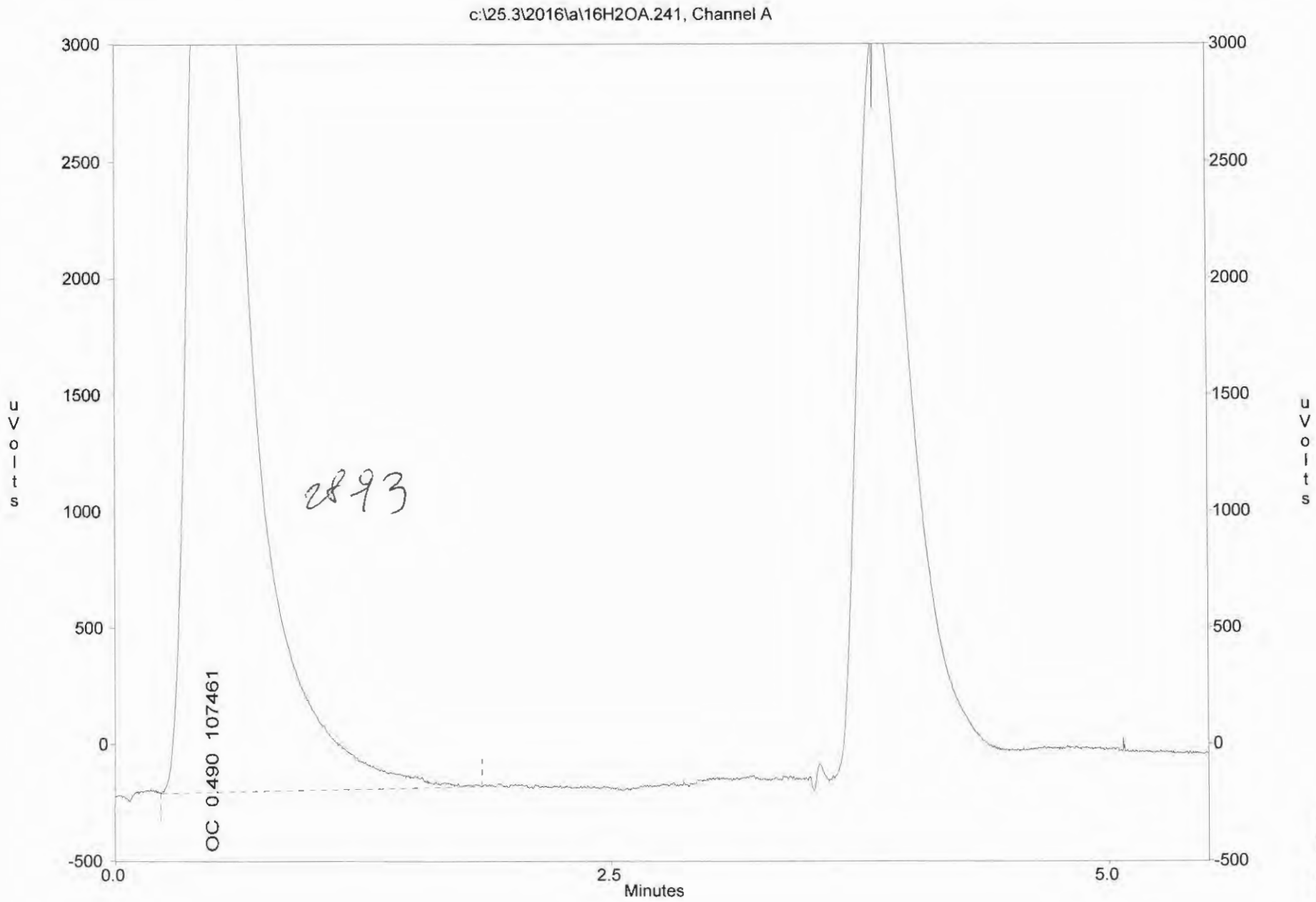
Avg. RF
2.64E-04

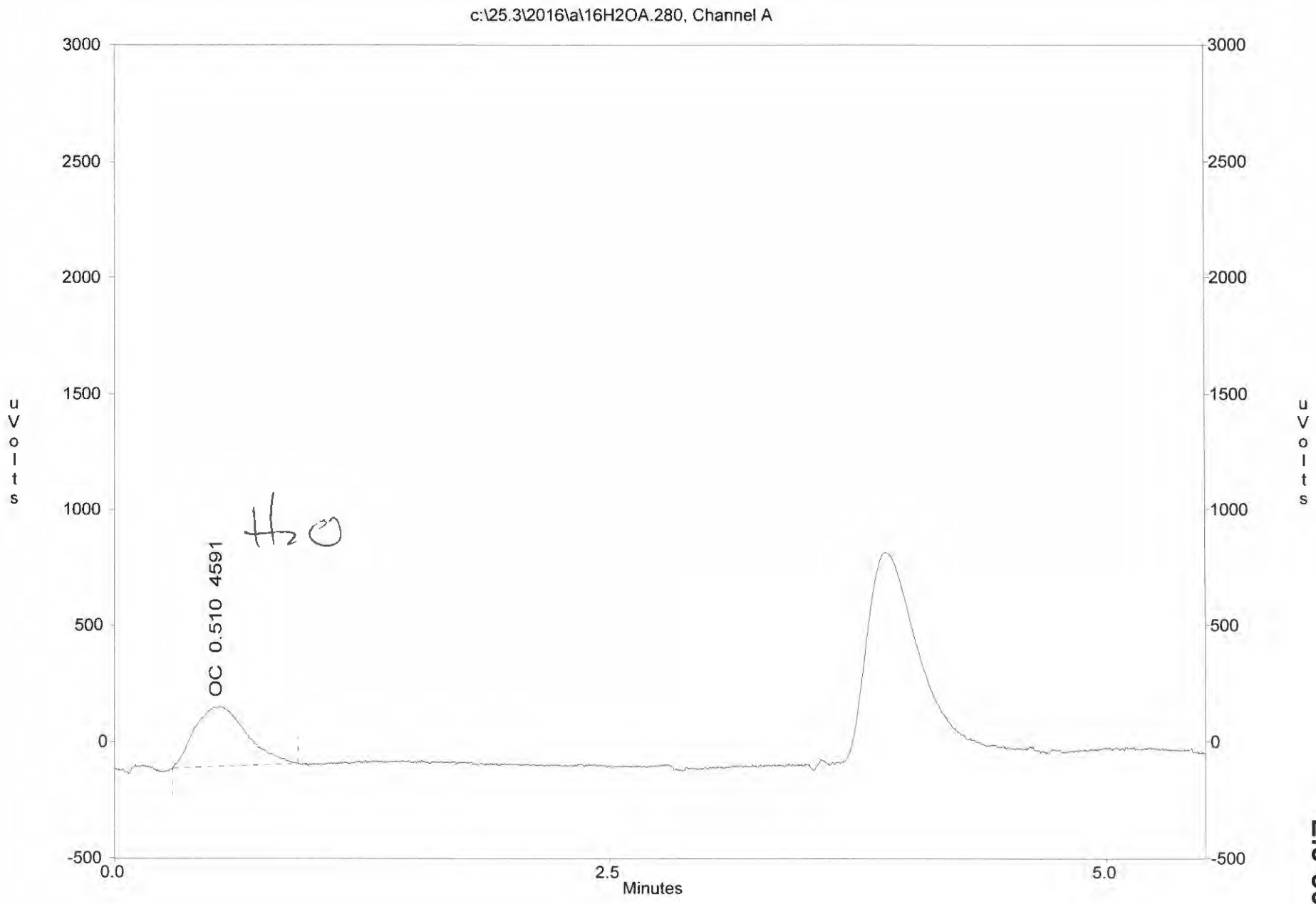


Water Vial Analysis, Method 25.3 Date: 2/3/16

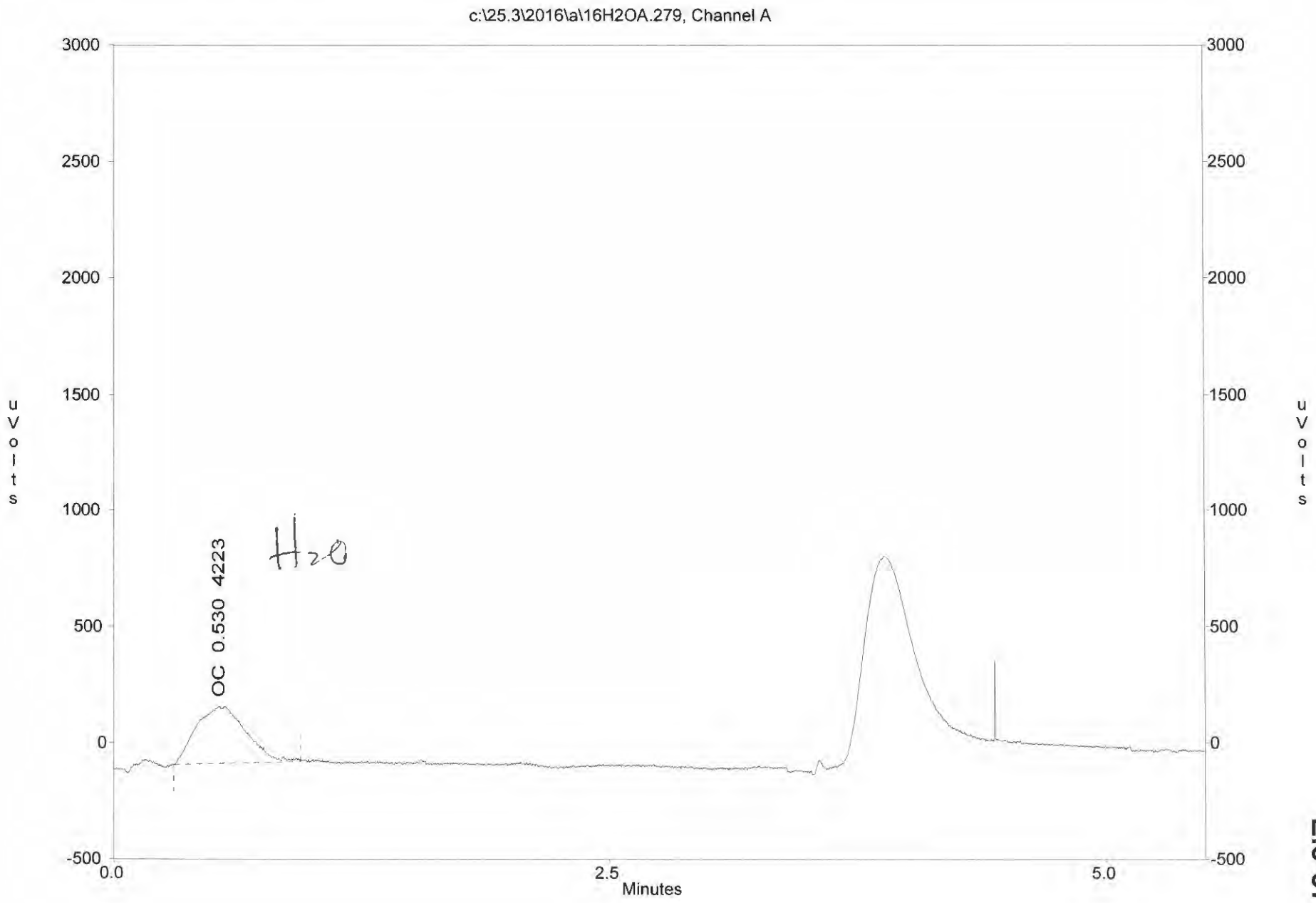
Client	Impinger No.	Received Wt. g	Vial Wt., g	Remarks
Delta	D30	8.0693	4.8558	
	D31	7.9254	4.8079	
	D32	8.0348	4.8613	
	D33	7.8011	4.7066	
	D34 (B)	7.5883	4.7043	

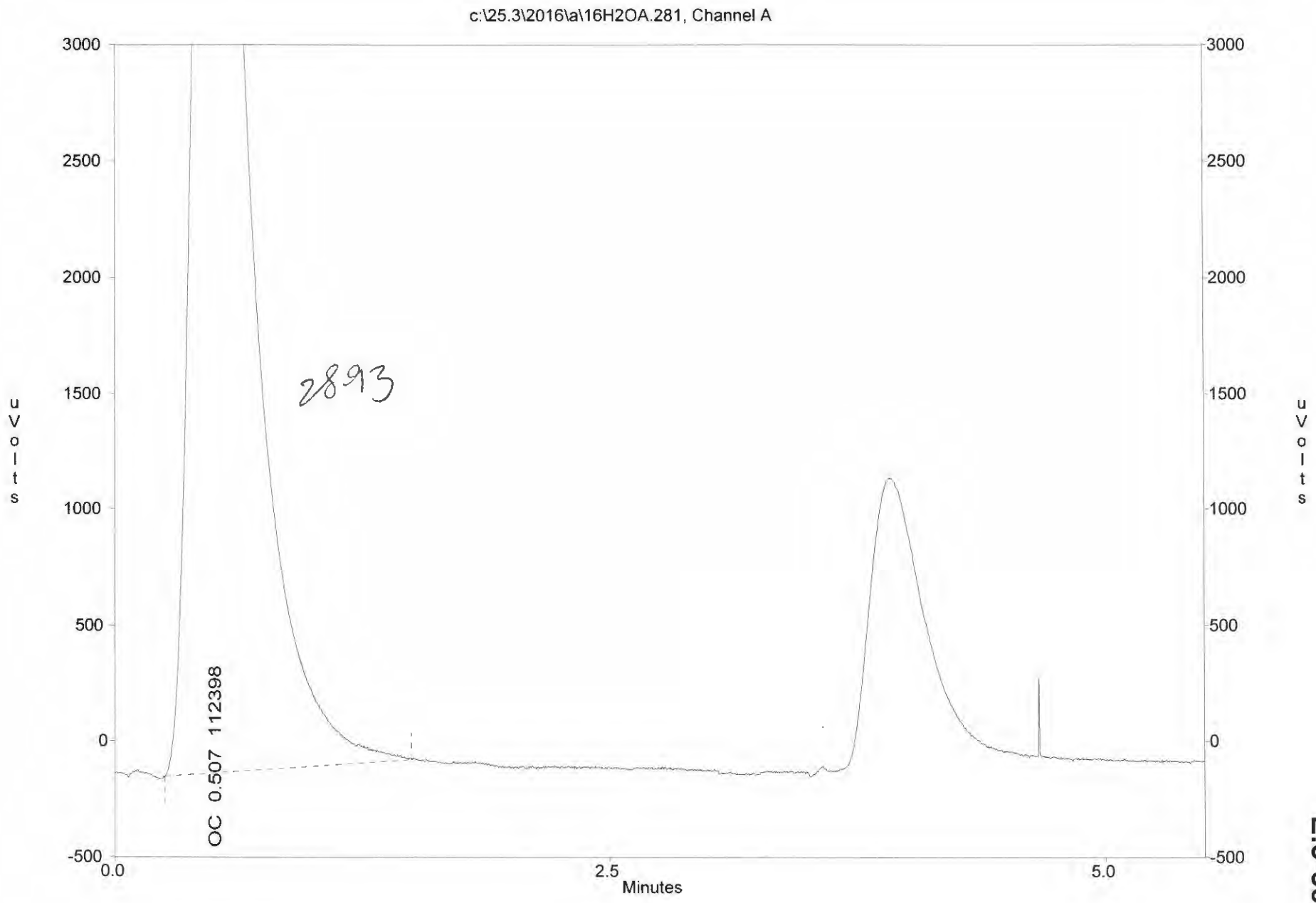

c:\25.3\2016\a\16H2OA.240, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
0.0
2.5
5.0
Minutes
OC 0.493 110153
28-93


c:\25.3\2016\a\16H2OA.241, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
0.0
2.5
5.0
Minutes
OC 0.490 107461
2893


c:\25.3\2016\a\16H2OA.280, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.510 4591
H2O
0.0
2.5
5.0
Minutes

E.3-56


c:\25.3\2016\a\16H2OA.279, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.530 4223
H2O
0.0
2.5
5.0
Minutes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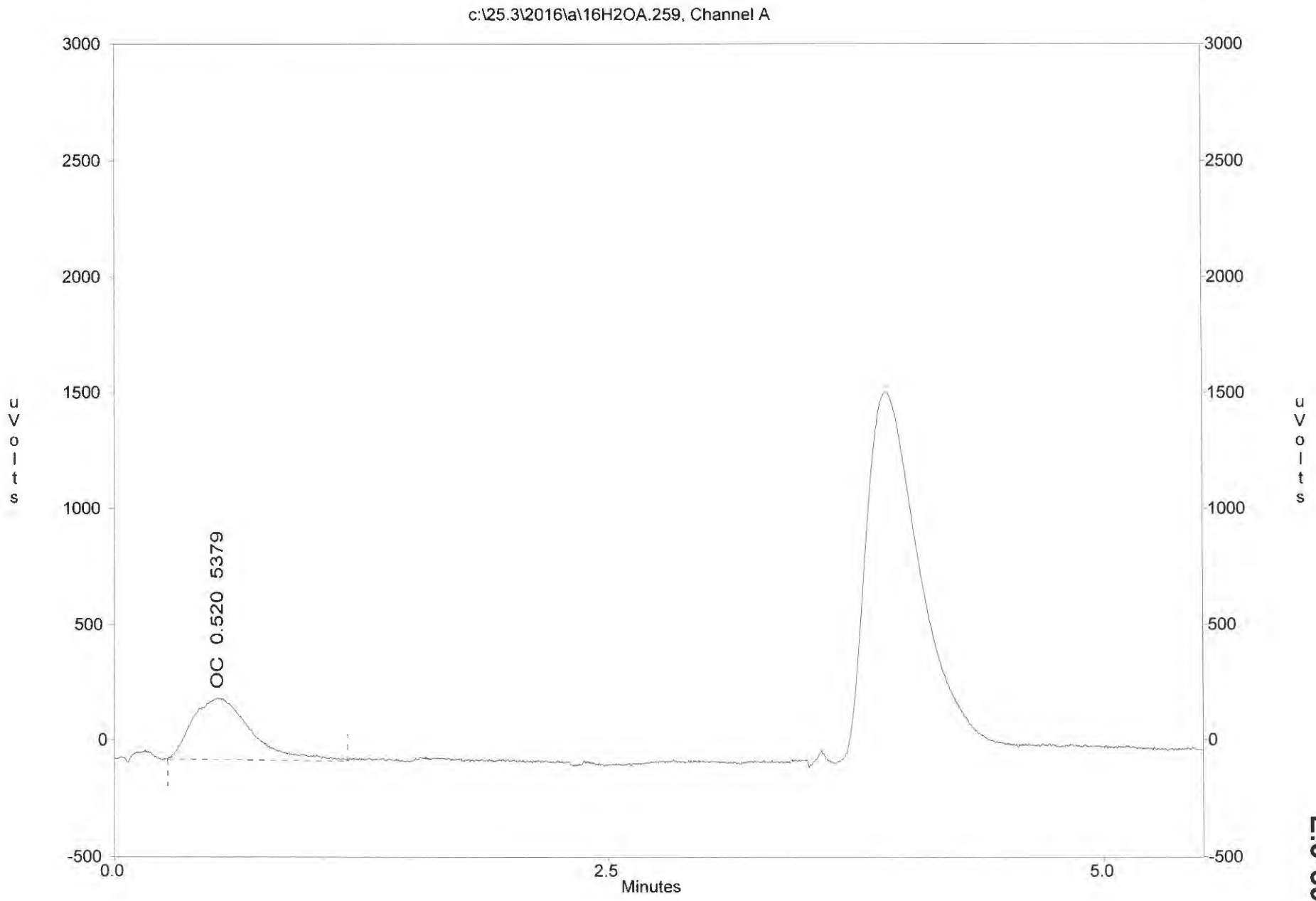
3000
2500
2000
1500
1000
500
0
-500
uVolts
0.0
2.5
5.0
Minutes
2893
OC 0.507 112398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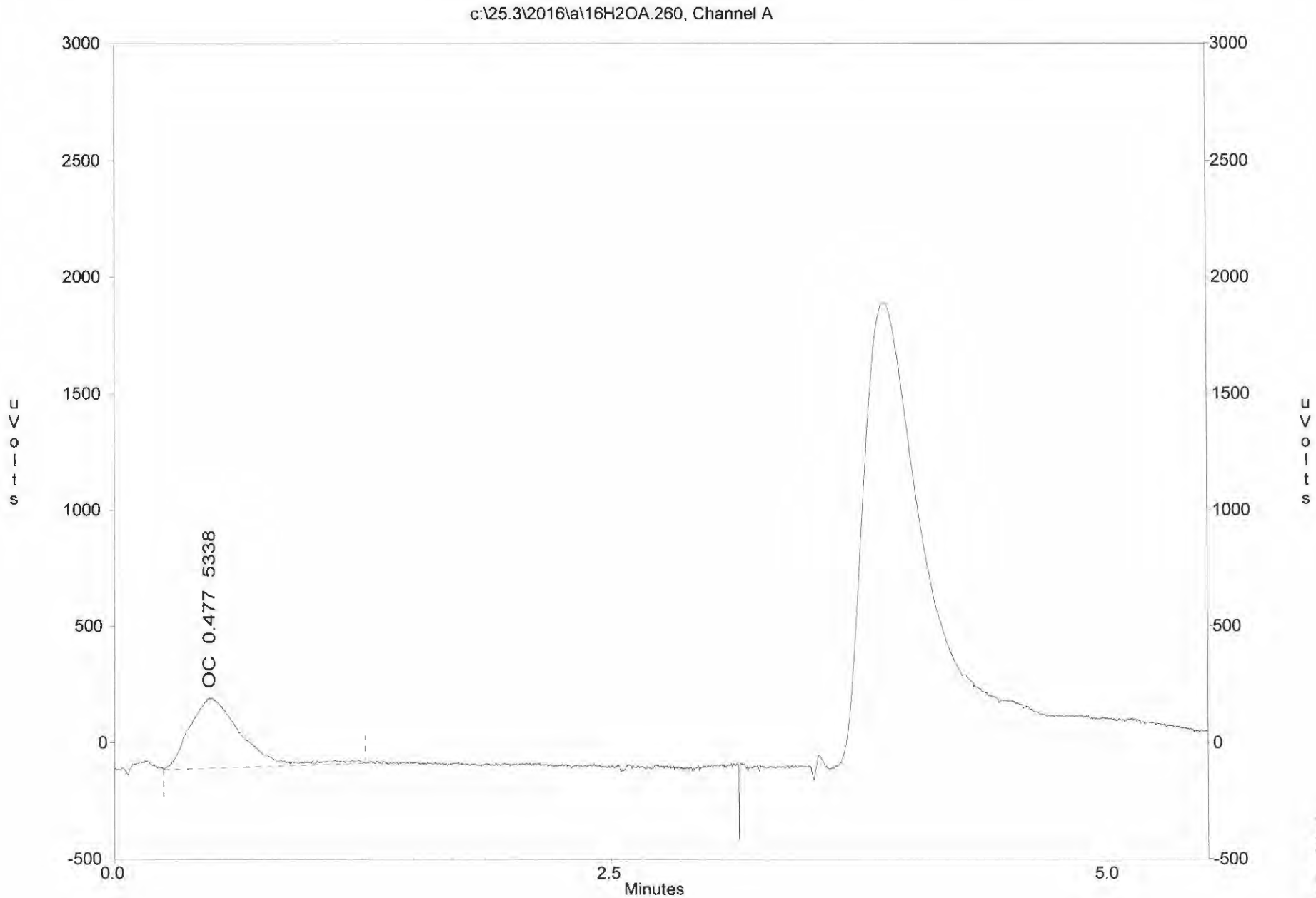
2.5
5.0
Minutes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1000
500
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-500
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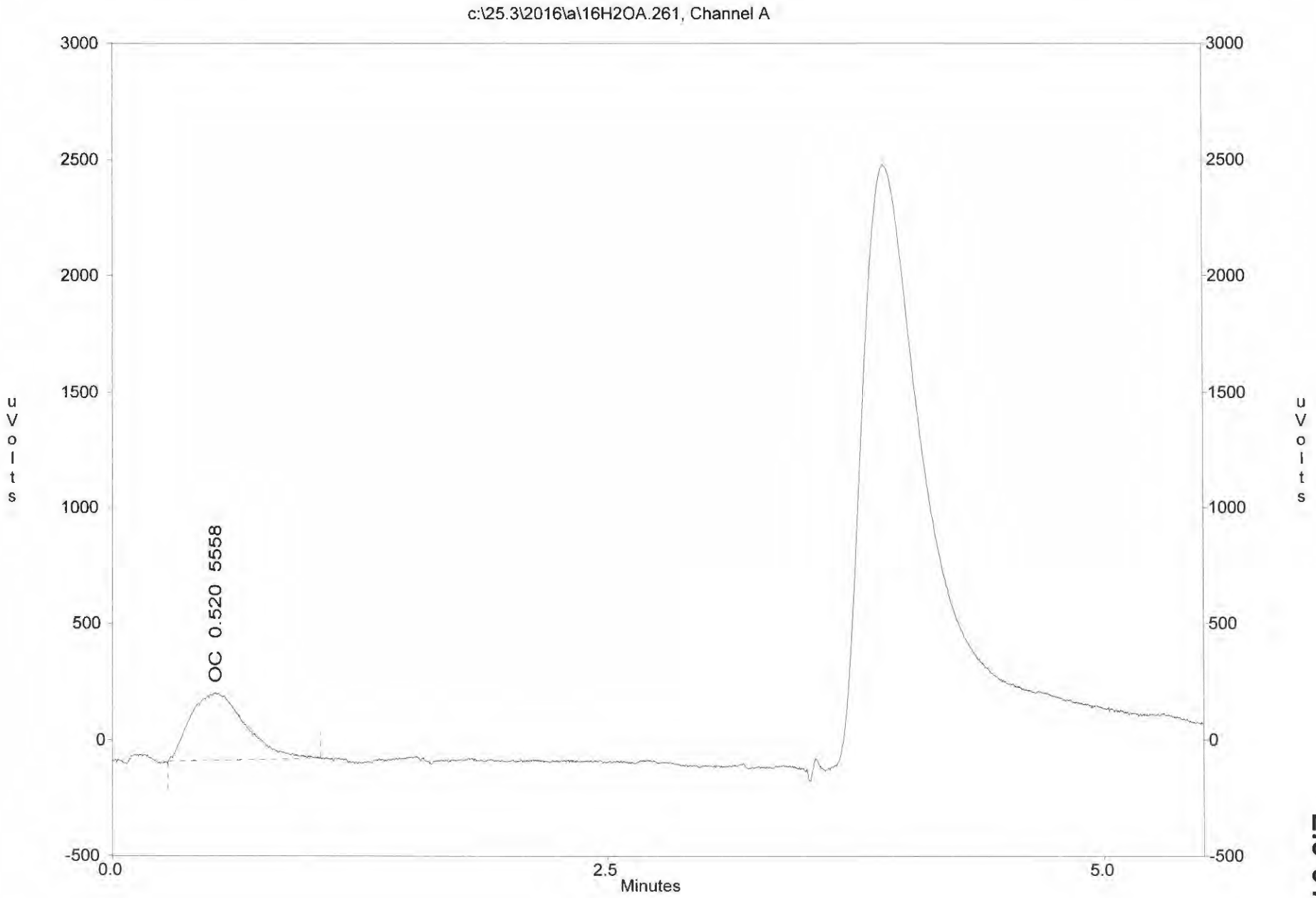
2.5
5.0
Minutes


c:\25.3\2016\a\16H2OA.261, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
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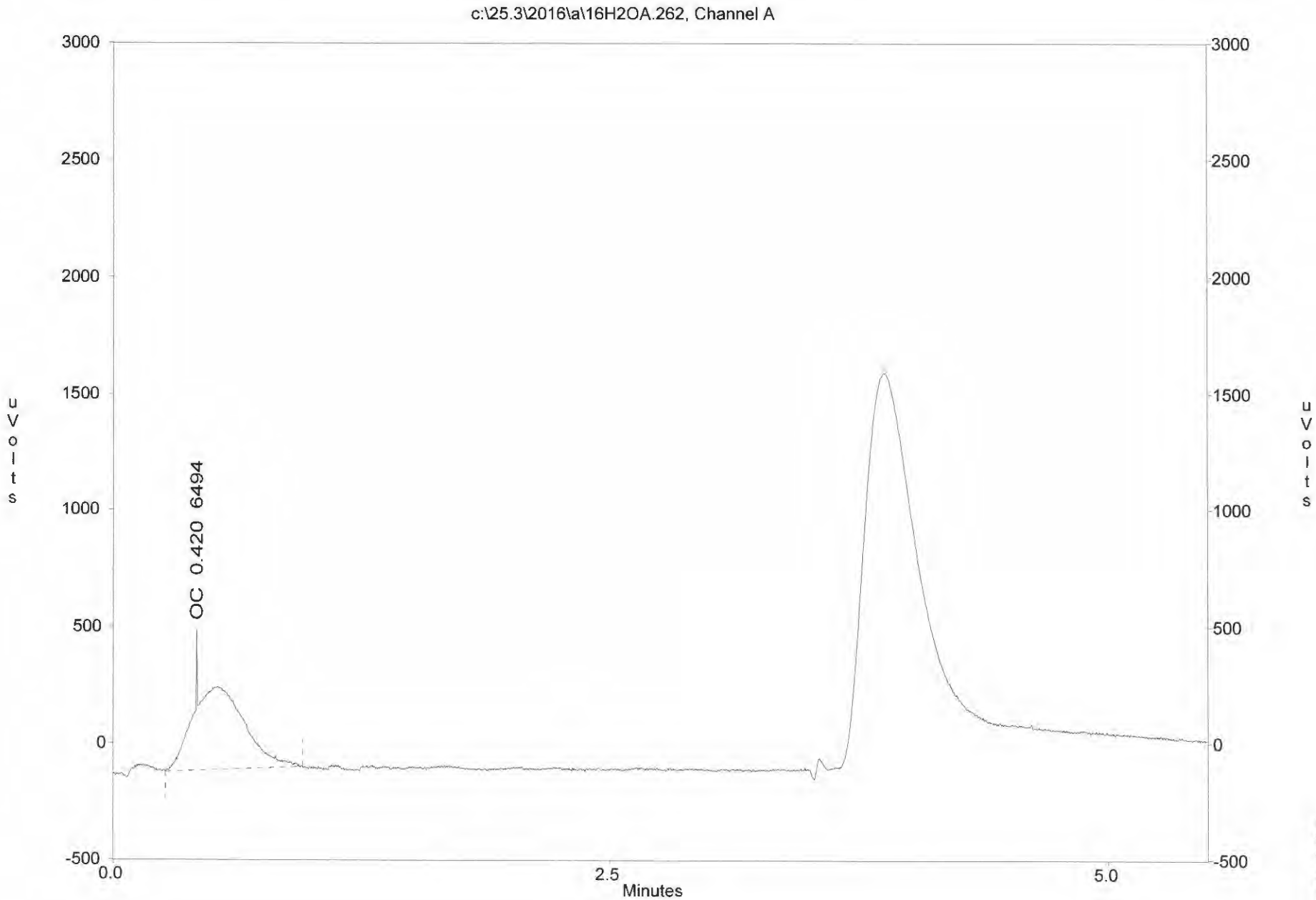
2.5
5.0
Minutes

E.3-61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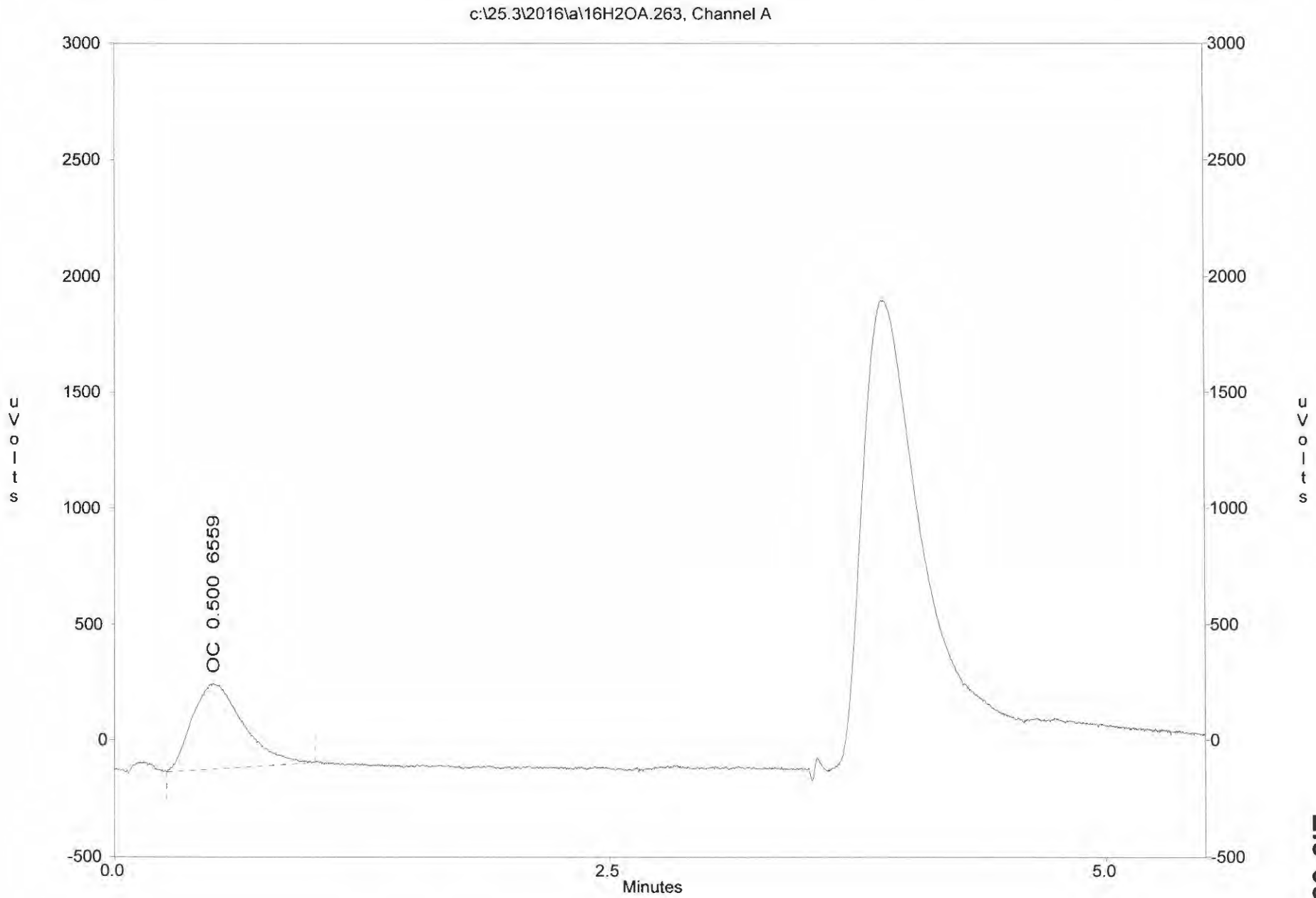
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.420 6494
0.0
2.5
5.0
Minutes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2500
2000
1500
1000
500
0
-500
uVolts
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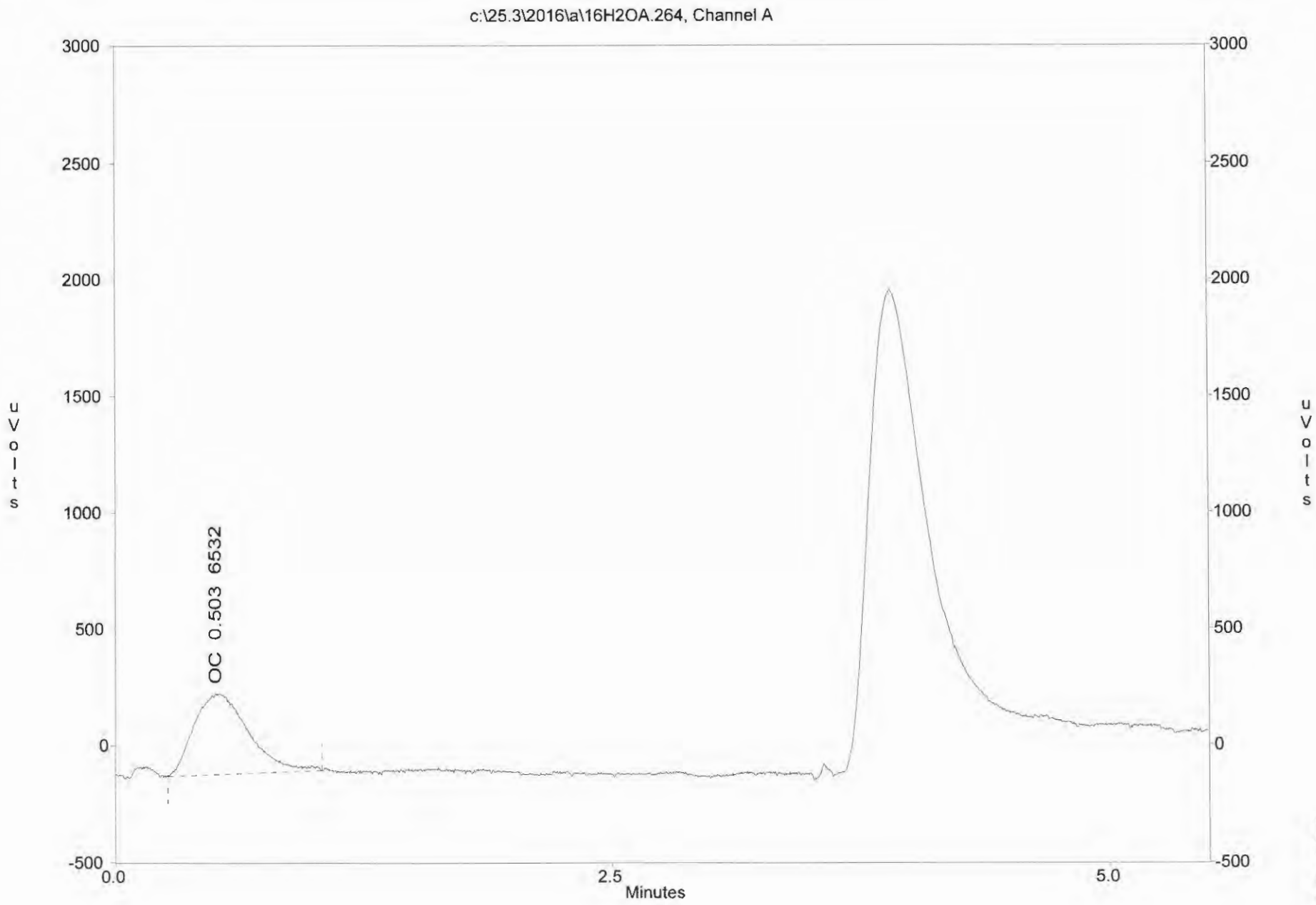
0.0
2.5
5.0
Minutes

E.3-63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2500
2000
1500
1000
500
0
-500
uVolts
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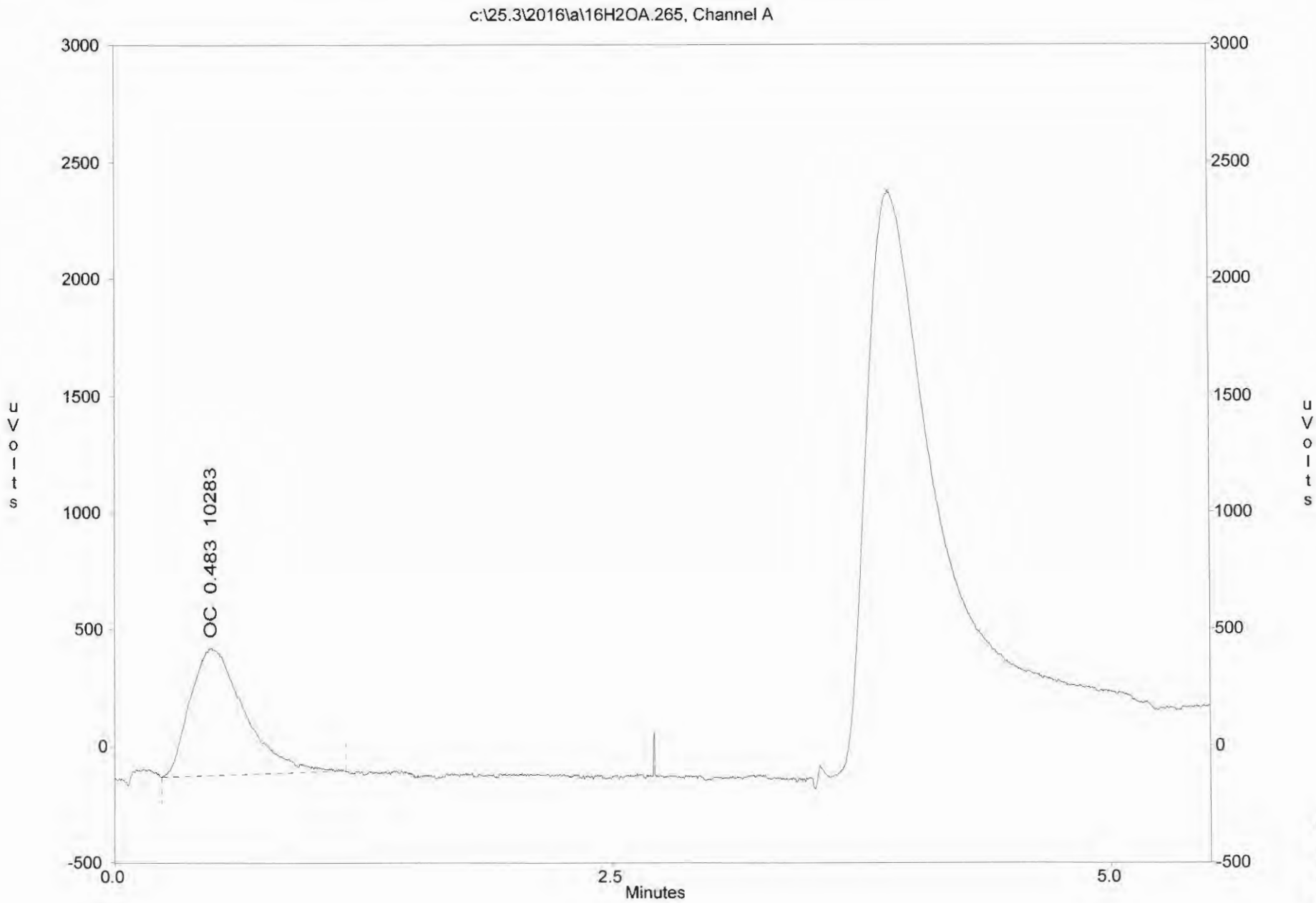
0.0
2.5
5.0
Minutes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1500
1000
500
0
-500
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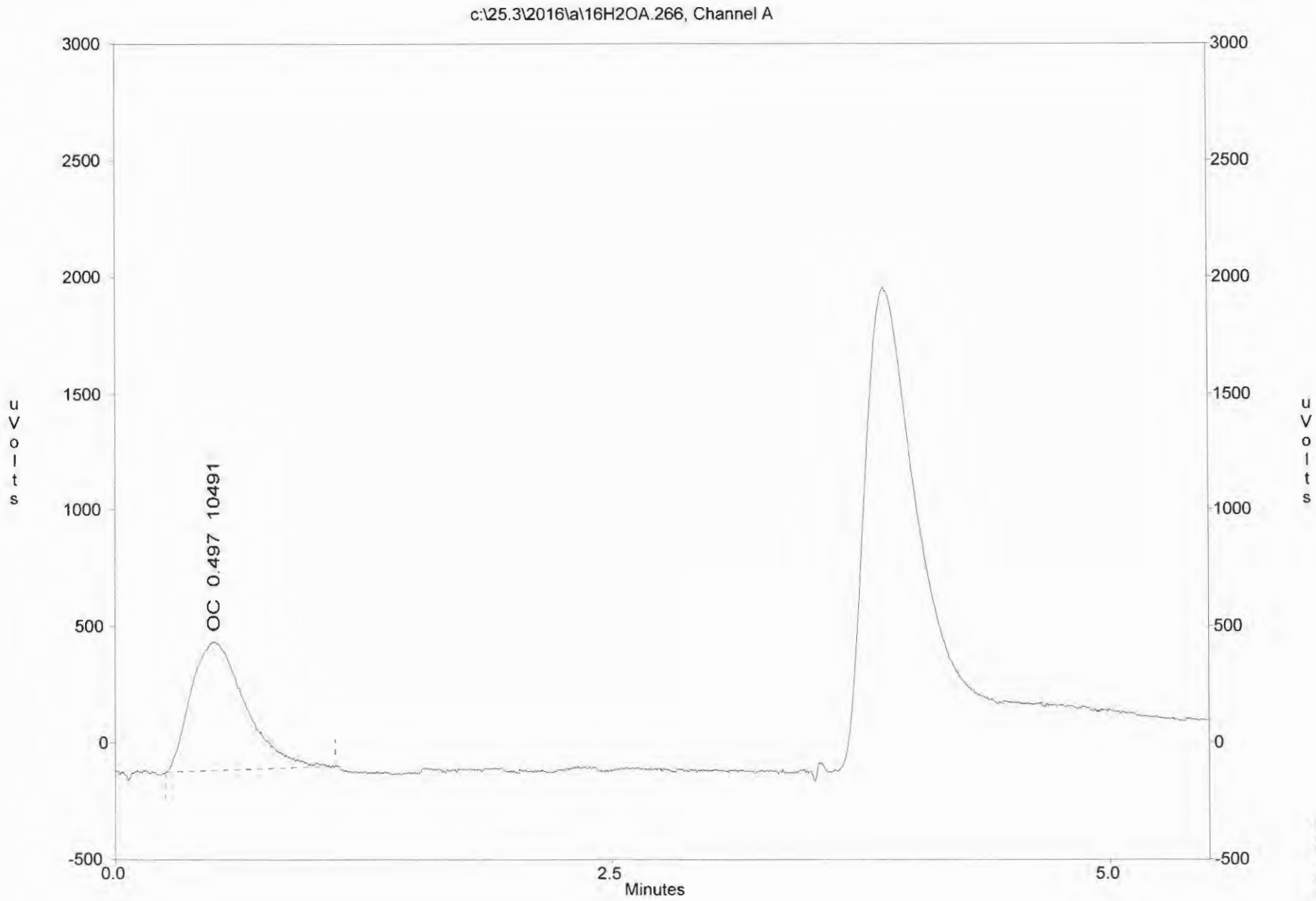
2.5
5.0
Minutes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1500
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-500
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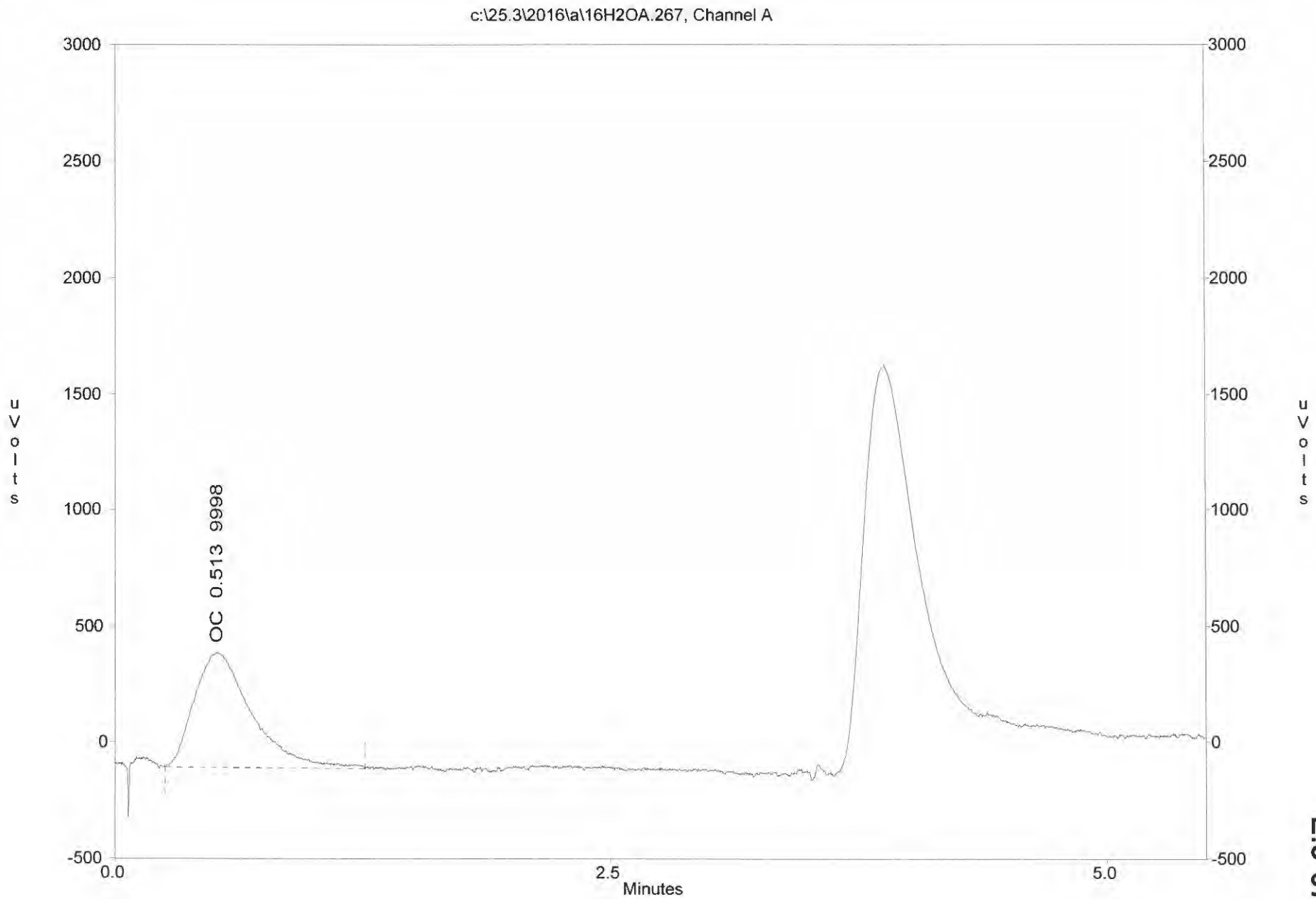
2.5
5.0
Minutes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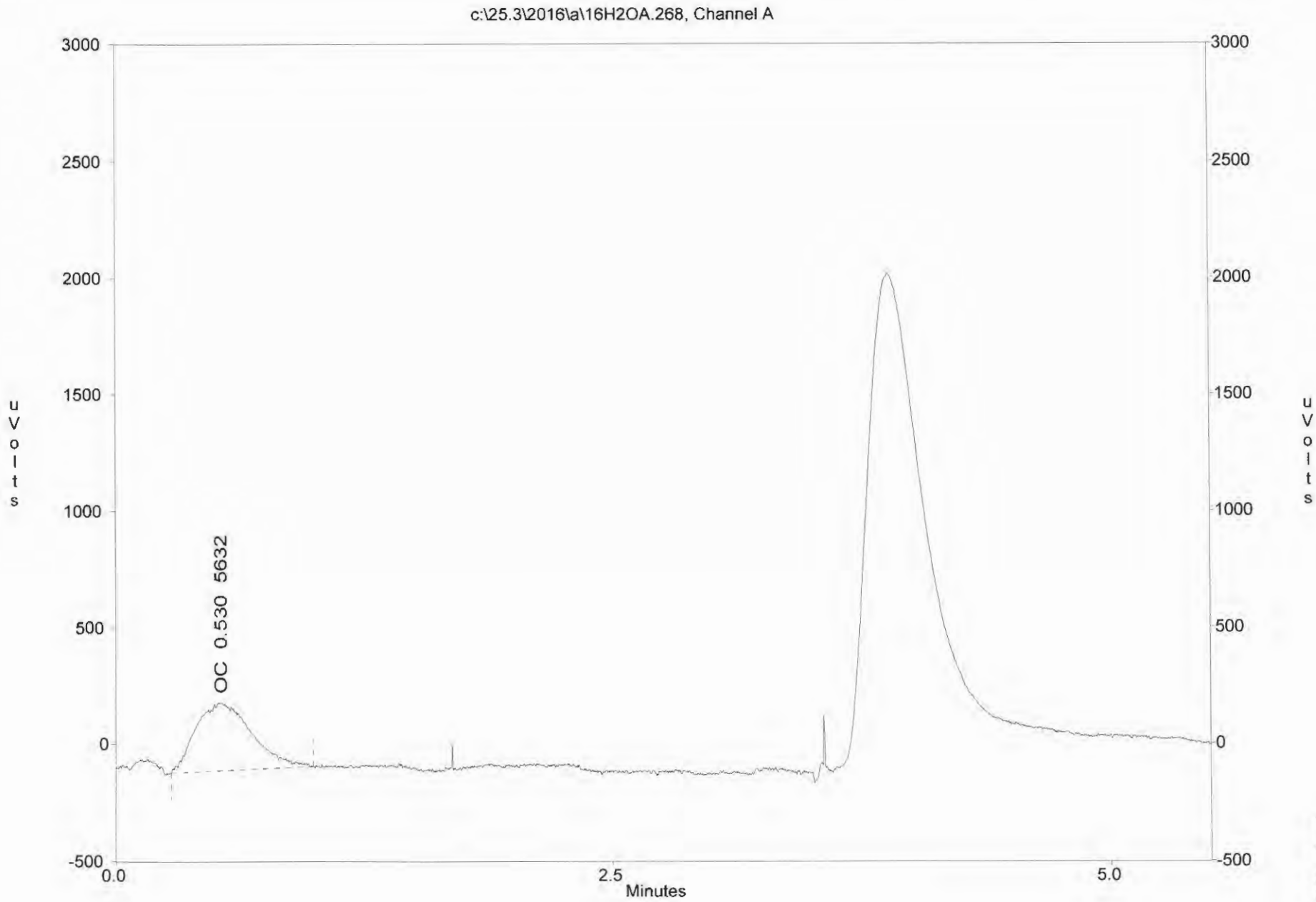
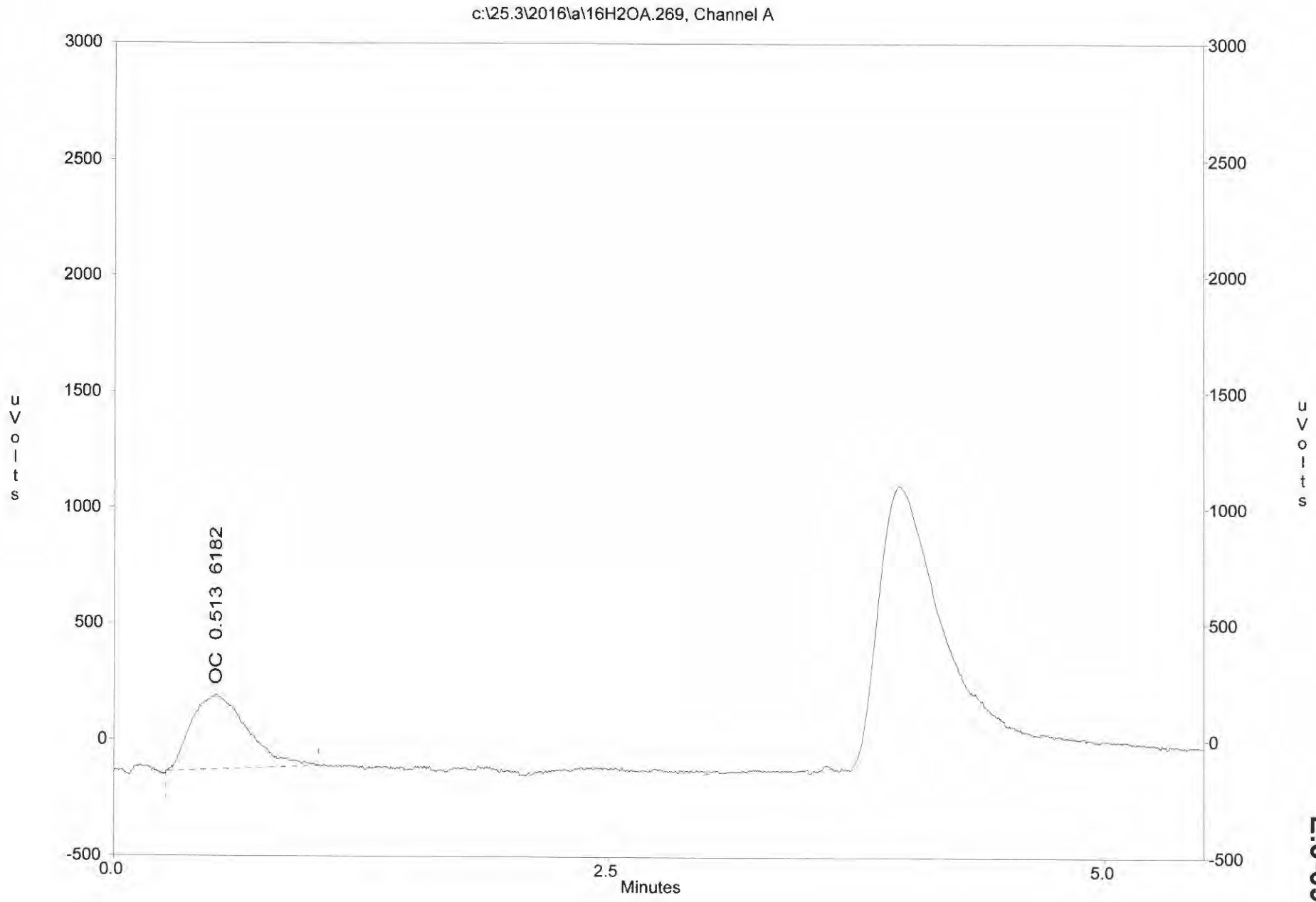
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.513 9998
0.0
2.5
5.0
Minutes


c:\25.3\2016\a\16H2OA.268, Channel A
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.530 5632
0.0
2.5
5.0
Minutes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1500
1000
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0
-500
uVolts
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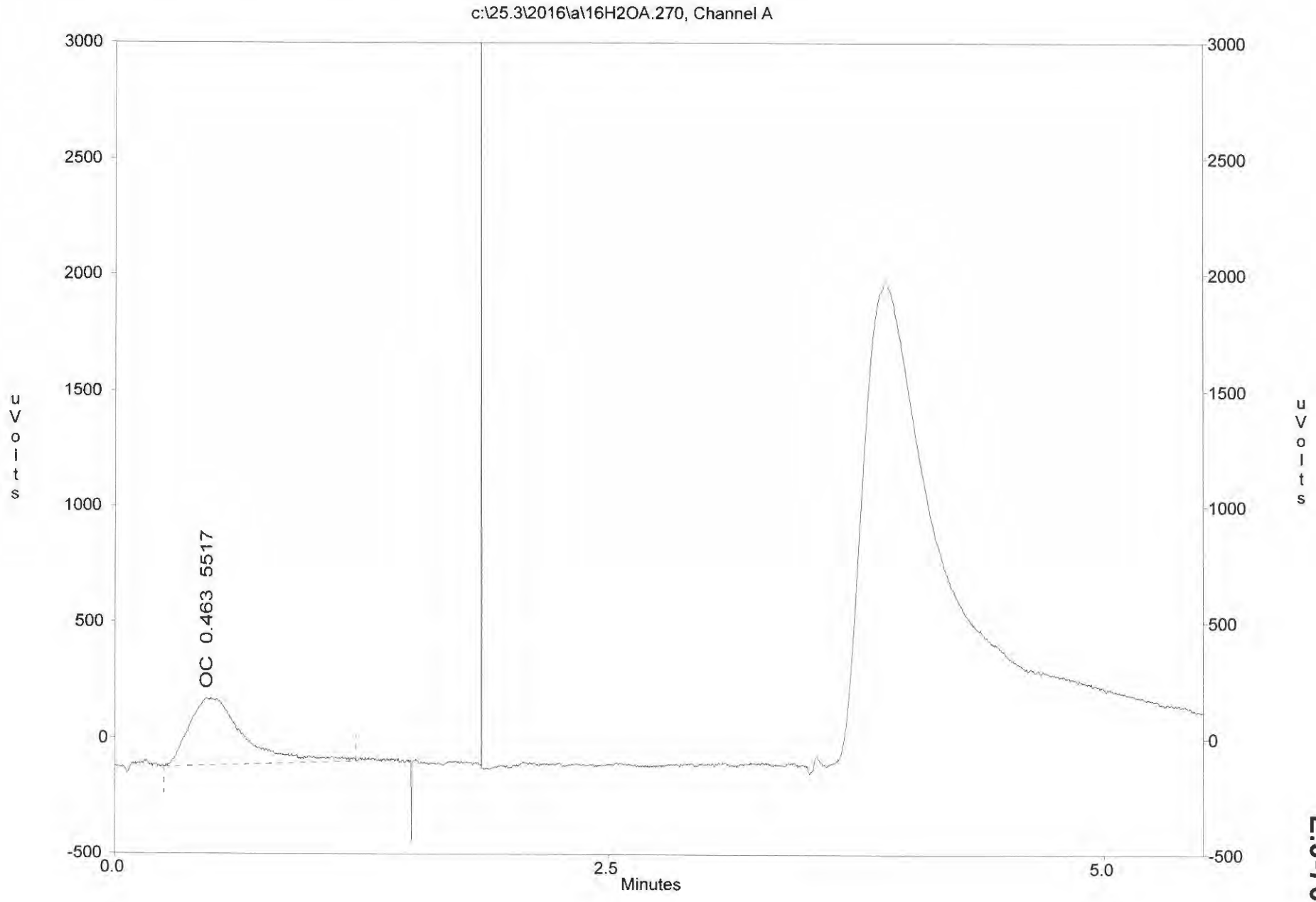
2.5
5.0
Minutes


c:\25.3\2016\a\16H2OA.270, Channel A
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1500
1000
500
0
-500
uVolts
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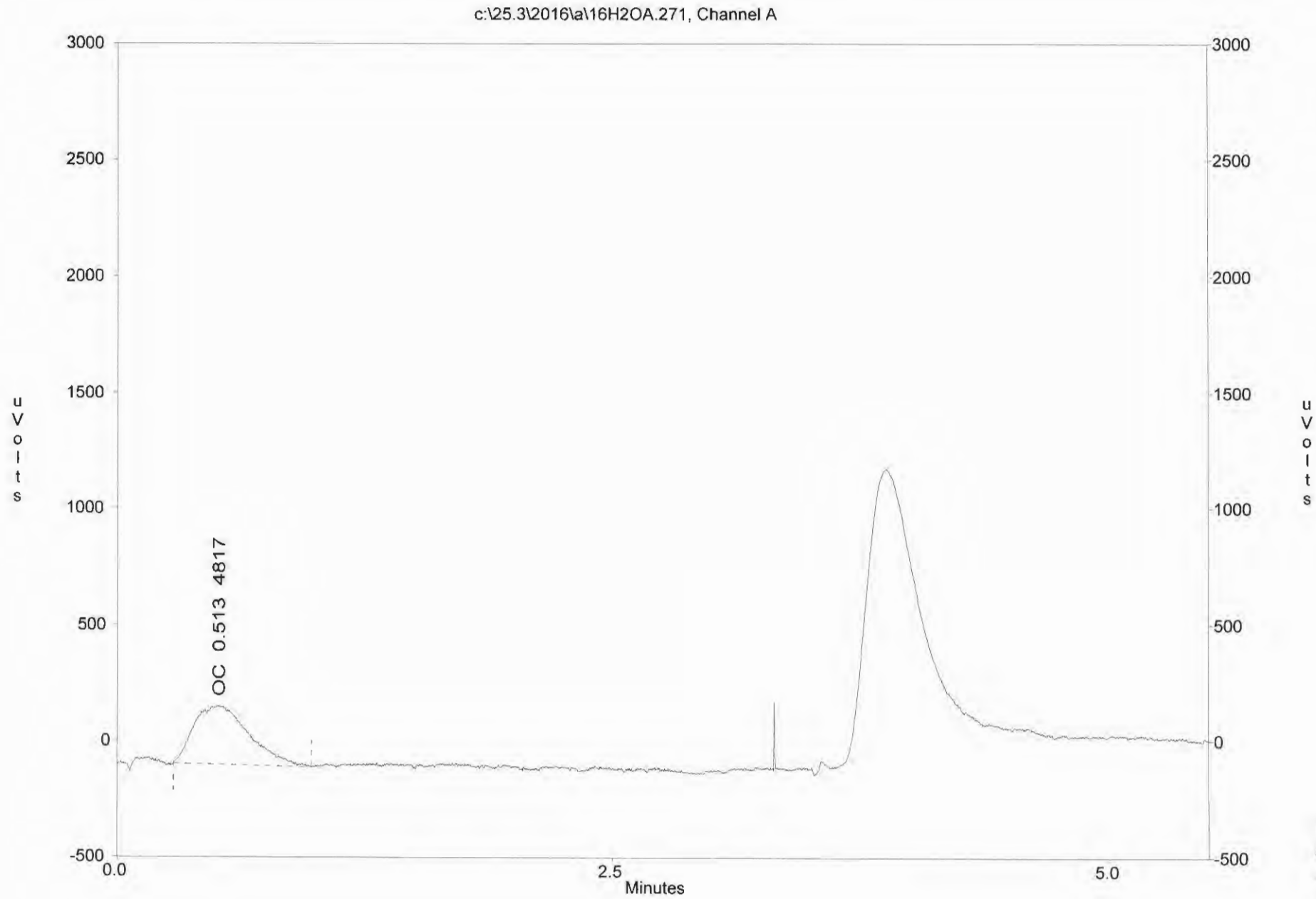
0.0
2.5
5.0
Minutes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3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.513 4817
0.0
2.5
5.0
Minutes

SGS

Analysis Report

March 18, 2016

Delta Air Quality Services
1845 Case
Orange, CA 92865
USA

Client Sample ID:	Unit 1 Fuel	**Date Sampled :**	03/01/2016
Date Received:	03/11/2016	**Location :**	Mecca
Matrix:	Wood	**P. O. # :**	13697
		Sample Type :	Comp

SGS Minerals Sample ID: 072-88071-001

		As Received	Dry	MAF
% Moisture, Total	[ASTM D 3302]	30.29		
% Ash	[ASTM D 7582]	7.75	11.12	
Gross Calorific Value (Btu/lb)	[ASTM D 5865]	5447	7814	8791
% Sulfur	[ASTM D 4239]	0.13	0.19	
% Carbon	[ASTM D 5373]	32.43	46.52	
% Hydrogen	[ASTM D 5373]	3.57	5.12	
% Nitrogen	[ASTM D 5373]	0.66	0.94	
% Oxygen (Calc)	[ASTM D 3176]	25.17	36.11	

Tests	Result	Unit	Method
Pounds of Ash/mm Btu	14.23	lb	
Pounds of Sulfur/mm Btu	0.24	lb	
Pounds of SO2/mm Btu	0.47	lb	

Anthony Grimaldi, Branch Manager

SGS North America Inc. | Minerals Services Division
4665 Paris St Suite B-200 Denver CO 80239
t (303) 373-4772 f (303) 373-4791 www.sgs.com/minerals

Member of SGS Group

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SGS

Analysis Report

March 18, 2016

Delta Air Quality Services
1845 Case
Orange, CA 92865
USA

Client Sample ID:	Unit 2 Fuel	**Date Sampled :**	03/02/2016
Date Received:	03/11/2016	**Location :**	Mecca
Matrix:	Wood	**P. O. # :**	13697
		Sample Type :	Comp

SGS Minerals Sample ID: 072-88071-002

		As Received	Dry	MAF
% Moisture, Total	[ASTM D 3302]	21.88		
% Ash	[ASTM D 7582]	6.09	7.80	
Gross Calorific Value (Btu/lb)	[ASTM D 5865]	6300	8064	8747
% Sulfur	[ASTM D 4239]	0.12	0.16	
% Carbon	[ASTM D 5373]	37.39	47.87	
% Hydrogen	[ASTM D 5373]	4.19	5.36	
% Nitrogen	[ASTM D 5373]	0.60	0.77	
% Oxygen (Calc)	[ASTM D 3176]	29.73	38.04	

Tests	Result	Unit	Method
Pounds of Ash/mm Btu	9.67	lb	
Pounds of Sulfur/mm Btu	0.20	lb	
Pounds of SO2/mm Btu	0.39	lb	

Anthony Grimaldi, Branch Manager

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Client: Desert View Power Unit 1
Sample Date: March 1, 2016
Sample Description: Composite Biomass Sample

EPA Fuel "F" factor calculations

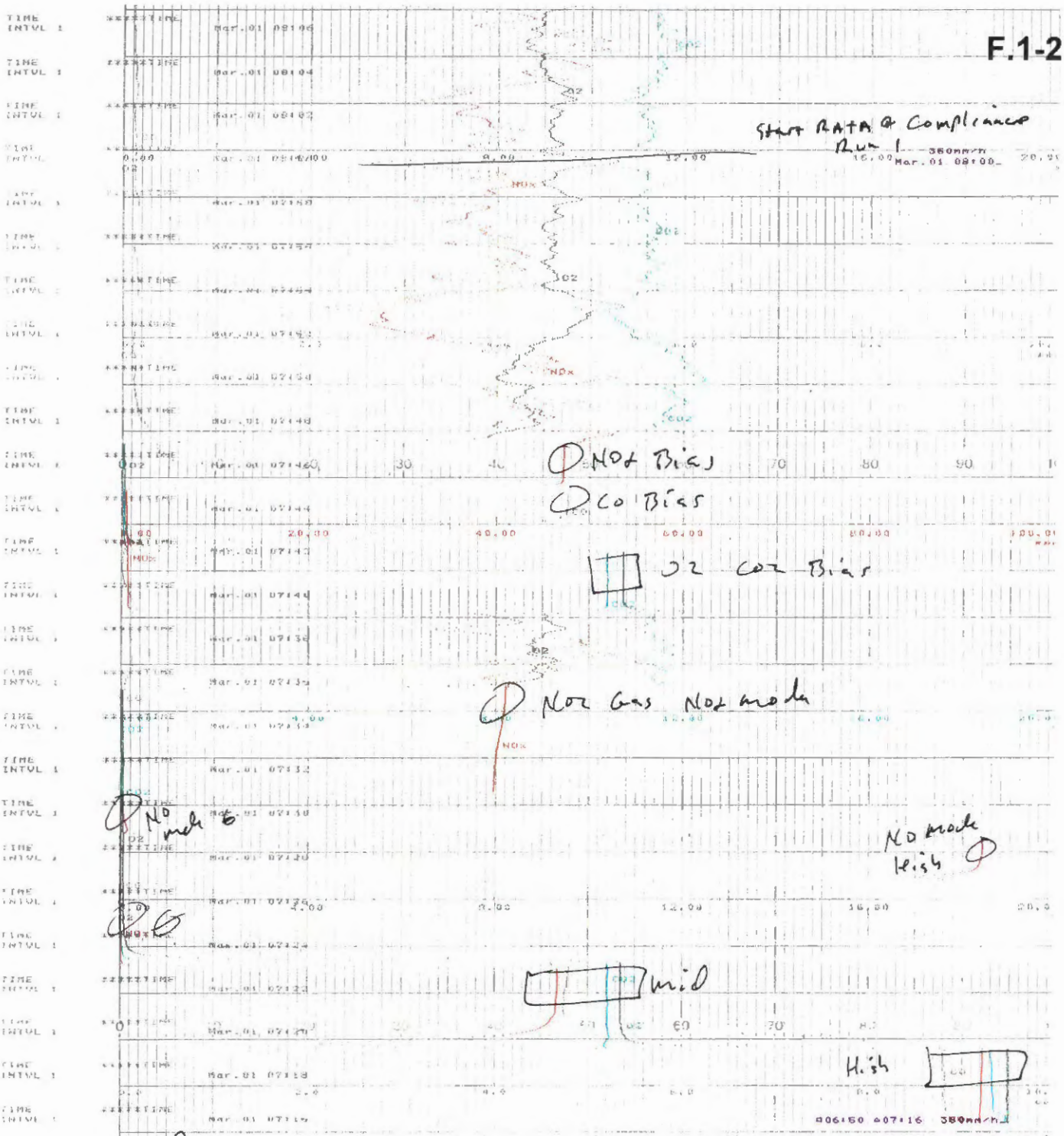
		Boimass
Reference temp, F:		68
	As Received	Dry Basis
Composition by wt, %:		
Moisture Total	30.29	30.29
Ash	7.75	11.12
Heating value, btu/lb:	5,447	7,814
Sulfur	0.13	0.19
Carbon	32.43	46.52
Hydrogen	3.57	5.12
Nitrogen	0.66	0.94
Oxygen	25.17	36.11
Chlorine		
F factor, dscf/mmbtu @ 0% O2:		9,399
Ash content, lb/mmbtu:		14.230

Client: Desert View Power Unit 2
Sample Date: March 2, 2016
Sample Description: Composite Biomass Sample

EPA Fuel "F" factor calculations

			Boimass
Reference temp, F:			68
	As Received	Dry Basis	
Composition by wt, %:			
Moisture Total	21.88	21.88	
Ash	6.09	7.8	
Heating value, btu/lb:	6,300	8,064	
Sulfur	0.12	0.16	
Carbon	37.39	47.87	
Hydrogen	4.19	5.36	
Nitrogen	0.6	0.77	
Oxygen	29.73	38.04	
Chlorine			
F factor, dscf/mmbtu @ 0% O2:		9,357	
Ash content, lb/mmbtu:		9.670	

APPENDIX F INSTRUMENT STRIP CHARTS



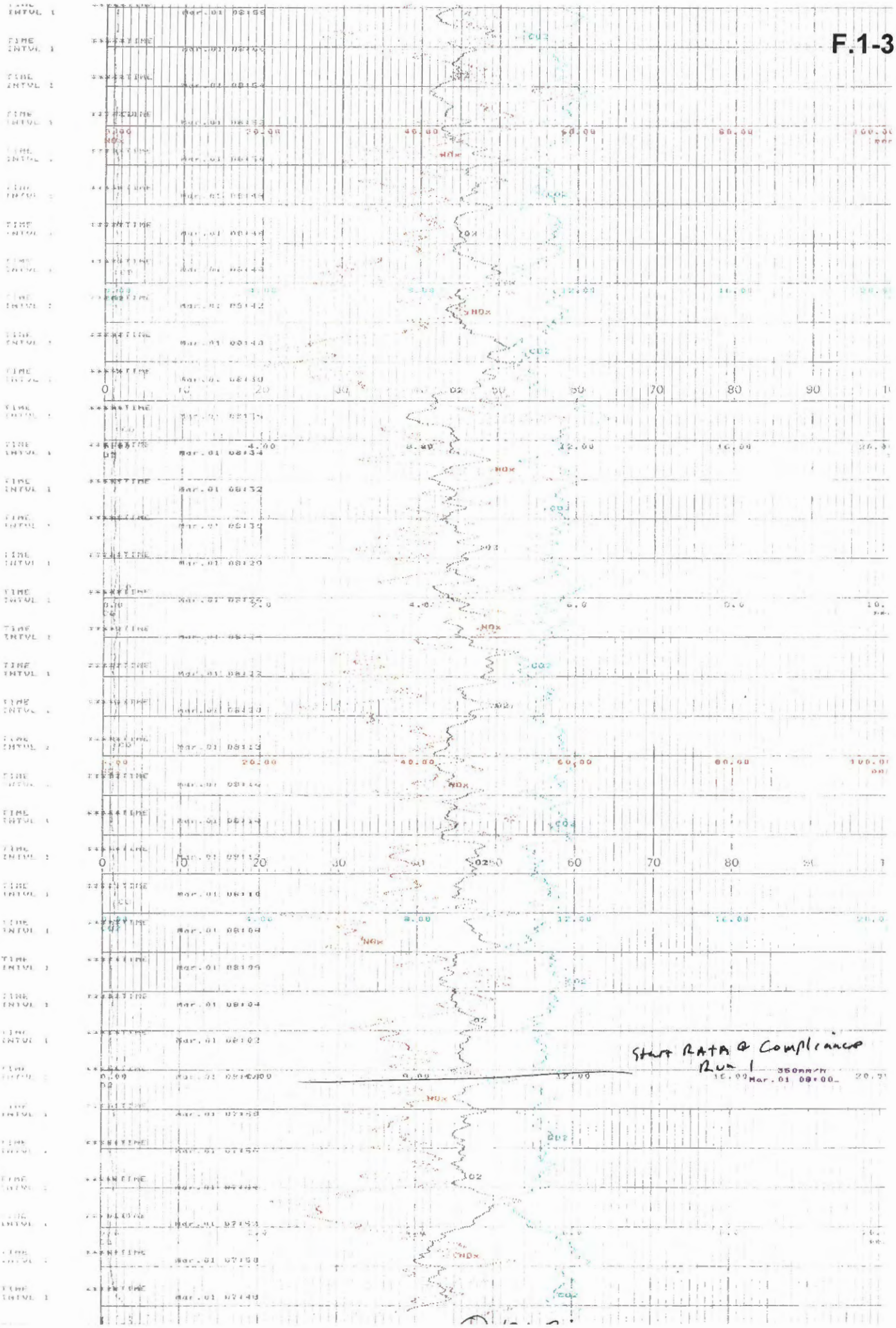
Desert View Power Unit 1 RATA + Compliance Dave Wood

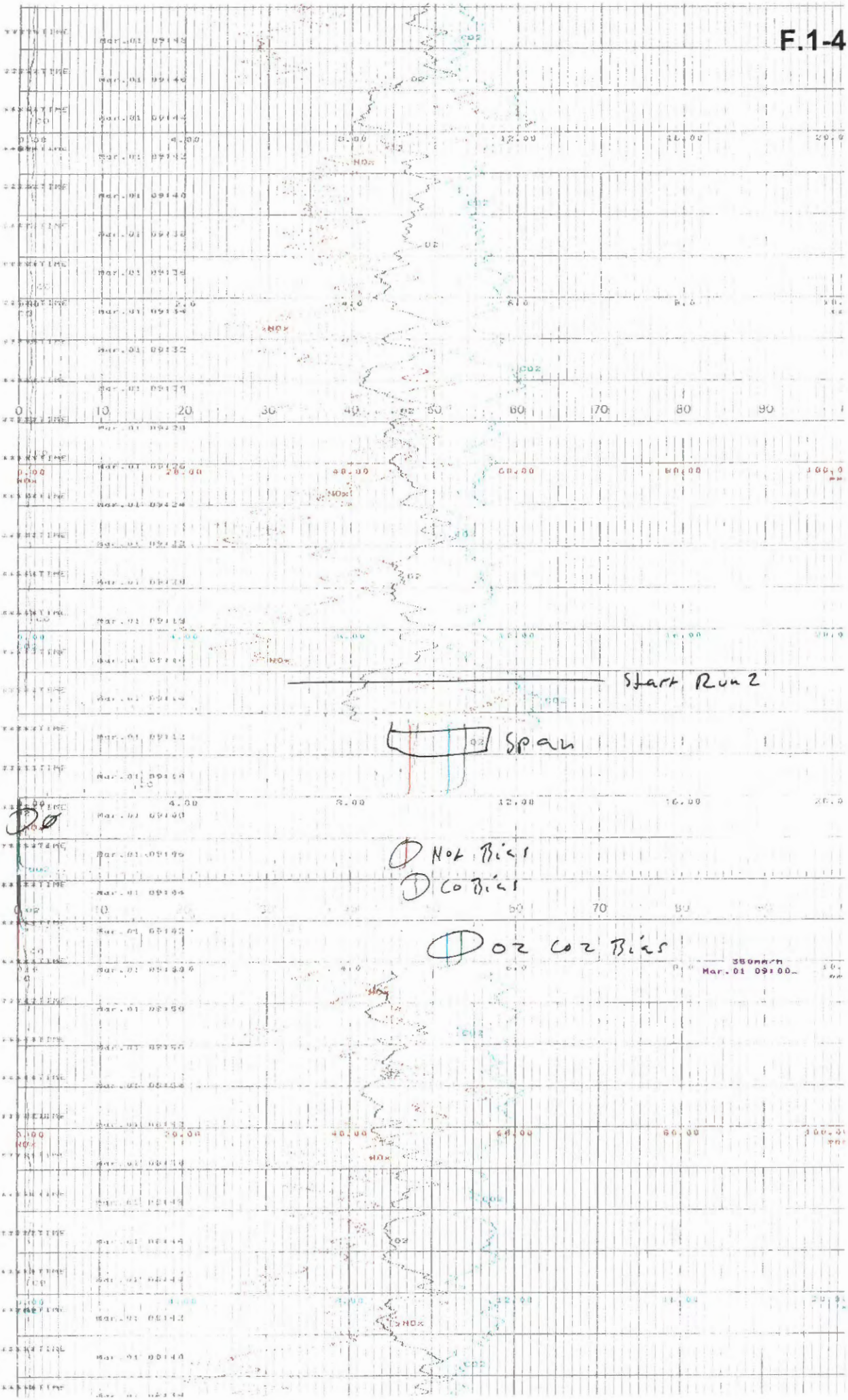
O2. 0-20% CO2. 0-20% NOx 0-100PPM CO. 0-10PPM

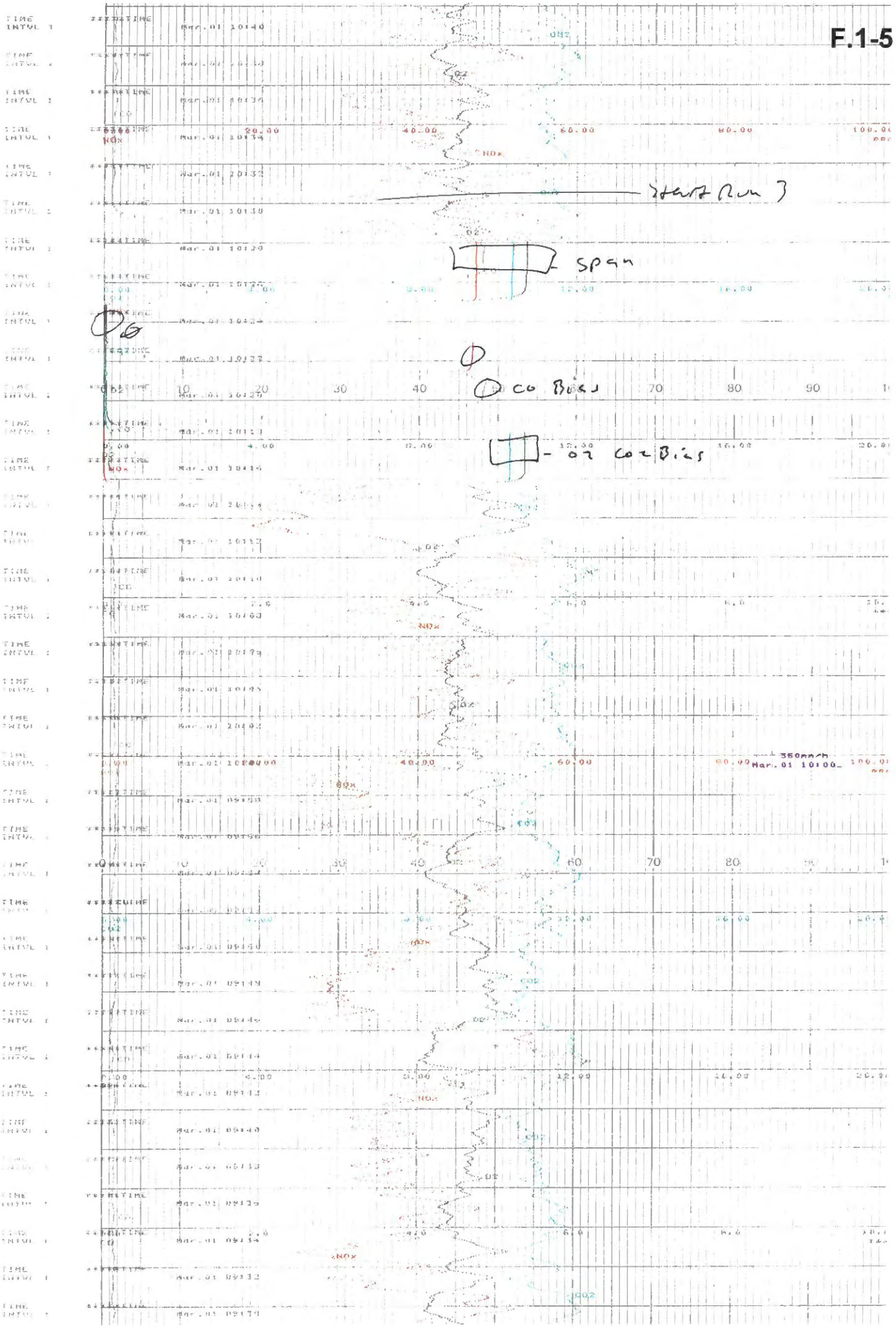
O2 - 10.67
CO2 - 10.5 CC168052

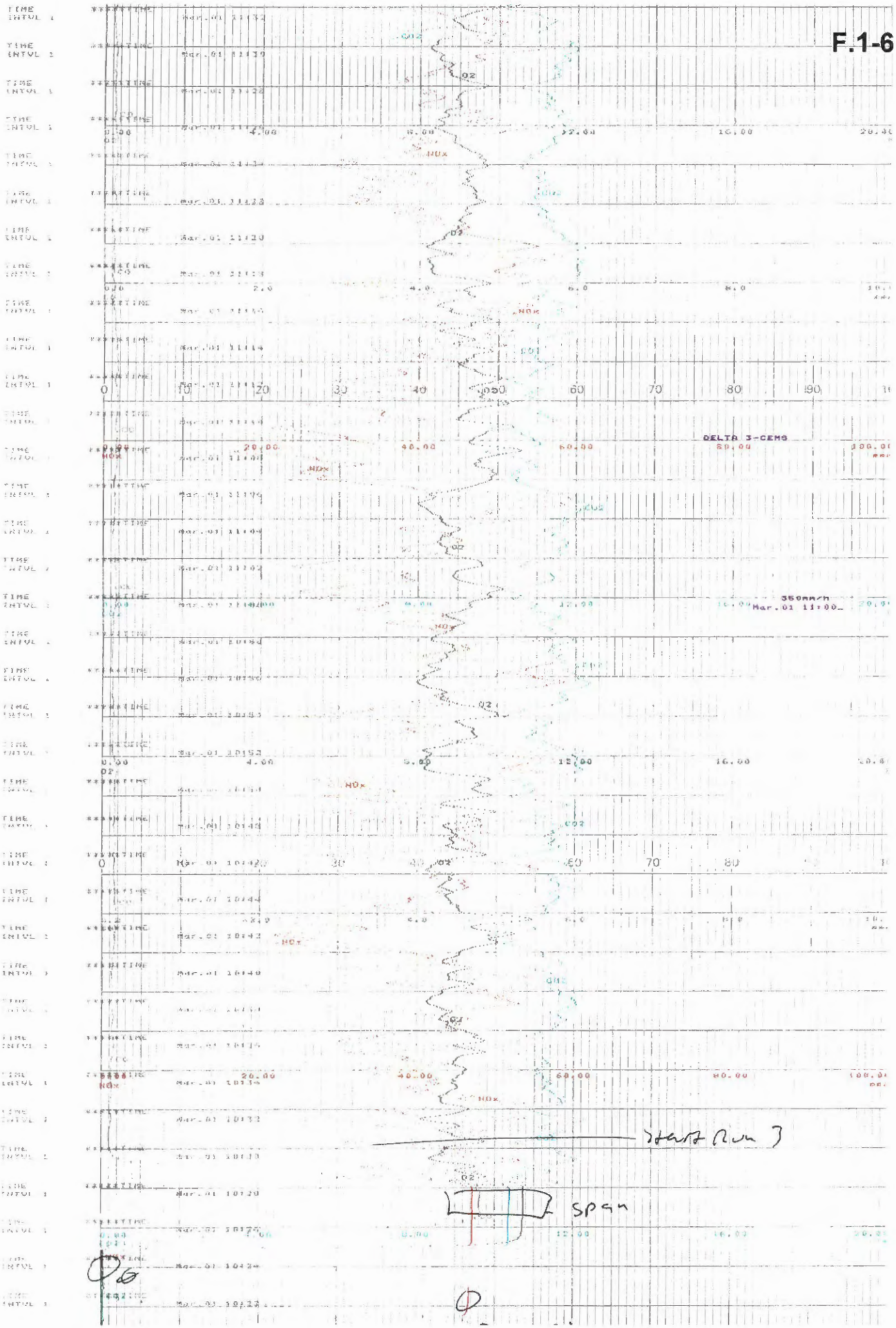
NOx 47.5 CC106193 CO 4.72 CC326082
NOx 93.0 CC149361 CO 8.81 CC326019

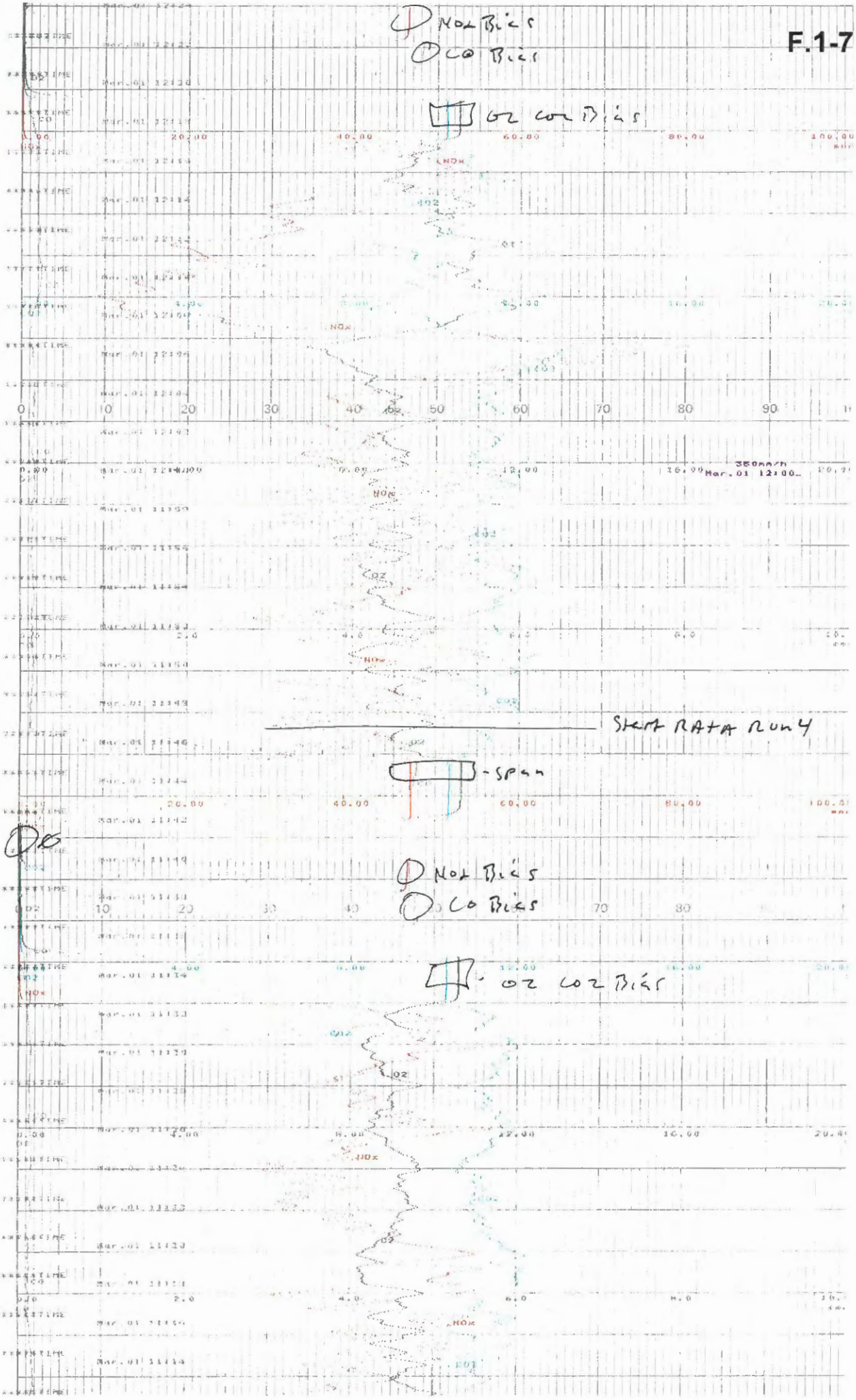
O2 - 18.97
CO2 - 18.62 CC175518 NO2 45.8 CC270245

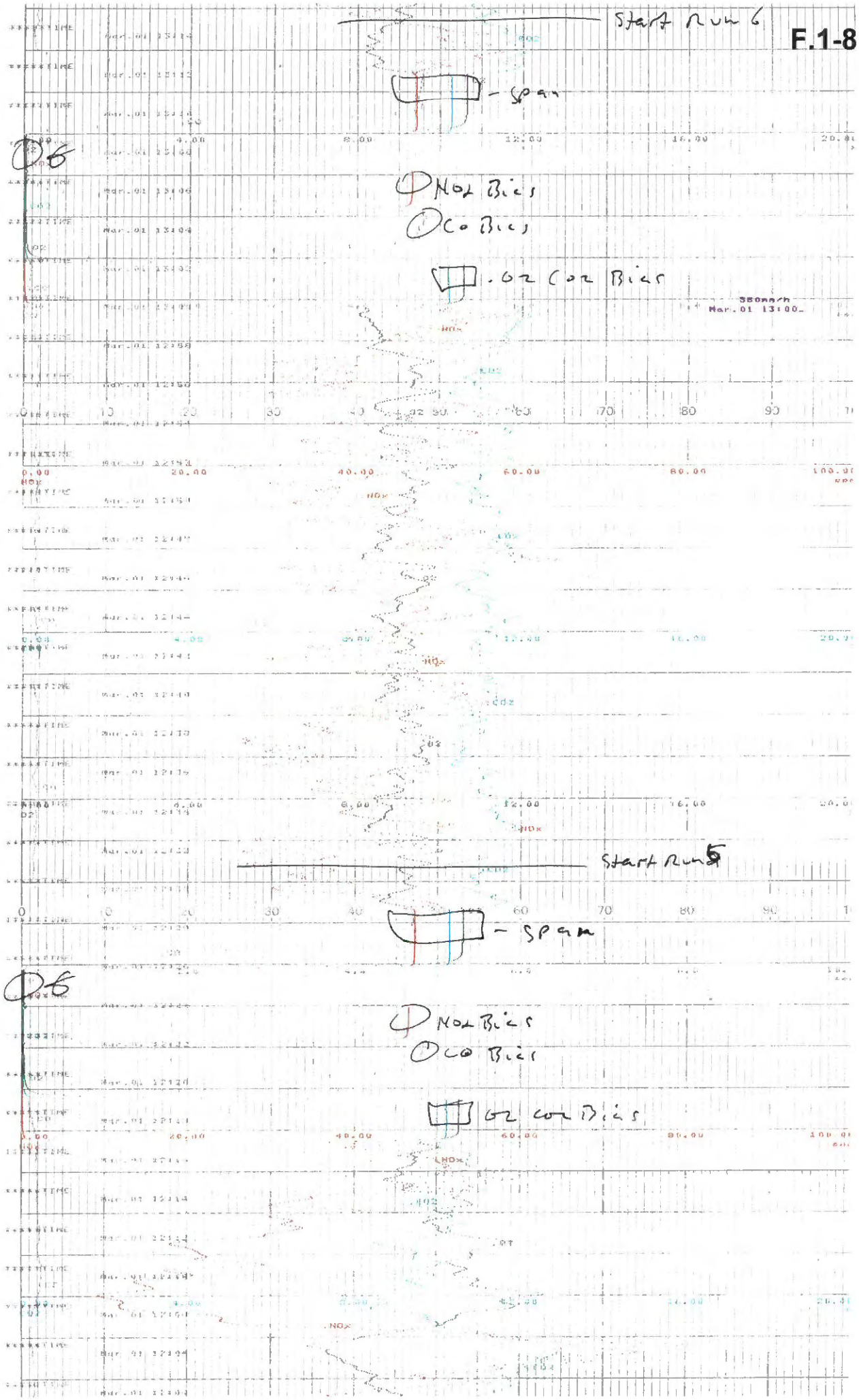

Start RATA & Compliance
Run 1
Mar.01 08:00

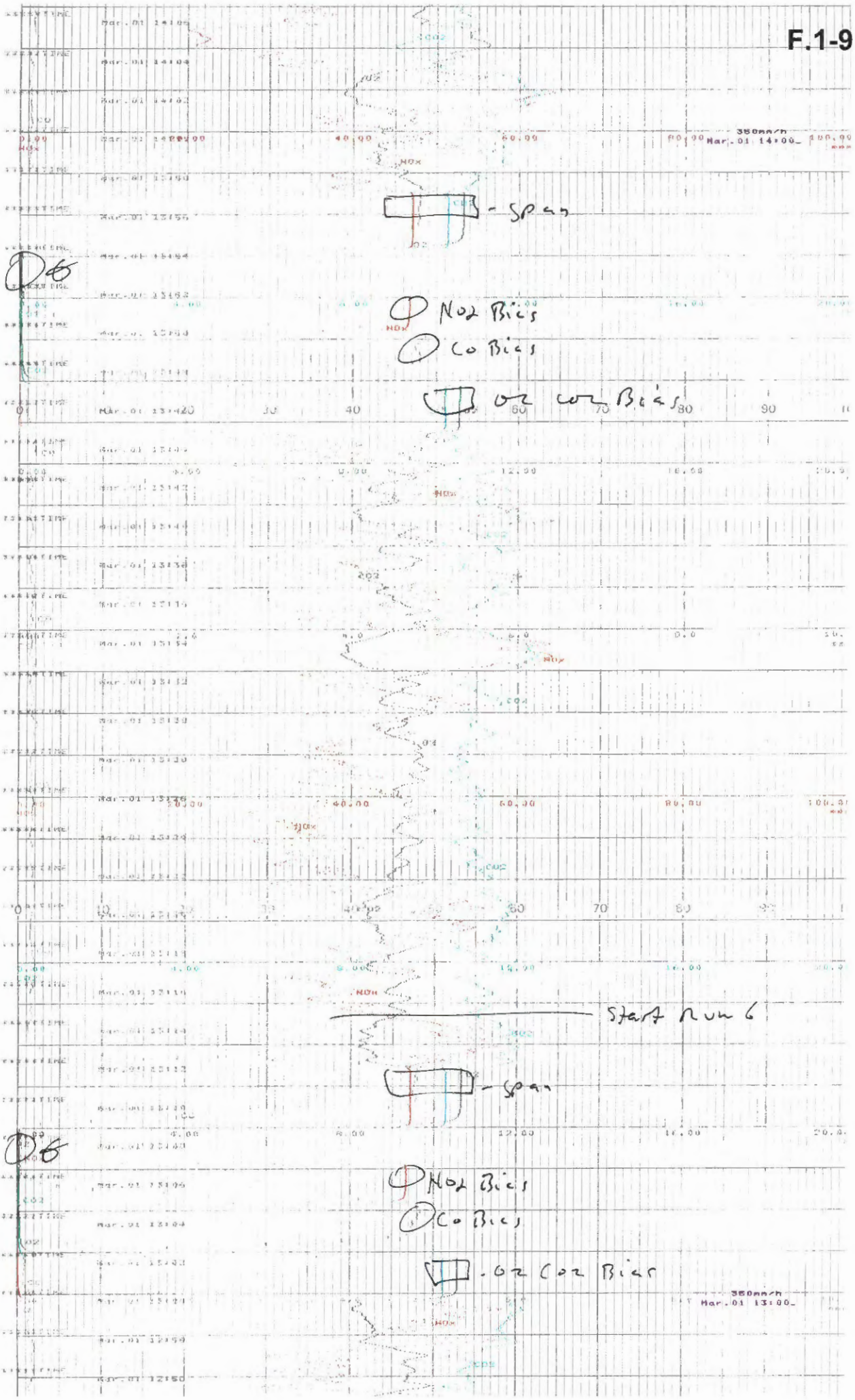

Start Run 2
Span
NOx Bias
CO Bias
O2 CO2 Bias
350mm/H
Mar. 01 09:00

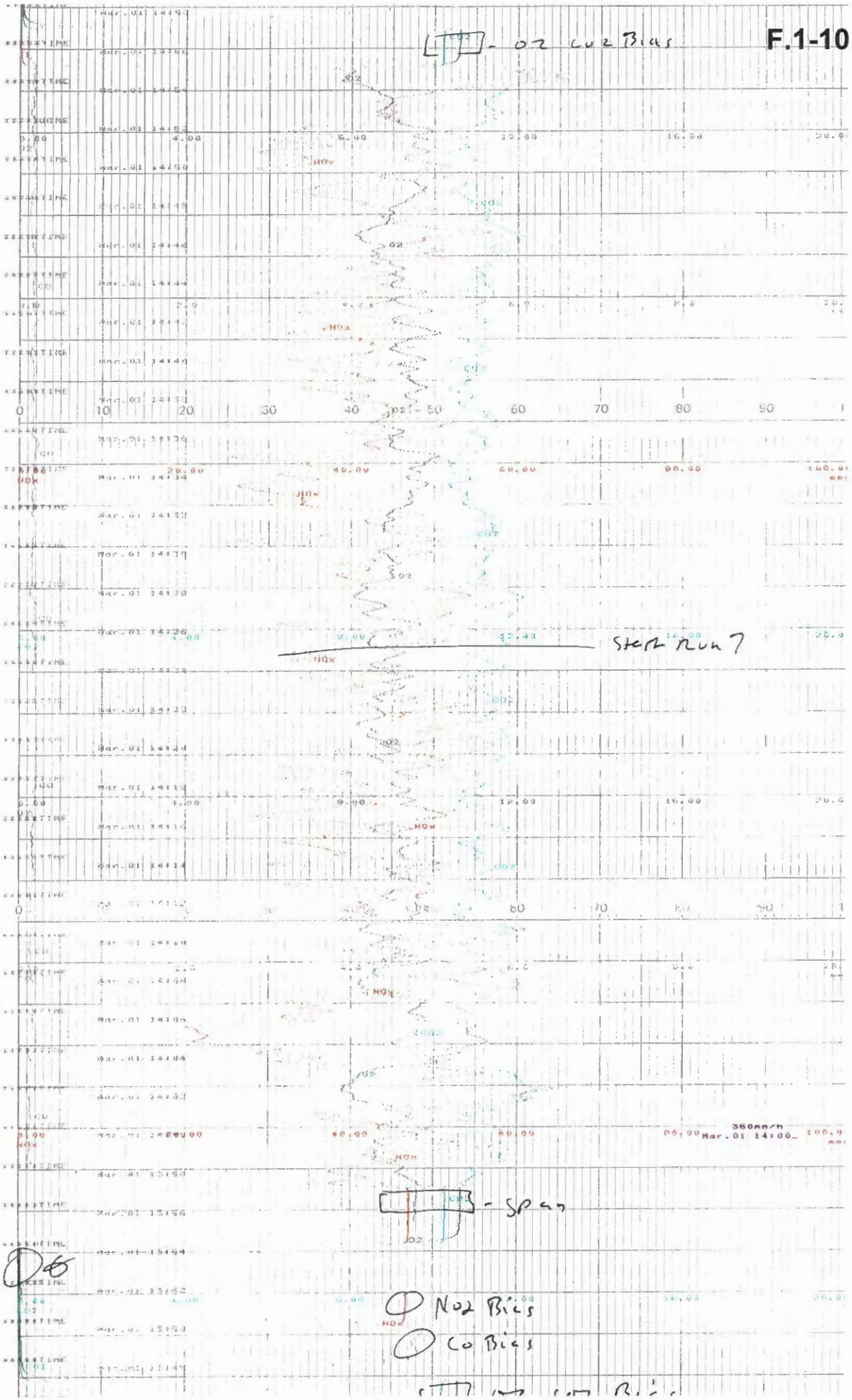

Start Run 3
span
CO Bias
CO2 Co Bias
350mm/h

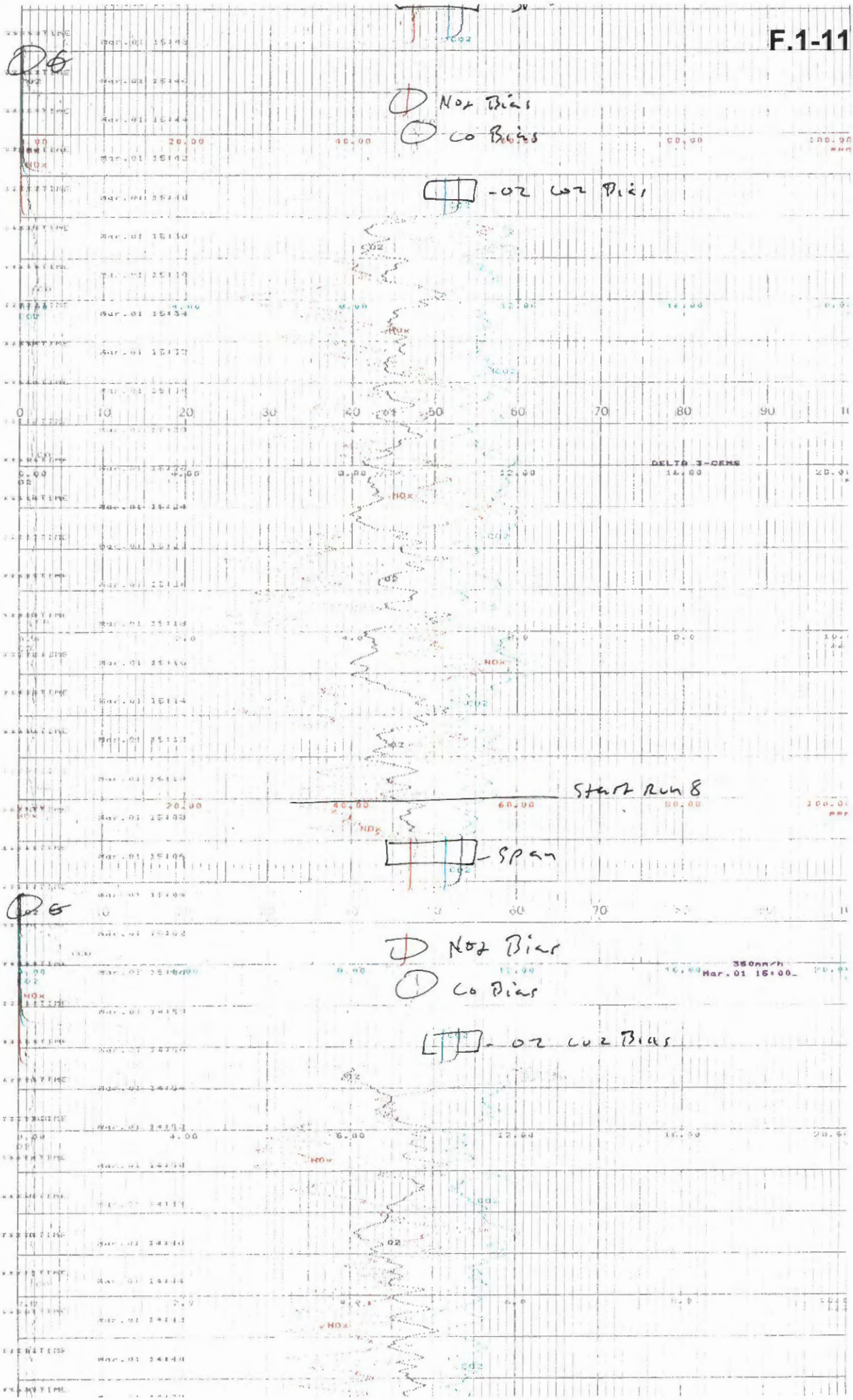

DELTA 3-CEMS
350mm/h
Mar.01 11:00
NOx
CO2
O2
start run 3
span

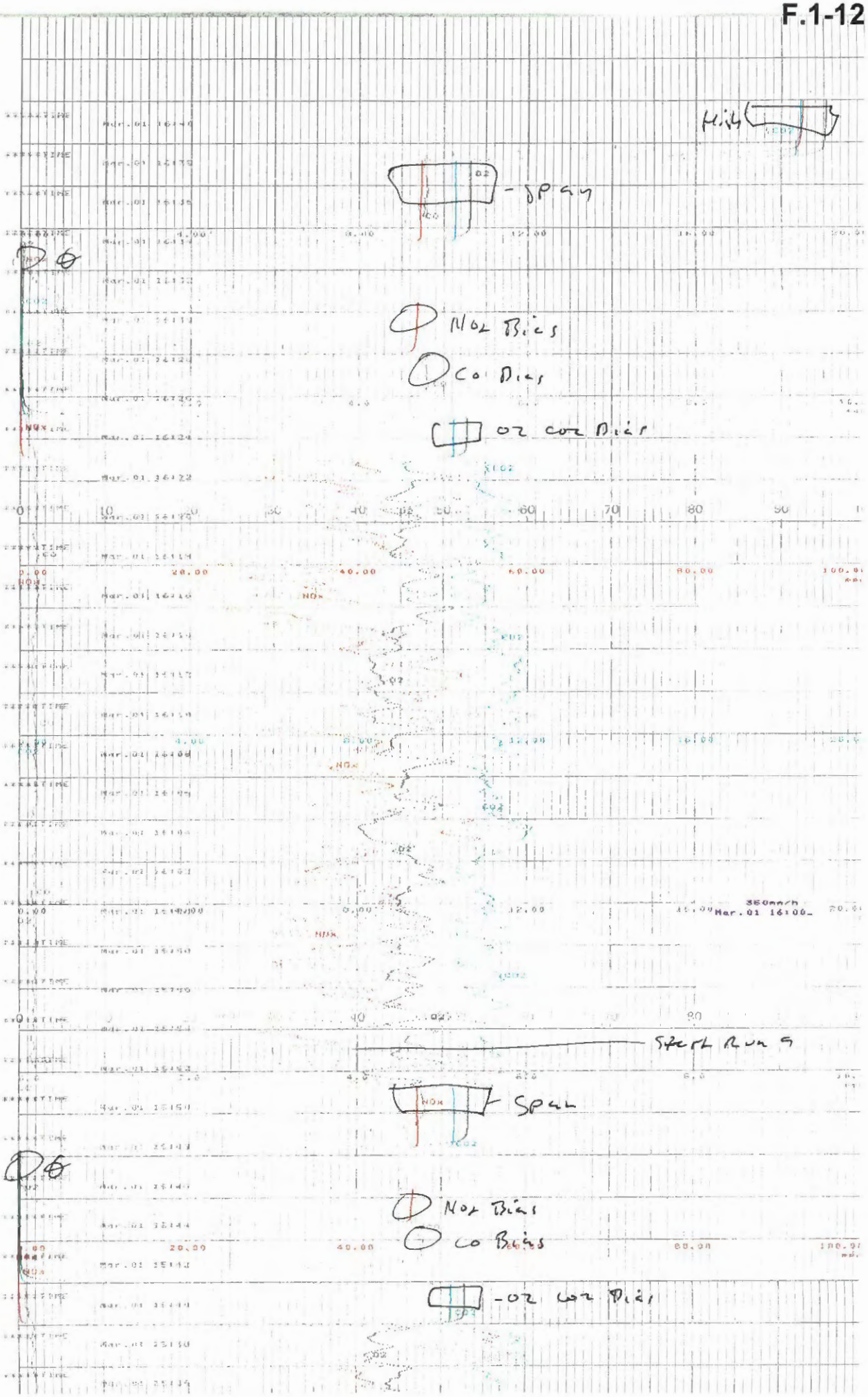

NOx Bias
CO Bias
O2 CO2 Bias
NOx
CO2
CO
0
10
20
30
40
50
60
70
80
90
Mar.01 12:00
Start Data Run 4
-span
NOx Bias
CO Bias
O2 CO2 Bias

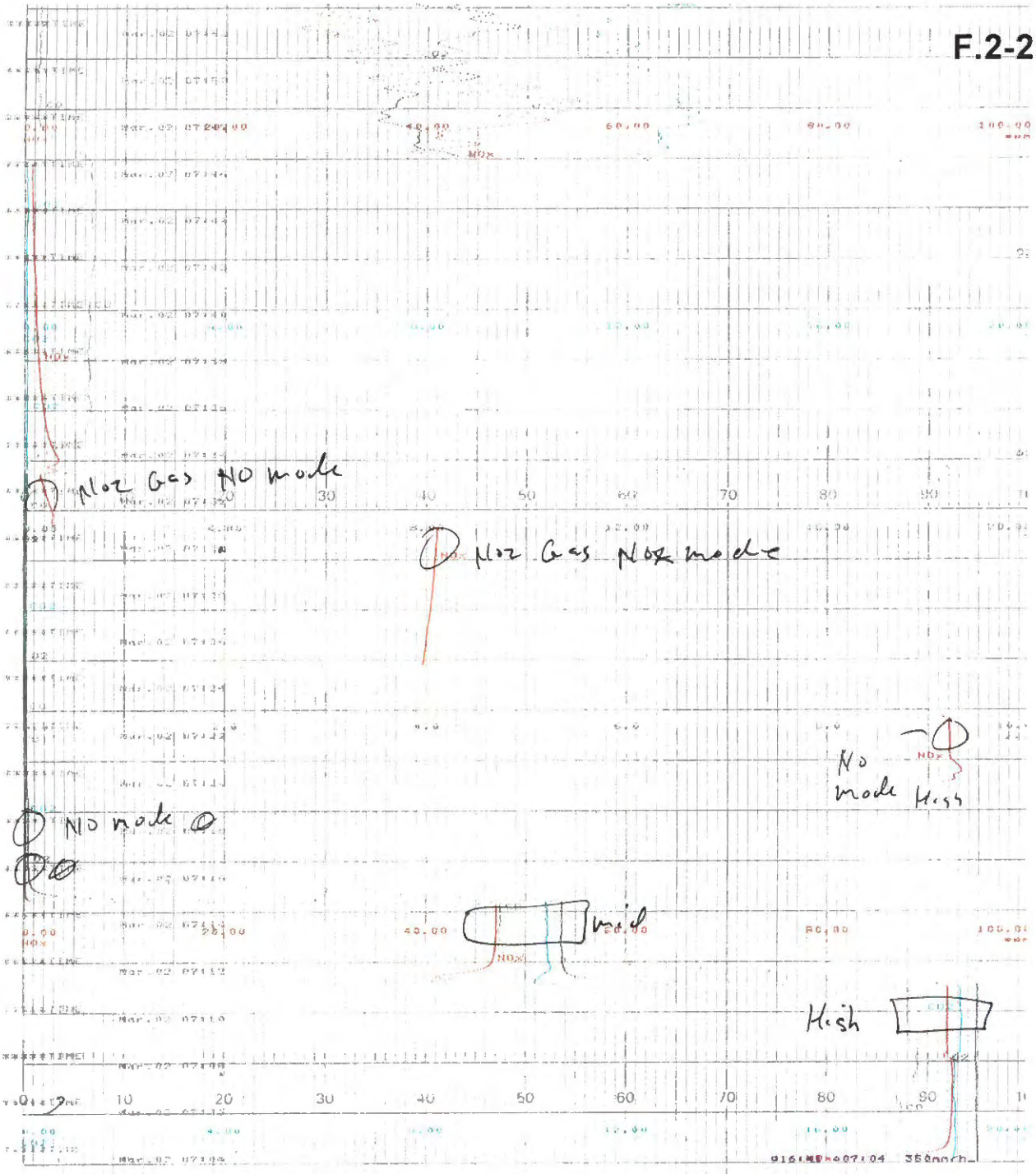

Start Run 6
- Span
NOx Bias
CO Bias
O2 Cor Bias
Start Run 5
- Span
NOx Bias
CO Bias
O2 Cor Bias

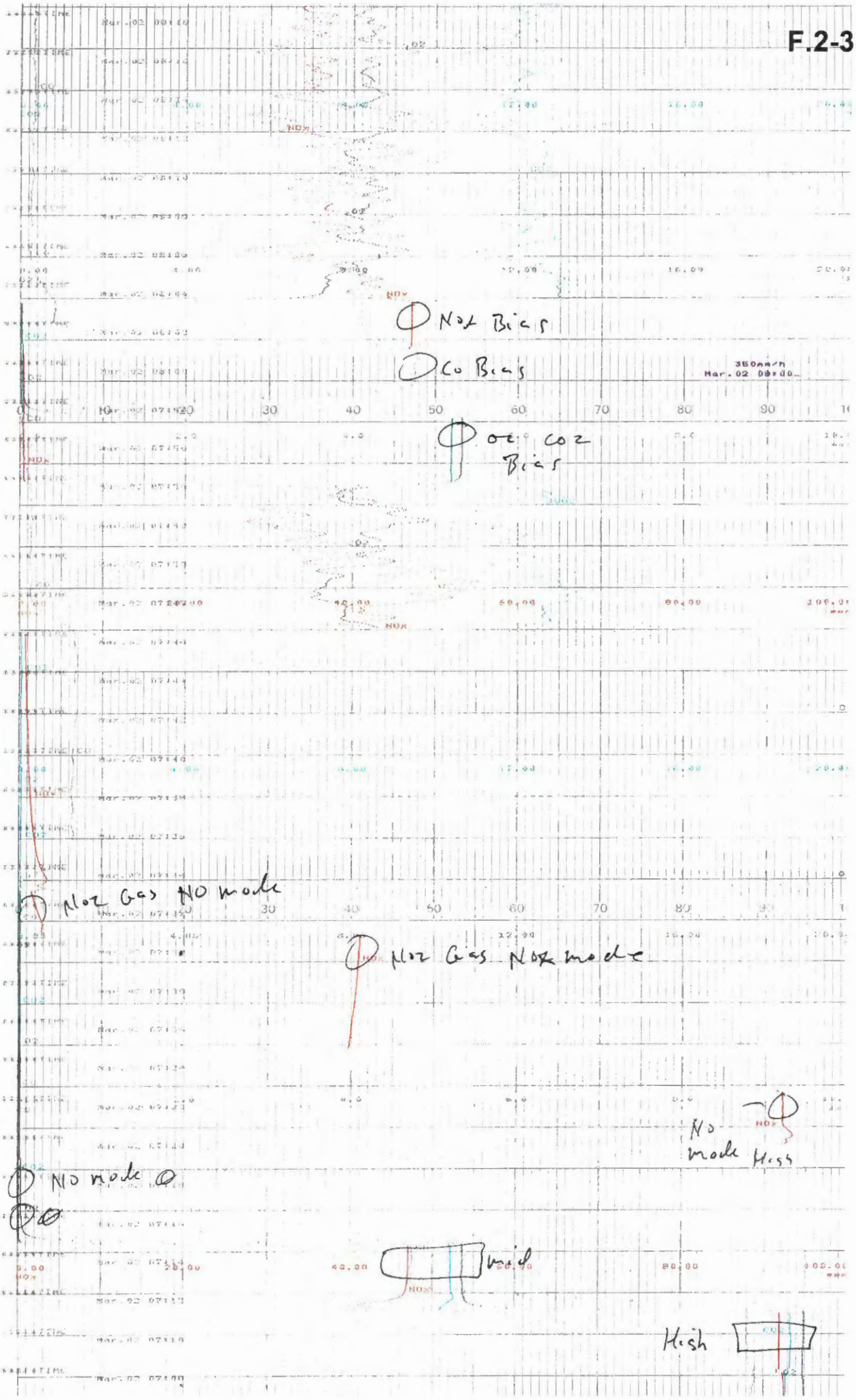

- Span
NOx Bias
CO Bias
O2 CO2 Bias
Start Run 6
- Span
NOx Bias
CO Bias
O2 CO2 Bias
350mm/h
Mar. 01 14:00
350mm/h
Mar. 01 13:00

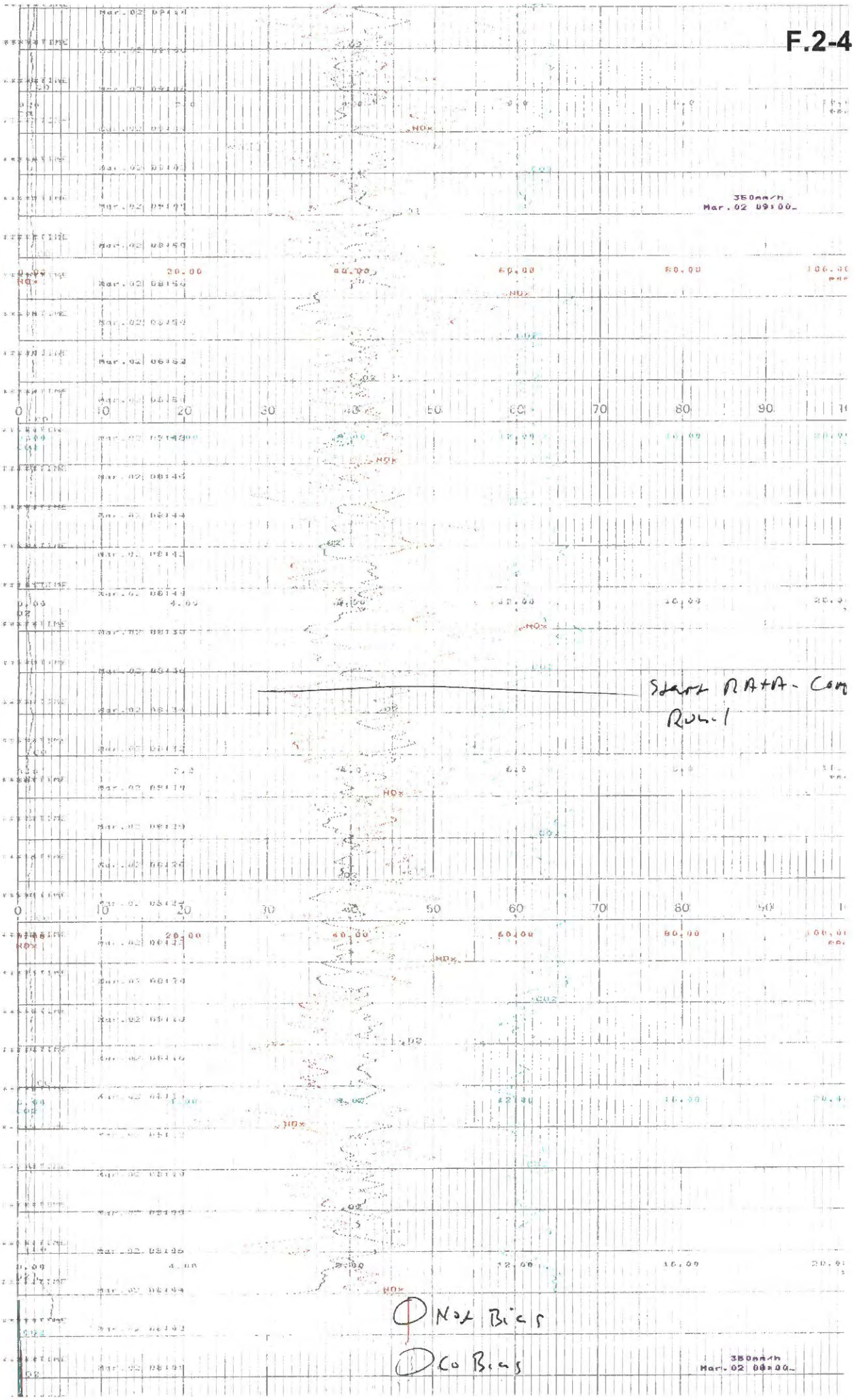

- O2 CO2 Bias
Start Run 7
- Span
NO2 Bias
CO Bias


NOx Bias
CO Bias
O2 CO2 Bias
DELTA 3-CEMS
Start Run 8
Span
NOx Bias
CO Bias
O2 CO2 Bias
Mar.01 15:00

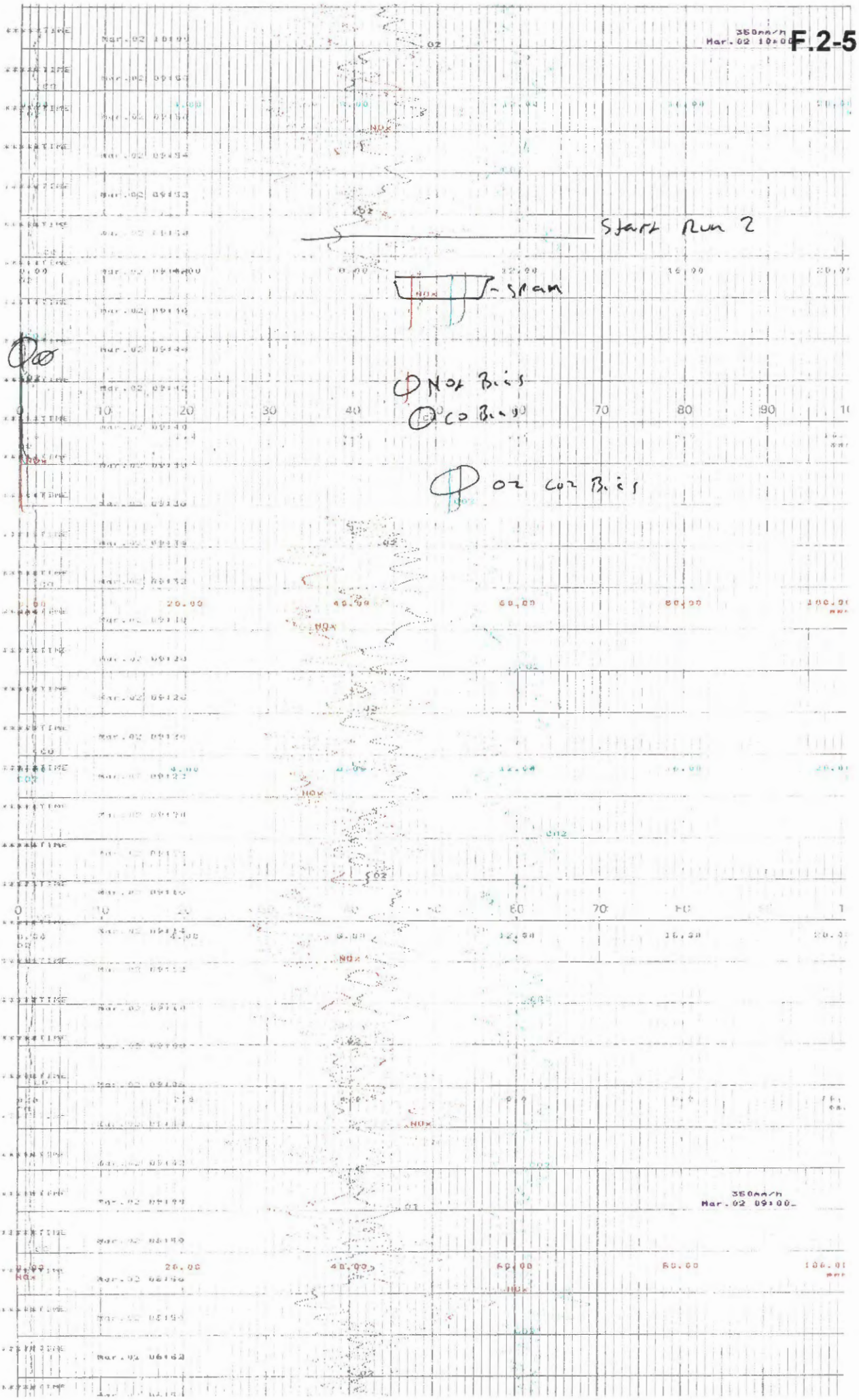

High
-SPAN
NOx Bias
CO Bias
O2 CO2 Bias
Spark Run 9
Spark
NOx Bias
CO Bias
-O2 CO2 Bias

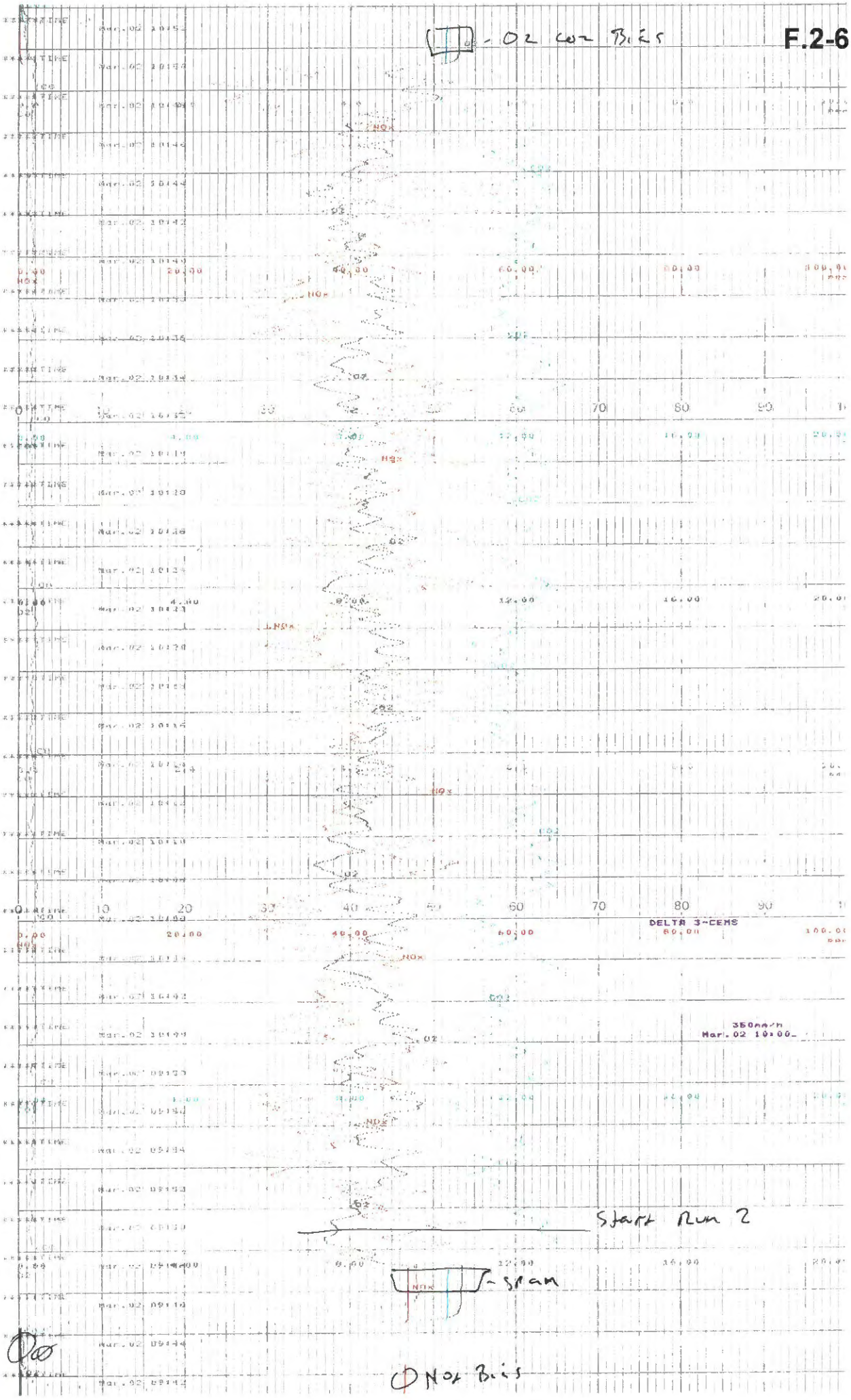

Nor Gas NO mode
Nor Gas NOx mode
No mode High
NO mode
Mid
High
Unit 2

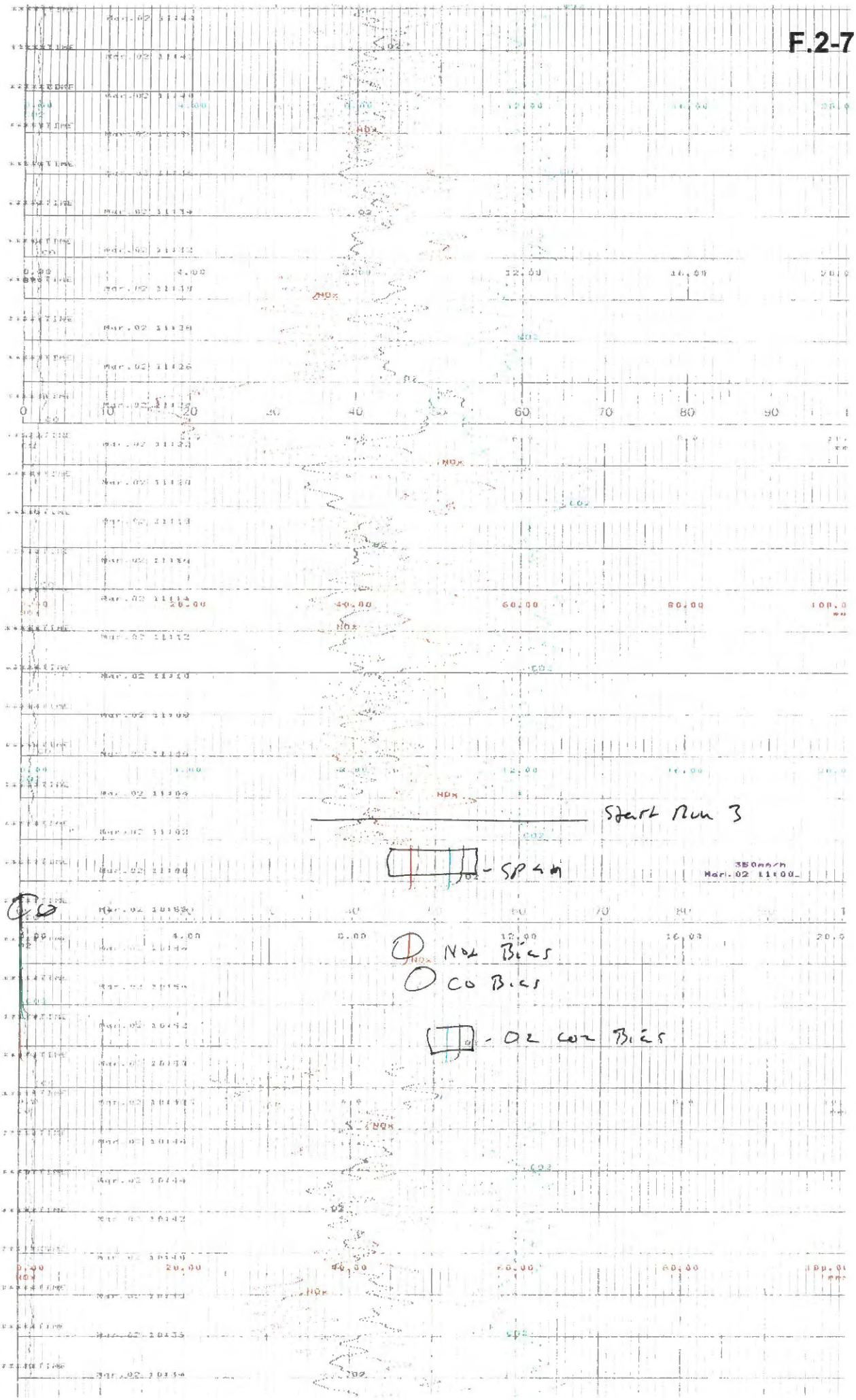

NOx Bias
CO Bias
O2 CO2 Bias
NOx Gas NO mode
NOx Gas NOx mode
NO mode
NO mode
Mid
High

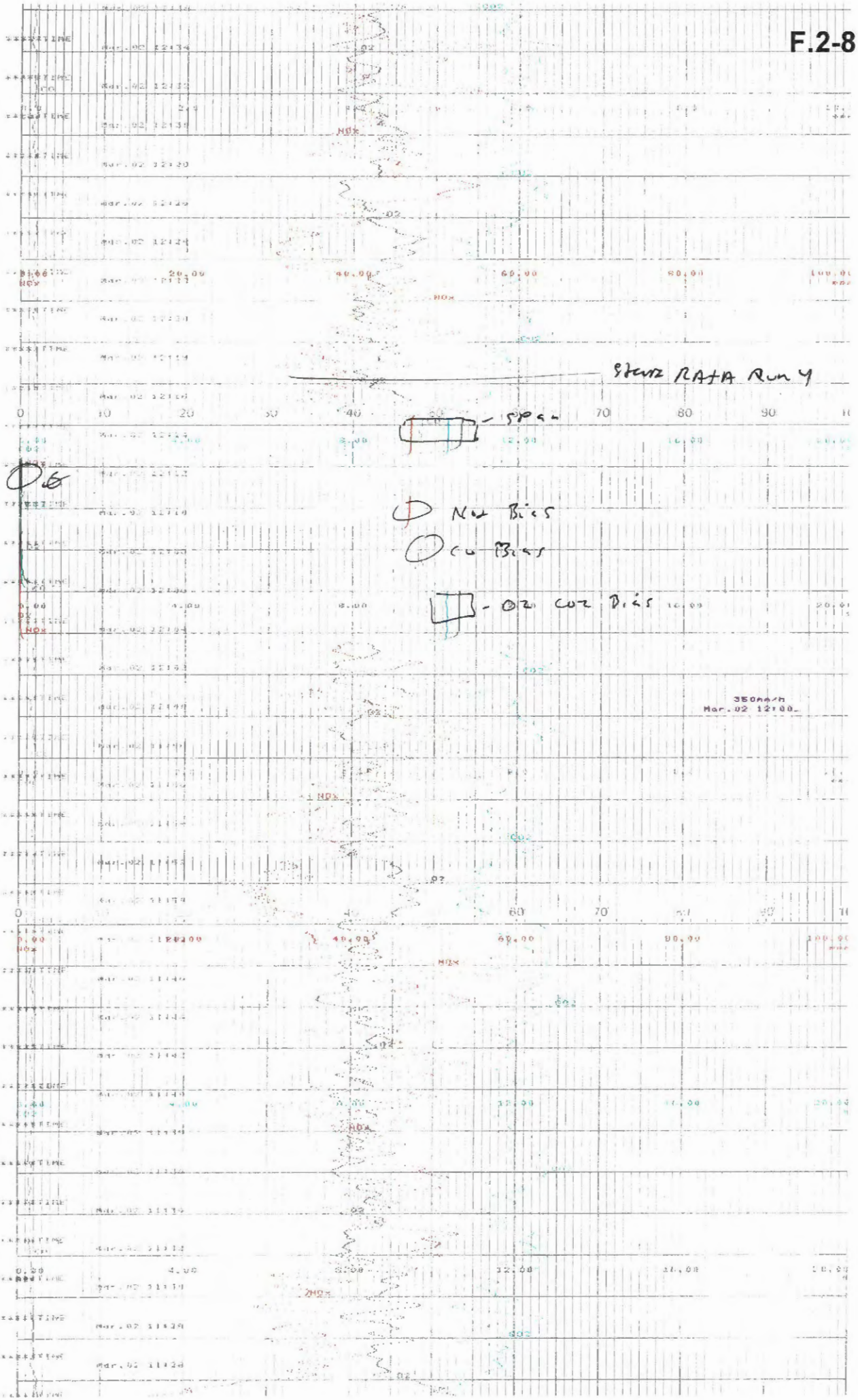

Start NH3 - Com
Run 1
Nox Bias
Co Bias

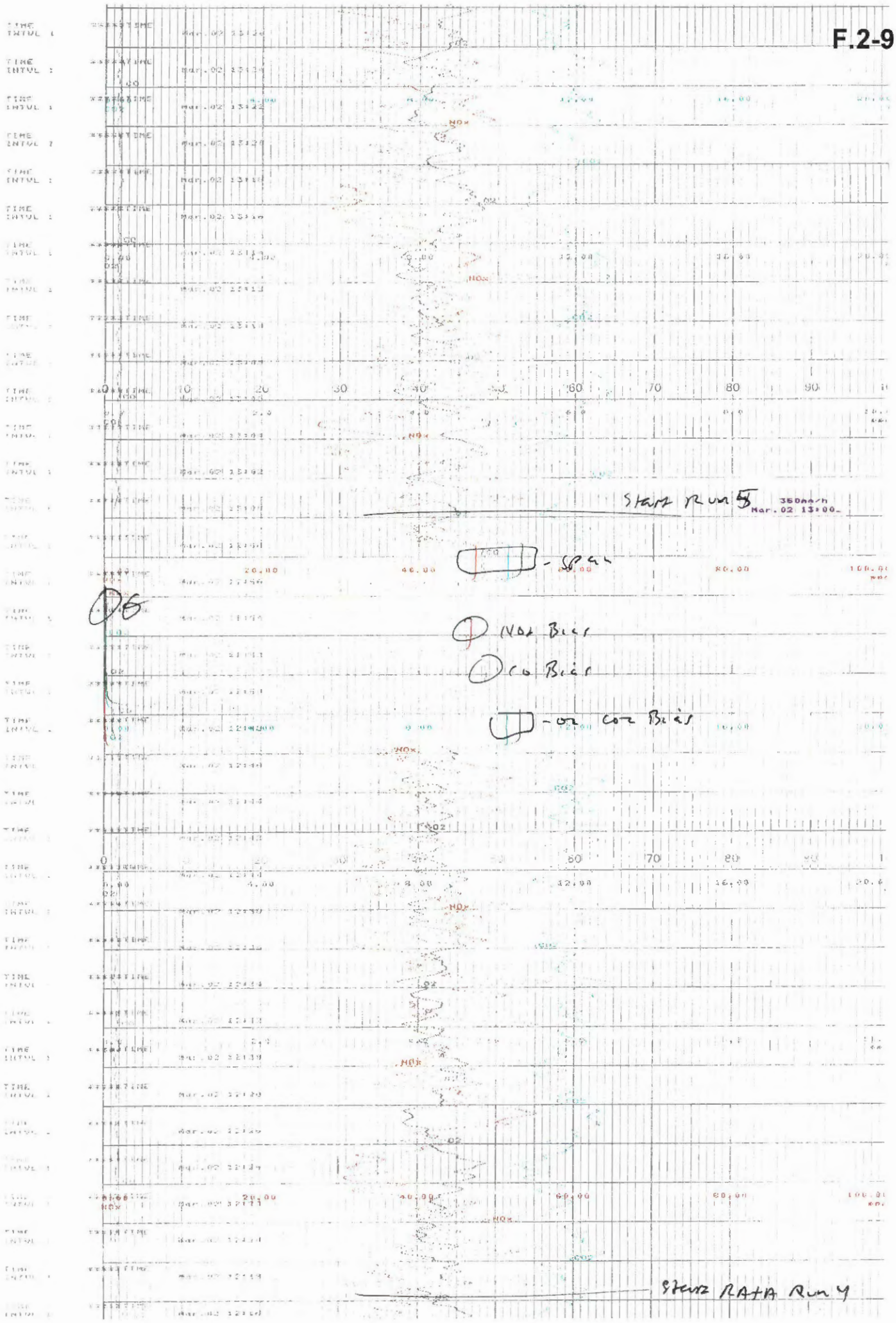
F.2-5

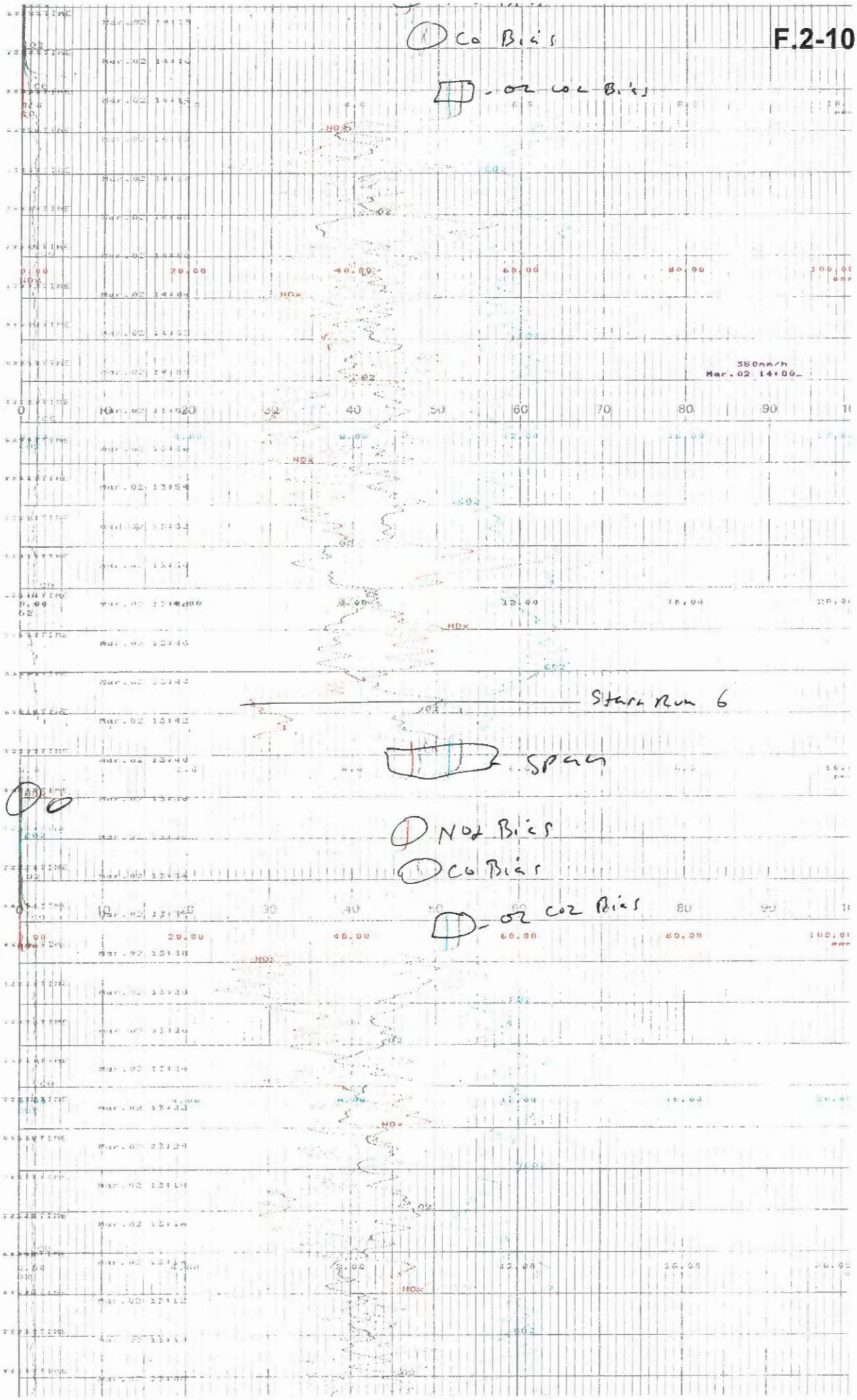

Start Run 2
- spam
NOx Bias
CO Bias
O2 CO2 Bias
350mm/h
Mar.02 09:00

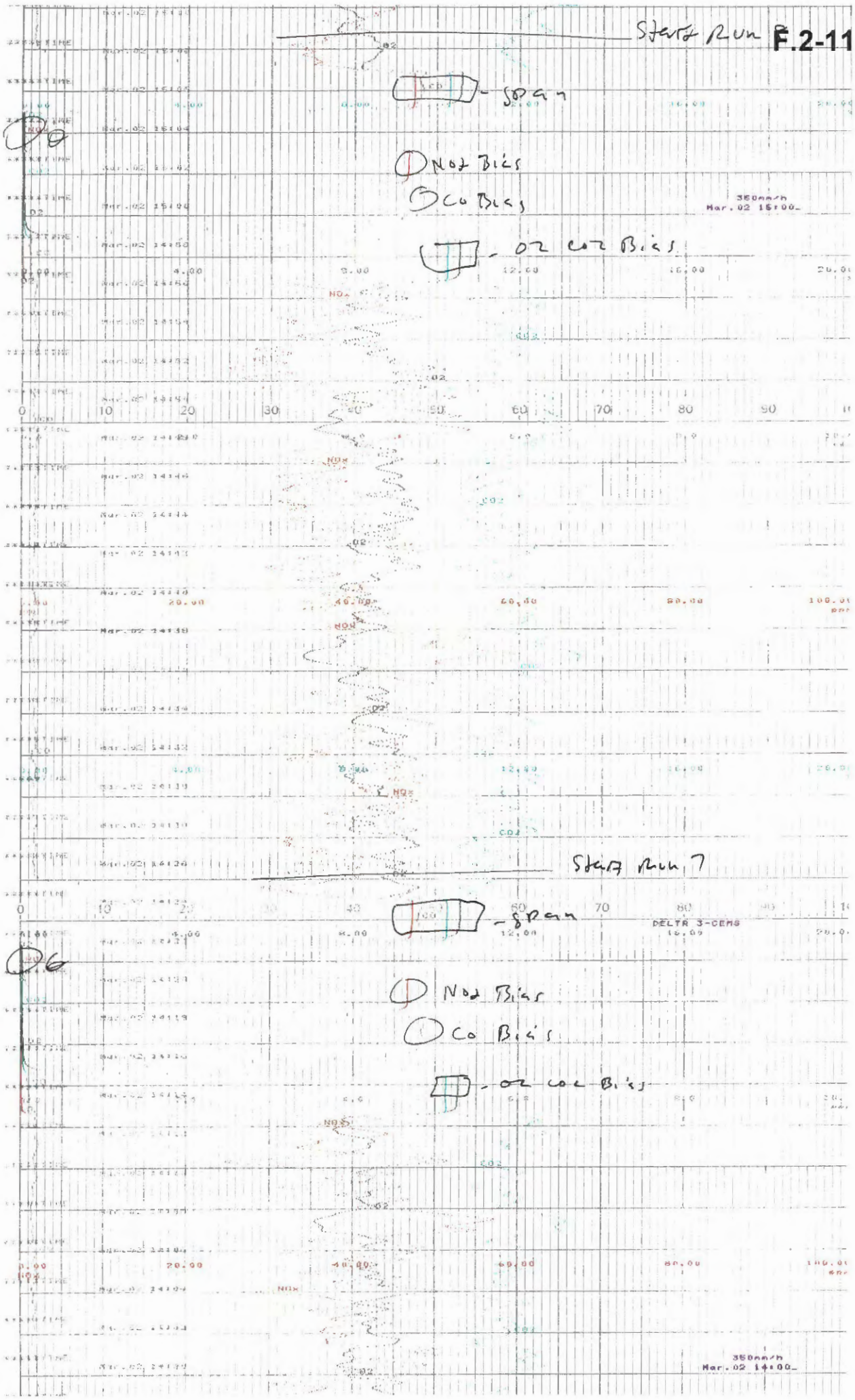

- O2 cor Bias
NOx
O2
DELTA 3-CEMS
350mm/h
Mar.02 10:00
Start Run 2
span
NOx Bias


Start Run 3
- SP 4 m
NOx Bias
CO Bias
- O2 CO2 Bias

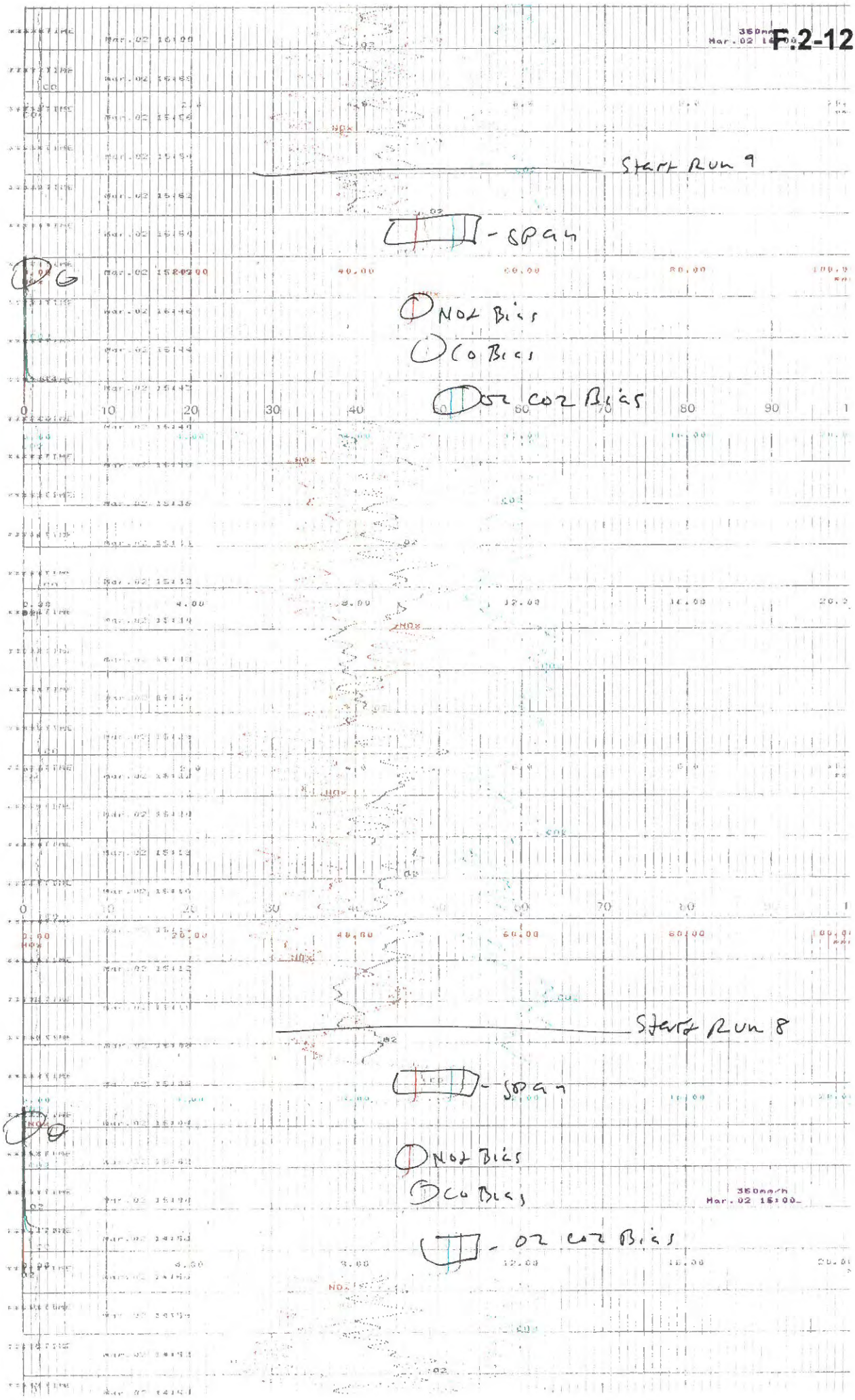

Start RATA Run 4
- span
Not Bias
Cu Bias
- O2 Cor Bias
350mg/m
Mar.02 12:00

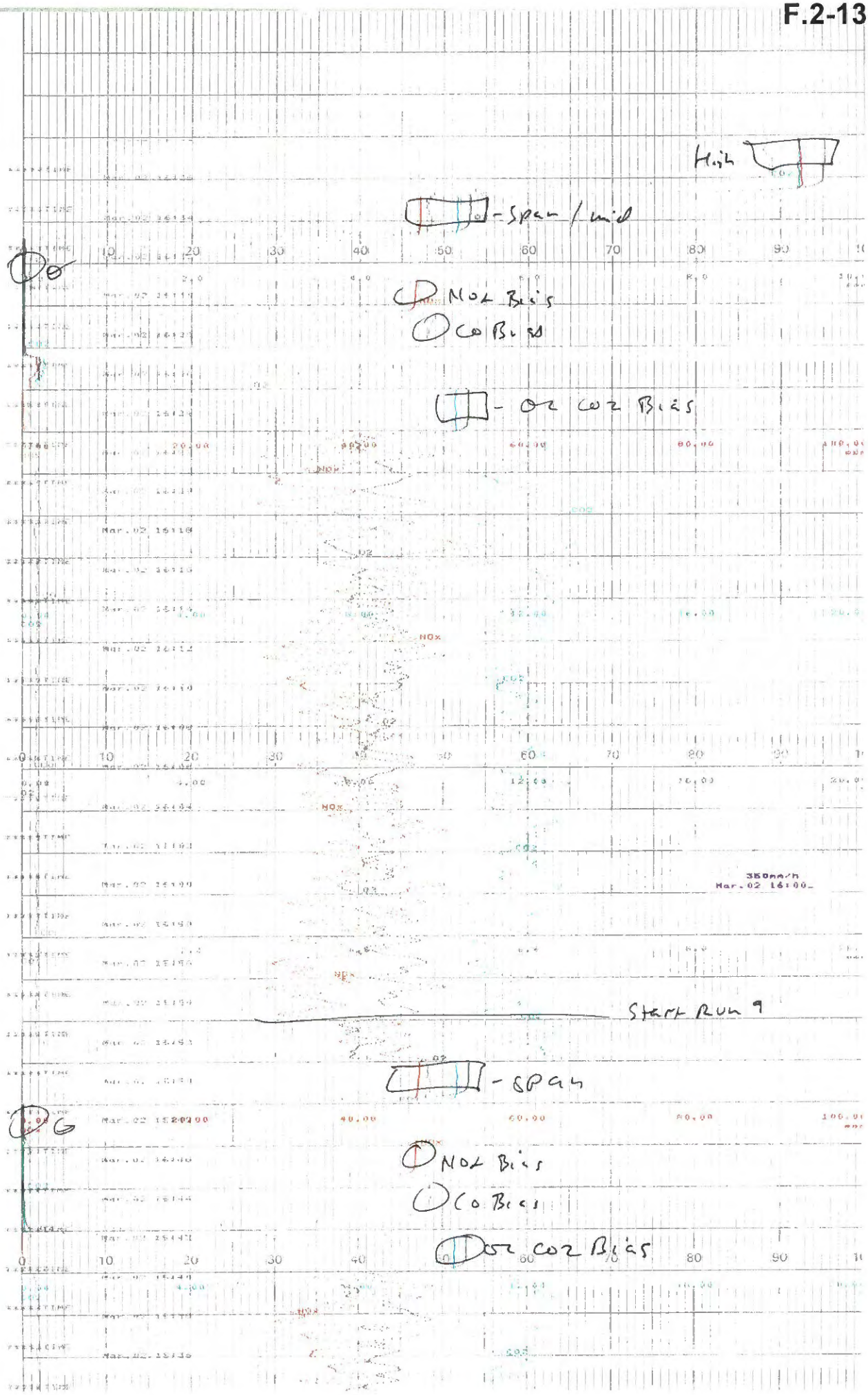

Start Run 5
350mm/h
Mar. 02 13:00
- Span
NOx Bias
CO Bias
- O2 Cor Bias
Start RATA Run 4


Co Bias
O2 CO2 Bias
NOx
O2
Start Run 6
Span
NO2 Bias
CO Bias
O2 CO2 Bias
Mar.02 14:00


Start Run
- span
NOx Bias
CO Bias
- O2 CO2 Bias
Start Run 7
- span
NOx Bias
CO Bias
- O2 CO2 Bias
DELTA 3-CEMS
350mm/h
Mar.02 14:00

F.2-12


Start Run 9
- span
NOx Bias
CO Bias
O2 CO2 Bias
Start Run 8
- span
NOx Bias
CO Bias
- O2 CO2 Bias


High
- Span / mid
NOx Bias
CO Bias
- O2 CO2 Bias
NOx
CO2
O2
350mg/h
Mar.02 16:00
Start Run 9
- Span
NOx Bias
CO Bias
O2 CO2 Bias

APPENDIX G CHAIN OF CUSTODY

CHAIN OF CUSTODY FORM

CLIENT: Desert View power

TEST DATE(S): 3-1 and 3-2, 2016

LOCATION: Mecca

SAMPLER(S): Rik Dupont

SAMPLE LOCATION: Unit 1 and 2 Stack Breaching

PROJECT MANAGER: Dave Wonderly

TEST METHOD(S): SCAQMD Method 25.3

DATE DUE:

OUTSIDE LAB REQUIRED: Yes

COMPLIANCE TEST: Yes

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
3/1/2016		1A-VOC Unit 1	Vial # D-30 Canister # 00139	2	RK	106336-7
3/1/2016		1B-VOC Unit 1	Vial # D-31 Canister # 00288	2	RK	-8
3/2/2016		1A-VOC Unit 2	Vial # D-32 Canister # 00166	2	RK	-9
3/2/2016		1B-VOC Unit 2	Vial # D-33 Canister # 00133	2	RK	-10
3/2/2016		Trip Blank	Vial # D- 34	1	DW	-11

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[illegible]	3-3-2016 0700	[illegible]	3-3-16 1:30

ANALYSIS REQUIRED: Total TGNMO By SCAQMD Method 25.3

Delta Air Quality Services, Incorporated

CHAIN OF CUSTODY FORM

CLIENT: Desert View Power

TEST DATE(S): 3-1-2016 and 3-2-2016

LOCATION: Mecca

SAMPLER(S): Shannon Scrugham

SAMPLE LOCATION: Unit 1 and 2 Stack Breaching

PROJECT MANAGER: Dave Wonderly

TEST METHOD(S): EPA Method 5

DATE DUE:

OUTSIDE LAB REQUIRED: Yes

COMPLIANCE TEST: Yes

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
3/1/2016	800/1019	1-PM-U1	Front ½ rinse-Filter #83-2553	2	SS	
3/1/2016	1031/1251	2-PM-U1	Front ½ rinse-Filter #83-2854	2	SS	
3/1/2016	1315/1551	3-PM-U1	Front ½ rinse-Filter #83-2856	2	SS	
3/2/2016	835/1045	1-PM-U2	Front ½ rinse-Filter #83-2557	2	SS	
3/2/2016	1103/1323	2-PM-U2	Front ½ rinse-Filter #83-2855	2	SS	
3/2/2016	1336/1546	3-PM-U2	Front ½ rinse-Filter #83-2858	2	SS	
		Reagent Blank	Acetone	1	AB	

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
	3-4-16 9:00		3/4/16 0900

ANALYSIS REQUIRED: Particulate By EPA Method 5

Delta Air Quality Services, Incorporated

APPENDIX H LOAD CALCULATIONS

COLMAC ENERGY INC.
2016 CEM SOURCE TEST
FUEL INPUT DATA FOR UNITS #1 & #2

Test Times

		BOILER #1				BOILER #2		
Date	m/d/y	3/1/2016				3/2/2016		
unit #1	24hr time	0751-1655				***		
unit #2	24hr time	***				0835-1645		
elapsed time	hrs	9.07				8.17		

Common Data

net MW output	MW	44.760				44.605		
green biomass	HHV (Btu/lbm)	7814.00				8064.00		
biomass totalizer	ton/hr	29.92				28.53		
biomass	mmbtu/hr	467.53				460.16		

Unit #1

steam flow	klbm/hr	211.94				196.78		
fuel gas to lance	mmbtu/hr	0.00				0.00		
fuel gas to burner	mmbtu/hr	0.00				0.00		
petcoke	mmbtu/hr	0.00				0.00		
biomass	mmbtu/hr	271.31				251.92		
total fuel input	**mmbtu/hr**	**271.31**	**0.00**	**0.00**	**0.00**	**251.92**	**0.00**	**0.00**
% MCR (297 mmbtu/hr)	**mmbtu/hr**	**91.4%**	**0.0%**	**0.0%**	**0.0%**	**84.8%**	**0.0%**	**0.0%**
ammonia flow	lb/hr	43.52				30.98		
limestone flow	lb/hr	316.99				286.77		

Unit #2

steam flow	klbm/hr	201.26				210.65		
fuel gas to lance	mmbtu/hr	0.00				0.00		
fuel gas to burner	mmbtu/hr	0.00				0.00		
petcoke	mmbtu/hr	0.00				0.00		
biomass	mmbtu/hr	257.65				269.67		
total fuel input	**mmbtu/hr**	**257.65**	**0.00**	**0.00**	**0.00**	**269.67**	**0.00**	**0.00**
% MCR (297 mmbtu/hr)	**mmbtu/hr**	**86.8%**	**0.0%**	**0.0%**	**0.0%**	**90.8%**	**0.0%**	**0.0%**
ammonia flow	lb/hr	34.53				43.98		
limestone flow	lb/hr	408.78				1209.24		

2016 CEM SOURCE TEST
Notes and Assumptions

Assumptions	
A	Steam 40;pg 8-17;table 15 S.C. Natural Gas Properties sg = 0.636 rel to air HHV = 1,116 Btu/ft^3 @ 60°F and 30 in. Hg
B	MCR fuel input = 297 mmbtu/hr MCR steam flow = 232 klbm/hr
C	No corrections made for variation from MCR steam conditions of 1265 psig & 925°F for comparison to assumption B
D	Since no data was available for wood flow the flow was back calculated under the assumption that the unit would operate at the specified MCR conditions which correlate to a boiler effiecency of 80.99%

Delta composite fuel analysis Feb/Mar		3/1/2016	3/2/2016					
Biomass	btu/lb as fired	7814	8064					
Pet Coke	btu/lb as fired	***	***	***	***	***	***	
TDF	btu/lb as fired	***	***	***	***	***	***	

APPENDIX I 1994 CARNOT SAMPLE LOCATION CERTIFICATION REPORT

This information is located in the Test Plan in Appendix A

END OF DOCUMENT