SHELL CLAUS OFFGAS TREATMENT
UNIT 1 (203) AND UNIT 2 (804)
EMISSIONS TEST REPORT
VALERO DELAWARE CITY REFINERY
DELAWARE CITY, DELAWARE

Testing Date: September 15, 2009

Prepared for:

Valero Delaware City Refinery
4550 Wrangle Hill Road
Delaware City, Delaware 19706

Prepared by:

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Project No. 09-129

Air/Compliance Consultants, Inc.

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AIR/COMPLIANCE CONSULTANTS, INC.

Jaimes C. Contreras
Senior Scientist, QSTI

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Vice President

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1. INTRODUCTION

Air/Compliance Consultants, Inc. (ACCI) conducted a compliance testing program on the Shell Claus Offgas Treatment (SCOT) Unit 1 (203) and Unit 2 (804) for the Valero Delaware City Refinery (Valero) in Delaware City, Delaware. Testing was performed for sulfuric acid mist (H_2SO_4), nitrogen oxides (NO_x), and carbon monoxide (CO) as required by Permit ACP-90/0264-C/O (A7)(NSPS).

2. TEST PERSONNEL

Testing was performed September 15, 2009. An additional day of testing was required due to weather conditions. The ACCI test team consisted of Mr. Jaimes C. Contreras, Senior Project Scientist; Mr. Todd Haas, Mr. Francis Barton, Mr. Michael Belfoure, and Mr. Christian Bartley, Scientists.

Mr. Mark Lutrzykowski of the Delaware Department of Natural Resources and Environmental Control (DNREC) observed portions of the testing program.

3. TESTING METHODOLOGY

ACCI conducted the measurements in accordance with the United States Environmental Protection Agency (USEPA) Title 40, Code of Federal Regulations (CFR) Part 60, Appendix A Testing Methods. Figure 1 represents an ACCI CEMS Sample Flow and Calibration System Schematic.

3.1. Flow Rate, Molecular Weight and Moisture Determinations

ACCI conducted testing in accordance with USEPA Methods 1 through 4 at the two SCOT Stacks. The ducts are designated as 1 and 2. USEPA Method 1 was followed for selection of traverse points. Sixteen (16) sampling points were utilized at SCOT 1, 8 in each of 2 test ports. Sixteen (16) sampling points were utilized at SCOT 2, 8 in each of 2 test ports. The ports met the criteria of

USEPA Method 1. USEPA Method 2 was followed for the determination of gas velocity and volumetric flow rate. This procedure utilized an S-type Pitot tube and inclined manometer to determine stack-gas velocity head. USEPA Method 3A was utilized for the determination of carbon dioxide (CO_2), oxygen (O_2), and stack-gas molecular weight. Nitrogen (N_2) was determined by the difference.

USEPA Method 4 was followed to determine the gas moisture content of the exhaust gas. A moisture determination was performed on each test run to allow determination of dry stack-gas molecular weight and to calculate the dry standard cubic feet per minute (DSCFM) flow rate. The USEPA Method 4 train was incorporated with the Method 8 sampling train.

3.2. Sulfuric Acid Emissions– USEPA Method 8

USEPA Method 8 was used to determine H_2SO_4 concentration and mass emission rates. Stack gas was passed through a glass-lined, temperature-controlled probe equipped with a Type S Pitot tube. The exit of the probe was connected to a series of full-sized impingers. A knock out impinger was added to cool the gas stream. The second impinger contained 100 milliliters (mL) of 80% isopropanol, the third and fourth impingers each contained 100 mL of 30% hydrogen peroxide (H_2O_2) and the fifth impinger contained a known amount of silica gel. Samples were analyzed by the barium-thorin titration method by Enthalpy Analytical, Inc.

Sampling was conducted at a central point not using a nozzle and analysis did not occur on site. These deviations from normal sampling procedures were clarified with DNREC prior to testing.

3.3. CEM Determinations

ACCI utilized a mobile continuous emission monitoring (CEM) vehicle for determining CO and NO_X. USEPA Protocol Gases were used to verify the instrumentation used in the test program. CEM sampling took place from a single point in the center of each of the stacks after testing for stratification.

3.3.1. CO Determinations

USEPA Method 10 was used to continuously measure CO concentrations. A Thermo Environmental Model 48 gas filter correlation gas analyzer was used to measure CO. An extractive gas-conditioning system was used to convey the sample gas to the analyzer.

3.3.2. NO_X Determinations

ACCI measured NO_X on a continuous basis by real-time extraction and analysis using a TECO chemiluminescent analyzer following procedures in USEPA Method 7E.

USEPA Protocol calibration gases were utilized to calibrate all RM analyzers. Data acquisition was conducted with a multi-channel Yokogawa datalogger. Data was sampled continuously and scanned into memory in 2-second intervals.

4. TEST RESULTS

Tables 1 and 2 contain the results of the testing for the SCOT Unit 1. Tables 3 and 4 contain the results of the testing for the SCOT Unit 2. Table 5 contains the table nomenclature.

To document the work performed, Appendix A includes all field data generated during the program including all manual method field data sheets and computerized spreadsheets. Appendix B contains CEM bias sheets and 1-minute averages.

Meter box, Pitot, and nozzle calibration data sheets can be found in Appendix C. Calibration gas Certificates of Analysis are also contained in Appendix C. Results of the nitrogen dioxide (NO_2)/nitrogen oxide (NO) conversion test and the NO_X interference test for the analyzer used during testing are also located in the Appendix C. Analytical data is contained in Appendix D. Sample calculations are contained in Appendix E and relevant facility process data is contained in Appendix F.

5. CONCLUSION

A compliance test program has been conducted for SCOT 1 and 2 Units at Valero Delaware City Refinery located in Delaware City, Delaware. Testing was performed September 15, 2009 for NO_X,

H_2SO_4, and CO. All of the testing has yielded data that is considered to be representative of the emission rates at the prevailing operating conditions.

The following tables contain brief summaries of the test results:

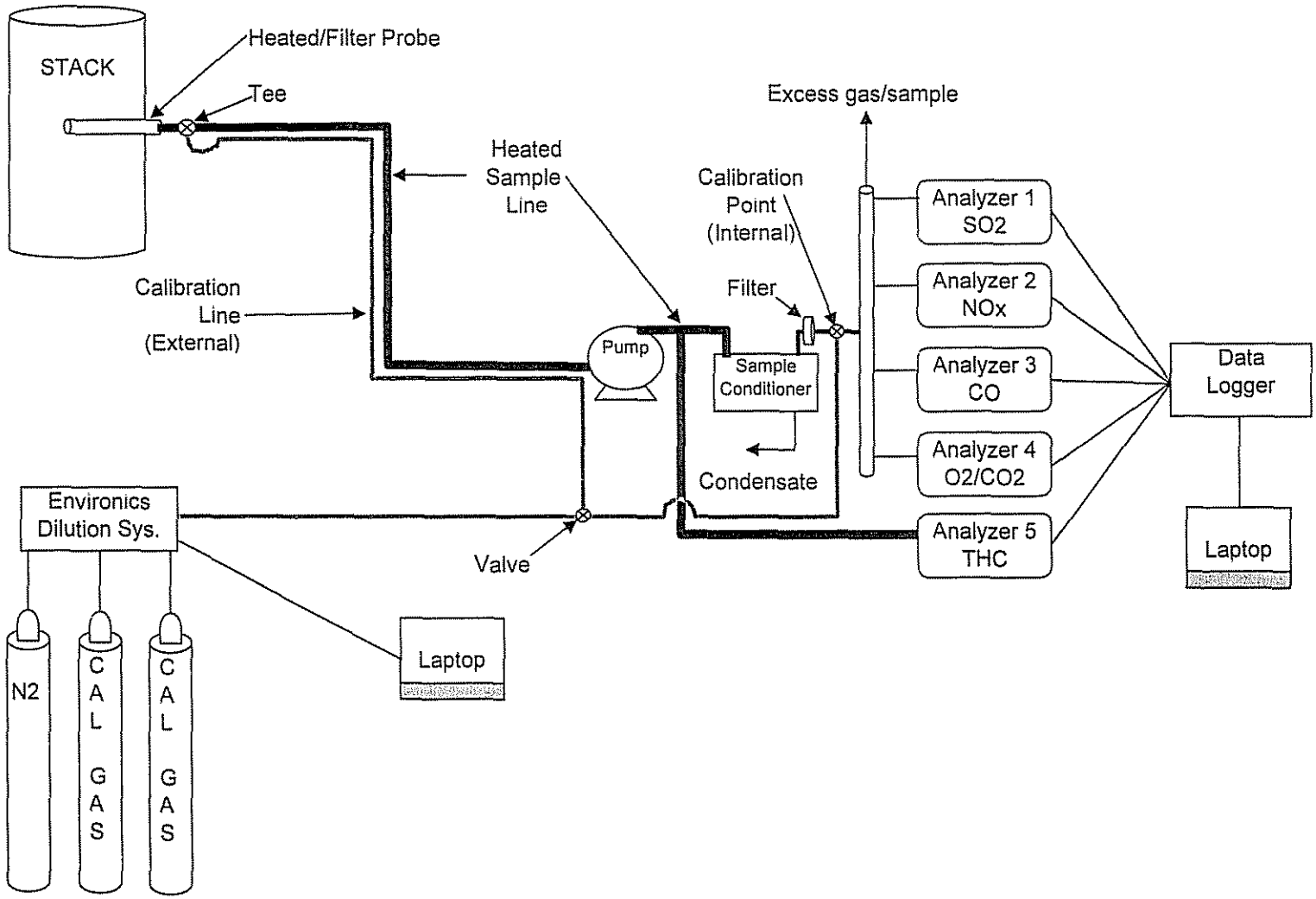
Permit APC-90/0262-C/O (A7)(NSPS) **Source Name: SCOT Unit 1 (203)**

Pollutant	Test Result	Permit Limit	Pass / Fail
H_2SO_4	0.65 lb/hr	1.6 lb/hr	Pass
	2.86 TPY	12.7 TPY	Pass
NO_x	4.31 lb/hr	7.0 lb/hr	Pass
	18.89 TPY	51.9 TPY	Pass
CO	0.56 ppm_{dv}	100 ppm_{dv}	Pass
	0.18 TPY	90.4 TPY	Pass

Permit APC-90/0262-C/O (A7)(NSPS) **Source Name: SCOT Unit 2 (804)**

Pollutant	Test Result	Permit Limit	Pass / Fail
H_2SO_4	0.29 lb/hr	1.6 lb/hr	Pass
	1.26 TPY	12.7 TPY	Pass
NO_x	1.43 lb/hr	7.0 lb/hr	Pass
	6.26 TPY	51.9 TPY	Pass
CO	8.59 ppm_{dv}	100 ppm_{dv}	Pass
	2.28 TPY	90.4 TPY	Pass

FIGURE



Air/Compliance Consultants, Inc.	ACCI CEMS Sample Flow and Calibration System Schematic	Figure 1

TABLES

Table 1. Sulfuric Acid Mist Test Results, SCOT 1 (203)
Valero Delaware City Refinery, Delaware City, Delaware

Test Data		Run 1	Run 2	Run 3	Average	
Date		9/15/2009	9/15/2009	9/15/2009		
Start Time		9:30 AM	11:00 AM	12:50 PM		
End Time		10:30 AM	12:00 PM	1:50 PM		
Flow Rate	(ACFM)	55,682	57,146	56,124	56,317	
Flow Rate	(SCFM)	17,763	18,446	18,315	18,175	
Flow Rate	(DSCFM)	16,282	16,849	16,844	16,658	
Sample Volume	(DSCF)	45.709	44.915	45.611	45.412	
Carbon Dioxide (CO_2)	(dry volume %)	16.8	16.2	15.6	16.2	
Oxygen (O_2)	(dry volume %)	4.1	4.3	4.5	4.3	
Water Vapor (H_2O)	(volume %)	8.3%	8.7%	8.0%	8.3%	
Stack Temperature	(°F)	1198.8	1179.3	1161.5	1,180	
Results						Permit Limit
Sulfuric Acid (H_2SO_4)						
Mass Collected	(mg)	17.10	15.10	8.30	13.50	
Emission Concentration	(lb/DSCF)	8.25E-07	7.41E-07	4.01E-07	6.56E-07	
Emission Concentration	(ppm_{dv})	3.24	2.91	1.58	2.58	
Emission Rate	(lb/hr)	0.81	0.75	0.41	0.65	1.6
Emission Rate	(tons/year)	3.53	3.28	1.78	2.86	12.7

Table 3. Sulfuric Acid Mist Test Results, SCOT 2 (804)
Valero Delaware City Refinery, Delaware City, Delaware

Test Data		Run 1	Run 2	Run 3	Average	
Date		9/15/2009	9/15/2009	9/15/2009		
Start Time		9:30 AM	11:00 AM	12:52 PM		
End Time		10:30 AM	12:00 PM	1:52 PM		
Flow Rate	(ACFM)	53,089	54,339	54,857	54,095	
Flow Rate	(SCFM)	15,785	16,118	16,326	16,076	
Flow Rate	(DSCFM)	13,665	13,936	14,167	13,923	
Sample Volume	(DSCF)	44.809	44.035	44.003	44.283	
Carbon Dioxide (CO_2)	(dry volume %)	14.8	14.8	14.3	14.6	
Oxygen (O_2)	(dry volume %)	2.0	2.2	2.2	2.1	
Water Vapor (H_2O)	(volume %)	13.4%	13.5%	13.2%	13.4%	
Stack Temperature	(°F)	1315.3	1319.6	1313.7	1316.2	
Results						Permit Limit
Sulfuric Acid (H_2SO_4)						
Mass Collected	(mg)	7.44	6.14	7.11	6.90	
Emission Concentration	(lb/DSCF)	3.66E-07	3.07E-07	3.56E-07	3.43E-07	
Emission Concentration	(ppm_{dv})	1.44	1.21	1.40	1.35	
Emission Rate	(lb/hr)	0.30	0.26	0.30	0.29	1.6
Emission Rate	(tons/year)	1.31	1.13	1.33	1.26	12.7

Table 2. CEM Test Results, SCOT 1 (203)
Valero Delaware City Refinery, Delaware City, Delaware

Test Data		Run 1	Run 2	Run 3	Average	
Date		9/15/2009	9/15/2009	9/15/2009		
Start Time		9:30 AM	11:00 AM	12:50 PM		
End Time		10:30 AM	12:00 PM	1:50 PM		
Flow Rate	(ACFM)	55,682	57,146	56,124	56,317	
Flow Rate	(SCFM)	17,763	18,446	18,315	18,175	
Flow Rate	(DSCFM)	16,282	16,849	16,844	16,658	
Sample Volume	(DSCF)	45.709	44.915	45.611	45.412	
Carbon Dioxide (CO_2)	(dry volume %)	16.83	16.20	15.57	16.20	
Oxygen (O_2)	(dry volume %)	4.06	4.34	4.46	4.29	
Water Vapor (H_2O)	(volume %)	8.34	8.66	8.03	8.34	
Stack Temperature	(°F)	1198.8	1179.3	1161.5	1179.9	
Results						Permit Limit
Carbon Monoxide (CO)						
Emission Concentration	(ppm_{dv})	0.79	0.20	0.69	0.56	100
Emission Rate	(lb/hr)	0.06	0.01	0.05	0.04	
Emission Rate	(tons/year)	0.24	0.06	0.22	0.18	90.4
Nitrogen Oxides (NOx) as NO_2						
Emission Concentration	(ppm_{dv})	30.5	39.5	38.2	36.07	
Emission Rate	(lb/hr)	3.56	4.76	4.61	4.31	7.0
Emission Rate	(tons/year)	15.60	20.87	20.20	18.89	51.9

CEM results have been bias calibration corrected.

Table 4. CEM Test Results, SCOT 2 (804)
Valero Delaware City Refinery, Delaware City, Delaware

Test Data		Run 1	Run 2	Run 3	Average	
Date		9/15/2009	9/15/2009	9/15/2009		
Start Time		9:30 AM	11:00 AM	12:52 PM		
End Time		10:30 AM	12:00 PM	1:52 PM		
Flow Rate	(ACFM)	53,089	54,339	54,857	54,095	
Flow Rate	(SCFM)	15,785	16,118	16,326	16,076	
Flow Rate	(DSCFM)	13,665	13,936	14,167	13,923	
Sample Volume	(DSCF)	44.809	44.035	44.003	44.283	
Carbon Dioxide (CO_2)	(dry volume %)	14.80	14.76	14.28	14.62	
Oxygen (O_2)	(dry volume %)	2.05	2.18	2.15	2.13	
Water Vapor (H_2O)	(volume %)	13.44	13.54	13.22	13.40	
Stack Temperature	(°F)	1315.3	1319.6	1313.7	1316.2	
Results						Permit Limit
Carbon Monoxide (CO)						
Emission Concentration	(ppm_{dv})	10.87	7.66	7.25	8.59	100
Emission Rate	(lb/hr)	0.65	0.47	0.45	0.52	
Emission Rate	(tons/year)	2.84	2.04	1.96	2.28	90.4
Nitrogen Oxides (NOx) as NO_2						
Emission Concentration	(ppm_{dv})	12.0	15.6	15.4	14.32	
Emission Rate	(lb/hr)	1.17	1.56	1.56	1.43	7.0
Emission Rate	(tons/year)	5.13	6.82	6.84	6.26	51.9

CEM results have been bias calibration corrected.

Table 5

TABLE NOMENCLATURE

SYMBOL		DESCRIPTION	SYMBOL		DESCRIPTION	SYMBOL		DESCRIPTION
%	-	Percent	gr/DSCF	-	Grains per dry standard cubic feet	OSHA	-	Occuptional Safety & Health Administration
% Volume	-	Percent by volume	gpm	-	Gallons per minute	PADEP	-	PA Department of Environmental Protection
°F	-	Degrees Fahrenheit	H_2O	-	Water	Pb	-	Lead
<	-	Less than	H_2SO_4	-	Sulfuric acid	PEL	-	Permissible exposure limit
>	-	Greater than	Hg	-	Mercury	PM	-	Particulate matter
AB	-	Acetone Blank	HI	-	Heat input	PM_{10}	-	Particulate matter less than 10 microns
ACFM	-	Actual cubic feet per minute	hr	-	Hour	ppb	-	Parts per billion
BTU	-	British thermal units	IC	-	Ion chromtography	PPE	-	Personal protective equipment
C_3H_8	-	Propane	in H_2O	-	Inches of Water	ppm	-	Parts per million
CE	-	Capture efficiency	in Hg	-	Inches of Mercury	ppm_{dv}	-	Parts per million, dry volume
CEMS	-	Continuous emission monitor system	Kg	-	Killograms	ppm_{wv}	-	Parts per million, wet volume
cf	-	Cubic foot	lb	-	Pound	PTE	-	Permanent total enclosure
CFR	-	Code of Federal Regulations	lb/hr	-	Pound per hour	RA	-	Relative Accuracy
CH_4	-	Ethane	lb/lb-mole	-	Pound per pound mole	RATA	-	Relative Accuracy Test Audit
Cl_2	-	Chlorine	lb/MMBTU	-	Pound per million British thermal units	RM	-	Reference Method
CO	-	Carbon monoxide	m^3	-	Cubic meters	RMD	-	Relative mean difference
CO_2	-	Carbon dioxide	MDL	-	Minimum detection limit	S	-	Sulfur
COG	-	Coke oven gas	mg	-	Milligrams	SCF	-	Standard cubic feet
DACF	-	Dry actual cubic feet	mg/g	-	Milligrams per gram	SCFM	-	Standard cubic feet per minute
DACM	-	Dry actual cubic meters	mL	-	Milliliter	SCM	-	Standard cubic meters
DE	-	Destruction efficiency	mm HG	-	Millimeters of mercury	SO_2	-	Sulfur dioxide
DSCF	-	Dry standard cubic feet	MMBtu	-	Million British thermal units	STD	-	Standard
DSCFM	-	Dry standard cubic feet per minute	MMBtu/hr	-	Million British thermal units per hour	THC	-	Total hydrocarbons
FID	-	Flame Ionization Detector	MNOC	-	Maximum normal operating capacity	tph	-	Tons per hour
ft	-	Foot	N_2	-	Nitrogen	tpy	-	Tons per year
ft/sec	-	Feet per second	NDO	-	Natural draft opening	µg	-	Micrograms
Ft^2	-	Square feet	ng	-	Nanograms	µg/DSCM	-	Micrograms per dry stanard cubic meter
Ft^3	-	Cubic feet	NMNVOC	-	Non-methane, non-ethane volatile organic compounds	USEPA	-	United States Environmental Protection Agency
ft^3/lb-mole	-	Cubic feet per pound mole	NMVOC	-	Non-methane volatile organic compound	VE	-	Visible emissions
g	-	Grams	NO_2	-	Nitrous Oxide	VOC	-	Volatile organic compound
g/mL	-	Gram per milliliter	NO_x	-	Oxides of Nitrogen	vol.	-	Volume
GC	-	Gas Chromatography	O_2	-	Oxygen	w/o	-	With out

APPENDIX A

Field and Computerized Data Sheets

SCOT 1 (203)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 1	
Unit:	SCOT 1 (203)		Test Start Time:	9:30 AM	
Unit Operation:	normal		Test Finish Time:	10:30 AM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1581		CO + N2	79.10	% dv
Meter $DH_@$ (0.75 scfm)	1.626	in. H2O	Water Collected (V_f - V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.988		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f - W_i)	88.2	g
Barometric Pressure (Phar)	30.00	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	4.159	scf
Stack Static Pressure (Pg)	-0.20	in. H2O	Vol. Water Vapor in Gas Stand.(Vw(std))	4.159	scf
Stack Diameter (Ds) (L if rectangular)	80.0	inches	Volume Dry Gas Metered (Vm)	47.350	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	45.709	dscf
Nozzle Diameter (Dn) (NA if NA)	na	inches	Volume Dry Gas Metered (Vm(m'))	1.341	dacm
CO2	16.83	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m')	1.294	dscm
O2	4.06	% dv	Stack Absolute Pressure (Ps)	29.99	in. Hg
Product Rate (enter NA if not needed)	NA	input ton/hr	Stack Absolute Temperature (Tsavg)	1658.4	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	59033.58	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	H2SO4 and CEMS		H2O in the gas from test data (Bws)	0.0834	vol. fraction
Fc @ 68 F and 760 mm Hg (NA if NA)	NA	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0834	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.86	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.78	lb/lb-mole
Calculations			Gas Velocity (Vs)	26.59	ft/s
Meter Temperature (Tm)	83.8	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1198.8	F	Area Stack (As)	34.907	ft^2
Orifice Pressure Drop (dHavg)	1.600	in. H2O	Actual Gas Flowrate	55,682	acfm
GasVelocity Head (dP)^avg	0.2717	in. H2O^1/2	Standard Gas Flowrate	17,763	scfm
F_c @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	16,282	dscfm
F_c @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	1,577	acm/min
Heat Input Based on F_c	NA	MMBtu/hr	Standard Gas Flowrate	503	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	461	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K3method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide (CO)			**Nitrogen Oxides (NOx) as NO2**		
MW	28	lb/lb-mole	MW	46	lb/lb-mole
O2 for Correction	NA	vol. %	O2 for Correction	NA;Dn = NA	vol. %
Concentration	0.79	$ppm_{d,\ scfm}$	Concentration	30.53	ppm_d
Concentration	0.79	$ppm_{d,\ stack}$	Concentration	NA	ppm_d, 7% O2
Concentration	NA	ppm_d, 7% O2	Concentration	0.0000036	lb/dscf
Concentration	0.0000001	lb/dscf	Emission	3.56	lb/hr
Emission	0.06	lb/hr	Emission	0.000	lb/MMBtu
Emission	0.000	lb/MMBtu			
			Sulfuric Acid (H2SO4)		
			Total mass as H2SO4	17.100	mg
			MW H2SO4	98	lb/lb-mole
			O2 for Correction	NA	vol. %
			Concentration as H2SO4	8.25E-07	lb/dscf
			Concentration as H2SO4	3.24	ppm_d
			Concentration as H2SO4	NA	ppm_d, 7% O2
			Emission as H2SO4	0.81	lb/hr
			Emission as H2SO4	0.000	lb/MMBtu

Valero **Run 1** **F or C?**

SCOT 1 (203) **F=1,C=0** 1

Point	Pitot DP (dH') (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.06	0.245	1.60	1196	80	78
A-2	0.06	0.245	1.60	1197	82	78
A-3	0.07	0.265	1.60	1198	85	79
A-4	0.08	0.283	1.60	1198	86	80
A-5	0.09	0.300	1.60	1199	87	80
A-6	0.08	0.283	1.60	1200	88	80
A-7	0.06	0.245	1.60	1200	88	81
A-8	0.06	0.245	1.60	1198	89	81
B-1	0.06	0.245	1.60	1197	89	81
B-2	0.07	0.265	1.60	1198	90	82
B-3	0.08	0.283	1.60	1199	90	83
B-4	0.09	0.300	1.60	1200	90	83
B-5	0.10	0.316		1200		
B-6	0.09	0.300		1201		
B-7	0.08	0.283		1200		
B-8	0.06	0.245		1199		
Average	0.07	0.272	1.60	1198.8		83.8

Initial volume	831.865	ft³	Initial volume	0.000	liters
Final volume	879.215	ft³	Final volume	0.000	liters
Total metered	47.350	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1	884.5	895	-10.5			0.0
2	894	860.5	33.5			0.0
3	818.5	818	0.5			0.0
4	757	711.5	45.5			0.0
5	257.3	238.1	19.2			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3611.3	3523.1	88.2	0.0	0.0	0.0
	W_f	W_i	(W_f - W_i)	V_f	V_i	(V_f - V_i)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 2	
Unit:	SCOT 1 (203)		Test Start Time:	11:00 AM	
Unit Operation:	normal		Test Finish Time:	12:00 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1581		CO + N2	79.47	% dv
Meter $DH_@$ (0.75 scfm)	1.626	in. H_2O	Water Collected (V_f - V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.988		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f - W_i)	90.3	g
Barometric Pressure (Phar)	30.0	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	4.258	scf
Stack Static Pressure (Pg)	-0.20	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	4.258	scf
Stack Diameter (Ds) (L if rectangular)	80.0	inches	Volume Dry Gas Metered (Vm)	47.095	dacf
Stack Width (enter NA if circular)	na	inches	Vol. Dry Gas Metered Stand.(Vm(std))	44.915	dscf
Nozzle Diameter (Dn) (NA if NA)	na	inches	Volume Dry Gas Metered ($Vm(m^3)$)	1.334	dacm
CO2	16.20	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	1.272	dscm
O2	4.34	% dv	Stack Absolute Pressure (Ps)	29.99	in. Hg
Product Rate (enter NA if not needed)	NA	input ton/hr	Stack Absolute Temperature (Tsavg)	1639.0	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	55596.83	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0866	vol. fraction
F_c @ 68 F and 760 mm Hg (NA if NA)	NA	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0866	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.76	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.66	lb/lb-mole
Calculations			Gas Velocity (Vs)	27.29	ft/s
Meter Temperature (Tm)	90.4	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1179.3	F	Area Stack (As)	34.907	ft^2
Orifice Pressure Drop (dHavg)	1.600	in. H_2O	Actual Gas Flowrate	57,146	acfm
GasVelocity Head (dP)^avg	0.2799	in. $H_2O^{1/2}$	Standard Gas Flowrate	18,446	scfm
F_c @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	16,849	dscfm
F_c @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	1,618	acm/min
Heat Input Based on F_d	NA	MMBtu/hr	Standard Gas Flowrate	522	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	477	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide (CO)			**Nitrogen Oxides (NOx) as NO2**		
MW	28	lb/lb-mole	MW	46	lb/lb-mole
O2 for Correction	NA	vol. %	O2 for Correction	NA	vol. %
Concentration	0.20	$ppm_{d,\ smoke}$	Concentration	39.47	ppm_d
Concentration	0.20	$ppm_{d,\ stack}$	Concentration	NA	ppm_d, 7% O2
Concentration	NA	ppm_d, 7% O2	Concentration	0.0000047	lb/dscf
Concentration	0.0000000	lb/dscf	Emission	4.76	lb/hr
Emission	0.01	lb/hr	Emission	0.000	lb/MMBtu
Emission	0.000	lb/MMBtu			
			Sulfuric Acid (H2SO4)		
			Total mass as H2SO4	15.100	mg
			MW H2SO4	98	lb/lb-mole
			O2 for Correction	NA	vol. %
			Concentration as H2SO4	7.41E-07	lb/dscf
			Concentration as H2SO4	2.91	ppm_d,
			Concentration as H2SO4	NA	ppm_d, 7% O2
			Emission as H2SO4	0.75	lb/hr
			Emission as H2SO4	0.000	lb/MMBtu

Valero — Run 2 — F or C?

SCOT 1 (203) — F=1,C=0: 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.06	0.245	1.60	1177	91	86
A-2	0.07	0.265	1.60	1178	93	86
A-3	0.07	0.265	1.60	1175	94	87
A-4	0.08	0.283	1.60	1178	94	87
A-5	0.10	0.316	1.60	1179	94	87
A-6	0.09	0.300	1.60	1178	94	87
A-7	0.08	0.283	1.60	1177	94	88
A-8	0.07	0.265	1.60	1176	94	87
B-1	0.06	0.245	1.60	1180	94	88
B-2	0.08	0.283	1.60	1181	94	88
B-3	0.08	0.283	1.60	1181	94	88
B-4	0.09	0.300	1.60	1182	93	87
B-5	0.10	0.316		1182		
B-6	0.08	0.283		1182		
B-7	0.08	0.283		1182		
B-8	0.07	0.265		1181		
Average		0.280	1.60	1179.3		90.4

Initial volume	891.075	ft^3	Initial volume	0.000	liters
Final volume	938.170	ft^3	Final volume	0.000	liters
Total metered	47.095	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain			ml Gain
1	771	760	11.0			0.0
2	772.5	766.5	6.0			0.0
3	748.5	707	41.5			0.0
4	714.5	706.5	8.0			0.0
5	265.2	241.4	23.8			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3271.7	3181.4	90.3	0.0	0.0	0.0
	W_f	W_i	(W_f - W_i)	V_f	V_i	(V_f - Vi)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 3	
Unit:	SCOT 1 (203)		Test Start Time:	12:50 PM	
Unit Operation:	normal		Test Finish Time:	1:50 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1581		CO + N2	79.97	% dv
Meter $DH_@$ (0.75 scfm)	1.626	in. H_2O	Water Collected (V_f- V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.9880		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f- W_i)	84.5	g
Barometric Pressure (Pbar)	30.0	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	3.984	scf
Stack Static Pressure (Pg)	-0.20	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	3.984	scf
Stack Diameter (Ds) (L if rectangular)	80.0	inches	Volume Dry Gas Metered (Vm)	47.745	dacf
Stack Width (enter NA if circular)	na	inches	Vol. Dry Gas Metered Stand.(Vm(std))	45.611	dscf
Nozzle Diameter (Dn) (NA if NA)	na	inches	Volume Dry Gas Metered ($Vm(m^3)$)	1.352	dacm
CO2	15.57	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	1.292	dscm
O2	4.46	% dv	Stack Absolute Pressure (Ps)	29.99	in. Hg
Product Rate (enter NA if not needed)	NA	input ton/hr	Stack Absolute Temperature (Tsavg)	1621.2	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	52522.73	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0803	vol. fraction
F_c @ 68 F and 760 mm Hg (NA if NA)	NA	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0803	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.67	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.65	lb/lb-mole
Calculations			Gas Velocity (Vs)	26.80	ft/s
Meter Temperature (Tm)	89.5	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1161.5	F	Area Stack (As)	34.907	ft^2
Orifice Pressure Drop (dHavg)	1.600	in. H_2O	Actual Gas Flowrate	56,124	acfm
GasVelocity Head (dP)^avg	0.2763	in. H_2O^1/2	Standard Gas Flowrate	18,315	scfm
F_c @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	16,844	dscfm
F_c @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	1,589	acm/min
Heat Input Based on F_c	NA	MMBtu/hr	Standard Gas Flowrate	519	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	477	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide (CO)			**Nitrogen Oxides (NOx) as NO2**		
MW	28	lb/lb-mole	MW	46	lb/lb-mole
O2 for Correction	NA	vol. %	O2 for Correction	NA	vol. %
Concentration	0.69	$ppm_{d,\ MBR}$	Concentration	38.21	ppm_d
Concentration	0.69	$ppm_{d,\ Stack}$	Concentration	NA	ppm_d, 7% O2
Concentration	NA	ppm_d, 7% O2	Concentration	0.0000946	lb/dscf
Concentration	0.0000001	lb/dscf	Emission	4.61	lb/hr
Emission	0.05	lb/hr	Emission	0.000	lb/MMBtu
Emission	0.000	lb/MMBtu			
			Sulfuric Acid (H2SO4)		
			Total mass as H2SO4	8.300	mg
			MW H2SO4	98	lb/lb-mole
			O2 for Correction	NA	vol. %
			Concentration as H2SO4	4.01E-07	lb/dscf
			Concentration as H2SO4	1.58	ppm_d
			Concentration as H2SO4	NA	ppm_d, 7% O2
			Emission as H2SO4	0.41	lb/hr
			Emission as H2SO4	0.000	lb/MMBtu

Valero **Run 3** **F or C?**

SCOT 1 (203) F=1,C=0 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.06	0.245	1.60	1158	89	86
A-2	0.07	0.265	1.60	1160	89	86
A-3	0.08	0.283	1.60	1161	91	86
A-4	0.09	0.300	1.60	1162	92	86
A-5	0.09	0.300	1.60	1162	93	87
A-6	0.08	0.283	1.60	1163	93	87
A-7	0.07	0.265	1.60	1163	93	87
A-8	0.06	0.245	1.60	1162	93	87
B-1	0.06	0.245	1.60	1160	93	87
B-2	0.07	0.265	1.60	1161	93	87
B-3	0.08	0.283	1.60	1162	94	87
B-4	0.09	0.300	1.60	1162	94	87
B-5	0.10	0.316		1162		
B-6	0.09	0.300		1162		
B-7	0.08	0.283		1162		
B-8	0.06	0.245		1162		
Average	0.077	0.276	1.60	1161.5		89.5

Initial volume	952.845	ft³	Initial volume	0.000	liters
Final volume	1000.590	ft³	Final volume	0.000	liters
Total metered	47.745	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain			ml Gain
1	707	746	-39.0			0.0
2	769.5	765	4.5			0.0
3	743.5	696.5	47.0			0.0
4	746.5	713.5	33.0			0.0
5	293.6	254.6	39.0			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3260.1	3175.6	84.5	0.0	0.0	0.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- V_i)

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.626	**Start Time:**	0930
Date:	9/15/09	**Run Number:**	1	**Meter Correction:**	0.988	**Stop Time:**	1030
Plant:	Delaware City Refinery	**Nozzle Dia:**	-	**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 203 SRU	**Static Press, Ps:**	-0.20	**Control Box Num.:**	1581	**Probe Number:**	SAC-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	~~SAC-1~~
Project Number:	09-129	**Ambient Temp:**	75 °F	**Thermocouple ID:**	SAC-1	**Filter Number:**	
Test Crew:	JC CB FB MB TH	**K-factor (K_f)**				**Measured Stack Diameter:**	80"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F 68°	Comments
		0930	831.865										FILTER °F
	5		835.840		1.6	4.0	80	78	1194	256	250	53	77
	10		840.095		1.6	4.0	82	78	1197	250	253	53	76
	15		843.765		1.6	4.0	85	79	1203	251	255	55	75
	20		847.725		1.6	4.0	86	80	1202	251	250	57	75
	25		851.700		1.6	4.0	87	80	1200	249	248	58	75
	30		855.525		1.6	4.0	88	80	1198	249	245	58	74
	35		859.710		1.6	4.0	88	81	1196	247	246	59	74
	40		863.675		1.6	4.0	89	81	1195	252	253	59	75
	45		867.610		1.6	4.0	89	81	1194	249	250	59	75
	50		871.570		1.6	4.0	90	82	1204	248	247	59	75
	55		875.450		1.6	4.0	90	83	1196	250	250	57	76
	60	1030	879.215		1.6	4.0	90	83	1197	253	246	57	77

TOTAL/AVERAGE

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15"	0.00
Final	10"	0.00

Pitot Leak Check ✓

Pressure	+/-	✓
Static	+/-	✓

CEMS

	1	2	3	Average
CO2				
O2				
CO				
N2				

JC

IMP	Contents	Final	Initial	Difference
1	IPA	~~790.5~~ 884.5	895.0	
2	IPA	894.0	860.5	
3	H_2O_2	~~795.5~~ 818.5	818.0	
4	H_2O_2	752.0	711.5	
5	SILICA	257.3	238.1	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.626	**Start Time:**	1100
Date:	9/15/09	**Run Number:**	2	**Meter Correction:**	0.988	**Stop Time:**	1200
Plant:	Delaware City Refinery	**Nozzle Dia:**	-	**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 203 SRU	**Static Press, Ps:**	-0.20	**Control Box Num.:**	1581	**Probe Number:**	SAC-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	-
Project Number:	09-129	**Ambient Temp:**	75 °F	**Thermocouple ID:**	SAC-1	**Filter Number:**	
Test Crew:	JC CB TH MB FB	**K-factor (K_f)**				**Measured Stack Diameter:**	80"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F	Comments
			891.075									68°	FILTER °F
		5	895.070		1.6	4.0	91	86	1171	250	248	56	68
		10	898.995		1.6	4.0	93	86	1165	251	246	56	68
		15	902.925		1.6	4.0	94	87	1167	250	247	56	69
		20	906.830		1.6	4.0	94	87	1164	250	248	57	70
		25	910.750		1.6	4.0	94	87	1181	249	245	58	70
		30	914.675		1.6	4.0	94	87	1176	250	249	59	70
		35	918.580		1.6	4.0	94	88	1182	248	244	59	70
		40	922.510		1.6	4.0	94	87	1183	251	248	56	70
		45	926.440		1.6	4.0	94	88	1182	249	253	57	69
		50	930.345		1.6	4.0	94	88	1178	250	252	59	70
		55	934.155		1.6	4.0	94	88	1176	248	253	60	71
		60	438.170		1.6	4.0	93	87	1182	250	248	61	71
TOTAL/AVERAGE													

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15"	0.00
Final	10"	0.00

Pitot Leak Check

Pressure	+/-	✓
Static	+/-	✓

CEMS

	1	2	3	Average
CO2				
O2				
CO				
N2				

JC OK

IMP	Contents	Final	Initial	Difference
1	IPA	771.0	~~770.0~~ 769	
2	IPA	772.5	~~800.5~~ 769.5	
3	H_2O_2	748.5	707.0	
4	H_2O_2	714.5	~~800.5~~ 706.5	
5	silica	265.2	241.4	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.626	**Start Time:**	1250
Date:	9/15/09	**Run Number:**	3	**Meter Correction:**	0.988	**Stop Time:**	1350
Plant:	Delaware City Refinery	**Nozzle Dia:**	-	**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 203 SRU	**Static Press, Ps:**	-0.20	**Control Box Num.:**	1581	**Probe Number:**	STAC-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	-
Project Number:	09-129	**Ambient Temp:**	75 °F	**Thermocouple ID:**	STAC-1	**Filter Number:**	-
Test Crew:	SC CB KB FH MB	**K-factor (K_f)**				**Measured Stack Diameter:**	80"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F	Comments
→			952.845									68°	FILTER °F
5		5	956.830		1.6	4.5	89	86	1160	250	257	60	70
10			960.800		1.6	4.5	89	86	1158	249	249	59	71
15			964.790		1.6	4.5	91	86	1165	250	247	60	71
20			968.695		1.6	4.5	92	86	1161	252	250	61	72
25			972.575		1.6	4.5	93	87	1164	248	249	61	72
30			976.460		1.6	4.5	93	87	1179	249	250	59	72
35			980.450		1.6	4.5	93	87	1164	252	250	59	73
40			984.430		1.6	4.5	93	87	1158	248	252	60	73
45			988.425		1.6	4.5	93	87	1167	249	251	61	73
50			992.565		1.6	4.5	93	87	1143	252	253	61	73
55			996.685		1.6	4.5	94	87	1148	254	252	62	74
60			1000.590		1.6	4.5	94	87	1147	250	253	62	74
TOTAL/AVERAGE													

Sample Train Leak Check

	(in. Hg)	Rate (ft^3/m)
Initial	15"	0.00
Final	10"	0.00

Pitot Leak Check

Pressure	+/-	✓
Static	+/-	✓

CEMS

	1	2	3	Average
CO2				
O2				
CO				
N2				

IMP	Contents	Final	Initial	Difference
1	IPA	707.0	796.0	
2	IPA	769.5	765.0	
3	H_2O_2	743.5	696.5	
4	H_2O_2	746.5	713.5	
5	SILICA	293.6	254.6	

AIR/COMPLIANCE CONSULTANTS, INC.
USEPA METHOD 2 DATA SHEET

Client: VALERO
Project No.: 09-129
Test Location: S-203 SRU
Test Crew: JC CB FB MB TH
Pitot Tube ID No.: 9PP6-1

Date: 9/15/09 Time: 0951			Date: 9/15/09 Time: 1131			Date: 9/15/09 Time: 1255		
Stack ID: S-203			Stack ID: S-203			Stack ID: S-203		
Measured Stack Diameter: 80"			Stack Diameter: 80"			Stack Diameter: 80"		
Run No: 1			Run No: 2			Run No: 3		
Static Pressure (in H_2O): -0.20			Static Pressure (in H_2O): -0.20			Static Pressure (in H_2O): -0.20		
Barometric Pressure (in Hg): 30.00			Barometric Pressure (in Hg): 30.00			Barometric Pressure (in Hg): 30.00		
Traverse Point no.	Velocity Delta P	Stack Temp (°F)	Traverse Point no.	Velocity Delta P	Stack Temp (°F)	Traverse Point no.	Velocity Delta P	Stack Temp (°F)
A1	.06	1196	A1	.06	1177	A1	.06	1158
2	.06	1197	2	.07	1178	2	.07	1160
3	.07	1198	3	.07	1175	3	.08	1161
4	.08	1198	4	.08	1178	4	.09	1162
5	.09	1199	5	.10	1179	5	.09	1162
6	.08	1200	6	.09	1178	6	.08	1163
7	.06	1200	7	.08	1177	7	.07	1163
8	.06	1198	8	.07	1176	8	.06	1162
B1	.06	1197	B1	.06	1180	B1	.06	1160
2	.07	1198	2	.08	1181	2	.07	1161
3	.08	1199	3	.08	1181	3	.08	1162
4	.09	1200	4	.09	1182	4	.09	1162
5	.10	1200	5	.10	1182	5	.10	1162
6	.09	1201	6	.08	1182	6	.09	1162
7	.08	1200	7	.08	1182	7	.08	1162
8	.06	1199	8	.07	1181	8	.06	1162

SCOT 2 (804)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 1	
Unit:	SCOT 2 (804)		Test Start Time:	9:30 AM	
Unit Operation:	normal		Test Finish Time:	10:30 AM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1462		CO + N2	83.15	% dv
Meter $DH_@$ (0.75 scfm)	1.684	in. H_2O	Water Collected (V_f - V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.994		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f - W_i)	147.5	g
Barometric Pressure (Pbar)	30.00	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	6.955	scf
Stack Static Pressure (Pg)	-1.20	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	6.955	scf
Stack Diameter (Ds) (L if rectangular)	72.0	inches	Volume Dry Gas Metered (Vm)	45.505	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	44.809	dscf
Nozzle Diameter (Dn) (NA if NA)	NA	inches	Volume Dry Gas Metered (Vm(m^3))	1.289	dacm
CO2	14.80	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m^3)	1.269	dscm
O2	2.05	% dv	Stack Absolute Pressure (Ps)	29.91	in. Hg
Product Rate (enter NA if not needed)	na	input ton/hr	Stack Absolute Temperature (Tsavg)	1774.9	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	80661.60	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	H2SO4 and CEMS		H2O in the gas from test data (Bws)	0.1344	vol. fraction
Fc @ 68 F and 760 mm Hg (NA if NA)	1.094	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.1344	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.45	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	28.78	lb/lb-mole
Calculations			Gas Velocity (Vs)	31.29	ft/s
Meter Temperature (Tm)	76.4	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1315.3	F	Area Stack (As)	28.274	ft^2
Orifice Pressure Drop (dHavg)	1.700	in. H_2O	Actual Gas Flowrate	53,089	acfm
GasVelocity Head (dP)^avg	0.3034	in. H_2O^1/2	Standard Gas Flowrate	15,785	scfm
F_c @ Standard Conditions	1.094	dscf/MMBtu	Dry Standard Gas Flowrate	13.665	dscfm
F_c @ Stan. Cond. & Actual O2	1.094	dscf/MMBtu	Actual Gas Flowrate	1,503	acm/min
Heat Input Based on F_c	750	MMBtu/hr	Standard Gas Flowrate	447	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	387	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945		**Nitrogen Oxides (NOx) as NO2**		
Standard lb-mole volume	385.3	ft^3/lb-mole	MW	46	lb/lb-mole
Carbon Monoxide (CO)			O2 for Correction	7	vol.%
MW	28	lb/lb-mole	Concentration	11.96	ppm_d,
O2 for Correction	7	vol. %	Concentration	8.82	ppm_d, 7% O2
Concentration	10.87	$ppm_{d,\ STDR}$	Concentration	0.0000014	lb/dscf
Concentration	10.87	$ppm_{d,\ Stack}$	Emission	1.17	lb/hr
Concentration	8.01	ppm_d, 7% O2	Emission	0.011	lb/MMBtu
Concentration	0.0000008	lb/dscf	**Sulfuric Acid (H2SO4)**		
Emission	0.65	lb/hr	Total mass as H2SO4	7.440	mg
Emission	0.006	lb/MMBtu	MW H2SO4	98	lb/lb-mole
			O2 for Correction	7	vol.%
			Concentration as H2SO4	3.66E-07	lb/dscf
			Concentration as H2SO4	1.44	ppm_d,
			Concentration as H2SO4	0.96	ppm_d, 7% O2
			Emission as H2SO4	0.30	lb/hr
			Emission as H2SO4	0.003	lb/MMBtu

Valero		Run 1				F or C?
SCOT 2 (804)						F=1,C=0 1
Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.08	0.283	1.70	1310	72	71
A-2	0.09	0.300	1.70	1318	74	71
A-3	0.09	0.300	1.70	1305	76	71
A-4	0.11	0.332	1.70	1322	77	72
A-5	0.10	0.316	1.70	1308	78	72
A-6	0.10	0.316	1.70	1324	79	73
A-7	0.08	0.283	1.70	1325	81	74
A-8	0.07	0.265	1.70	1306	82	75
B-1	0.09	0.300	1.70	1315	82	76
B-2	0.10	0.316	1.70	1311	83	76
B-3	0.10	0.316	1.70	1308	83	76
B-4	0.12	0.346	1.70	1331	83	77
B-5	0.10	0.316				
B-6	0.09	0.300				
B-7	0.08	0.283				
B-8	0.08	0.283				
Average	0.09	0.303	1.70	1315.3		76.4

Initial volume	642.440	ft	Initial volume	0.000	liters
Final volume	687.945	ft	Final volume	0.000	liters
Total metered	45.505	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1	763.3	777.9	-14.6			0.0
2	749.4	682	67.4			0.0
3	772.3	724.1	48.2			0.0
4	713	689.9	23.1			0.0
5	265.6	242.2	23.4			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3263.6	3116.1	147.5	0.0	0.0	0.0
	W_f	W_i	(W_f - W_i)	V_f	V_i	(V_f - V_i)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 2	
Unit:	SCOT 2 (804)		Test Start Time:	11:00 AM	
Unit Operation:	normal		Test Finish Time:	12:00 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1462		CO + N2	83.06	% dv
Meter $DH_@$ (0.75 scfm)	1.684	in. H_2O	Water Collected (V_f - V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.994		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f - W_i)	146.2	g
Barometric Pressure (Pbar)	30.0	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	6.893	scf
Stack Static Pressure (Pg)	-1.20	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	6.893	scf
Stack Diameter (Ds) (L if rectangular)	72.0	inches	Volume Dry Gas Metered (Vm)	45.320	dacf
Stack Width (enter NA if circular)	na	inches	Vol. Dry Gas Metered Stand.(Vm(std))	44.035	dscf
Nozzle Diameter (Dn) (NA if NA)	na	inches	Volume Dry Gas Metered ($Vm(m^3)$)	1.283	dacm
CO2	14.76	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	1.247	dscm
O2	2.18	% dv	Stack Absolute Pressure (Ps)	29.91	in. Hg
Product Rate (enter NA if not needed)	na	input ton/hr	Stack Absolute Temperature (Tsavg)	1779.3	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	81471.05	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.1354	vol. fraction
F_c @ 68 F and 760 mm Hg (NA if NA)	1.094	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.1354	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.45	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	28.76	lb/lb-mole
Calculations			Gas Velocity (Vs)	32.03	ft/s
Meter Temperature (Tm)	83.6	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1319.6	F	Area Stack (As)	28.274	ft^2
Orifice Pressure Drop (dHavg)	1.700	in. H_2O	Actual Gas Flowrate	54,339	acfm
GasVelocity Head (dP)' avg	0.3101	in. H-O^1/2	Standard Gas Flowrate	16,118	scfm
F_c @ Standard Conditions	1.094	dscf/MMBtu	Dry Standard Gas Flowrate	13,936	dscfm
F_c @ Stan. Cond. & Actual O2	1.094	dscf/MMBtu	Actual Gas Flowrate	1,539	acm/min
Heat Input Based on F_c	765	MMBtu/hr	Standard Gas Flowrate	456	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	395	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide (CO)			**Nitrogen Oxides (NOx) as NO2**		
MW	28	lb/lb-mole	MW	46	lb/lb-mole
O2 for Correction	7	vol. %	O2 for Correction	7	vol. %
Concentration	7.66	$ppm_{d,\ stack}$	Concentration	15.60	ppm_d,
Concentration	7.66	$ppm_{d,\ Stack}$	Concentration	11.59	ppm_d, 7% O2
Concentration	5.69	ppm_d, 7% O2	Concentration	0.0000019	lb/dscf
Concentration	0.0000006	lb/dscf	Emission	1.56	lb/hr
Emission	0.47	lb/hr	Emission	0.014	lb/MMBtu
Emission	0.004	lb/MMBtu	**Sulfuric Acid (H2SO4)**		
			Total mass as H2SO4	6.140	mg
			MW H2SO4	98	lb/lb-mole
			O2 for Correction	7	vol. %
			Concentration as H2SO4	3.07E-07	lb/dscf
			Concentration as H2SO4	1.21	ppm_d,
			Concentration as H2SO4	0.80	ppm_d, 7% O2
			Emission as H2SO4	0.26	lb/hr
			Emission as H2SO4	0.002	lb/MMBtu

Valero — Run 2 — F or C? F=1,C=0: 1

SCOT 2 (804)

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.09	0.300	1.70	1312	85	81
A-2	0.10	0.316	1.70	1314	86	81
A-3	0.12	0.346	1.70	1321	87	82
A-4	0.12	0.346	1.70	1324	88	82
A-5	0.10	0.316	1.70	1309	88	82
A-6	0.09	0.300	1.70	1317	87	82
A-7	0.08	0.283	1.70	1315	87	81
A-8	0.07	0.265	1.70	1312	85	81
B-1	0.09	0.300	1.70	1322	85	80
B-2	0.11	0.332	1.70	1324	85	80
B-3	0.11	0.332	1.70	1334	86	80
B-4	0.12	0.346	1.70	1331	86	80
B-5	0.10	0.316				
B-6	0.10	0.316				
B-7	0.08	0.283				
B-8	0.07	0.265				
Average		0.310	1.70	1319.6		83.6

Initial volume	699.000	ft^3	Initial volume	0.000	liters
Final volume	744.320	ft^3	Final volume	0.000	liters
Total metered	45.320	dacf	Total metered	0.000	dry actual liters

Impinger			Gram Gain	Final ml	Initial ml	ml Gain
1	762.9	768	-5.1			0.0
2	778	720.6	57.4			0.0
3	748.4	705.2	43.2			0.0
4	744.1	726.2	17.9			0.0
5	292.3	259.5	32.8			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3325.7	3179.5	146.2	0.0	0.0	0.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- V_i)

Client:	Valero		Test Date:	September 15, 2009	
Project No.:	09-129		Test Location:	Exhaust	
Plant:	Valero DCR		Test Run:	Run 3	
Unit:	SCOT 2 (804)		Test Start Time:	12:52 PM	
Unit Operation:	normal		Test Finish Time:	1:52 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1462		CO + N2	83.56	% dv
Meter $DH_@$ (0.75 scfm)	1.684	in. H_2O	Water Collected (V_f - V_i)	0.0	ml
Meter Calibration Factor (Yd)	0.9940		Water Vapor Condensed (Vwc(std))	0.000	scf
Test Time (Theta)	60	minutes	Water Collected (W_f - W_i)	142.2	g
Barometric Pressure (Pbar)	30.0	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	6.705	scf
Stack Static Pressure (Pg)	-1.20	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	6.705	scf
Stack Diameter (Ds) (L if rectangular)	72.0	inches	Volume Dry Gas Metered (Vm)	45.700	dacf
Stack Width (enter NA if circular)	na	inches	Vol. Dry Gas Metered Stand.(Vm(std))	44.003	dscf
Nozzle Diameter (Dn) (NA if NA)	na	inches	Volume Dry Gas Metered (Vm(m^3))	1.294	dacm
CO2	14.28	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m^3)	1.246	dscm
O2	2.15	% dv	Stack Absolute Pressure (Ps)	29.91	in. Hg
Product Rate (enter NA if not needed)	na	input ton/hr	Stack Absolute Temperature (Tsavg)	1773.3	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	80365.44	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	1.0000	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.1322	vol. fraction
F_c @ 68 F and 760 mm Hg (NA if NA)	1.094	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.1322	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	30.37	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	28.74	lb/lb-mole
Calculations			Gas Velocity (Vs)	32.34	ft/s
Meter Temperature (Tm)	88.6	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	1313.7	F	Area Stack (As)	28.274	ft^2
Orifice Pressure Drop (dHavg)	1.700	in. H-O	Actual Gas Flowrate	54.857	acfm
GasVelocity Head (dP)^avg	0.3135	in. H-O^1/2	Standard Gas Flowrate	16.326	scfm
F_c @ Standard Conditions	1.094	dscf/MMBtu	Dry Standard Gas Flowrate	14.167	dscfm
F_c @ Stan. Cond. & Actual O2	1.094	dscf/MMBtu	Actual Gas Flowrate	1.553	acm/min
Heat Input Based on F_d	777	MMBtu/hr	Standard Gas Flowrate	462	scm/min
K1method 4	0.04707	scf/ml	Dry Standard Gas Flowrate	401	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	NA;Dn = NA	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	NA;Dn = NA	%
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide (CO)			**Nitrogen Oxides (NOx) as NO2**		
MW	28	lb/lb-mole	MW	46	lb/lb-mole
O2 for Correction	7	vol. %	O2 for Correction	7	vol. %
Concentration	7.25	$ppm_{d,\ NDIR}$	Concentration	15.39	ppm_d,
Concentration	7.25	$ppm_{d,\ Stack}$	Concentration	11.41	ppm_d, 7% O2
Concentration	5.38	ppm_d, 7% O2	Concentration	0.0000018	lb/dscf
Concentration	0.0000005	lb/dscf	Emission	1.56	lb/hr
Emission	0.45	lb/hr	Emission	0.014	lb/MMBtu
Emission	0.004	lb/MMBtu	**Sulfuric Acid (H2SO4)**		
			Total mass as H2SO4	7.110	mg
			MW H2SO4	98	lb/lb-mole
			O2 for Correction	7	vol. %
			Concentration as H2SO4	3.56E-07	lb/dscf
			Concentration as H2SO4	1.40	ppm_d,
			Concentration as H2SO4	0.93	ppm_d, 7% O2
			Emission as H2SO4	0.30	lb/hr
			Emission as H2SO4	0.003	lb/MMBtu

Valero Run 3 F or C?
SCOT 2 (804) F=1,C=0 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.08	0.283	1.70	1320	88	84
A-2	0.10	0.316	1.70	1313	89	84
A-3	0.11	0.332	1.70	1326	90	84
A-4	0.12	0.346	1.70	1320	91	85
A-5	0.11	0.332	1.70	1319	92	86
A-6	0.10	0.316	1.70	1299	92	86
A-7	0.10	0.316	1.70	1300	91	86
A-8	0.08	0.283	1.70	1320	92	87
B-1	0.09	0.300	1.70	1325	92	87
B-2	0.10	0.316	1.70	1303	93	87
B-3	0.10	0.316	1.70	1315	93	87
B-4	0.11	0.332	1.70	1304	93	87
B-5	0.12	0.346				
B-6	0.10	0.316				
B-7	0.09	0.300				
B-8	0.07	0.265				
Average		0.313	1.70	1313.7		88.6

Initial volume	756.345	ft	Initial volume	0.000	liters
Final volume	802.045	ft^3	Final volume	0.000	liters
Total metered	45.700	dacf	Total metered	0.000	dry actual liters

Impinger			Gram Gain	Final ml	Initial ml	ml Gain
1	755.7	780.4	-24.7			0.0
2	744.2	682.6	61.6			0.0
3	777.7	724	53.7			0.0
4	717.1	691.4	25.7			0.0
5	276.1	250.2	25.9			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	3270.8	3128.6	142.2	0.0	0.0	0.0
	W_f	W_i	(W_f - W_i)	V_f	V_i	(V_f - V_i)

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.684	**Start Time:**	9:30
Date:	9/15/09	**Run Number:**	1	**Meter Correction:**	.994	**Stop Time:**	10:30
Plant:	Delaware City Refinery	**Nozzle Dia:**		**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 804 SRU	**Static Press, Ps:**	-1.2	**Control Box Num.:**	1462	**Probe Number:**	TAL-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	10-1
Project Number:	09-129	**Ambient Temp:**	65 °F	**Thermocouple ID:**	7-1	**Filter Number:**	
Test Crew:	MB, TH, JC	**K-factor (K_f)**				**Measured Stack Diameter:**	72"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F	Comments
	0		642.440		1.7							68°	
A1	5		646.215	.08	1.7	5.0	72	71	1310	239	241	53	
2	10		650.265	.09	1.7	5.0	74	71	1318	251	251	54	
3	15		653.980	.09	1.7	5.0	76	71	1305	254	254	55	
4	20		657.970	.11	1.7	5.0	77	72	1322	256	241	58	
5	25		661.815	.10	1.7	5.0	78	72	1308	249	241	59	
6	30		665.650	.10	1.7	5.0	79	73	1324	251	240	60	
7	35		669.485	.08	1.7	5.0	81	74	1325	249	240	61	
8	40		673.345	.07	1.7	5.0	82	75	1306	250	239	61	
B1	45		677.135	.09	1.7	5.0	82	76	1315	251	242	61	
B2	50		680.735	.10	1.7	5.0	83	76	1311	249	242	61	
3	55		684.330	.10	1.7	5.0	83	76	1308	249	248	61	
4	60		687.945	.12	1.7	5.0	83	77	1331	250	245	62	
5				.10									
6				.09									
7				.08									
8				.08									
	TOTAL/AVERAGE												

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	10.00	0.000
Final	6.00	0.000

	1	2	3	Average
CO2				
O2				
CO				
N2				

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

IMP	Contents	Final	Initial	Difference
1	IPA	763.3	777.9	
2	IPA	749.4	682.0	
3		772.3	724.1	
4		713.0	689.9	
5	Silica	~~265.6~~ 265.6	~~242.2~~ 242.2	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.684	**Start Time:**	11:00
Date:	9/15/09	**Run Number:**	2	**Meter Correction:**	.994	**Stop Time:**	12:00
Plant:	Delaware City Refinery	**Nozzle Dia:**		**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 804 SRU	**Static Press, Ps:**	-1.2	**Control Box Num.:**	1462	**Probe Number:**	7AC-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	10-1
Project Number:	09-129	**Ambient Temp:**	70 °F	**Thermocouple ID:**	7-1	**Filter Number:**	
Test Crew:	MB, TH, JC	**K-factor (K_f)**				**Measured Stack Diameter:**	22"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F	Comments
	0		699.000		1.7							68°	
A1	5		702.845	.09	1.7	4.5	85	81	1312	255	250	52	
2	10		706.655	.10	1.7	4.5	86	81	1314	258	249	53	
3	15		710.440	.12	1.7	4.5	87	82	1321	253	251	53	
4	20		714.180	.12	1.7	4.5	88	82	1324	251	243	55	
5	25		717.175	.10	1.7	4.5	88	82	1309	251	245	56	
6	30		721.635	.09	1.7	4.5	87	82	1317	251	249	57	
7	35		725.320	.08	1.7	4.5	87	81	1315	249	247	59	
8	40		729.045	.07	1.7	4.5	85	81	1312	251	243	60	
B1	45		732.775	.09	1.7	4.5	85	80	1322	251	242	61	
2	50		736.565	.11	1.7	4.5	85	80	1324	250	244	62	
3	55		740.440	.11	1.7	5.0	86	80	1334	254	248	63	
4	60		744.320	.12	1.7	5.0	86	80	1331	256	247	62	
5				.10									
6				.10									
7				.08									
8				.07									
	TOTAL/AVERAGE												

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	10.00	0.000
Final	8.00	0.060

	1	2	3	Average
CO2				
O2				
CO				
N2				

IMP	Contents	Final	Initial	Difference
1	IPA	762.9	~~770.7~~ 768.0	
2	IPA	778.0	~~~~ 720.6	
3		748.4	705.2	
4		744.1	726.2	
5	Silica	292.3	~~~~ 259.5	

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 8 DATA SHEET

Client:	Valero	**Test Type:**	Method 8	**Meter Delta H@:**	1.684	**Start Time:**	12:52
Date:	9/15/09	**Run Number:**	3	**Meter Correction:**	.994	**Stop Time:**	13:52
Plant:	Delaware City Refinery	**Nozzle Dia:**		**Pitot Correction:**	.84	**Umbilical Length:**	50'
Sampling Location:	Scot 804 SRU	**Static Press, Ps:**	-1.2	**Control Box Num.:**	1462	**Probe Number:**	TAC-1
		Barometric Press:	30.00	**Assumed Moisture:**		**Pitot Number:**	10-1
Project Number:	09-129	**Ambient Temp:**	75° °F	**Thermocouple ID:**	T-1	**Filter Number:**	
Test Crew:	MB, TH, JL	**K-factor (K_f)**				**Measured Stack Diameter:**	72"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (dcf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp °F	Imp Out Temp °F	Comments
	0		756.345	[illegible]	1.7							68°	
A1	.5		760.225	[illegible].08	1.7	5.0	88	84	1320	248	252	55	
2	10		764.135	.10	1.7	5.0	89	84	1313	254	251	56	
3	15		767.950	.11	1.7	5.0	90	84	1326	252	245	59	
4	20		771.785	.12	1.7	5.0	91	85	1320	250	244	61	
5	25		775.620	.11	1.7	5.0	92	86	1319	251	246	61	
6	30		779.450	.10	1.7	5.0	92	86	1299	250	250	62	
7	35		783.390	.10	1.7	5.0	91	86	1300	249	240	62	
8	40		787.035	.08	1.7	5.0	92	87	1320	249	242	62	
B1	45		790.790	.09	1.7	5.0	92	87	1325	250	245	62	
2	50		794.540	.10	1.7	5.0	93	87	1323	248	245	63	
3	55		798.290	.10	1.7	5.0	93	87	1315	250	251	63	
4	60		802.045	.11	1.7	5.0	93	87	1304	250	247	64	
5				.12									
6				.10									
7				.09									
8				.07									
	TOTAL/AVERAGE												

Sample Train Leak Check

	(in. Hg)	Rate (ft^3/m)
Initial	6.00	[illegible] 0.00
Final	0.00	8.00

	1	2	3	Average
CO2				
O2				
CO				
N2				

IMP	Contents	Final	Initial	Difference
1		755.7	780.4	
2		744.2	682.6	
3		777.7	724.0	
4		717.1	691.4	
5	Silica	276.1	250.2	

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

APPENDIX B

RM Bias Sheets and 1-Minute Averages

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
1	2009/09/15	07:33:02	0 0	0.2	-0.2	0.0	2 0	14 7	9 5	20 8
2	2009/09/15	07:34:02	9.8	22.6	-0 2	0 0	1 8	14 7	10 1	5 6
3	2009/09/15	07:35:02	21 2	11 1	-0 2	0 0	2 0	14 7	9 5	11 0
4	2009/09/15	07:36:02	22 6	10.0	-0 2	0 0	2 1	14 7	9 2	28 9
5	2009/09/15	07:37:02	1 2	1 2	-0 2	22 5	1 9	14.8	9 7	10 8
6	2009/09/15	07:38:02	-0.1	0 5	-0 2	25 6	2 0	14 7	10 1	8.2
7	2009/09/15	07:39:02	-0 1	0 3	-0 2	25.6	2 1	14 6	9 7	23 6
8	2009/09/15	07:40:02	-0 1	0 2	-0 2	52 5	1 9	14 7	9 9	6 6
9	2009/09/15	07:41:02	-0 1	0 2	-0 2	55 7	2 0	14 6	9 7	8 6
10	2009/09/15	07:42:02	-0 1	0 2	-0 2	57.0	2 1	14 6	9 5	20.2
11	2009/09/15	07:43:02	-0 1	0 2	24 5	3 2	1 9	14 7	9 9	4 0
12	2009/09/15	07:44:02	-0 1	0 2	25 4	1 0	2 1	14 6	9 6	8 1
13	2009/09/15	07:45:02	-0 1	0 2	51 4	0 0	2 1	14 5	9 4	19 1
14	2009/09/15	07:46:02	-0 1	0 2	52.3	0 0	1 9	14 6	9 8	5 5
15	2009/09/15	07:47:02	-0 1	0 2	89 6	0 0	2 1	14 6	9 6	9 7
16	2009/09/15	07:48:02	-0 1	0 2	47 6	0 0	0 1	2 1	2 1	2 1
17	2009/09/15	07:49:02	-0 1	0 2	47 0	0 0	0.0	0.1	0.0	1 0
18	2009/09/15	07:50:02	-0 1	0 2	47 1	0 0	22 1	9 4	0 0	-0 1
19	2009/09/15	07:51:02	-0 1	0 2	47 1	0 0	22.7	9.9	0 0	-0 1
20	2009/09/15	07:52:02	-0 1	0 2	47 0	0 0	10 1	22 0	0 0	-0 1
21	2009/09/15	07:53:02	-0 1	0 2	47 0	0 0	9.9	22.7	0 0	-0.1
22	2009/09/15	07:54:02	-0 1	0 2	47 1	0 0	1 1	2 1	0 0	22 4
23	2009/09/15	07:55:02	-0 1	0 2	47 0	0 0	0 0	0 4	0 0	25.6
24	2009/09/15	07:56:02	-0 1	0 2	47 1	0 0	0 0	0 1	0 0	55 4
25	2009/09/15	07:57:02	-0 1	0 2	47 0	0 0	0 0	0 1	0.0	56.8
26	2009/09/15	07:58:02	12 3	0 2	88 7	0 0	0 0	0 1	25 0	4 3
27	2009/09/15	07:59:02	20 8	0 2	1 2	0 0	0 0	0 1	25.5	0 2
28	2009/09/15	08:00:02	20 8	0 2	-0 2	0 0	0 0	0 1	52.0	-0 1
29	2009/09/15	08:01:02	20 8	0 2	-0 2	0 0	0 0	0 1	52.5	-0 1
30	2009/09/15	08:02:02	20 8	0 2	-0 2	0 0	0 0	0 1	52 9	-0 1
31	2009/09/15	08:03:02	20 8	0 2	-0 2	0 0	0 0	0 1	77 7	-0 1
32	2009/09/15	08:04:02	20 8	0 2	-0 2	0 0	0 0	0 1	48 2	-0 1
33	2009/09/15	08:05:02	20 8	0 2	-0 2	2 0	0 0	0 1	46 9	-0 1
34	2009/09/15	08:06:02	20 8	0 2	-0 2	2 0	0 0	0 1	46 8	-0 1
35	2009/09/15	08:07:02	20 8	0 2	-0 2	1 8	0 0	0 1	47 0	-0 1
36	2009/09/15	08:08:02	19 7	0 3	-0 2	2 1	0 0	0 1	46 9	-0 1
37	2009/09/15	08:09:02	12 3	0 6	-0 2	2 2	0 0	0 1	46 9	-0 1
38	2009/09/15	08:10:02	0 0	0 2	-0 2	1 3	0 0	0 1	46 9	-0 1
39	2009/09/15	08:11:02	1 9	4.2	-0 2	0 3	0 0	0 1	47 0	-0 1
40	2009/09/15	08:12:02	9 7	20 5	-0 2	0 3	1 2	4 5	67 8	4.4
41	2009/09/15	08:13:02	9 8	21 6	-0 2	0 0	2 6	11 8	12 3	96 1
42	2009/09/15	08:14:02	9.8	21 9	-0 2	0 0	2 4	12 2	9 0	85 9
43	2009/09/15	08:15:02	7 8	18 1	-0 2	0 0	2 0	12.4	9 3	2 1
44	2009/09/15	08:16:02	0 0	1 8	3 6	0 0	2 2	12.5	9 4	22 6
45	2009/09/15	08:17:02	-0 1	1 1	18 6	0 0	2 1	12 6	9 5	93 9
46	2009/09/15	08:18:02	-0 1	0 8	20 1	0 2	2 2	12 4	9 6	-0 1
47	2009/09/15	08:19:02	-0 1	0 6	25.3	0.1	2 5	12 4	9 3	1 3
48	2009/09/15	08:20:02	-0 1	0 4	20.5	5.4	2 6	12 4	9 2	5 8
49	2009/09/15	08:21:02	-0.1	0.3	0 3	26 0	2 4	12 4	9 3	0 9
50	2009/09/15	08:22:02	0 8	2 2	0 0	26.0	2 5	10 1	9 0	3 7
51	2009/09/15	08:23:02	5 0	10 4	4 1	21.2	2 2	0 4	4 3	15 1
52	2009/09/15	08:24:02	6 8	12 7	21 2	1 7	-0.1	0 3	0 0	2 0
53	2009/09/15	08:25:02	6 8	12.9	21 5	1 1	0 0	0 3	-0.1	1 5
54	2009/09/15	08:26:02	6 6	13 3	21 8	0 8	0 0	0.2	23 5	-0 1
55	2009/09/15	08:27:02	6 7	13 1	21 6	0 6	0 0	0.2	25.5	2.4
56	2009/09/15	08:28:02	6.7	13 2	21 7	0 8	0 0	0 2	11 2	15 7
57	2009/09/15	08:29:02	6 6	13 3	22 1	0 8	1 2	4 1	0 0	24 8
58	2009/09/15	08:30:02	6 6	13 3	21 9	0 8	7 0	19 9	0 1	16.9
59	2009/09/15	08:31:02	6 7	13 2	22 1	0 8	10.0	22 2	0 0	-1.0
60	2009/09/15	08:32:02	6 5	13 4	21 8	0 8	9 2	18.0	0 0	-1 0
61	2009/09/15	08:33:02	6 5	13 6	21 6	0 8	4 8	0 7	0 0	3 0
62	2009/09/15	08:34:02	6 5	13 4	21 6	0 8	0 5	3 0	0 0	23 7
63	2009/09/15	08:35:02	6 7	13 3	21 8	0 8	2 1	13 8	0 2	22 6
64	2009/09/15	08:36:02	6 5	13 5	21 7	0 9	2 3	14 0	0 2	27 7
65	2009/09/15	08:37:02	6 5	13 5	21 5	1 1	2 1	14 0	0 2	1 8
66	2009/09/15	08:38:02	6 7	13 3	21 9	1 0	2 2	14 1	0 2	3 4
67	2009/09/15	08:39:02	6 6	13 5	21 6	0 9	2 3	14 1	2 0	21 7
68	2009/09/15	08:40:02	6 6	13 5	21 8	1 1	2 1	14.2	9 3	8 0
69	2009/09/15	08:41:02	6 7	13 4	21 6	1 1	2 1	14 2	9 6	2 7
70	2009/09/15	08:42:02	6 6	13 5	21 7	1 0	2 3	14 2	9 0	17 0
71	2009/09/15	08:43:02	6 5	13 5	22 0	1 2	2 1	14 2	9 6	6 7
72	2009/09/15	08:44:02	6 6	13 4	21 8	1 1	2 0	14 2	9 7	1 1
73	2009/09/15	08:45:02	6 5	13 5	21 8	1 2	2 2	14 2	9 2	12 9
74	2009/09/15	08:46:02	6 5	13 5	21 6	1 2	2 0	14.2	9 5	8 3
75	2009/09/15	08:47:02	6 5	13 5	21 6	1 2	2 0	14 3	9 8	2 3
76	2009/09/15	08:48:02	6 7	13 4	21 7	1 2	2 1	14 2	9 3	15 2
77	2009/09/15	08:49:02	6 6	13 4	21 5	1 2	1 9	14 3	9 7	5 9
78	2009/09/15	08:50:02	6 6	13 3	21 8	1 2	1 9	14 3	9 8	2 9
79	2009/09/15	08:51:02	6 5	13 4	21 6	1 2	2 0	14 2	9 3	16.7
80	2009/09/15	08:52:02	6 6	13 3	21 8	1 2	1 8	14 4	9 8	2 5
81	2009/09/15	08:53:02	6 6	13 4	21 6	1 4	1 9	14 3	9 8	3 5

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
82	2009/09/15	08:54:02	6 4	13 6	21 6	1 5	2 0	14 2	9 3	16.7
83	2009/09/15	08:55:02	6 5	13.4	21 5	1 4	1 8	14 3	9 9	2 9
84	2009/09/15	08:56:02	6 5	13 4	21 2	1 4	1 9	14 3	10.0	2.5
85	2009/09/15	08:57:02	6.5	13 4	21 4	1 5	2 0	14 2	9 3	17 5
86	2009/09/15	08:58:02	6.5	13 4	21 6	1 4	1 8	14 4	9 7	6 1
87	2009/09/15	08:59:02	6 6	13 3	21 5	1 4	1 8	14 4	9 8	3 0
88	2009/09/15	09:00:02	5 9	14 0	22.5	1 6	1 9	14 3	9 3	18 4
89	2009/09/15	09:01:02	3 1	16.2	28 0	1 9	1 7	14 4	9 7	4 0
90	2009/09/15	09:02:02	3 2	16 1	29 4	2.2	1 7	14 4	9 8	3 4
91	2009/09/15	09:03:02	3 1	16 3	29 2	2 4	1 9	14 3	9 1	21 6
92	2009/09/15	09:04:02	3 1	16 3	29 1	2 4	1 7	14 4	9 7	4 4
93	2009/09/15	09:05:02	3 3	16 2	28 6	2 6	1 8	14.4	10 0	3 4
94	2009/09/15	09:06:02	3 3	16.2	28 7	2 6	1 9	14 4	9 1	24 1
95	2009/09/15	09:07:02	3 5	16.1	28.4	2.6	1 7	14 5	9 6	11 4
96	2009/09/15									
97	2009/09/15									
98	2009/09/15									
99	2009/09/15	09:11:47	INVALID	INVALID	INVALID	INVALID	INVALID	INVALID	INVALID	INVALID
100	2009/09/15	09:12:47	4 35	15 9	25 67	2 07	1 91	14 5	9 58	10.23
101	2009/09/15	09:13:47	4 49	15 9	25 33	1 93	1 69	14 6	9 88	5 41
102	2009/09/15	09:14:47	4 54	15 9	25 31	1 79	1 65	14 7	10 13	1 12
103	2009/09/15	09:15:47	4 58	15 9	24 91	1 75	1 66	14 7	9 77	8 47
104	2009/09/15	09:16:47	4 62	15 8	24.75	1 68	1 42	14 7	10 24	2 14
105	2009/09/15	09:17:47	4 68	15 7	24 93	1 59	1 53	14 7	10.30	0 01
106	2009/09/15	09:18:47	4 66	15 7	24 88	1 52	1 74	14 7	9 77	8 68
107	2009/09/15	09:19:47	4 68	15 7	24 61	1 44	1 61	14 7	10 01	6 03
108	2009/09/15	09:20:47	4 74	15 7	24 48	1 44	1 61	14 7	10.23	-0 06
109	2009/09/15	09:21:47	4 71	15 8	24 82	1 41	1 84	14 6	9 70	9 74
110	2009/09/15	09:22:47	4.76	15 8	24 59	1 35	1 86	14 6	9 71	14 20
111	2009/09/15	09:23:47	4 80	15 9	24 65	1 35	1 76	14 6	10 00	1 41
112	2009/09/15	09:24:47	4 71	16 0	24 39	1 27	1 95	14 6	9 66	10 60
113	2009/09/15	09:25:47	4 41	16.2	25 11	1 28	1 87	14 6	9 77	15 74
114	2009/09/15	09:26:47	4 33	16 3	25 36	1 28	1 80	14 6	10 04	1 24
115	2009/09/15	09:27:47	4 13	16 4	25 41	1 20	1 98	14 6	9 60	8.09
116	2009/09/15	09:28:47	4 05	16 4	25 74	1 19	1 95	14 6	9 52	15 05
117	2009/09/15	09:29:47	4 04	16 4	25 99	1 15	1 79	14 6	9 99	2 40
RUN 1										
1	2009/09/15	09:30:47	4 00	16.4	26 33	1 16	1 92	14 6	10 00	3 03
2	2009/09/15	09:31:47	3 94	16 4	26.39	1 13	2 07	14 6	9 53	17 16
3	2009/09/15	09:32:47	3 93	16 5	26.37	1 12	1 93	14 6	9 75	10 75
4	2009/09/15	09:33:47	3 92	16 5	25 84	1 17	1 88	14 7	9 91	3 13
5	2009/09/15	09:34:47	3 86	16 6	25 70	1 18	2 03	14 6	9 44	15 68
6	2009/09/15	09:35:47	3 85	16 5	25 95	1 20	1 85	14 7	9 70	8 75
7	2009/09/15	09:36:47	3 85	16.5	25 87	1 21	1 88	14 7	9 81	5 05
8	2009/09/15	09:37:47	3 81	16 7	25 74	1 23	2 02	14 7	9 33	20.55
9	2009/09/15	09:38:47	3 80	16 7	25 68	1 19	1 85	14 8	9 61	8 61
10	2009/09/15	09:39:47	3 80	16 6	25 82	1 15	1 94	14 7	9 49	7 79
11	2009/09/15	09:40:47	3 84	16 6	25 59	1 10	2 00	14 7	9 48	20 80
12	2009/09/15	09:41:47	3 78	16 6	25 41	1 08	1 82	14 7	10 10	5 65
13	2009/09/15	09:42:47	3 86	16.6	25 38	1 01	2 00	14 7	9 45	10 95
14	2009/09/15	09:43:47	3 88	16 6	25 69	0 99	2 08	14 7	9 21	28 86
15	2009/09/15	09:44:47	4.01	16 5	25 54	0 98	1 90	14 8	9 72	10 81
16	2009/09/15	09:45:47	4 01	16 5	25 05	1 01	1 97	14 7	10 08	8.19
17	2009/09/15	09:46:47	4 01	16 5	24.60	1 04	2 09	14.6	9 69	23 62
18	2009/09/15	09:47:47	4 02	16.4	24 55	1 02	1 89	14 7	9 90	6 61
19	2009/09/15	09:48:47	3 97	16.4	24 73	1 03	2 01	14 6	9 67	8 58
20	2009/09/15	09:49:47	3 94	16 4	24 72	1 01	2 05	14 6	9 50	20 23
21	2009/09/15	09:50:47	3 98	16 4	24 75	0 97	1 89	14 7	9 92	4 03
22	2009/09/15	09:51:47	3 95	16 4	24.69	0 98	2 06	14 6	9 60	8.11
23	2009/09/15	09:52:47	3 97	16 4	24 70	1 01	2 11	14 5	9 45	19 13
24	2009/09/15	09:53:47	4 02	16 3	24 85	0 99	1 94	14 6	9 81	5 54
25	2009/09/15	09:54:47	4 01	16 3	24 84	0 96	2 08	14 6	9 58	9 68
26	2009/09/15	09:55:47	3 99	16 4	24 51	1 01	2 15	14 6	9 28	26 15
27	2009/09/15	09:56:47	4 05	16 3	24 53	1 02	1 98	14 6	9 56	10 05
28	2009/09/15	09:57:47	4 07	16 3	24 60	0 98	2 03	14 6	9 65	7.15
29	2009/09/15	09:58:47	4 05	16.4	24 70	1 00	2 17	14 6	9.25	27 15
30	2009/09/15	09:59:47	4 06	16.4	24 22	1 02	1 96	14.7	9 66	14 76
31	2009/09/15	10:00:47	4 05	16 4	24 18	1 03	1 98	14 6	9 74	4 95
32	2009/09/15	10:01:47	4 00	16 4	24 19	1 01	2 15	14 5	9 38	21 08
33	2009/09/15	10:02:47	4 02	16 3	24 53	1 01	1 99	14 5	9 59	14 83
34	2009/09/15	10:03:47	4 04	16 2	24 70	1 00	1 98	14 6	9 77	8.40
35	2009/09/15	10:04:47	3 95	16.3	24 91	0 98	2 23	14 5	9 34	37.46
36	2009/09/15	10:05:47	3 94	16.3	24 88	1 02	2.03	14 6	9 58	28 27
37	2009/09/15	10:06:47	3 95	16 4	25 34	1 04	1 92	14 7	10 01	4 44
38	2009/09/15	10:07:47	3 91	16 5	28 16	1 01	2 10	14 7	11 32	14 38
39	2009/09/15	10:08:47	3 84	16 6	37 63	1 01	1 92	14 8	15 90	3 59
40	2009/09/15	10:09:47	3 88	16 5	40 14	1 01	2 01	14 7	16 48	-0 46
41	2009/09/15	10:10.47	3 82	16.6	39 92	1 03	2 25	14 7	15 63	4 50
42	2009/09/15	10:11:47	3 87	16.6	39 65	1 06	2 07	14 7	15 92	2 73
43	2009/09/15	10:12:47	3 90	16 5	40 44	1 02	2 02	14.7	16 03	0 30
44	2009/09/15	10:13:47	3 97	16 4	39 98	1 04	2 28	14 6	15 31	6 59

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
45	2009/09/15	10:14:47	4.01	16.3	39.31	1.02	2.09	14.7	15.53	5.06
46	2009/09/15	10:15:47	4.14	16.3	39.57	1.09	2.05	14.7	15.81	1.03
47	2009/09/15	10:16:47	4.14	16.3	39.38	1.13	2.23	14.6	15.43	7.03
48	2009/09/15	10:17:47	4.17	16.3	39.01	1.01	2.03	14.7	15.75	3.23
49	2009/09/15	10:18:47	4.22	16.4	39.05	1.04	2.12	14.7	15.83	1.70
50	2009/09/15	10:19:47	4.15	16.5	38.69	1.06	2.15	14.8	15.48	7.59
51	2009/09/15	10:20:47	4.13	16.5	39.10	1.05	1.90	14.8	16.07	2.23
52	2009/09/15	10:21:47	4.19	16.5	38.86	1.11	1.95	14.9	16.03	0.75
53	2009/09/15	10:22:47	4.15	16.5	37.99	1.12	2.20	14.7	15.41	7.96
54	2009/09/15	10:23:47	4.25	16.4	38.39	1.04	2.00	14.8	15.79	4.03
55	2009/09/15	10:24:47	4.23	16.4	38.08	1.01	2.00	14.8	15.68	1.31
56	2009/09/15	10:25:47	4.31	16.3	38.11	1.04	2.19	14.7	15.23	7.81
57	2009/09/15	10:26:47	4.34	16.3	38.17	1.19	1.95	14.8	15.65	3.00
58	2009/09/15	10:27:47	4.30	16.3	38.03	1.23	2.05	14.8	15.51	2.53
59	2009/09/15	10:28:47	4.33	16.2	37.99	1.13	2.11	14.7	15.35	8.00
60	2009/09/15	10:29:47	4.36	16.3	38.18	1.20	1.89	14.9	15.74	1.58
RUN AVERAGES			**4.01**	**16.43**	**30.23**	**1.06**	**2.02**	**14.67**	**11.89**	**9.87**
61	2009/09/15	10:30:47	5.32	16.3	36.09	2.68	2.08	14.8	15.31	3.65
62	2009/09/15	10:31:47	9.29	17.5	23.17	6.85	2.03	14.8	15.30	6.23
63	2009/09/15	10:32:47	9.90	22.0	0.67	0.47	1.96	14.8	15.38	2.30
64	2009/09/15	10:33:47	8.82	19.9	-0.13	1.96	2.21	14.7	14.86	11.09
65	2009/09/15	10:34:47	3.74	9.3	-0.20	8.73	2.00	14.8	15.25	7.28
66	2009/09/15	10:35:47	0.00	1.4	-0.20	25.13	1.99	14.8	15.38	2.70
67	2009/09/15	10:36:47	0.00	0.9	2.87	21.72	2.12	14.8	15.17	10.64
68	2009/09/15	10:37:47	-0.02	0.3	16.64	4.77	1.90	14.9	15.70	3.63
69	2009/09/15	10:38:47	0.09	1.1	25.13	0.75	2.07	13.2	15.44	1.86
70	2009/09/15	10:39:47	1.42	5.8	26.94	0.67	2.07	5.4	16.10	7.14
71	2009/09/15	10:40:47	4.23	15.6	34.48	0.66	0.14	0.5	25.33	0.60
72	2009/09/15	10:41:47	4.24	15.9	38.39	0.48	0.00	0.5	19.58	5.62
73	2009/09/15	10:42:47	4.15	16.2	37.86	0.40	0.00	0.4	1.13	22.98
74	2009/09/15	10:43:47	4.11	16.3	37.76	0.41	1.12	4.1	0.00	25.31
75	2009/09/15	10:44:47	4.13	16.2	38.34	0.43	6.31	18.7	0.00	13.52
76	2009/09/15	10:45:47	4.11	16.2	38.76	0.40	9.92	22.2	0.00	-1.64
77	2009/09/15	10:46:47	4.12	16.3	38.58	0.43	8.64	20.6	2.19	-3.47
78	2009/09/15	10:47:47	4.18	16.2	38.46	0.52	3.25	15.0	11.45	-1.54
79	2009/09/15	10:48:47	4.25	16.2	39.04	0.47	2.07	14.9	15.25	4.05
80	2009/09/15	10:49:47	4.23	16.3	39.11	0.46	2.02	14.9	15.38	8.24
81	2009/09/15	10:50:47	4.25	16.3	38.68	0.44	1.81	15.0	15.76	0.94
82	2009/09/15	10:51:47	4.27	16.3	38.71	0.47	1.96	14.9	15.61	2.05
83	2009/09/15	10:52:47	4.28	16.4	38.41	0.47	2.02	14.9	15.26	7.18
84	2009/09/15	10:53:47	4.30	16.4	38.00	0.49	1.85	15.0	15.71	2.14
85	2009/09/15	10:54:47	4.27	16.4	38.46	0.61	1.96	14.9	15.54	2.17
86	2009/09/15	10:55:47	4.18	16.5	38.44	0.67	2.00	14.9	15.25	5.40
87	2009/09/15	10:56:47	4.19	16.4	39.06	0.69	1.84	14.9	15.79	1.22
88	2009/09/15	10:57:47	4.11	16.4	38.93	0.76	1.97	14.8	15.62	1.84
89	2009/09/15	10:58:47	4.04	16.3	39.32	0.60	2.09	14.8	15.67	8.46
90	2009/09/15	10:59:47	4.11	16.3	40.00	0.60	1.91	14.9	15.42	2.84
RUN 2										
1	2009/09/15	11:00:47	4.07	16.3	39.65	0.60	2.07	14.8	15.13	5.35
2	2009/09/15	11:01:47	4.06	16.4	39.03	0.60	2.20	14.6	14.98	16.62
3	2009/09/15	11:02:47	4.11	16.3	39.58	0.56	1.95	14.9	15.86	4.02
4	2009/09/15	11:03:47	4.15	16.3	39.48	0.55	2.26	14.8	15.34	13.05
5	2009/09/15	11:04:47	4.16	16.2	39.54	0.61	2.09	14.8	15.72	13.93
6	2009/09/15	11:05:47	4.29	16.1	39.95	0.64	1.93	14.8	16.32	0.72
7	2009/09/15	11:06:47	4.30	16.1	39.71	0.65	2.12	14.8	15.78	2.60
8	2009/09/15	11:07:47	4.29	16.1	39.47	0.57	2.13	14.8	15.58	5.03
9	2009/09/15	11:08:47	4.33	16.1	38.97	0.61	1.97	14.9	15.67	1.28
10	2009/09/15	11:09:47	4.25	16.3	38.12	0.68	2.13	14.9	15.11	4.38
11	2009/09/15	11:10:47	4.30	16.2	37.76	0.71	2.10	14.9	14.81	9.25
12	2009/09/15	11:11:47	4.28	16.2	37.38	0.61	1.96	15.0	15.20	2.08
13	2009/09/15	11:12:47	4.22	16.3	37.63	0.64	2.21	14.9	14.81	8.07
14	2009/09/15	11:13:47	4.25	16.2	37.45	0.67	2.07	14.9	14.98	8.16
15	2009/09/15	11:14:47	4.25	16.2	37.26	0.67	1.98	15.0	15.13	1.48
16	2009/09/15	11:15:47	4.24	16.2	37.38	0.65	2.22	14.8	14.67	7.79
17	2009/09/15	11:16:47	4.28	16.1	37.55	0.60	2.05	14.9	15.01	4.70
18	2009/09/15	11:17:47	4.28	16.1	37.09	0.61	2.12	14.8	14.90	3.37
19	2009/09/15	11:18:47	4.30	16.1	37.18	0.63	2.24	14.8	14.73	11.55
20	2009/09/15	11:19:47	4.29	16.1	37.33	0.60	2.01	14.9	15.17	3.26
21	2009/09/15	11:20:47	4.30	16.1	37.67	0.60	2.18	14.8	15.08	5.44
22	2009/09/15	11:21:47	4.32	16.1	38.73	0.60	2.17	14.8	15.48	10.17
23	2009/09/15	11:22:47	4.30	16.0	39.28	0.61	2.00	14.9	16.11	1.46
24	2009/09/15	11:23:47	4.27	16.0	39.39	0.63	2.27	14.7	15.79	5.94
25	2009/09/15	11:24:47	4.30	16.0	39.36	0.61	2.17	14.8	15.91	7.35
26	2009/09/15	11:25:47	4.31	16.0	39.71	0.63	2.08	14.9	16.15	2.05
27	2009/09/15	11:26:47	4.27	16.2	39.60	0.63	2.28	14.9	15.62	9.62
28	2009/09/15	11:27:47	4.33	16.1	39.33	0.63	2.09	14.9	15.99	6.08
29	2009/09/15	11:28:47	4.30	16.1	39.43	0.60	2.01	15.0	16.27	0.90
30	2009/09/15	11:29:47	4.26	16.1	39.72	0.61	2.31	14.8	15.67	7.17
31	2009/09/15	11:30:47	4.29	16.1	39.51	0.69	2.19	14.8	15.82	6.64

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
32	2009/09/15	11:31:47	4 30	16 0	39 36	0 74	2 16	14 8	15 89	2 81
33	2009/09/15	11:32:47	4 27	15 9	39 80	0 67	2 37	14 7	15 44	11 00
34	2009/09/15	11:33:47	4 29	15 8	40 02	0 65	2 15	14 7	15 85	5 26
35	2009/09/15	11:34:47	4 27	15 9	40 38	0 61	2 26	14 7	15 83	4 50
36	2009/09/15	11:35:47	4 27	15 9	39 88	0 64	2 35	14 7	15 54	14 10
37	2009/09/15	11:36:47	4 32	15 9	40 09	0 67	2 11	14 8	16 00	5 04
38	2009/09/15	11:37:47	4 30	15 9	40 02	0 67	2 15	14 8	15 99	2 76
39	2009/09/15	11:38:47	4 30	15 8	39 98	0 69	2 32	14 7	15 55	10 60
40	2009/09/15	11:39:47	4 35	15 7	40 09	0 77	2 13	14 8	15 91	4 03
41	2009/09/15	11:40:47	4 37	15 6	39 73	0 77	2 32	14 6	15 63	5 70
42	2009/09/15	11:41:47	4 35	15 6	39 61	0 77	2 32	14 5	15 50	13 16
43	2009/09/15	11:42:47	4 40	15 5	39 43	0 77	2 11	14 5	16 10	2 60
44	2009/09/15	11:43:47	4 38	15 5	39 80	0 67	2 30	14 4	15 84	4 61
45	2009/09/15	11:44:47	4 41	15 5	39 76	0 71	2 31	14 4	15 67	9 34
46	2009/09/15	11:45:47	4 46	15 4	39 88	0 73	2 13	14 5	16 03	1 88
47	2009/09/15	11:46:47	4 37	15 5	39 59	0 72	2 31	14 4	15 72	4 49
48	2009/09/15	11:47:47	4 40	15 6	39 65	0 69	2 34	14 4	15 61	11 11
49	2009/09/15	11:48:47	4 39	15 6	39 69	0 64	2 15	14 5	15 84	2 74
50	2009/09/15	11:49:47	4 38	15 7	39 15	0 70	2 39	14 4	15 29	7 63
51	2009/09/15	11:50:47	4 38	15 7	38 73	0 80	2 21	14 5	15 45	6 92
52	2009/09/15	11:51:47	4 31	15 8	38 64	0 80	2 20	14 6	15 45	3 57
53	2009/09/15	11:52:47	4 33	15 8	38 04	0 81	2 38	14 4	15 03	12 67
54	2009/09/15	11:53:47	4 37	15 7	37 54	0 83	2 18	14 5	15 44	3 95
55	2009/09/15	11:54:47	4 37	15 7	37 96	0 80	2 35	14 5	15 20	6 05
56	2009/09/15	11:55:47	4 40	15 6	38 18	0 80	2 32	14 4	15 34	11 88
57	2009/09/15	11:56:47	4 46	15 6	38 50	0 80	2 15	14 5	15 73	2 47
58	2009/09/15	11:57:47	4 44	15 6	38 50	0 80	2 39	14 4	15 22	7 72
59	2009/09/15	11:58:47	4 51	15 5	38 66	0 81	2 27	14 4	15 41	8 23
60	2009/09/15	11:59:47	4 51	15 3	38 94	0 87	2 19	14 3	15 71	1 46
RUN AVERAGES			4.31	15 92	38.98	0.68	2 18	14.70	15.53	6.30
61	2009/09/15	12:00:47	4 44	15 3	39 16	0 88	2.35	14 2	15 37	6.07
62	2009/09/15	12:01:47	4 39	15 2	39 06	0 80	2 12	14 3	15 84	1 62
63	2009/09/15	12:02:47	4 12	13 5	39 28	2 19	2 30	14 2	15 60	3 17
64	2009/09/15	12:03:47	2 60	5 8	35 56	6 24	2 38	14 1	15 40	8 77
65	2009/09/15	12:04:47	0 00	1 0	25 09	2 30	2 24	14 2	15 68	1 84
66	2009/09/15	12:05:47	-0.02	0.5	19 25	8.49	2 44	14 1	15 34	5 53
67	2009/09/15	12:06:47	1 02	2 8	1 53	26.12	2 38	14 1	15 31	9 97
68	2009/09/15	12:07:47	6.20	13 5	-0 06	17 22	2 25	14 2	15 80	1 81
69	2009/09/15	12:08:47	9 80	22.1	-0.20	1 47	2 68	13 2	15 16	8 27
70	2009/09/15	12:09:47	8 74	20 7	3 13	0.49	2 76	7 6	15 89	7 88
71	2009/09/15	12:10:47	4 73	15 7	20 59	1 04	0 53	0 5	21 52	-0 11
72	2009/09/15	12:11:47	4 51	15 5	39 08	1 00	0 00	0 5	25.46	-1.90
73	2009/09/15	12:12:47	4 57	15 4	38 83	0 76	0 00	0 4	21.62	2.23
74	2009/09/15	12:13:47	4 62	15 4	39 09	0 73	0.00	0.4	5 77	16 32
75	2009/09/15	12:14:47	4 62	15 4	39 04	0 72	0 81	3.3	0 05	25.05
76	2009/09/15	12:15:47	4 64	15 5	38 29	0 79	5 12	16 0	0 11	16 01
77	2009/09/15	12:16:47	4 62	15 4	37 75	0 77	9.84	22.3	-0.02	-1 82
78	2009/09/15	12:17:47	4 59	15 4	37 59	0 81	9 52	21 4	0 16	-3 86
79	2009/09/15	12:18:47	4 59	15 4	37 93	0 82	6 59	17 3	3.97	-3 15
80	2009/09/15	12:19:47	4 65	15 3	38 43	0 76	2 42	14 3	15 05	-0 98
81	2009/09/15	12:20:47	4 64	15 3	37 69	0 77	2 46	14 2	14 98	11 23
82	2009/09/15	12:21:47	4 69	15 2	37 58	0 90	2 26	14 2	15 34	6 38
83	2009/09/15	12:22:47	4 67	15 3	37 95	0 88	2 32	14 2	15 46	2 74
84	2009/09/15	12:23:47	4 63	15 3	38 03	0 81	2 42	14 2	15 16	10 08
85	2009/09/15	12:24:47	4 65	15 3	37 71	0 85	2 22	14 3	15 69	3 39
86	2009/09/15	12:25:47	4 61	15 3	37 85	0 77	2 28	14 3	15 72	2 46
87	2009/09/15	12:26:47	4 63	15 3	37 98	0 81	2 44	14 3	15 14	10 54
88	2009/09/15	12:27:47	4 67	15 3	38 26	0 90	2 21	14 3	15 48	4 43
89	2009/09/15	12:28:47	4 69	15 3	38 39	1 05	2 32	14 3	15 57	3 08
90	2009/09/15	12:29:47	4 61	15 4	38 90	1 07	2 44	14 3	15 16	12 05
91	2009/09/15	12:30:47	4 60	15 4	38 87	0 98	2 25	14 3	15 54	5 91
92	2009/09/15	12:31:47	4 61	15 3	38 73	1 06	2 23	14 4	15 80	1 70
93	2009/09/15	12:32:47	4 57	15 4	39 05	0 82	2 48	14 3	15 15	9 98
94	2009/09/15	12:33:47	4 57	15 5	38 97	0 87	2 31	14 4	15 50	8 92
95	2009/09/15	12:34:47	4 61	15 5	39 08	0 89	2 27	14 4	15 72	1 97
96	2009/09/15	12:35:47	4 55	15 5	39 60	0 83	2 43	14 5	15 28	9 54
97	2009/09/15	12:36:47	4 57	15 6	38 74	0 85	2 29	14 5	15 57	7 81
98	2009/09/15	12:37:47	4 55	15 6	38 98	0 91	2 16	14 4	15 85	0 67
99	2009/09/15	12:38:47	4 51	15 5	39 58	0 86	2 39	14 3	15 56	4 21
100	2009/09/15	12:39:47	4 51	15 5	39 26	0 95	2 34	14 3	15 49	9 06
101	2009/09/15	12:40:47	4 49	15 5	39 51	0 87	2 19	14 4	15 89	0 94
102	2009/09/15	12:41:47	4 53	15 5	39 97	0 92	2 37	14 3	15 55	3 99
103	2009/09/15	12:42:47	4 42	15 6	39 58	1 00	2 34	14 4	15 34	9 29
104	2009/09/15	12:43:47	4 39	15 6	39 06	1 00	2 14	14 4	15 78	1 55
105	2009/09/15	12:44:47	4 37	15 5	39 36	0 98	2 22	14 3	15 71	1 08
106	2009/09/15	12:45:47	4 34	15 5	39 58	0 91	2 38	14 3	15 24	7 53
107	2009/09/15	12:46:47	4 39	15 4	38 94	0 94	2 21	14 3	15 66	3 73
108	2009/09/15	12:47:47	4 41	15 4	38 67	0 93	2 23	14 2	15 74	0 78
109	2009/09/15	12:48:47	4.39	15 4	39 00	0 93	2 42	14 3	15 21	8 93

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
110	2009/09/15	12:49:47	4 40	15 6	38 69	0 92	2 34	14 4	15 30	10 87
111	2009/09/15	12:50:47	4 50	15 6	38 56	1 01	2.20	14 4	15 74	1 85
112	2009/09/15	12:51:47	4 47	15 6	38 22	1 01	2 31	14 4	15 46	4 42
RUN 3										
1	2009/09/15	12:52:47	4 45	15 6	37 82	0 93	2 26	14 3	15 30	12 39
2	2009/09/15	12:53:47	4 47	15 5	37 56	0 91	2 02	14 4	15 84	2 89
3	2009/09/15	12:54:47	4 49	15 5	37 87	0 95	2 10	14 3	15 73	2 18
4	2009/09/15	12:55:47	4 43	15 5	37 41	1 01	2.21	14 3	15 29	9 38
5	2009/09/15	12:56:47	4 48	15 4	37 99	1 04	2.01	14 3	15 65	2 89
6	2009/09/15	12:57:47	4 45	15 4	37 98	1 05	2 13	14 3	15 49	3 06
7	2009/09/15	12:58:47	4 47	15 3	37 89	1 00	2 21	14 2	15 34	8 75
8	2009/09/15	12:59:47	4 51	15 2	38 09	1 00	2 10	14 2	15 56	1 81
9	2009/09/15	13:00:47	4 43	15 3	37 74	1 01	2 27	14 2	15 32	6 87
10	2009/09/15	13:01:47	4 42	15 4	37 98	1 03	2.19	14 2	15 37	12 05
11	2009/09/15	13:02:47	4 43	15 4	37 96	1 00	2 06	14 3	15 52	1 59
12	2009/09/15	13:03:47	4 43	15 4	37 21	0 99	2 23	14 3	15 08	7 95
13	2009/09/15	13:04:47	4 41	15 5	36 75	0 98	2 13	14 3	15 26	9 74
14	2009/09/15	13:05:47	4 43	15 4	37 52	1 04	2 02	14 3	15 38	0 95
15	2009/09/15	13:06:47	4 39	15 4	37 70	1 15	2 28	14 2	14 93	8 07
16	2009/09/15	13:07:47	4 44	15 3	37 47	1 13	2.21	14 2	15 00	11 85
17	2009/09/15	13:08:47	4 48	15 3	37 78	1 22	2 11	14 3	15 28	3 36
18	2009/09/15	13:09:47	4 47	15 3	37 38	1 05	2 30	14 1	15 05	12.41
19	2009/09/15	13:10:47	4 52	15 3	37 39	1 01	2 12	14.2	15 27	8 31
20	2009/09/15	13:11:47	4 53	15 3	37 18	1 09	2 18	14.2	15 29	4 02
21	2009/09/15	13:12:47	4 49	15 3	37 46	1 17	2 23	14 2	15 00	12 02
22	2009/09/15	13:13:47	4 55	15 3	37 32	1 18	2.01	14 3	15 51	2 63
23	2009/09/15	13:14:47	4 44	15 3	36 77	1 09	2 16	14 3	15 21	3 85
24	2009/09/15	13:15:47	4 39	15 4	36 49	1 03	2 20	14.2	15 17	11 28
25	2009/09/15	13:16:47	4 41	15 4	36 69	1 05	1 98	14.3	15 58	2 12
26	2009/09/15	13:17:47	4 36	15 3	36 90	1 10	2 17	14 2	15 12	5 03
27	2009/09/15	13:18:47	4 29	15 4	37 08	1 09	2 18	14 2	15 07	11 66
28	2009/09/15	13:19:47	4 31	15 3	37 04	1 06	1 99	14 2	15 47	1 64
29	2009/09/15	13:20:47	4 35	15 3	37 61	1 14	2 21	14 1	15 26	5.42
30	2009/09/15	13:21:47	4 36	15 2	37 59	1 15	2 29	14.0	15 05	16 13
31	2009/09/15	13:22:47	4 39	15 2	38 06	1 11	2 05	14.1	15 61	4 17
32	2009/09/15	13:23:47	4 45	15 2	38 02	1 15	2 20	14 1	15 28	4 74
33	2009/09/15	13:24:47	4 37	15 3	38 16	1 07	2.25	14 1	15 10	13 82
34	2009/09/15	13:25:47	4 45	15 2	38 13	1 08	2 06	14 2	15 60	4 50
35	2009/09/15	13:26:47	4 47	15 2	37 94	1 15	2 14	14.2	15 54	2 96
36	2009/09/15	13:27:47	4 39	15 4	37 43	1 20	2 25	14.2	15 04	12 49
37	2009/09/15	13:28:47	4 32	15 5	37 23	1 19	2 04	14 3	15 35	7 46
38	2009/09/15	13:29:47	4 35	15 5	37 58	1 15	2 00	14 3	15 52	1 72
39	2009/09/15	13:30:47	4 32	15 6	36 85	1 20	2.20	14 2	15 08	9 20
40	2009/09/15	13:31:47	4 36	15 5	37 05	1 19	2 02	14 2	15 46	5 98
41	2009/09/15	13:32:47	4 36	15 4	37 50	1 15	2 11	14.2	15 38	3 79
42	2009/09/15	13:33:47	4 36	15 5	37 03	1 20	2 20	14 1	15 33	12.97
43	2009/09/15	13:34:47	4 45	15 4	37 03	1 20	1 99	14 2	15 60	2 79
44	2009/09/15	13:35:47	4 42	15 4	37 32	1 23	2 18	14 2	15 26	6 02
45	2009/09/15	13:36:47	4 41	15 3	37 53	1 36	2 08	14 2	15 37	8 97
46	2009/09/15	13:37:47	4 41	15 3	37 79	1 42	1 98	14.2	15 73	0 55
47	2009/09/15	13:38:47	4 33	15 4	37 66	1 34	2 15	14.2	15 29	5 69
48	2009/09/15	13:39:47	4 30	15 4	37 13	1 23	2 01	14.3	15 36	6 65
49	2009/09/15	13:40:47	4 24	15 4	37 27	1 20	1 89	14 3	15 71	-0 04
50	2009/09/15	13:41:47	4 25	15 4	38 08	1 20	2 08	14 2	15 29	3 95
51	2009/09/15	13:42:47	4 23	15 4	38 14	1 20	2 02	14 2	15 26	7 51
52	2009/09/15	13:43:47	4 28	15 3	38 29	1 20	1 87	14 2	15 85	-0 10
53	2009/09/15	13:44:47	4 32	15 3	38 49	1 20	2 07	14.2	15 45	1 91
54	2009/09/15	13:45:47	4 30	15 4	38 45	1 20	2 16	14.2	15 16	8 79
55	2009/09/15	13:46:47	4 29	15 5	37 86	1 21	1 98	14 3	15 53	3 91
56	2009/09/15	13:47:47	4 36	15 5	37 99	1 23	1 99	14 3	15 63	0 26
57	2009/09/15	13:48:47	4 36	15 5	38 70	1 19	2 15	14 3	15 14	6 73
58	2009/09/15	13:49:47	4 30	15 6	38 85	1 18	2 04	14 4	15 35	8 72
59	2009/09/15	13:50:47	4 32	15 6	38 56	1 21	1 87	14 4	15 82	0 13
60	2009/09/15	13:51:47	4 32	15 6	38 13	1 23	2 03	14 3	15 46	2 00
RUN AVERAGES			**4 39**	**15.39**	**37 63**	**1.13**	**2 11**	**14.23**	**15.37**	**6 01**
61	2009/09/15	13:52:47	4 17	14 1	37 31	2 93	2 10	14.2	15 17	8 15
62	2009/09/15	13:53:47	2 93	6 9	32 63	8 02	1 88	14 3	15 62	1 45
63	2009/09/15	13:54:47	-0 07	1 1	23 69	2 72	2.04	14 2	15 48	2.24
64	2009/09/15	13:55:47	-0 10	0 8	**25.00**	**0.40**	2 07	14 2	15 23	8 11
65	2009/09/15	13:56:47	**-0.10**	0 6	24 40	1 37	1 87	14 4	15 67	1 16
66	2009/09/15	13:57:47	-0 09	0.5	17 72	10 30	2 02	14 3	15 38	4 00
67	2009/09/15	13:58:47	0 98	2 6	0 89	**25.44**	1 94	14 3	15 38	7 29
68	2009/09/15	13:59:47	6 06	13 3	-0 18	17 81	1 80	14 4	15 63	-0 21
69	2009/09/15	14:00:47	**9.80**	**22.1**	**-0.20**	1 80	2 18	13 6	15 17	4 83
70	2009/09/15	14:01:47	8 75	20 8	3 27	1 46	2 35	8 7	16 47	7 85
71	2009/09/15	14:02:47	4 66	16 3	20 74	1 54	0 59	0 5	**25.48**	**-1.09**
72	2009/09/15	14:03:47	4 17	15 7	37 44	1 53	-0 10	0 5	21 75	1 08
73	2009/09/15	14:04:47	4 14	15 6	37 49	1 50	**-0.10**	**0.5**	6 33	15 12
74	2009/09/15	14 05:47	4 20	15 5	37 48	1 43	0 31	2.4	0 07	24.95

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2, THC			
Client	Valero	Units	SCOT 1 and 2
Project No	09-129	Operation	normal
Plant	Valero DCR	Location	Exhaust

MINUTE	DATE	TIME	203 O2 (DV %)	203 CO2 (DV %)	203 NOx (PPMdv)	203 CO (PPMdv)	804 O2 (DV %)	804 CO2 (DV %)	804 NOx (PPMdv)	804 CO (PPMdv)
75	2009/09/15	14:06:47	4 21	15 5	37 68	1 61	3 42	12 4	0 31	17 94
76	2009/09/15	14:07:47	4 19	15 4	37 54	1 35	9 46	22 2	0 16	0 04
77	2009/09/15	14:08:47	4 24	15 4	37 29	1 17	9 88	22 1	0 00	0 50
78	2009/09/15	14:09:47	4 44	15 2	37 94	1 08	10 44	17 9	1 20	0 22
79	2009/09/15	14:10:47	8 48	11 7	33 66	0 88	14 46	3 5	4 53	1 00
80	2009/09/15	14:11:47	20 83	1 4	19 40	-0 08	20 84	0 6	0 09	1 00

SCOT 1 (203)

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valeor	Date	September 15, 2009
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	Run 3
Unit	Scot 1 (203)	Start Time	09:45:47
Operation	Normal	End Time	10:44:47
Tester(s)	JCC, cb, mb, fb, th		

Cal.	LOW		MID		HIGH			Conc.	Response Time	
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	Span	Units	Up	Down
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %	38	38
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %	39	40
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv	60	60
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv	70	70
LIMITS				40 % to 60 %		80 % to 100 %				
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %				

	Upscale: Enter "Low" "Mid" or "High" below "Zero"			Initial Values		Final Values				Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
Gas		Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span				
O2	Zero		-0.1	-0.10	0.00	-0.02	0.35	0.35	22.59	-0.060642806			
	Mid	9.885	9.8	9.80	0.00	9.90	0.44	0.44	22.59	9.849999809	4.01	4.06	d. vol. %
CO2	Zero		0.2	0.30	0.44	0.30	0.44	0.00	22.58	0.3			
	HIGH	22.58	22.6	21.90	-3.10	21.97	-2.79	0.31	22.58	21.93446941	16.43	16.83	d. vol. %
NOx	Zero		-0.2	-0.20	0.00	-0.20	0.00	0.00	52.5	-0.200000001			
	Mid	25.5	25.4	25.30	-0.19	25.13	-0.51	-0.32	52.5	25.21655216	30.23	30.53	ppmdv
CO	Zero		0.0	0.10	0.18	0.47	0.83	0.65	56.7	0.285			
	Mid	25.6	25.6	26.00	0.71	25.13	-0.84	-1.54	56.7	25.56316757	1.06	0.79	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.44					9.885	9.8	-0.38		22.59	22.6	0.04		22.59	d. vol. %
CO2	0.2	0.89					9.967	10.0	0.15		22.58	22.6	0.09		22.58	d. vol. %
NOx	-0.2	-0.38					25.5	25.4	-0.19		52.5	52.3	-0.38		52.5	ppmdv
CO	0.0	0.00					25.6	25.6	0.00		56.7	57.0	0.53		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valcor	Date	2009/09/15
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	Run 2
Unit	Scot 1 (203)	Start Time	11:00:47
Operation	Normal	End Time	11:59:47
Tester(s)	JCC, cb, mb, fb, th		

Cal. Gas	LOW		MID		HIGH		Span	Conc. Units
	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)		
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv
LIMITS				40 % to 60 %		80 % to 100 %		
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %		

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values		Final Values		Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
				System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)						
O2	Zero		-0.1	-0.02	0.35	-0.02	0.34	-0.01	22.59	-0.022618388			
	Mid	9.885	9.8	9.90	0.44	9.80	-0.01	-0.45	22.59	9.848950863	4.31	4.34	d. vol %
CO2	Zero		0.2	0.30	0.44	0.50	1.33	0.89	22.58	0.4			
	HIGH	22.58	22.6	21.97	-2.79	22.10	-2.21	0.58	22.58	22.03446941	15.92	16.20	d. vol. %
NOx	Zero		-0.2	-0.20	0.00	-0.20	0.00	0.00	52.5	-0.200000003			
	Mid	25.5	25.4	25.13	-0.51	25.09	-0.59	-0.08	52.5	25.1112175	38.98	39.47	ppmdv
CO	Zero		0.0	0.47	0.83	0.49	0.86	0.04	56.7	0.48			
	Mid	25.6	25.6	25.13	-0.84	26.12	0.92	1.75	56.7	25.62316757	0.68	0.20	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.44					9.885	9.8	-0.38		22.59	22.6	0.04		22.59	d. vol. %
CO2	0.2	0.89					9.967	10.0	0.15		22.58	22.6	0.09		22.58	d. vol. %
NOx	-0.2	-0.38					25.5	25.4	-0.19		52.5	52.3	-0.38		52.5	ppmdv
CO	0.0	0.00					25.6	25.6	0.00		56.7	57.0	0.53		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valeor	Date	September 9, 2008
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	Run 3
Unit	Scot 1 (203)	Start Time	12:52:47
Operation	Normal	End Time	13:51:47
Tester(s)	JCC, cb, mb, fb, th		

Cal. Gas	LOW		MID		HIGH		Span	Conc. Units
	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)		
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv
LIMITS				40 % to 60 %		80 % to 100 %		
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %		

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		-0.1	-0.02	0.34	-0.10	0.01	-0.33	22.59	-0.0609259915			
	Mid	9.885	9.8	9.80	-0.01	9.80	0.00	0.01	22.59	9.798951149	4.39	4.46	d. vol. %
CO2	Zero		0.2	0.50	1.33	0.47	1.21	-0.12	22.58	0.486869782			
	HIGH	22.58	22.6	22.10	-2.21	22.10	-2.21	0.00	22.58	22.1	15.39	15.57	d. vol. %
NOx	Zero		-0.2	-0.20	0.00	-0.20	0.00	0.00	52.5	-0.200000003			
	Mid	25.5	25.4	25.09	-0.59	25.00	-0.76	-0.17	52.5	25.04466534	37.63	38.21	ppmdv
CO	Zero		0.0	0.49	0.86	0.40	0.71	-0.16	56.7	0.445			
	Mid	25.6	25.6	26.12	0.92	25.44	-0.28	-1.20	56.7	25.7794767	1.13	0.69	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.44					9.885	9.8	-0.38		22.59	22.6	0.04		22.59	d. vol. %
CO2	0.2	0.89					9.967	10.0	0.15		22.58	22.6	0.09		22.58	d. vol. %
NOx	-0.2	-0.38					25.5	25.4	-0.19		52.5	52.3	-0.38		52.5	ppmdv
CO	0.0	0.00					25.6	25.6	0.00		56.7	57.0	0.53		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

SCOT 2 (804)

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valero	Date	2009/09/15
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	Run 1
Unit	SCOT 2 (804)	Start Time	09:45:47
Operation	normal	End Time	10:44:47
Tester(s)	JCC, cb, mb, fb, th		

Cal.	LOW		MID		HIGH			Conc.	Response Time	
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	Span	Units	Up	Down
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %	26	27
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %	27	28
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv	40	40
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv	40	40
LIMITS				40 % to 60 %		80 % to 100 %				
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %				

	Upscale, Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span				
O2	Zero		0.0	-0.10	-0.44	0.00	0.00	0.44	22.59	-0.05			
	Mid	9.885	9.9	10.00	0.44	9.92	0.10	-0.34	22.59	9.961788654	2.02	2.05	d. vol. %
CO2	Zero		0.1	0.20	0.44	0.41	1.39	0.94	22.58	0.306617162			
	HIGH	22.58	22.7	22.20	-2.21	22.24	-2.02	0.20	22.58	22.22210846	14.67	14.80	d. vol. %
NOx	Zero		0.0	-0.10	-0.19	0.00	0.00	0.19	52.5	-0.05			
	Mid	25.5	25.5	25.50	0.00	25.33	-0.32	-0.32	52.5	25.415	11.89	11.96	ppmdv
CO	Zero		-0.1	-1.00	-1.59	-1.64	-2.72	-1.13	56.7	-1.32			
	Mid	25.6	25.6	24.80	-1.41	25.31	-0.51	0.90	56.7	25.055	9.87	10.87	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					9.885	9.9	0.07		22.59	22.7	0.49		22.59	d. vol. %
CO2	0.1	0.44					9.967	9.9	-0.30		22.58	22.7	0.53		22.58	d. vol. %
NOx	0.0	0.00					25.5	25.5	0.00		52.5	52.5	0.00		52.5	ppmdv
CO	-0.1	-0.18					25.6	25.6	0.00		56.7	56.8	0.18		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valero	Date	2009/09/15
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	2
Unit	SCOT 2 (804)	Start Time	11:00:47
Operation	normal	End Time	11:59:47
Tester(s)	JCC, cb, mb, fb, th		

Cal.	LOW		MID		HIGH			Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	Span	Units
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv
LIMITS				40 % to 60 %		80 % to 100 %		
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %		

	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values		Final Values		Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
Gas				System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)						
O2	Zero		0.0	0.00	0.00	0.00	0.00	0.00	22.59	0			
	Mid	9.885	9.9	9.92	0.10	9.84	-0.26	-0.36	22.59	9.882770538	2.18	2.18	d. vol. %
CO2	Zero		0.1	0.41	1.39	0.40	1.33	-0.05	22.58	0.407141715			
	HIGH	22.58	22.7	22.24	-2.02	22.29	-1.80	0.22	22.58	22.26907635	14.70	14.76	d. vol. %
NOx	Zero		0.0	0.00	0.00	-0.02	-0.03	-0.03	52.5	-0.007693349			
	Mid	25.5	25.5	25.33	-0.32	25.46	-0.08	0.24	52.5	25.39343742	15.53	15.60	ppmdv
CO	Zero		-0.1	-1.64	-2.72	-1.90	-3.17	-0.46	56.7	-1.77			
	Mid	25.6	25.6	25.31	-0.51	25.05	-0.97	-0.46	56.7	25.18	6.30	7.66	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
Gas																
O2	0.0	0.00					9.885	9.9	0.07		22.59	22.7	0.49		22.59	d. vol. %
CO2	0.1	0.44					9.967	9.9	-0.30		22.58	22.7	0.53		22.58	d. vol. %
NOx	0.0	0.00					25.5	25.5	0.00		52.5	52.5	0.00		52.5	ppmdv
CO	-0.1	-0.18					25.6	25.6	0.00		56.7	56.8	0.18		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 6C

Client	Valero	Date	#REF!
Project No	09-129	Location	Exhaust
Plant	Valero DCR	Run	3
Unit	SCOT 2 (804)	Start Time	12:52:47
Operation	normal	End Time	13:51:47
Tester(s)	JCC, cb, mb, fb, th		

Cal. Gas	LOW		MID		HIGH		Span	Conc. Units
	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)		
O2	N/A	N/A	9.885	43.8	22.59	100.0	22.59	d. vol. %
CO2	N/A	N/A	9.967	44.1	22.58	100.0	22.58	d. vol. %
NOx	N/A	N/A	25.5	48.6	52.5	100.0	52.5	ppmdv
CO	N/A	N/A	25.6	45.1	56.7	100.0	56.7	ppmdv
LIMITS				40 % to 60 %		80 % to 100 %		
THC LIMITS		25 % to 35 %		45 % to 55 %		80 % to 90 %		

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.00	0.00	-0.10	-0.44	-0.44	22.59	-0.050000001			
	Mid	9.885	9.9	9.84	-0.26	9.88	-0.10	0.16	22.59	9.859951019	2.11	2.15	d. vol. %
CO2	Zero		0.1	0.40	1.33	0.48	1.69	0.36	22.58	0.441777334			
	HIGH	22.58	22.7	22.29	-1.80	22.20	-2.23	-0.43	22.58	22.24520111	14.23	14.28	d. vol. %
NOx	Zero		0.0	-0.02	-0.03	0.00	0.00	0.03	52.5	-0.007693349			
	Mid	25.5	25.5	25.46	-0.08	25.48	-0.04	0.04	52.5	25.46843742	15.37	15.39	ppmdv
CO	Zero		-0.1	-1.90	-3.17	-1.09	-1.74	1.43	56.7	-1.494468284			
	Mid	25.6	25.6	25.05	-0.97	24.95	-1.15	-0.18	56.7	25	6.01	7.25	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					9.885	9.9	0.07		22.59	22.7	0.49		22.59	d. vol. %
CO2	0.1	0.44					9.967	9.9	-0.30		22.58	22.7	0.53		22.58	d. vol. %
NOx	0.0	0.00					25.5	25.5	0.00		52.5	52.5	0.00		52.5	ppmdv
CO	-0.1	-0.18					25.6	25.6	0.00		56.7	56.8	0.18		56.7	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

APPENDIX C

Calibration QA/QC Data

NOX CONVERTER EFFICIENCY TEST **SCOT 1 NOX ANALYZER**

MUST USE NO2 GAS BETWEEN 40 AND 60 PPMV
PER 7.1.4

NO2 CAL GAS USED
MUST BE EPA PROTOCOL

46.7

ANALYZER RESPONSE

DATE	TIME	NOX RESPONSE
2009/09/15	07:49:02	47
2009/09/15	07:50:02	47.1
2009/09/15	07:51:02	47.1
2009/09/15	07:52:02	47
2009/09/15	07:53:02	47
2009/09/15	07:54:02	47.1
2009/09/15	07:55:02	47
2009/09/15	07:56:02	47.1
2009/09/15	07:57:02	47
AVERAGE RESPONSE		47.04444444

EQ. 7E-7

$$EFFNO2 = \frac{\text{MEASURED CONCENTRATION OF CALIBRATION GAS}}{\text{MANUFACTURER CERTIFIED CONCENTRATION OF CAL GAS}} \times 100$$

$$EFFNO2 = \frac{47.04444444}{46.7} \times 100$$

EFFNO2 = 8

MUST BE GREATER THAN OR EQUAL TO 90 PERCENT
PER 13.5

NOX CONVERTER EFFICIENCY TEST **SCOT 2 NOX ANALYZER**

MUST USE NO2 GAS BETWEEN 40 AND 60 PPMV
PER 7.1.4

NO2 CAL GAS USED
MUST BE EPA PROTOCOL

46.7

ANALYZER RESPONSE

DATE	TIME	NOX RESPONSE
2009/09/15	08:05:02	46.9
2009/09/15	08:06:02	46.8
2009/09/15	08:07:02	47
2009/09/15	08:08:02	46.9
2009/09/15	08:09:02	46.9
2009/09/15	08:10:02	46.9
2009/09/15	08:11:02	47

AVERAGE RESPONSE 46.91428571

EQ. 7E-7

$$EFFNO2 = \frac{\text{MEASURED CONCENTRATION OF CALIBRATION GAS}}{\text{MANUFACTURER CERTIFIED CONCENTRATION OF CAL GAS}} \times 100$$

$$EFFNO2 = \frac{46.91428571}{46.7} \times 100$$

EFFNO2 = **100.4588559**

MUST BE GREATER THAN OR EQUAL TO 90 PERCENT
PER 13.5

AIR/COMPLIANCE CONSULTANTS, INC.
DRAFT
USEPA METHOD 2 AND METHOD 4 DATA SHEET

Cyclone

Client	VALERO	Date	9/10/09
ACCI Project #	09-129	Run #	1
Plant Location	DELAWARE CITY	Meter Box #	1581
Stack ID	S-203	Yd	0.988
Stack Diameter	80"	Delta H	1.626
Pitot ID	9PP6-1	Test Crew:	JC CB MB
Pitot Cp	.84	Pre-Test Leak Check	
B. P (in. Hg)	30.33	Impingers	0.00 @ 10"
Ps (in. H_2O)	-0.20	Pitot (+/-)	✓ ✓
Start Time:	0920	Post-Test Leak Check	
Stop Time:	0950	Impingers	0.00 @ 10"
		Pitot (+/-)	✓ ✓

Stack Dia. Measured? 80"

DIAGRAM

MOISTURE DATA

Clock	Elapsed	Meter Volume	Meter Temp		Delta H	Vacuum/ Pressure	Impinger Temp.
	Initial	601.695	IN	OUT			
	5 Min	605.455	63	63	1.6	3.0	61
	10 Min	609.035	64	63	1.6	3.0	62
	15 Min	612.840	65	63	1.6	3.0	60
	20 Min	616.495	67	63	1.6	3.0	59
	25 Min	619.805	69	66	1.6	3.0	60
	30 Min	623.642	69	65	1.6	3.0	61
	35 Min						
	Final						

IMPINGER WEIGHTS

Impinger	Initial	Final
1	100	130
2	100	102
3	0	0
4	241.7	248.0
WET bulb		
DRY Bulb		

O_2%	CO_2%	N_2%
CEMS		

start: 0925 stop: 0928

TRAVERSE PORT/POINT	Delta P	Stack Temp ° F	Cyclonic ° from Hor.
A1	.08	1239	4
2	.08	1240	9
3	.10	1239	2
4	.10	1240	12
5	.11	1240	10
6	.09	1238	14
7	.08	1237	12
8	.06	1237	10
B1	.07	1241	12
2	.08	1242	9
3	.08	1242	12
4	.10	1241	13
5	.11	1241	13
6	.09	1241	18
7	.07	1242	9
8	.06	1241	10

start: stop:

TRAVERSE PORT/POINT	Delta P	Stack Temp ° F	Cyclonic ° from Hor.

STRATIFICATION CHECK 203 2009/09/10

POINT	O2 %	CO2 %	SO2 ppm	POINT	AVERAGE O2 %	AVERAGE CO2 %	AVERAGE SO2 ppm	DIFFERENCE FROM MEAN O2 %	DIFFERENCE FROM MEAN CO2 %	DIFFERENCE FROM MEAN SO2 ppm
1	3.2	17.2	67.4							
1	3.2	17.2	67.1	1	3.2	17.2	67.2	-0.04	-0.10	-2.99%
2	3.3	17.1	66.1							
2	3.3	17.1	65.3	2	3.3	17.1	65.7	0.02	-0.21	-0.62%
3	3.3	17.1	64.7							
3	3.3	17.1	64.3	3	3.3	17.1	64.5	0.06	-0.19	1.24%
4	3.3	17.1	64.0							
4	3.3	17.1	64.2	4	3.3	17.1	64.1	0.03	-0.17	1.78%
5	3.3	17.2	64.9							
5	3.2	17.3	65.6	5	3.2	17.3	65.2	0.00	-0.03	0.09%
6	3.2	17.4	66.2							
6	3.2	17.4	66.6	6	3.2	17.4	66.4	-0.06	0.10	-1.71%
7	3.2	17.4	66.5							
7	3.2	17.4	66.3	7	3.2	17.4	66.4	-0.04	0.10	-1.75%
8	3.2	17.5	66.4							
8	3.2	17.5	66.3	8	3.2	17.5	66.3	-0.03	0.20	-1.58%
9	3.2	17.4	65.9							
9	3.2	17.4	65.7	9	3.2	17.4	65.8	-0.03	0.10	-0.83%
10	3.2	17.4	65.2							
10	3.2	17.3	64.5	10	3.2	17.3	64.9	-0.01	0.04	0.63%
11	3.3	17.3	64.0							
11	3.3	17.4	63.6	11	3.3	17.3	63.8	0.02	0.05	2.32%
12	3.3	17.4	63.2							
12	3.3	17.4	62.9	12	3.3	17.4	63.1	0.08	0.10	3.41%
				MEAN	3.2	17.3	65.3			

Per USEPA Part 60, three point traverse used.

C:\VALERO DELAWARE CITY\09-129 valero sru 32-h-1-1 and H2S Ratas\sru ratas\203 9-10-09\testing\s-203 9-10-2009stat check

804
Cyclonic

AIR/COMPLIANCE CONSULTANTS, INC.
DRAFT
USEPA METHOD 2 AND METHOD 4 DATA SHEET

INITIAL FLOW

Client	VALERO	Date	
ACCI Project #		Run #	
Plant Location	DELAWARE CITY	Meter Box #	1462
Stack ID	S-804	Yd	
Stack Diameter	72"	Delta H	
Pitot ID	10PTG-1	Test Crew:	
Pitot Cp	.84	Pre-Test Leak Check	
B. P. (in. Hg)		Impingers	
Ps (in. H_2O)		Pitot (+/-)	
Start Time:		Post-Test Leak Check	
Stop Time:		Impingers	
		Pitot (+/-)	

Stack Dia. Measured? 72"

DIAGRAM

MOISTURE DATA

Clock	Elapsed	Meter Volume	Meter Temp		Delta H	Vacuum/ Pressure	Impinger Temp.
	Initial						
	5 Min						
	10 Min						
	15 Min						
	20 Min						
	25 Min						
	30 Min						
	35 Min						
	Final						

IMPINGER WEIGHTS

Impinger	Initial	Final
1		
2		
3		
4		
WET bulb		
DRY Bulb		

O_2%	CO_2%	N_2%

start: stop: ~~Static -1.2~~

TRAVERSE PORT/POINT	Delta P	Stack Temp ° F	Cyclonic ° from Hor.
A1	.13		11
2	.13		11
3	.11		10
4	.09		8
5	.12		4
6	.11		2
7	.07		2
8	.05		12
B1	.02		5
2	.02		5
3	.02		8
4	.10		9
5	.10		11
6	.10		01
7	.07		3
8	.07		12

start: stop: Static -1.2

TRAVERSE PORT/POINT	Delta P	Stack Temp ° F	Cyclonic ° from Hor.
A1	.09	1332	6
2	.10	1334	6
3	.11	1334	8
4	.12	1335	8
5	.10	1334	4
6	.08	1332	2
7	.08	1330	2
8	.07	1330	2
B1	.10	1334	5
2	.11	1334	5
3	.12	1335	8
4	.13	1333	6
5	.11	1334	4
6	.09	1332	2
7	.07	1334	3
8	.04	1334	2

804

STRATIFICATION CHECK 2009/09/09

POINT	O2 %	CO2 %	SO2 ppm	POINT	AVERAGE O2 %	AVERAGE CO2 %	AVERAGE SO2 ppm	DIFFERENCE FROM MEAN O2 %	DIFFERENCE FROM MEAN CO2 %	DIFFERENCE FROM MEAN SO2 ppm
1	3.6	17.7	57.4							
1	3.6	18.0	57.0	1	3.6	17.9	57.2	-0.11	0.08	-16.08%
2	3.5	18.0	56.9							
2	3.5	18.0	54.1	2	3.5	18.0	55.5	-0.18	0.20	-12.56%
3	3.5	17.9	51.0							
3	3.5	17.9	49.7	3	3.5	17.9	50.3	-0.18	0.11	-2.07%
4	3.5	17.8	47.7							
4	3.5	17.8	45.9	4	3.5	17.8	46.8	-0.20	0.03	5.00%
5	3.5	17.7	45.5							
5	3.6	17.9	46.5	5	3.6	17.8	46.0	-0.12	0.02	6.72%
6	3.6	17.9	47.4							
6	3.7	18.0	48.5	6	3.7	18.0	47.9	-0.02	0.19	2.79%
7	3.8	18.0	50.0							
7	3.8	17.9	50.3	7	3.8	18.0	50.1	0.10	0.17	-1.72%
8	3.8	17.9	50.6							
8	3.7	18.0	49.9	8	3.8	18.0	50.2	0.09	0.20	-1.93%
9	3.8	17.9	48.3							
9	3.8	17.7	46.5	9	3.8	17.8	47.4	0.09	0.03	3.79%
10	3.8	17.6	45.1							
10	3.9	17.5	44.8	10	3.9	17.5	44.9	0.19	-0.25	8.88%
11	3.9	17.4	46.0							
11	3.9	17.2	49.5	11	3.9	17.3	47.7	0.24	-0.47	3.20%
12	3.9	17.2	46.8							
12	3.7	17.8	47.9	12	3.8	17.5	47.3	0.11	-0.32	3.99%
				MEAN	3.7	17.8	49.3			

Per PS2, 3 point traverse conducted.

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Airgas

164934

Airgas Great Lakes, Inc
2009 Bellaire Ave.
Royal Oak, MI 48067
Ph: (248) 399-9150
Fax: (248) 584-2540
http://www airgas com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	PITTSBURG		
Part Number:	E03NI67E15A3611	Reference Number:	32-112736601-2
Cylinder Number:	CC87369	Cylinder Volume:	160 Cu Ft
Laboratory:	MIC - Royal Oak - MI	Cylinder Pressure:	2015 PSIG
Analysis Date:	Sep 02, 2008	Valve Outlet:	590

Expiration Date: Sep 02, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept 1997)" using the assay procedures listed Analytical Methodology does not require correction for analytical interferences This cylinder has a total analytical uncertainty as stated below with a confidence level of 95% There are no significant impurities which affect the use of this calibration mixture All concentrations are on a volume/volume basis unless otherwise noted
Do Not Use This Cylinder below 150 psig i e 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	10 00 %	9 885 %	G1	+/- 1% NIST Traceable
CARBON DIOXIDE	22 50 %	22 59 %	G2	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	98051103	SG9168330BAL	9 507% OXYGEN/NITROGEN	Jan 01 2010
NTRM	99061020	XC019265B	3 44% CARBON DIOXIDE/NITROGEN	Jul 01 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54 20% FS CO2 Nicolet 6700	Fourier Transform Infrared (FTIR)	Aug 08 2008
E/N 51, 25%FS O2, Rosemont 755R	Paramagnetic (Para)	Aug 11, 2008

Triad Data Available Upon Request

Notes:ORDER#074661

QA Approval

164334

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Great Lakes, Inc
2009 Bellaire Ave.
Royal Oak, MI 48067
Ph: (248) 399-9150
Fax: (248) 584-2540
http://www airgas com

Customer	PITTSBURG		
Part Number	E03NI67E15A1068	Reference Number:	32-112740141-1
Cylinder Number	CC53162	Cylinder Volume	152 Cu Ft
Laboratory	MIC - Royal Oak - MI	Cylinder Pressure	2015 PSIG
Analysis Date:	Sep 12, 2008	Valve Outlet	590

Expiration Date: Sep 12, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept 1997) using the assay procedures listed Analytical Methodology does not require correction for analytical interferences This cylinder has a total analytical uncertainty as stated below with a confidence level of 95% There are no significant impurities which affect the use of this calibration mixture All concentrations are on a volume/volume basis unless otherwise noted
Do Not Use This Cylinder below 150 psig i e 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	10 00 %	9 967 %	G1	+/- 1% NIST Traceable
OXYGEN	22 50 %	22 58 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	06060803	CC206012	22 51% OXYGEN/NITROGEN	May 01 2010
NTRM	970510	SG9198969BAL	10 818% CARBON DIOXIDE/NITROGEN	May 15 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 136 20%FS CO2 Horiba VIA-510	Nondispersive Infrared (NDIR)	Aug 25 2008
E/N 51, 25%FS O2, Rosemont 755R	Paramagnetic (Para)	Sep 12, 2008

Triad Data Available Upon Request

Notes:

AFM

QA Approval

Inv. 173465

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Great Lakes, Inc.
2009 Bellaire Ave.
Royal Oak, MI 48067
Ph: (248) 399-9150
Fax: (248) 584-2540
http://www airgas com

Customer:	CRAFTON		
Part Number:	E02NI99E15A0129	Reference Number:	32-112786333-1
Cylinder Number:	CC152699	Cylinder Volume:	144 Cu Ft.
Laboratory:	MIC - Royal Oak - MI	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 29, 2008	Valve Outlet:	660

Expiration Date: Dec 29, 2010

Certification performed in accordance with "EPA Traceability Protocol (Sept 1997)" using the assay procedures listed Analytical Methodology does not require correction for analytical interferences This cylinder has a total analytical uncertainty as stated below with a confidence level of 95% There are no significant impurities which affect the use of this calibration mixture All concentrations are on a volume/volume basis unless otherwise noted
Do Not Use This Cylinder below 150 psig i e 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOx	25 00 PPM	25 68 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	25 00 PPM	25 50 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	46-E-18	CC206032	49 38PPM NITRIC OXIDE/NITROGEN	Oct 02 2012
NTRM	07060302X	CC206032	49 87PPM NOx/NITROGEN	Oct 02 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54 25ppmFS NO Nicolet 6700	Fourier Transform Infrared (FTIR)	Dec 18 2008
E/N 54 25ppmFS NO Nicolet 6700	Fourier Transform Infrared (FTIR)	Dec 18 2008

Triad Data Available Upon Request

Notes

AFM

QA Approval

Fig. 169139

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding (Pittsburgh, PA)
Date	December 30, 2008
Delivery Receipt	DR-23379
Gas Standard	55.0 ppm Nitric Oxide/Nitrogen - EPA PROTOCOL
Final Analysis Date	December 29, 2008
Expiration Date	December 29, 2010
Component	Nitric Oxide
Balance Gas	Nitrogen

Analytical Data: **DO NOT USE BELOW 150 psig**

EPA Protocol, Section No. 2.2, Procedure G-1

Reported Concentrations

Nitric Oxide: 51.8 ppm +/- 0.51 ppm

Nitrogen: Balance

Total Oxides of Nitrogen: 52.5 ppm

** NOx for Reference Use Only **

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	CC-159052	CC-125597
Concentration:	50.6 ppm NO/Nitrogen	57.2 ppm NO/Nitrogen
Expiration Date:	September 18, 2010	April 05, 2009

Certification Instrumentation

Component:	Nitric Oxide
Make/Model:	Nicolet-NEXUS 470
Serial Number:	AEP99000154
Principal of Measurement:	FTIR
Last Calibration:	December 02, 2008

Cylinder Data

Cylinder Serial Number:	CC-251502	Cylinder Outlet:	CGA 660
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:

Date: December 30, 2008

Unmatched Excellence

2564 Pemberton Drive ~ Apopka, Florida 32703 ~ Phone (407)-292-2990 ~ Fax (407)-292-3313
~ www.liquidtechcorp.com ~

164871

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding - (Pittsburgh, PA)
Date	September 18, 2008
Delivery Receipt	DR-22620
Gas Standard	25.0 ppm Carbon Monoxide/Nitrogen - EPA PROTOCOL GAS
Final Analysis Date	September 10, 2008
Expiration Date	September 10, 2011

DO NOT USE BELOW 150 psig

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1.

Reported Concentrations:
Carbon Monoxide: 25.6 ppm +/- 0.25 ppm
Nitrogen: Balance

Reference Standards

SRM/GMIS	GMIS	GMIS
Cylinder Number:	CC-158976	CC-166348
Concentration:	25.1 ppm CO/Nitrogen	45.9 ppm CO/Nitrogen
Expiration Date:	August 04, 2010	February 25, 2009

Certification Instrumentation

Component:	Carbon Monoxide
Make/Model:	Nicolet NEXUS 470
Serial Number:	AEP99000154
Principal of Measurement:	FTIR
Last Calibration:	September 09, 2008

Cylinder Data

Cylinder Number:	CC-129106	Cylinder Volume:	140 Cubic Feet
Cylinder Outlet:	CGA 350	Cylinder Pressure:	2000 psig, 70°F
Expiration Date:	September 10, 2011		

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:
Date: September 18, 2008

164871

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding - (Pittsburgh, PA)
Date	September 18, 2008
Delivery Receipt	DR-22620
Gas Standard	55.0 ppm Carbon Monoxide/Nitrogen - EPA PROTOCOL GAS
Final Analysis Date	September 10, 2008
Expiration Date	September 10, 2011

DO NOT USE BELOW 150 psig

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1

Reported Concentrations:
Carbon Monoxide: 56.7 ppm +/- 0.56 ppm
Nitrogen: Balance

Reference Standards

SRM/GMIS	GMIS	GMIS
Cylinder Number:	CC-184191	CC-231409
Concentration:	50 9 ppm CO/Nitrogen	98 6 ppm CO/Nitrogen
Expiration Date:	June 15, 2010	November 30, 2011

Certification Instrumentation

Component:	Carbon Monoxide
Make/Model:	Nicolet NEXUS 470
Serial Number:	AEP99000154
Principal of Measurement:	FTIR
Last Calibration:	September 09, 2008

Cylinder Data

Cylinder Number:	CC-166625	Cylinder Volume:	140 Cubic Feet
Cylinder Outlet:	CGA 350	Cylinder Pressure:	2000 psig, 70°F
Expiration Date:	September 10, 2011		

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:
Date: September 18, 2008

Unmatched Excellence

2564 Pemberton Drive ~ Apopka, Florida 32703 ~ Phone (407)-292-2990 ~ Fax (407)-292-3313
~ www.liquidtechcorp.com ~

NOX CONVERTER EFFICIENCY TEST

SCOT 1 NOX ANALYZER

MUST USE NO2 GAS BETWEEN 40 AND 60 PPMV
PER 7.1.4

NO2 CAL GAS USED
MUST BE EPA PROTOCOL

46.7

ANALYZER RESPONSE

DATE	TIME	NOX RESPONSE
2009/09/15	07:49:02	47
2009/09/15	07:50:02	47.1
2009/09/15	07:51:02	47.1
2009/09/15	07:52:02	47
2009/09/15	07:53:02	47
2009/09/15	07:54:02	47.1
2009/09/15	07:55:02	47
2009/09/15	07:56:02	47.1
2009/09/15	07:57:02	47

AVERAGE RESPONSE 47.04444444

EQ. 7E-7

$$EFFNO2 = \frac{\text{MEASURED CONCENTRATION OF CALIBRATION GAS}}{\text{MANUFACTURER CERTIFIED CONCENTRATION OF CAL GAS}} \times 100$$

$$EFFNO2 = \frac{47.04444444}{46.7} \times 100$$

$$EFFNO2 = \mathbf{100.7375684}$$

MUST BE GREATER THAN OR EQUAL TO 90 PERCENT
PER 13.5

NOX CONVERTER EFFICIENCY TEST

SCOT 2 NOX ANALYZER

MUST USE NO2 GAS BETWEEN 40 AND 60 PPMV
PER 7.1.4

NO2 CAL GAS USED
MUST BE EPA PROTOCOL

46.7

ANALYZER RESPONSE

DATE	TIME	NOX RESPONSE
2009/09/15	08:05:02	46.9
2009/09/15	08:06:02	46.8
2009/09/15	08:07:02	47
2009/09/15	08:08:02	46.9
2009/09/15	08:09:02	46.9
2009/09/15	08:10:02	46.9
2009/09/15	08:11:02	47

AVERAGE RESPONSE 46.91428571

EQ. 7E-7

$$\text{EFFNO2} = \frac{\text{MEASURED CONCENTRATION OF CALIBRATION GAS}}{\text{MANUFACTURER CERTIFIED CONCENTRATION OF CAL GAS}} \times 100$$

$$\text{EFFNO2} = \frac{46.91428571}{46.7} \times 100$$

EFFNO2 = **100.4588559**

MUST BE GREATER THAN OR EQUAL TO 90 PERCENT
PER 13.5

Oxides of Nitrogen Interference Test.

Analyzer Type	TECO 42C HIGH LEVEL
Model Number	42C
Serial Number	42 CHL 69556-363
Date	5-Jan-09
Calibration Span	100
	NOX

Potential Interferent		NOX PRESENT Dried	NOX ABSENT Dried	NOX* Analyzer Response (PPM)
CO2	9.83%	0.0	0.0	0.0
CO2	22.09%	0.0	0.0	0.0
O2	1%	0.0	0.0	0.0
O2	10%	0.0	0.0	0.0
O2	22%	0.0	0.0	0.0
CO	30	0.0	0.0	0.0
CO	302	0.0	0.0	0.0
CO	5104	0.0	0.0	0.0
NH3	20	0.0	0.0	0.0
CH4	99.2	0.0	0.0	0.0
CH4	907	0.0	0.0	0.0
SO2	25	0.0	0.0	0.0
SO2	253	0.0	0.0	0.0
SO2	2032	0.0	0.0	0.0
H2	50	0.0	0.0	0.0
HCl	55	0.0	0.0	0.0

* Uses the larger of the absolute values obtained for the interferent tested with and without the pollutant present

Sum of Responses	0.0
% of Calibration Span	0.00%

MUST NOT BE GREATER THAN 2.50% OF CALIBRATION SPAN
PER METHOD 7E 13.4

E:\Personal\interference checks\NOX\NOX interference WITH nox SPECIFICATIONS Jan 200942 CHL nox

Carbon Monoxide Interference Test.

Analyzer Type	Gas Filter Correlation CO Analyzer
Model Number	48 C CO Analyzer High Level
Serial Number	48CHL-68385-360
Date	5-Jan-09
Calibration Span	100

Potential Interferent	Dried	CO Analyzer Response (ppm) **CO ABSENT**	CO Analyzer Response (ppm) **CO PRESENT**	CO* Analyzer Response (ppm)
CO2	22.59%	1.5	1.5	1.5
CO2	10.00%	0.6	0.6	0.6
H2O	1%	0.0	0.0	0.0
NO	25.3 ppm	0.0	0.0	0.0
NO2	49.4 ppm	0.0	0.0	0.0
NH3	20 ppm	0.0	0.0	0.0
CH4	87.2	0.0	0.0	0.0
SO2	25.2	0.0	0.0	0.0
H2	50 ppm	0.0	0.0	0.0
HCl	54.8	0.0	0.0	0.0

* Uses the larger of the absolute values obtained for the interferent tested with and without the pollutant present

Sum of Responses	**2.1**
% of Calibration Span	**2.10%**

MUST NOT BE GREATER THAN 2.50% OF CALIBRATION SPAN PER METHOD 7E 13.4

CO	Carbon monoxide.
ppmv	Parts per million by volume.
ppm	Parts per million.
USEPA	U.S. Environmental Protection Agency.

Oxygen and Carbon Dioxide Interference Test.

Analyzer Type	California Analytical Instruments O2 and CO2	
Model Number	Model 200	Model 200
Serial Number	1L04001	1L04001
Date	5-Jan-09	5-Jan-09
Calibration Span	22	17.9
	O2	**CO2**

Potential Interferent	Dried	**O2** Analyzer Response (%) **O2 ABSENT**	**O2** Analyzer Response (%) **O2 PRESENT**	**O2*** Analyzer Response (%)	Dried	**CO2** Analyzer Response (%) **CO2 ABSENT**	**CO2** Analyzer Response (%) **CO2 PRESENT**	**CO2*** Analyzer Response (%)
CO2	22.09%	0.0	0.0	0.0				
CO2	9.83%	0.0	0.0	0.0				
H2O	1%	0.0	0.0	0.0	1%	0.0	0.0	0.0
NOx	24.7	0.0	0.0	0.0	24.7	0.0	0.0	0.0
NOx	227	0.0	0.0	0.0	227	0.0	0.0	0.0
NOx	1026	0.0	0.0	0.0	1026	0.0	0.0	0.0
NO2	49.97	0.0	0.0	0.0	49.97	0.0	0.0	0.0
NH3	20	0.0	0.0	0.0	20	0.0	0.0	0.0
CH4	99.2	0.0	0.0	0.0	99.2	0.0	0.0	0.0
CH4	907	0.0	0.0	0.0	907	0.0	0.0	0.0
SO2	25.4	0.0	0.0	0.0	25.4	0.0	0.0	0.0
SO2	253	0.0	0.0	0.0	253	0.0	0.0	0.0
SO2	2032	0.0	0.0	0.0	2032	0.0	0.0	0.0
H2	50	0.0	0.0	0.0	50	0.0	0.0	0.0
HCl	55	0.0	0.0	0.0	55	0.0	0.0	0.0
CO	30	0.0	0.0	0.0	30	0.0	0.0	0.0
CO	302	0.0	0.0	0.0	302	0.0	0.0	0.0
CO	5104	0.0	0.0	0.0	5104	0.0	0.0	0.0

* Uses the larger of the absolute values obtained for the interferent tested with and without the pollutant present

Sum of Responses	**0.0**	**0.0**
% of Calibration Span	**0.00%**	**0.00%**

MUST NOT BE GREATER THAN 2.50% OF CALIBRATION SPAN PER METHOD 3A 8.3

	Previous Cal	New Cal	% Difference
Y	0.997	0.994	0.295
dH	1.663	1.684	1.263

Air Compliance Consultants, Inc.
EPA Method 5
Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor
Apex Orifices

Model #: C-5000
Serial #: 1462

Date: ——————> 08/10/09 60.00
Barometric Pressure: ——> 29.32 (in. Hg)
Theoretical Critical Vacuum:—> 13.83 (in. Hg)

!!!!!!!!
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)).
!!!!!!!!

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)
0.46	15.00	503.912	510.434	6.522	82.0	81.0	84.0	82.0	47	0.3249	22.0	81.0	81.0	81.0
0.87	10.00	526.572	532.503	5.931	87.0	84.0	88.0	85.0	55	0.4419	20.5	83.0	83.0	83.0
1.50	10.00	496.238	503.802	7.564	81.0	80.0	82.0	80.0	63	0.5756	19.0	81.0	81.0	81.0
2.85	11.00	533.058	544.593	11.535	87.0	85.0	89.0	86.0	73	0.7835	17.0	83.0	83.0	83.0
4.20	13.00	510.527	526.493	15.966	83.0	82.0	89.0	84.0	81	0.9463	15.0	82.0	83.0	82.5

********** RESULTS **********

DRY GAS METER VOLUME CORRECTED	
Vm(std) (cu ft)	Vm(std) (liters)
6.228	176.4
5.630	159.5
7.262	205.7
10.990	311.2
15.325	434.0

ORIFICE		
VOLUME CORRECTED		VOLUME NOMINAL
Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)
6.143	174.0	6.426
5.560	157.5	5.837
7.256	205.5	7.590
10.844	307.1	11.385
15.486	438.6	16.243

DRY GAS METER CALIBRATION FACTOR	
Y	
Value (number)	Variation (number)
0.986	-0.008
0.988	-0.007
0.999	0.005
0.987	-0.007
1.010	0.016
Avg Y--> 0.994	

ORIFICE CALIBRATION FACTOR		
dH@		
Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.613	40.96	-0.071
1.658	42.11	-0.026
1.680	42.68	-0.004
1.725	43.80	0.040
1.745	44.33	0.061
Avg dH@--> 1.684	42.78	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: _____ Date: 08-10-09

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	Previous Cal	New Cal	% Difference
Y	1.003	0.988	1.516
dH	1.680	1.626	3.251

Air Compliance Consultants, Inc.
EPA Method 5
Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor
Apex Orifices

Model #: C-5000
Serial #: 1581

Date: ——————> 08/12/09 60.00
Barometric Pressure: ——> 29.40 (in. Hg)
Theoretical Critical Vacuum:—> 13.87 (in. Hg)

!!!!!!!!
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)).
!!!!!!!!

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	Ambient Temperature		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.46	15.00	910.537	917.038	6.501	80.0	76.0	80.0	76.0	47	0.3249	23.0	75.0	75.0	75.0
0.88	10.00	930.004	935.901	5.897	84.0	79.0	81.0	79.0	55	0.4419	21.5	75.0	75.0	75.0
1.50	11.00	902.006	910.419	8.413	80.0	78.0	80.0	79.0	63	0.5756	20.0	75.0	75.0	75.0
2.85	10.00	936.014	946.482	10.468	81.0	79.0	84.0	80.0	73	0.7835	17.0	75.0	75.0	75.0
4.25	10.00	917.155	929.755	12.600	80.0	79.0	84.0	80.0	81	0.9463	15.0	75.0	75.0	75.0

RESULTS

DRY GAS METER VOLUME CORRECTED	
Vm(std) (cu ft)	Vm(std) (liters)
6.274	177.7
5.668	160.5
8.121	230.0
10.106	286.2
12.213	345.9

ORIFICE		
VOLUME CORRECTED		VOLUME NOMINAL
Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)
6.195	175.4	6.390
5.617	159.1	5.794
8.048	227.9	8.302
9.959	282.0	10.273
12.028	340.6	12.408

DRY GAS METER CALIBRATION FACTOR	
Y	
Value (number)	Variation (number)
0.987	-0.001
0.991	0.003
0.991	0.003
0.985	-0.003
0.985	-0.003
Avg Y--> 0.988	

ORIFICE CALIBRATION FACTOR		
dH@		
Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.563	39.70	-0.063
1.607	40.82	-0.019
1.616	41.05	-0.010
1.654	42.02	0.028
1.691	42.95	0.065
Avg dH@--> 1.626	41.31	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: _____ Date: 08-12-09

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AIR COMPLIANCE/CONSULTANTS, INC.
TYPE S PITOT TUBE INSPECTION DATA

DATE	9/4/2009
PITOT ID	9-1
IS TUBE ASSEMBLY LEVEL ?	yes
ARE OPENINGS DAMAGED?	no

PA=	0.576	PB=	0.577	Pavg=	0 577
DT=	0 386	A=	1.153	Pavg/Dt=	**1.494**
					(1.05<X<1.5)

TRAVERSE AXIS (ALPHA 1)	0 (<10)	
TRAVERSE AXIS (ALPHA 2)	1 (<10)	
LONG AXIS (BETA 1)	1 (<05)	
LONG AXIS (BETA 2)	0 (<05)	
FRONT ANGLE (GAMMA)	0	0
SIDE ANGE (THETA)	0	0
ALIGN DISPLACEMENT Z	0	<0 125 INCHES
ALIGN DISPLACEMENT W	0	<0 03125 INCHES

CALIBRATION REQUIRED?	NO
CALIBRATED BY ?	jcc

ALL PARAMETERS MEET SPECS?	YES

thermocouple calibration

bp in Hg.	29 8
ambient temp	63
mercury in glass	yes

		mercury	thermocoulple	temperature difference(%)
reference point		36	35	0.20%
	ambient day of test	64	62	0.38%
		103	101	0.36%
		211	208	0.45%
		302	299	0.39%
		406	401	0.58%
		489	484	0.53%

difference must be less than or equal to 1 50%

AIR COMPLIANCE/CONSULTANTS, INC.
TYPE S PITOT TUBE INSPECTION DATA

DATE	9/4/2009
PITOT ID	10-1
IS TUBE ASSEMBLY LEVEL ?	yes
ARE OPENINGS DAMAGED?	no

PA=	0 577	PB=	0 579	Pavg=	0 578
DT=	0 390	A=	1 156	Pavg/Dt=	**1.482**
					(1.05<X<1.5)

TRAVERSE AXIS (ALPHA 1)	1 (<10)	
TRAVERSE AXIS (ALPHA 2)	1 (<10)	
LONG AXIS (BETA 1)	1 (<05)	
LONG AXIS (BETA 2)	1 (<05)	
FRONT ANGLE (GAMMA)	0	0
SIDE ANGE (THETA)	0	0
ALIGN DISPLACEMENT Z	0	<0 125 INCHES
ALIGN DISPLACEMENT W	0	<0 03125 INCHES

CALIBRATION REQUIRED? NO
CALIBRATED BY ? jcc

ALL PARAMETERS
MEET SPECS? YES

thermocouple calibration

bp in Hg.	29 3
ambient temp	78
mercury in glass	yes

		mercury	thermocoulple	temperature difference(%)
reference point		34	32	0.40%
	ambient day of test	68	66	0.38%
		101	99	0.36%
		203	200	0.45%
		298	295	0.40%
		400	396	0.47%
		503	499	0.42%

difference must be less than or equal to 1 50%

APPENDIX D

Laboratory Analytical Data

Air Compliance Consultants, Inc

1050 William Pitt Way
Pittsburgh, PA 15238

Valero Energy
Delaware City Refinery

Project # 09-129
PO # 831-09

Analytical Report
(0909-78)

EPA Method 8

Sulfuric acid mist

Enthalpy Analytical, Inc.

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www enthalpy.com
2202 Ellis Road Durham, NC 27703 - 5518

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)
- This analytical report was prepared in Portable Document Format (.PDF) and contains 14 pages.

Valgena Respass

QA Review Performed by – Valgena Respass

Summary of Results

Company	ACC, Inc
Analyst	EO
Parameters	EPA Method 8
# Samples	6 Runs & 2 blanks

Client #	09-129
Job #	0909-78
PO #	831-09
Report Date	10/1/2009

Sample Identification	Compound / Catch Weight (mg)
	Sulfuric acid mist (H_2SO_4)
Run 1 S-804	7.44
Run 2 S-804	6.14
Run 3 S-804	7.11
Run 1 S203	17.1
Run 2 S203	15.1
Run 3 S203	8.30
IPA Blank	0.0474 ND

Results

Company	ACC, Inc.
Analyst	EO
Parameters	EPA Method 8
# Samples	6 Runs & 1 Blank

Client #	09-129
Job #	0909-78
PO #	831-09
Report Date	10/1/2009

MDL 0.04

Blank titrant amount (Vtb) 0.03

$BaCl_2$ normality 0.0097

Sulfuric acid mist (H_2SO_4)

Sample ID.	Volume Received (mL)	Titration Aliquot Vol (mL)	1st Titration $BaCl_2$ Vol (mL)	2nd Titration $BaCl_2$ Vol (mL)	Average $BaCl_2$ Vol (mL)	% Difference	Aliquot Factor	Catch Weight H_2SO_4 (mg)
IPA Fractions								
Run 1 S-804	365	10.0	0.45	0.47	0.46	4.3	36.5	7.44
Run 2 S-804	350	10.0	0.40	0.40	0.40	0.0	35.0	6.14
Run 3 S-804	300	10.0	0.52	0.54	0.53	3.8	30.0	7.11
Run 1 S203	445	10.0	0.83	0.85	0.84	2.4	44.5	17.1
Run 2 S203	300	10.0	1.08	1.10	1.09	1.8	30.0	15.1
Run 3 S203	240	10.0	0.75	0.77	0.76	2.6	24.0	8.30
IPA Blank	100	10.0	0.04 ND	0.04 ND	0.04 ND	0.0	10.0	0.0474 ND
LCS-1	100	1.00	0.32	0.34	0.33	6.1	100	14.2
							Spike Amount	15.4
							Spike Recovery (%)	92.5%
LCS-2	100	1.00	0.56	0.57	0.57	1.8	100	25.3
							Spike Amount	24.0
							Spike Recovery (%)	106%

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	ACC, Inc.
Analyst	EO
Parameters	EPA Method 8
# Samples	6 Runs & 1 blank

Client #	09-129
Job #	0909-78
PO #	831-09
Report Date	10/1/2009

Custody

Tony Mastriani of Enthalpy Analyti cal, Inc. received the sam ples on 9/18/2009 at 21.6 °C after being relinquished by Air Com pliance Consultants, Inc. The sam ples were received in good condition. Prior to and during analysis, the sam ples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The sam ples were analyzed for sulfur ic acid m ist using the analytical procedures in EPA Method 8, Determ ination of Sulfuric Acid and Sulfur Dioxide Em issions from St ationary Sources (40 CFR Part 60, Appendix A).

The sam ples were titrated using a barium chloride solution prepared in the lab. The norm ality was determ ined according to the procedures described in the m ethod. The sam ples were titrated to a pink endpoint using a thorin indicator. Replicate titrations were perf ormed, with the titrant volumes meeting the QC crite ria established for EPA Method 8. Results are reported in milligrams (mg) catch.

Sulfuric acid (H_2SO_4)calculations:

$$C_{H2SO4} = (N)(V_t - V_b)(V_{sol}/V_a)(49.04)$$

Where:

C_{H2SO4}	Catch weight as sulfuric acid (mg)
N	Normality of the barium chloride titrant
V_t	Volume of the titrant used to achieve pink endpoint
V_b	Titrant volume to achieve pink endpoint w/Lab IPA
V_{sol}	Volume of the entire sample solution
V_a	Volume of the aliquot taken for the titration
49.04	Equivalent weight for sulfuric acid

QC Notes

No blank corrections were applied to the sam ple results (aside from the titrant blank as shown above).

Enthalpy Analytical Narrative Summary
(continued)

Reporting Notes

Samples are analyzed using a micro-burette to conserve sample and reduce waste. The burette is 1/10 th the volume of that specified in EPA Method 8. Therefore, the reproducibility criteria used is 1% or 0.02 mL (1/10th the 0.2 mL default volume specified in EPA Method 8).

Enthalpy Analytical, Inc. is accredited to perform this method for compliance purposes by the National Environmental Laboratory Accreditation Conference (NELAC) through the Louisiana Environmental Laboratory Accreditation Program (LELAP), certificate number 04010.

General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, Inc. reports, unless specifically noted otherwise.

- The symbol ***MDL*** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.
- The symbol ***LOQ*** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.
- The symbol ***ND*** following a value indicates a non-detect or analytical result below the MDL.
- The symbol ***J*** following a value indicates an analytical result between the MDL and the LOQ. A J flag indicates that the laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.
- The symbol ***E*** following a value indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.
- The symbol ***DF*** represents a Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to get final results.
- The Sample ID ***MS*** represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. This shows what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix prohibits analysis for the analyte(s).
- The Sample ID ***MSD*** represents a Matrix Spike Duplicate. Prepared in the same manner as an MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times. Most methods performed by Enthalpy do not require analysis of an MSD.
- The Sample ID ***LD*** represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results for the duplicate analysis are compared to the initial result. The result should have a % difference value of 10% or less, though either aliquot receiving a 'J-flagged' result makes the pair exempt from this criteria.
- The Sample ID ***AD*** represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.
- The Sample ID ***LCS*** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our clients more spikes are prepared than needed. The extras (randomly chosen) are kept in-house at the appropriate temperature conditions. When the spike samples come back from the client for analysis, the LCSs (usually two are saved) are analyzed to confirm that the analyte could be recovered from the media, separate from the spike samples which were used on the project and which may have had issues caused during collection and/or transport.

General Reporting Notes

(continued)

- **Significant Figures**: Where the reported value is m uch greater than unity (1.00) in the units expressed, the number is rounded to a whole num ber of units, rather than to 3 significant figures. For exam ple, a value of 10,456.45 ug catch is rounded to 10,456 ug. There are five significant digits display ed, but no confidence should be placed on more than two significant digits.
- **Manual Integration**: The data sy stems used for processing will flag manually integrated peaks with an "M". There are several reasons a peak m ay be m anually integrated. These reasons will be identified by the following two letter designations. The peak was not integrated by the software "NI", the peak was integrated incorrectly by the software "II" or th e wrong peak was integrated by the software "WP". These codes will accompany the analyst's manual integration stamp placed next to the compound name.

Sample Custody

Analysis Request / Chain of Custody Form

Air/Compliance Consultants, Inc.
www.air-comp.com

1050 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-3636
Fax: 412-826-3640

Please Print Neatly

Page 1 of 1

(1) Client Name: VALERO ENERGY
Project Location: DELAWARE CITY REFINERY
Project No.: 09-129
Project Manager (PM): JAIMES CONTRERAS
PM Email: jcontrer@air-comp.com
Laboratory: ENTHALPY
PO #: 831-09
Lab Contact / Phone #: BRIAN TYLER / 919-850-4392

Sample Identification (2)	Date Collected	Time Collected	(3) Grab	(3) Composite	Matrix (4): 80% IPA SOL'N	Matrix (4): Air (☐ Source ☐ Ambient)	Total # of Containers	Canisters*	Analysis Requested (5): EPA METHOD 8	(6) Remarks
IMP 1+2+RINSE RUN 1 S-804	9/15	-			X		1		X	
IMP 1+2+RINSE RUN 2 S804	9/15	-			X		1		X	
IMP 1+2+RINSE RUN 3 S804	9/15	-			X		1		X	
IMP 1+2+RINSE RUN 1 S203	9/15	-			X		1		X	
IMP 1+2+RINSE RUN 2 S203	9/15	-			X		1		X	
IMP 1+2+RINSE RUN 3 S203	9/15	-			X		1		X	
80% IPA SOL'N BLANK	9/15	-			X		1		X	
80% IPA SOL'N BLANK	9/15	-			X		1		X	CAN BE USED AS BLANK OR SAMPLE DILUTED

Temperature of samples upon receipt (if requested): T° = 21.6°C Temp blank #1

(7) **Turnaround Time Requested** (TAT)
(please circle): (Normal) Rush
Date results are needed:
If rush results requested please fax to:
Fax #:

(8) **Notes:** SECOND BLANK CAN BE USED FOR SAMPLE DILUTION IF NECESSARY

Please call (412) 826-3636 if there are any questions prior to proceeding. Please cc slindquist@air-comp.com with all laboratory results

(11) **Project Manager Approval (Print & Sign)**
PM Sign:
PM Print: JAIMES CONTRERAS
COC completed by (initial): CWB Date 9/16/09

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	9/16/09	10:30	[signature]	9/18/09	0955
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

(10) ***Canister Pressure / Vacuum**

Initial	Final	Units	Receipt

Instructions on reverse side correspond with circled numbers

WHITE - LAB • YELLOW - FILE

№ 2264

This Is The Last Page Of This Report.

APPENDIX E

Sample Calculations

SCOT 1 (203)

ACCI SAMPLE CALCULATIONS
H2SO4 and CEMS
Valero
09-129
Valero DCR
SCOT 1 (203)
normal
15-Sep-09
Exhaust
Run 1

Vf	0.0	ml	Tstandard	68	F
Vi	0.0	ml	Pstandard	760	mm Hg
Wf	3,611.3	g	K1method 4	0.04707	scf/ml
Wi	3,523.1	g	K2method 4	0.04715	scf/g
Vm	47.350	dacf	K1method 5	17.64	R/in. Hg
Vm	0.000	dry actual liters	K4method 5	0.0945	
Yd	0.9880		$V/n_{standard}$	385.3	ft3/lb-mole
Pbar	30.00	in. Hg	Kp	85.49	
dHavg	1.60	in. H2O	p_a	0	0
Tm	83.8	F	π	3.141593	
O2	4.06	% dv	Ds (or L)	80.00	inches
CO2	16.83	% dv	Stack Width (W)	NA	inches
Pg	-0.20	in. H2O	Dn	na	inches
Cp	0.84		Time	60	minutes
$(dP)^{1/2}avg$	0.272	in. H2O^1/2	Tsavg	1198.8	F
F_c	NA	dscf/MMBtu	Product rate	0.00	0.00
			An	NA;Dn = NA	ft2

CEMS DATA

Carbon Monoxide			Oxides of Nitrogen (NOX)		
$Caverage_{CO}$	1.1	ppmdv	$Caverage_{NO2}$	30.2	ppmdv
C_{0CO}	0.3	ppmdv	C_{0MO2}	-0.2	ppmdv
Cma_{CO}	25.6	ppmdv	Cma_{NO2}	25.5	ppmdv
Cm_{CO}	25.6	ppmdv	Cm_{NO2}	25.2	ppmdv
			MW SO2	64.0	lb/lb-mole
			MW NO2	46.0	lb/lb-mole
			MW CO	28.0	lb/lb-mole

Volume of Water Vapor Condensed (Vwc)

Vwc(std) = K1method 4 * (Vf - Vi)

K1method 4=	0.04707 scf/ml
Vf=	0.0 ml
Vi=	0.0 ml
Vwc(std)=	0.000 scf

Volume of Water Vapor Collected in Silica Gel (Vwsg)

Vwsg(std) = K2method 4 * (Wf - Wi)

K2method 4=	0.04715 scf/g
Wf=	3,611.3 g
Wi=	3,523.1 g
Vwsg(std)=	4.159 scf

Total Volume of Water Vapor in Gas Sample (Vw)

Vw(std) = Vwc(std) + Vwsg(std)

Vwc(std)=	0.000 scf
Vwsg(std)=	4.159 scf
Vw(std)=	4.159 scf

Volume of Gas Metered

Vm = Volume metered in dacf + Volume metred in dry actual liters * (1 cf / 28.317 liters)

Volume metered in dacf=		47.350 dacf
Volume metered in dry actual liters=		0.000 dry actual liters
Vm=	47.350 dacf	

$Vm(m^3)$ = Vm * (1 m^3 / 35.3145 cf)

Vm=	47.350 dacf	
$Vm(m^3)$=	1.341 dacm	

Volume of Gas Metered , dry basis, STD

Vm(std) = (K1method 5 * Vm * Yd * (Pbar + (dHavg/13.6))) / (Tm + 460)

K1method 5=	17.64	R/in. Hg
Vm=	47.350	dacf
Yd=	0.9880	
Pbar=	30.00	in. Hg
dHavg=	1.60	in. H2O
Tm=	83.8	F
Vm(std)=	45.709	dscf

$Vm(std)m^3$ = Vm(std) * (1 m^3 / 35.3145 cf)

Vm(std)=	45.709	dscf
$Vm(std)m^3$=	1.294	dscm

Water Vapor in the Gas Stream

Bws used = the lower of $SP_{H2O@Tsavg}$ / Ps

and Vw(std) / (Vm(std) + Vw(std))

Bws = $SP_{H2O@Tsavg}$ / Ps With a maximum allowable value of 1.0

$SP_{H2O@Tsavg}$ = The saturation pressure of water at stack temperature

1997 ASHRAE Handbook page 6.2 Eq. (6)

EXP(C8/T + C9 +C10*T + C11*T^2 + C12*T^3 + C13*ln(T)) * (29.921/14.696)

T = Tsavg + 459.67

Tsavg=	1198.8	F
T=	1658.4	R
C8=	-1.044040E+04	
C9=	-1.1294650E+01	
C10=	-2.702236E-02	
C11=	1.289036E-05	
C12=	-2.478068E-09	
C13=	6.545967E+00	
$SP_{H2O@Tsavg}$=	59033.58	in. Hg
Ps=	29.99	in. Hg
Bws=	1.0000	vol. fraction

Bws = Vw(std) / (Vm(std) + Vw(std))

Vw(std)=	4.159	scf
Vm(std)=	45.709	dscf
Bws=	0.0834	vol. fraction
Bws used=	0.0834	vol. fraction

Carbon Monoxide and Nitrogen in gas

CO + N2 = 100 - (CO2 + O2)

CO2=	16.83	% dv
O2=	4.06	% dv
CO + N2=	79.10	% dv

Molecular weight of dry gas stream

Md = 0.44 * CO2 %dv + 0.32 * O2 %dv + 0.28 * (CO + N2 %dv)		
CO2=	16.83	% dv
O2=	4.06	% dv
CO + N2=	79.10	% dv
Md=	30.86	lb/lb-mole

Molecular weight of wet gas stream

Ms = Md * (1 - Bws) + 18 * Bws		
Md=	30.86	lb/lb-mole
Bws=	0.0834	vol. fraction
Ms=	29.78	lb/lb-mole

Stack Pressure

Ps = Pbar + Pg/13.6		
Pbar=	30.00	in. Hg
Pg=	-0.20	in. H2O
Ps=	29.99	in. Hg

Average Stack Gas Velocity

Vs = Kp * Cp * $(dP)^{1/2}$avg * ((Tsavg + 460) / (Ps * Ms))^1/2		
Kp=	85.49	
Cp=	0.84	
$(dP)^{1/2}$avg=	0.2717	in. H2O^1/2
Tsavg=	1198.8	F
Ps=	29.99	in. Hg
Ms=	29.78	lb/lb-mole
Vs=	26.59	ft/s

Area of the Stack

If W = 0, the stack is circular

Circular

As = PI * (Ds)^2 / 4 * (1 ft / 12 in.)^2		
PI=	3.141593	
Ds=	80.00	inches
As=	34.91	ft2

Rectangular

As = L * W * (1 ft / 12 in.)^2		
L=	0.00	inches
W=	NA	inches
As=	0.00	ft2

Stack Gas Flow Rate, Actual

Qacfm = Vs * As * 60		
Vs=	26.59	ft/s
As=	34.91	ft2
Qacfm=	55,682	acfm

Qacm/min = Qacfm * (1 m^3 / 35.3145 cf)		
Qacfm=	55,682	acfm
Qacm/min=	1,577	acm/min

Stack Gas Flow Rate, Standard

Qscfm = Qacfm * ((Tstandard + 460) / (Tsavg + 460)) * (Ps / Pstandard)

Qacfm=	55,682	acfm
Tstandard=	68	F
Tsavg=	1198 8	F
Ps=	29 99	in Hg
Pstandard=	29 92	in Hg
Qscfm=	17,763	scfm

Qscm/min = Qscfm * (1 m^3 / 35 3145 cf)

Qscfm=	17,763	scfm
Qscm/min=	503	scm/min

Stack Gas Flow Rate, Dry Standard

Qdscfm = Qscfm * (1 - Bws)

Qscfm=	17,763	scfm
Bws=	0 0834	vol fraction
Qdscfm=	16,282	dscfm

Qdscm/min = Qdscfm * (1 m^3 / 35 3145 cf)

Qdscfm=	16,282	dscfm
Qdscm/min=	461	dscm/min

Oxides of Nitrogen concentration (ppmdv)

$C_{NOx} = (Caverage_{NOx} - C_{0NOx}) * Cma_{NOx} / (Cm_{NOx} - C_{0NOx})$

$Caverage_{NOx}$=	30 23	ppmdv
C_{0NOx}=	-0 20	ppmdv
Cma_{NOx}=	25 50	ppmdv
Cm_{NOx}=	25 22	ppmdv
C_{NOx}=	30.53	ppmdv

Oxides of Nitrogen emission rate (lb/hr)

$NOx(lb/hr) = C_{NOx} / 1{,}000{,}000 * Qdscfm * (60 \text{ min} / 1 \text{ hour}) / V/n_{standard} * NOx_{MW}$

C_{NOx}=	30 53	ppmdv
Qdscfm=	16,282	dscfm
$V/n_{standard}$=	385 3	ft3/lb-mole
NOx_{MW}=	46 0	lb/lb-mole
NOx(lb/hr)=	3 56	lb/hr

Carbon Monoxide concentration (ppmdv)

C_{CO} = (Caverage$_{CO}$ - C0$_{CO}$) * Cma$_{CO}$ / (Cm$_{CO}$ - C0$_{CO}$)		
Caverage$_{CO}$=	1.06	ppmdv
C0$_{CO}$=	0.29	ppmdv
Cma$_{CO}$=	25.60	ppmdv
Cm$_{CO}$=	25.56	ppmdv
C_{CO}=	0.79	ppmdv

Carbon Monoxide emission rate (lb/hr)

CO(lb/hr) = C_{CO} / 1,000,000 * Qdscfm * (60 min / 1 hour) / V/n$_{standard}$ * CO$_{MW}$		
C_{CO}=	0.79	ppmdv
Qdscfm=	16,282	dscfm
V/n$_{standard}$=	385.3	ft3/lb-mole
COMW=	28.0	lb/lb-mole
CO(lb/hr)=	0.06	lb/hr

Sulfuric Acid Emission Concentration (lb/dscf)

E = Sulfuric Acid * (1/1000 *(1/453.593)/Vm(std)		
H_2SO_4 =	17.10	mg
Vm(std) =	45.709	dscf
E =	8.25E-07	lb/dscf

Sulfuric Acid Emission Concentration (ppmdv)

E = E/MW * V/nstandard*1000000		
MW =	98	lb/lb-mole
V/nstandard =	385.3	ft3/lb-mole
E =	8.25E-07	lb/dscf
E =	3.24	ppmdv

Sulfuric Acid Emission Rate (lb/hr)

E = E(lb/dscf) * dscfm * 60		
E =	8.25E-07	lb/dscf
Qdscfm=	16,282	dscfm
E =	0.81	lb/hr

SCOT 2 (804)

ACCI SAMPLE CALCULATIONS
H2SO4 and CEMS
Valero
09-129
Valero DCR
SCOT 2 (804)
normal
September 15, 2009
Exhaust
Run 1

Vf	0.0	ml	Tstandard	68	F
Vi	0.0	ml	Pstandard	760	mm Hg
Wf	3,263.6	g	K1method 4	0.04707	scf/ml
Wi	3,116.1	g	K2method 4	0.04715	scf/g
Vm	45.505	dacf	K1method 5	17.64	R/in. Hg
Vm	0.000	dry actual liters	K4method 5	0.0945	
Yd	0.9940		$V/n_{standard}$	385.3	ft3/lb-mole
Pbar	30.00	in Hg	Kp	85.49	
dHavg	1.70	in H2O	p_a	0	0
Tm	76.4	F	π	3.141593	
O2	2.05	% dv	Ds (or L)	72.00	inches
CO2	14.80	% dv	Stack Width (W)	NA	inches
Pg	-1.20	in H2O	Dn	NA	inches
Cp	0.84		Time	60	minutes
$(dP)^{1/2}$avg	0.303	in. H2O^1/2	Tsavg	1315.3	F
F_c	1,094	dscf/MMBtu	Product rate	#REF!	#REF!
			An	NA;Dn = NA	ft2

CEMS DATA

Carbon Monoxide			Oxides of Nitrogen (NOX)		
$Caverage_{CO}$	9.9	ppmdv	$Caverage_{NO2}$	11.9	ppmdv
C_{0CO}	-1.3	ppmdv	C_{0MO2}	-0.1	ppmdv
Cma_{CO}	25.6	ppmdv	Cma_{NO2}	25.5	ppmdv
Cm_{CO}	25.1	ppmdv	Cm_{NO2}	25.4	ppmdv
			MW SO2	64.0	lb/lb-mole
			MW NO2	46.0	lb/lb-mole
			MW CO	28.0	lb/lb-mole

Volume of Water Vapor Condensed (Vwc)

Vwc(std) = K1method 4 * (Vf - Vi)

K1method 4=	0.04707 scf/ml
Vf=	0.0 ml
Vi=	0.0 ml
Vwc(std)=	0.000 scf

Volume of Water Vapor Collected in Silica Gel (Vwsg)

Vwsg(std) = K2method 4 * (Wf - Wi)

K2method 4=	0.04715 scf/g
Wf=	3,263.6 g
Wi=	3,116.1 g
Vwsg(std)=	6.955 scf

Total Volume of Water Vapor in Gas Sample (Vw)

Vw(std) = Vwc(std) + Vwsg(std)

Vwc(std)=	0.000 scf
Vwsg(std)=	6.955 scf
Vw(std)=	6.955 scf

Volume of Gas Metered

Vm = Volume metered in dacf + Volume metred in dry actual liters * (1 cf / 28.317 liters)

Volume metered in dacf=		45.505 dacf
Volume metered in dry actual liters=		0.000 dry actual liters
Vm=	45.505 dacf	

$Vm(m^3)$ = Vm * (1 m^3 / 35.3145 cf)

Vm=	45.505 dacf	
$Vm(m^3)$=	1.289 dacm	

Volume of Gas Metered , dry basis, STD

Vm(std) = (K1method 5 * Vm * Yd * (Pbar + (dHavg/13.6))) / (Tm + 460)

K1method 5=	17.64	R/in Hg
Vm=	45.505	dacf
Yd=	0.9940	
Pbar=	30.00	in. Hg
dHavg=	1.70	in. H2O
Tm=	76.4	F
Vm(std)=	44.809	dscf

$Vm(std)m^3$ = Vm(std) * (1 m^3 / 35.3145 cf)

Vm(std)=	44.809	dscf
$Vm(std)m^3$=	1.269	dscm

Water Vapor in the Gas Stream

Bws used = the lower of $SP_{H2O@Tsavg}$ / Ps

and Vw(std) / (Vm(std) + Vw(std))

Bws = $SP_{H2O@Tsavg}$ / Ps With a maximum allowable value of 1.0

$SP_{H2O@Tsavg}$ = The saturation pressure of water at stack temperature

1997 ASHRAE Handbook page 6.2 Eq. (6)

EXP(C8/T + C9 +C10*T + C11*T^2 + C12*T^3 + C13*ln(T)) * (29.921/14.696)

T = Tsavg + 459.67

Tsavg=	1315.3	F
T=	1774.9	R
C8=	-1.044040E+04	
C9=	-1.1294650E+01	
C10=	-2.702236E-02	
C11=	1.289036E-05	
C12=	-2.478068E-09	
C13=	6.545967E+00	
$SP_{H2O@Tsavg}$=	80661.60	in. Hg
Ps=	29.91	in. Hg
Bws=	1.0000	vol. fraction

Bws = Vw(std) / (Vm(std) + Vw(std))

Vw(std)=	6.955	scf
Vm(std)=	44.809	dscf
Bws=	0.1344	vol. fraction
Bws used=	0.1344	vol. fraction

Carbon Monoxide and Nitrogen in gas

CO + N2 = 100 - (CO2 + O2)

CO2=	14.80	% dv
O2=	2.05	% dv
CO + N2=	83.15	% dv

Molecular weight of dry gas stream

Md = 0 44 * CO2 %dv + 0 32 * O2 %dv + 0 28 * (CO + N2 %dv)		
CO2=	14 80	% dv
O2=	2 05	% dv
CO + N2=	83 15	% dv
Md=	30.45	lb/lb-mole

Molecular weight of wet gas stream

Ms = Md * (1 - Bws) + 18 * Bws		
Md=	30 45	lb/lb-mole
Bws=	0 1344	vol fraction
Ms=	28.78	lb/lb-mole

Stack Pressure

Ps = Pbar + Pg/13 6		
Pbar=	30.00	in Hg
Pg=	-1.20	in H2O
Ps=	29.91	in. Hg

Average Stack Gas Velocity

Vs = Kp * Cp * $(dP)^{1/2}$avg * ((Tsavg + 460) / (Ps * Ms))^1/2		
Kp=	85 49	
Cp=	0 84	
$(dP)^{1/2}$avg=	0 3034	in. H2O^1/2
Tsavg=	1315 3	F
Ps=	29 91	in Hg
Ms=	28 78	lb/lb-mole
Vs=	31.29	ft/s

Area of the Stack

If W = 0, the stack is circular.

Circular

As = PI * (Ds)^2 / 4 * (1 ft / 12 in)^2		
PI=	3 141593	
Ds=	72.00	inches
As=	28.27	ft2

Rectangular

As = L * W * (1 ft / 12 in)^2		
L=	0.00	inches
W=	NA	inches
As=	0.00	ft2

Stack Gas Flow Rate, Actual

Qacfm = Vs * As * 60		
Vs=	31 29	ft/s
As=	28.27	ft2
Qacfm=	53,089	acfm

Qacm/min = Qacfm * (1 m^3 / 35 3145 cf)		
Qacfm=	53,089	acfm
Qacm/min=	1,503	acm/min

Stack Gas Flow Rate, Standard

Qscfm = Qacfm * ((Tstandard + 460) / (Tsavg + 460)) * (Ps / Pstandard)		
Qacfm=	53,089	acfm
Tstandard=	68	F
Tsavg=	1315.3	F
Ps=	29.91	in Hg
Pstandard=	29.92	in Hg
Qscfm=	15,785	scfm
Qscm/min = Qscfm * (1 m^3 / 35.3145 cf)		
Qscfm=	15,785	scfm
Qscm/min=	447	scm/min

Stack Gas Flow Rate, Dry Standard

Qdscfm = Qscfm * (1 - Bws)		
Qscfm=	15,785	scfm
Bws=	0.1344	vol. fraction
Qdscfm=	13,665	dscfm
Qdscm/min = Qdscfm * (1 m^3 / 35.3145 cf)		
Qdscfm=	13,665	dscfm
Qdscm/min=	387	dscm/min

Oxides of Nitrogen concentration (ppmdv)

C_{NOx} = ($Caverage_{NOx}$ - $C_{\theta NOx}$) * Cma_{NOx} / (Cm_{NOx} - $C_{\theta NOx}$)		
$Caverage_{NOx}$=	11.89	ppmdv
$C_{\theta NOx}$=	-0.05	ppmdv
Cma_{NOx}=	25.50	ppmdv
Cm_{NOx}=	25.42	ppmdv
C_{NOx}=	11.96	ppmdv

Oxides of Nitrogen emission rate (lb/hr)

NOx(lb/hr) = C_{NOx} / 1,000,000 * Qdscfm * (60 min / 1 hour) / $V/n_{standard}$ * NOx_{MW}		
C_{NOx}=	11.96	ppmdv
Qdscfm=	13,665	dscfm
$V/n_{standard}$=	385.3	ft3/lb-mole
NOx_{MW}=	46.0	lb/lb-mole
NOx(lb/hr)=	1.17	lb/hr

Carbon Monoxide concentration (ppmdv)

C_{CO} = ($Caverage_{CO}$ - $C0_{CO}$) * Cma_{CO} / (Cm_{CO} - $C0_{CO}$)		
$Caverage_{CO}$=	9.87	ppmdv
$C0_{CO}$=	-1.32	ppmdv
Cma_{CO}=	25.60	ppmdv
Cm_{CO}=	25.06	ppmdv
C_{CO}=	10.87	ppmdv

Carbon Monoxide emission rate (lb/hr)

CO(lb/hr) = C_{CO} / 1,000,000 * Qdscfm * (60 min / 1 hour) / $V/n_{standard}$ * CO_{MW}		
C_{CO}=	10.87	ppmdv
Qdscfm=	13,665	dscfm
$V/n_{standard}$=	385.3	ft3/lb-mole
COMW=	28.0	lb/lb-mole
CO(lb/hr)=	0.65	lb/hr

Sulfuric Acid Emission Concentration (lb/dscf)

E = Sulfuric Acid * (1/1000 *(1/453.593)/Vm(std)		
H_2SO_4 =	7.44	mg
Vm(std) =	44.809	dscf
E =	3.66E-07	lb/dscf

Sulfuric Acid Emission Concentration (ppmdv)

E = E/MW * V/nstandard*1000000		
MW =	98	lb/lb-mole
V/nstandard =	385.3	ft3/lb-mole
E =	3.66E-07	lb/dscf
E =	1.44	ppmdv

Sulfuric Acid Emission Rate (lb/hr)

E = E(lb/dscf) * dscfm * 60		
E =	3.66E-07	lb/dscf
Qdscfm=	13,665	dscfm
E =	0.30	lb/hr

Nomenclature

NOMENCLATURE

SYMBOL		DESCRIPTION
ACFM	-	Actual cubic feet per minute
A_s	-	Stack Area
AB	-	Acetone Blank
AB1	-	Acetone Blank Tare Weight 1
AB2	-	Acetone Blank Tare Weight 2
ABF1	-	Acetone Blank Final Weight 1
ABF2	-	Acetone Blank Final Weight 2
AT1	-	Acetone Rinse Tare Weight 1
AT2	-	Acetone Rinse Tare Weight 2
A_n	-	Nozzle Area
B_{wo}	-	Moisture content of sample gas, measured impinger collection
B_{ws}	-	Moisture content of sample gas, wet saturated
BTU	-	British Thermal Units
C	-	Carbon
C_3H_8	-	Propane
Ca	-	Acetone Blank Correction
C_M	-	Average of initial and final system calibration bias check responses for the upscale gas, ppm
cf	-	Cubic foot
C_{MA}	-	Actual concentration of the upscale calibration gas, ppm
C_d	-	Concentration of Particulate Emissions
C_O	-	Average of initial and final system calibration bias check responses for the zero gas, ppm
CO	-	Carbon monoxide
CO_2	-	Carbon dioxide
C_p	-	Pitot co-efficient, 0 84 for S-type, 0 99 for standard (English units)
E_{NOX}	-	Emission rate of Oxides of nitrogen as NO2, lb/hr
DACF	-	Dry actual cubic feet
DSCF	-	Dry standard cubic feet
DACM	-	Dry actual cubic meters
DSCFM	-	Dry standard cubic feet per minute
dscf/MMBtu	-	Dry standard cubic feet per Million British Thermal Units (units for Fd)
D_S	-	Stack diameter
D_N	-	Nozzle diameter
°F	-	Degrees Fahrenheit
ft	-	foot
F1	-	Filter Final Weight 1
F2	-	Filter Final Weight 2
FT1	-	Filter Tare Weight 1
FT2	-	Filter Tare Weight 2
F_c	-	CO2 based F-Factor for natural gas (1,040 SCF/MMBtu)
F_d	-	F-factor
Ft^2	-	Square feet
Ft^3	-	Cubic feet
FTIR	-	Fourier Transform Infrared
ft^3/lb-mole	-	Cubic feet per pound mole
ft/sec	-	Feet per second
g	-	Grams
g/mL	-	Gram per milliliter
gr/DSCF	-	Grains per dry standard cubic feet

HI	-	Heat Input
ΔH_{avg}	-	Average pressure drop across the meter box during test run, inches H2O
H_2O	-	Water
Hg	-	Mercury
hr	-	Hour
in Hg	-	Inches of Mercury
in H_2O	-	Inches of Water
$\sqrt{inH_2O}$	-	Square root of Inches of Water
I	-	Isokinetic Sampling
K1 method 5	-	Conversion to standard conditions, 17.64 °R/inches Hg
K1 method 4	-	Conversion to standard conditions, 0.04707 f3/ml
K2 method 4	-	Conversion to standard conditions, 0.04715 ft3/g
K4 method 5	-	Conversion to standard conditions, 0.0945
K_p	-	Pitot tube constant, 85.49 for English units
Kg	-	Killograms
L	-	Length of Stack if Rectangular
lb	-	Pound
lb/lb-mole	-	Pound per pound mole
lb-mole	-	Pound mole
lb/hr	-	Pound per hour
lb/MMBTU	-	Pound per million British thermal units
ma	-	Average Final (total) weight after evaporation - Average Tare Weigth of Acetone Blank
m^3	-	Cubic meters
mg	-	Milligrams
mg/g	-	Milligrams per gram
mL	-	Milliliter
M_d	-	Molecular weight of stack gas mixture, dry basis
MMBTU	-	Million British Thermal Units
MMBtu/hr	-	Million British Thermal Units per hour
mm HG	-	Millimeters of Mercury
M_n	-	Mass of particulate matter, g
M_s	-	Molecular weight of stack gas mixture, wet basis
M_{SAT}	-	Ratio of vapor pressure of water at stack conditions to stack pressure
M_W	-	Molecular weight of a specific compound or element
N_2	-	Nitrogen
O_2	-	Oxygen
ng	-	Nanograms
NMNEVOC	-	Non-Methane, Non-Ethane Volatile Organic Compounds
NO_x	-	Oxides of Nitrogen
NO_2	-	Nitrous Oxide
%	-	Percent
% Volume	-	Percent by volume
% dv	-	Percent by volume, dry basis
ΔP	-	Gas velocity pressure, in H2O
P_a	-	Density of Acetone
P_{BAR}	-	Barometric pressure, in H2O
P_S	-	Static Pressure, in H2O
P_g	-	Total pressure of gas at stack conditions
P_{STD}	-	Standard pressure, 760 mmHG
$\sqrt{(P)_{avg}}$	-	Averag of the square root of gas velocity pressure, in H2O
ppm_{dv}	-	Parts per million, volume and dry basis
ppb_{dv}	-	Parts per billion, volume and dry basis
Q_{ACFM}	-	Flow rate of stack gas, actual cubic feet per minute
Q_{SCFM}	-	Flow rate of stack gas, standard cubic feet per minute
Q_{DSCFM}	-	Flow rate of stack gas, dry standard cubic feet per minute

°R	-	Degrees Rankin
°R/in. Hg	-	Degrees Rankin per inches of Mercury
scf/ml	-	Standard cubic feet per milliliter
scf/g	-	Standard cubic feet per gram
SCFM	-	Standard cubic feet per minute
SCM	-	Standard cubic meters
SCF	-	Standard cubic feet
$SP_{H2O@Tavg}$	-	Saturation pressure of water at average stack temperature
STD	-	Standard
s	-	Second
T	-	Stack Temperature
tph	-	Tons per hour
ton/yr	-	Tons per year
T_M	-	Temperature of the dry gas meter
T_S	-	Temperature of the stack
T_{STD}	-	Standard temperature, 68 °F
THC	-	Total Hydrocarbons
ug	-	Micrograms
Va	-	Volume of Acetone Blank, in mL
Vaw	-	Volume of Acetone Rinse, in mL
vol	-	Volume
V/n_{std}	-	Volume mole in standard conditions, in cubic feet per pound mole
V_{lc}	-	Total volume of water vapor condensed, at STP
V_m	-	Volume of sample gas measured by the dry gas meter
V_{MSTD}	-	Volume of sample gas measured by the dry gas meter, corrrected to standard conditions
VOC	-	Volatile Organic Compounds
V_S	-	Velocity of stack gas, ft/s
$V_{Wc(std)}$	-	Volume of water condensed, corrected to standard conditions
$V_{Wsg(std)}$	-	Volume of water collected in silica gel, corrected to standard conditions
$V_{W(std)}$	-	Volume of water vapor in gas stream. corrected to standard conditions
Y_d	-	Dry gas meter calibration factor
V_f	-	Final volume of water
V_i	-	Initial volume of water
W1	-	Acetone Rinse Final Weight 1
W2	-	Acetone Rinse Final Weight 2
W	-	Width of Stack if Rectangular
Wa	-	Weight of Acetone
W_f	-	Final weight
W_i	-	Initial weight

APPENDIX F

Facility Data

SCOT 1 (203)

S-203 Emission Test (Minute Results)

Date/Time	28AI2015A (INCINERATOR STACK S-203 SO2)	28AI2015B (28-S-203 FLUE GAS O2)	28AI2017A (SRU TAIL GAS H2S)	28AI2017B (SRU TAIL GAS SO2)	28FC239 (FUEL GAS TO WHB 28-S-204)	28FC240 (PROC. AIR TO WHB 28-S-204)	28FI284 (FUEL GAS TO S203)	28FC214 (SRU2 REPOWERING AG FD TO D201)	28FC213 (SRU2 GAG TO R201 ZONE 3)	28FC221 (SRU2 R201 RAG+SCOT ZONE 2)	28FC220 (SRU2 RAG+SCOT TO R201 ZONE 2)	28TC623 (WASTE HEAT INCINERATOR OUTLET)	28TC626 (SCOT INCINERATOR STACK)	28FI285 (STACK SO2 FLOW THERMAL OXIDZR)	28PDI285 (S203 STACK FLOW DP)	28TI628 (STACK TEMPERATURE THERMAL OXIDZR)
	PPMSO2	% O2	% H2S	% SO2	MMSCFD	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	DEG F	DEG F	PPH	INH2O	DEGF
(Avg)	102.72	3.94	0.00	0.00	0.00	633.70	447.06	0.21	2.23	4.37	2.25	0.00	1251.78	10.82	0.03	1052.97
Run #1																
09/15/2009 09:30	101.31	4.01	0.00	0.00	0.00	633.70	483.03	0.21	2.12	4.01	2.18	0.00	1246.42	10.45	0.00	22.92
09/15/2009 09:31	101.49	4.02	0.00	0.00	0.00	633.70	483.49	0.21	2.19	4.06	2.17	0.00	1247.34	10.45	0.00	1282.34
09/15/2009 09:32	101.34	4.02	0.00	0.00	0.00	633.70	483.57	0.21	2.18	4.05	2.20	0.00	1248.04	10.45	0.00	1.64
09/15/2009 09:33	101.49	4.01	0.00	0.00	0.00	633.70	483.90	0.21	2.20	4.08	2.19	0.00	1248.68	10.95	0.05	1287.23
09/15/2009 09:34	101.66	4.01	0.00	0.00	0.00	633.70	484.22	0.21	2.25	4.08	2.20	0.00	1250.16	10.62	0.04	1289.06
09/15/2009 09:35	114.01	3.93	0.00	0.00	0.00	633.70	483.63	0.21	2.27	4.10	2.20	0.00	1251.38	11.72	0.04	1290.98
09/15/2009 09:36	110.10	3.71	0.00	0.00	0.00	633.70	483.25	0.21	2.26	4.12	2.21	0.00	1252.16	12.42	0.05	1292.27
09/15/2009 09:37	103.97	3.72	0.00	0.00	0.00	633.70	483.57	0.21	2.27	4.12	2.21	0.00	1253.48	11.53	0.05	1291.52
09/15/2009 09:38	104.42	3.72	0.00	0.00	0.00	633.70	477.22	0.21	2.26	4.12	2.23	0.00	1253.96	11.22	0.05	1292.27
09/15/2009 09:39	103.95	3.85	0.00	0.00	0.00	633.70	476.19	0.21	2.28	4.12	2.23	0.00	1254.50	10.83	0.04	1293.44
09/15/2009 09:40	107.11	3.71	0.00	0.00	0.00	633.70	473.20	0.21	2.25	4.12	2.23	0.00	1254.50	11.47	0.00	23.09
09/15/2009 09:41	107.37	3.71	0.00	0.00	0.00	633.70	471.16	0.21	2.26	4.14	2.23	0.00	1254.34	11.48	0.00	1269.49
09/15/2009 09:42	107.17	3.71	0.00	0.00	0.00	633.70	470.24	0.21	2.26	4.14	2.23	0.00	1254.34	11.48	0.00	1.56
09/15/2009 09:43	107.17	3.72	0.00	0.00	0.00	633.70	468.63	0.21	2.24	4.14	2.24	0.00	1253.80	12.09	0.05	1289.18
09/15/2009 09:44	106.88	3.72	0.00	0.00	0.00	633.70	467.58	0.21	2.24	4.14	2.24	0.00	1253.96	11.90	0.05	1292.27
09/15/2009 09:45	95.53	4.01	0.00	0.00	0.00	633.70	465.59	0.21	2.22	4.16	2.24	0.00	1254.02	10.17	0.05	1292.15
09/15/2009 09:46	96.76	3.97	0.00	0.00	0.00	633.70	464.06	0.21	2.26	4.16	2.24	0.00	1253.44	9.81	0.04	1291.02
09/15/2009 09:47	98.39	3.88	0.00	0.00	0.00	633.70	464.47	0.21	2.24	4.21	2.25	0.00	1252.86	10.43	0.04	1287.89
09/15/2009 09:48	103.50	3.88	0.00	0.00	0.00	633.70	463.10	0.21	2.24	4.18	2.25	0.00	1252.38	10.47	0.04	1287.77
09/15/2009 09:49	101.17	3.92	0.00	0.00	0.00	633.70	463.18	0.21	2.26	4.20	2.25	0.00	1252.38	10.60	0.05	1284.80
09/15/2009 09:50	100.59	3.89	0.00	0.00	0.00	633.70	461.25	0.21	2.27	4.15	2.24	0.00	1252.00	10.34	0.00	1.56
09/15/2009 09:51	100.61	3.89	0.00	0.00	0.00	633.70	460.61	0.21	2.27	4.14	2.23	0.00	1251.68	10.34	0.00	1281.72
09/15/2009 09:52	100.43	3.89	0.00	0.00	0.00	633.70	460.28	0.21	2.27	4.15	2.23	0.00	1251.53	10.34	0.00	1.64
09/15/2009 09:53	100.59	3.88	0.00	0.00	0.00	633.70	459.58	0.21	2.27	4.16	2.24	0.00	1251.53	9.99	0.04	1264.64
09/15/2009 09:54	100.61	3.89	0.00	0.00	0.00	633.70	460.28	0.21	2.23	4.17	2.24	0.00	1250.74	10.53	0.04	1256.60
09/15/2009 09:55	98.30	4.04	0.00	0.00	0.00	633.70	460.52	0.21	2.21	4.22	2.26	0.00	1250.94	9.85	0.04	1256.05
09/15/2009 09:56	97.66	4.04	0.00	0.00	0.00	633.70	458.85	0.21	2.21	4.23	2.27	0.00	1250.63	9.88	0.04	1284.80
09/15/2009 09:57	99.20	3.97	0.00	0.00	0.00	633.70	459.57	0.21	2.18	4.24	2.28	0.00	1250.04	10.34	0.04	1284.15
09/15/2009 09:58	98.62	3.97	0.00	0.00	0.00	633.70	460.61	0.21	2.17	4.25	2.27	0.00	1249.73	10.23	0.04	1282.23
09/15/2009 09:59	100.46	3.97	0.00	0.00	0.00	633.70	459.73	0.21	2.18	4.21	2.26	0.00	1248.82	9.79	0.04	1279.26
09/15/2009 10:00	99.69	4.01	0.00	0.00	0.00	633.70	458.99	0.21	2.24	4.19	2.25	0.00	1248.82	9.29	0.01	1.56
09/15/2009 10:01	100.00	4.00	0.00	0.00	0.00	633.70	459.08	0.21	2.23	4.18	2.26	0.00	1247.50	9.29	0.00	1248.32
09/15/2009 10:02	100.00	4.00	0.00	0.00	0.00	633.70	464.39	0.21	2.26	4.20	2.26	0.00	1247.18	9.29	0.03	1271.37
09/15/2009 10:03	99.71	4.01	0.00	0.00	0.00	633.70	465.25	0.21	2.25	4.18	2.26	0.00	1246.98	10.53	0.05	1280.55
09/15/2009 10:04	99.69	4.01	0.00	0.00	0.00	633.70	466.88	0.21	2.25	4.17	2.26	0.00	1247.41	10.17	0.04	1280.53
09/15/2009 10:05	105.18	4.04	0.00	0.00	0.00	633.70	464.71	0.21	2.27	4.18	2.25	0.00	1248.15	10.29	0.04	1280.43
09/15/2009 10:06	107.62	3.89	0.00	0.00	0.00	633.70	439.23	0.21	2.26	4.19	2.27	0.00	1248.72	11.47	0.05	1286.05
09/15/2009 10:07	108.71	3.71	0.00	0.00	0.00	633.70	434.91	0.21	2.18	4.19	2.26	0.00	1249.62	11.62	0.04	1286.05
09/15/2009 10:08	107.62	3.80	0.00	0.00	0.00	633.70	433.71	0.21	2.21	4.19	2.25	0.00	1251.68	11.38	0.04	1285.43
09/15/2009 10:09	107.20	3.79	0.00	0.00	0.00	633.70	433.56	0.21	2.19	4.19	2.24	0.00	1252.74	11.87	0.05	1284.80
09/15/2009 10:10	110.07	3.72	0.00	0.00	0.00	633.70	432.36	0.21	2.20	4.18	2.25	0.00	1254.29	11.99	0.00	1.56
09/15/2009 10:11	109.81	3.72	0.00	0.00	0.00	633.70	427.15	0.21	2.20	4.18	2.26	0.00	1255.10	11.99	0.00	1287.89
09/15/2009 10:12	109.65	3.72	0.00	0.00	0.00	633.70	424.25	0.21	2.19	4.18	2.24	0.00	1255.73	11.99	0.00	1.56
09/15/2009 10:13	109.81	3.72	0.00	0.00	0.00	633.70	422.08	0.21	2.18	4.15	2.25	0.00	1255.73	11.80	0.05	1283.63
09/15/2009 10:14	110.10	3.71	0.00	0.00	0.00	633.70	419.77	0.21	2.25	4.16	2.25	0.00	1255.73	12.45	0.05	1281.72
09/15/2009 10:15	109.94	4.12	0.00	0.00	0.00	633.70	417.51	0.21	2.21	4.19	2.26	0.00	1256.00	11.22	0.04	1285.31
09/15/2009 10:16	108.88	4.08	0.00	0.00	0.00	633.70	415.99	0.21	2.22	4.22	2.27	0.00	1255.51	11.68	0.05	1284.80
09/15/2009 10:17	102.11	4.09	0.00	0.00	0.00	633.70	413.91	0.21	2.24	4.27	2.28	0.00	1254.61	10.86	0.05	1281.17
09/15/2009 10:18	101.67	4.09	0.00	0.00	0.00	633.70	411.20	0.21	2.23	4.26	2.30	0.00	1254.56	10.21	0.04	1283.48
09/15/2009 10:19	101.34	4.04	0.00	0.00	0.00	633.70	409.48	0.21	2.22	4.28	2.29	0.00	1254.52	11.08	0.05	1284.69
09/15/2009 10:20	99.84	3.98	0.00	0.00	0.00	633.70	409.31	0.21	2.24	4.25	2.29	0.00	1254.20	11.25	0.00	1.64
09/15/2009 10:21	100.13	3.98	0.00	0.00	0.00	633.70	407.66	0.21	2.24	4.21	2.27	0.00	1253.88	11.25	0.00	1260.39
09/15/2009 10:22	99.98	3.98	0.00	0.00	0.00	633.70	407.09	0.21	2.23	4.19	2.25	0.00	1253.38	11.25	0.03	1279.91
09/15/2009 10:23	99.98	3.98	0.00	0.00	0.00	633.70	406.44	0.21	2.22	4.16	2.24	0.00	1252.65	10.68	0.05	1281.17
09/15/2009 10:24	99.69	3.99	0.00	0.00	0.00	633.70	405.61	0.21	2.22	4.16	2.25	0.00	1252.49	11.01	0.05	1284.06
09/15/2009 10:25	94.42	4.29	0.00	0.00	0.00	633.70	404.61	0.21	2.20	4.16	2.25	0.00	1251.99	9.88	0.05	1280.61
09/15/2009 10:26	94.63	4.29	0.00	0.00	0.00	633.70	404.68	0.21	2.20	4.15	2.24	0.00	1251.66	9.76	0.04	1279.26
09/15/2009 10:27	96.26	4.16	0.00	0.00	0.00	633.70	405.00	0.21	2.21	4.20	2.27	0.00	1250.85	10.11	0.04	1276.57
09/15/2009 10:28	96.94	4.18	0.00	0.00	0.00	633.70	403.95	0.21	2.21	4.24	2.28	0.00	1250.11	10.43	0.05	1273.83
09/15/2009 10:29	98.44	4.13	0.00	0.00	0.00	633.70	403.56	0.21	2.21	4.22	2.26	0.00	1249.37	10.74	0.05	1273.71
09/15/2009 10:30	104.64	4.17	0.00	0.00	0.00	633.70	403.79	0.21	2.23	4.21	2.26	0.00	1248.53	10.99	0.00	43.97

S-203 Emission Test (Minute Results)

Date/Time	28AI2015A (INCINERATOR STACK S-203 SO2)	28AI2015B (2S-S-203 FLUE GAS O2)	28AI2017A (SRU TAIL GAS H2S)	28AI2017B (SRU TAIL GAS SO2)	28FC239 (FUEL GAS TO WHB 2S-S-204)	28FC240 (PROC. AIR TO WHB 2S-S-204)	28FI284 (FUEL GAS TO S203)	28FC214 (SRU2 RECOVERED NG AG FD TO D201)	28FC213 (SRU2 GAG TO R201 ZONE 2)	28FC221 (SRU2 R201 RAG+SCOT ZONE 2)	28FC220 (SRU2 RAG+SCOT TO R201 ZONE 2)	28TC623 (WASTE HEAT INCINERATOR OUTLET)	28TC626 (SCOT INCINERATOR STACK)	28FI285 (STACK SO2 FLOW THERMAL OXIDZR)	28PDI285 (S203 STACK FLOW DP)	28TI628 (STACK TEMPERATURE THERMAL OXIDZR)
	PPMSO2	% O2	% H2S	% SO2	MMSCFD	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	DEG F	DEG F	PPH	INH2O	DEGF
(Avg)	98.24	4.20	0.00	0.00	0.00	633.70	406.26	0.22	1.97	4.17	2.24	0.00	1250.73	10.76	0.04	1113.21
Run #2																
09/15/2009 11:00	103.33	3.96	0.00	0.00	0.00	633.70	424.42	0.22	2.13	4.13	2.23	0.00	1252.78	11.50	0.00	22.97
09/15/2009 11:01	103.33	3.96	0.00	0.00	0.00	633.70	420.23	0.22	2.06	4.12	2.23	0.00	1253.26	11.50	0.00	1284.14
09/15/2009 11:02	103.33	3.97	0.00	0.00	0.00	633.70	417.74	0.22	2.06	4.15	2.23	0.00	1254.04	11.50	0.04	1286.05
09/15/2009 11:03	103.04	3.97	0.00	0.00	0.00	633.70	417.10	0.22	2.13	4.13	2.23	0.00	1254.04	10.86	0.04	1282.89
09/15/2009 11:04	103.04	3.97	0.00	0.00	0.00	633.70	415.75	0.22	2.14	4.12	2.23	0.00	1253.68	11.17	0.05	1284.14
09/15/2009 11:05	94.94	4.33	0.00	0.00	0.00	633.70	414.55	0.21	2.19	4.13	2.24	0.00	1253.89	9.76	0.04	1284.14
09/15/2009 11:06	94.91	4.12	0.00	0.00	0.00	633.70	414.55	0.21	2.25	4.17	2.25	0.00	1253.68	9.52	0.04	1282.91
09/15/2009 11:07	98.59	4.21	0.00	0.00	0.00	633.70	414.29	0.21	2.28	4.22	2.26	0.00	1253.37	10.67	0.05	1287.23
09/15/2009 11:08	103.49	4.20	0.00	0.00	0.00	633.70	413.82	0.22	2.30	4.24	2.26	0.00	1253.14	11.04	0.05	1283.52
09/15/2009 11:09	98.30	4.17	0.00	0.00	0.00	633.70	411.80	0.22	2.31	4.22	2.26	0.00	1253.10	10.59	0.05	1281.72
09/15/2009 11:10	100.88	4.17	0.00	0.00	0.00	633.70	410.92	0.22	2.32	4.18	2.24	0.00	1252.24	10.01	0.00	1.56
09/15/2009 11:11	100.91	4.17	0.00	0.00	0.00	633.70	409.89	0.22	2.33	4.14	2.24	0.00	1252.24	10.01	0.00	1281.72
09/15/2009 11:12	100.88	4.17	0.00	0.00	0.00	633.70	409.89	0.22	2.31	4.11	2.22	0.00	1251.93	10.01	0.04	1278.09
09/15/2009 11:13	101.17	4.16	0.00	0.00	0.00	633.70	409.01	0.22	2.31	4.11	2.23	0.00	1252.52	10.88	0.05	1281.00
09/15/2009 11:14	101.20	4.16	0.00	0.00	0.00	633.70	407.87	0.22	2.29	4.11	2.23	0.00	1252.36	10.71	0.05	1284.14
09/15/2009 11:15	113.56	4.24	0.00	0.00	0.00	633.70	408.19	0.22	2.27	4.15	2.25	0.00	1252.04	11.86	0.05	1280.62
09/15/2009 11:16	107.03	4.25	0.00	0.00	0.00	633.70	407.55	0.22	2.23	4.23	2.25	0.00	1251.88	11.62	0.05	1278.59
09/15/2009 11:17	101.34	4.12	0.00	0.00	0.00	633.70	406.90	0.21	2.23	4.24	2.27	0.00	1251.18	10.77	0.05	1279.77
09/15/2009 11:18	97.21	4.17	0.00	0.00	0.00	633.70	406.90	0.22	2.22	4.23	2.27	0.00	1250.60	10.59	0.05	1278.09
09/15/2009 11:19	101.82	4.18	0.00	0.00	0.00	633.70	405.94	0.22	2.20	4.17	2.25	0.00	1250.13	10.31	0.04	1273.05
09/15/2009 11:20	101.84	4.20	0.00	0.00	0.00	633.70	405.06	0.22	2.26	4.12	2.23	0.00	1249.38	10.55	0.00	1.64
09/15/2009 11:21	101.65	4.20	0.00	0.00	0.00	633.70	404.59	0.22	2.25	4.09	2.23	0.00	1249.38	10.55	0.00	1216.60
09/15/2009 11:22	101.68	4.21	0.00	0.00	0.00	633.70	403.77	0.22	2.29	4.11	2.22	0.00	1249.86	10.55	0.00	1275.74
09/15/2009 11:23	101.49	4.21	0.00	0.00	0.00	633.70	402.74	0.22	2.29	4.12	2.23	0.00	1249.54	10.92	0.05	1281.17
09/15/2009 11:24	101.34	4.21	0.00	0.00	0.00	633.70	402.42	0.22	2.30	4.14	2.23	0.00	1249.38	10.32	0.04	1280.55
09/15/2009 11:25	89.48	4.25	0.00	0.00	0.00	633.70	402.01	0.22	2.31	4.15	2.24	0.00	1249.99	9.33	0.05	1283.52
09/15/2009 11:26	89.32	4.21	0.00	0.00	0.00	633.70	401.60	0.22	2.25	4.17	2.24	0.00	1249.61	8.72	0.04	1279.88
09/15/2009 11:27	93.88	4.15	0.00	0.00	0.00	633.70	401.78	0.22	2.22	4.14	2.23	0.00	1249.13	9.83	0.05	1281.72
09/15/2009 11:28	96.46	4.16	0.00	0.00	0.00	633.70	400.58	0.22	2.21	4.15	2.24	0.00	1249.45	10.34	0.05	1281.72
09/15/2009 11:29	102.14	4.19	0.00	0.00	0.00	633.70	400.18	0.22	2.18	4.14	2.23	0.00	1250.12	11.05	0.05	1282.21
09/15/2009 11:30	99.23	4.09	0.00	0.00	0.00	633.70	400.49	0.22	2.12	4.16	2.23	0.00	1250.35	10.86	0.00	22.25
09/15/2009 11:31	99.23	4.09	0.00	0.00	0.00	633.70	400.58	0.22	2.08	4.14	2.24	0.00	1250.67	10.85	0.00	1279.26
09/15/2009 11:32	99.41	4.08	0.00	0.00	0.00	633.70	402.89	0.22	2.06	4.15	2.23	0.00	1250.35	10.85	0.04	1283.63
09/15/2009 11:33	99.23	4.09	0.00	0.00	0.00	633.70	401.22	0.22	2.00	4.18	2.24	0.00	1250.42	10.53	0.05	1284.14
09/15/2009 11:34	99.35	4.08	0.00	0.00	0.00	633.70	401.86	0.22	1.93	4.21	2.26	0.00	1250.42	10.38	0.04	1287.23
09/15/2009 11:35	101.49	4.32	0.00	0.00	0.00	633.70	401.78	0.22	1.79	4.23	2.28	0.00	1250.19	10.68	0.05	1287.89
09/15/2009 11:36	101.20	4.21	0.00	0.00	0.00	633.70	401.69	0.22	1.75	4.26	2.28	0.00	1250.51	10.59	0.05	1288.40
09/15/2009 11:37	101.65	4.21	0.00	0.00	0.00	633.70	401.05	0.22	1.65	4.25	2.29	0.00	1250.13	9.79	0.04	1278.59
09/15/2009 11:38	93.98	4.25	0.00	0.00	0.00	633.70	401.76	0.22	1.63	4.25	2.28	0.00	1250.50	9.82	0.05	1281.55
09/15/2009 11:39	98.10	4.25	0.00	0.00	0.00	633.70	402.98	0.22	1.60	4.26	2.29	0.00	1250.83	9.79	0.05	1279.88
09/15/2009 11:40	96.14	4.25	0.00	0.00	0.00	633.70	402.31	0.22	1.62	4.24	2.28	0.00	1250.73	10.67	0.00	1.64
09/15/2009 11:41	96.44	4.25	0.00	0.00	0.00	633.70	401.92	0.22	1.62	4.22	2.27	0.00	1250.67	10.67	0.00	1286.05
09/15/2009 11:42	96.30	4.25	0.00	0.00	0.00	633.70	401.05	0.22	1.62	4.19	2.27	0.00	1250.67	10.67	0.04	1284.14
09/15/2009 11:43	96.44	4.25	0.00	0.00	0.00	633.70	401.92	0.22	1.70	4.19	2.27	0.00	1250.67	10.41	0.05	1286.05
09/15/2009 11:44	95.98	4.25	0.00	0.00	0.00	633.70	401.22	0.22	1.76	4.17	2.25	0.00	1250.67	10.38	0.05	1282.89
09/15/2009 11:45	89.32	4.41	0.00	0.00	0.00	633.70	401.22	0.22	1.78	4.18	2.26	0.00	1250.28	9.30	0.05	1284.69
09/15/2009 11:46	90.63	4.25	0.00	0.00	0.00	633.70	402.81	0.22	1.82	4.19	2.25	0.00	1249.78	9.54	0.05	1286.03
09/15/2009 11:47	92.33	4.25	0.00	0.00	0.00	633.70	402.83	0.22	1.88	4.18	2.25	0.00	1249.77	9.76	0.05	1285.43
09/15/2009 11:48	94.17	4.21	0.00	0.00	0.00	633.70	403.07	0.22	1.93	4.17	2.25	0.00	1249.52	10.14	0.05	1275.74
09/15/2009 11:49	96.87	4.25	0.00	0.00	0.00	633.70	404.33	0.22	1.96	4.14	2.24	0.00	1249.52	10.73	0.05	1284.54
09/15/2009 11:50	96.59	4.25	0.00	0.00	0.00	633.70	404.50	0.22	1.94	4.13	2.23	0.00	1250.10	10.41	0.00	0.90
09/15/2009 11:51	96.75	4.25	0.00	0.00	0.00	633.70	404.18	0.22	1.87	4.12	2.22	0.00	1250.10	10.41	0.00	1283.52
09/15/2009 11:52	96.59	4.25	0.00	0.00	0.00	633.70	403.47	0.22	1.87	4.13	2.22	0.00	1250.26	10.41	0.00	1.56
09/15/2009 11:53	96.91	4.24	0.00	0.00	0.00	633.70	406.26	0.22	1.69	4.13	2.22	0.00	1250.19	9.66	0.04	1253.12
09/15/2009 11:54	96.91	4.25	0.00	0.00	0.00	633.70	406.11	0.22	1.59	4.11	2.23	0.00	1249.26	9.76	0.04	1278.09
09/15/2009 11:55	100.88	4.49	0.00	0.00	0.00	633.70	405.39	0.22	1.50	4.16	2.25	0.00	1248.98	10.31	0.04	1281.66
09/15/2009 11:56	97.26	4.33	0.00	0.00	0.00	633.70	406.55	0.22	1.58	4.18	2.26	0.00	1248.98	9.76	0.04	1281.17
09/15/2009 11:57	94.83	4.35	0.00	0.00	0.00	633.70	406.12	0.22	1.31	4.19	2.25	0.00	1248.63	9.64	0.04	1275.83
09/15/2009 11:58	68.07	4.37	0.00	0.00	0.00	633.70	409.95	0.22	1.26	4.15	2.22	0.00	1247.87	8.79	0.04	1274.45
09/15/2009 11:59	95.39	4.43	0.00	0.00	0.00	633.70	409.01	0.22	1.23	4.12	2.22	0.00	1247.33	9.46	0.04	1280.53
09/15/2009 12:00	91.29	4.25	0.00	0.00	0.00	633.70	407.40	0.22	1.21	4.09	2.20	0.00	1247.87	16.12	0.00	1.56

S-203 Emission Test (Minute Results)

Date/Time	28AI2015A (INCINERATOR STACK S-203 SO2)	28AI2015B (28-S-203 FLUE GAS O2)	28AI2017A (SRU TAIL GAS H2S)	28AI2017B (SRU TAIL GAS SO2)	28FC239 (FUEL GAS TO WHB 28-S-204)	28FC240 (PROC. AIR TO WHB 28-S-204)	28FI284 (FUEL GAS TO S203)	28FC214 (SRU2 REPOWERING AG FD TO D201)	28FC213 (SRU2 GAG TO R201 ZONE 2)	28FC221 (SRU2 R201 RAG+SCOT ZONE 2)	28FC220 (SRU2 RAG+SCOT TO R201 ZONE 2)	28TC623 (WASTE HEAT INCINERATOR OUTLET)	28TC626 (SCOT INCINERATOR STACK)	28FI285 (STACK SO2 FLOW THERMAL OXIDZR)	28PDI285 (S203 STACK FLOW DP)	28TI628 (STACK TEMPERATURE THERMAL OXIDZR)
	PPMSO2	% O2	% H2S	% SO2	MMSCFD	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	DEG F	DEG F	PPH	INH2O	DEGF
(Avg)	94.96	4.28	0.00	0.00	0.00	633.70	390.23	0.23	1.30	4.27	2.30	0.00	1249.94	10.56	0.03	1092.92
Run #3																
09/15/2009 12:52	97.07	4.33	0.00	0.00	0.00	633.70	394.72	0.23	1.29	4.25	2.28	0.00	1252.62	10.19	0.04	1281.83
09/15/2009 12:53	96.91	4.33	0.00	0.00	0.00	633.70	394.07	0.23	1.34	4.23	2.28	0.00	1252.29	10.04	0.05	1281.05
09/15/2009 12:54	97.04	4.33	0.00	0.00	0.00	633.70	393.02	0.23	1.32	4.21	2.27	0.00	1251.98	10.04	0.05	1280.43
09/15/2009 12:55	82.71	4.40	0.00	0.00	0.00	633.70	393.28	0.23	1.34	4.19	2.25	0.00	1251.66	8.76	0.05	1281.05
09/15/2009 12:56	90.10	4.37	0.00	0.00	0.00	633.70	392.53	0.23	1.32	4.16	2.24	0.00	1251.39	9.30	0.05	1279.26
09/15/2009 12:57	92.63	4.37	0.00	0.00	0.00	633.70	391.67	0.23	1.30	4.20	2.26	0.00	1251.23	9.58	0.05	1284.14
09/15/2009 12:58	94.94	4.37	0.00	0.00	0.00	633.70	390.20	0.23	1.31	4.21	2.28	0.00	1251.82	9.98	0.05	1289.06
09/15/2009 12:59	96.91	4.29	0.00	0.00	0.00	633.70	389.50	0.22	1.33	4.30	2.31	0.00	1251.98	10.01	0.04	1287.23
09/15/2009 13:00	101.52	4.33	0.00	0.00	0.00	633.70	388.54	0.23	1.35	4.36	2.33	0.00	1251.82	9.67	0.00	1.56
09/15/2009 13:01	101.84	4.33	0.00	0.00	0.00	633.70	385.40	0.23	1.33	4.39	2.35	0.00	1251.49	9.67	0.00	1282.89
09/15/2009 13:02	101.65	4.33	0.00	0.00	0.00	633.70	386.28	0.23	1.32	4.36	2.34	0.00	1251.39	9.67	0.04	1281.72
09/15/2009 13:03	101.84	4.33	0.00	0.00	0.00	633.70	386.13	0.23	1.31	4.35	2.33	0.00	1251.39	10.65	0.05	1283.43
09/15/2009 13:04	101.65	4.33	0.00	0.00	0.00	633.70	385.58	0.23	1.31	4.31	2.30	0.00	1251.01	10.50	0.05	1282.34
09/15/2009 13:05	103.65	4.33	0.00	0.00	0.00	633.70	385.17	0.23	1.34	4.28	2.30	0.00	1251.49	10.80	0.05	1285.43
09/15/2009 13:06	104.13	4.34	0.00	0.00	0.00	633.70	384.29	0.23	1.27	4.23	2.29	0.00	1251.49	10.89	0.05	1281.17
09/15/2009 13:07	101.04	4.43	0.00	0.00	0.00	633.70	383.79	0.23	1.27	4.24	2.29	0.00	1251.49	10.53	0.05	1283.52
09/15/2009 13:08	96.91	4.33	0.00	0.00	0.00	633.70	383.41	0.23	1.24	4.26	2.30	0.00	1251.01	10.20	0.05	1281.05
09/15/2009 13:09	93.46	4.31	0.00	0.00	0.00	633.70	384.01	0.23	1.30	4.28	2.31	0.00	1250.37	9.77	0.05	1281.71
09/15/2009 13:10	91.43	4.45	0.00	0.00	0.00	633.70	384.67	0.23	1.30	4.29	2.32	0.00	1250.56	9.65	0.00	1.56
09/15/2009 13:11	91.10	4.45	0.00	0.00	0.00	633.70	385.17	0.23	1.29	4.32	2.33	0.00	1249.53	9.65	0.00	1280.43
09/15/2009 13:12	91.27	4.45	0.00	0.00	0.00	633.70	385.23	0.23	1.29	4.31	2.33	0.00	1248.82	9.65	0.00	1.56
09/15/2009 13:13	91.58	4.45	0.00	0.00	0.00	633.70	385.58	0.23	1.27	4.30	2.32	0.00	1248.82	9.00	0.04	1285.43
09/15/2009 13:14	91.46	4.45	0.00	0.00	0.00	633.70	384.99	0.23	1.27	4.30	2.30	0.00	1248.82	9.44	0.05	1284.82
09/15/2009 13:15	100.00	4.36	0.00	0.00	0.00	633.70	384.52	0.23	1.26	4.32	2.32	0.00	1248.40	10.26	0.04	1285.43
09/15/2009 13:16	98.13	4.37	0.00	0.00	0.00	633.70	386.69	0.23	1.27	4.32	2.33	0.00	1248.40	9.72	0.04	1290.55
09/15/2009 13:17	92.33	4.37	0.00	0.00	0.00	633.70	387.89	0.23	1.26	4.28	2.32	0.00	1248.56	9.61	0.05	1283.47
09/15/2009 13:18	94.33	4.15	0.00	0.00	0.00	633.70	387.66	0.23	1.26	4.27	2.29	0.00	1248.56	10.11	0.05	1285.43
09/15/2009 13:19	93.68	4.17	0.00	0.00	0.00	633.70	389.27	0.23	1.27	4.24	2.29	0.00	1248.72	10.11	0.05	1283.31
09/15/2009 13:20	97.07	4.25	0.00	0.00	0.00	633.70	388.21	0.23	1.32	4.23	2.29	0.00	1248.98	17.86	0.00	22.96
09/15/2009 13:21	97.36	4.25	0.00	0.00	0.00	633.70	388.56	0.23	1.31	4.21	2.28	0.00	1249.45	18.01	0.00	1256.81
09/15/2009 13:22	97.36	4.25	0.00	0.00	0.00	633.70	388.56	0.23	1.34	4.23	2.29	0.00	1249.46	18.00	0.00	1.56
09/15/2009 13:23	97.07	4.25	0.00	0.00	0.00	633.70	388.62	0.23	1.32	4.23	2.30	0.00	1249.42	9.73	0.04	1291.17
09/15/2009 13:24	96.91	4.25	0.00	0.00	0.00	633.70	388.45	0.23	1.33	4.25	2.29	0.00	1249.58	10.17	0.05	1281.72
09/15/2009 13:25	84.42	4.53	0.00	0.00	0.00	633.70	389.00	0.23	1.33	4.30	2.30	0.00	1249.58	8.91	0.05	1283.52
09/15/2009 13:26	87.91	4.36	0.00	0.00	0.00	633.70	388.45	0.23	1.32	4.30	2.31	0.00	1249.58	8.91	0.04	1281.72
09/15/2009 13:27	90.39	4.28	0.00	0.00	0.00	633.70	388.95	0.23	1.32	4.32	2.32	0.00	1249.84	9.36	0.05	1287.14
09/15/2009 13:28	88.53	4.13	0.00	0.00	0.00	633.70	389.74	0.23	1.29	4.30	2.31	0.00	1249.62	9.31	0.05	1279.88
09/15/2009 13:29	97.07	4.21	0.00	0.00	0.00	633.70	390.70	0.23	1.26	4.30	2.31	0.00	1249.62	10.08	0.04	1284.69
09/15/2009 13:30	92.20	4.16	0.00	0.00	0.00	633.70	391.26	0.23	1.27	4.28	2.30	0.00	1249.42	17.78	0.00	1.56
09/15/2009 13:31	92.04	4.17	0.00	0.00	0.00	633.70	391.73	0.23	1.27	4.24	2.30	0.00	1248.71	17.78	0.00	1282.23
09/15/2009 13:32	91.88	4.16	0.00	0.00	0.00	633.70	391.99	0.23	1.27	4.25	2.29	0.00	1249.03	17.78	0.04	1279.26
09/15/2009 13:33	92.20	4.16	0.00	0.00	0.00	633.70	392.78	0.23	1.30	4.25	2.28	0.00	1249.19	9.95	0.05	1286.17
09/15/2009 13:34	92.17	4.16	0.00	0.00	0.00	633.70	392.14	0.23	1.33	4.26	2.28	0.00	1248.81	9.27	0.04	1279.26
09/15/2009 13:35	98.93	4.37	0.00	0.00	0.00	633.70	393.55	0.23	1.32	4.23	2.28	0.00	1248.24	9.69	0.04	1281.14
09/15/2009 13:36	100.43	4.20	0.00	0.00	0.00	633.70	393.84	0.23	1.34	4.22	2.29	0.00	1248.45	10.29	0.04	1279.88
09/15/2009 13:37	101.02	4.25	0.00	0.00	0.00	633.70	394.56	0.23	1.32	4.26	2.30	0.00	1249.19	10.72	0.05	1283.51
09/15/2009 13:38	95.98	4.25	0.00	0.00	0.00	633.70	394.16	0.23	1.32	4.27	2.30	0.00	1249.51	10.05	0.05	1282.36
09/15/2009 13:39	96.58	4.14	0.00	0.00	0.00	633.70	393.35	0.23	1.34	4.29	2.30	0.00	1249.86	10.01	0.04	1281.07
09/15/2009 13:40	94.03	4.05	0.00	0.00	0.00	633.70	392.71	0.23	1.31	4.25	2.28	0.00	1250.09	9.96	0.00	22.89
09/15/2009 13:41	94.00	4.05	0.00	0.00	0.00	633.70	392.95	0.23	1.29	4.26	2.29	0.00	1249.72	9.96	0.00	1264.15
09/15/2009 13:42	94.00	4.05	0.00	0.00	0.00	633.70	393.02	0.23	1.26	4.26	2.29	0.00	1249.55	9.96	0.00	1.64
09/15/2009 13:43	93.71	4.06	0.00	0.00	0.00	633.70	393.90	0.23	1.27	4.27	2.30	0.00	1249.55	9.58	0.04	1276.37
09/15/2009 13:44	93.71	4.06	0.00	0.00	0.00	633.70	393.28	0.23	1.27	4.28	2.30	0.00	1249.71	9.43	0.04	1278.55
09/15/2009 13:45	99.55	4.29	0.00	0.00	0.00	633.70	394.31	0.23	1.31	4.28	2.30	0.00	1249.71	10.11	0.04	1274.34
09/15/2009 13:46	94.94	4.25	0.00	0.00	0.00	633.70	393.28	0.23	1.31	4.26	2.30	0.00	1250.03	9.55	0.04	1281.05
09/15/2009 13:47	92.49	4.29	0.00	0.00	0.00	633.70	394.48	0.23	1.31	4.27	2.31	0.00	1249.55	9.20	0.04	1277.97
09/15/2009 13:48	93.22	4.25	0.00	0.00	0.00	633.70	396.39	0.23	1.29	4.30	2.31	0.00	1249.44	9.36	0.05	1281.55
09/15/2009 13:49	93.11	4.16	0.00	0.00	0.00	633.70	395.74	0.23	1.26	4.30	2.31	0.00	1249.55	9.52	0.04	1281.72
09/15/2009 13:50	91.43	4.29	0.00	0.00	0.00	633.70	396.56	0.23	1.30	4.26	2.30	0.00	1249.06	8.72	0.00	0.90
09/15/2009 13:51	91.27	4.29	0.00	0.00	0.00	633.70	396.24	0.23	1.31	4.22	2.28	0.00	1248.90	8.72	0.00	1278.09
09/15/2009 13:52	91.27	4.29	0.00	0.00	0.00	633.70	398.23	0.23	1.31	4.22	2.28	0.00	1248.58	8.72	0.04	1272.54

SCOT 2 (804)

S-804 Emission Test (Minute Results)

Date/Time	28A8953 (285804 SO2 NORMAL SAMPLE)	28A8954 (285504 O2 NORMAL SAMPLE)	28AI4023A (FINAL COND OUTLET H2S)	28AI4023B (FINAL COND OUTLET SO2)	28FC3117 (MAIN AIR FLOW TO REAC FURNACE)	28FC8134X (SCOT2 FUEL GAS THERMOX)	28FC214 (SRU2 RECOVERING AG FD TO D201)	28FC213 (SRU2 GAG TO R201 ZONE 2)	28FC221 (SRU2 R201 RAG+SCOT ZONE 2)	28FC220 (SRU2 RAG+SCOT TO R201 ZONE 2)	28FI8152 (STACK SO2 FLOW THERMAL OXIDZR)	28FI8156B (COMBUST AIR FLOW T.O. BURNER)	28TI8562 (VENT TEMPERATURE THERMAL OXIDZR)	28TI8570 (THERMAL OXIDIZER STACK)	28AI8953 (THERMAL OXIDZR STACK S-804 SO2)	28AI8954 (28-S-804 FLUE GAS O2)
	PPM	PCT	MOLE	MOLE%	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	PPH	MSCFD	DEGF	DEGF	PPM	PCT
(Avg)	99.58	2.25	0.06	0.23	4.82	460.01	0.21	2.23	4.17	2.25	14.46	7006.78	1423.12	1133.24	98.88	2.25
Run #1																
09/15/2009 09:30	104.64	2.61	0.05	0.25	4.55	473.30	0.21	2.12	4.01	2.18	13.96	6842.92	1418.92	21.71	99.66	2.69
09/15/2009 09:31	104.64	2.61	0.04	0.25	4.68	474.94	0.21	2.19	4.06	2.17	13.94	6917.31	1418.68	1344.80	99.58	2.69
09/15/2009 09:32	104.64	2.61	0.05	0.25	5.13	470.14	0.21	2.18	4.05	2.20	13.94	6992.97	1428.02	-0.27	99.64	2.69
09/15/2009 09:33	99.53	2.69	0.04	0.25	4.55	474.26	0.21	2.20	4.08	2.19	14.15	6830.85	1419.78	1340.20	99.53	2.69
09/15/2009 09:34	99.64	2.69	0.05	0.24	4.90	474.49	0.21	2.25	4.08	2.20	14.45	6992.97	1420.88	1348.95	99.64	2.69
09/15/2009 09:35	106.16	1.85	0.06	0.24	5.04	467.49	0.21	2.27	4.10	2.20	16.01	7025.40	1429.67	1353.13	106.16	1.87
09/15/2009 09:36	102.23	2.18	0.04	0.24	4.54	474.02	0.21	2.26	4.12	2.21	15.78	6971.36	1418.68	1344.69	102.23	2.15
09/15/2009 09:37	96.48	1.92	0.04	0.24	5.00	472.79	0.21	2.27	4.12	2.21	14.21	7014.59	1423.63	1355.78	96.48	1.89
09/15/2009 09:38	101.80	1.81	0.04	0.24	5.06	469.16	0.21	2.26	4.12	2.23	15.23	7056.21	1426.37	1353.75	101.80	1.89
09/15/2009 09:39	98.12	2.10	0.05	0.24	4.56	475.27	0.21	2.28	4.12	2.23	15.12	7026.21	1416.48	1345.12	98.12	2.07
09/15/2009 09:40	98.12	2.10	0.05	0.24	4.98	470.79	0.21	2.25	4.12	2.23	15.12	7023.58	1426.75	21.96	95.32	2.06
09/15/2009 09:41	98.12	2.10	0.05	0.24	5.08	469.26	0.21	2.26	4.14	2.23	15.12	7014.77	1426.92	1325.23	95.12	2.06
09/15/2009 09:42	95.22	2.10	0.04	0.24	4.54	475.21	0.21	2.26	4.14	2.23	15.12	7057.82	1414.84	1306.25	95.22	2.06
09/15/2009 09:43	95.36	2.06	0.04	0.24	5.02	475.85	0.21	2.24	4.14	2.24	14.09	7079.44	1418.68	1348.44	95.36	2.06
09/15/2009 09:44	95.30	2.06	0.05	0.24	5.09	467.37	0.21	2.24	4.14	2.24	13.93	7068.63	1426.92	1354.30	95.30	2.06
09/15/2009 09:45	98.67	2.61	0.04	0.24	4.53	476.33	0.21	2.22	4.16	2.23	13.97	7079.44	1416.48	1346.52	98.67	2.49
09/15/2009 09:46	98.54	2.34	0.04	0.24	5.07	469.99	0.21	2.26	4.16	2.24	13.97	7068.81	1426.75	1359.93	98.54	2.31
09/15/2009 09:47	95.44	2.48	0.05	0.24	5.06	468.10	0.21	2.24	4.21	2.25	14.97	7079.44	1428.02	1355.01	95.44	2.48
09/15/2009 09:48	93.62	2.69	0.04	0.24	4.54	473.82	0.21	2.24	4.18	2.25	13.35	7111.86	1417.58	1350.12	93.62	2.77
09/15/2009 09:49	96.59	2.47	0.05	0.24	4.97	470.03	0.21	2.26	4.20	2.25	13.35	7122.67	1428.02	1362.42	96.59	2.40
09/15/2009 09:50	97.82	2.32	0.05	0.24	5.05	466.78	0.21	2.27	4.15	2.24	17.84	7101.06	1428.02	-0.47	97.84	2.32
09/15/2009 09:51	97.84	2.33	0.06	0.24	4.57	471.10	0.21	2.27	4.14	2.23	17.84	7101.06	1418.68	1347.70	97.84	2.33
09/15/2009 09:52	97.84	2.33	0.06	0.24	4.63	467.25	0.21	2.27	4.15	2.23	3.17	7090.25	1426.92	-0.35	97.71	2.33
09/15/2009 09:53	97.77	2.32	0.06	0.24	5.10	462.26	0.21	2.27	4.16	2.24	14.01	7068.63	1429.12	1353.87	97.76	2.33
09/15/2009 09:54	97.87	2.33	0.06	0.24	4.54	470.46	0.21	2.23	4.17	2.24	14.12	7101.06	1414.84	1346.41	97.87	2.32
09/15/2009 09:55	98.09	2.57	0.06	0.24	4.86	467.35	0.21	2.21	4.22	2.26	14.01	7101.06	1422.53	1358.91	98.09	2.56
09/15/2009 09:56	99.74	2.61	0.07	0.23	5.07	463.43	0.21	2.21	4.23	2.27	13.54	7101.06	1426.92	1356.88	99.74	2.65
09/15/2009 09:57	96.24	2.94	0.07	0.23	4.60	468.79	0.21	2.18	4.21	2.28	13.84	7079.80	1416.65	1347.73	96.24	2.90
09/15/2009 09:58	93.54	2.61	0.07	0.23	4.53	473.04	0.21	2.17	4.25	2.27	13.26	7101.06	1419.78	1356.05	93.54	2.58
09/15/2009 09:59	101.35	2.40	0.07	0.23	5.09	462.07	0.21	2.18	4.21	2.26	13.84	7079.44	1429.67	1361.56	101.35	2.40
09/15/2009 10:00	101.35	2.40	0.07	0.23	4.65	466.26	0.21	2.21	4.19	2.25	13.97	7101.06	1418.68	-1.02	102.10	2.52
09/15/2009 10:01	101.35	2.40	0.07	0.23	4.54	466.19	0.21	2.23	4.18	2.26	13.97	7101.06	1423.55	1353.09	102.07	2.52
09/15/2009 10:02	102.12	2.53	0.07	0.23	5.14	459.53	0.21	2.26	4.20	2.26	13.97	7068.63	1431.87	1357.30	102.07	2.53
09/15/2009 10:03	102.12	2.52	0.07	0.23	4.55	465.16	0.21	2.25	4.18	2.26	14.94	7036.21	1415.38	1343.95	102.07	2.53
09/15/2009 10:04	102.04	2.52	0.07	0.23	4.64	469.32	0.21	2.25	4.17	2.26	15.11	7047.01	1414.84	1350.12	102.04	2.53
09/15/2009 10:05	102.76	2.60	0.07	0.23	5.07	463.52	0.21	2.27	4.18	2.25	15.14	7057.82	1426.92	1362.30	102.76	2.52
09/15/2009 10:06	100.44	2.23	0.07	0.23	4.69	464.23	0.21	2.26	4.19	2.27	15.03	7025.40	1417.58	1352.59	100.44	2.27
09/15/2009 10:07	98.09	2.07	0.07	0.23	4.56	463.42	0.21	2.18	4.19	2.26	15.23	7068.63	1426.92	1368.71	98.09	1.97
09/15/2009 10:08	100.81	1.93	0.08	0.23	5.13	448.50	0.21	2.21	4.19	2.25	15.09	6982.16	1439.01	1372.23	100.81	1.93
09/15/2009 10:09	102.15	2.19	0.07	0.23	4.59	452.15	0.21	2.19	4.19	2.24	15.21	7025.40	1424.73	1356.21	97.73	2.19
09/15/2009 10:10	102.15	2.19	0.07	0.23	4.55	452.40	0.21	2.20	4.18	2.25	15.21	6982.16	1426.92	-1.02	98.67	2.19
09/15/2009 10:11	102.15	2.19	0.08	0.23	5.15	444.61	0.21	2.20	4.18	2.26	15.21	6982.16	1435.71	1371.48	98.67	2.19
09/15/2009 10:12	102.15	2.19	0.07	0.23	4.56	442.22	0.21	2.19	4.18	2.24	15.21	6982.16	1422.53	-0.27	98.49	2.19
09/15/2009 10:13	98.59	2.19	0.07	0.23	4.88	448.73	0.21	2.18	4.15	2.25	14.33	6938.93	1419.78	1353.78	98.59	2.19
09/15/2009 10:14	98.70	2.19	0.07	0.23	5.04	442.89	0.21	2.25	4.16	2.25	14.32	6971.36	1428.57	1362.42	98.70	2.19
09/15/2009 10:15	101.29	2.26	0.07	0.23	4.58	446.78	0.21	2.21	4.19	2.26	15.11	6982.16	1417.03	1349.49	101.29	2.33
09/15/2009 10:16	94.47	2.07	0.07	0.23	4.56	446.61	0.21	2.22	4.22	2.27	14.69	7014.59	1421.98	1361.88	94.47	2.02
09/15/2009 10:17	104.26	1.98	0.08	0.23	5.14	441.56	0.21	2.24	4.27	2.28	15.81	6982.16	1426.92	1360.67	104.26	2.02
09/15/2009 10:18	95.92	2.19	0.07	0.23	4.57	448.94	0.21	2.23	4.26	2.30	13.90	6939.63	1413.96	1352.76	95.92	2.19
09/15/2009 10:19	97.07	1.93	0.07	0.23	4.84	448.82	0.21	2.22	4.28	2.29	14.21	6928.12	1423.63	1367.30	94.34	1.87
09/15/2009 10:20	97.07	1.93	0.08	0.23	5.13	440.25	0.21	2.24	4.25	2.29	14.21	6938.93	1434.07	-1.02	94.58	1.87
09/15/2009 10:21	97.07	1.93	0.07	0.23	4.55	445.75	0.21	2.24	4.21	2.27	14.21	6981.44	1414.08	1326.98	94.64	1.87
09/15/2009 10:22	94.68	1.88	0.06	0.23	5.08	445.44	0.21	2.23	4.19	2.25	14.21	6982.16	1422.30	1358.82	94.64	1.87
09/15/2009 10:23	94.53	1.88	0.07	0.23	5.09	439.88	0.21	2.22	4.16	2.24	13.47	6938.93	1431.32	1363.67	94.53	1.87
09/15/2009 10:24	94.69	1.87	0.07	0.23	4.54	444.88	0.21	2.22	4.16	2.25	14.45	6928.12	1414.84	1351.33	94.69	1.87
09/15/2009 10:25	101.10	1.97	0.08	0.23	5.13	441.43	0.21	2.20	4.16	2.25	15.70	6896.24	1424.02	1364.85	101.10	1.95
09/15/2009 10:26	107.17	1.88	0.06	0.23	4.90	438.16	0.21	2.20	4.15	2.24	14.90	6830.85	1426.92	1368.90	107.17	2.01
09/15/2009 10:27	102.66	2.23	0.07	0.23	4.54	445.70	0.21	2.21	4.20	2.27	14.69	6841.66	1413.74	1355.27	102.66	2.23
09/15/2009 10:28	100.04	1.89	0.07	0.23	5.15	444.08	0.21	2.21	4.24	2.28	15.12	6874.08	1424.73	1368.48	100.04	1.85
09/15/2009 10:29	107.23	2.02	0.07	0.23	4.55	439.79	0.21	2.21	4.22	2.26	15.00	6798.42	1421.43	1356.64	107.23	2.09
09/15/2009 10:30	107.23	2.02	0.08	0.23	4.79	440.25	0.21	2.23	4.21	2.26	15.00	6892.46	1420.90	44.24	106.58	2.07

S-804 Emission Test (Minute Results)

Date/Time	28AI8953	28AI8954	28AI40123A	28AI40123B	28FC3117	28FCR134X	28FC214	28FC213	28FC221	28FC220	28FI8152	28FI81568	28TI8562	28TI8570	26AI8953	28AI8954
	(285804 SO2 NORMAL SAMPLE)	(285804 O2 NORMAL SAMPLE)	(FINAL COND OUTLET H2S)	(FINAL COND OUTLET SO2)	(MAIN AIR FLOW TO REAC FURNACE)	(SCOT2 FUEL GAS THERMOX)	(SRU2 REPOWERING AG FD TO D201)	(SRU2 GAS TO R201 ZONE 2)	(SRU2 R201 RAG+SCOT ZONE 2)	(SRU2 RAG+SCOT TO R201 ZONE 2)	(STACK SO2 FLOW THERMAL OXIDZR)	(COMBUST AIR FLOW T.O. BURNER)	(VENT TEMPERATURE THERMAL OXIDZR)	(THERMAL OXIDIZER STACK)	(THERMAL OXIDZR STACK S-804 SO2)	(28-S-804 FLUE GAS O2)
	FPM	PCT	MOLE	MOLE%	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	PPH	MSCFD	DEGF	DEGF	PPM	PCT
(Avg)	107.45	2.17	0.07	0.21	4.84	441.48	0.22	1.97	4.17	2.24	15.47	6873.92	1420.17	1186.11	107.88	2.17
Run #2																
09/15/2009 11:00	101.40	1.98	0.07	0.22	4.54	441.94	0.22	2.13	4.13	2.23	15.00	6700.79	1412.84	21.96	106.00	2.07
09/15/2009 11:01	101.40	1.98	0.08	0.22	5.06	448.79	0.22	2.06	4.12	2.23	15.00	6722.76	1422.53	1369.26	106.00	2.07
09/15/2009 11:02	106.00	2.06	0.06	0.23	4.92	444.16	0.22	2.06	4.15	2.23	15.00	6679.53	1408.79	1345.20	106.00	2.07
09/15/2009 11:03	105.95	2.07	0.07	0.23	4.55	452.14	0.22	2.13	4.13	2.23	15.63	6787.61	1404.40	1355.86	105.95	2.07
09/15/2009 11:04	106.04	2.07	0.07	0.22	5.11	446.43	0.22	2.14	4.12	2.23	15.09	6863.27	1424.73	1370.94	106.04	2.07
09/15/2009 11:05	111.69	2.19	0.07	0.22	4.87	443.73	0.21	2.19	4.13	2.24	16.82	6798.42	1424.73	1363.98	111.69	2.20
09/15/2009 11:06	101.31	2.23	0.08	0.22	4.54	446.37	0.21	2.25	4.17	2.25	14.25	6777.17	1417.70	1362.30	101.31	2.21
09/15/2009 11:07	105.70	1.99	0.07	0.22	5.11	442.54	0.21	2.28	4.22	2.26	15.63	6839.23	1426.92	1372.85	105.70	1.98
09/15/2009 11:08	111.80	1.98	0.06	0.22	4.80	441.57	0.22	2.30	4.24	2.26	16.01	6701.15	1424.18	1365.39	111.80	2.06
09/15/2009 11:09	106.03	2.19	0.06	0.22	4.58	445.35	0.22	2.31	4.22	2.26	15.66	6852.46	1415.93	1361.09	106.03	2.17
09/15/2009 11:10	106.03	2.19	0.09	0.22	5.12	440.00	0.22	2.32	4.18	2.24	15.66	6874.08	1426.92	-1.02	105.30	2.12
09/15/2009 11:11	106.03	2.19	0.07	0.22	4.61	442.08	0.22	2.33	4.14	2.24	15.66	6917.31	1418.68	1358.13	105.30	2.12
09/15/2009 11:12	105.22	2.12	0.07	0.22	4.99	446.54	0.22	2.31	4.11	2.22	15.66	6917.31	1417.03	1362.70	105.24	2.12
09/15/2009 11:13	105.22	2.11	0.07	0.22	5.04	441.29	0.22	2.31	4.11	2.23	14.81	6895.70	1426.37	1370.39	105.24	2.12
09/15/2009 11:14	105.41	2.12	0.07	0.22	4.53	444.97	0.22	2.29	4.11	2.23	15.11	6895.70	1413.74	1359.30	105.41	2.12
09/15/2009 11:15	108.17	2.17	0.07	0.22	5.06	443.83	0.22	2.27	4.15	2.25	15.55	6854.62	1421.05	1371.06	108.17	2.06
09/15/2009 11:16	112.20	2.02	0.07	0.21	5.02	440.55	0.22	2.23	4.23	2.25	16.36	6884.89	1426.92	1369.77	112.20	1.98
09/15/2009 11:17	105.49	2.32	0.07	0.21	4.53	445.47	0.21	2.23	4.24	2.27	15.27	6928.12	1412.64	1359.30	105.49	2.31
09/15/2009 11:18	107.73	1.93	0.06	0.21	5.14	443.64	0.22	2.22	4.23	2.27	15.63	6973.36	1424.73	1374.22	107.73	1.95
09/15/2009 11:19	108.72	2.10	0.09	0.21	4.64	442.84	0.22	2.20	4.17	2.25	16.21	6917.31	1418.68	1363.55	108.72	2.13
09/15/2009 11:20	108.72	2.10	0.06	0.21	4.64	448.77	0.22	2.26	4.12	2.23	16.21	6949.74	1412.64	-1.02	110.92	2.23
09/15/2009 11:21	108.72	2.10	0.07	0.21	5.07	440.71	0.22	2.26	4.09	2.23	16.21	6908.67	1428.30	1351.84	110.92	2.23
09/15/2009 11:22	110.92	2.23	0.06	0.21	4.70	443.96	0.22	2.29	4.11	2.22	16.21	6949.74	1417.58	1356.95	110.92	2.23
09/15/2009 11:23	110.92	2.23	0.07	0.21	4.55	447.93	0.22	2.29	4.12	2.23	16.76	6928.12	1417.58	1362.93	110.92	2.23
09/15/2009 11:24	110.92	2.22	0.08	0.21	5.12	439.53	0.22	2.30	4.14	2.23	15.29	6928.12	1429.12	1370.39	110.92	2.23
09/15/2009 11:25	110.09	2.40	0.08	0.21	4.60	444.57	0.22	2.31	4.15	2.24	15.79	7014.59	1414.84	1358.01	110.09	2.40
09/15/2009 11:26	104.92	2.24	0.07	0.21	4.65	448.57	0.22	2.25	4.17	2.24	14.38	6928.93	1414.84	1367.85	104.92	2.23
09/15/2009 11:27	110.35	1.94	0.07	0.21	5.11	440.20	0.22	2.22	4.14	2.23	16.48	6906.51	1432.42	1376.68	110.35	1.93
09/15/2009 11:28	109.18	2.30	0.08	0.21	4.54	440.31	0.22	2.21	4.15	2.24	15.57	6863.27	1421.33	1361.02	109.18	2.31
09/15/2009 11:29	103.88	2.15	0.07	0.21	4.94	441.55	0.22	2.18	4.14	2.23	15.54	6999.10	1421.39	1369.48	103.66	2.15
09/15/2009 11:30	103.70	2.15	0.07	0.21	5.05	435.19	0.22	2.12	4.16	2.23	15.54	6961.27	1428.99	21.83	103.75	2.11
09/15/2009 11:31	103.70	2.15	0.07	0.21	4.56	440.94	0.22	2.08	4.14	2.24	15.54	6960.53	1414.84	1354.61	103.75	2.11
09/15/2009 11:32	105.78	2.11	0.07	0.21	4.80	440.15	0.22	2.06	4.15	2.23	15.54	6895.70	1423.08	1363.70	103.75	2.11
09/15/2009 11:33	105.78	2.11	0.06	0.21	5.12	434.14	0.22	2.00	4.18	2.24	14.54	6906.51	1428.02	1364.65	103.75	2.11
09/15/2009 11:34	105.75	2.11	0.07	0.21	4.55	440.39	0.22	1.93	4.21	2.26	14.97	6852.46	1412.64	1354.49	103.75	2.11
09/15/2009 11:35	105.38	2.16	0.07	0.21	5.06	443.26	0.22	1.79	4.23	2.28	15.36	6906.51	1419.78	1369.22	103.38	2.19
09/15/2009 11:36	117.17	1.93	0.07	0.21	5.08	438.09	0.22	1.75	4.26	2.28	16.16	6928.12	1427.47	1371.68	117.17	1.98
09/15/2009 11:37	106.35	2.40	0.07	0.21	4.55	440.65	0.22	1.65	4.25	2.29	15.51	6895.70	1414.29	1359.30	106.35	2.40
09/15/2009 11:38	108.15	2.11	0.07	0.21	5.04	437.61	0.22	1.63	4.25	2.28	16.02	6853.18	1424.56	1374.51	108.15	2.05
09/15/2009 11:39	112.78	2.18	0.07	0.21	5.05	435.35	0.22	1.60	4.26	2.29	16.27	6863.27	1420.88	1362.70	112.12	2.27
09/15/2009 11:40	112.78	2.18	0.07	0.21	4.55	441.72	0.22	1.62	4.24	2.28	16.27	6906.51	1411.54	-1.02	111.53	2.27
09/15/2009 11:41	112.78	2.18	0.07	0.21	5.07	440.19	0.22	1.62	4.22	2.27	16.27	6830.85	1424.18	1373.59	111.58	2.27
09/15/2009 11:42	111.61	2.28	0.07	0.21	4.96	436.68	0.22	1.62	4.19	2.27	16.27	6893.70	1420.88	1359.18	111.66	2.27
09/15/2009 11:43	111.61	2.28	0.09	0.21	4.52	442.22	0.22	1.70	4.19	2.27	16.12	6906.51	1412.64	1356.21	111.66	2.27
09/15/2009 11:44	111.61	2.27	0.07	0.21	5.13	438.78	0.22	1.76	4.17	2.25	15.23	6874.08	1426.37	1373.51	111.66	2.27
09/15/2009 11:45	112.36	2.25	0.08	0.21	4.56	436.13	0.22	1.78	4.18	2.26	16.46	6906.51	1424.73	1363.55	112.36	2.26
09/15/2009 11:46	106.52	2.42	0.07	0.21	4.90	443.41	0.22	1.82	4.19	2.25	14.45	6895.88	1413.92	1363.55	106.52	2.39
09/15/2009 11:47	106.88	2.00	0.07	0.21	5.13	436.77	0.22	1.88	4.18	2.25	14.81	6895.70	1426.92	1374.22	106.88	2.06
09/15/2009 11:48	109.55	2.35	0.07	0.21	4.55	436.55	0.22	1.93	4.17	2.25	14.66	6928.12	1419.23	1361.64	109.55	2.36
09/15/2009 11:49	102.14	2.20	0.08	0.21	5.08	439.76	0.22	1.96	4.14	2.24	14.78	6843.10	1418.69	1373.24	103.10	2.15
09/15/2009 11:50	102.01	2.19	0.07	0.21	4.89	436.17	0.22	1.94	4.13	2.23	14.78	6798.42	1424.73	-1.02	100.33	2.15
09/15/2009 11:51	102.01	2.19	0.07	0.21	4.54	440.17	0.22	1.87	4.12	2.22	14.78	6928.12	1412.64	1356.95	100.37	2.15
09/15/2009 11:52	100.37	2.19	0.09	0.21	5.12	440.15	0.22	1.87	4.13	2.22	14.78	6863.27	1422.53	-0.90	100.35	2.15
09/15/2009 11:53	100.32	2.15	0.07	0.21	4.60	437.20	0.22	1.69	4.13	2.22	15.63	6831.39	1417.66	1358.67	100.32	2.15
09/15/2009 11:54	100.32	2.15	0.09	0.21	4.57	443.57	0.22	1.59	4.11	2.23	14.60	6917.31	1407.69	1357.70	100.32	2.15
09/15/2009 11:55	108.71	2.10	0.08	0.21	5.09	439.80	0.22	1.50	4.16	2.25	15.50	6779.15	1424.45	1372.06	108.71	2.09
09/15/2009 11:56	109.72	2.35	0.08	0.21	4.54	440.63	0.22	1.38	4.18	2.26	14.87	6874.08	1415.93	1358.44	109.72	2.40
09/15/2009 11:57	99.93	2.31	0.07	0.21	5.04	444.39	0.22	1.31	4.19	2.25	14.36	6969.74	1417.55	1368.31	99.93	2.28
09/15/2009 11:58	102.76	1.98	0.08	0.21	5.06	438.94	0.22	1.26	4.15	2.22	14.66	6830.85	1426.92	1373.91	102.76	2.02
09/15/2009 11:59	110.78	2.40	0.06	0.21	4.55	441.50	0.22	1.23	4.12	2.22	15.39	6798.42	1417.58	1364.22	110.78	2.40
09/15/2009 12:00	110.78	2.39	0.08	0.21	5.10	437.30	0.22	1.21	4.09	2.20	15.26	6798.42	1430.77	-1.02	110.49	2.36

S-804 Emission Test (Minute Results)

Date/Time		28AI8953 (25580 4 SO2 NORMAL SAMPLE)	28AI8954 (25580 4 O2 NORMAL SAMPLE)	28AI4023A (FINAL COND OUTLET H2S)	28AI4023B (FINAL COND OUTLET SO2)	28FC3117 (MAIN AIR FLOW TO REAC FURNACE)	28FC8134X (SCOT2 FUEL GAS THERMOX)	28FC214 (SRU2 REPOWERING AG FD TO D201)	28FC213 (SRU2 GAG TO R201 ZONE 2)	28FC221 (SRU2 R201 RAG+SCOT ZONE 2)	28FC220 (SRU2 RAG+SCOT TO R201 ZONE 2)	28FI8152 (STACK SO2 FLOW THERMAL OXIDZR)	28FI8156B (COMBUST AIR FLOW T.O. BURNER)	28TI8362 (VENT TEMPERATURE THERMAL OXIDZR)	28TI8520 (THERMAL OXIDIZER STACK)	28AI8953 (THERMAL OXIDZR STACK S-804 SO2)	28AI8954 (28-S-804 FLUE GAS O2)
		PPM	PCT	MOLE	MOLE%	MMSCFD	MSCFD	MMSCFD	MMSCFD	MMSCFD	MMSCFD	PPH	MSCFD	DEGF	DEGF	PPM	PCT
	(Avg)	108.20	2.36	0.09	0.20	4.85	436.33	0.23	1.30	4.27	2.30	14.99	7211.60	1419.23	1388.67	108.28	2.35
Rep #3																	
09/15/2009 12:52		103.95	2.57	0.09	0.21	5.01	439.21	0.23	1.29	4.25	2.28	14.54	7175.99	1421.76	1369.32	103.91	2.57
09/15/2009 12:53		103.99	2.57	0.09	0.21	5.09	434.68	0.23	1.34	4.23	2.28	14.15	7176.71	1424.73	1370.70	103.99	2.57
09/15/2009 12:54		103.91	2.57	0.08	0.21	4.56	440.37	0.23	1.32	4.21	2.27	14.06	7176.71	1432.64	1360.47	103.91	2.57
09/15/2009 12:55		103.32	2.61	0.08	0.21	5.09	438.57	0.23	1.34	4.19	2.25	13.91	7198.33	1423.08	1373.08	103.32	2.58
09/15/2009 12:56		108.00	2.61	0.09	0.21	5.00	436.14	0.23	1.32	4.16	2.24	14.15	7219.95	1424.73	1370.39	108.00	2.61
09/15/2009 12:57		101.46	2.87	0.09	0.21	4.55	438.63	0.23	1.30	4.20	2.26	13.90	7230.75	1415.93	1364.84	101.46	2.88
09/15/2009 12:58		101.46	2.53	0.09	0.21	5.07	434.11	0.23	1.31	4.21	2.28	13.47	7219.95	1429.12	1377.11	101.46	2.55
09/15/2009 12:59		105.14	2.72	0.09	0.21	4.88	433.98	0.22	1.33	4.20	2.31	14.48	7187.52	1418.68	1363.55	105.14	2.74
09/15/2009 13:00		105.14	2.71	0.09	0.21	4.56	439.83	0.23	1.35	4.26	2.33	14.48	7230.75	1411.54	-0.90	106.98	2.76
09/15/2009 13:01		105.14	2.71	0.09	0.21	5.09	434.74	0.23	1.33	4.39	2.35	14.48	7263.18	1426.37	1370.70	106.93	2.76
09/15/2009 13:02		107.04	2.76	0.09	0.21	4.86	435.18	0.23	1.32	4.26	2.34	14.48	7209.14	1417.03	1355.66	107.04	2.76
09/15/2009 13:03		107.04	2.76	0.09	0.21	4.54	438.79	0.23	1.31	4.35	2.33	14.69	7198.33	1413.74	1362.07	107.04	2.76
09/15/2009 13:04		107.04	2.76	0.08	0.21	5.12	432.58	0.23	1.31	4.31	2.30	14.51	7219.95	1429.67	1376.25	107.04	2.76
09/15/2009 13:05		114.92	2.77	0.10	0.20	4.56	430.61	0.23	1.34	4.28	2.30	14.87	7198.33	1419.78	1362.62	114.92	2.78
09/15/2009 13:06		111.32	2.81	0.10	0.21	4.97	434.92	0.23	1.27	4.23	2.29	14.63	7219.95	1414.84	1365.70	111.32	2.78
09/15/2009 13:07		111.75	2.57	0.08	0.20	5.04	430.18	0.23	1.27	4.24	2.29	15.54	7219.95	1424.73	1370.94	111.75	2.57
09/15/2009 13:08		110.03	2.82	0.09	0.20	4.56	435.47	0.23	1.24	4.26	2.30	14.97	7241.56	1410.44	1357.46	110.03	2.82
09/15/2009 13:09		102.99	2.58	0.08	0.20	5.00	437.64	0.23	1.30	4.28	2.31	14.11	7252.19	1417.46	1369.56	102.99	2.57
09/15/2009 13:10		102.87	2.58	0.10	0.20	5.09	433.56	0.23	1.30	4.29	2.32	14.09	7219.95	1421.98	-0.90	102.81	2.52
09/15/2009 13:11		102.87	2.58	0.09	0.20	4.54	441.71	0.23	1.29	4.32	2.33	14.09	7252.37	1408.79	1357.46	102.73	2.52
09/15/2009 13:12		102.73	2.58	0.08	0.20	4.97	439.47	0.23	1.29	4.31	2.33	14.09	7252.37	1419.78	13.59	102.73	2.52
09/15/2009 13:13		102.73	2.53	0.09	0.20	5.01	434.44	0.23	1.27	4.30	2.32	13.69	7219.95	1421.98	1363.55	102.73	2.52
09/15/2009 13:14		102.73	2.53	0.08	0.20	4.57	440.22	0.23	1.27	4.30	2.30	14.19	7251.29	1411.89	1362.00	102.73	2.52
09/15/2009 13:15		104.23	2.48	0.09	0.20	4.98	435.67	0.23	1.26	4.32	2.32	14.27	7230.75	1426.92	1375.94	104.23	2.44
09/15/2009 13:16		110.43	2.68	0.10	0.20	5.06	431.81	0.23	1.27	4.32	2.33	15.85	7241.56	1423.08	1366.33	110.43	2.65
09/15/2009 13:17		103.50	2.48	0.10	0.20	4.55	437.27	0.23	1.26	4.28	2.32	15.49	7209.68	1413.90	1363.29	103.50	2.40
09/15/2009 13:18		108.72	2.11	0.09	0.20	4.81	430.92	0.23	1.26	4.27	2.29	15.11	7252.37	1425.82	1375.63	108.72	2.09
09/15/2009 13:19		116.47	2.15	0.09	0.21	5.06	430.23	0.23	1.27	4.24	2.29	16.54	7284.80	1426.92	1369.41	116.47	2.16
09/15/2009 13:20		115.69	2.23	0.08	0.20	4.64	435.61	0.23	1.32	4.23	2.29	15.71	7263.54	1409.09	21.94	119.03	2.23
09/15/2009 13:21		115.67	2.23	0.09	0.20	4.70	435.55	0.23	1.31	4.21	2.28	15.70	7273.81	1421.22	1346.99	119.09	2.23
09/15/2009 13:22		119.01	2.23	0.08	0.20	5.04	431.95	0.23	1.34	4.23	2.29	15.70	7273.99	1424.73	52.77	119.01	2.23
09/15/2009 13:23		119.09	2.23	0.08	0.20	4.79	436.68	0.23	1.32	4.23	2.30	16.76	7273.99	1410.44	1353.20	119.09	2.23
09/15/2009 13:24		119.09	2.23	0.09	0.20	4.54	436.76	0.23	1.33	4.25	2.29	16.30	7252.37	1419.78	1369.10	119.09	2.23
09/15/2009 13:25		116.10	2.19	0.09	0.20	5.12	432.33	0.23	1.33	4.20	2.30	15.91	7263.18	1424.73	1368.48	116.10	2.21
09/15/2009 13:26		106.21	2.40	0.10	0.20	4.55	437.64	0.23	1.32	4.30	2.31	14.90	7241.56	1410.44	1356.21	106.21	2.37
09/15/2009 13:27		102.22	2.20	0.08	0.20	4.97	439.83	0.23	1.32	4.32	2.32	14.61	7220.31	1414.77	1367.12	102.22	2.19
09/15/2009 13:28		112.66	2.02	0.10	0.20	5.11	434.74	0.23	1.29	4.30	2.31	15.73	7230.75	1425.82	1374.77	112.66	2.02
09/15/2009 13:29		113.51	2.40	0.09	0.20	4.54	438.16	0.23	1.26	4.20	2.31	15.63	7252.37	1412.09	1359.92	113.51	2.39
09/15/2009 13:30		113.51	2.40	0.07	0.20	5.10	438.77	0.23	1.27	4.28	2.30	15.63	7241.56	1420.35	-1.02	109.18	2.34
09/15/2009 13:31		113.51	2.40	0.08	0.20	4.97	433.91	0.23	1.27	4.24	2.30	15.63	7209.14	1423.82	1368.59	109.07	2.34
09/15/2009 13:32		109.04	2.33	0.10	0.20	4.55	440.33	0.23	1.27	4.25	2.29	15.63	7241.56	1410.44	1353.12	109.04	2.34
09/15/2009 13:33		109.18	2.34	0.08	0.20	5.03	439.35	0.23	1.30	4.25	2.28	14.78	7273.99	1422.53	1369.77	109.18	2.34
09/15/2009 13:34		109.10	2.34	0.10	0.20	4.88	438.75	0.23	1.33	4.26	2.28	15.51	7263.18	1415.93	1359.20	109.10	2.34
09/15/2009 13:35		103.19	2.32	0.08	0.20	4.56	441.55	0.23	1.32	4.23	2.28	14.73	7273.81	1412.69	1364.44	103.19	2.25
09/15/2009 13:36		113.11	2.01	0.09	0.20	5.01	439.18	0.23	1.34	4.22	2.29	15.81	7241.56	1425.27	1375.43	113.11	1.98
09/15/2009 13:37		112.95	2.23	0.10	0.20	4.99	439.25	0.23	1.32	4.26	2.30	15.91	7252.01	1417.20	1364.59	112.95	2.22
09/15/2009 13:38		103.24	2.25	0.10	0.20	4.58	440.92	0.23	1.32	4.27	2.30	14.63	7187.52	1414.84	1366.45	103.24	2.20
09/15/2009 13:39		109.69	1.86	0.08	0.20	4.91	435.72	0.23	1.34	4.29	2.30	15.28	7219.41	1426.18	1380.39	109.69	1.90
09/15/2009 13:40		109.79	1.85	0.09	0.20	5.03	434.93	0.23	1.31	4.25	2.28	15.29	7188.06	1418.81	22.13	107.87	1.92
09/15/2009 13:41		109.79	1.85	0.09	0.20	4.73	441.03	0.23	1.29	4.26	2.29	15.29	7176.89	1412.74	1342.39	107.89	1.92
09/15/2009 13:42		107.89	1.85	0.09	0.21	4.56	439.53	0.23	1.26	4.26	2.29	15.29	7187.52	1423.63	1373.91	107.89	1.92
09/15/2009 13:43		107.84	1.92	0.09	0.21	5.04	433.49	0.23	1.27	4.27	2.30	14.94	7165.90	1425.82	1367.85	107.84	1.92
09/15/2009 13:44		107.92	1.92	0.10	0.20	4.97	435.95	0.23	1.27	4.28	2.30	15.44	7155.28	1413.94	1360.59	107.92	1.92
09/15/2009 13:45		102.81	2.19	0.09	0.21	4.58	438.43	0.23	1.31	4.28	2.30	14.48	7187.52	1415.93	1368.48	102.81	2.14
09/15/2009 13:46		111.45	2.03	0.09	0.20	4.70	433.42	0.23	1.31	4.26	2.30	15.42	7144.29	1428.02	1376.48	111.45	2.06
09/15/2009 13:47		109.39	2.22	0.09	0.21	5.08	431.70	0.23	1.31	4.27	2.31	15.45	7101.06	1418.68	1365.39	109.39	2.21
09/15/2009 13:48		102.95	2.27	0.08	0.20	4.60	437.87	0.23	1.29	4.30	2.31	14.88	7133.48	1410.44	1361.76	102.95	2.24
09/15/2009 13:49		104.87	1.94	0.08	0.20	4.82	436.01	0.23	1.26	4.30	2.31	14.72	7079.44	1421.43	1375.82	104.67	1.94
09/15/2009 13:50		104.87	1.98	0.08	0.20	5.08	433.12	0.23	1.30	4.26	2.30	15.26	7079.44	1424.73	-1.02	108.78	1.91
09/15/2009 13:51		104.87	1.98	0.04	0.19	4.51	436.59	0.23	1.31	4.22	2.28	15.26	7057.82	1411.54	1361.76	108.78	1.91
09/15/2009 13:52		108.78	1.91	0.05	0.19	5.09	433.65	0.23	1.31	4.22	2.28	15.26	7047.01	1425.82	1371.68	108.75	1.91