EMISSIONS TEST REPORT

CCR Vent
(CH-004)

located in the

79 Plant

at the
CHEVRON REFINERY

in
Pascagoula, Mississippi

Prepared for
Chevron Products USA

March 2011
TRC Project Number: 181714

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ASTM D7036-04 Report Certification

I certify that to the best of my knowledge:

- Testing data and all corresponding information have been checked for accuracy and completeness.
- Sampling and analysis have been conducted in accordance with the approved protocol and applicable reference methods (as applicable).
- All deviations, method modifications, or sampling and analytical anomalies are summarized in the appropriate report narrative(s).

_____
Jim Barufaldi
TRC Project Manager

_____5/2/11_____
Date

TRC was operating in conformance with the requirements of ASTM D7036-04 during this test program.

_____
Jeffrey W. Burdette
TRC Air Measurements Technical Director

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INTRODUCTION

Emission testing was conducted on one regenerator vent at the Chevron Products' Pascagoula Refinery. This vent, designated as CCR Vent (EPN CH-004), is located in the 79 Plant. The purpose of these tests was to satisfy the requirements of the State of Mississippi Department of Environmental Quality (MDEQ) Permit No. 1280-00058. TRC Environmental of Austin, Texas conducted the testing on March 8 and 10, 2011.

Quantities of oxides of nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOC), dioxins and furans (Ds/Fs), inorganic HAPs (HCl), and other compounds were measured in the exhaust stack associated with the vent. Inorganic HAPs (HCl) measurements were also made on the inlet prior to the HCl removal system to calculate the HCl reduction efficiency. Mass emission rates were measured while the unit operated at the maximum available operating capacity.

The emission tests followed the procedures set forth in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 3A, 4, 7E, 10, 23, 25A, and 26A. Table 1 summarizes the background information pertinent to these tests.

This report has been reviewed and approved for submittal to the MDEQ by the following representatives:

TRC Environmental	Chevron Products

TABLE 1
BACKGROUND DATA

Source Owner/Operator:	Chevron Products Company 250 Industrial Road Pascagoula, Mississippi 39581 Attn: T.K. Connie Nguyen (228) 938-4530 TEL (228) 938-4682 FAX
Test Contractor:	TRC Air Measurements 9225 U.S. Hwy. 183 South Austin, Texas 78747 Attn: Jim Barufaldi (512) 243-0202 (512) 243-0222 FAX
Test Date:	March 8 and 10, 2011
Location:	Chevron Refinery in Pascagoula, Mississippi
Process Descriptions:	Continuous Catalyst Regeneration Vent
Emission Point:	Emissions were measured in the vent exhaust of emission point CH-004 and the inlet prior to the HCl removal system.
Test Methods:	EPA Method 1 for traverse point layout EPA Method 2 for stack differential pressure EPA Method 3A for O_2 and CO_2 concentrations EPA Method 4 for stack gas moisture content EPA Method 7E for NO_X concentrations EPA Method 10 for CO concentrations EPA Method 23 for Ds/Fs concentrations EPA Method 25A for VOC concentrations EPA Method 26A for HCl concentrations
Regulatory Applications:	MDEQ Permit # 1280-00058

SUMMARY OF RESULTS

Exhaust gases from the CCR vent located within the Chevron Pascagoula Refinery were tested to determine the compliance status with regard to MDEQ Permit No. 1280-00058. TRC Environmental of Austin, Texas conducted the testing on March 8 and 10, 2011.

The compliance test matrix for the emission test on the CCR vent consisted of three test runs during which NO_X, CO, VOC, Ds/Fs, HCl, O_2, and CO_2 concentrations and mass emission rates were measured in the exhaust of the CCR vent. Three additional test runs were performed for HCl on the outlet exhaust and the inlet prior to the HCl removal system to determine HCl reduction efficiency. The detailed summaries of results are located in Appendix A.

TABLE 2:
EXECUTIVE SUMMARY

Compliance Emissions Testing

Unit Designation	NO_X (lbs/hr)	CO (lbs/hr)	HCl (Reduction Efficiency)	Ds/Fs (ng/dscm@15% O2)
CCR Vent EPN CH-004	<0.001	0.01	97	0.0026
Permit Limit	0.84	0.97	97	N/A

Detailed results for all test runs are presented in Appendix A. Documentation of quality assurance activities is contained in Appendix B. Appendix C includes example calculations of any equations that were used in the analysis. All field and laboratory data sheets can be found in Appendix D. Appendix E contains copies of the operational data collected during the tests. Appendix F includes copies of the data log records used to record the emission concentrations. All equipment calibrations and gas concentration certifications are located in Appendix G.

PROCESS DESCRIPTION

Chevron Products owns and operates the Pascagoula Refinery in Pascagoula, Jackson County, Mississippi. The facility refines crude oil products obtained worldwide. Within this facility a continuous catalyst regenerator vent, located in the 79 plant, was tested for mass emissions. This section of the report provides a brief description of the vent.

The CCR Vent (EPN CH-004) is vented to the atmosphere through a 12 inch diameter circular stack approximately 400 feet above the grade. EPA Method 1 ports are located on the vent stack at the 375 foot level. Emissions from the CCR Vent are controlled with a gas-solid adsorption system, for removal of HCl, and a residual contaminant removal system, for removal of dioxins. Inlet measurements for HCl reduction efficiency determination were made in a 12 inch diameter circular pipe prior to the HCl removal system.

ANALYTICAL TECHNIQUE

The sampling and analysis procedures used during these tests conformed in principle with those outlined in the Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 1, 2, 3A, 4, 7E, 10, 23, 25A, and 26A. Table 3 lists the instruments and detection principles used for these analyses. The test procedures are discussed in the below paragraphs.

Table 3: Analytical Instrumentation

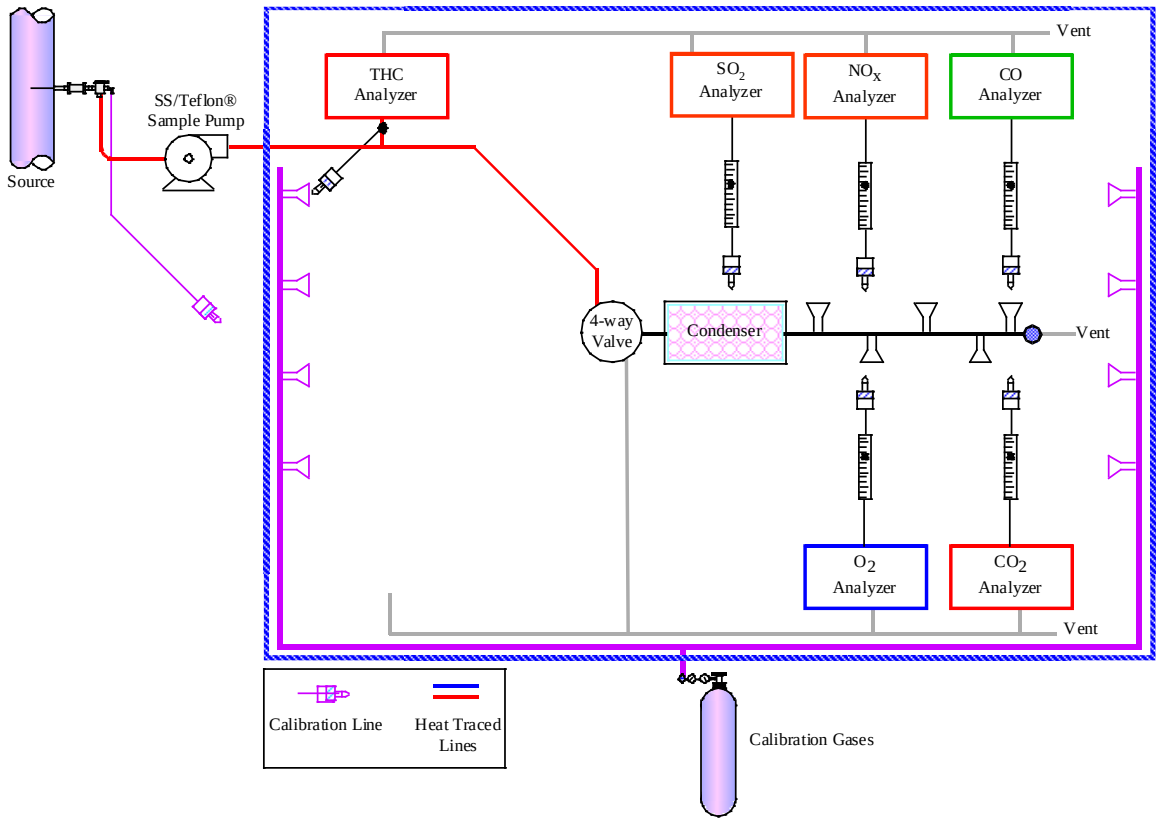
Parameter	Model and Manufacturer	Range Capabilities (ppm or vol%)	Span Value(s) this Project (ppm or vol%)	Sensitivity (ppm or vol%)	Response Time (sec)	Detection Principle
NOx	TECO 42i	0-10 0-30 0-50 0-100 0-300	0-100	0.01	1.7	Thermal reduction of NOx to NO Chemiluminescence of reaction of NO with O2. Detection by PMT. Inherently linear for range capabilities.
CO	TECO 48i	0-10 0-30 0-50 0-100	0-100	0.01	10	Infrared absorption, gas filter correlation detector (prevents CO2 interference). Microprocessor based linearization.
	Servomex 1400		0-25	0.01	15	
O2	1420	0-5				Paramagnetic Cell
CO2	1420	0-25				Infrared Absorption
VOC	JUM 3-300	0-100 0-1000	0-100	0.01	5	Flame Ionazation Detector Calibrated with propane
Temp.	Omega HH82	-256-2502 °F	0.1°F	n.a.	n.a.	chromel-alumel, K-type thermo-couple with digital thermometer.

The test matrix for testing the exhaust stack consisted of three 1-hour test runs for the determination of NO_X, CO, VOC, HCl, O_2, and CO_2 concentrations. Test runs for Ds/Fs were 2-hours in duration to achieve acceptable lower detection limits.

The sampling and analysis system used to determine gaseous emission concentrations of NO_X, CO, VOC, CO_2 and O_2 is depicted in Figure 1. Stack gas entered the system through a stainless steel probe with a glass wool in-stack filter. The sample was transported via 3/8-inch heat-traced Teflon® tubing to ground level via a heated stainless steel/Teflon® diaphragm pump. The sample is then transported through a specially designed stainless steel minimum-contact condenser which dried the sample without removing the pollutants of interest. From there, the sample is directed into the sample manifold where the sample is partitioned to the analyzers through glass and stainless steel rotometers that control the flow of the sample.

Figure 1 shows that the sampling system was equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the EPA testing methods.

FIGURE 1
SAMPLE SYSTEM DIAGRAM



All instruments were housed in a climate controlled trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor.

All data from the continuous monitoring instruments were recorded utilizing a computerized data logging system. The datalog records may be found in Appendix F of this report.

EPA Methods 1 and 2 were followed for determination of stack gas velocity and flow rate. As shown in the stack diagram in Appendix D, the sample ports for the exhaust stack met EPA Method 1 criteria. The stack gas temperature was determined with a K-type (chromel-alumel) thermocouple used in conjunction with a digital thermometer. This instrument also assisted in monitoring the sampling

system conditions (impinger temperature, etc.). Velocity head pressures were measured at each traverse point using an S-type pitot tube and oil, inclined manometer. All emission rate calculations are based on the stack flow rates obtained from the pitot tube traverses.

The O_2 and CO_2 concentration measurements used in determination of stack gas molecular weight were measured in accordance with the procedures of EPA Method 3A. Instrumental analysis was used in lieu of the Orsat or Fyrite techniques. A paramagnetic O_2 analyzer and an infrared absorption CO_2 analyzer were utilized for these emission tests.

The moisture content of the stack gas was determined by the use of EPA Method 4 via the Method 23 and 26A sample trains. The impingers were weighed individually before and after each test run to gravimetrically determine the moisture content of the stack gas.

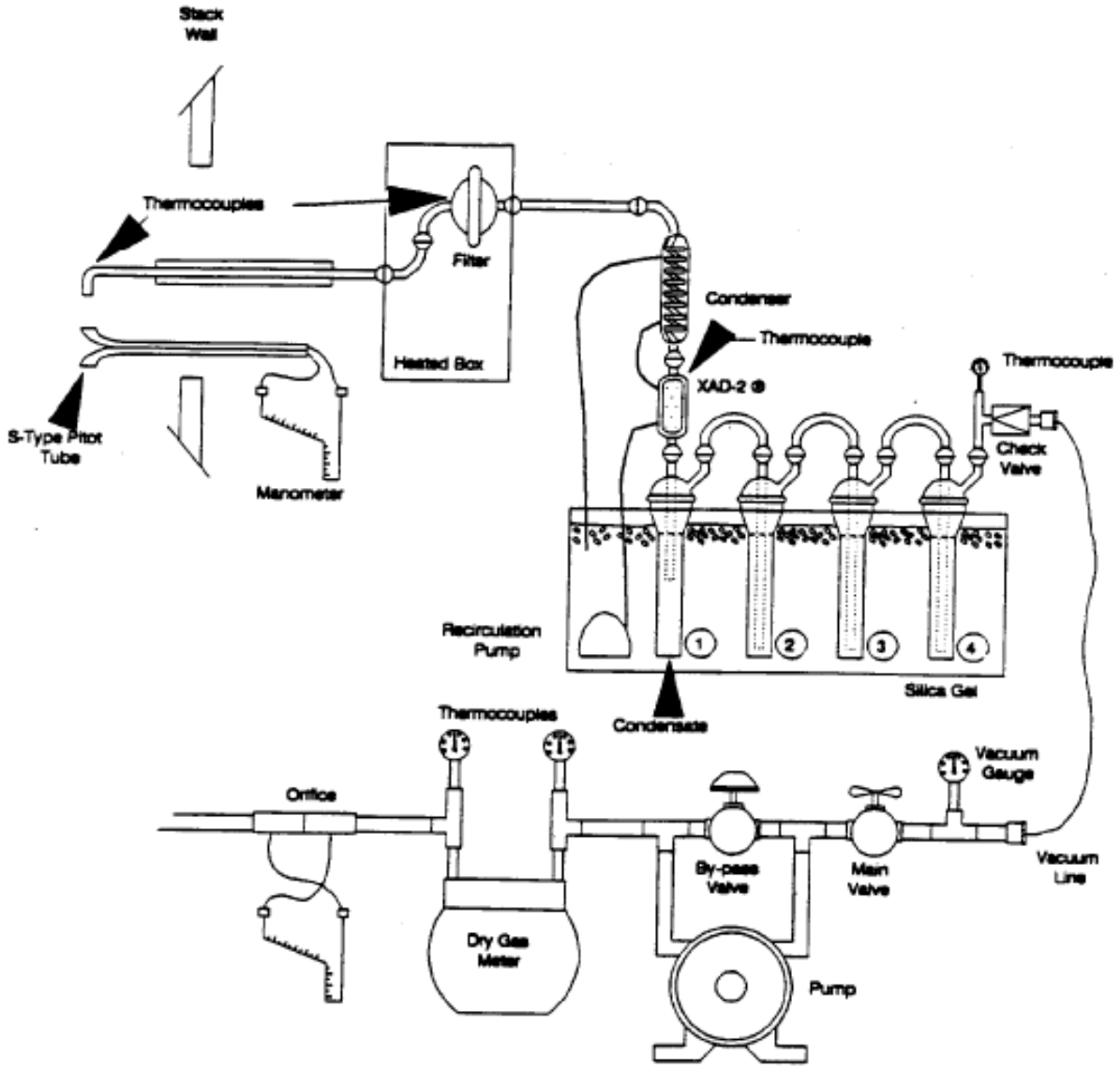
EPA Method 7E was used for measurement of NO_X concentrations. A chemiluminescence cell analyzer was used. The NO_X mass emission rates were calculated as if all the NO_X were in the form of NO_2. This approach corresponds to EPA's convention.

CO concentrations were quantified during the tests in accordance with procedures set forth in EPA Method 10. A continuous non-dispersive infrared (NDIR) analyzer was used for this purpose. This analyzer is equipped with a gas correlation filter that also removes any interference from CO2 or other combustion products, eliminating the need for ascarite traps and the associated correction factors.

Volatile organic compound concentrations (VOC) were measured using EPA method 25A. A continuous flame ionization detection analyzer, calibrated with methane standards, was used to determine VOC concentration in ppm.

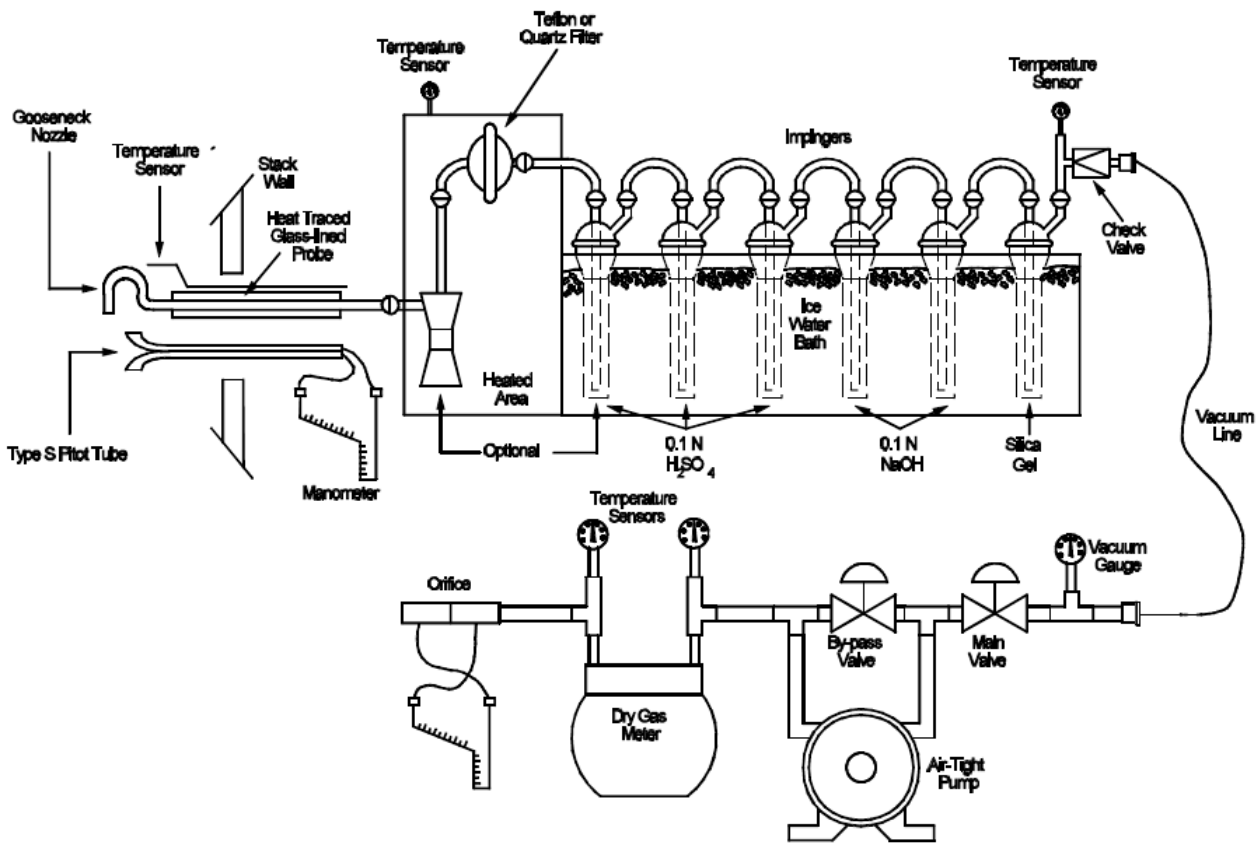
EPA Method 23 was used to determine Ds/Fs emissions. Figure 2 shows the sampling system for Method 23. The nozzle was sized such that an isokinetic sampling rate (i.e. sampling at the same rate as the stack velocity) could be maintained within the capabilities of the sample pump. Method 23 analysis was performed by Test America in Knoxville, TN. Results from the Ds/Fs analysis can be found in Appendix D.

Figure 2: Method 23 Ds/Fs Sampling System Diagram



EPA Method 26A was used to determine HCl emissions. Figure 3 shows the sampling system for Method 26A. The nozzle was sized such that an isokinetic sampling rate (i.e. sampling at the same rate as the stack velocity) could be maintained within the capabilities of the sample pump. Inlet HCl samples were collected from a 12 inch diameter pipe prior to the HCl removal system. Inlet HCl mass rates were calculated using inlet process flow rates supplied by Chevron instrumentation. Method 26A analysis was performed by Test America in Knoxville, TN. Results from the HCl analysis can be found in Appendix D.

Figure 3: Method 26A HCl Sampling System Diagram



Atmospheric pressure was measured at the test site using a certified aircraft-type aneroid altimeter. Ambient temperature and humidity were quantified during each test run via sling psychrometry.

Chevron personnel provided operational data during the tests.

QUALITY ASSURANCE ACTIVITIES

A number of quality assurance activities were undertaken before, during, and after this testing project to ensure the accuracy of results obtained. This section of the report and the documentation contained in Appendices B and G describe each quality assurance activity that was performed.

All sampling and analysis, except the particulate matter analysis, was conducted on site to afford any interested parties the opportunity to observe all aspects of the test and to circumvent the possibility of sample loss or contamination during transport.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by first adjusting the zero and span responses to zero (nitrogen or air) and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within $\pm$ 2 percent of range of the predicted values. The results of the multi-point linearity checks are provided in Appendix B.

In addition to the initial linearity checks, the calibration error checks were repeated as required throughout the tests. Anytime an adjustment was made to an analyzer, the calibration error test was repeated. During typical emissions tests, adjustments to the analyzer will be due to one of three reasons. If the post test run calibration check showed that the analyzer drift was approaching the 3% allowable, the technician may have chosen to reset the analyzer back to the correct setting before continuing with the next test run. Anytime the analyzer drift exceeded 3%, recalibration of the analyzer was performed as required by the test method. Additionally, analyzer span settings could be changed during the tests to account for changing concentrations. Anytime an adjustment was made to an analyzer for any of these reasons, the calibration error check (and bias check) was repeated before continuing.

Before and after each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documented the precision of the data just collected. Documentation of drift also allowed for the use of Equation 7E-5 for correction of the observed emission concentrations. Calibrations were made through the entire sample system (via the bias check valve) each time zero and span drift checks were made. The criterion for acceptable data is that the instrument drift is no more than 3 percent of the full-scale response or

5% provided that additional QA procedures are followed before proceeding with the next run. The quality assurance worksheets in Appendix B summarize all multipoint calibration checks and zero to span checks performed during the tests.

The use of Equation 7E-5 requires documentation of both the initial and final zero and calibration responses. When two consecutive test runs were conducted immediately after one another, the final drift for the previous run was used for the initial calibration response of the subsequent run. In cases where there was a sufficient delay between test runs to deem this strategy invalid, a separate initial calibration (i.e. bias check procedure) was conducted and the response from this calibration was used in Equation 7E-5.

The instrumental sampling systems were leak checked by demonstrating that a vacuum greater than 10" Hg could be held for at least 1 minute with a decline of less than 1" Hg. A leak test was conducted after a sample system was set up and before that system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests was repaired and another leak check conducted before testing commenced. No leaks were found during the post-test leak checks.

The absence of leaks in the sampling system was also verified by system bias checks. The sampling system's integrity was tested by comparing the responses of each of the analyzers used to a calibration gas introduced via two paths. The first path was into the analyzer via the zero/span calibration manifold. The second path was to introduce a calibration gas into the sample system at the sample probe via the calibration line and switching valve. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. Bias checks were conducted prior to and upon completion of testing on all analyzers. The quality assurance data worksheets in Appendix B show that the analyzer responses via both sample paths agreed within acceptable limits in all cases.

Bias checks were also conducted at other times throughout the tests as required by the test method. Any time adjustment to the analyzer or drifts in excess of 3% was recorded necessitated a repeat of the calibration error check, the bias check was also repeated.

The Method 4 sample trains were leak checked independently of the gaseous sample system before and after each individual test run. These leak checks were performed in accordance with this method to ensure that the sample was not diluted by ambient air. The criterion for acceptance was a leakage rate of less than

2 percent of the average sampling rate at a vacuum of at least 10 in. Hg. No leaks were detected and the results of these leak checks are summarized on the field data sheets.

The residence time of the sampling and measurement system was estimated using the pump flow rate and the sampling system volume. The pump's rated flow is 0.8 SCFM at 5 psig. The sampling system volume is approximately 0.13 scf. Therefore, the sample residence time is approximately 33 seconds.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to $\pm$ 1% accuracy or EPA Protocol 1. The gas calibration sheets as prepared by the vendor are contained in Appendix G.

The pitot tube used during the testing was visually inspected to ensure that it met the criteria of EPA Method 2. The pitot tube lines were leak checked in the field each time connection to the manometer was made in accordance with EPA Method 2 guidelines.

The Method 4 dry gas meters were calibrated prior to testing in accordance with EPA Method 4. A standard dry gas meter traceable to NIST was used for these calibrations. Calibration certification documentation of the dry gas meter can be found in Appendix G.

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

APPENDIX A:
DETAILED SUMMARY OF RESULTS

Plant: **Chevron Pascagoula**
Location: Pascagoula, MS
Source: CCR Vent (CH-004)
Technicians: **JB, NA, DM, JH, RM, DA**

Test Run Designation	**Run 1**	**Run 2**	**Run 3**	
Date	3/8/2011	3/8/2011	3/8/2011	
Start Time (24 hr)	9:58	12:46	15:19	
Stop Time (24 hr)	11:03	13:50	16:25	
Stack Gas Sampling Data				
Sample Time Length (min)	60	60	60	
Atmospheric Pressure (" Hg)	30.14	30.14	30.14	
Avg. Stack Temperature (°F)	224	226	228	
Avg. Meter Temperature (°F)	67.5	66.9	69.0	
Average √ΔP	0.794	0.788	0.765	
Average ΔH	1.88	1.87	1.73	
Sample Volume at STP (DSCF)	46.499	46.516	44.858	
Moisture (% volume)	2.34	2.16	2.14	
Dry Gas Fraction (unitless)	0.977	0.978	0.979	
Molecular Weight (lb/lb-mole)	29.169	29.188	29.207	
Static Pressure (in. H2O)	-0.27	-0.27	-0.27	
Stack Velocity (ft/min @ stack conditions)	3019	3001	2916	
Stack Flow, dry (DSCFH)	1.08E+05	1.07E+05	1.04E+05	
Stack Flow, wet (wetSCFH)	1.11E+05	1.10E+05	1.06E+05	
% Isokinetic	99.2	100.0	99.4	
Emissions Results				**Averages**
O2 (%)	14.31	14.32	14.31	14.31
CO2 (%)	5.40	5.39	5.50	5.43
NOx (ppmv)	< 0.10	< 0.10	< 0.10	< 0.10
CO (ppmv	0.81	0.91	0.72	0.81
VOC (ppmv)	264.91	262.98	263.99	263.96
Calculated Mass Emissions				
NOx (lbs/hr)	< 0.001	< 0.001	< 0.001	< 0.001
CO (lbs/hr)	0.01	0.01	0.01	0.01
THC (lbs/hr)	3.34	3.29	3.20	3.28
HCl (micro grams collected)	11100	12500	17000	13533
HCl (micro grams/DSCF)	239	269	379	295
HCl (lbs/hr)	0.057	0.064	0.087	0.069
HCl (ppmv)	5.56	6.26	8.83	6.88
HCl (ppmv @ 3% O2)	15.11	17.03	23.98	18.71

Plant: **Chevron Pascagoula**
Location: Pascagoula, MS
Source: CCR Vent
Technicians: **JB, NA, DM, JH, RM, DA**

Test Run Designation	**Run 1**	**Run 2**	**Run 3**
Date	3/8/2011	3/8/2011	3/8/2011
Start Time (24 hr)	9:58	12:46	15:19
Stop Time (24 hr)	12:05	14:53	17:25
Stack Gas Sampling Data			
Sample Time Length (min)	120	120	120
Atmospheric Pressure (" Hg)	30.06	30.06	30.14
Avg. Stack Temperature (°F)	225	218	214
Avg. Meter Temperature (°F)	69.6	70.6	70.6
Average $\sqrt{\Delta P}$	0.794	0.772	0.781
Average ΔH	1.92	1.80	1.79
Sample Volume at STP (DSCF)	90.314	89.375	90.890
Moisture (% volume)	2.06	2.63	2.07
Dry Gas Fraction (unitless)	0.979	0.974	0.979
Molecular Weight (lb/lb-mole)	29.201	29.134	29.216
Static Pressure (in. H2O)	-0.27	-0.27	-0.27
Stack Velocity (ft/min @ stack conditions)	3024	2930	2944
Stack Flow, dry (DSCFH)	1.08E+05	1.05E+05	1.07E+05
Stack Flow, wet (wetSCFH)	1.10E+05	1.08E+05	1.09E+05
% Isokinetic	96.4	98.0	97.7
Emissions Results			
O2 (%)	14.31	14.32	14.31
CO2 (%)	5.40	5.39	5.50

Dioxins/Furans		3/8/2011 9:58:00 AM Run 1 12:05:00 PM Sample Volume (dscf): 90.31 Volumetric Flow Rate (dscfh): 107,958 Oxygen Concentration (%): 14.31			3/8/2011 12:46:00 PM Run 2 2:53:00 PM Sample Volume (dscf): 89.37 Volumetric Flow Rate (dscfh): 105,082 Oxygen Concentration (%): 14.32			3/8/2011 3:19:00 PM Run 3 5:25:00 PM Sample Volume (dscf): 90.89 Volumetric Flow Rate (dscfh): 107,123 Oxygen Concentration (%): 14.31		
Compound	2,3,7,8-TCDD Toxicity Equivalence Factor	Combined Rinse/Filter/XAD (picograms)	Total picograms	Emission Rate w/TEF (gram/second)	Combined Rinse/Filter/XAD (picograms)	Total picograms	Emission Rate w/TEF (gram/second)	Combined Rinse/Filter/XAD (picograms)	Total picograms	Emission Rate w/TEF (gram/second)
2,3,7,8-TCDD	1	3.6	3.6	1.20E-12	4.1	4.1	1.34E-12	3.4	3.4	1.11E-12
1,2,3,7,8-PeCDD	0.5	1.8	1.8	2.99E-13	1.8	1.8	2.94E-13	1.5	1.5	2.46E-13
1,2,3,4,7,8-HxCDD	0.1	1.6	1.6	5.31E-14	1.6	1.6	5.23E-14	1.4	1.4	4.58E-14
1,2,3,6,7,8-HxCDD	0.1	1.6	1.6	5.31E-14	1.5	1.5	4.90E-14	1.3	1.3	4.26E-14
1,2,3,7,8,9-HxCDD	0.1	1.6	1.6	5.31E-14	1.6	1.6	5.23E-14	1.4	1.4	4.58E-14
1,2,3,4,6,7,8-HpCDD	0.01	5.9	5.9	1.96E-14	3.8	3.8	1.24E-14	4.8	4.8	1.57E-14
OCDD	0.001	23	23	7.64E-15	8.2	8.2	2.68E-15	30	30	9.82E-15
2,3,7,8-TCDF	0.1	3.7	3.7	1.23E-13	2.3	2.3	7.51E-14	2.1	2.1	6.88E-14
1,2,3,7,8-PeCDF	0.05	2	2	3.32E-14	1.4	1.4	2.29E-14	1.1	1.1	1.80E-14
2,3,4,7,8-PeCDF	0.5	3.3	3.3	5.48E-13	1.5	1.5	2.45E-13	1.1	1.1	1.80E-13
1,2,3,4,7,8-HxCDF	0.1	6.2	6.2	2.06E-13	2.2	2.2	7.19E-14	2.5	2.5	8.18E-14
1,2,3,6,7,8-HxCDF	0.1	3.6	3.6	1.20E-13	1.2	1.2	3.92E-14	1.6	1.6	5.24E-14
2,3,4,6,7,8-HxCDF	0.1	3.000	3.0	9.96E-14	1.0	1.0	3.27E-14	0.5	0.5	1.64E-14
1,2,3,7,8,9-HxCDF	0.1	1.3	1.3	4.32E-14	1.1	1.1	3.59E-14	0.92	0.92	3.01E-14
1,2,3,4,6,7,8-HpCDF	0.01	27	27	8.97E-14	4.5	4.5	1.47E-14	13	13	4.26E-14
1,2,3,4,7,8,9-HpCDF	0.01	8.3	8.3	2.76E-14	3.6	3.6	1.18E-14	3.1	3.1	1.01E-14
OCDF	0.001	45	45	1.49E-14	9.9	9.9	3.23E-15	20.0	20	6.55E-15
		total picograms	142.5		total picograms	51.3		total picograms	89.72	
Total 2,3,7,8-TCDD Equivalents (g/sec)				2.99E-12			2.35E-12			2.03E-12
Total 2,3,7,8-TCDD Equivalents (g/hr)				1.07E-08			8.47E-09			7.29E-09
TEQ Concentration (ng/dscm@15% O2)				**0.0031**			**0.0026**			**0.0022**
TEQ Concentration (ng/dscm@7% O2)				**0.0074**			**0.0060**			**0.0051**

HCl Reduction Efficiency Test

Plant: **Chevron Pascagoula**
Location: Pascagoula, MS
Source: CCR
Technicians: **JB, NA, DM, JH, RM, DA**

Test Run Designation	**Run 1**	**Run 2**	**Run 3**	
Date	3/10/2011	3/10/2011	3/10/2011	
Start Time (24 hr)	9:00	10:16	11:33	
Stop Time (24 hr)	10:05	11:21	12:38	
Stack Gas Sampling Data				
Sample Time Length (min)	60	60	60	
Atmospheric Pressure (" Hg)	30.27	30.27	30.27	
Avg. Stack Temperature (°F)	207	208	213	
Avg. Meter Temperature (°F)	55.3	57.0	60.4	
Average √ΔP	0.611	0.610	0.622	
Average ΔH	1.21	1.25	1.00	
Sample Volume at STP (DSCF)	36.804	36.889	37.139	
Moisture (% volume)	0.84	1.72	1.43	
Dry Gas Fraction (unitless)	0.992	0.983	0.986	
Molecular Weight (lb/lb-mole)	29.599	29.504	29.532	
Static Pressure (in. H2O)	-0.27	-0.27	-0.27	
Stack Velocity (ft/min @ stack conditions)	2274	2274	2326	
Stack Flow, dry (DSCFH)	8.50E+04	8.41E+04	8.58E+04	
Stack Flow, wet (wetSCFH)	8.57E+04	8.56E+04	8.70E+04	
% Isokinetic	99.8	101.0	99.8	
Emissions Results				**Averages**
O2 (%)	11.43	11.44	11.58	11.48
CO2 (%)	7.75	7.80	7.72	7.76
HCl Outlet Emissions				
HCl (micro grams collected)	14200	14900	14900	
HCl (micro grams/DSCF)	386	404	401	
HCl (lbs/hr)	0.072	0.075	0.076	0.074
HCl (ppmv)	8.99	9.41	9.35	9.25
HCl (ppmv @ 3% O2)	16.99	17.81	17.95	17.58
HCl Inlet Emissions				**Averages**
Inlet Flow Rate (MDSCFH)	49	49	49	
Meter Factor	1.0099	1.0099	1.0099	
Meter Reading Initial (DCF)	990.670	8.423	25.578	
Meter Reading Final (DCF)	1008.060	25.213	43.180	
Average Meter Temperature (F)	54.0	55.0	57.0	
Sample Volume (DSCF)	18.252	17.588	18.367	
HCl (micro grams collected)	221000	793000	850000	
HCl (micro grams/DSCF)	12109	45089	46279	
HCl (lbs/hr)	1.308	4.871	4.999	3.726
HCl (ppmv)	282.10	1050.45	1078.19	803.58
HCl RE%	**94%**	**98%**	**98%**	**97%**

Testing by TRC, Austin, Texas

APPENDIX B:
QUALITY ASSURANCE ACTIVITIES

181714 Chevron	CCR Outlet											
Run 1	3/8/2011	9:58:00 AM	10:58:00 AM									
Initial Calibration Error	**Range**	**Low Gas**	**Mid Gas**	**High Gas**	**Zero Response**	**Low Response**	**Mid Response**	**High Response**	**Zero Cal Error**	**Low Cal Error**	**Mid Cal Error**	**High Cal Error**
NOx (ppm)	50.62	0.00	24.84	50.62	-0.50	0.00	24.17	50.25	-0.99	0.00	-1.32	-0.73
CO (ppm)	50.03	0.00	24.93	50.03	-0.01	0.00	24.57	49.72	-0.02	0.00	-0.72	-0.62
O2 (%)	21.00	0.00	10.01	21.00	-0.03	0.00	9.99	20.99	-0.13	0.00	-0.12	-0.05
CO2 (%)	20.80	0.00	9.90	20.80	0.00	0.00	9.96	20.65	0.00	0.00	0.29	-0.75
VOC (ppmv)	1000.00	266.10	445.00	890.10	0.10	268.10	445.50	889.80	0.01	0.20	0.05	-0.03

Thru the Probe Bias and Drift	**Bias Gas Used**	**TTP Initial Zero**	**TTP Final Zero**	**TTP Initial Span**	**TTP Final Span**	**Zero Bias**	**Span Bias**	**Zero Drift**	**Span Drift**
NOx (ppm)	24.84	0.00	0.41	24.24	24.44	1.80	-0.79	-0.81	-0.40
CO (ppm)	24.93	0.00	-0.52	24.57	24.24	-1.02	-1.38	1.04	0.66
O2 (%)	10.01	0.00	0.05	9.99	9.96	0.35	-0.26	-0.21	0.14
CO2 (%)	9.90	0.00	0.04	9.96	9.99	0.20	0.45	-0.20	-0.17
VOC (ppmv)	445.00	0.00	0.00	444.50	443.50	-0.01	-0.15	0.00	0.10

Test Run Results	**Minimum**	**Maximum**	**Std. Dev.**	**Raw Results**	**Corrected Results**
NOx (ppm)	-0.53	0.14	0.17	-0.29	-0.51
CO (ppm)	0.43	0.65	0.04	0.54	0.81
O2 (%)	13.44	15.36	0.31	14.25	14.31
CO2 (%)	4.51	6.15	0.26	5.45	5.40
VOC (ppmv)	145.80	394.20	47.44	264.31	264.91

181714 Chevron	CCR Outlet											
Run 2	3/8/2011	12:46:05 PM	1:46:05 PM									
Initial Calibration Error	**Range**	**Low Gas**	**Mid Gas**	**High Gas**	**Zero Response**	**Low Response**	**Mid Response**	**High Response**	**Zero Cal Error**	**Low Cal Error**	**Mid Cal Error**	**High Cal Error**
NOx (ppm)	50.62	0.00	24.84	50.62	-0.50	0.00	24.17	50.25	-0.99	0.00	-1.32	-0.73
CO (ppm)	50.03	0.00	24.93	50.03	-0.01	0.00	24.57	49.72	-0.02	0.00	-0.72	-0.62
O2 (%)	21.00	0.00	10.01	21.00	-0.03	0.00	9.99	20.99	-0.13	0.00	-0.12	-0.05
CO2 (%)	20.80	0.00	9.90	20.80	0.00	0.00	9.96	20.65	0.00	0.00	0.29	-0.75
VOC (ppmv)	1000.00	266.10	445.00	890.10	0.10	268.10	445.50	889.80	0.01	0.20	0.05	-0.03

Thru the Probe Bias and Drift	**Bias Gas Used**	**TTP Initial Zero**	**TTP Final Zero**	**TTP Initial Span**	**TTP Final Span**	**Zero Bias**	**Span Bias**	**Zero Drift**	**Span Drift**
NOx (ppm)	24.84	0.41	-0.22	24.44	24.50	0.55	-0.67	1.24	-0.12
CO (ppm)	24.93	-0.52	-0.36	24.24	24.24	-0.70	-1.38	-0.32	0.00
O2 (%)	10.01	0.05	0.09	9.96	9.92	0.56	-0.45	-0.21	0.19
CO2 (%)	9.90	0.04	0.09	9.99	9.81	0.42	-0.43	-0.22	0.88
VOC (ppmv)	445.00	0.00	0.00	443.50	451.00	-0.01	0.60	0.00	-0.75

Test Run Results	**Minimum**	**Maximum**	**Std. Dev.**	**Raw Results**	**Corrected Results**
NOx (ppm)	-0.46	0.03	0.18	-0.30	-0.40
CO (ppm)	0.35	0.57	0.04	0.46	0.91
O2 (%)	13.51	15.07	0.26	14.18	14.32
CO2 (%)	4.66	5.99	0.22	5.43	5.39
VOC (ppmv)	162.70	385.50	41.06	264.31	262.98

181714 Chevron	CCR Outlet		
Run 3	3/8/2011	3:19:11 PM	4:19:11 PM

Initial Calibration Error	Range	Low Gas	Mid Gas	High Gas	Zero Response	Low Response	Mid Response	High Response	Zero Cal Error	Low Cal Error	Mid Cal Error	High Cal Error
NOx (ppm)	50.62	0.00	24.84	50.62	-0.50	0.00	24.17	50.25	-0.99	0.00	-1.32	-0.73
CO (ppm)	50.03	0.00	24.93	50.03	-0.01	0.00	24.57	49.72	-0.02	0.00	-0.72	-0.62
O2 (%)	21.00	0.00	10.01	21.00	-0.03	0.00	9.99	20.99	-0.13	0.00	-0.12	-0.05
CO2 (%)	20.80	0.00	9.90	20.80	0.00	0.00	9.96	20.65	0.00	0.00	0.29	-0.75
VOC (ppmv)	1000.00	266.10	445.00	890.10	0.10	268.10	445.50	889.80	0.01	0.20	0.05	-0.03

Thru the Probe Bias and Drift	Bias Gas Used	TTP Initial Zero	TTP Final Zero	TTP Initial Span	TTP Final Span	Zero Bias	Span Bias	Zero Drift	Span Drift
NOx (ppm)	24.84	-0.22	-0.04	24.50	24.50	0.91	-0.67	-0.36	0.00
CO (ppm)	24.93	-0.36	-0.36	24.24	24.21	-0.70	-1.44	0.00	0.06
O2 (%)	10.01	0.09	0.02	9.92	9.86	0.24	-0.71	0.32	0.26
CO2 (%)	9.90	0.09	0.05	9.81	9.75	0.22	-0.69	0.20	0.26
VOC (ppmv)	445.00	0.00	0.10	451.00	451.00	0.00	0.60	-0.01	0.00

Test Run Results	Minimum	Maximum	Std. Dev.	Raw Results	Corrected Results
NOx (ppm)	-0.60	0.07	0.17	-0.31	-0.18
CO (ppm)	0.15	0.58	0.04	0.35	0.72
O2 (%)	13.38	15.04	0.26	14.11	14.31
CO2 (%)	4.71	6.08	0.22	5.46	5.50
VOC (ppmv)	155.20	405.20	42.46	267.57	263.99

APPENDIX C:
EXAMPLE CALCULATIONS

Stack Moisture and Molecular Weight

Example for Run: **CCR Vent M26A Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
852.132	beginning DGM reading (ft3)	528	Tstd, EPA standard temperature (R)
897.588	ending DGM reading (ft3)	29.92	Pstd, EPA standard pressure (in. Hg)
2920	beginning impinger weight (g)	0.04715	water (ft3/g)
2943.6	ending impinger weight (g)	1.335	water (L/g)
1.0099	Y, DGM factor (unitless)	28.3	conversion factor, (L/ft3)
527.5	Tm, ave. DGM temperature (R = F + 460)	13.6	conversion factor, (in H2O/in Hg)
30.14	P_{bar}, barometric pressure (in. Hg)		
5.40	CO2 (%)		
14.31	O2 (%)		
1.88	dH, average		

Impinger Wt. Gain (IWG): = ending impinger wt. (g) - beginning impinger wt. (g)

= 2943.6 - 2920

= 23.6 (g)

Volume Metered (Vm): = ending DGM reading (ft3) - beginning DGM reading (ft3)

= 897.588 - 852.132

= 45.456 (ft3)

Standard Volume Metered (Vstd):

$$= \frac{(Vm)\ (Y)\ (Tstd)\ (P_{bar}+(dH/13.6)}{(Pstd)\ (Tm)}$$

$$= \frac{45.456 \times 1.0099 \times 528 \times (30.14 + (1.88 / 13.6))}{29.92 \times 527.5}$$

= 46.499 (SCF)

Moisture Content (Bws):

$$= \frac{IWG\ (g) \times 0.04715\ (ft3/g)}{((IWG\ (g) \times 0.04715\ (ft3/g)) + (Vstd\ (ft3)))}$$

$$= \frac{1.1127}{(1.1127 + 46.499)}$$

= 0.023

= **2.3** **(%)**

Dry Gas Fraction: = 1 - Bws

= 1 - 0.023

= 0.977

Molecular Wt. (Ms):

Compound	Total Percent	Molecular Weight	Moisture or Dry Fraction	Partial Mol. Wt.
H2O	n/a	18	0.023	0.421
O2	14.3	32	0.977	4.472
CO2	5.4	44	0.977	2.320
N2	80.3	28	0.977	21.956
				29.17 **(lb/lb-mole)**

Stack Gas Flow Rate

Example for Run: **CCR Vent M26A Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
0.84	Cps, pitot tube factor (unitless)	528	Tstd, EPA standard temperature (R)
30.14	Pb, barometric pressure (in. Hg)	29.92	Pstd, EPA standard pressure (in. Hg)
684.0	Ts(abs), ave. stack temperature (R, F + 460)	85.49	Kp, (ft/s) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
29.17	Ms, stack gas molecular wt. (lb/lb-mole)	5129.4	Kp, (ft/min) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
-0.27	Pg, stack static pressure (in. H2O)	60	conversion factor, (s/min)
0.7854	A, stack area (ft2)	60	conversion factor, (min/hr)
8	Number of traverse Points	0.07355	conversion factor, (in Hg/in H2O)
0.977	Fd, stack dry gas fraction		

Point#	dP	Point#	dP	Point#	dP
1	0.56	9	0.00	17	0.00
2	0.62	10	0.00	18	0.00
3	0.77	11	0.00	19	0.00
4	0.55	12	0.00	20	0.00
5	0.58	13	0.00	21	0.00
6	0.64	14	0.00	22	0.00
7	0.79	15	0.00	23	0.00
8	0.56	16	0.00	24	0.00

Absolute Stack Pressure (Ps): = Pb + (Pg x 0.07355)

30.14 + (-0.27 x 0.07355)

= 30.12 (in. Hg)

Average Square Root of ∑dP (p1): = $\frac{6.354}{8}$

= 0.7942

Stack Velocity (Vs): = Kp x Cp x p1 x [Ts(abs) / (Ps x Ms)]^0.5

(ft/min) = 5129.4 x 0.84 x 0.7942 [684.0 / (30.12 x 29.17)]^0.5

= 3019 (ft/min)

Stack Velocity (Vs): = Vs / 60 (s/min)

(ft/sec) = 3019.3 / 60

= 50.32 (ft/sec)

Stack Volumetric Flow (Qa): = Vs x A

= 3019.3 x 0.7854

= 2371 (ACFM)

Stack Volumetric Flow (Qd): = Qa x 60 (Tstd/Pstd) x (Ps/Ts(abs)) x Fd

= $2371 \times 60 \times \frac{528 \times 30.12}{29.92 \quad 684.0} \times 0.977$

= **1.08E+05 DSCFH**

Stack Moisture and Molecular Weight

Example for Run: **CCR Vent M23 Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
415.45	beginning DGM reading (ft3)	528	Tstd, EPA standard temperature (R)
503.89	ending DGM reading (ft3)	29.92	Pstd, EPA standard pressure (in. Hg)
3723.4	beginning impinger weight (g)	0.04715	water (ft3/g)
3763.7	ending impinger weight (g)	1.335	water (L/g)
1.0148	Y, DGM factor (unitless)	28.3	conversion factor, (L/ft3)
529.6	Tm, ave. DGM temperature (R = F + 460)	13.6	conversion factor, (in H2O/in Hg)
30.06	P_{bar}, barometric pressure (in. Hg)		
5.40	CO2 (%)		
14.31	O2 (%)		
1.92	dH, average		

Impinger Wt. Gain (IWG): = ending impinger wt. (g) - beginning impinger wt. (g)

= 3763.7 - 3723.4

= 40.3 (g)

Volume Metered (Vm): = ending DGM reading (ft3) - beginning DGM reading (ft3)

= 503.89 - 415.45

= 88.44 (ft3)

Standard Volume Metered (Vstd):

$$= \frac{(Vm)\ (Y)\ (Tstd)\ (P_{bar}+(dH/13.6)}{(Pstd)\ (Tm)}$$

$$= \frac{88.44 \times 1.0148 \times 528 \times (30.06 + (1.92 / 13.6))}{29.92 \times 529.6}$$

= 90.314 (SCF)

Moisture Content (Bws):

$$= \frac{IWG\ (g) \times 0.04715\ (ft3/g)}{((IWG\ (g) \times 0.04715\ (ft3/g)) + (Vstd\ (ft3)))}$$

$$= \frac{1.9001}{(1.9001 + 90.314)}$$

= 0.021

= **2.1** **(%)**

Dry Gas Fraction: = 1 - Bws

= 1 - 0.021

= 0.979

Molecular Wt. (Ms):

Compound	Total Percent	Molecular Weight	Moisture or Dry Fraction	Partial Mol. Wt.
H2O	n/a	18	0.021	0.371
O2	14.3	32	0.979	4.485
CO2	5.4	44	0.979	2.327
N2	80.3	28	0.979	22.018
				29.20 **(lb/lb-mole)**

Stack Gas Flow Rate

Example for Run: **CCR Vent M23 Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
0.84	Cps, pitot tube factor (unitless)	528	Tstd, EPA standard temperature (R)
30.06	Pb, barometric pressure (in. Hg)	29.92	Pstd, EPA standard pressure (in. Hg)
685.4	Ts(abs), ave. stack temperature (R, F + 460)	85.49	Kp, (ft/s) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
29.20	Ms, stack gas molecular wt. (lb/lb-mole)	5129.4	Kp, (ft/min) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
-0.27	Pg, stack static pressure (in. H2O)	60	conversion factor, (s/min)
0.7854	A, stack area (ft2)	60	conversion factor, (min/hr)
8	Number of traverse Points	0.07355	conversion factor, (in Hg/in H2O)
0.979	Fd, stack dry gas fraction		

Point#	dP	Point#	dP	Point#	dP
1	0.61	9	0.00	17	0.00
2	0.60	10	0.00	18	0.00
3	0.67	11	0.00	19	0.00
4	0.58	12	0.00	20	0.00
5	0.59	13	0.00	21	0.00
6	0.67	14	0.00	22	0.00
7	0.71	15	0.00	23	0.00
8	0.62	16	0.00	24	0.00

Absolute Stack Pressure (Ps): = Pb + (Pg x 0.07355)

30.06 + (-0.27 x 0.07355)

= 30.04 (in. Hg)

Average Square Root of ∑dP (p1): = $\frac{6.352}{8}$

= 0.7940

Stack Velocity (Vs): = Kp x Cp x p1 x [Ts(abs) / (Ps x Ms)]^0.5

(ft/min) = 5129.4 x 0.84 x 0.7940 [685.4 / (30.04 x 29.20)]^0.5

= 3024 (ft/min)

Stack Velocity (Vs): = Vs / 60 (s/min)

(ft/sec) = 3024.2 / 60

= 50.40 (ft/sec)

Stack Volumetric Flow (Qa): = Vs x A

= 3024.2 x 0.7854

= 2375 (ACFM)

Stack Volumetric Flow (Qd): = Qa x 60 (Tstd/Pstd) x (Ps/Ts(abs)) x Fd

= 2375 x 60 $\frac{\text{x 528}}{29.92}$ $\frac{\text{x 30.04}}{685.4}$ x 0.979

= **1.08E+05 DSCFH**

Stack Moisture and Molecular Weight

Example for Run: **CCR Vent Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
685.036	beginning DGM reading (ft3)	528	Tstd, EPA standard temperature (R)
719.915	ending DGM reading (ft3)	29.92	Pstd, EPA standard pressure (in. Hg)
2845.1	beginning impinger weight (g)	0.04715	water (ft3/g)
2851.7	ending impinger weight (g)	1.335	water (L/g)
1.0148	Y, DGM factor (unitless)	28.3	conversion factor, (L/ft3)
515.3	Tm, ave. DGM temperature (R = F + 460)	13.6	conversion factor, (in H2O/in Hg)
30.27	P_{bar}, barometric pressure (in. Hg)		
7.75	CO2 (%)		
11.43	O2 (%)		
1.21	dH, average		

Impinger Wt. Gain (IWG): = ending impinger wt. (g) - beginning impinger wt. (g)

= 2851.7 - 2845.1

= 6.6 (g)

Volume Metered (Vm): = ending DGM reading (ft3) - beginning DGM reading (ft3)

= 719.915 - 685.036

= 34.879 (ft3)

Standard Volume Metered (Vstd):

$$= \frac{(Vm)\ (Y)\ (Tstd)\ (P_{bar}+(dH/13.6)}{(Pstd)\ (Tm)}$$

$$= \frac{34.879 \times 1.0148 \times 528 \times (30.27 + (1.21 / 13.6))}{29.92 \times 515.3}$$

= 36.804 (SCF)

Moisture Content (Bws):

$$= \frac{IWG\ (g) \times 0.04715\ (ft3/g)}{((IWG\ (g) \times 0.04715\ (ft3/g)) + (Vstd\ (ft3)))}$$

$$= \frac{0.3112}{(0.3112 + 36.804)}$$

= 0.008

= **0.8** **(%)**

Dry Gas Fraction: = 1 - Bws

= 1 - 0.008

= 0.992

Molecular Wt. (Ms):

Compound	Total Percent	Molecular Weight	Moisture or Dry Fraction	Partial Mol. Wt.
H2O	n/a	18	0.008	0.151
O2	11.4	32	0.992	3.627
CO2	7.8	44	0.992	3.381
N2	80.8	28	0.992	22.440
				29.60 **(lb/lb-mole)**

Values may differ from Summary Tables due to rounding and truncation.

Stack Gas Flow Rate

Example for Run: **CCR Vent Run 1**

Observed Measurements:		**Constants/Conversions/Standards:**	
0.84	Cps, pitot tube factor (unitless)	528	Tstd, EPA standard temperature (R)
30.27	Pb, barometric pressure (in. Hg)	29.92	Pstd, EPA standard pressure (in. Hg)
667.4	Ts(abs), ave. stack temperature (R, F + 460)	85.49	Kp, (ft/s) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
29.60	Ms, stack gas molecular wt. (lb/lb-mole)	5129.4	Kp, (ft/min) [(lb/lb-mole) (in. Hg) / (R)(in.H2O)]^0.5
-0.27	Pg, stack static pressure (in. H2O)	60	conversion factor, (s/min)
0.7854	A, stack area (ft2)	60	conversion factor, (min/hr)
8	Number of traverse Points	0.07355	conversion factor, (in Hg/in H2O)
0.992	Fd, stack dry gas fraction		

Point#	dP	Point#	dP	Point#	dP
1	0.30	9	0.00	17	0.00
2	0.42	10	0.00	18	0.00
3	0.45	11	0.00	19	0.00
4	0.32	12	0.00	20	0.00
5	0.31	13	0.00	21	0.00
6	0.40	14	0.00	22	0.00
7	0.47	15	0.00	23	0.00
8	0.34	16	0.00	24	0.00

Absolute Stack Pressure (Ps): = Pb + (Pg x 0.07355)

= 30.27 + (-0.27 x 0.07355)

= 30.25 (in. Hg)

Average Square Root of ∑dP (p1): = $\frac{4.890}{8}$

= 0.6113

Stack Velocity (Vs): = Kp x Cp x p1 x [Ts(abs) / (Ps x Ms)]^0.5

(ft/min) = 5129.4 x 0.84 x 0.6113 [667.4 / (30.25 x 29.60)]^0.5

= 2274 (ft/min)

Stack Velocity (Vs): = Vs / 60 (s/min)

(ft/sec) = 2273.9 / 60

= 37.90 (ft/sec)

Stack Volumetric Flow (Qa): = Vs x A

= 2273.9 x 0.7854

= 1786 (ACFM)

Stack Volumetric Flow (Qd): = Qa x 60 (Tstd/Pstd) x (Ps/Ts(abs)) x Fd

= $1786 \times 60 \times \frac{528 \times 30.25}{29.92 \quad 667.4} \times 0.992$

= **8.50E+04 DSCFH**

Values may differ from Summary Tables due to rounding and truncation.

Particulate Matter Emissions / Isokinetics

Example for Run: **CCR Vent Run 1**

Observed Measurements:		Constants/Conversions/Standards:	
36.804	Vstd, gaseous volume collected (DSCF)	528	Tstd, EPA standard temperature (R)
84992	Qd, stack volumetric flowrate (DSCFH)	29.92	Pstd, EPA standard pressure (in. Hg)
0.000341	An, nozzle area (ft2)	7000	conversion factor, (grains/lb)
0.992	Fd, dry gas fraction (unitless)	2000	conversion factor, (lb/ton)
1.214	dH, average dH of DGM (in. H2O)	8760	conversion factor, (hr/year)
30.25	Ps, stack absolute pressure (in. Hg)		
667.4	Ts, ave. stack temperature (R, F + 460)		
60	ts, sample time (min)		
2273.9	Vs, stack gas velocity (ft/min)		

Ave. Sampling Isokinetics (%):

$$= \frac{(Ts \times Vstd \times Pstd \times 100)}{(Tstd \times Vs \times ts \times An \times Ps \times Fd)}$$

$$= \frac{667.4 \times 36.804 \times 29.92 \times 100}{528 \times 2273.9 \times 60 \times 0.000341 \times 30.25 \times 0.992}$$

= 99.77 (%)

Values may differ from Summary Tables due to rounding and truncation.

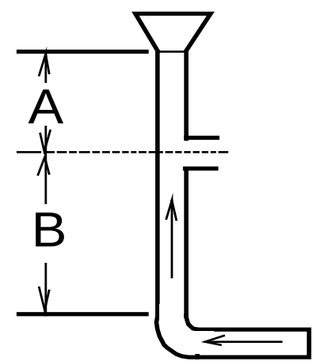
APPENDIX D:
FIELD/LABORATORY DATA SHEETS

Company:	**Chevron**
Plant:	**CCR**
Location:	**Pascagoula**
Technicians:	**JB, NA, PG, RM, JH, DM**
Source:	**CCR Vent**

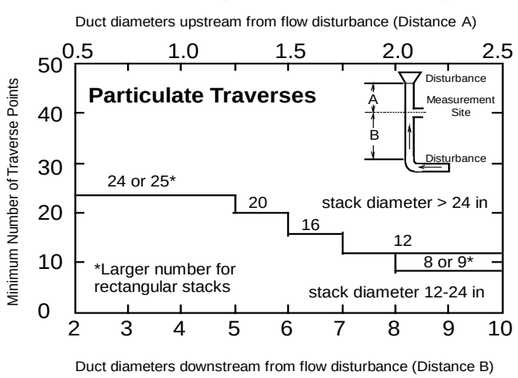
Select the Traverse Type (Particulate or Non-Particulate) ***Particulate*** <-- Select traverse type using pull-down menu

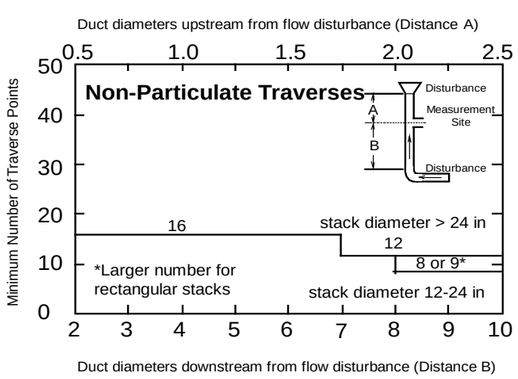
Stack/Duct Info

Stack Diameter + Port Length (in)	27	
Port Length (in)	15	<-- Remember to account for ALL port lengths!!
Total # of Diameters to be Traversed (generally 2)	2	
Distance ***from*** Flow Disturbance to Ports, Upstream, A (ft)	15	
Distance ***from*** Flow Disturbance to Ports, Downstream, B (ft)	9	
Calculated Values		
Stack ID (in)	12	
Stack Radius (ft)	0.50	
Stack Area (ft2)	0.79	
Distance from flow disturbances		
Distance Upstream, A (duct diameters)	15.00	
Distance Downstream, B (duct diameters)	9.00	
Ports Meet Method 1 Criteria?	**Yes**	
Minimum Traverse Points via Upstream (A)	8	
Minimum Traverse Points via Downstream (B)	8	
Total Minimum Number of Traverse Points	**8**	
Traverse Points per Diameter	**4**	



Traverse Point Locations (Circular Stacks/Ducts): ***Particulate*** **Traverse Point Locations**





Traverse Point	Traverse Pt. (in)	Traverse Pt. + Port (in)	*Stack Wall Distance, (in)
1	0.8	15.8	
2	3.0	18.0	
3	9.0	24.0	
4	11.2	26.2	
5	0.0		
6	0.0		
7	0.0		
8	0.0		
9	0.0		
10	0.0		
11	0.0		
12	0.0		
13	0.0		
14	0.0		
15	0.0		
16	0.0		
17	0.0		
18	0.0		
19	0.0		
20	0.0		
21	0.0		
22	0.0		
23	0.0		
24	0.0		

*Correct traverse point distances that are too close to stack wall. Select a minimum of 1.0" or 0.5" for stack IDs of >24" and ≤24", respectively.

Note: If traversing large diameter, 4-port stacks with a short probe, simply mark the probe with the first half of the traverse points and traverse each of the 4 ports (which equals the total # of traverse pts.).

40CFR60, App. B, PS2 Traverse Point Locations

	Diameter Traverse (16.7,50,83.3%)		**"Short" Line Traverse (.4,1.2,2.0m)**	
Traverse Point Number	Traverse Pt. Location (in)	Traverse Pt. Location + Port (in)	Traverse Pt. Location (in)	Traverse Pt. Location + Port (in)
1	2.0	17.0	N/A	N/A
2	6.0	21.0	N/A	N/A
3	10.0	25.0	N/A	N/A

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent (CH-004)
Technicians:	**JB, NA, DM, JH, RM, DA**

Preliminary Velocity and Moisture		
Date	3/8/2011	
Start Time (24 hr)	8:00	
Stop Time (24 hr)	8:30	
Stack Moisture & Molecular Wt.		
CO2 (%)	5.47	
O2 (%)	14.40	
H2 (%)	0.00	
Beginning Meter Reading (ft3)		
Ending Meter Reading (ft3)		
Beginning Impinger Wt (g)		
Ending Impinger Wt. (g)		
Dry Gas Meter Factor (Kd)	1.0099	
Dry Gas Meter Temperature (°F begin)		
Dry Gas Meter Temperature (°F end)		
Atmospheric Pressure (in Hg, abs.)	30.14	
ΔH during preliminary moisture (in. H2O)	0.50	
Sample Volume at STP (DSCF)	0.000	
Sample Volume at STP (liters)	0.00	
Stack Gas Moisture (% volume)	6.38	6.37559809
Dry Gas Fraction	0.936	
Stack Gas Molecular Wt. (lbs/lb-mole)	28.72	

Velocity Pitot Tube Data	***Δp***	***Temp (°F)***	***Cyclonic (α)***
ΔP #1	0.55	227	2
ΔP #2	0.61	228	1
ΔP #3	0.76	230	0
ΔP #4	0.62	228	0
ΔP #5	0.57	228	1
ΔP #6	0.63	229	2
ΔP #7	0.78	229	1
ΔP #8	0.60	227	0

Pitot Tube Factor	0.84
Sum of Square Root of Vertical Component	6.39
Number of Traverse Points	8
Average Square Root of ΔP's	0.799
Average Temperature (°F)	228
Average Cyclonic Flow Angle	1
Static Pressure (in. H2O)	
Absolute stack pressure (in. Hg)	30.14
Stack Configuration (R or C)	C
Stack Diameter (if Circular) (in)	12
Stack Length (if Rectangular) (in)	
Stack Width (if Rectangular) (in)	
Stack Area (ft2)	0.785
Stack Velocity (ft/min @ stack conditions)	3068
Stack Flow,wet (ACFM)	2410
Stack Flow, dry (SCFH)	**104602**
Stack Flow, wet (SCFH)	**111726**
Stack Velocity (DSFM)	**2219.73**

Nozzle Selection & K Factor Calculation	
Stack Velocity (DSFM)	2219.73
Target Sampling Rate(SCFM)(0.40-0.75)	0.7
Target Nozzle Area (Ft2)	0.00031535
Suggested Nozzle Number	7.7
Selected Nozzle Number	8
Nozzle measured diameter (in)	0.250
Actual Nozzle Area (ft2)	0.00034088
No. of M-5 Traverse Pts	8
Minutes per point (min.)	15
Sampling Time (min.) (>60 min)	120
Expected Total Sample Vol. (SCF)(>30 SCF)	90.80
Sampling Rate (SCFM) (using actual nozzle)	0.757
ΔH ("H2O)(@ sampling rate from Meter Box Calib Curve)	1.9
K-Factor (ΔH/ΔP)	**2.98**

Nozzle Measurements	
Diameter 1	0.2500
Diameter 2	0.2500
Diameter 3	0.2500
Average Nozzle Diameter	***0.2500***

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent (CH-004)
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 1**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0099
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.14
Prelim Static Pressure (in. H2O)	0.00
Perlim Stack Gas Moisture (% volume)	6.38
Prelim Dry Gas Fraction	0.9362
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	28.72

Final values to be entered upon completion of test run	
CO2 (%)	5.40
O2 (%)	14.31
H2 (%)	0.00
Beginning Impinger Wt (g)	2920.0
Ending Impinger Wt. (g)	2943.6
Sample Volume at STP (DSCF)	46.499
Sample Volume at STP (liters)	1316.86
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.14
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.34
Dry Gas Fraction	0.9766
Stack Gas Molecular Wt. (lbs/lb-mole)	29.17

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	698.0	703.7	598.3	920.0
Final wt (g)	705.3	705.4	600.6	932.3
Wt. Gain (g)	7.3	1.7	2.3	12.3

Average Meter Box Readings	
Average DGM Temperature (°F)	67.5
Average Stack Temperature (°F)	224.0
Average Square Root of ΔP's	0.794
Average Measured ΔH	1.876
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.1201415
Stack Velocity (ft/min @ stack conditions)	3019
Stack Flow,wet (ACFM)	2371
Stack Flow, dry (SCFH)	107984
Stack Flow, wet (SCFH)	110567
Stack Velocity (DSFM)	2291
Final Isokinetic Results	
Percent of isokinetic sampling rate	**99.21**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	852.132		9:58												
Point 1	857.556	857.332	10:12	63	63	63	1.65	1.65	5.593	0.5600	0.7483	217	47.52	104.3	104.3
Point 2	863.070	862.996	10:19	64	64	64	1.83	1.85	5.678	0.6200	0.7874	227	50.37	101.4	102.8
Point 3	869.410	869.133	10:27	65	65	65	2.28	2.30	6.523	0.7700	0.8775	228	56.18	104.6	103.4
Point 4	874.796	874.576	10:33	67	67	67	1.64	1.65	5.512	0.5500	0.7416	224	47.34	104.3	103.6
Point 5	880.303	880.136	10:40	69	69	69	1.73	1.74	5.615	0.5800	0.7616	220	48.47	103.1	103.5
Point 6	885.892	885.896	10:48	70	70	70	1.91	1.75	5.691	0.6400	0.8000	226	51.14	99.9	102.9
Point 7	892.110	892.102	10:55	71	71	71	2.37	2.38	6.326	0.7900	0.8888	228	56.90	100.1	102.5
Point 8	897.588	897.370	11:03	71	71	71	1.68	1.69	5.564	0.5600	0.7483	222	47.70	104.1	102.7
Average Values				**67.5**			**1.9**	**1.9**		**0.6338**	**0.794**	**224.0**	**50.7**	**102.7**	

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent (CH-004)
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 2**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0099
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.14
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	2.34
Prelim Dry Gas Fraction	0.9766
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.17

Final values to be entered upon completion of test run	
CO2 (%)	5.39
O2 (%)	14.32
H2 (%)	0.00
Beginning Impinger Wt (g)	2897.4
Ending Impinger Wt. (g)	2919.2
Sample Volume at STP (DSCF)	46.516
Sample Volume at STP (liters)	1317.33
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.14
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.16
Dry Gas Fraction	0.9784
Stack Gas Molecular Wt. (lbs/lb-mole)	29.19

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	681.9	679.0	618.8	917.7
Final wt (g)	691.2	680.9	619.3	927.8
Wt. Gain (g)	9.3	1.9	0.5	10.1

Average Meter Box Readings	
Average DGM Temperature (°F)	66.9
Average Stack Temperature (°F)	225.9
Average Square Root of ΔP's	0.788
Average Measured ΔH	1.870
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.1201415
Stack Velocity (ft/min @ stack conditions)	3001
Stack Flow,wet (ACFM)	2357
Stack Flow, dry (SCFH)	107218
Stack Flow, wet (SCFH)	109587
Stack Velocity (DSFM)	2275
Final Isokinetic Results	
Percent of isokinetic sampling rate	**99.96**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No. Port A	898.744		14:46												
Point 1	904.047	904.071	14:53	64	64	64	1.63	1.64	5.458	0.5500	0.7416	221	46.89	99.5	99.5
Point 2	909.893	909.868	15:01	65	65	65	1.96	1.98	6.010	0.6600	0.8124	226	51.55	100.4	100.0
Point 3	916.020	916.051	15:08	66	66	66	2.20	2.22	6.290	0.7400	0.8602	229	54.71	99.5	99.8
Point 4	921.589	921.502	15:16	66	66	66	1.72	1.74	5.711	0.5800	0.7616	223	48.22	101.6	100.2
Point 5	926.885	926.883	15:27	67	67	67	1.61	1.62	5.419	0.5400	0.7348	225	46.60	100.0	100.2
Point 6	932.585	932.593	15:35	68	68	68	1.88	1.89	5.825	0.6300	0.7937	229	50.48	99.9	100.1
Point 7	938.688	938.690	15:42	69	69	69	2.15	2.16	6.229	0.7200	0.8485	230	54.00	100.0	100.1
Point 8	944.163	944.160	15:50	70	70	70	1.70	1.71	5.572	0.5700	0.7550	224	47.84	100.0	100.1
Average Values				**66.9**			**1.9**	**1.9**		**0.6238**	**0.788**	**225.9**	**50.0**	**100.1**	

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent (CH-004)
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 3**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0099
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.14
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	2.16
Prelim Dry Gas Fraction	0.9784
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.19

Final values to be entered upon completion of test run	
CO2 (%)	5.50
O2 (%)	14.31
H2 (%)	0.00
Beginning Impinger Wt (g)	2926.3
Ending Impinger Wt. (g)	2947.1
Sample Volume at STP (DSCF)	44.858
Sample Volume at STP (liters)	1270.37
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.14
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.14
Dry Gas Fraction	0.9786
Stack Gas Molecular Wt. (lbs/lb-mole)	29.21

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	712.8	684.3	599.4	929.8
Final wt (g)	721.4	685.6	601.0	939.1
Wt. Gain (g)	8.6	1.3	1.6	9.3

Average Meter Box Readings	
Average DGM Temperature (°F)	69.0
Average Stack Temperature (°F)	227.6
Average Square Root of ΔP's	0.765
Average Measured ΔH	1.726
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.1201415
Stack Velocity (ft/min @ stack conditions)	2916
Stack Flow,wet (ACFM)	2290
Stack Flow, dry (SCFH)	103936
Stack Flow, wet (SCFH)	106208
Stack Velocity (DSFM)	2206
Final Isokinetic Results	
Percent of isokinetic sampling rate	**99.44**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	944.713		15:19												
Point 1	949.765	949.752	15:26	66	66	66	1.45	1.47	5.177	0.4900	0.7000	226	44.40	100.3	100.3
Point 2	955.261	955.335	15:34	67	67	67	1.78	1.80	5.626	0.6000	0.7746	229	49.24	98.7	99.4
Point 3	961.399	961.359	15:41	68	68	68	2.15	2.16	6.277	0.7200	0.8485	231	54.02	100.6	99.9
Point 4	966.477	966.572	15:49	69	69	69	1.52	1.53	5.175	0.5100	0.7141	225	45.27	98.2	99.4
Point 5	971.610	971.706	16:02	70	70	70	1.56	1.56	5.222	0.5200	0.7211	226	45.74	98.2	99.2
Point 6	977.243	977.299	16:10	70	70	70	1.85	1.86	5.735	0.6200	0.7874	230	50.09	99.0	99.2
Point 7	983.285	983.334	16:17	71	71	71	2.13	2.13	6.144	0.7100	0.8426	231	53.65	99.2	99.2
Point 8	988.705	988.634	16:25	71	71	71	1.62	1.62	5.504	0.5400	0.7348	223	46.51	101.3	99.4
Average Values				**69.0**			**1.8**	**1.7**		**0.5888**	**0.765**	**227.6**	**48.6**	**99.4**	

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent
Technicians:	**JB, NA, DM, JH, RM, DA**

Preliminary Velocity and Moisture			
Date	3/8/2011		
Start Time (24 hr)	8:00		
Stop Time (24 hr)	8:30		
Stack Moisture & Molecular Wt.			
CO2 (%)	5.47		
O2 (%)	14.40		
H2 (%)	0.00		
Beginning Meter Reading (ft3)			
Ending Meter Reading (ft3)			
Beginning Impinger Wt (g)			
Ending Impinger Wt. (g)			
Dry Gas Meter Factor (Kd)	1.0148		
Dry Gas Meter Temperature (°F begin)			
Dry Gas Meter Temperature (°F end)			
Atmospheric Pressure (in Hg, abs.)	30.14		
ΔH during preliminary moisture (in. H2O)	0.50		
Sample Volume at STP (DSCF)	0.000		
Sample Volume at STP (liters)	0.00		
Stack Gas Moisture (% volume)	6.38	6.37559809	
Dry Gas Fraction	0.936		
Stack Gas Molecular Wt. (lbs/lb-mole)	28.72		
Velocity Pitot Tube Data	***Δp***	***Temp (°F)***	***Cyclonic (α)***
ΔP #1	0.55	227	2
ΔP #2	0.61	228	3
ΔP #3	0.76	230	1
ΔP #4	0.62	228	0
ΔP #5	0.57	228	2
ΔP #6	0.63	229	2
ΔP #7	0.78	229	1
ΔP #8	0.60	227	1
Pitot Tube Factor	0.84		
Sum of Square Root of Vertical Component	6.39		
Number of Traverse Points	8		
Average Square Root of ΔP's	0.799		
Average Temperature (°F)	228		
Average Cyclonic Flow Angle	2		
Static Pressure (in. H2O)			
Absolute stack pressure (in. Hg)	30.14		
Stack Configuration (R or C)	C		
Stack Diameter (if Circular) (in)	12		
Stack Length (if Rectangular) (in)			
Stack Width (if Rectangular) (in)			
Stack Area (ft2)	0.785		
Stack Velocity (ft/min @ stack conditions)	3068		
Stack Flow,wet (ACFM)	2410		
Stack Flow, dry (SCFH)	**104602**		
Stack Flow, wet (SCFH)	**111726**		
Stack Velocity (DSFM)	**2219.73**		

Nozzle Selection & K Factor Calculation	
Stack Velocity (DSFM)	2219.73
Target Sampling Rate(SCFM)(0.40-0.75)	0.7
Target Nozzle Area (Ft2)	0.00031535
Suggested Nozzle Number	7.7
Selected Nozzle Number	8
Nozzle measured diameter (in)	0.250
Actual Nozzle Area (ft2)	0.00034088
No. of M-5 Traverse Pts	8
Minutes per point (min.)	15
Sampling Time (min.) (>60 min)	120
Expected Total Sample Vol. (SCF)(>30 SCF)	90.80
Sampling Rate (SCFM) (using actual nozzle)	0.757
ΔH ("H2O)(@ sampling rate from Meter Box Calib Curve)	1.9
K-Factor (ΔH/ΔP)	**2.98**

Nozzle Measurements	
Diameter 1	0.2500
Diameter 2	0.2500
Diameter 3	0.2500
Average Nozzle Diameter	***0.2500***

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 1**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	120
Number of Points	8
Time per Travese Point (min)	15
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.14
Prelim Static Pressure (in. H2O)	0.00
Perlim Stack Gas Moisture (% volume)	6.38
Prelim Dry Gas Fraction	0.9362
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	28.72

Final values to be entered upon completion of test run	
CO2 (%)	5.40
O2 (%)	14.31
H2 (%)	0.00
Beginning Impinger Wt (g)	3723.4
Ending Impinger Wt. (g)	3763.7
Sample Volume at STP (DSCF)	90.314
Sample Volume at STP (liters)	2557.69
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.06
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.06
Dry Gas Fraction	0.9794
Stack Gas Molecular Wt. (lbs/lb-mole)	29.20

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	1783.3	620.1	339.8	980.2
Final wt (g)	1790.9	623.1	349.2	1000.5
Wt. Gain (g)	7.6	3.0	9.4	20.3

Average Meter Box Readings	
Average DGM Temperature (°F)	69.6
Average Stack Temperature (°F)	225.4
Average Square Root of ΔP's	0.794
Average Measured ΔH	1.917
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.0401415
Stack Velocity (ft/min @ stack conditions)	3024
Stack Flow,wet (ACFM)	2375
Stack Flow, dry (SCFH)	107958
Stack Flow, wet (SCFH)	110229
Stack Velocity (DSFM)	2291
Final Isokinetic Results	
Percent of isokinetic sampling rate	**96.37**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	415.450		9:58												
Point 1	426.110	426.182	10:13	64	64	64	1.80	1.82	11.029	0.6100	0.7810	228	50.00	99.3	99.3
Point 2	436.720	436.803	10:28	66	66	66	1.78	1.79	10.935	0.6000	0.7746	227	49.55	99.2	99.3
Point 3	448.070	448.069	10:43	69	69	69	2.00	2.01	11.637	0.6700	0.8185	228	52.40	100.0	99.5
Point 4	458.700	458.684	10:58	71	71	71	1.74	1.75	10.851	0.5800	0.7616	227	48.72	100.2	99.7
Point 5	469.420	469.412	11:20	71	71	71	1.77	1,78	10.944	0.5900	0.7681	226	49.10	100.1	99.8
Point 6	480.950	480.867	11:35	72	72	72	2.01	2.03	11.755	0.6700	0.8185	224	52.25	100.7	99.9
Point 7	492.880	492.747	11:50	72	72	72	2.13	2.15	12.167	0.7100	0.8426	222	53.71	101.1	100.1
Point 8	503.890	503.919	12:05	72	72	72	1.86	1.87	11.221	0.6200	0.7874	221	50.15	99.7	100.1
Average Values				**69.6**			**1.9**	**1.9**		**0.6313**	**0.794**	**225.4**	**50.7**	**100.0**	

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 2**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	120
Number of Points	8
Time per Travese Point (min)	15
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.06
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	2.06
Prelim Dry Gas Fraction	0.9794
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.20

Final values to be entered upon completion of test run	
CO2 (%)	5.39
O2 (%)	14.32
H2 (%)	0.00
Beginning Impinger Wt (g)	3591.3
Ending Impinger Wt. (g)	3642.6
Sample Volume at STP (DSCF)	89.375
Sample Volume at STP (liters)	2531.09
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.06
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.63
Dry Gas Fraction	0.9737
Stack Gas Molecular Wt. (lbs/lb-mole)	29.13

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	1790.0	536.0	304.5	960.8
Final wt (g)	1806.5	538.2	317.1	980.8
Wt. Gain (g)	16.5	2.2	12.6	20.0

Average Meter Box Readings	
Average DGM Temperature (°F)	70.6
Average Stack Temperature (°F)	218.1
Average Square Root of ΔP's	0.772
Average Measured ΔH	1.804
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.0401415
Stack Velocity (ft/min @ stack conditions)	2930
Stack Flow,wet (ACFM)	2301
Stack Flow, dry (SCFH)	105082
Stack Flow, wet (SCFH)	107925
Stack Velocity (DSFM)	2230
Final Isokinetic Results	
Percent of isokinetic sampling rate	**97.98**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	504.230		12:46												
Point 1	514.595	514.835	13:01	67	67	67	1.61	1.62	10.629	0.5400	0.7348	221	46.50	97.7	97.7
Point 2	525.870	526.020	13:16	69	69	69	1.85	1.86	11.526	0.6200	0.7874	218	49.71	98.7	98.2
Point 3	537.340	537.579	13:31	70	70	70	1.94	1.96	11.705	0.6500	0.8062	219	50.94	98.0	98.1
Point 4	547.870	548.147	13:46	71	71	71	1.65	1.70	10.718	0.5500	0.7416	218	46.82	97.4	98.0
Point 5	558.520	558.794	14:08	72	72	72	1.68	1.69	10.821	0.5600	0.7483	218	47.24	97.5	97.9
Point 6	569.600	570.110	14:23	72	72	72	1.89	1.90	11.264	0.6300	0.7937	217	50.07	95.6	97.5
Point 7	581.190	581.460	14:38	72	72	72	1.98	2.00	11.785	0.6600	0.8124	217	51.25	97.7	97.5
Point 8	591.940	592.219	14:53	72	72	72	1.71	1.70	10.923	0.5700	0.7550	217	47.63	97.5	97.5
Average Values				**70.6**			**1.8**	**1.8**		**0.5975**	**0.772**	**218.1**	**48.8**	**97.5**	

Plant:	**Chevron Pascagoula**
Location:	Pascagoula, MS
Source:	CCR Vent
Technicians:	**JB, NA, DM, JH, RM, DA**

Test Run Designation:	**Run 3**
Computerized Isokinetic Sampling Data Sheet	
K-factor	2.980
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	120
Number of Points	8
Time per Travese Point (min)	15
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.06
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	2.63
Prelim Dry Gas Fraction	0.9737
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.13

Final values to be entered upon completion of test run	
CO2 (%)	5.50
O2 (%)	14.31
H2 (%)	0.00
Beginning Impinger Wt (g)	3674.5
Ending Impinger Wt. (g)	3715.2
Sample Volume at STP (DSCF)	90.890
Sample Volume at STP (liters)	2574.00
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.14
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	2.07
Dry Gas Fraction	0.9793
Stack Gas Molecular Wt. (lbs/lb-mole)	29.22

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	1782.9	623.1	972.5	296.0
Final wt (g)	1787.1	625.7	993.9	308.5
Wt. Gain (g)	4.2	2.6	21.4	12.5

Average Meter Box Readings	
Average DGM Temperature (°F)	70.6
Average Stack Temperature (°F)	214.1
Average Square Root of ΔP's	0.781
Average Measured ΔH	1.794
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.1201415
Stack Velocity (ft/min @ stack conditions)	2944
Stack Flow,wet (ACFM)	2312
Stack Flow, dry (SCFH)	107123
Stack Flow, wet (SCFH)	109385
Stack Velocity (DSFM)	2273
Final Isokinetic Results	
Percent of isokinetic sampling rate	**97.74**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/8/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	595.227		15:19												
Point 1	605.835	606.047	15:34	69	69	69	1.67	1.68	10.839	0.5600	0.7483	217	47.26	98.0	98.0
Point 2	617.245	617.506	15:49	70	70	70	1.94	2.00	11.644	0.6500	0.8062	217	50.92	97.8	97.9
Point 3	628.900	629.053	16:04	71	71	71	1.98	2.00	11.873	0.6600	0.8124	214	51.20	98.7	98.2
Point 4	639.700	639.967	16:19	71	71	71	1.74	1.75	10.995	0.5800	0.7616	215	48.03	97.6	98.0
Point 5	650.235	650.681	16:40	71	71	71	1.71	1.72	10.725	0.5700	0.7550	214	47.58	95.9	97.6
Point 6	661.750	661.783	16:55	71	71	71	1.89	1.90	11.728	0.6300	0.7937	213	49.98	99.7	98.0
Point 7	673.315	673.486	17:10	71	71	71	1.95	1.95	11.780	0.6500	0.8062	212	50.73	98.5	98.1
Point 8	684.190	684.415	17:25	71	71	71	1.74	1.75	11.072	0.5800	0.7616	211	47.89	98.0	98.1
Average Values				**70.6**			**1.8**	**1.8**		**0.6100**	**0.781**	**214.1**	**49.2**	**98.0**	

Preliminary Velocity, Cyclonic Flow Check, Moisture, and K-Factor

Plant: **Chevron Pascagoula**
Location: Pascagoula, MS
Source: CCR
Technicians: **JB, NA, DM, JH, RM, DA**

Preliminary Velocity and Moisture	
Date	3/10/2011
Start Time (24 hr)	8:00
Stop Time (24 hr)	8:20
Stack Moisture & Molecular Wt.	
CO2 (%)	8.00
O2 (%)	11.00
H2 (%)	0.00
Beginning Meter Reading (ft3)	
Ending Meter Reading (ft3)	
Beginning Impinger Wt (g)	
Ending Impinger Wt. (g)	
Dry Gas Meter Factor (Kd)	
Dry Gas Meter Temperature (°F begin)	
Dry Gas Meter Temperature (°F end)	
Atmospheric Pressure (in Hg, abs.)	30.27
ΔH during preliminary moisture (in. H2O)	0.50
Sample Volume at STP (DSCF)	0.000
Sample Volume at STP (liters)	0.00
Stack Gas Moisture (% volume)	2.20
Dry Gas Fraction	0.978
Stack Gas Molecular Wt. (lbs/lb-mole)	29.46

9.71052632

Velocity Pitot Tube Data	***Δp***	***Temp (°F)***	***Cyclonic (α)***
ΔP #1	0.38	209	2
ΔP #2	0.45	209	1
ΔP #3	0.40	208	1
ΔP #4	0.31	208	0
ΔP #5	0.35	208	0
ΔP #6	0.42	209	1
ΔP #7	0.39	208	2
ΔP #8	0.34	207	1

Pitot Tube Factor	0.84
Sum of Square Root of Vertical Component	4.92
Number of Traverse Points	8
Average Square Root of ΔP's	0.615
Average Temperature (°F)	208
Average Cyclonic Flow Angle	1
Static Pressure (in. H2O)	
Absolute stack pressure (in. Hg)	30.27
Stack Configuration (R or C)	C
Stack Diameter (if Circular) (in)	12
Stack Length (if Rectangular) (in)	
Stack Width (if Rectangular) (in)	
Stack Area (ft2)	0.785
Stack Velocity (ft/min @ stack conditions)	2296
Stack Flow,wet (ACFM)	1803
Stack Flow, dry (SCFH)	**84569**
Stack Flow, wet (SCFH)	**86471**
Stack Velocity (DSFM)	**1794.61**

Nozzle Selection & K Factor Calculation	
Stack Velocity (DSFM)	1794.61
Target Sampling Rate(SCFM)(0.40-0.75)	0.7
Target Nozzle Area (Ft2)	0.00039006
Suggested Nozzle Number	8.6
Selected Nozzle Number	8
Nozzle measured diameter (in)	0.250
Actual Nozzle Area (ft2)	0.00034088
No. of M-5 Traverse Pts	8
Minutes per point (min.)	15
Sampling Time (min.) (>60 min)	120
Expected Total Sample Vol. (SCF)(>30 SCF)	73.41
Sampling Rate (SCFM) (using actual nozzle)	0.612
ΔH ("H2O)(@ sampling rate from Meter Box Calib Curve)	1.25
K-Factor (ΔH/ΔP)	**3.30**

Nozzle Measurements	
Diameter 1	0.2500
Diameter 2	0.2500
Diameter 3	0.2500
Average Nozzle Diameter	***0.2500***

Emissions testing performed by TRC, Austin, Texas

Out Run 1 Point by Point Isokinetics

Plant:	**Chevron Pascagoula**		
Location:	Pascagoula, MS	Inlet O2	0.05
Source:	CCR	Inlet CO2	18.64
Technicians:	**JB, NA, DM, JH, RM, DA**		

Test Run Designation:	**Run 1**
Computerized Isokinetic Sampling Data Sheet	
K-factor	3.300
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.27
Prelim Static Pressure (in. H2O)	0.00
Perlim Stack Gas Moisture (% volume)	2.20
Prelim Dry Gas Fraction	0.9780
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.46

Final values to be entered upon completion of test run	
CO2 (%)	7.75
O2 (%)	11.43
H2 (%)	0.00
Beginning Impinger Wt (g)	2845.1
Ending Impinger Wt. (g)	2851.7
Sample Volume at STP (DSCF)	36.804
Sample Volume at STP (liters)	1042.28
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.27
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	0.84
Dry Gas Fraction	0.9916
Stack Gas Molecular Wt. (lbs/lb-mole)	29.60

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	687.6	669.4	619.2	868.9
Final wt (g)	686.8	673.5	620.2	871.2
Wt. Gain (g)	-0.8	4.1	1.0	2.3

Average Meter Box Readings	
Average DGM Temperature (°F)	55.3
Average Stack Temperature (°F)	207.4
Average Square Root of ΔP's	0.611
Average Measured ΔH	1.214
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.25
Stack Velocity (ft/min @ stack conditions)	2274
Stack Flow,wet (ACFM)	1786
Stack Flow, dry (SCFH)	84992
Stack Flow, wet (SCFH)	85711
Stack Velocity (DSFM)	1804
Final Isokinetic Results	
Percent of isokinetic sampling rate	**99.77**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/10/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	685.036		9:00												
Point 1	688.904	688.874	9:07	51	51	51	0.96	0.96	4.113	0.3000	0.5477	209	34.07	100.8	100.8
Point 2	693.440	693.455	9:15	53	53	53	1.35	1.35	4.809	0.4200	0.6481	210	40.34	99.7	100.2
Point 3	698.134	698.175	9:22	55	55	55	1.45	1.45	4.958	0.4500	0.6708	208	41.69	99.1	99.8
Point 4	702.330	702.142	9:30	56	56	56	1.03	1.05	4.419	0.3200	0.5657	207	35.13	104.7	100.9
Point 5	706.345	706.275	9:42	56	56	56	1.00	1.00	4.228	0.3100	0.5568	207	34.58	101.8	101.1
Point 6	710.750	710.832	9:50	57	57	57	1.29	1.30	4.633	0.4000	0.6325	207	39.28	98.2	100.6
Point 7	715.780	715.614	9:57	57	57	57	1.52	1.50	5.293	0.4700	0.6856	206	42.54	103.4	101.0
Point 8	719.915	719.925	10:05	57	57	57	1.10	1.10	4.347	0.3400	0.5831	205	36.16	99.8	100.9
Average Values				**55.3**			**1.2**	**1.2**		**0.3763**	**0.611**	**207.4**	**38.0**	**100.9**	

Out Run 2 Point by Point Isokinetics

Plant:	**Chevron Pascagoula**		
Location:	Pascagoula, MS	Inlet O2	0.1
Source:	CCR	Inlet CO2	18.06
Technicians:	**JB, NA, DM, JH, RM, DA**		

Test Run Designation:	**Run 2**
Computerized Isokinetic Sampling Data Sheet	
K-factor	3.300
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.27
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	0.84
Prelim Dry Gas Fraction	0.9916
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.60

Final values to be entered upon completion of test run	
CO2 (%)	7.80
O2 (%)	11.44
H2 (%)	0.00
Beginning Impinger Wt (g)	2902.7
Ending Impinger Wt. (g)	2916.4
Sample Volume at STP (DSCF)	36.889
Sample Volume at STP (liters)	1044.71
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.27
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	1.72
Dry Gas Fraction	0.9828
Stack Gas Molecular Wt. (lbs/lb-mole)	29.50

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	700.0	699.7	599.6	903.4
Final wt (g)	704.2	699.9	600.7	911.6
Wt. Gain (g)	4.2	0.2	1.1	8.2

Average Meter Box Readings	
Average DGM Temperature (°F)	57.0
Average Stack Temperature (°F)	208.1
Average Square Root of ΔP's	0.610
Average Measured ΔH	1.250
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.25
Stack Velocity (ft/min @ stack conditions)	2274
Stack Flow,wet (ACFM)	1786
Stack Flow, dry (SCFH)	84136
Stack Flow, wet (SCFH)	85609
Stack Velocity (DSFM)	1785
Final Isokinetic Results	
Percent of isokinetic sampling rate	**101.02**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/10/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	720.134		10:16												
Point 1	724.175	724.057	10:23	55	55	55	0.97	0.97	4.263	0.3000	0.5477	205	33.90	103.0	103.0
Point 2	728.780	728.864	10:31	55	55	55	1.38	1.38	4.863	0.4300	0.6557	206	40.61	98.2	100.4
Point 3	733.415	733.521	10:38	56	56	56	1.42	1.42	4.886	0.4400	0.6633	209	41.17	97.8	99.4
Point 4	737.480	737.535	10:51	57	57	57	1.07	1.10	4.273	0.3300	0.5745	208	35.63	98.7	99.3
Point 5	741.660	741.728	10:58	58	58	58	1.13	1.13	4.386	0.3500	0.5916	209	36.72	98.4	99.1
Point 6	746.460	746.423	11:06	58	58	58	1.42	1.40	5.041	0.4400	0.6633	208	41.14	100.8	99.4
Point 7	751.063	750.764	11:13	58	58	58	1.17	1.50	4.831	0.3600	0.6000	210	37.27	106.9	100.5
Point 8	755.210	755.255	11:21	59	59	59	1.10	1.10	4.343	0.3400	0.5831	210	36.22	98.9	100.3
Average Values				**57.0**			**1.2**	**1.3**		**0.3738**	**0.610**	**208.1**	**37.8**	**100.3**	

Out Run 3 Point by Point Isokinetics

Plant:	**Chevron Pascagoula**		
Location:	Pascagoula, MS	Inlet O2	0.1
Source:	CCR	Inlet CO2	18.34
Technicians:	**JB, NA, DM, JH, RM, DA**		

Test Run Designation:	**Run 3**
Computerized Isokinetic Sampling Data Sheet	
K-factor	3.300
Nozzle Area (ft2)	0.00034088
Total Sample Time (min)	60
Number of Points	8
Time per Travese Point (min)	7.5
Pitot Tube Factor	0.84
Dry Gas Meter Factor (Kd)	1.0148
Preliminary values entered before test run	
Prelim Atmospheric Pressure (in Hg, abs.)	30.27
Prelim Static Pressure (in. H2O)	-0.27
Perlim Stack Gas Moisture (% volume)	1.72
Prelim Dry Gas Fraction	0.9828
Prelim Stack Gas Molecular Wt. (lbs/lb-mole)	29.50

Final values to be entered upon completion of test run	
CO2 (%)	7.72
O2 (%)	11.58
H2 (%)	0.00
Beginning Impinger Wt (g)	2875.2
Ending Impinger Wt. (g)	2886.6
Sample Volume at STP (DSCF)	37.139
Sample Volume at STP (liters)	1051.78
Stack Area (ft2)	0.79
Atmospheric Pressure (in Hg, abs.)	30.27
Static Pressure (in. H2O)	-0.27
Stack Gas Moisture (% volume)	1.43
Dry Gas Fraction	0.9857
Stack Gas Molecular Wt. (lbs/lb-mole)	29.53

Impinger Wt.	#1 H2O	#2 H2O	#3 MT	#4 SiGel
Initial wt (g)	701.6	682.2	620.2	871.2
Final wt (g)	700.9	687.1	620.9	877.7
Wt. Gain (g)	-0.7	4.9	0.7	6.5

Average Meter Box Readings	
Average DGM Temperature (°F)	60.4
Average Stack Temperature (°F)	212.6
Average Square Root of ΔP's	0.622
Average Measured ΔH	0.996
Final Flow Rate Results	
Absolute stack pressure (in. Hg)	30.25
Stack Velocity (ft/min @ stack conditions)	2326
Stack Flow,wet (ACFM)	1827
Stack Flow, dry (SCFH)	85752
Stack Flow, wet (SCFH)	86993
Stack Velocity (DSFM)	1820
Final Isokinetic Results	
Percent of isokinetic sampling rate	**99.79**

	DGM		Date	DGM					Corrected			Stack Gas	Stack Gas		
	Observed	Target	3/10/2011	Temp.	DGM	DGM	Calculated	Measured	Volume			Temp	Velocity	% ISO	% ISO
	(ft3)	(ft3)	Time	Ave. (°F)	in (°F)	out (°F)	ΔH	ΔH	(ft3)	ΔP	√ΔP	(°F)	(ft/s)	Point	Total
Traverse Point No.	755.444		11:33												
Point 1	759.500	759.465	11:40	58	58	58	1.04	1.04	4.255	0.3200	0.5657	213	35.28	100.9	100.9
Point 2	764.000	764.110	11:48	58	58	58	1.36	1.36	4.725	0.4200	0.6481	211	40.35	97.6	99.1
Point 3	768.850	768.828	11:55	59	59	59	1.49	1.49	5.084	0.4600	0.6782	212	42.26	100.4	99.6
Point 4	773.044	773.067	10:51	60	60	60	1.14	1.14	4.384	0.3500	0.5916	214	36.92	99.5	99.6
Point 5	777.250	777.147	12:08	61	61	61	1.07	1.07	4.388	0.3300	0.5745	214	35.85	102.5	100.1
Point 6	781.955	782.000	12:15	62	62	62	1.44	0.14	4.903	0.4400	0.6633	212	41.33	99.0	99.9
Point 7	786.730	786.651	12:23	62	62	62	1.40	0.14	4.976	0.4300	0.6557	212	40.86	101.7	100.2
Point 8	791.010	791.034	12:30	63	63	63	1.18	1.18	4.449	0.3600	0.6000	213	37.42	99.4	100.1
Average Values				**60.4**			**1.3**	**1.0**		**0.3888**	**0.622**	**212.6**	**38.8**	**100.1**	

M23

TRC STACK SAMPLING DATA SHEET

Plant Name: Chevron Pascagoula		Stack Height: 24		Meter Box Serial No: 1011028	
Date: 3/8/11		Stack Diameter: 12		Meter Box Factor (Y): 1.0148	
Source: CCR Vent		Stack Moisture (% by Vol.): 6.4		Molecular Weight: 28.7	
Technicians: JMH, DGM, RAM, NTA, PWG		ATM Pressure: 30.14		Static Pressure: .27	
Probe Size: 4ft		K Factor: 3.0		Total Sample Time (min): 120	
Nozzle No: JMH 3/8/11	Nozzle Area: 0.00034	PTCF: 0.84		#of Sample PTS.: 8	
M.23 Test Run#: ~~M-26~~ R-1	Box #:	Filter #:	Pitot Tube #:		

Meter box Data:

Meter Reading (ft³, Start): 415.450		Time (Start): 9:58	
Meter Reading (ft³, Stop): 503.89		Time (Stop): 12:05	

Quality Assurance Leak Checks:

Meterbox Leak Check	cfm	in. Hg Vacuum
Pre-test	0	17
Post-test	0	13

†Pitot Tube Leak Check (+/-)	in. H_2O	seconds
Pre-test	4.6	5
Post-test	4.1	15

Impinger #	1	2	3	4	Total		
Contents	~~0.1N H_2SO_4~~	~~0.1N H_2SO_4~~	~~Empty~~	Silica Gel	~~XAD~~ Resin	Silica Gel	
Initial Wt. (g)	~~698.0~~	~~703.7~~	~~518.3~~	~~920.0~~	339.8	980.2	
Final Wt. (g)	361.9	705.1	724.9	623.1	349.2	1000.5	

JMH 3/8/11

Point #	Clock time	DGM reading	ΔP in. H_2O	ΔH in. H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM Inlet Temp °F	Line Vacuum in. Hg	XAD Temp
Start	9:58	415.450	.61	—	—	—	—	—	—	—	—
1	10:13	426.11	.61	1.82	228	233	230	57	64	3	48
2	10:28	436.72	.60	1.79	~~233~~ 227	~~238~~ 233	229	54	66	3	48
3	10:43	448.07	.67	2.01	228	242	232	57	69	3	49
4	10:58	458.70	~~.62~~ .58	1.75	227	240	244	58	71	3	49
Start	11:05	458.70	—	—	—	—	—	—	—	—	—
1	11:20	469.42	.59	1.78	226	243	235	59	71	5	47
2	11:35	480.95	.67	2.03	224	244	234	60	72	5	49
3	11:50	492.88	.71	2.15	222	243	240	63	72	5	53
4	12:05	503.89	.62	1.87	221	243	237	62	72	5	48
Totals or Avgs.											

$$\Delta H = \Delta P \times K_{factor} \times \frac{(T_{dgm} + 460)}{528}$$

Impinger Contents (1-4) Initial

	Wt (g)
1. Empty	351.3
2. H_2O	707.3
3. H_2O	724.7
4.	620.1

* meter box leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum during test.
† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC

Reviewed by:

M23 TRC STACK SAMPLING DATA SHEET

Plant Name: Chevron Pascagoula	Stack Height: 24	Meter Box Serial No: 1011028
Date: 3/8/11	Stack Diameter: 12	Meter Box Factor (Y): 1.0148
Source: CCR Vent	Stack Moisture (% by Vol.): 64.5	Molecular Weight: 28.7
Technicians: JMH, DGM, RAM, NTA, PWD	ATM Pressure: 30.14	Static Pressure: .27
Probe Size:	K Factor: 3.0	Total Sample Time (min): 120
Nozzle No: Nozzle Area: .00034	PTCF: 0.84	#of Sample PTS.: 8
Test Run#: M.23 R-2 Box #: Filter #:	Pitot Tube #:	

Meter box Data:

Meter Reading (ft³, Start):	504.23	Time (Start):	12:46
Meter Reading (ft³, Stop):	591.94	Time (Stop):	14:53

Quality Assurance Leak Checks:

Meterbox* Leak Check	cfm	in. Hg Vacuum
Pre-test	Ø	13
Post-test	Ø	12

†Pitot Tube Leak Check (+/-)	in. H₂O	seconds
Pre-test	4.1	15
Post-test	4.2	15

Impinger #	1	2	3	4	Total	
Contents	Empty	H_2O	H_2O	Empty	XAD	Silica Gel
Initial Wt. (g)	344.4	718.8	726.8	536.0	304.5	960.8
Final Wt. (g)	358.1	718.9	729.5	538.2	317.1	980.8

point #	Clock time	DGM reading	ΔP in. H₂O	ΔH in. H₂O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM Inlet Temp °F	Line Vacuum in. Hg	XAD Temp
Start	12:46	504.23	—	—	—	—	—	—	—	—	
1	13:01	514.595	.54	1.62	221	239	227	56	~~56~~ 67	3	56
2	13:16	525.07	.62	1.86	218	242	233	54	69	3.5	56
3	13:31	537.34	.65	1.96	219	243	237	58	70	3	58
4	13:46	547.87	.55	1.7	214	240	224	60	71	3	56
Start	13:53	547.87	—	—	—	—	—	—	—	—	—
1	14:08	558.52	.56	1.69	218	241	232	57	72	3	54
2	14:23	569.6	.63	1.9	217	243	238	57	72	3	55
3	14:38	581.19	.64	2.0	217	243	239	56	72	5	55
4	14:53	591.94	.57	1.7	217	241	238	56	72	4	56
Totals or Avgs.											

$\Delta H = \Delta P \times K_{factor} \times \frac{(T_{dgm} + 460)}{528}$

* meter box leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum during test.
† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC

Reviewed by:

TRC Air Measurements

M23 ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in): 12	Dry Gas Meter ID: 1011028
Date: 3/8/11	Stack Moisture (%, est.): 5	Dry Gas Meter Factor (Y): 1.0148
Source: CCR Vent	Barometric Pres. (Pb, in. Hg): 30.14	Total # of Sample Points: 8
Technicians: [illegible]	Static Press (Pg, in H2O): .27	# of Sample Points per Port: 4
Probe Working Length (ft):	Pitot Tube Factor (Cp): 0.84	
Nozzle Area (ft2):	Total Sample Time (min): 120	
Test Run#: M23 R-3 Box #: Filter #:	K Factor: 3.0	

Meterbox Data:

Meter Reading (ft³, Start): 595.277 Time (Start): 15:19

Meter Reading (ft³, Stop): 684.19 Time (Stop): 17:25

Impinger #	1	2	3	4	5	6
Contents	~~DI H2O~~	DI H2O	~~Empty~~	~~Si Gel~~	Silica Gel	XAD Resin
Initial Wt. (g)	353.9	705.0	724.9	623.1	972.5	296.0
Final Wt. (g)	355.3	702.4	725.4	625.7	993.9	308.5

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)		leak (cfm)	in. Hg Vac.
	Pre-test	Ø	12
	Post-test	Ø	15
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	4.3	15
	Post-test	4.6	15

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg	XAD Temp
START	15:19	595.277	-----	-----	-----	-----	-----	-----	-----	-----	
1	15:34	605.835	.56	1.66	217	238	236	56	69	6	61
2	15:49	617.245	.65	2.0	217	240	232	50	70	6.5	61
3	16:04	628.9	.66	2.0	214	239	237	54	71	7	61
4	16:19	639.7	.58	1.75	215	239	239	57	71	6	60
START	16:25	639.7	-----	-----	-----	-----	-----	-----	-----	-----	
5	16:40	650.235	.57	1.72	214	241	237	58	71	6	60
6	16:55	660.75	.63	1.9	213	242	234	60	71	7	61
7	17:10	671.315	.65	1.95	212	240	235	61	71	8	61
8	17:25	684.19	.56	1.75	211	241	238	61	71	7.5	60
Totals or Avgs.											

$\Delta H = \Delta P \times K \text{ factor} \times \frac{(T_{dgm} + 460)}{528}$

* meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec

26A Run 1 **TRC STACK SAMPLING DATA SHEET**

Plant Name: Chevron Pascagoula		Stack Height: 24'		Meter Box Serial No: 1010027	
Date: 3/8/11		Stack Diameter: 12"		Meter Box Factor (Y): 1.0099	
Source: CCR Vent		Stack Moisture (% by Vol.): 6.4		Molecular Weight: 28.7	
Technicians: NTA, PWG		ATM Pressure: 30.14		Static Pressure: 0.27	
Probe Size: 4'		K Factor: 3.0		Total Sample Time (min): ~~120~~ 60	
Nozzle No: 8	Nozzle Area: 0.255	PTCF:	0.84	#of Sample PTS.: 8 N.A.	
26A Test Run#: ~~[illegible]~~	Box #: 1	Filter #:		Pitot Tube #:	

Meter box Data:

Meter Reading (ft³, Start):	852.132	Time (Start):	9:58
Meter Reading (ft³, Stop):		Time (Stop):	11:03

Impinger#	1	2	3	4	Total	
Contents	~~Empty~~	~~H_2O~~	~~H_2O~~	~~Empty~~	~~XAD Resin~~	~~Silica Gel~~
Initial Wt. (g)	~~351.3~~	~~707.3~~	~~224.7~~	~~620.1~~	~~339.8~~	~~980.0~~
Final Wt. (g)	705.3	705.4	600.6	932.3		

JMH 3/8/11

Quality Assurance Leak Checks:

Meterbox Leak Check	cfm	in. Hg Vacuum
Pre-test	N.A. ~~19.5~~ 0.001	19.5
Post-test	0.001	20.0

Pitot Tube Leak Check (*)	in. H_2O	seconds
Pre-test	5.2	15
Post-test	6.3	15

point #	Clock Time	DGM Reading	ΔP in. H_2O	ΔH in. H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM Inlet/Outlet Temp °F	Pump Vacuum in. Hg
Northport-Start	9:58	852.132	—	—	—	—	—	—	—	—
1	10:04:30	857.456	0.56	1.65	217	260	261	62	63/63	4.0
2	10:12:00	863.070	0.62	1.85	227	265	258	51	64/64	4.0
3	10:19:30	869.410	0.77	2.30	228	268	256	51	65/65	5.0
4 (stop)	10:27:00	874.796	0.55	1.65	224	270	254	53	67/67	4.0
Start-~~South~~ West N.A.	10:33:00		—	—	—	—	—	—	—	—
5	10:40:30	880.303	0.58	1.74	220	269	255	58	69/69	4.0
6	10:48:00	885.892	0.64	1.75	226	271	251	57	70/70	4.0
7	10:55:30	892.110	0.79	2.38 ~~1.93~~ N.A	228	271	250	58	71/71	5.0
8 (stop)	11:03:00	897.588	0.56	1.69	222	270	252	59	71/71	4.5
Totals or Avgs.										

Neal Afflerbach

$\Delta H = \Delta P \times K_{factor} \times \frac{(T_{dgm} + 460)}{528}$

* meter box leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum during test.
pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

Initial Impinger Contents

	Initial Wt. (g)
1. 0.1 N H_2SO_4	698.0
2. 0.1 N H_2SO_4	703.7
3. Empty	598.3
4. Silica Gel	920.0

TRC

Reviewed by:

Z6A

TRC STACK SAMPLING DATA SHEET

Plant Name: Chevron Pascagoula		Stack Height:	Meter Box Serial No: 1010027
Date: 3/8/11		Stack Diameter:	Meter Box Factor (Y): 1.0099
Source: CCR Unit		Stack Moisture (% by Vol.): 5	Molecular Weight: 28.70
Technicians: NTA, PWG		ATM Pressure: 30.14	Static Pressure: 0.27
Probe Size: 4'		K Factor: 3.0	Total Sample Time (min): 60
Nozzle No: 8	Nozzle Area: 0.255	PTCF: 0.84	#of Sample PTS.: 8
Test Run#: M.26A - R2	Box #: Filter #:	Pitot Tube #:	

Meter box Data:

Meter Reading (ft³, Start):	898.744	Time (Start):	14:46
Meter Reading (ft³, Stop):	944.163	Time (Stop):	15:50

Impinger #	1	2	3	4	Total
Contents	0.1N H_2SO_4	0.1N H_2SO_4	Empty	Silica Gel	--------
Initial Wt. (g)	681.9	679.0	618.8	917.7	
Final Wt. (g)	691.2	680.9	619.3	927.8	

Quality Assurance Leak Checks:

Meterbox Leak Check*	cfm	in. Hg Vacuum
Pre-test	0.001	16.0
Post-test	0.001	24.0

†Pitot Tube Leak Check (+/-)	in. H_2O	seconds
Pre-test	6.7	15
Post-test	5.4	15

point #	Clock time	DGM reading	ΔP in. H_2O	ΔH in. H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM Temp °F	Pump Vacuum in. Hg
Start	14:46:00	898.744	—	—	—	—	—	—	—	-
1	14:53:30	904.047	0.55	1.64	221	256	251	63	64/64	4.0
2	15:01:00	909.893	0.66	1.98	226	266	254	50	65/65	4.5
3	15:08:30	916.020	0.74	2.22	229	264	249	49	66/66	5.0
4 (stop)	15:16:00	921.589	0.58	1.74	223	263	247	53	66/66	4.5
Start	15:20:00		—	—	—	—	—	—	—	—
5	15:27:30	926.885	0.54	1.62	225	266	246	56	67/67	4.0
6	15:35:00	932.585	0.63	1.89	229	268	245	56	68/68	4.5
7	15:42:30	938.688	0.72	2.16	230	263	246	57	69/69	5.0
8	15:50:00	944.163	0.57	1.71	224	267	245	58	70/70	4.5
Totals or Avgs.										

Neal Afflerbach

$\Delta H = \Delta P \times K_{factor} \times \frac{(T_{dgm} + 460)}{528}$

* meter box leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum during test.
† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC

Reviewed by:

Z6A

TRC STACK SAMPLING DATA SHEET

Plant Name: Chevron Pascagoula	Stack Height:	Meter Box Serial No: 1010027
Date: 3/8/11	Stack Diameter:	Meter Box Factor (Y): 1.0099
Source: CCR Vent	Stack Moisture (% by Vol.): 5 %	Molecular Weight: 28.70
Technicians: NTA, PWG	ATM Pressure: 30.14	Static Pressure: 0.27
Probe Size: 4'	K Factor: 3.0	Total Sample Time (min): 60
Nozzle No: 8 Nozzle Area: 0.255	PTCF: 0.84	#of Sample PTS.: 8
Test Run#: M.26 R-3 Box #: Filter #:	Pitot Tube #:	

Meter box Data:

Meter Reading (ft³, Start):	944.713	Time (Start):	~~13:10~~ 15:19
Meter Reading (ft³, Stop):	988.705	Time (Stop):	16:25:00

Quality Assurance Leak Checks:

Meterbox Leak Check	cfm	in. Hg Vacuum
Pre-test	0.001	18.0
Post-test		

†Pitot Tube Leak Check (+/-)	in. H_2O	seconds
Pre-test	~~0.001~~ 7.1	15
Post-test	5.9	15

Impinger #	1	2	3	4	Total
Contents	0.1 N H_2SO_4	0.1 N H_2SO_4	Empty	Silica Gel	--------
Initial Wt. (g)	712.8	684.3	599.4	929.8	
Final Wt. (g)	721.4	685.6	601.0	939.1	

point #	Clock time	DGM reading	ΔP in. H_2O	ΔH in. H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM Inlet Temp °F	Line Vacuum in. Hg
Start	15:19:00	944.713	—	—	—	—	—	—	—	—
1	15:26:30	949.765	0.49	1.47	226	269	247	57	66/66	4.0
2	15:34:00	955.261	0.60	1.80	229	268	248	53	67/67	4.5
3	15:41:30	961.399	0.72	2.16	231	269	244	53	68/68	5.0
4 (stop)	15:49:00	966.477	0.51	1.53	225	267	247	55	69/69	4.0
start	15:55:00		—	—	—	—	—	—	—	—
5	16:02:30	971.610	0.52	1.56	226	268	250	56	70/70	4.0
6	16:10:00	977.243	0.62	1.86	230	270	245	56	70/70	4.5
7	16:17:30	983.285	0.71	2.13	231	268	243	56	71/71	5.0
8 (stop)	16:25:00	988.705	0.54	1.62	223	270	248	56	71/71	4.5
Totals or Avgs.										

Neal Afflerbach

$\Delta H = \Delta P \times K_{factor} \times \frac{(T_{dgm} + 460)}{528}$

** meter box leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum during test.*
† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC

Reviewed by:

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in):	Dry Gas Meter ID: 1010027
Date: ~~3/9/11~~ 3/10/11	Stack Moisture (%, est.):	Dry Gas Meter Factor (Y): 1.0099
Source: Inlet Vent	Barometric Pres. (Pb, in. Hg):	Total # of Sample Points:
Technicians: NTA, DGM,	Static Press (Pg, in H2O):	# of Sample Points per Port:
Probe Working Length (ft): 2'	Pitot Tube Factor (Cp): 0.84	
Nozzle Area (ft2): n/a	Total Sample Time (min): 60	
Test Run#: M.26A-R1 Box #: Filter #:	K Factor:	

Meterbox Data:

Meter Reading (ft³, Start): 990.670 Time (Start): 9:00:00
Meter Reading (ft³, Stop): 1008.060 Time (Stop): 10:00:00

Impinger #	1	2	3	4	5	6
Contents	0.1N H_2SO_4	0.1N H_2SO_4	Empty	Silica Gel		
Initial Wt. (g)	707.7	687.7	536.4	923.4		
Final Wt. (g)	723.5	692.2	537.4	929.5		

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)		leak (cfm)	in. Hg Vac.
	Pre-test	0.001	19.0
	Post-test	0.001	23.0
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	n/a	n/a
	Post-test	n/a	n/a

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	9:00	990.670	-----	-----	-----	-----	-----	-----	-----	-----
1	9:07:30	993.680	—	0.32	—	—	256	47	51/51	10.0
2	9:15:00	995.786	—	0.29	—	—	253	44	53/53	6.0
3	9:22:30	997.800	—	0.29	—	—	253	44	54/54	23.0
4	9:30:00	999.904	—	0.31	—	—	254	44	55/55	3.0
START			-----	-----	-----	-----	-----	-----	-----	-----
5	9:37:30	1001.962	—	0.29	—	—	253	45	56/56	3.0
6	9:45:00	1003.890	—	0.29	—	—	251	46	56/56	3.0
7	9:52:30	1006.018	—	0.29	—	—	256	46	56/56	9.0
8	10:00:00	1008.060	—	0.29	—	—	252	46	56/56	14.5
			—							
Totals or Avgs.										

Neal Applebach

$\Delta H = \Delta P \times K\ factor \times \frac{(T_{dgm} + 460)}{528}$

** meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.*
† pitot tube leak check = hold 3 in. H_2O for at least 15 sec

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in):	Dry Gas Meter ID: 1010027
Date: ~~3/9/11~~ 3/10/11	Stack Moisture (%, est.):	Dry Gas Meter Factor (Y): 1.0099
Source: Inlet Vent LCR	Barometric Pres. (Pb, in. Hg):	Total # of Sample Points:
Technicians: NTA, DGM	Static Press (Pg, in H2O):	# of Sample Points per Port:
Probe Working Length (ft): 2'	Pitot Tube Factor (Cp): 0.84	
Nozzle Area (ft2): n/a	Total Sample Time (min): 60	
Test Run#: M.26 R-2 Box #: Filter #:	K Factor: n/a	

Meterbox Data:

Meter Reading (ft³, Start): 8.423	Time (Start): 10:16
Meter Reading (ft³, Stop):	Time (Stop): 11:16

Impinger #	1	2	3	4	5	6
Contents	0.1N H_2SO_4	0.1N H_2SO_4	Empty	Silica Gel		
Initial Wt. (g)	726.8	716.4	622.6	935.2		
Final Wt. (g)	745.6	721.1	623.7	941.5		

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)		leak (cfm)	in. Hg Vac.
	Pre-test	0.001	24.0
	Post-test	0.001	23.0
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	n/a	n/a
	Post-test	n/a	n/a

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	10:16	8.423	-----	-----	-----	-----	-----	-----	-----	-----
1	10:23:30	10.927	–	0.29	–	–	263	47	54/54	11.0
2	10:31:00	13.023	–	0.30	–	–	264	47	54/54	5.5
3	10:38:30	15.084	–	0.29	–	–	265	48	55/55	6.0
4	10:46:00	17.097	–	0.28	–	–	262	48	55/55	6.0
~~START~~ 5	10:53:30	19.135	-----	-----	-----	-----	-----	-----	-----	-----
6	11:01:00	21.078	–	0.28	–	–	263	48	56/56	9.0
7	11:08:30	23.110	–	0.27	–	–	265	49	56/56	11.0
8	11:16:00	25.213	–	0.31	–	–	264	50	56/56	10.5
			–	0.31	–	–	261	50	56/56	10.5
Totals or Avgs.										

Neal Afflerbach

$\Delta H = \Delta P \times \text{K factor} \times \frac{(T_{dgm} + 460)}{528}$

* meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in):	Dry Gas Meter ID: 1010027
Date: 3/16/11	Stack Moisture (%, est.):	Dry Gas Meter Factor (Y): 1.0099
Source: CCR Inlet Vent	Barometric Pres. (Pb, in. Hg):	Total # of Sample Points:
Technicians: NTA, DGM	Static Press (Pg, in H2O):	# of Sample Points per Port:
Probe Working Length (ft): 2'	Pitot Tube Factor (Cp): 0.84	
Nozzle Area (ft2): n/a	Total Sample Time (min): 60	
Test Run#: M.26 R-3 Box #: Filter #:	K Factor:	

Meterbox Data:

Meter Reading (ft^3, Start): 25.578 Time (Start): 11:33

Meter Reading (ft^3, Stop): Time (Stop): 12:33

Impinger #	1	2	3	4	5	6
Contents	0.1N H_2SO_4	0.1N H_2SO_4	Empty	Silica Gel		
Initial Wt. (g)	699.7	686.8	537.4	929.5		
Final Wt. (g)	722.3	696	538.6	935.3		

Quality Assurance Leak Checks:

*Meterbox Leak Check:		leak (cfm)	in. Hg Vac.
(one-minute leak rate)	Pre-test	0.001	21
	Post-test	0.001	17.5
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	n/a	n/a
	Post-test	n/a	n/a

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	11:33:00	25.578	-----	-----	-----	-----	-----	-----	-----	-----
1	11:40:30	27.889	–	0.31	–	–	263	49	56/56	11.0
2	11:48:00	30.043	–	0.30	–	–	263	49	56/56	11.0
3	11:55:30	32.217	–	0.31	–	–	264	49	56/56	11.0
4	12:03:00	34.374	–	0.31	–	–	260	48	57/57	10.5
START		36.555	-----	-----	-----	-----	-----	-----	-----	-----
5	12:10:30	~~34.374~~	–	0.31	–	–	264	49	57/57	10.5
6	12:18:00	38.736	–	0.32	–	–	265	49	57/57	10.5
7	12:25:30	40.949	–	0.31	–	–	263	49	58/58	10.5
8	12:33:00 N.A.	43.180	–	0.32	–	–	262	51	58/58	10.5
Totals or Avgs.										

Neal Afflerbach

$\Delta H = \Delta P \times K\ factor \times \frac{(T_{dgm} + 460)}{528}$

* meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in): 12	Dry Gas Meter ID: 1011028
Date: ~~3/9/11~~ 3/10/11	Stack Moisture (%, est.): 2.2	Dry Gas Meter Factor (Y): 1.0148
Source: UCR Outlet	Barometric Pres. (Pb, in. Hg): 30.27	Total # of Sample Points: 8
Technicians: RAM, PWG	Static Press (Pg, in H2O): .27	# of Sample Points per Port: 4
Probe Working Length (ft): 4ft	Pitot Tube Factor (Cp):	
Nozzle Area (ft2): .00034	Total Sample Time (min): 60	
Test Run#: M.26A Run1 Box #: Filter #:	K Factor: 3.173	

Meterbox Data:

Meter Reading (ft³, Start): 685.036 Time (Start): 9:00

Meter Reading (ft³, Stop): 719.915 Time (Stop): 10:05

Impinger #	1	2	3	4	5	6
Contents	0.1N H_2SO_4	0.1N H_2SO_4	Empty	Silica Gel		
Initial Wt. (g)	687.6	669.4	619.2	868.9		
Final Wt. (g)	686.8	673.5	620.2	871.2		

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)		leak (cfm)	in. Hg Vac.
	Pre-test	0	15
	Post-test	0	14
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	4.3	~~4.3~~ 15
	Post-test	4.6	15

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	9:00	685.036	-----	-----	-----	-----	-----	-----	-----	-----
1	9:07	688.904	.3	.96	209	236	233	42	51	2
2	9:15	693.44	.42	1.35	210	249	246	40	53	2.5
3	9:22	698.134	.45	1.45	208	249	237	41	55	3
4	9:30	702.33	.32	1.05	207	249	236	43	56	2
START	9:35	702.33	-----	-----	-----	-----	-----	-----	-----	-----
5	9:42	706.345	.31	1.00	207	249	245	44	56	2
6	9:50	710.75	.40	1.3	207	249	258	44	57	2
7	9:57	715.78	.47	1.5	206	249	248	45	57	3
8	10:05	719.915	.34	1.1	205	249	252	45	57	2
Totals or Avgs.										

K factor x $\frac{(T_{dgm} + 460)}{528}$

* meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in): 12	Dry Gas Meter ID: 1011028
Date: ~~3/9/11~~ 3/10/11	Stack Moisture (%, est.): 2.2	Dry Gas Meter Factor (Y): 1.0148
Source: CCR Outlet	Barometric Pres. (Pb, in. Hg): 30.27	Total # of Sample Points: 8
Technicians: LAM, PWG	Static Press (Pg, in H2O): .27	# of Sample Points per Port: 4
Probe Working Length (ft): 4 ft	Pitot Tube Factor (Cp):	
Nozzle Area (ft2): .00034	Total Sample Time (min): 60	
Test Run#: M.26A - R2 Box #: Filter #:	K Factor: 3.3	

Meterbox Data:

Meter Reading (ft³, Start): 720.134 Time (Start): 10:16

Meter Reading (ft³, Stop): 755.201 Time (Stop): 11:21

Impinger #	1	2	3	4	5	6
Contents	0.1N H_2SO_4	0.1N H_2SO_4	0.1N H_2SO_4	0.1N H_2SO_4		
Initial Wt. (g)	700.0	699.7	599.6	903.4		
Final Wt. (g)	704.2	699.9	600.7	911.6		

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)	leak (cfm)	in. Hg Vac.
Pre-test	Ø	14
Post-test	Ø	15
†Pitot Tube Leak Check (+/-)	in. H_2O	seconds
Pre-test	4.5	15
Post-test	4.4	15

point #	Clock time	DGM reading	ΔP " H_2O	ΔH " H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	10:16	720.134	-----	-----	-----	-----	-----	-----	-----	-----
1	10:23	724.175	.3	.97	205	243	237	51	55	3.5
2	10:31	728.78	.43	1.38	206	250	246	44	55	4
3	10:38	733.415	.44	1.42	209	251	246	44	56	4
4	10:46	737.44	.33	1.1	208	249	245	45	57	3.5
START	10:51	737.48	-----	-----	-----	-----	-----	-----	-----	-----
5	10:58	741.66	.35	1.13	209	251	252	45	58	3.5
6	11:06	746.26	.44	1.4	208	252	253	46	58	4.5
7	11:13	752.063	.46	1.5	210	250	240	46	58	5
8	11:21	755.201	.34	1.1	210	252	247	47	59	4
Totals or Avgs.										

$\Delta H = \Delta P \times K \text{ factor} \times \frac{(T_{dgm} + 460)}{528}$

** meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.*

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec.

TRC Air Measurements
ISOKENETIC SAMPLING DATA SHEET

Plant Name: **Chevron Pascagoula**	Stack Diameter (in): 12	Dry Gas Meter ID: 10711028
Date: ~~3/10/11~~ 3/10/11 JPB	Stack Moisture (%, est.): 2.2	Dry Gas Meter Factor (Y): 1.0148
Source: CCR Vent Outlet	Barometric Pres. (Pb, in. Hg): 30.27	Total # of Sample Points: 8
Technicians: RAM, PWG	Static Press (Pg, in H2O): .27	# of Sample Points per Port: 4
Probe Working Length (ft): 4	Pitot Tube Factor (Cp):	
Nozzle Area (ft2): .00034	Total Sample Time (min): 60	
Test Run#: M-26 Run 3 Box #: Filter #:	K Factor: 3.3	

Meterbox Data:

Meter Reading (ft³, Start): 755.444 Time (Start): 11:33

Meter Reading (ft³, Stop): 791.01 Time (Stop): 12:38

Impinger #	1	2	3	4	5	6
Contents	0.1N H2SO4	0.1N H2SO4	Empty	Silicagel		
Initial Wt. (g)	701.6	682.2	620.2	871.2		
Final Wt. (g)	700.9	687.1	620.9	877.7		

Quality Assurance Leak Checks:

*Meterbox Leak Check: (one-minute leak rate)		leak (cfm)	in. Hg Vac.
	Pre-test	~~6~~	15
	Post-test	0	13
†Pitot Tube Leak Check (+/-)		in. H_2O	seconds
	Pre-test	4.0	15
	Post-test	3.9	15

point #	Clock time	DGM reading	ΔP "H_2O	ΔH "H_2O	Stack Temp °F	Probe Temp °F	Filter Temp °F	Last Impinger Temp °F	DGM in/out Temp °F	Line Vacuum " Hg
START	11:33	755.444	-----	-----	-----	-----	-----	-----	-----	-----
1	11:40	759.50	~~.37~~	1.04	213	246	239	48	58	1
2	11:48	764.00	.42	1.36	211	251	249	49	58	1.5
3	11:55	768.85	.46	1.49	212	252	248	48	59	3
4	12:03	773.04	.35	1.14	214	250	240	48	60	1
START	12:08	773.044	-----	-----	-----	-----	-----	-----	-----	-----
5	12:15	777.25	.33	1.07	214	250	244	49	61	1
6	12:23	781.955	.44	1.44	212	249	239	50	62	2
7	12:30	786.73	.43	1.40	212	251	251	48	62	2
8	12:38	791.01	.34	1.18	213	251	246	49	63	1
Totals or Avgs.										

$\Delta H = \Delta P \times$ K factor $\times \frac{(T_{dgm} + 460)}{528}$

* meterbox leak check = less than 0.02 cfm at 15 in. Hg or greatest vacuum observed during test.

† pitot tube leak check = hold 3 in. H_2O for at least 15 sec

TRC Environmental Corp

Sample ID: M23 RUN 1 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 001	**Work Order #....:**	MFH8Q1AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	3.6	pg/sample
Total TCDD	ND		10	3.6	pg/sample
1,2,3,7,8-PeCDD	**1.8**	**Q J**	**50**	**1.6**	**pg/sample**
Total PeCDD	**11**	**J Q**	**50**	**1.6**	**pg/sample**
1,2,3,4,7,8-HxCDD	ND		50	1.6	pg/sample
1,2,3,6,7,8-HxCDD	ND		50	1.6	pg/sample
1,2,3,7,8,9-HxCDD	ND		50	1.6	pg/sample
Total HxCDD	**19**	**J Q**	**50**	**1.6**	**pg/sample**
1,2,3,4,6,7,8-HpCDD	**5.9**	**Q J**	**50**	**1.7**	**pg/sample**
Total HpCDD	**14**	**J Q**	**50**	**1.7**	**pg/sample**
OCDD	**23**	**Q J**	**100**	**1.7**	**pg/sample**
2,3,7,8-TCDF	**3.7**	**Q J**	**10**	**2.1**	**pg/sample**
Total TCDF	**49**	**J Q**	**10**	**2.1**	**pg/sample**
1,2,3,7,8-PeCDF	**2.0**	**Q J**	**50**	**1.3**	**pg/sample**
2,3,4,7,8-PeCDF	**3.3**	**J**	**50**	**1.3**	**pg/sample**
Total PeCDF	**26**	**Q J**	**50**	**1.3**	**pg/sample**
1,2,3,4,7,8-HxCDF	**6.2**	**J**	**50**	**1.2**	**pg/sample**
1,2,3,6,7,8-HxCDF	**3.6**	**Q J**	**50**	**1.1**	**pg/sample**
2,3,4,6,7,8-HxCDF	**3.0**	**Q J**	**50**	**1.1**	**pg/sample**
1,2,3,7,8,9-HxCDF	ND		50	1.3	pg/sample
Total HxCDF	**23**	**Q J**	**50**	**1.2**	**pg/sample**
1,2,3,4,6,7,8-HpCDF	**27**	**J**	**50**	**1.7**	**pg/sample**
1,2,3,4,7,8,9-HpCDF	**8.3**	**Q J**	**50**	**2.2**	**pg/sample**
Total HpCDF	**50**	**J Q**	**50**	**1.9**	**pg/sample**
OCDF	**45**	**J**	**100**	**2.1**	**pg/sample**

TRC Environmental Corp

Sample ID: M23 RUN 1 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 001	**Work Order #....:**	MFH8Q1AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	91	40 - 130
13C-1,2,3,7,8-PeCDD	87	40 - 130
13C-1,2,3,6,7,8-HxCDD	90	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	89	25 - 130
13C-OCDD	76	25 - 130
13C-2,3,7,8-TCDF	95	40 - 130
13C-1,2,3,7,8-PeCDF	85	40 - 130
13C-1,2,3,6,7,8-HxCDF	89	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	80	25 - 130

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,4,7,8-HxCDD	100	70 - 130
13C-2,3,4,7,8-PeCDF	94	70 - 130
13C-1,2,3,4,7,8-HxCDF	88	70 - 130
13C-1,2,3,4,7,8,9-HpCDF	94	70 - 130
37Cl4-2,3,7,8-TCDD	86	70 - 130

QUALIFIERS

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TRC Environmental Corp

Sample ID: M23 RUN 2 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 002	**Work Order #....:**	MFH811AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/17/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Patricia(Trish) M. Parsly				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	4.1	pg/sample
Total TCDD	ND		10	4.1	pg/sample
1,2,3,7,8-PeCDD	ND		50	1.8	pg/sample
Total PeCDD	**4.4**	**J**	**50**	**1.8**	**pg/sample**
1,2,3,4,7,8-HxCDD	ND		50	1.6	pg/sample
1,2,3,6,7,8-HxCDD	ND		50	1.5	pg/sample
1,2,3,7,8,9-HxCDD	ND		50	1.6	pg/sample
Total HxCDD	**9.8**	**Q J**	**50**	**1.6**	**pg/sample**
1,2,3,4,6,7,8-HpCDD	**3.8**	**Q J**	**50**	**1.8**	**pg/sample**
Total HpCDD	**8.8**	**Q J**	**50**	**1.8**	**pg/sample**
OCDD	**8.2**	**J**	**100**	**1.7**	**pg/sample**
2,3,7,8-TCDF	ND		10	2.3	pg/sample
Total TCDF	**11**	**Q J**	**10**	**2.3**	**pg/sample**
1,2,3,7,8-PeCDF	ND		50	1.4	pg/sample
2,3,4,7,8-PeCDF	ND		50	1.5	pg/sample
Total PeCDF	**5.6**	**Q J**	**50**	**1.5**	**pg/sample**
1,2,3,4,7,8-HxCDF	**2.2**	**J**	**50**	**1.1**	**pg/sample**
1,2,3,6,7,8-HxCDF	**1.2**	**Q J**	**50**	**0.94**	**pg/sample**
2,3,4,6,7,8-HxCDF	ND		50	1.0	pg/sample
1,2,3,7,8,9-HxCDF	ND		50	1.1	pg/sample
Total HxCDF	**5.6**	**J Q**	**50**	**1.0**	**pg/sample**
1,2,3,4,6,7,8-HpCDF	**4.5**	**J**	**50**	**1.4**	**pg/sample**
1,2,3,4,7,8,9-HpCDF	**3.6**	**Q J**	**50**	**1.9**	**pg/sample**
Total HpCDF	**11**	**Q J**	**50**	**1.6**	**pg/sample**
OCDF	**9.9**	**J**	**100**	**1.8**	**pg/sample**

TRC Environmental Corp

Sample ID: M23 RUN 2 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 002	**Work Order #....:**	MFH811AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/17/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Patricia(Trish) M. Parsly				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	87	40 - 130
13C-1,2,3,7,8-PeCDD	87	40 - 130
13C-1,2,3,6,7,8-HxCDD	95	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	90	25 - 130
13C-OCDD	79	25 - 130
13C-2,3,7,8-TCDF	92	40 - 130
13C-1,2,3,7,8-PeCDF	86	40 - 130
13C-1,2,3,6,7,8-HxCDF	93	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	85	25 - 130

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,4,7,8-HxCDD	91	70 - 130
13C-2,3,4,7,8-PeCDF	93	70 - 130
13C-1,2,3,4,7,8-HxCDF	86	70 - 130
13C-1,2,3,4,7,8,9-HpCDF	90	70 - 130
37Cl4-2,3,7,8-TCDD	82	70 - 130

QUALIFIERS

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TRC Environmental Corp

Sample ID: M23 RUN 3 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 003	**Work Order #....:**	MFH821AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/17/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Patricia(Trish) M. Parsly				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	3.4	pg/sample
Total TCDD	**3.7**	**J**	**10**	**3.4**	**pg/sample**
1,2,3,7,8-PeCDD	ND		50	1.5	pg/sample
Total PeCDD	**4.2**	**J**	**50**	**1.5**	**pg/sample**
1,2,3,4,7,8-HxCDD	ND		50	1.4	pg/sample
1,2,3,6,7,8-HxCDD	ND		50	1.3	pg/sample
1,2,3,7,8,9-HxCDD	ND		50	1.4	pg/sample
Total HxCDD	**7.1**	**Q J**	**50**	**1.3**	**pg/sample**
1,2,3,4,6,7,8-HpCDD	**4.8**	**Q J**	**50**	**1.7**	**pg/sample**
Total HpCDD	**12**	**J Q**	**50**	**1.7**	**pg/sample**
OCDD	**30**	**J**	**100**	**1.5**	**pg/sample**
2,3,7,8-TCDF	ND		10	2.1	pg/sample
Total TCDF	**14**	**J Q**	**10**	**2.1**	**pg/sample**
1,2,3,7,8-PeCDF	ND		50	1.1	pg/sample
2,3,4,7,8-PeCDF	ND		50	1.1	pg/sample
Total PeCDF	**8.5**	**Q J**	**50**	**1.1**	**pg/sample**
1,2,3,4,7,8-HxCDF	**2.5**	**J**	**50**	**0.85**	**pg/sample**
1,2,3,6,7,8-HxCDF	**1.6**	**J**	**50**	**0.75**	**pg/sample**
2,3,4,6,7,8-HxCDF	ND		50	0.80	pg/sample
1,2,3,7,8,9-HxCDF	ND		50	0.92	pg/sample
Total HxCDF	**7.8**	**Q J**	**50**	**0.83**	**pg/sample**
1,2,3,4,6,7,8-HpCDF	**13**	**J**	**50**	**1.1**	**pg/sample**
1,2,3,4,7,8,9-HpCDF	**3.1**	**Q J**	**50**	**1.5**	**pg/sample**
Total HpCDF	**23**	**J Q**	**50**	**1.3**	**pg/sample**
OCDF	**20**	**Q J**	**100**	**1.6**	**pg/sample**

TRC Environmental Corp

Sample ID: M23 RUN 3 COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 003	**Work Order #....:**	MFH821AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/17/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Patricia(Trish) M. Parsly				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	87	40 - 130
13C-1,2,3,7,8-PeCDD	93	40 - 130
13C-1,2,3,6,7,8-HxCDD	89	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	87	25 - 130
13C-OCDD	77	25 - 130
13C-2,3,7,8-TCDF	92	40 - 130
13C-1,2,3,7,8-PeCDF	89	40 - 130
13C-1,2,3,6,7,8-HxCDF	89	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	85	25 - 130

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,4,7,8-HxCDD	95	70 - 130
13C-2,3,4,7,8-PeCDF	93	70 - 130
13C-1,2,3,4,7,8-HxCDF	86	70 - 130
13C-1,2,3,4,7,8,9-HpCDF	88	70 - 130
37Cl4-2,3,7,8-TCDD	83	70 - 130

QUALIFIERS

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TRC Environmental Corp

Sample ID: M23 BLANK COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 004	**Work Order #....:**	MFH831AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	4.7	pg/sample
Total TCDD	ND		10	4.7	pg/sample
1,2,3,7,8-PeCDD	ND		50	1.9	pg/sample
Total PeCDD	ND		50	1.9	pg/sample
1,2,3,4,7,8-HxCDD	ND		50	2.0	pg/sample
1,2,3,6,7,8-HxCDD	ND		50	1.9	pg/sample
1,2,3,7,8,9-HxCDD	ND		50	1.9	pg/sample
Total HxCDD	ND		50	1.9	pg/sample
1,2,3,4,6,7,8-HpCDD	ND		50	2.0	pg/sample
Total HpCDD	ND		50	2.0	pg/sample
OCDD	**19**	**J**	**100**	**2.8**	**pg/sample**
2,3,7,8-TCDF	ND		10	2.6	pg/sample
Total TCDF	ND		10	2.6	pg/sample
1,2,3,7,8-PeCDF	ND		50	1.5	pg/sample
2,3,4,7,8-PeCDF	ND		50	1.5	pg/sample
Total PeCDF	ND		50	1.5	pg/sample
1,2,3,4,7,8-HxCDF	ND		50	0.88	pg/sample
1,2,3,6,7,8-HxCDF	ND		50	0.79	pg/sample
2,3,4,6,7,8-HxCDF	ND		50	0.83	pg/sample
1,2,3,7,8,9-HxCDF	ND		50	0.96	pg/sample
Total HxCDF	ND		50	0.86	pg/sample
1,2,3,4,6,7,8-HpCDF	ND		50	1.4	pg/sample
1,2,3,4,7,8,9-HpCDF	ND		50	1.9	pg/sample
Total HpCDF	ND		50	1.6	pg/sample
OCDF	ND		100	2.5	pg/sample

TRC Environmental Corp

Sample ID: M23 BLANK COMBINED

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 004	**Work Order #....:**	MFH831AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	84	40 - 130
13C-1,2,3,7,8-PeCDD	89	40 - 130
13C-1,2,3,6,7,8-HxCDD	93	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	81	25 - 130
13C-OCDD	71	25 - 130
13C-2,3,7,8-TCDF	90	40 - 130
13C-1,2,3,7,8-PeCDF	85	40 - 130
13C-1,2,3,6,7,8-HxCDF	97	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	79	25 - 130

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,4,7,8-HxCDD	91	70 - 130
13C-2,3,4,7,8-PeCDF	96	70 - 130
13C-1,2,3,4,7,8-HxCDF	82	70 - 130
13C-1,2,3,4,7,8,9-HpCDF	81	70 - 130
37Cl4-2,3,7,8-TCDD	84	70 - 130

QUALIFIERS

J Estimated Result.

TRC Environmental Corp

Sample ID: A-6375,A-6376 MEDIA CHECK

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 005	**Work Order #....:**	MFH841AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

PARAMETER	RESULT	MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND	10	4.2	pg/sample
Total TCDD	ND	10	4.2	pg/sample
1,2,3,7,8-PeCDD	ND	50	1.8	pg/sample
Total PeCDD	ND	50	1.8	pg/sample
1,2,3,4,7,8-HxCDD	ND	50	1.8	pg/sample
1,2,3,6,7,8-HxCDD	ND	50	1.7	pg/sample
1,2,3,7,8,9-HxCDD	ND	50	1.8	pg/sample
Total HxCDD	ND	50	1.8	pg/sample
1,2,3,4,6,7,8-HpCDD	ND	50	1.7	pg/sample
Total HpCDD	ND	50	1.7	pg/sample
OCDD	ND	100	1.8	pg/sample
2,3,7,8-TCDF	ND	10	2.5	pg/sample
Total TCDF	ND	10	2.5	pg/sample
1,2,3,7,8-PeCDF	ND	50	1.4	pg/sample
2,3,4,7,8-PeCDF	ND	50	1.4	pg/sample
Total PeCDF	ND	50	1.4	pg/sample
1,2,3,4,7,8-HxCDF	ND	50	0.82	pg/sample
1,2,3,6,7,8-HxCDF	ND	50	0.73	pg/sample
2,3,4,6,7,8-HxCDF	ND	50	0.77	pg/sample
1,2,3,7,8,9-HxCDF	ND	50	0.89	pg/sample
Total HxCDF	ND	50	0.80	pg/sample
1,2,3,4,6,7,8-HpCDF	ND	50	1.1	pg/sample
1,2,3,4,7,8,9-HpCDF	ND	50	1.4	pg/sample
Total HpCDF	ND	50	1.2	pg/sample
OCDF	ND	100	2.0	pg/sample

TRC Environmental Corp

Sample ID: A-6375,A-6376 MEDIA CHECK

Trace Level Organic Compounds

Lot - Sample #....:	H1C110419 - 005	**Work Order #....:**	MFH841AA	**Matrix....:**	AIR
Date Sampled....:	03/08/11	**Date Received....:**	03/11/11	**Dilution Factor:**	1
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	82	40 - 130
13C-1,2,3,7,8-PeCDD	85	40 - 130
13C-1,2,3,6,7,8-HxCDD	87	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	85	25 - 130
13C-OCDD	73	25 - 130
13C-2,3,7,8-TCDF	87	40 - 130
13C-1,2,3,7,8-PeCDF	82	40 - 130
13C-1,2,3,6,7,8-HxCDF	82	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	88	25 - 130

QUALIFIERS

Method Blank Report

Trace Level Organic Compounds

Lot - Sample #....:	H1C110000 - 159B	**Work Order #....:**	MFJCQ1AA	**Matrix....:**	AIR
Dilution Factor:	1				
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

PARAMETER	RESULT	MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND	10	3.7	pg/sample
Total TCDD	ND	10	3.7	pg/sample
1,2,3,7,8-PeCDD	ND	50	1.4	pg/sample
Total PeCDD	ND	50	1.4	pg/sample
1,2,3,4,7,8-HxCDD	ND	50	1.7	pg/sample
1,2,3,6,7,8-HxCDD	ND	50	1.7	pg/sample
1,2,3,7,8,9-HxCDD	ND	50	1.7	pg/sample
Total HxCDD	ND	50	1.7	pg/sample
1,2,3,4,6,7,8-HpCDD	ND	50	1.7	pg/sample
Total HpCDD	ND	50	1.7	pg/sample
OCDD	ND	100	1.7	pg/sample
2,3,7,8-TCDF	ND	10	2.2	pg/sample
Total TCDF	ND	10	2.2	pg/sample
1,2,3,7,8-PeCDF	ND	50	1.3	pg/sample
2,3,4,7,8-PeCDF	ND	50	1.3	pg/sample
Total PeCDF	ND	50	1.3	pg/sample
1,2,3,4,7,8-HxCDF	ND	50	0.95	pg/sample
1,2,3,6,7,8-HxCDF	ND	50	0.84	pg/sample
2,3,4,6,7,8-HxCDF	ND	50	0.89	pg/sample
1,2,3,7,8,9-HxCDF	ND	50	1.0	pg/sample
Total HxCDF	ND	50	0.92	pg/sample
1,2,3,4,6,7,8-HpCDF	ND	50	1.4	pg/sample
1,2,3,4,7,8,9-HpCDF	ND	50	1.8	pg/sample
Total HpCDF	ND	50	1.6	pg/sample
OCDF	ND	100	2.4	pg/sample

Method Blank Report

Trace Level Organic Compounds

Lot - Sample #....:	H1C110000 - 159B	**Work Order #....:**	MFJCQ1AA	**Matrix....:**	AIR
Dilution Factor:	1				
Prep Date....:	03/11/11	**Analysis Date....:**	03/16/11		
Prep Batch # ....:	1070159				
Initial Wgt/Vol :	1 Sample	**Instrument ID....:**	M2A	**Method:**	CFR60A 23
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	87	40 - 130
13C-1,2,3,7,8-PeCDD	82	40 - 130
13C-1,2,3,6,7,8-HxCDD	85	40 - 130
13C-1,2,3,4,6,7,8-HpCDD	78	25 - 130
13C-OCDD	68	25 - 130
13C-2,3,7,8-TCDF	90	40 - 130
13C-1,2,3,7,8-PeCDF	82	40 - 130
13C-1,2,3,6,7,8-HxCDF	80	40 - 130
13C-1,2,3,4,6,7,8-HpCDF	79	25 - 130

QUALIFIERS

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...:	H1C110419	**Work Order # ...:**	MFJCQ1AC-LCS MFJCQ1AD-LCSD	**Matrix .....:**	AIR
LCS Lot-Sample# :	H1C110000 - 159				
Prep Date .....:	03/11/11	**Analysis Date ..:**	03/16/11		
Prep Batch # ...:	1070159				
Dilution Factor :	1				
Analyst ID.....:	Melissa A. Davidson	**Instrument ID..:**	M2A	**Method.....:**	CFR60A 23
Initial Wgt/Vol:	1 Sample				

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS
2,3,7,8-TCDD	**200**	**203**	**pg/sample**	**102**	**(70 - 130)**		
	200	**196**	**pg/sample**	**98**	**(70 - 130)**	**3.4**	**(0 - 50)**
1,2,3,7,8-PeCDD	**1000**	**928**	**pg/sample**	**93**	**(70 - 130)**		
	1000	**905**	**pg/sample**	**91**	**(70 - 130)**	**2.5**	**(0 - 50)**
1,2,3,4,7,8-HxCDD	**1000**	**896**	**pg/sample**	**90**	**(70 - 130)**		
	1000	**871**	**pg/sample**	**87**	**(70 - 130)**	**2.9**	**(0 - 50)**
1,2,3,6,7,8-HxCDD	**1000**	**990**	**pg/sample**	**99**	**(70 - 130)**		
	1000	**961**	**pg/sample**	**96**	**(70 - 130)**	**2.9**	**(0 - 50)**
1,2,3,7,8,9-HxCDD	**1000**	**1050**	**pg/sample**	**105**	**(70 - 130)**		
	1000	**994**	**pg/sample**	**99**	**(70 - 130)**	**6.0**	**(0 - 50)**
1,2,3,4,6,7,8-HpCDD	**1000**	**969**	**pg/sample**	**97**	**(70 - 130)**		
	1000	**938**	**pg/sample**	**94**	**(70 - 130)**	**3.3**	**(0 - 50)**
OCDD	**2000**	**1840**	**pg/sample**	**92**	**(70 - 130)**		
	2000	**1820**	**pg/sample**	**91**	**(70 - 130)**	**1.1**	**(0 - 50)**
2,3,7,8-TCDF	**200**	**179**	**pg/sample**	**90**	**(70 - 130)**		
	200	**176**	**pg/sample**	**88**	**(70 - 130)**	**1.6**	**(0 - 50)**
1,2,3,7,8-PeCDF	**1000**	**976**	**pg/sample**	**98**	**(70 - 130)**		
	1000	**957**	**pg/sample**	**96**	**(70 - 130)**	**2.0**	**(0 - 50)**
2,3,4,7,8-PeCDF	**1000**	**883**	**pg/sample**	**88**	**(70 - 130)**		
	1000	**900**	**pg/sample**	**90**	**(70 - 130)**	**1.9**	**(0 - 50)**
1,2,3,4,7,8-HxCDF	**1000**	**945**	**pg/sample**	**95**	**(70 - 130)**		
	1000	**916**	**pg/sample**	**92**	**(70 - 130)**	**3.1**	**(0 - 50)**
1,2,3,6,7,8-HxCDF	**1000**	**965**	**pg/sample**	**97**	**(70 - 130)**		
	1000	**953**	**pg/sample**	**95**	**(70 - 130)**	**1.3**	**(0 - 50)**
2,3,4,6,7,8-HxCDF	**1000**	**949**	**pg/sample**	**95**	**(70 - 130)**		
	1000	**907**	**pg/sample**	**91**	**(70 - 130)**	**4.5**	**(0 - 50)**
1,2,3,7,8,9-HxCDF	**1000**	**910**	**pg/sample**	**91**	**(70 - 130)**		
	1000	**855**	**pg/sample**	**86**	**(70 - 130)**	**6.2**	**(0 - 50)**
1,2,3,4,6,7,8-HpCDF	**1000**	**941**	**pg/sample**	**94**	**(70 - 130)**		
	1000	**911**	**pg/sample**	**91**	**(70 - 130)**	**3.2**	**(0 - 50)**
1,2,3,4,7,8,9-HpCDF	**1000**	**894**	**pg/sample**	**89**	**(70 - 130)**		
	1000	**849**	**pg/sample**	**85**	**(70 - 130)**	**5.1**	**(0 - 50)**
OCDF	**2000**	**1720**	**pg/sample**	**86**	**(70 - 130)**		
	2000	**1790**	**pg/sample**	**89**	**(70 - 130)**	**3.9**	**(0 - 50)**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	83	(40 - 130)
	84	(40 - 130)
13C-1,2,3,7,8-PeCDD	88	(40 - 130)
	88	(40 - 130)
13C-1,2,3,6,7,8-HxCDD	89	(40 - 130)

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...: H1C110419 **Work Order # ...:** MFJCQ1AC-LCS **Matrix .....:** AIR
LCS Lot-Sample# : H1C110000 - 159 MFJCQ1AD-LCSD

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
	91	(40 - 130)
13C-1,2,3,4,6,7,8-HpCDD	88	(25 - 130)
	87	(25 - 130)
13C-OCDD	86	(25 - 130)
	78	(25 - 130)
13C-2,3,7,8-TCDF	91	(40 - 130)
	89	(40 - 130)
13C-1,2,3,7,8-PeCDF	90	(40 - 130)
	86	(40 - 130)
13C-1,2,3,6,7,8-HxCDF	81	(40 - 130)
	86	(40 - 130)
13C-1,2,3,4,6,7,8-HpCDF	87	(25 - 130)
	88	(25 - 130)

Notes:

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

PROJECT NO. CCR HCL

Chevron Pascagoula - M26A

Lot #: H1C150495

Jim Barufaldi

TRC Environmental Corporation
9225 US Highway 183 South
Austin, TX 78747

TESTAMERICA LABORATORIES, INC.

Kevin S. Woodcock
Project Manager

March 23, 2011

5815 Middlebrook Pike Knoxville, TN 37921 tel 865.291.3000 fax 865.584.4315 www.testamericainc.com

ANALYTICAL METHODS SUMMARY

H1C150495

PARAMETER	ANALYTICAL METHOD
Hydrogen Chloride Emissions	KNOX 0050/26A Mod

References:

KNOX TestAmerica Laboratories Inc., Knoxville Laboratory Standard Operating Procedure

SAMPLE SUMMARY

H1C150495

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MFNDX	001	CCR VENT-IMP 1&2-RUN 1	03/08/11	
MFND2	002	CCR VENT-IMP 1&2-RUN 2	03/08/11	
MFND3	003	CCR VENT-IMP 1&2-RUN 3	03/08/11	
MFND4	004	CCR VENT-H2SO4 BLANK	03/08/11	
MFND5	005	CCR OUTLET-IMP 1&2-RUN 1	03/10/11	
MFND7	006	CCR OUTLET-IMP 1&2-RUN 2	03/10/11	
MFND8	007	CCR OUTLET-IMP 1&2-RUN 3	03/10/11	
MFND9	008	CCR INLET-IMP 1&2-RUN 1	03/10/11	
MFNEC	009	CCR INLET-IMP 1&2-RUN 2	03/10/11	
MFNEE	010	CCR INLET-IMP 1&2-RUN 3	03/10/11	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H1C150495

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

Custody seals were not present.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Samples were analyzed for chloride (Cl^-) by ion chromatography using SOP number KNOX-WC-005 (based on EPA methods 9056, 9057 and 26A). All sample results were reported as total µg hydrogen chloride (HCl). The standard operating procedure was modified by the use of a new ion chromatography column technology that improves the data by separating the peaks of interest from interferences. Results were calculated using the following equation:

$$\text{HCl, ug} = \left(Cl^-, \text{ug/mL}\right) * \left(\text{Sample Volume, mL}\right) * \left(\frac{\text{Molecular Weight HCl}}{\text{Molecular Weight } Cl^-}\right) * \text{Bench Dilution}$$

Note: A sample volume of 100 mL was used to convert the results to total µg for the method blanks, laboratory control samples, and client reagent blanks.

For demonstration of analytical method performance on these samples, TestAmerica Knoxville analyzed matrix spikes (MS) and matrix spike duplicates (MSD). Acceptable recoveries of these spikes demonstrate that quantitation from this particular stack gas

TestAmerica Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Lab #88-0688, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Lab #PH-0223, Florida DOH Lab #E87177, Georgia DNR Lab #906, Hawaii DOH, Illinois EPA Lab #200012, Indiana DOH Lab #C-TN-02, Iowa DNR Lab #375, Kansas DHE Cert. #E-10349, Kentucky DEP Lab #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH, Maryland DOE Cert. #277, Michigan DEQ Lab #9933, Nevada DEP, New Jersey DEP Lab #TN001, New York DOH Lab #10781, North Carolina DPH Lab #21705, North Carolina DEHNR Cert. #64, Ohio EPA VAP Lab #CL0059, Oklahoma DEQ Lab #9415, Pennsylvania DEP Lab #68-00576, South Carolina DHEC Cert #84001001, Tennessee DOH Lab #02014, Texas CEQ, Utah DOH Lab # QUAN3, Virginia DGS Lab #00165, Washington DOE Lab #C1314, West Virginia DEP Cert. #345, West Virginia DHHR Cert #9955C, Wisconsin DNR Lab #998044300, Naval Facilities Engineering Service Center and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

matrix is accurate and acceptable. Impinger samples containing 0.1N H_2SO_4 often display matrix interference effects causing poor method performance and possibly giving unreliable data unless steps are taken to mitigate the interference. The ion chromatograph calibration range used to quantify the sample results permits a standard ten-fold sample dilution while supporting the reporting limit with the low calibration standard.

The dilution factor reported on the sample result form **does not** represent the bench dilution factor. It is actually the combination of factors required by the method to convert the anion reporting limit and method detection limit from µg/mL to total µg. It appears to be elevated since it includes the total sample impinger volume in mL in order to calculate total µg in the sample.

QC DATA ASSOCIATION SUMMARY

H1C150495

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	AIR	KNOX 0050/26A Mod		1081178	
002	AIR	KNOX 0050/26A Mod		1081178	1081174
003	AIR	KNOX 0050/26A Mod		1081178	
004	AIR	KNOX 0050/26A Mod		1081178	
005	AIR	KNOX 0050/26A Mod		1081178	
006	AIR	KNOX 0050/26A Mod		1081178	1081174
007	AIR	KNOX 0050/26A Mod		1081178	
008	AIR	KNOX 0050/26A Mod		1081179	
009	AIR	KNOX 0050/26A Mod		1081179	1081181
010	AIR	KNOX 0050/26A Mod		1081179	

Sample Data Summary

TRC Environmental Corp

Client Sample ID: CCR VENT-IMP 1&2-RUN 1

General Chemistry

Lot-Sample #...: H1C150495-001 Work Order #...: MFNDX Matrix.....: AIR
Date Sampled...: 03/08/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	11100	1110	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 11107.04 MDL.....: 470

TRC Environmental Corp

Client Sample ID: CCR VENT-IMP 1&2-RUN 2

General Chemistry

Lot-Sample #...: H1C150495-002 Work Order #...: MFND2 Matrix.....: AIR
Date Sampled...: 03/08/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	12500	1170	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 11724.09 MDL.....: 490

TRC Environmental Corp

Client Sample ID: CCR VENT-IMP 1&2-RUN 3

General Chemistry

Lot-Sample #...: H1C150495-003 Work Order #...: MFND3 Matrix.....: AIR
Date Sampled...: 03/08/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	17000	1650	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 16454.87 MDL.....: 690

TRC Environmental Corp

Client Sample ID: CCR VENT-H2SO4 BLANK

General Chemistry

Lot-Sample #...: H1C150495-004 Work Order #...: MFND4 Matrix.....: AIR
Date Sampled...: 03/08/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	ND	103	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 1028.43 MDL.....: 43

TRC Environmental Corp

Client Sample ID: CCR OUTLET-IMP 1&2-RUN 1

General Chemistry

Lot-Sample #...: H1C150495-005 Work Order #...: MFND5 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	14200	1650	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 16454.87 MDL.....: 690

TRC Environmental Corp

Client Sample ID: CCR OUTLET-IMP 1&2-RUN 2

General Chemistry

Lot-Sample #...: H1C150495-006 Work Order #...: MFND7 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	14900	1280	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 12752.52 MDL.....: 540

TRC Environmental Corp

Client Sample ID: CCR OUTLET-IMP 1&2-RUN 3

General Chemistry

Lot-Sample #...: H1C150495-007 Work Order #...: MFND8 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	14900	1110	ug	KNOX 0050/26A Mod	03/21/11	1081178

Dilution Factor: 11107.04 MDL.....: 470

TRC Environmental Corp

Client Sample ID: CCR INLET-IMP 1&2-RUN 1

General Chemistry

Lot-Sample #...: H1C150495-008 Work Order #...: MFND9 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	221000	40100	ug	KNOX 0050/26A Mod	03/22/11	1081179

Dilution Factor: 401087.3 MDL.....: 17000

TRC Environmental Corp

Client Sample ID: CCR INLET-IMP 1&2-RUN 2

General Chemistry

Lot-Sample #...: H1C150495-009 Work Order #...: MFNEC Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	793000	60700	ug	KNOX 0050/26A Mod	03/22/11	1081179

Dilution Factor: 606773.2 MDL.....: 25000

TRC Environmental Corp

Client Sample ID: CCR INLET-IMP 1&2-RUN 3

General Chemistry

Lot-Sample #...: H1C150495-010 Work Order #...: MFNEE Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride	850000	53100	ug	KNOX 0050/26A Mod	03/22/11	1081179

Dilution Factor: 530669.4 MDL.....: 22000

METHOD BLANK REPORT

General Chemistry

Client Lot #...: H1C150495 Matrix.....: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride		Work Order #: MF1V11AA		MB Lot-Sample #:	H1C220000-178	
	ND	103	ug	KNOX 0050/26A Mod	03/21/11	1081178
		Dilution Factor: 1028.				
Hydrogen chloride		Work Order #: MF10F1AA		MB Lot-Sample #:	H1C220000-179	
	ND	103	ug	KNOX 0050/26A Mod	03/22/11	1081179
		Dilution Factor: 1028.				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: H1C150495 Matrix.....: AIR

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride		WO#:MF1V11AC-LCS/MF1V11AD-LCSD			LCS Lot-Sample#: H1C220000-178		
	96	(90 - 110)			KNOX 0050/26A Mod	03/21/11	1081178
	97	(90 - 110)	0.47	(0-20)	KNOX 0050/26A Mod	03/21/11	1081178
		Dilution Factor: 1028.					
Hydrogen chloride		WO#:MF10F1AC-LCS/MF10F1AD-LCSD			LCS Lot-Sample#: H1C220000-179		
	100	(90 - 110)			KNOX 0050/26A Mod	03/22/11	1081179
	99	(90 - 110)	0.32	(0-20)	KNOX 0050/26A Mod	03/22/11	1081179
		Dilution Factor: 1028.					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: H1C150495 Matrix.....: AIR

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride		WO#:MF1V11AC-LCS/MF1V11AD-LCSD LCS Lot-Sample#: H1C220000-178						
	771	743	ug	96		KNOX 0050/26A Mod	03/21/11	1081178
	771	747	ug	97	0.47	KNOX 0050/26A Mod	03/21/11	1081178
		Dilution Factor: 1028.						
Hydrogen chloride		WO#:MF10F1AC-LCS/MF10F1AD-LCSD LCS Lot-Sample#: H1C220000-179						
	771	770	ug	100		KNOX 0050/26A Mod	03/22/11	1081179
	771	767	ug	99	0.32	KNOX 0050/26A Mod	03/22/11	1081179
		Dilution Factor: 1028.						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: H1C150495 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride		WO#: MFND21AC-MS/MFND21AD-MSD MS Lot-Sample #: H1C150495-002					
	107	(75 - 125)			KNOX 0050/26A Mod	03/21/11	1081178
	108	(75 - 125)	0.19	(0-20)	KNOX 0050/26A Mod	03/21/11	1081178
		Dilution Factor: 11724					
Hydrogen chloride		WO#: MFND71AC-MS/MFND71AD-MSD MS Lot-Sample #: H1C150495-006					
	94	(75 - 125)			KNOX 0050/26A Mod	03/21/11	1081178
	96	(75 - 125)	0.32	(0-20)	KNOX 0050/26A Mod	03/21/11	1081178
		Dilution Factor: 12752					
Hydrogen chloride		WO#: MFNEC1AC-MS/MFNEC1AD-MSD MS Lot-Sample #: H1C150495-009					
	106	(75 - 125)			KNOX 0050/26A Mod	03/22/11	1081179
	103	(75 - 125)	0.34	(0-20)	KNOX 0050/26A Mod	03/22/11	1081179
		Dilution Factor: 60677					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: H1C150495 Matrix.....: AIR
Date Sampled...: 03/10/11 Date Received..: 03/15/11

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hydrogen chloride			WO#: MFND21AC-MS/MFND21AD-MSD				MS Lot-Sample #: H1C150495-002		
	12500	2340	15000	ug	107		KNOX 0050/26A	03/21/11	1081178
	12500	2340	15000	ug	108	0.19	KNOX 0050/26A	03/21/11	1081178
			Dilution Factor: 11724						
Hydrogen chloride			WO#: MFND71AC-MS/MFND71AD-MSD				MS Lot-Sample #: H1C150495-006		
	14900	3190	17900	ug	94		KNOX 0050/26A	03/21/11	1081178
	14900	3190	18000	ug	96	0.32	KNOX 0050/26A	03/21/11	1081178
			Dilution Factor: 12752						
Hydrogen chloride			WO#: MFNEC1AC-MS/MFNEC1AD-MSD				MS Lot-Sample #: H1C150495-009		
	793000	121000	922000	ug	106		KNOX 0050/26A	03/22/11	1081179
	793000	121000	919000	ug	103	0.34	KNOX 0050/26A	03/22/11	1081179
			Dilution Factor: 60677						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Sample Receipt Documentation

Chain of Custody Record

H1C150495

Page ____ of ____

Report To: Test America
Lab Contact: Kevin Woodcock

Telephone: 865-291-3000

Bill To: Chevron Pascagoula
CCR HCl

P.O. No.: 181714.0000.0000

Sample Identification	Sample Description	Date/Time Collected	Collected By	Container Type	Required Analyses	Special Instructions/Conditions
CCR Vent-Imp1&2-Run 1	0.1N H2SO4	3/8/2011	JMH	HDPE	M.26A HCl	
CCR Vent-Imp1&2-Run 2	0.1N H2SO4	3/8/2011	JMH	HDPE	M.26A HCl	
CCR Vent-Imp1&2-Run 3	0.1N H2SO4	3/8/2011	JMH	HDPE	M.26A HCl	
CCR Vent-H2SO4 Blank	0.1N H2SO4	3/8/2011	JMH	HDPE	M.26A HCl	Box CBA 3/15/11
CCR Outlet-Imp1&2-Run 1	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	1 Cooler Received @
CCR Outlet-Imp1&2-Run 2	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	Ambient (20°C) CBA 3/15/11
CCR Outlet-Imp1&2-Run 3	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	No Custody Seals.
CCR Inlet-Imp1&2-Run 1	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	Fed Ex: 7945 3045 3221
CCR Inlet-Imp1&2-Run 2	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	
CCR Inlet-Imp1&2-Run 3	0.1N H2SO4	3/10/2011	JMH	HDPE	M.26A HCl	

Turn around Time Required:
Normal Rush Report By: 3/24/11

Hazard Identification:

Relinquished by: [signature] Date: 3/14/11
Affiliation: TRC Time: 11:43

Received by: [signature] Date: 3/15/11
Affiliation: TA Time: 1000

Other Instructions:

TRC
9225 U.S. Hwy. 183 South, Austin, Texas 78747
PHONE: 512.243.0202
FAX: 512.243.0222

chain_of_custody_v3.0.xls

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: 1-1C15P495

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	4a NO Custody Seals ~~5a ND Matrix~~ 3/15/11
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)			✓	☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____ ☐ 2c Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☑ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓	✗	3/15/11	☑ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?		✓			

Quote #: 88578 PM Instructions: NA

Sample Receiving Associate: Lawrence Adkins Date: 3/15/11

QA026R22.doc, 012811

APPENDIX E:
OPERATIONAL DATA

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/2011 9:58	54.22	114686.42	0.48	35.13	0.00	109.84	0.00014	297.53	747.90	1030.15	937.30	0.77	0.01	0.00	0.08	4.03
3/8/2011 9:59	54.35	118251.72	0.00	33.72	0.00	109.10	0.00021	297.36	746.45	1031.83	937.07	0.73	0.01	0.00	0.08	3.86
3/8/2011 10:00	54.21	111224.84	0.00	32.38	0.00	109.10	0.00017	297.57	746.28	1036.58	937.90	0.73	0.01	0.00	0.08	3.71
3/8/2011 10:01	54.13	92699.07	0.00	35.73	0.00	109.16	0.00038	297.78	747.12	1035.71	937.39	0.81	0.01	0.00	0.08	4.06
3/8/2011 10:02	54.27	89628.09	0.00	34.91	0.00	110.00	0.00041	297.65	747.61	1032.19	936.91	0.86	0.01	0.00	0.08	3.93
3/8/2011 10:03	54.38	100891.62	0.00	33.77	0.00	110.00	0.00032	297.84	746.95	1035.98	937.42	0.69	0.01	0.00	0.08	3.84
3/8/2011 10:04	53.79	98736.36	0.00	32.23	0.00	110.04	0.00056	298.06	746.75	1037.77	937.55	0.68	0.01	0.00	0.08	3.67
3/8/2011 10:05	53.59	94472.22	0.00	35.27	0.00	110.50	0.00041	298.23	747.41	1035.77	937.04	0.82	0.01	0.00	0.08	3.96
3/8/2011 10:06	53.94	102079.36	0.00	35.85	0.00	110.50	0.00042	298.29	747.74	1032.35	935.62	0.75	0.01	0.00	0.08	4.03
3/8/2011 10:07	54.02	95348.80	0.00	32.60	0.00	110.44	0.00016	298.23	748.00	1033.04	935.36	0.73	0.01	0.00	0.08	3.69
3/8/2011 10:08	54.11	98687.76	0.01	31.61	0.00	109.60	0.00016	298.53	747.16	1035.92	935.85	0.75	0.01	0.00	0.08	3.60
3/8/2011 10:09	54.32	140113.30	0.29	36.57	0.00	109.60	0.00026	299.09	747.51	1034.21	934.53	0.73	0.01	0.00	0.08	4.18
3/8/2011 10:10	54.40	118042.38	0.44	35.88	0.00	109.60	0.00017	298.46	747.94	1023.66	933.14	0.72	0.01	0.00	0.08	4.12
3/8/2011 10:11	54.06	95798.97	0.00	34.02	0.00	109.60	0.00001	298.85	746.95	1028.54	933.38	0.66	0.01	0.00	0.08	3.88
3/8/2011 10:12	54.17	122798.41	0.01	32.47	0.00	109.60	0.00016	298.83	744.95	1031.22	933.14	0.66	0.01	0.00	0.08	3.71
3/8/2011 10:13	54.11	117859.23	0.24	36.68	0.00	109.51	0.00049	298.97	745.05	1030.87	933.34	0.72	0.01	0.00	0.08	4.19
3/8/2011 10:14	53.79	112499.25	0.00	36.51	0.00	108.30	0.00049	298.78	744.78	1028.88	932.81	0.74	0.01	0.00	0.08	4.19
3/8/2011 10:15	54.26	132550.31	0.00	34.27	0.00	108.30	0.00020	299.02	746.29	1031.37	933.13	0.67	0.01	0.00	0.08	3.95
3/8/2011 10:16	54.17	100470.09	0.00	31.70	0.00	108.13	0.00015	298.94	747.42	1033.31	933.64	0.78	0.01	0.00	0.08	3.65
3/8/2011 10:17	53.69	110439.55	0.00	36.78	0.00	105.90	0.00047	299.17	745.76	1033.84	933.91	0.65	0.01	0.00	0.08	4.33
3/8/2011 10:18	54.32	104483.64	0.00	36.22	0.00	105.90	0.00052	299.21	745.88	1031.88	933.38	0.76	0.01	0.00	0.08	4.24
3/8/2011 10:19	54.62	97172.62	0.00	32.66	0.00	105.85	0.00010	299.14	745.87	1031.07	933.36	0.74	0.01	0.00	0.08	3.85
3/8/2011 10:20	54.02	102673.31	0.00	32.36	0.00	105.20	0.00023	299.43	744.61	1033.17	933.77	0.71	0.01	0.00	0.08	3.84
3/8/2011 10:21	54.22	103424.43	0.00	35.94	0.00	105.20	0.00024	299.63	743.72	1033.62	934.27	0.74	0.01	0.00	0.08	4.24
3/8/2011 10:22	54.12	119491.17	0.00	36.33	0.00	105.07	0.00021	299.63	743.48	1031.57	933.65	0.78	0.01	0.00	0.08	4.28
3/8/2011 10:23	54.12	117694.70	0.00	33.64	0.00	103.40	0.00000	299.31	744.86	1031.84	934.23	0.74	0.01	0.00	0.08	4.05
3/8/2011 10:24	53.86	94633.20	0.00	32.91	0.00	103.40	0.00004	299.55	744.20	1035.88	934.96	0.69	0.01	0.00	0.09	3.97
3/8/2011 10:25	54.04	101896.45	0.00	35.78	0.00	103.34	0.00030	299.57	744.06	1034.57	934.89	0.79	0.01	0.00	0.08	4.29
3/8/2011 10:26	53.97	122043.39	0.00	36.08	0.00	102.60	0.00050	299.24	745.39	1031.71	933.74	0.74	0.01	0.00	0.08	4.36
3/8/2011 10:27	53.56	120885.77	0.00	34.20	0.00	102.60	0.00027	299.34	746.38	1034.14	934.72	0.69	0.01	0.00	0.09	4.15
3/8/2011 10:28	54.38	117470.85	0.00	31.86	0.00	102.60	0.00010	299.37	746.19	1035.06	934.66	0.76	0.01	0.00	0.09	3.87
3/8/2011 10:29	54.28	117944.62	0.00	36.27	0.00	102.49	0.00038	299.06	744.81	1035.00	933.75	0.68	0.01	0.00	0.09	4.40
3/8/2011 10:30	54.15	95093.13	0.00	35.29	0.00	101.00	0.00058	299.18	746.69	1034.35	933.40	0.85	0.01	0.00	0.09	4.31
3/8/2011 10:31	54.20	102787.10	0.00	33.01	0.00	101.00	0.00041	298.89	745.79	1033.49	933.51	0.77	0.01	0.00	0.09	4.06
3/8/2011 10:32	54.33	109428.29	0.00	32.32	0.00	100.95	0.00027	298.94	745.05	1035.99	933.71	0.79	0.01	0.00	0.09	3.98
3/8/2011 10:33	54.03	115292.84	0.02	36.10	0.00	100.30	0.00029	298.98	745.29	1035.23	932.87	0.72	0.01	0.00	0.09	4.47
3/8/2011 10:34	54.11	101786.89	0.42	36.40	0.00	100.30	0.00006	298.77	746.30	1033.22	933.37	0.79	0.01	0.00	0.09	4.53
3/8/2011 10:35	53.82	96738.87	0.00	32.22	0.00	100.31	0.00001	298.61	745.25	1034.56	933.13	0.75	0.00	0.00	0.09	4.00
3/8/2011 10:36	54.40	114692.48	0.00	32.39	0.00	100.40	0.00007	298.76	744.96	1037.31	933.19	0.74	0.00	0.00	0.09	4.02
3/8/2011 10:37	53.96	130400.41	0.04	36.45	0.00	100.40	0.00000	298.71	745.31	1035.09	932.46	0.68	0.01	0.00	0.09	4.51
3/8/2011 10:38	54.07	97249.27	0.72	35.72	0.00	100.39	0.00004	298.18	745.70	1031.82	932.72	0.80	0.01	0.00	0.09	4.48
3/8/2011 10:39	54.36	88565.16	0.00	31.47	0.00	100.20	0.00013	298.16	744.60	1035.60	933.25	0.81	0.01	0.00	0.09	3.90
3/8/2011 10:40	54.12	102430.94	0.00	31.37	0.00	100.20	0.00000	298.30	745.24	1038.86	933.24	0.75	0.01	0.00	0.09	3.90
3/8/2011 10:41	53.90	105435.10	0.06	35.42	0.00	100.31	0.00000	298.32	746.50	1037.05	933.09	0.75	0.01	0.00	0.09	4.38
3/8/2011 10:42	53.49	93681.26	0.95	35.34	0.00	101.70	0.00001	297.93	747.24	1034.58	932.02	0.85	0.01	0.00	0.09	4.40
3/8/2011 10:43	53.91	104391.21	0.00	32.40	0.00	101.70	0.00001	297.99	747.20	1037.50	932.05	0.73	0.01	0.00	0.09	3.97
3/8/2011 10:44	54.13	93712.58	0.00	30.62	0.00	101.66	0.00000	297.86	747.19	1038.46	933.20	0.84	0.01	0.00	0.09	3.74
3/8/2011 10:45	54.52	99524.91	0.00	33.89	0.00	101.20	0.00001	297.87	746.59	1036.48	931.46	0.81	0.01	0.00	0.09	4.15
3/8/2011 10:46	54.10	91466.41	0.00	35.10	0.00	101.20	0.00020	297.30	747.73	1034.27	931.10	0.81	0.01	0.00	0.09	4.29
3/8/2011 10:47	53.93	92356.30	0.00	31.78	0.00	101.20	0.00022	297.34	747.61	1036.68	931.85	0.75	0.01	0.00	0.09	3.91
3/8/2011 10:48	54.40	92639.09	0.00	30.67	0.00	101.22	0.00000	297.43	747.45	1037.81	931.07	0.82	0.01	0.00	0.09	3.76
3/8/2011 10:49	53.78	93402.13	0.03	33.75	0.00	101.50	0.00000	297.14	747.56	1036.54	930.51	0.65	0.01	0.00	0.09	4.15
3/8/2011 10:50	53.22	96275.55	0.74	34.95	0.00	101.50	0.00000	297.20	748.37	1035.31	930.58	0.84	0.01	0.00	0.09	4.34

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/2011 10:51	53.83	91171.02	0.00	31.04	0.00	101.49	0.00000	296.97	747.53	1034.87	929.97	0.82	0.01	0.00	0.09	3.80
3/8/2011 10:52	53.79	100529.04	0.00	31.08	0.00	101.40	0.00005	296.70	747.51	1037.11	929.96	0.74	0.01	0.00	0.09	3.82
3/8/2011 10:53	53.87	107017.86	0.05	34.69	0.00	101.40	0.00013	296.65	746.86	1035.78	930.60	0.71	0.01	0.00	0.09	4.26
3/8/2011 10:54	54.27	103856.02	0.74	35.00	0.00	101.34	0.00003	296.43	747.54	1032.05	929.58	0.77	0.01	0.00	0.09	4.37
3/8/2011 10:55	53.66	108026.87	0.00	30.76	0.00	100.70	0.00038	296.06	747.84	1033.74	929.79	0.69	0.01	0.00	0.09	3.82
3/8/2011 10:56	54.02	128308.18	0.00	31.45	0.00	100.70	0.00040	296.18	748.60	1037.39	930.38	0.66	0.01	0.00	0.09	3.91
3/8/2011 10:57	54.01	89980.62	0.06	33.06	0.00	100.70	0.00008	296.11	747.89	1035.20	929.83	0.80	0.01	0.00	0.09	4.08
3/8/2011 10:58	54.01	90336.16	0.91	34.12	0.00	100.70	0.00000	295.93	747.70	1033.73	929.13	0.80	0.01	0.00	0.09	4.30
3/8/2011 10:59	54.14	91603.19	0.00	31.22	0.00	100.70	0.00000	296.18	747.58	1036.27	929.61	0.72	0.01	0.00	0.09	3.87
3/8/2011 11:00	53.52	81772.13	0.00	29.73	0.00	100.64	0.00000	296.10	747.10	1036.77	929.79	0.79	0.01	0.00	0.09	3.68
3/8/2011 11:01	54.27	112860.09	0.02	33.73	0.00	99.80	0.00007	296.27	747.46	1035.77	929.10	0.76	0.01	0.00	0.09	4.20
3/8/2011 11:02	53.79	88323.58	0.35	34.28	0.00	99.80	0.00014	296.24	748.78	1032.85	928.89	0.80	0.01	0.00	0.09	4.29
3/8/2011 11:03	53.97	92525.02	0.00	30.01	0.00	99.81	0.00000	296.13	747.69	1033.35	928.99	0.78	0.01	0.00	0.09	3.75
3/8/2011 11:04	53.59	98383.26	0.02	30.44	0.00	99.90	0.00000	296.19	746.90	1036.55	929.16	0.70	0.01	0.00	0.09	3.81
3/8/2011 11:05	54.17	104303.41	0.42	32.93	0.00	99.90	0.00000	296.34	747.29	1035.65	928.99	0.77	0.01	0.00	0.09	4.14
3/8/2011 11:06	53.94	86280.40	1.16	33.36	0.00	99.90	0.00000	296.04	747.74	1032.28	928.46	0.85	0.01	0.00	0.09	4.27
3/8/2011 11:07	54.01	88590.16	0.00	30.05	0.00	99.91	0.00004	295.99	746.87	1034.22	928.03	0.75	0.01	0.00	0.09	3.75
3/8/2011 11:08	53.75	111898.86	0.00	30.48	0.00	100.00	0.00002	296.01	747.42	1035.83	928.28	0.74	0.01	0.00	0.09	3.80
3/8/2011 11:09	54.16	94748.15	0.07	32.82	0.00	100.00	0.00016	296.09	746.82	1032.93	928.04	0.78	0.01	0.00	0.09	4.08
3/8/2011 11:10	54.03	88006.09	1.12	33.46	0.00	100.04	0.00005	295.85	747.02	1030.66	926.91	0.84	0.01	0.00	0.09	4.27
3/8/2011 11:11	53.86	112592.20	0.00	30.37	0.00	100.40	0.00007	295.68	747.01	1032.49	927.36	0.68	0.01	0.00	0.09	3.78
3/8/2011 11:12	53.82	101102.52	0.00	30.37	0.00	100.40	0.00000	295.75	747.13	1035.86	928.87	0.73	0.01	0.00	0.09	3.77
3/8/2011 11:13	53.70	96242.10	0.05	33.27	0.00	100.38	0.00001	295.95	746.68	1033.67	927.26	0.80	0.01	0.00	0.09	4.12
3/8/2011 11:14	53.73	85215.42	1.09	32.79	0.00	100.10	0.00010	295.33	748.64	1028.20	926.67	0.85	0.01	0.00	0.09	4.18
3/8/2011 11:15	54.42	93626.86	0.00	30.55	0.00	100.10	0.00002	295.33	747.87	1028.50	926.75	0.69	0.01	0.00	0.09	3.82
3/8/2011 11:16	54.10	98264.63	0.00	30.16	0.00	100.09	0.00022	295.20	746.18	1031.25	927.97	0.74	0.01	0.00	0.09	3.76
3/8/2011 11:17	54.26	89871.52	0.05	32.45	0.00	99.90	0.00019	295.03	745.15	1031.55	927.28	0.77	0.01	0.00	0.09	4.04
3/8/2011 11:18	53.73	84077.31	1.13	33.34	0.00	99.90	0.00000	294.84	746.75	1031.60	927.18	0.86	0.01	0.00	0.09	4.26
3/8/2011 11:19	53.87	89242.96	0.00	30.58	0.00	99.92	0.00000	294.84	747.70	1032.57	927.96	0.71	0.01	0.00	0.09	3.82
3/8/2011 11:20	54.11	96406.16	0.00	30.22	0.00	100.20	0.00000	294.61	746.85	1033.48	928.68	0.68	0.01	0.00	0.09	3.77
3/8/2011 11:21	53.96	113122.86	0.05	33.43	0.00	100.20	0.00000	294.75	746.07	1034.11	927.96	0.66	0.01	0.00	0.09	4.17
3/8/2011 11:22	53.97	106026.39	0.78	33.82	0.00	100.21	0.00000	294.54	747.57	1031.36	926.87	0.75	0.01	0.00	0.09	4.28
3/8/2011 11:23	54.11	95499.08	0.00	29.87	0.00	100.36	0.00002	294.39	747.16	1032.64	927.49	0.72	0.01	0.00	0.09	3.72
3/8/2011 11:24	53.61	113194.51	0.00	30.56	0.00	100.50	0.00017	294.27	746.32	1034.22	927.94	0.69	0.01	0.00	0.09	3.80
3/8/2011 11:25	54.28	100163.30	0.07	33.56	0.00	100.50	0.00013	294.33	745.62	1035.01	927.70	0.72	0.01	0.00	0.09	4.16
3/8/2011 11:26	54.20	92238.73	1.15	34.12	0.00	100.51	0.00010	293.96	746.10	1031.46	927.15	0.78	0.01	0.00	0.09	4.34
3/8/2011 11:27	53.69	95702.15	0.00	29.97	0.00	100.60	0.00005	293.65	746.40	1032.37	927.74	0.72	0.01	0.00	0.09	3.72
3/8/2011 11:28	54.26	131053.05	0.00	31.12	0.00	100.60	0.00009	293.62	746.32	1035.14	928.67	0.64	0.01	0.00	0.09	3.88
3/8/2011 11:29	54.15	87907.97	0.04	32.19	0.00	100.54	0.00012	293.48	746.29	1032.10	926.70	0.79	0.01	0.00	0.09	3.98
3/8/2011 11:30	53.77	120107.13	0.86	34.05	0.00	99.80	0.00026	293.16	746.77	1028.86	926.59	0.70	0.01	0.00	0.09	4.35
3/8/2011 11:31	53.28	108507.35	0.00	29.82	0.00	99.80	0.00012	293.02	746.05	1029.28	926.42	0.69	0.01	0.00	0.09	3.74
3/8/2011 11:32	54.04	109964.82	0.00	30.74	0.00	99.78	0.00000	292.95	744.35	1032.82	926.70	0.71	0.01	0.00	0.09	3.85
3/8/2011 11:33	54.25	107207.23	0.05	32.64	0.00	99.50	0.00000	293.02	744.18	1032.58	927.65	0.74	0.01	0.00	0.09	4.09
3/8/2011 11:34	54.23	89009.94	1.15	33.45	0.00	99.50	0.00004	292.73	744.14	1029.32	926.40	0.75	0.01	0.00	0.09	4.31
3/8/2011 11:35	54.16	105510.93	0.00	29.89	0.00	99.41	0.00034	292.69	746.67	1032.79	927.10	0.75	0.01	0.00	0.09	3.75
3/8/2011 11:36	54.13	105119.56	0.00	30.79	0.00	98.46	0.00001	292.81	746.93	1035.33	927.52	0.72	0.01	0.00	0.09	3.90
3/8/2011 11:37	53.98	92394.91	0.05	32.37	0.00	98.40	0.00012	292.87	746.59	1034.70	927.13	0.77	0.01	0.00	0.09	4.09
3/8/2011 11:38	54.12	106762.69	0.88	33.58	0.00	98.40	0.00029	292.54	747.45	1031.25	926.37	0.71	0.01	0.00	0.09	4.35
3/8/2011 11:39	54.28	80411.32	0.00	29.85	0.00	98.44	0.00020	292.52	747.23	1032.77	926.75	0.76	0.01	0.00	0.09	3.78
3/8/2011 11:40	54.09	107056.13	0.00	30.54	0.00	98.90	0.00000	292.29	745.36	1032.02	926.32	0.68	0.01	0.00	0.09	3.86
3/8/2011 11:41	53.43	109657.81	0.07	33.04	0.00	98.90	0.00000	292.43	745.06	1031.66	926.59	0.73	0.01	0.00	0.09	4.16
3/8/2011 11:42	54.00	95391.47	1.13	33.68	0.00	98.89	0.00005	292.16	744.51	1029.07	926.81	0.77	0.01	0.00	0.09	4.36
3/8/2011 11:43	54.33	83801.58	0.00	29.35	0.00	98.70	0.00010	292.07	743.70	1032.20	927.04	0.76	0.01	0.00	0.09	3.71

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/2011 11:44	53.51	82447.54	0.00	31.24	0.00	98.70	0.00008	292.35	744.99	1036.45	928.45	0.66	0.01	0.00	0.09	3.96
3/8/2011 11:45	54.06	130627.22	0.05	33.41	0.00	98.74	0.00009	292.36	745.55	1033.79	927.91	0.67	0.01	0.00	0.09	4.22
3/8/2011 11:46	54.33	88753.65	1.06	33.43	0.00	99.20	0.00002	292.33	745.80	1029.49	926.44	0.78	0.01	0.00	0.09	4.31
3/8/2011 11:47	53.61	80034.66	0.00	29.80	0.00	99.20	0.00000	292.13	745.76	1032.22	927.01	0.72	0.01	0.00	0.09	3.75
3/8/2011 11:48	53.98	113317.96	0.00	31.48	0.00	99.30	0.00002	292.21	744.61	1033.55	926.96	0.65	0.01	0.00	0.09	3.97
3/8/2011 11:49	53.95	91677.62	0.07	33.24	0.00	100.30	0.00000	292.24	744.00	1030.94	926.72	0.66	0.01	0.00	0.09	4.14
3/8/2011 11:50	53.80	99629.58	1.19	33.69	0.00	100.30	0.00001	292.19	745.16	1027.95	926.43	0.74	0.01	0.00	0.09	4.31
3/8/2011 11:51	54.31	92996.66	0.00	30.25	0.00	100.27	0.00003	292.16	744.64	1029.42	926.71	0.69	0.01	0.00	0.09	3.77
3/8/2011 11:52	53.65	101103.41	0.00	31.31	0.00	99.91	0.00002	292.30	744.91	1033.71	927.39	0.70	0.01	0.00	0.09	3.91
3/8/2011 11:53	53.82	81158.14	0.07	32.36	0.00	99.90	0.00000	292.48	744.61	1032.66	927.11	0.73	0.01	0.00	0.09	4.04
3/8/2011 11:54	53.97	86335.08	1.07	33.36	0.00	99.90	0.00001	292.36	745.27	1027.84	926.23	0.75	0.01	0.00	0.09	4.28
3/8/2011 11:55	53.77	89287.96	0.00	30.25	0.00	99.91	0.00015	292.26	745.22	1029.12	927.19	0.72	0.01	0.00	0.09	3.78
3/8/2011 11:56	53.78	95465.13	0.00	31.80	0.00	100.00	0.00004	292.37	744.08	1032.11	927.08	0.70	0.01	0.00	0.09	3.97
3/8/2011 11:57	54.16	83210.19	0.05	31.84	0.00	100.00	0.00000	292.52	743.85	1031.87	927.21	0.87	0.01	0.00	0.09	3.95
3/8/2011 11:58	53.90	89888.58	1.26	33.09	0.00	99.98	0.00001	292.35	745.30	1027.88	926.58	0.79	0.01	0.00	0.09	4.26
3/8/2011 11:59	54.13	110258.84	0.00	30.16	0.00	99.70	0.00016	292.33	744.51	1029.87	927.89	0.72	0.01	0.00	0.09	3.78
3/8/2011 12:00	54.34	112034.63	0.00	32.37	0.00	99.70	0.00002	292.54	744.64	1032.86	928.12	0.68	0.01	0.00	0.09	4.05
3/8/2011 12:01	54.00	92873.25	0.04	32.77	0.00	99.66	0.00009	292.75	744.63	1033.07	928.08	0.79	0.01	0.00	0.09	4.08
3/8/2011 12:02	52.97	93177.58	0.95	32.61	0.00	99.20	0.00036	292.47	746.13	1029.18	926.75	0.83	0.01	0.00	0.09	4.18
3/8/2011 12:03	54.01	90426.77	0.00	30.67	0.00	99.20	0.00024	292.71	746.03	1031.39	927.79	0.70	0.01	0.00	0.09	3.86
3/8/2011 12:04	53.92	111530.13	0.00	31.87	0.00	99.24	0.00017	292.65	744.60	1033.53	928.30	0.70	0.01	0.00	0.09	4.01
3/8/2011 12:05	53.89	87875.34	0.07	33.59	0.00	99.60	0.00049	292.73	743.35	1033.85	928.04	0.71	0.01	0.00	0.09	4.20
Average	**54.01**	**101324.41**	**0.19**	**32.84**	**0.00**	**101.92**	**0.00**	**295.90**	**746.20**	**1033.21**	**930.32**	**0.74**	**0.01**	**0.00**	**0.09**	**4.03**

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 12:46	54.19	92127.88	0.66	32.26	0.00	99.94	0.00	292.01	744.44	1029.36	926.66	0.81	0.01	0.00	0.09	4.08
3/8/11 12:47	54.33	99505.32	0.00	30.75	0.00	100.30	0.00	292.01	744.97	1033.24	927.44	0.70	0.01	0.00	0.09	3.83
3/8/11 12:48	54.19	92057.47	0.00	33.32	0.00	100.30	0.00	292.14	744.38	1036.15	928.98	0.67	0.01	0.00	0.09	4.14
3/8/11 12:49	53.97	99304.98	0.00	32.80	0.00	100.34	0.00	292.21	743.68	1033.48	928.31	0.67	0.01	0.00	0.09	4.08
3/8/11 12:50	54.06	101042.70	0.00	32.51	0.00	100.70	0.00	292.15	745.06	1031.40	927.15	0.79	0.01	0.00	0.09	4.01
3/8/11 12:51	54.06	100791.63	0.05	30.97	0.00	100.70	0.00	292.18	744.83	1033.29	928.72	0.69	0.01	0.00	0.09	3.85
3/8/11 12:52	54.08	100044.32	0.81	32.94	0.00	100.67	0.00	292.13	744.33	1035.06	928.76	0.74	0.01	0.00	0.09	4.17
3/8/11 12:53	54.13	90054.66	0.03	31.82	0.00	100.40	0.00	292.17	744.61	1034.80	927.19	0.79	0.01	0.00	0.08	3.94
3/8/11 12:54	54.19	107665.64	0.66	33.05	0.00	100.40	0.00	291.97	746.23	1031.56	926.94	0.81	0.01	0.00	0.09	4.16
3/8/11 12:55	54.01	111065.63	0.00	30.73	0.00	100.39	0.00	291.65	744.38	1031.94	926.89	0.66	0.01	0.00	0.09	3.83
3/8/11 12:56	54.02	85256.05	0.00	32.87	0.00	100.20	0.00	291.49	744.15	1035.01	927.93	0.75	0.01	0.00	0.09	4.08
3/8/11 12:57	54.14	99316.80	0.03	33.72	0.00	100.20	0.00	291.58	744.04	1034.42	927.74	0.68	0.01	0.00	0.09	4.20
3/8/11 12:58	53.66	87791.89	0.66	32.49	0.00	100.14	0.00	291.30	745.92	1029.72	926.57	0.80	0.01	0.00	0.08	4.11
3/8/11 12:59	54.11	94067.70	0.02	30.43	0.00	99.35	0.00	291.10	745.90	1030.66	926.78	0.67	0.01	0.00	0.09	3.83
3/8/11 13:00	54.12	88273.19	0.52	33.42	0.00	99.30	0.00	291.00	745.19	1033.36	927.64	0.66	0.01	0.00	0.09	4.26
3/8/11 13:01	54.51	90632.29	0.02	32.73	0.00	99.30	0.00	290.91	743.90	1032.08	926.92	0.66	0.01	0.00	0.09	4.12
3/8/11 13:02	53.91	101353.96	0.44	32.11	0.00	99.33	0.00	290.76	744.48	1030.11	926.56	0.75	0.01	0.00	0.09	4.07
3/8/11 13:03	53.79	96819.34	0.03	29.90	0.00	99.70	0.00	290.72	744.71	1032.13	926.96	0.69	0.01	0.00	0.09	3.76
3/8/11 13:04	53.72	122378.27	0.61	33.79	0.00	99.70	0.00	290.97	744.83	1035.25	927.70	0.64	0.01	0.00	0.08	4.30
3/8/11 13:05	53.45	106316.97	0.03	33.01	0.00	99.65	0.00	291.13	744.21	1033.79	927.00	0.66	0.01	0.00	0.09	4.14
3/8/11 13:06	53.99	99295.63	0.51	32.35	0.00	99.10	0.00	290.76	744.30	1030.24	926.89	0.71	0.01	0.00	0.09	4.13
3/8/11 13:07	53.48	102143.32	0.04	30.51	0.00	99.10	0.00	290.81	744.13	1032.71	926.98	0.72	0.01	0.00	0.09	3.85
3/8/11 13:08	53.81	104351.72	0.80	33.37	0.00	99.12	0.00	290.85	743.70	1035.16	927.94	0.67	0.01	0.00	0.09	4.29
3/8/11 13:09	53.79	96809.59	0.00	32.06	0.00	99.40	0.00	290.87	744.37	1033.28	927.07	0.69	0.01	0.00	0.09	4.02
3/8/11 13:10	54.18	90834.13	0.00	32.81	0.00	99.40	0.00	290.94	745.27	1030.35	926.46	0.78	0.01	0.00	0.09	4.10
3/8/11 13:11	53.87	111374.84	0.05	30.29	0.00	99.49	0.00	290.67	744.86	1031.35	927.16	0.67	0.01	0.00	0.09	3.82
3/8/11 13:12	54.11	87530.02	0.94	33.03	0.00	100.50	0.00	290.70	743.87	1034.55	926.96	0.67	0.01	0.00	0.09	4.21
3/8/11 13:13	53.85	87231.08	0.00	32.04	0.00	100.50	0.00	290.77	744.24	1033.98	926.87	0.77	0.01	0.00	0.09	3.96
3/8/11 13:14	53.89	102901.65	0.00	32.22	0.00	100.44	0.00	290.50	745.15	1029.26	926.13	0.80	0.01	0.00	0.09	3.98
3/8/11 13:15	54.29	96347.58	0.04	30.10	0.00	99.80	0.00	290.48	744.73	1032.34	926.53	0.72	0.01	0.00	0.09	3.77
3/8/11 13:16	54.34	88991.55	0.75	33.21	0.00	99.80	0.00	290.53	744.51	1034.93	926.96	0.67	0.01	0.00	0.09	4.24
3/8/11 13:17	53.19	86356.54	0.00	31.89	0.00	99.80	0.00	290.58	744.39	1033.27	926.87	0.68	0.01	0.00	0.09	3.99
3/8/11 13:18	54.24	98271.76	0.00	32.00	0.00	99.86	0.00	290.50	744.87	1029.37	926.03	0.73	0.01	0.00	0.09	3.99
3/8/11 13:19	54.28	100808.31	0.02	30.16	0.00	100.60	0.00	290.48	745.31	1030.11	926.48	0.70	0.01	0.00	0.09	3.75
3/8/11 13:20	53.39	88867.69	0.36	33.55	0.00	100.60	0.00	290.62	744.50	1033.76	927.55	0.67	0.01	0.00	0.09	4.20
3/8/11 13:21	54.56	113309.99	0.00	32.99	0.00	100.64	0.00	290.64	743.48	1031.50	926.28	0.64	0.01	0.00	0.09	4.10
3/8/11 13:22	53.71	88817.91	0.00	32.09	0.00	101.10	0.00	290.52	745.29	1027.17	925.93	0.84	0.01	0.00	0.09	3.93
3/8/11 13:23	53.94	87875.66	0.05	30.81	0.00	101.10	0.00	290.50	744.29	1027.71	926.13	0.71	0.01	0.00	0.09	3.81
3/8/11 13:24	54.59	100382.70	0.99	33.88	0.00	101.02	0.00	290.56	743.18	1031.25	926.89	0.66	0.01	0.00	0.09	4.30
3/8/11 13:25	54.16	106478.00	0.00	32.45	0.00	100.10	0.00	290.57	742.69	1031.40	927.16	0.65	0.01	0.00	0.09	4.05
3/8/11 13:26	53.54	127351.65	0.00	33.21	0.00	100.10	0.00	290.81	743.93	1029.78	926.71	0.70	0.01	0.00	0.09	4.13
3/8/11 13:27	53.95	91783.34	0.05	30.62	0.00	100.08	0.00	290.77	744.34	1031.45	927.14	0.75	0.01	0.00	0.09	3.82
3/8/11 13:28	53.96	99120.71	0.95	33.56	0.00	99.80	0.00	290.92	744.39	1033.97	927.85	0.76	0.01	0.00	0.09	4.29
3/8/11 13:29	54.06	95566.25	0.00	32.68	0.00	99.80	0.00	290.97	743.87	1032.92	927.19	0.68	0.01	0.00	0.09	4.08
3/8/11 13:30	53.88	89853.20	0.00	32.01	0.00	99.83	0.00	290.82	744.17	1030.32	926.92	0.84	0.01	0.00	0.09	3.97
3/8/11 13:31	53.71	109988.93	0.05	30.97	0.00	100.20	0.00	290.90	743.66	1030.48	926.85	0.68	0.01	0.00	0.09	3.87
3/8/11 13:32	53.61	118177.59	1.03	34.10	0.00	100.20	0.00	290.94	743.74	1032.95	927.77	0.75	0.01	0.00	0.09	4.35
3/8/11 13:33	53.79	115178.30	0.00	33.30	0.00	100.15	0.00	290.84	742.71	1032.01	927.14	0.65	0.01	0.00	0.09	4.15
3/8/11 13:34	53.58	93172.28	0.00	32.89	0.00	99.58	0.00	290.71	743.68	1030.05	926.93	0.73	0.01	0.00	0.09	4.11
3/8/11 13:35	54.01	101376.57	0.05	30.71	0.00	99.40	0.00	290.68	743.11	1030.49	926.94	0.70	0.01	0.00	0.09	3.86
3/8/11 13:36	54.12	92437.28	0.99	33.69	0.00	99.40	0.00	290.54	742.81	1033.08	927.89	0.66	0.01	0.00	0.09	4.35
3/8/11 13:37	54.13	116389.16	0.00	33.79	0.00	99.46	0.00	290.78	742.81	1033.61	927.78	0.62	0.01	0.00	0.09	4.24
3/8/11 13:38	54.21	93051.05	0.00	32.63	0.00	100.20	0.00	290.57	744.08	1027.91	926.49	0.81	0.01	0.00	0.09	4.04

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 13:39	54.11	101669.05	0.06	30.90	0.00	100.20	0.00	290.32	743.55	1029.27	927.05	0.70	0.01	0.00	0.09	3.86
3/8/11 13:40	53.76	91340.84	1.13	33.81	0.00	100.24	0.00	290.47	743.09	1034.21	927.68	0.68	0.01	0.00	0.09	4.34
3/8/11 13:41	53.86	106891.95	0.00	32.50	0.00	100.70	0.00	290.47	742.66	1032.55	927.17	0.72	0.01	0.00	0.09	4.02
3/8/11 13:42	54.16	96968.80	0.00	32.82	0.00	100.70	0.00	290.34	745.29	1029.20	926.42	0.88	0.01	0.00	0.09	4.03
3/8/11 13:43	54.17	90503.29	0.04	30.40	0.00	100.62	0.00	290.01	744.61	1029.95	926.93	0.69	0.01	0.00	0.09	3.78
3/8/11 13:44	53.73	91600.60	0.83	33.19	0.00	99.70	0.00	290.24	744.24	1034.24	927.38	0.75	0.01	0.00	0.09	4.24
3/8/11 13:45	53.68	91455.77	0.00	32.35	0.00	99.70	0.00	290.13	743.66	1032.33	926.89	0.74	0.01	0.00	0.09	4.04
3/8/11 13:46	53.98	92784.84	0.00	32.79	0.00	99.72	0.00	289.89	744.41	1030.40	926.96	0.83	0.01	0.00	0.09	4.07
3/8/11 13:47	54.06	112114.97	0.06	31.01	0.00	100.00	0.00	289.85	743.90	1032.05	927.20	0.70	0.01	0.00	0.09	3.88
3/8/11 13:48	53.91	118174.77	1.11	33.72	0.00	100.00	0.00	289.86	744.22	1034.69	927.65	0.67	0.01	0.00	0.09	4.34
3/8/11 13:49	53.80	96193.20	0.00	32.41	0.00	100.02	0.00	289.71	743.86	1034.05	927.31	0.68	0.01	0.00	0.09	4.04
3/8/11 13:50	54.18	104654.39	0.00	33.27	0.00	100.20	0.00	289.62	743.97	1032.05	926.82	0.83	0.01	0.00	0.09	4.11
3/8/11 13:51	53.63	87154.52	0.04	30.52	0.00	100.20	0.00	289.57	743.33	1034.13	927.00	0.78	0.01	0.00	0.09	3.80
3/8/11 13:52	54.05	93896.77	0.77	33.19	0.00	100.20	0.00	289.54	744.37	1034.64	927.69	0.75	0.01	0.00	0.09	4.21
3/8/11 13:53	54.00	87807.07	0.00	31.89	0.00	100.18	0.00	289.42	742.53	1033.58	927.21	0.71	0.01	0.00	0.09	3.97
3/8/11 13:54	53.94	106791.59	0.00	33.07	0.00	99.90	0.00	289.45	743.07	1032.63	926.47	0.76	0.01	0.00	0.08	4.11
3/8/11 13:55	54.36	93693.18	0.04	29.91	0.00	99.90	0.00	289.27	744.01	1033.38	926.97	0.73	0.01	0.00	0.08	3.74
3/8/11 13:56	54.38	91924.34	0.82	32.67	0.00	99.99	0.00	289.36	743.91	1036.02	927.17	0.75	0.01	0.00	0.08	4.16
3/8/11 13:57	54.52	95330.11	0.00	32.25	0.00	101.00	0.00	289.29	743.71	1033.59	926.54	0.76	0.01	0.00	0.08	3.97
3/8/11 13:58	53.82	90705.49	0.00	32.66	0.00	101.00	0.00	289.01	744.67	1029.70	925.49	0.82	0.01	0.00	0.08	4.01
3/8/11 13:59	54.06	88546.45	0.05	30.35	0.00	100.96	0.00	288.87	743.56	1030.51	926.11	0.68	0.01	0.00	0.08	3.77
3/8/11 14:00	54.11	100033.52	0.95	32.37	0.00	100.50	0.00	288.89	743.18	1033.18	926.97	0.72	0.01	0.00	0.08	4.13
3/8/11 14:01	53.81	109921.20	0.00	32.41	0.00	100.50	0.00	288.98	741.98	1032.80	926.82	0.68	0.01	0.00	0.08	4.03
3/8/11 14:02	53.65	103680.67	0.00	33.19	0.00	100.41	0.00	288.81	743.56	1031.13	926.40	0.73	0.01	0.00	0.08	4.11
3/8/11 14:03	53.98	98297.69	0.03	29.67	0.00	99.40	0.00	288.80	743.94	1033.28	926.74	0.77	0.01	0.00	0.08	3.73
3/8/11 14:04	53.95	98646.34	0.50	32.99	0.00	99.40	0.00	288.84	744.14	1035.26	926.89	0.72	0.01	0.00	0.08	4.19
3/8/11 14:05	54.17	97397.88	0.00	32.27	0.00	99.40	0.00	288.84	743.84	1033.93	926.62	0.69	0.01	0.00	0.08	4.05
3/8/11 14:06	53.77	97522.77	0.00	33.26	0.00	99.40	0.00	288.63	743.26	1030.49	926.18	0.73	0.01	0.00	0.08	4.16
3/8/11 14:07	53.90	99568.87	0.02	30.44	0.00	99.40	0.00	288.62	743.03	1033.17	926.75	0.66	0.01	0.00	0.08	3.84
3/8/11 14:08	53.90	100118.74	0.30	32.16	0.00	99.40	0.00	288.59	742.88	1035.34	927.66	0.71	0.01	0.00	0.08	4.07
3/8/11 14:09	54.22	86395.60	0.00	31.40	0.00	99.38	0.00	288.77	743.53	1034.77	927.03	0.72	0.01	0.00	0.08	3.94
3/8/11 14:10	53.96	79361.80	0.00	32.93	0.00	99.10	0.00	288.67	744.65	1031.57	926.49	0.81	0.01	0.00	0.08	4.12
3/8/11 14:11	54.11	95843.13	0.03	29.75	0.00	99.10	0.00	288.46	744.04	1031.98	926.44	0.68	0.01	0.00	0.08	3.76
3/8/11 14:12	53.90	105617.89	0.66	32.77	0.00	99.15	0.00	288.63	743.17	1035.09	926.94	0.66	0.01	0.00	0.08	4.20
3/8/11 14:13	54.12	112984.55	0.00	32.18	0.00	99.70	0.00	288.78	743.15	1033.48	927.05	0.70	0.01	0.00	0.08	4.02
3/8/11 14:14	53.22	86774.09	0.00	32.49	0.00	99.70	0.00	288.69	742.93	1030.16	926.23	0.88	0.01	0.00	0.08	4.03
3/8/11 14:15	54.12	88367.78	0.03	29.89	0.00	99.75	0.00	288.78	743.78	1031.74	925.91	0.72	0.01	0.00	0.08	3.75
3/8/11 14:16	54.14	101290.35	0.58	31.97	0.00	100.30	0.00	288.76	743.81	1034.38	927.00	0.70	0.01	0.00	0.08	4.05
3/8/11 14:17	54.17	93775.32	0.00	31.66	0.00	100.30	0.00	289.08	743.24	1033.85	926.62	0.71	0.01	0.00	0.08	3.94
3/8/11 14:18	54.13	99317.56	0.00	32.90	0.00	100.28	0.00	288.89	744.16	1031.19	926.16	0.80	0.01	0.00	0.08	4.07
3/8/11 14:19	54.32	84368.89	0.02	29.31	0.00	100.10	0.00	288.79	744.53	1032.71	926.44	0.87	0.01	0.00	0.08	3.64
3/8/11 14:20	54.18	84670.09	0.45	32.63	0.00	100.10	0.00	289.09	743.68	1034.82	926.14	0.68	0.01	0.00	0.08	4.12
3/8/11 14:21	54.50	84635.27	0.00	31.49	0.00	100.15	0.00	288.89	743.73	1031.17	926.15	0.72	0.01	0.00	0.08	3.92
3/8/11 14:22	53.76	105696.04	0.00	33.01	0.00	100.70	0.00	288.87	743.47	1028.58	925.27	0.82	0.01	0.00	0.08	4.06
3/8/11 14:23	53.86	104140.97	0.02	30.05	0.00	100.70	0.00	288.87	743.43	1031.44	926.12	0.72	0.01	0.00	0.08	3.73
3/8/11 14:24	54.20	88232.80	0.38	32.38	0.00	100.66	0.00	288.87	743.02	1034.01	926.11	0.66	0.01	0.00	0.08	4.07
3/8/11 14:25	54.24	91115.33	0.00	32.07	0.00	100.24	0.00	289.13	743.06	1032.80	925.72	0.70	0.01	0.00	0.08	3.99
3/8/11 14:26	54.20	86944.42	0.00	32.83	0.00	100.10	0.00	289.06	743.86	1028.82	926.00	0.79	0.01	0.00	0.08	4.07
3/8/11 14:27	54.17	87519.91	0.03	30.19	0.00	100.10	0.00	289.14	743.10	1029.35	926.19	0.69	0.01	0.00	0.08	3.78
3/8/11 14:28	54.15	106291.39	0.60	32.22	0.00	100.09	0.00	289.29	742.27	1034.29	926.99	0.70	0.01	0.00	0.08	4.09
3/8/11 14:29	54.11	87182.45	0.00	31.74	0.00	100.00	0.00	289.65	742.75	1033.70	926.41	0.71	0.01	0.00	0.08	3.96
3/8/11 14:30	53.99	97843.02	0.00	33.24	0.00	100.00	0.00	289.61	744.35	1029.21	926.48	0.79	0.01	0.00	0.08	4.12
3/8/11 14:31	54.12	122720.92	0.04	30.72	0.00	100.10	0.00	289.71	743.78	1030.04	926.77	0.65	0.01	0.00	0.08	3.85

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 14:32	54.21	85580.62	0.79	32.01	0.00	101.20	0.00	289.93	742.79	1035.01	926.94	0.80	0.01	0.00	0.08	4.02
3/8/11 14:33	53.97	94265.64	0.00	32.13	0.00	101.20	0.00	289.99	743.16	1034.46	927.04	0.73	0.01	0.00	0.08	3.96
3/8/11 14:34	52.76	84774.73	0.00	32.91	0.00	101.10	0.00	290.19	743.39	1031.28	926.91	0.89	0.01	0.00	0.08	4.02
3/8/11 14:35	53.47	82457.55	0.04	29.87	0.00	99.90	0.00	290.25	742.14	1031.17	926.64	0.68	0.01	0.00	0.07	3.75
3/8/11 14:36	54.32	91809.87	0.75	32.92	0.00	99.90	0.00	290.54	742.69	1034.79	927.90	0.69	0.01	0.00	0.07	4.20
3/8/11 14:37	53.91	102246.32	0.00	32.14	0.00	99.92	0.00	290.65	742.86	1031.65	926.92	0.78	0.01	0.00	0.07	4.00
3/8/11 14:38	54.06	119836.22	0.00	33.91	0.00	100.10	0.00	290.62	743.24	1029.15	926.55	0.81	0.01	0.00	0.07	4.19
3/8/11 14:39	53.85	86818.14	0.03	30.30	0.00	100.10	0.00	290.49	743.17	1030.92	926.69	0.71	0.01	0.00	0.07	3.79
3/8/11 14:40	54.02	93660.85	0.60	32.53	0.00	100.17	0.00	290.71	742.72	1032.72	927.16	0.76	0.01	0.00	0.08	4.11
3/8/11 14:41	54.32	118397.53	0.00	32.60	0.00	101.00	0.00	290.83	741.65	1031.44	927.24	0.69	0.01	0.00	0.08	4.03
3/8/11 14:42	53.75	108102.41	0.00	34.02	0.00	101.00	0.00	290.97	742.24	1029.71	926.42	0.76	0.01	0.00	0.08	4.18
3/8/11 14:43	53.70	106362.73	0.03	30.34	0.00	101.00	0.00	290.86	743.71	1030.20	926.99	0.76	0.01	0.00	0.08	3.75
3/8/11 14:44	53.95	92160.09	0.95	32.87	0.00	100.92	0.00	291.04	742.94	1034.85	927.69	0.71	0.01	0.00	0.08	4.17
3/8/11 14:45	53.57	100412.84	0.00	32.96	0.00	99.80	0.00	291.21	742.54	1034.12	927.15	0.60	0.01	0.00	0.08	4.13
3/8/11 14:46	53.72	112909.80	0.00	33.28	0.00	99.80	0.00	290.89	744.59	1029.82	926.30	0.80	0.01	0.00	0.08	4.13
3/8/11 14:47	53.19	111571.61	0.03	30.93	0.00	99.81	0.00	290.72	743.19	1031.15	926.63	0.63	0.01	0.00	0.08	3.89
3/8/11 14:48	53.26	126688.83	0.80	33.58	0.00	99.90	0.00	290.80	743.10	1034.71	926.61	0.67	0.01	0.00	0.08	4.29
3/8/11 14:49	53.54	114257.32	0.00	32.54	0.00	99.90	0.00	290.51	742.39	1029.53	925.52	0.65	0.01	0.00	0.08	4.07
3/8/11 14:50	53.53	108835.33	0.00	34.56	0.00	99.91	0.00	290.30	742.75	1027.18	926.37	0.72	0.01	0.00	0.08	4.30
3/8/11 14:51	53.22	80908.10	0.03	29.74	0.00	100.00	0.00	290.04	741.26	1028.82	926.61	0.74	0.01	0.00	0.08	3.72
3/8/11 14:52	53.39	110601.21	0.62	33.08	0.00	100.00	0.00	290.29	741.22	1034.43	926.72	0.67	0.01	0.00	0.08	4.20
3/8/11 14:53	53.42	109874.53	0.00	32.87	0.00	99.94	0.00	290.41	743.61	1034.47	927.16	0.66	0.01	0.00	0.08	4.11
Average	**53.95**	**98494.56**	**0.21**	**32.17**	**0.00**	**100.08**	**0.00**	**290.21**	**743.77**	**1032.20**	**926.89**	**0.72**	**0.01**	**0.00**	**0.08**	**4.03**

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 15:19	51.70	91125.65	0.01	30.18	0.00	100.59	0.00	290.52	744.90	1031.41	925.97	0.69	0.01	0.00	0.08	3.76
3/8/11 15:20	51.47	89336.68	0.11	31.57	0.00	99.30	0.00	290.62	745.05	1034.31	926.76	0.71	0.01	0.00	0.08	3.98
3/8/11 15:21	51.65	91116.08	0.00	31.82	0.00	99.30	0.00	290.80	744.17	1032.92	926.23	0.76	0.01	0.00	0.08	3.99
3/8/11 15:22	51.50	99763.43	0.00	34.51	0.00	99.35	0.00	290.78	744.36	1030.19	925.37	0.83	0.01	0.00	0.08	4.29
3/8/11 15:23	51.69	109779.39	0.04	30.29	0.00	99.90	0.00	290.63	743.92	1029.25	925.59	0.70	0.01	0.00	0.08	3.79
3/8/11 15:24	51.74	113621.94	0.86	32.97	0.00	99.90	0.00	290.67	741.83	1032.26	926.80	0.63	0.01	0.00	0.08	4.23
3/8/11 15:25	51.22	93125.04	0.03	32.23	0.00	99.94	0.00	290.82	742.46	1032.90	926.54	0.70	0.01	0.00	0.08	4.02
3/8/11 15:26	51.64	110159.21	0.54	34.27	0.00	100.40	0.00	290.38	743.08	1030.19	926.43	0.77	0.01	0.00	0.08	4.30
3/8/11 15:27	51.79	104289.03	0.03	30.84	0.00	100.40	0.00	290.33	743.01	1033.00	926.96	0.67	0.01	0.00	0.08	3.85
3/8/11 15:28	51.64	89412.75	0.64	31.68	0.00	100.37	0.00	290.35	743.30	1035.89	927.15	0.71	0.01	0.00	0.08	4.01
3/8/11 15:29	51.11	89230.15	0.00	31.76	0.00	100.00	0.00	290.20	743.79	1033.31	926.37	0.72	0.01	0.00	0.08	3.96
3/8/11 15:30	51.67	90571.26	0.00	34.37	0.00	100.00	0.00	289.89	744.22	1027.92	925.88	0.80	0.01	0.00	0.08	4.25
3/8/11 15:31	51.87	91895.05	0.01	30.51	0.00	100.07	0.00	289.71	743.11	1028.45	926.26	0.78	0.01	0.00	0.08	3.80
3/8/11 15:32	51.11	101855.59	0.18	32.01	0.00	100.89	0.00	289.56	741.77	1032.93	926.94	0.68	0.01	0.00	0.08	3.98
3/8/11 15:33	51.76	105696.79	0.00	32.85	0.00	100.90	0.00	289.71	741.99	1034.07	926.93	0.67	0.01	0.00	0.08	4.06
3/8/11 15:34	51.64	88558.36	0.00	34.06	0.00	100.90	0.00	289.54	743.87	1030.00	926.38	0.85	0.01	0.00	0.08	4.17
3/8/11 15:35	51.59	99371.74	0.03	30.07	0.00	100.88	0.00	289.25	743.55	1030.64	926.27	0.74	0.01	0.00	0.08	3.72
3/8/11 15:36	51.48	89883.93	0.58	31.91	0.00	100.60	0.00	289.22	742.56	1035.34	927.20	0.65	0.01	0.00	0.08	4.04
3/8/11 15:37	51.52	108187.91	0.00	32.35	0.00	100.60	0.00	289.36	742.04	1034.91	926.70	0.68	0.01	0.00	0.08	4.01
3/8/11 15:38	51.35	92700.14	0.00	34.22	0.00	100.57	0.00	289.03	743.67	1029.62	925.77	0.80	0.01	0.00	0.08	4.21
3/8/11 15:39	51.53	89005.44	0.00	30.72	0.00	100.20	0.00	288.87	743.59	1029.60	926.34	0.75	0.01	0.00	0.08	3.82
3/8/11 15:40	51.39	96228.42	0.00	32.11	0.00	100.20	0.00	288.80	742.79	1032.84	927.14	0.66	0.01	0.00	0.08	4.01
3/8/11 15:41	51.65	81656.09	0.00	31.49	0.00	100.18	0.00	288.79	742.39	1032.84	926.60	0.77	0.01	0.00	0.08	3.91
3/8/11 15:42	51.66	86866.31	0.00	34.19	0.00	100.00	0.00	288.57	743.29	1030.38	926.06	0.81	0.01	0.00	0.08	4.23
3/8/11 15:43	51.50	76660.63	0.02	30.41	0.00	100.00	0.00	288.42	743.15	1031.05	926.44	0.76	0.01	0.00	0.08	3.79
3/8/11 15:44	51.14	82392.78	0.36	31.87	0.00	99.95	0.00	288.37	742.08	1033.20	926.84	0.66	0.01	0.00	0.08	4.03
3/8/11 15:45	51.48	103737.95	0.00	33.16	0.00	99.40	0.00	288.40	741.57	1034.16	926.62	0.67	0.01	0.00	0.08	4.16
3/8/11 15:46	51.48	102131.32	0.00	34.92	0.00	99.40	0.00	288.22	741.79	1031.16	926.59	0.75	0.01	0.00	0.08	4.35
3/8/11 15:47	51.34	93650.80	0.02	30.64	0.00	99.47	0.00	288.22	741.95	1030.36	926.41	0.69	0.01	0.00	0.08	3.85
3/8/11 15:48	51.54	95257.62	0.48	31.23	0.00	100.30	0.00	288.22	741.04	1034.01	927.26	0.74	0.01	0.00	0.08	3.94
3/8/11 15:49	52.06	99026.46	0.00	32.42	0.00	100.30	0.00	288.33	741.44	1033.16	926.93	0.68	0.01	0.00	0.08	4.04
3/8/11 15:50	51.53	113046.70	0.00	35.04	0.00	100.34	0.00	288.31	742.97	1031.27	926.79	0.74	0.01	0.00	0.08	4.33
3/8/11 15:51	51.74	105813.72	0.00	30.57	0.00	100.76	0.00	288.06	742.58	1031.17	927.11	0.68	0.01	0.00	0.08	3.80
3/8/11 15:52	51.33	83752.49	0.00	31.93	0.00	100.90	0.00	288.14	741.56	1035.87	927.68	0.60	0.01	0.00	0.08	3.97
3/8/11 15:53	51.75	106327.27	0.00	32.59	0.00	100.90	0.00	288.43	741.80	1034.22	926.97	0.69	0.01	0.00	0.08	4.03
3/8/11 15:54	51.62	93176.78	0.00	34.13	0.00	100.96	0.00	288.23	742.38	1031.02	926.69	0.81	0.01	0.00	0.08	4.19
3/8/11 15:55	51.65	102330.24	0.00	30.87	0.00	101.70	0.00	288.28	741.80	1031.72	926.99	0.64	0.01	0.00	0.08	3.80
3/8/11 15:56	51.22	100274.56	0.00	31.64	0.00	101.70	0.00	288.36	741.42	1034.58	927.70	0.65	0.01	0.00	0.08	3.89
3/8/11 15:57	51.32	104463.59	0.00	32.97	0.00	101.71	0.00	288.53	741.89	1033.56	927.14	0.65	0.01	0.00	0.08	4.05
3/8/11 15:58	51.88	116807.65	0.00	35.09	0.00	101.80	0.00	288.40	742.99	1028.67	926.40	0.70	0.01	0.00	0.08	4.29
3/8/11 15:59	51.38	110284.72	0.00	30.94	0.00	101.80	0.00	288.49	742.61	1031.31	926.99	0.68	0.01	0.00	0.08	3.80
3/8/11 16:00	51.71	91597.95	0.00	31.59	0.00	101.75	0.00	288.45	741.49	1034.16	927.72	0.68	0.01	0.00	0.08	3.88
3/8/11 16:01	51.57	90626.98	0.00	31.94	0.00	101.20	0.00	288.53	740.78	1034.92	927.74	0.70	0.01	0.00	0.08	3.94
3/8/11 16:02	51.70	110031.04	0.00	35.00	0.00	101.20	0.00	288.67	741.40	1033.06	927.59	0.72	0.01	0.00	0.08	4.30
3/8/11 16:03	51.32	109901.02	0.02	30.81	0.00	101.11	0.00	288.72	742.56	1032.35	927.09	0.68	0.01	0.00	0.08	3.81
3/8/11 16:04	51.42	97817.98	0.39	31.27	0.00	100.10	0.00	288.70	742.71	1034.71	927.55	0.75	0.01	0.00	0.08	3.94
3/8/11 16:05	51.36	101186.48	0.00	32.35	0.00	100.10	0.00	288.83	742.45	1034.82	927.41	0.71	0.01	0.00	0.08	4.03
3/8/11 16:06	50.97	99636.80	0.00	34.71	0.00	100.03	0.00	288.69	742.34	1032.24	926.67	0.74	0.01	0.00	0.08	4.31
3/8/11 16:07	51.79	114505.96	0.01	30.54	0.00	99.22	0.00	288.43	742.19	1032.98	926.68	0.64	0.01	0.00	0.08	3.86
3/8/11 16:08	51.46	99072.83	0.26	31.50	0.00	99.10	0.00	288.38	742.08	1034.93	926.75	0.62	0.01	0.00	0.08	4.01
3/8/11 16:09	51.65	116348.63	0.00	32.69	0.00	99.10	0.00	288.44	741.99	1033.34	926.65	0.63	0.01	0.00	0.08	4.12
3/8/11 16:10	51.85	117407.09	0.00	35.08	0.00	99.14	0.00	288.30	742.11	1028.26	926.12	0.71	0.01	0.00	0.08	4.39
3/8/11 16:11	51.78	94544.35	0.00	30.49	0.00	99.60	0.00	288.17	741.90	1030.43	926.36	0.69	0.01	0.00	0.08	3.83

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 16:12	51.58	95267.10	0.00	31.82	0.00	99.60	0.00	288.42	741.63	1034.30	927.73	0.72	0.01	0.00	0.08	3.98
3/8/11 16:13	51.60	87009.30	0.02	31.51	0.00	99.62	0.00	288.32	741.56	1033.01	927.08	0.72	0.01	0.00	0.08	3.95
3/8/11 16:14	51.51	95463.52	0.41	35.06	0.00	99.90	0.00	288.39	743.31	1031.58	926.42	0.77	0.01	0.00	0.08	4.39
3/8/11 16:15	51.56	91010.88	0.02	30.40	0.00	99.90	0.00	288.31	744.11	1032.14	926.75	0.74	0.01	0.00	0.08	3.80
3/8/11 16:16	51.87	88448.69	0.47	30.82	0.00	99.92	0.00	288.28	742.90	1035.27	926.84	0.68	0.01	0.00	0.08	3.91
3/8/11 16:17	51.38	107365.61	0.02	33.40	0.00	100.20	0.00	288.42	741.97	1033.97	926.39	0.65	0.01	0.00	0.08	4.16
3/8/11 16:18	51.55	87098.05	0.32	34.59	0.00	100.20	0.00	288.10	742.81	1027.77	926.03	0.78	0.01	0.00	0.08	4.31
3/8/11 16:19	51.62	86511.41	0.00	30.30	0.00	100.25	0.00	287.81	741.42	1027.45	926.40	0.71	0.01	0.00	0.08	3.78
3/8/11 16:20	51.51	85502.05	0.00	31.32	0.00	101.00	0.00	287.82	740.33	1032.83	926.84	0.67	0.01	0.00	0.08	3.88
3/8/11 16:21	52.05	85545.04	0.00	32.12	0.00	101.00	0.00	287.90	741.05	1032.83	927.13	0.68	0.01	0.00	0.08	3.97
3/8/11 16:22	51.74	86655.89	0.00	34.54	0.00	100.90	0.00	287.87	742.40	1029.16	926.37	0.80	0.01	0.00	0.08	4.24
3/8/11 16:23	51.33	98711.92	0.00	30.30	0.00	99.71	0.00	287.73	743.04	1029.40	926.46	0.74	0.01	0.00	0.08	3.79
3/8/11 16:24	50.93	87302.45	0.00	31.46	0.00	99.70	0.00	287.81	741.80	1034.49	927.19	0.63	0.01	0.00	0.08	3.95
3/8/11 16:25	50.65	108039.98	0.01	32.31	0.00	99.70	0.00	287.90	741.89	1034.74	926.89	0.69	0.01	0.00	0.08	4.04
3/8/11 16:26	51.46	101179.10	0.17	34.66	0.00	99.73	0.00	287.60	742.89	1031.43	926.29	0.77	0.01	0.00	0.08	4.33
3/8/11 16:27	51.67	106108.02	0.00	30.98	0.00	100.10	0.00	287.64	743.14	1033.86	926.79	0.66	0.01	0.00	0.08	3.87
3/8/11 16:28	51.42	108813.42	0.00	31.71	0.00	100.10	0.00	287.78	743.19	1034.87	926.65	0.69	0.01	0.00	0.08	3.96
3/8/11 16:29	51.15	108469.87	0.02	31.82	0.00	100.08	0.00	287.46	742.57	1032.70	926.39	0.66	0.01	0.00	0.08	3.98
3/8/11 16:30	51.41	118679.59	0.34	35.50	0.00	99.80	0.00	287.32	742.75	1031.25	926.39	0.72	0.01	0.00	0.08	4.45
3/8/11 16:31	51.58	90296.61	0.00	30.77	0.00	99.80	0.00	287.25	741.96	1032.06	926.43	0.66	0.01	0.00	0.08	3.86
3/8/11 16:32	51.45	84055.34	0.00	30.86	0.00	99.78	0.00	287.29	741.75	1034.31	926.93	0.72	0.01	0.00	0.08	3.86
3/8/11 16:33	51.65	87395.45	0.00	31.74	0.00	99.50	0.00	287.39	741.64	1032.97	927.03	0.70	0.01	0.00	0.08	3.98
3/8/11 16:34	51.42	105497.45	0.00	35.08	0.00	99.50	0.00	287.33	742.32	1030.92	926.32	0.77	0.01	0.00	0.08	4.37
3/8/11 16:35	51.76	80961.30	0.00	30.27	0.00	99.60	0.00	287.27	742.61	1031.05	925.90	0.81	0.01	0.00	0.08	3.78
3/8/11 16:36	51.58	99015.84	0.00	31.43	0.00	100.70	0.00	287.35	742.11	1032.82	926.36	0.65	0.01	0.00	0.08	3.91
3/8/11 16:37	51.66	107113.48	0.01	32.23	0.00	100.70	0.00	287.42	741.86	1032.54	927.01	0.71	0.01	0.00	0.08	3.99
3/8/11 16:38	51.67	123407.75	0.15	34.95	0.00	100.64	0.00	287.27	741.47	1029.52	925.82	0.73	0.01	0.00	0.08	4.33
3/8/11 16:39	51.36	98804.88	0.00	30.54	0.00	100.00	0.00	287.22	742.51	1031.99	926.28	0.71	0.01	0.00	0.08	3.81
3/8/11 16:40	51.05	90147.51	0.00	31.13	0.00	100.00	0.00	287.32	742.54	1034.28	927.55	0.71	0.01	0.00	0.08	3.89
3/8/11 16:41	51.61	105579.82	0.01	31.70	0.00	100.00	0.00	287.37	741.65	1032.62	927.10	0.66	0.01	0.00	0.08	3.96
3/8/11 16:42	51.43	105463.75	0.26	35.22	0.00	100.02	0.00	287.24	742.90	1030.39	926.01	0.76	0.01	0.00	0.08	4.39
3/8/11 16:43	51.34	91180.26	0.00	30.43	0.00	100.20	0.00	287.09	742.91	1031.78	927.00	0.70	0.01	0.00	0.08	3.80
3/8/11 16:44	50.92	106278.20	0.00	30.82	0.00	100.20	0.00	287.12	742.54	1034.90	927.66	0.68	0.01	0.00	0.08	3.85
3/8/11 16:45	51.74	108686.28	0.00	32.31	0.00	100.18	0.00	287.25	741.99	1034.13	926.71	0.68	0.01	0.00	0.08	4.03
3/8/11 16:46	51.53	130728.53	0.00	35.89	0.00	100.00	0.00	287.15	743.23	1030.39	926.23	0.71	0.01	0.00	0.08	4.45
3/8/11 16:47	51.18	105386.60	0.00	30.60	0.00	100.00	0.00	287.06	742.14	1024.57	925.60	0.71	0.01	0.00	0.08	3.82
3/8/11 16:48	51.62	103995.63	0.00	30.67	0.00	99.91	0.00	286.92	741.50	1030.26	926.97	0.66	0.01	0.00	0.08	3.84
3/8/11 16:49	52.06	102829.34	0.02	32.53	0.00	98.90	0.00	287.00	740.87	1031.87	926.91	0.69	0.01	0.00	0.08	4.10
3/8/11 16:50	51.43	98163.21	0.43	35.47	0.00	98.90	0.00	286.98	740.20	1031.08	926.95	0.73	0.01	0.00	0.08	4.50
3/8/11 16:51	50.49	95392.01	0.00	29.90	0.00	98.94	0.00	286.90	742.18	1033.19	927.35	0.74	0.01	0.00	0.08	3.77
3/8/11 16:52	50.94	85637.80	0.00	30.45	0.00	99.40	0.00	287.12	742.04	1037.63	928.94	0.67	0.01	0.00	0.08	3.83
3/8/11 16:53	51.76	91283.58	0.01	32.64	0.00	99.40	0.00	287.31	742.76	1036.87	927.87	0.63	0.01	0.00	0.07	4.11
3/8/11 16:54	51.64	114759.38	0.26	35.45	0.00	99.38	0.00	287.14	743.04	1032.12	927.00	0.72	0.01	0.00	0.07	4.46
3/8/11 16:55	51.46	99231.16	0.00	30.49	0.00	99.20	0.00	287.01	742.91	1031.51	926.88	0.75	0.01	0.00	0.07	3.83
3/8/11 16:56	51.52	90329.98	0.00	30.63	0.00	99.20	0.00	287.06	741.51	1034.96	927.78	0.72	0.01	0.00	0.07	3.85
3/8/11 16:57	51.31	116052.90	0.04	33.17	0.00	99.26	0.00	287.20	741.69	1034.08	927.19	0.64	0.01	0.00	0.07	4.18
3/8/11 16:58	51.34	123357.84	0.70	35.68	0.00	99.95	0.00	287.00	742.12	1029.46	926.50	0.67	0.01	0.00	0.07	4.52
3/8/11 16:59	51.72	81256.84	0.00	30.29	0.00	100.00	0.00	286.91	742.42	1027.05	926.18	0.76	0.01	0.00	0.07	3.78
3/8/11 17:00	51.23	90176.16	0.00	30.72	0.00	100.00	0.00	286.84	741.83	1030.34	927.43	0.67	0.01	0.00	0.07	3.84
3/8/11 17:01	51.37	87824.88	0.04	31.91	0.00	100.07	0.00	286.80	740.52	1030.95	926.85	0.66	0.01	0.00	0.07	3.99
3/8/11 17:02	51.58	87347.05	0.71	35.58	0.00	100.90	0.00	286.79	741.10	1030.23	926.36	0.79	0.01	0.00	0.07	4.45
3/8/11 17:03	51.97	85261.54	0.00	30.29	0.00	100.90	0.00	286.75	742.74	1029.91	926.67	0.85	0.01	0.00	0.07	3.73
3/8/11 17:04	51.86	79736.84	0.00	29.93	0.00	100.85	0.00	286.61	741.97	1033.10	926.75	0.69	0.01	0.00	0.07	3.71

Tag	79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
Descriptor	CCR Feed Total Flow	Regen Vent Gas Flow	Air to Regen Gas - O2 Analyzer controlled	Air to Regen Cooling Zone Flow Controller	Regen N2 to Drying Air	Avg Cat Flow Rate	Oxy-Chlorination Zone Chloride Flow	Regen Vent Gas Temp Controller	Regen Vent Gas to E7981A	Regenerator Bed Temp	Regen Blwr K7981 Suc Temp	Regen O2 Analyzer Controller	CCR N2 Header H2 content	CCR N2 Heater HC Content	CCR N2 Header O2 Content	Coke By Air Demand
EngUnits	KBPD	SCFH	MSCFH	MSCFH	MSCFH	%	GPM	DEGF	DEGF	DEGF	DEGF	%	Mol %	Mol %	Mol %	wt%
3/8/11 17:05	51.30	83329.98	0.03	31.83	0.00	100.30	0.00	286.65	741.57	1034.21	927.05	0.69	0.01	0.00	0.07	3.97
3/8/11 17:06	51.24	85915.77	0.46	35.24	0.00	100.30	0.00	286.51	741.90	1030.96	926.07	0.73	0.01	0.00	0.07	4.41
3/8/11 17:07	51.62	110945.79	0.00	30.60	0.00	100.36	0.00	286.50	741.91	1031.38	926.32	0.71	0.01	0.00	0.07	3.81
3/8/11 17:08	51.57	85112.84	0.00	29.48	0.00	101.10	0.00	286.43	741.89	1033.21	926.89	0.73	0.01	0.00	0.07	3.64
3/8/11 17:09	51.35	84933.88	0.03	32.53	0.00	101.10	0.00	286.54	740.69	1033.80	926.62	0.63	0.01	0.00	0.07	4.03
3/8/11 17:10	51.56	115314.40	0.53	35.37	0.00	101.02	0.00	286.37	741.47	1030.26	926.01	0.77	0.01	0.00	0.07	4.40
3/8/11 17:11	51.71	117880.34	0.00	30.58	0.00	100.10	0.00	286.15	741.25	1029.41	925.49	0.67	0.01	0.00	0.07	3.82
3/8/11 17:12	51.50	99911.35	0.00	29.99	0.00	100.10	0.00	286.19	740.45	1033.98	926.65	0.66	0.01	0.00	0.07	3.75
3/8/11 17:13	51.90	86468.77	0.04	31.78	0.00	100.07	0.00	286.29	740.69	1031.91	926.41	0.67	0.01	0.00	0.07	3.97
3/8/11 17:14	51.54	82535.19	0.77	35.55	0.00	99.71	0.00	286.12	740.79	1028.60	926.15	0.75	0.01	0.00	0.07	4.51
3/8/11 17:15	51.31	82629.52	0.00	30.32	0.00	99.70	0.00	286.05	739.87	1030.44	926.27	0.85	0.01	0.00	0.07	3.77
3/8/11 17:16	51.65	98997.60	0.00	30.29	0.00	99.70	0.00	285.94	740.29	1033.45	926.92	0.69	0.00	0.00	0.07	3.80
3/8/11 17:17	51.62	87601.54	0.04	31.82	0.00	99.68	0.00	285.99	739.74	1033.34	927.11	0.66	0.01	0.00	0.07	3.99
3/8/11 17:18	51.16	85587.16	0.70	35.42	0.00	99.50	0.00	286.06	742.01	1032.12	926.65	0.75	0.00	0.00	0.07	4.49
3/8/11 17:19	51.29	86834.43	0.00	29.95	0.00	99.50	0.00	286.13	741.96	1031.31	926.38	0.76	0.00	0.00	0.07	3.75
3/8/11 17:20	51.69	85642.44	0.00	29.89	0.00	99.59	0.00	286.19	741.94	1032.16	926.90	0.70	0.00	0.00	0.07	3.75
3/8/11 17:21	51.45	78252.43	0.04	31.44	0.00	100.60	0.00	286.38	740.95	1031.73	926.81	0.70	0.00	0.00	0.07	3.91
3/8/11 17:22	51.68	104652.27	0.86	35.29	0.00	100.60	0.00	286.32	740.28	1029.82	926.44	0.76	0.00	0.00	0.07	4.45
3/8/11 17:23	51.24	96666.74	0.00	30.49	0.00	100.54	0.00	286.32	741.53	1032.13	926.88	0.67	0.00	0.00	0.07	3.80
3/8/11 17:24	51.43	101952.44	0.00	29.43	0.00	99.90	0.00	286.43	741.67	1035.41	926.98	0.66	0.00	0.00	0.07	3.69
3/8/11 17:25	52.04	105997.34	0.04	31.83	0.00	99.90	0.00	286.67	742.44	1034.76	926.81	0.66	0.00	0.00	0.08	3.99
3/8/11 17:26	51.41	103508.08	0.80	35.45	0.00	99.94	0.00	286.54	743.23	1031.26	925.67	0.72	0.00	0.00	0.07	4.50
Average	**51.51**	**97591.69**	**0.10**	**32.21**	**0.00**	**100.15**	**0.00**	**287.90**	**742.19**	**1032.16**	**926.72**	**0.71**	**0.01**	**0.00**	**0.08**	**4.02**

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
54.10	81205.91	0.37	34.57	0.00	110.64	0.00025	300.75	750.99	1031.05	927.66	0.75	0.02	0.00	0.00	3.93
54.19	90057.91	0.00	31.31	0.00	110.30	0.00047	301.02	751.24	1030.16	927.09	0.72	0.02	0.00	0.00	3.55
54.16	74693.13	0.00	30.95	0.00	110.30	0.00028	301.37	752.30	1031.60	926.92	0.75	0.02	0.00	0.00	3.51
54.05	68113.05	0.04	32.42	0.00	110.44	0.00024	301.90	752.38	1031.74	926.93	0.77	0.02	0.00	0.00	3.67
53.87	79655.00	0.34	34.47	0.00	111.30	0.00008	302.04	752.14	1030.74	926.62	0.74	0.02	0.00	0.00	3.90
54.14	64580.07	0.00	30.87	0.00	111.30	0.00000	301.80	751.73	1029.82	926.59	0.74	0.02	0.00	0.00	3.47
54.36	61481.72	0.00	30.60	0.00	111.13	0.00000	301.70	751.04	1030.76	927.11	0.77	0.01	0.00	0.00	3.44
53.69	57956.21	0.10	31.47	0.00	110.10	0.00000	301.45	750.99	1029.54	926.59	0.83	0.02	0.00	0.00	3.57
54.00	67292.67	0.86	35.04	0.00	110.10	0.00000	301.57	750.86	1027.74	926.69	0.70	0.02	0.00	0.00	4.06
54.03	63459.09	0.00	31.03	0.00	110.11	0.00000	301.20	749.80	1027.52	926.75	0.74	0.01	0.00	0.00	3.53
54.35	51490.40	0.00	31.19	0.00	110.20	0.00000	301.02	748.80	1025.97	926.18	0.73	0.02	0.00	0.00	3.54
54.02	60768.77	0.11	32.99	0.00	110.20	0.00000	300.54	749.99	1025.01	926.15	0.65	0.02	0.00	0.00	3.76
54.05	82785.52	0.93	34.96	0.00	110.24	0.00003	300.25	750.05	1026.70	926.84	0.69	0.01	0.00	0.00	4.06
53.58	80462.97	0.00	31.48	0.00	110.50	0.00000	299.48	748.98	1029.19	926.41	0.70	0.01	0.00	0.00	3.57
53.93	68152.49	0.00	32.57	0.00	110.50	0.00029	299.02	751.19	1032.55	927.18	0.66	0.02	0.00	0.00	3.70
54.11	63388.96	0.11	32.68	0.00	110.51	0.00207	298.64	751.06	1030.73	927.03	0.69	0.02	0.00	0.00	3.71
54.13	94159.91	0.91	35.26	0.00	110.60	0.00196	298.17	750.30	1029.63	926.74	0.63	0.02	0.00	0.00	4.09
54.13	51278.71	0.00	31.66	0.00	110.60	0.00179	297.78	749.28	1029.86	926.90	0.66	0.02	0.00	0.00	3.59
54.11	71212.74	0.00	32.85	0.00	110.41	0.00188	297.52	748.44	1028.78	926.77	0.71	0.02	0.00	0.00	3.72
54.27	57835.47	0.11	31.89	0.00	109.20	0.00189	296.83	747.67	1029.70	926.98	0.71	0.02	0.00	0.00	3.66
54.09	87829.20	0.88	35.04	0.00	109.20	0.00192	297.15	748.60	1031.75	927.03	0.68	0.02	0.00	0.00	4.10
53.63	71600.09	0.00	31.06	0.00	109.06	0.00172	296.82	749.74	1029.32	926.74	0.72	0.02	0.00	0.00	3.57
54.10	77088.67	0.00	33.51	0.00	108.20	0.00165	296.91	748.77	1031.21	927.08	0.66	0.02	0.00	0.00	3.87
54.04	57061.54	0.10	32.39	0.00	108.20	0.00185	296.98	748.96	1031.63	927.19	0.78	0.01	0.00	0.00	3.74
54.02	72704.13	0.83	34.85	0.00	108.19	0.00187	296.86	749.89	1031.78	927.59	0.69	0.01	0.00	0.00	4.11
53.76	48304.16	0.01	31.15	0.00	108.10	0.00164	296.52	749.80	1031.30	927.46	0.67	0.01	0.00	0.00	3.61
53.94	58403.17	0.11	33.02	0.00	108.09	0.00159	296.61	750.45	1031.34	927.25	0.74	0.02	0.00	0.00	3.82
53.77	54697.44	0.10	31.88	0.00	108.01	0.00182	296.33	750.26	1028.82	926.69	0.75	0.01	0.00	0.00	3.69
53.81	66499.27	0.83	34.45	0.00	108.00	0.00202	296.28	750.16	1029.09	926.94	0.75	0.01	0.00	0.00	4.06
53.92	76953.59	0.00	30.92	0.00	108.43	0.00214	296.13	749.01	1029.41	926.91	0.69	0.01	0.00	0.00	3.57
53.78	81530.68	0.00	32.86	0.00	111.10	0.00218	296.44	748.53	1027.91	926.59	0.75	0.01	0.00	0.00	3.69
53.60	58325.09	0.08	32.15	0.00	111.10	0.00195	296.70	748.99	1025.59	926.36	0.84	0.01	0.00	0.00	3.61
54.12	75747.72	0.67	35.74	0.00	111.16	0.00180	297.23	748.20	1026.69	926.42	0.64	0.01	0.00	0.00	4.09
54.29	72248.63	0.00	31.06	0.00	111.50	0.00179	297.36	747.93	1027.49	926.32	0.74	0.01	0.00	0.00	3.49
54.08	61645.21	0.00	33.04	0.00	111.50	0.00193	297.67	749.87	1029.97	926.71	0.69	0.01	0.00	0.00	3.71
54.10	76448.13	0.08	32.36	0.00	111.57	0.00169	298.18	750.73	1030.46	926.97	0.73	0.01	0.00	0.00	3.64
54.12	71367.63	0.69	34.53	0.00	112.00	0.00168	298.38	751.12	1031.55	927.07	0.69	0.01	0.00	0.00	3.93
53.88	60891.18	0.00	31.45	0.00	112.00	0.00169	298.78	751.17	1031.53	926.69	0.75	0.01	0.00	0.00	3.51
54.16	60067.78	0.00	32.56	0.00	111.86	0.00186	298.69	752.19	1031.33	926.78	0.76	0.01	0.00	0.00	3.63
54.02	65954.86	0.11	32.09	0.00	111.00	0.00187	298.41	751.58	1030.95	926.70	0.71	0.01	0.00	0.00	3.63
54.09	97017.58	0.92	35.24	0.00	111.00	0.00209	298.87	751.19	1030.76	926.79	0.73	0.01	0.00	0.00	4.06
54.00	63440.92	0.00	30.66	0.00	110.86	0.00166	298.42	750.47	1028.23	926.28	0.79	0.01	0.00	0.00	3.45
53.94	74131.31	0.00	33.49	0.00	110.00	0.00201	298.29	750.53	1027.71	926.15	0.67	0.01	0.00	0.00	3.81
54.00	73789.05	0.13	32.42	0.00	110.00	0.00194	298.31	749.37	1027.77	926.33	0.77	0.01	0.00	0.00	3.69
54.25	64154.88	1.07	34.44	0.00	109.97	0.00205	298.08	748.94	1027.92	925.91	0.75	0.01	0.00	0.00	4.02
54.01	54881.61	0.00	31.07	0.00	109.80	0.00202	298.01	748.89	1028.28	926.06	0.72	0.01	0.00	0.00	3.54

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
54.16	64748.15	0.00	32.80	0.00	109.80	0.00204	298.06	749.27	1029.65	926.59	0.77	0.02	0.00	0.00	3.72
54.17	62104.92	0.11	31.84	0.00	109.69	0.00193	297.79	749.77	1029.56	926.25	0.76	0.01	0.00	0.00	3.63
53.80	74776.53	0.91	35.09	0.00	109.00	0.00185	297.58	750.37	1028.97	926.08	0.73	0.01	0.00	0.00	4.11
53.99	81212.43	0.00	31.59	0.00	109.00	0.00209	297.40	750.89	1028.70	926.39	0.73	0.01	0.00	0.00	3.62
54.27	59153.60	0.00	33.03	0.00	109.10	0.00191	296.73	749.43	1028.84	926.51	0.71	0.01	0.00	0.00	3.78
54.01	59012.83	0.12	32.31	0.00	109.70	0.00204	296.16	750.03	1029.56	926.40	0.70	0.01	0.00	0.00	3.70
53.97	72017.28	1.02	35.04	0.00	109.70	0.00202	295.88	750.26	1028.75	926.37	0.69	0.01	0.00	0.00	4.10
53.96	58398.22	0.00	31.20	0.00	109.69	0.00228	295.52	750.07	1027.34	926.19	0.78	0.01	0.00	0.00	3.55
54.17	55592.32	0.00	32.49	0.00	109.60	0.00223	295.03	749.85	1028.90	926.41	0.80	0.01	0.00	0.00	3.69
54.06	74779.49	0.08	33.15	0.00	109.77	0.00225	294.94	750.20	1028.74	926.27	0.73	0.01	0.00	0.00	3.78
54.31	95686.48	0.69	35.13	0.00	110.80	0.00229	294.71	750.24	1029.14	926.49	0.67	0.01	0.00	0.00	4.04
53.99	61055.43	0.00	31.59	0.00	110.80	0.00223	294.91	749.73	1030.06	926.31	0.72	0.01	0.00	0.00	3.57
54.14	79479.60	0.00	33.50	0.00	110.87	0.00210	295.23	750.67	1030.61	926.50	0.73	0.01	0.00	0.00	3.77
54.13	56040.02	0.11	31.79	0.00	111.30	0.00187	295.33	751.12	1028.59	926.63	0.83	0.01	0.00	0.00	3.57
53.68	64395.78	0.89	35.25	0.00	111.30	0.00207	295.55	750.47	1028.03	926.47	0.74	0.01	0.00	0.00	4.04
54.19	63648.21	0.03	31.66	0.00	111.05	0.00235	295.91	750.40	1028.59	926.88	0.74	0.01	0.00	0.00	3.57
53.74	88144.86	0.23	33.54	0.00	109.50	0.00248	296.06	749.59	1028.59	926.97	0.69	0.01	0.00	0.00	3.85
53.57	76466.45	0.11	32.79	0.00	109.50	0.00206	296.24	749.79	1030.21	926.88	0.68	0.01	0.00	0.00	3.76
54.02	80020.20	0.92	35.18	0.00	109.64	0.00242	296.59	750.52	1030.68	926.94	0.70	0.01	0.00	0.00	4.10
54.21	54193.26	0.00	30.78	0.00	110.50	0.00209	296.42	750.59	1029.05	926.64	0.76	0.01	0.00	0.00	3.48
54.02	**68996.07**	**0.24**	**32.78**	**0.00**	**110.13**	**0.00**	**297.89**	**750.12**	**1029.41**	**926.69**	**0.73**	**0.01**	**0.00**	**0.00**	**3.74**

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
54.10	79538.60	0.38	34.87	0.00	110.58	0.00	294.88	751.26	1030.88	926.28	0.65	0.01	0.00	0.00	3.99
53.81	64557.80	0.00	31.80	0.00	109.80	0.00	294.84	751.02	1028.83	925.75	0.67	0.01	0.00	0.00	3.63
53.89	77987.59	0.00	33.29	0.00	109.80	0.00	295.02	750.54	1029.64	926.62	0.76	0.01	0.00	0.00	3.78
54.11	70162.27	0.08	32.54	0.00	109.79	0.00	294.93	749.42	1029.80	926.44	0.75	0.02	0.00	0.00	3.71
54.12	87603.25	0.69	35.40	0.00	109.70	0.00	295.25	749.59	1031.22	926.71	0.62	0.02	0.00	0.00	4.11
53.58	65869.39	0.00	31.44	0.00	109.70	0.00	295.41	749.90	1030.92	926.88	0.71	0.01	0.00	0.00	3.59
54.01	58421.37	0.00	33.08	0.00	109.69	0.00	295.63	749.48	1030.95	926.71	0.75	0.01	0.00	0.00	3.76
54.41	70802.95	0.09	32.68	0.00	109.60	0.00	295.86	750.10	1031.16	926.49	0.75	0.01	0.00	0.00	3.73
54.07	83445.59	0.73	34.60	0.00	109.55	0.00	296.03	750.30	1030.81	926.31	0.68	0.01	0.00	0.00	4.03
53.94	63056.29	0.00	31.57	0.00	109.21	0.00	296.27	749.97	1029.60	925.82	0.70	0.01	0.00	0.00	3.62
54.09	69384.55	0.00	33.07	0.00	109.10	0.00	296.52	749.47	1028.84	925.70	0.69	0.01	0.00	0.00	3.79
53.68	65851.77	0.07	32.60	0.00	109.14	0.00	296.83	748.97	1027.66	925.25	0.70	0.01	0.00	0.00	3.74
54.28	79113.33	0.56	34.14	0.00	109.40	0.00	296.73	748.87	1027.44	925.98	0.72	0.02	0.00	0.00	3.95
54.03	67672.12	0.00	31.39	0.00	109.40	0.00	296.75	747.77	1029.89	926.50	0.67	0.01	0.00	0.00	3.60
54.27	74436.88	0.00	33.16	0.00	109.39	0.00	297.34	748.01	1031.03	926.33	0.76	0.01	0.00	0.00	3.78
54.23	85543.64	0.00	32.25	0.00	109.30	0.00	297.22	749.14	1027.89	926.67	0.73	0.02	0.00	0.00	3.69
53.86	83343.38	0.00	34.99	0.00	109.30	0.00	297.55	748.35	1029.05	926.86	0.65	0.02	0.00	0.00	4.00
53.43	64398.68	0.00	30.98	0.00	109.38	0.00	297.93	748.34	1030.36	926.43	0.76	0.01	0.00	0.00	3.54
54.20	78733.15	0.00	33.09	0.00	109.90	0.00	297.83	748.93	1030.74	926.56	0.71	0.01	0.00	0.00	3.76
54.05	51019.28	0.00	32.52	0.00	109.90	0.00	297.73	749.15	1030.03	926.15	0.71	0.01	0.00	0.00	3.70
54.26	81041.42	0.00	34.56	0.00	109.98	0.00	297.65	749.63	1026.59	925.93	0.73	0.02	0.00	0.00	3.92
54.09	50663.25	0.00	31.00	0.00	110.50	0.00	297.27	748.65	1012.04	924.62	0.66	0.01	0.00	0.00	3.52
53.74	57965.54	0.00	32.98	0.00	110.50	0.00	297.38	748.29	1016.57	925.19	0.78	0.01	0.00	0.00	3.72
54.11	81548.96	0.08	33.01	0.00	110.44	0.00	296.96	746.17	1021.66	925.64	0.68	0.01	0.00	0.00	3.75
54.06	75881.30	0.63	34.11	0.00	110.10	0.00	296.64	744.16	1026.64	926.08	0.65	0.01	0.00	0.00	3.95
54.15	58515.25	0.00	31.77	0.00	110.10	0.00	297.02	746.03	1028.68	926.74	0.67	0.01	0.00	0.00	3.62
53.84	65786.55	0.00	33.16	0.00	110.10	0.00	297.23	747.13	1028.71	927.11	0.72	0.01	0.00	0.00	3.76
53.70	62374.58	0.08	32.38	0.00	110.10	0.00	297.09	747.26	1029.81	926.49	0.67	0.01	0.00	0.00	3.69
53.64	81746.02	0.65	35.04	0.00	110.10	0.00	297.59	749.20	1032.60	926.90	0.64	0.01	0.00	0.00	4.05
54.51	59200.05	0.00	31.75	0.00	110.06	0.00	297.90	749.00	1031.07	926.58	0.69	0.01	0.00	0.00	3.61
53.96	75691.84	0.00	32.94	0.00	109.80	0.00	297.99	748.63	1029.86	926.17	0.70	0.01	0.00	0.00	3.75
54.56	62335.50	0.07	32.95	0.00	109.80	0.00	298.16	748.48	1028.60	926.24	0.70	0.02	0.00	0.00	3.76
54.44	52796.53	0.58	34.79	0.00	109.81	0.00	298.43	748.75	1027.62	926.75	0.66	0.01	0.00	0.00	4.02
54.06	60315.54	0.00	31.03	0.00	109.90	0.00	298.42	748.07	1027.12	926.17	0.70	0.01	0.00	0.00	3.54
53.21	63929.36	0.00	32.69	0.00	110.03	0.00	298.64	749.24	1028.65	926.79	0.81	0.01	0.00	0.00	3.70
53.91	62298.56	0.05	32.67	0.00	110.88	0.00	298.90	748.54	1028.73	926.70	0.74	0.01	0.00	0.00	3.69
54.39	87091.80	0.45	34.44	0.00	111.00	0.00	299.04	747.57	1030.13	926.79	0.70	0.01	0.00	0.00	3.92
53.82	82991.73	0.00	31.52	0.00	111.08	0.00	299.37	748.80	1031.19	926.79	0.76	0.02	0.00	0.00	3.55
54.05	81582.25	0.00	32.95	0.00	111.60	0.00	299.60	749.03	1031.24	927.38	0.76	0.01	0.00	0.00	3.68
54.09	64153.86	0.06	32.36	0.00	111.60	0.00	300.02	749.10	1031.36	926.72	0.79	0.01	0.00	0.00	3.62
53.89	84858.91	0.49	34.49	0.00	111.61	0.00	300.16	749.37	1031.97	927.00	0.72	0.01	0.00	0.00	3.91
54.08	76423.18	0.00	31.52	0.00	111.70	0.00	300.39	750.23	1030.38	926.64	0.71	0.01	0.00	0.00	3.53
54.14	59844.46	0.00	32.44	0.00	111.70	0.00	300.39	751.43	1029.10	926.67	0.81	0.01	0.00	0.00	3.62
54.21	63120.35	0.03	32.49	0.00	111.63	0.00	300.61	750.93	1029.57	926.53	0.76	0.01	0.00	0.00	3.64
53.80	63853.59	0.28	34.07	0.00	111.20	0.00	301.08	750.47	1029.12	926.15	0.73	0.01	0.00	0.00	3.85
54.14	58998.89	0.00	30.96	0.00	111.20	0.00	300.86	750.35	1028.85	926.29	0.76	0.02	0.00	0.00	3.48

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
54.15	57950.05	0.00	32.66	0.00	110.59	0.00	301.09	750.31	1030.13	926.18	0.77	0.01	0.00	0.00	3.68
53.34	73574.25	0.54	33.60	0.00	108.70	0.00	300.45	749.38	1030.54	925.92	0.68	0.01	0.00	0.00	3.92
53.63	83078.81	0.46	32.83	0.00	108.99	0.00	300.25	748.94	1029.28	925.77	0.66	0.01	0.00	0.00	3.82
54.12	70219.28	0.00	32.12	0.00	109.20	0.00	300.44	748.95	1029.89	926.11	0.73	0.01	0.00	0.00	3.68
54.27	63312.47	0.00	32.60	0.00	109.20	0.00	300.72	748.73	1029.83	926.62	0.76	0.01	0.00	0.00	3.72
53.85	65826.76	0.45	33.78	0.00	109.20	0.00	300.74	748.71	1030.67	926.96	0.71	0.01	0.00	0.00	3.91
53.71	67724.14	0.37	32.81	0.00	109.20	0.00	300.91	749.29	1031.87	927.13	0.73	0.01	0.00	0.00	3.79
53.90	63667.05	0.00	31.65	0.00	109.20	0.00	301.19	749.45	1031.69	927.48	0.78	0.01	0.00	0.00	3.61
53.83	74351.01	0.00	32.47	0.00	110.06	0.00	301.49	748.90	1031.55	927.26	0.72	0.01	0.00	0.00	3.69
54.05	92825.60	0.48	34.19	0.00	110.70	0.00	302.05	748.90	1031.55	927.04	0.65	0.01	0.00	0.00	3.92
54.12	94176.56	0.41	32.92	0.00	110.70	0.00	302.38	748.98	1027.77	926.73	0.68	0.01	0.00	0.00	3.77
54.16	90674.13	0.00	32.27	0.00	110.24	0.00	302.45	748.50	1025.80	926.31	0.68	0.01	0.00	0.00	3.67
54.20	89133.09	0.00	33.24	0.00	109.90	0.00	303.02	748.05	1026.49	926.34	0.73	0.01	0.00	0.00	3.78
54.04	87959.08	0.00	33.80	0.00	109.90	0.00	303.17	746.46	1026.03	926.39	0.72	0.01	0.00	0.00	3.84
53.78	75367.87	0.00	32.82	0.00	109.79	0.00	302.94	745.76	1027.90	926.47	0.66	0.01	0.00	0.00	3.75
53.83	66645.05	0.00	32.66	0.00	109.70	0.00	303.11	746.23	1030.88	926.77	0.68	0.01	0.00	0.00	3.73
53.85	72835.03	0.00	32.91	0.00	109.76	0.00	303.14	747.35	1031.31	926.99	0.70	0.01	0.00	0.00	3.75
53.77	86229.26	0.32	33.67	0.00	109.80	0.00	303.10	748.36	1032.15	927.20	0.68	0.01	0.00	0.00	3.87
53.99	79983.04	0.27	32.81	0.00	109.80	0.00	303.09	749.00	1032.57	927.25	0.72	0.01	0.00	0.00	3.76
53.95	65203.73	0.00	31.98	0.00	109.34	0.00	302.94	749.34	1032.55	928.12	0.75	0.01	0.00	0.00	3.65
53.99	**71767.99**	**0.14**	**32.90**	**0.00**	**110.03**	**0.00**	**298.94**	**748.83**	**1029.17**	**926.49**	**0.71**	**0.01**	**0.00**	**0.00**	**3.75**

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
53.96	74340.53	0.00	31.98	0.00	110.41	0.00	298.61	750.85	1029.06	926.82	0.70	0.01	0.00	0.00	3.63
54.19	74529.34	0.00	32.77	0.00	110.50	0.00	298.64	750.12	1030.20	926.78	0.71	0.01	0.00	0.00	3.71
54.02	64178.05	0.44	33.19	0.00	110.50	0.00	298.72	749.97	1030.57	926.71	0.70	0.01	0.00	0.00	3.80
53.79	64667.56	0.35	32.15	0.00	110.68	0.00	298.49	749.70	1029.71	926.58	0.71	0.01	0.00	0.00	3.67
54.07	61059.10	0.00	31.83	0.00	110.80	0.00	298.72	749.65	1030.82	926.44	0.78	0.01	0.00	0.00	3.59
53.77	59008.09	0.00	32.28	0.00	110.80	0.00	299.33	750.20	1031.05	926.49	0.79	0.01	0.00	0.00	3.63
53.82	58616.33	0.32	33.04	0.00	110.56	0.00	299.89	749.87	1028.12	925.89	0.69	0.01	0.00	0.00	3.77
54.11	57133.39	0.25	32.09	0.00	110.40	0.00	300.70	748.77	1024.24	925.32	0.69	0.01	0.00	0.00	3.67
54.02	72666.38	0.00	32.08	0.00	110.40	0.00	301.54	747.80	1023.23	925.85	0.72	0.01	0.00	0.00	3.63
53.86	73672.22	0.00	32.58	0.00	109.94	0.00	302.32	746.94	1025.53	926.50	0.74	0.01	0.00	0.00	3.70
53.83	90940.19	0.36	33.21	0.00	109.60	0.00	303.02	746.43	1028.62	927.05	0.69	0.02	0.00	0.00	3.83
53.92	91620.70	0.30	32.63	0.00	109.86	0.00	303.62	747.53	1029.39	927.15	0.64	0.02	0.00	0.00	3.76
54.26	85942.72	0.00	32.80	0.00	110.07	0.00	304.18	749.29	1028.98	927.03	0.64	0.02	0.00	0.00	3.74
54.38	89402.88	0.00	33.32	0.00	110.09	0.00	304.34	749.72	1028.92	927.07	0.64	0.02	0.00	0.00	3.79
54.32	85453.23	0.00	32.99	0.00	110.12	0.00	304.37	749.79	1028.87	927.10	0.67	0.01	0.00	0.00	3.75
54.26	81503.59	0.00	32.66	0.00	110.15	0.00	304.40	749.86	1028.81	927.14	0.71	0.01	0.00	0.00	3.71
54.20	77553.93	0.00	32.32	0.00	110.18	0.00	304.43	749.94	1028.75	927.18	0.74	0.01	0.00	0.00	3.66
54.14	73604.28	0.00	31.99	0.00	110.20	0.00	304.45	750.01	1028.81	927.11	0.77	0.01	0.00	0.00	3.62
54.10	69548.70	0.07	31.93	0.00	110.12	0.00	304.49	750.03	1029.88	926.43	0.78	0.01	0.00	0.00	3.62
54.30	64193.69	0.66	34.03	0.00	109.54	0.00	304.63	749.56	1031.33	926.58	0.64	0.01	0.00	0.00	3.96
53.98	58570.32	0.00	31.03	0.00	109.50	0.00	304.70	749.34	1029.56	926.46	0.72	0.01	0.00	0.00	3.55
53.92	73971.99	0.00	33.17	0.00	109.54	0.00	304.85	749.14	1028.42	926.69	0.69	0.01	0.00	0.00	3.79
53.98	85378.08	0.08	32.48	0.00	109.80	0.00	304.65	749.00	1028.95	926.74	0.71	0.01	0.00	0.00	3.71
53.79	81323.66	0.69	33.71	0.00	109.80	0.00	304.37	748.61	1030.77	926.93	0.64	0.01	0.00	0.00	3.92
53.99	64244.95	0.00	30.84	0.00	109.79	0.00	304.05	750.16	1030.92	926.87	0.75	0.01	0.00	0.00	3.51
53.96	76532.58	0.00	32.82	0.00	109.70	0.00	303.58	750.03	1031.30	926.97	0.68	0.01	0.00	0.00	3.75
53.78	60516.69	0.22	32.68	0.00	109.81	0.00	302.55	749.66	1030.99	926.46	0.70	0.01	0.00	0.00	3.75
53.84	62616.17	0.69	33.00	0.00	110.00	0.00	300.55	747.67	1029.84	926.59	0.69	0.01	0.00	0.00	3.83
53.83	67435.65	0.55	32.71	0.00	110.00	0.00	300.52	747.83	1030.12	926.65	0.69	0.01	0.00	0.00	3.78
53.82	72255.13	0.41	32.42	0.00	110.00	0.00	300.48	747.99	1030.41	926.71	0.68	0.01	0.00	0.00	3.74
53.80	77074.60	0.27	32.14	0.00	110.00	0.00	300.45	748.15	1030.69	926.77	0.68	0.01	0.00	0.00	3.69
53.79	81894.07	0.13	31.85	0.00	110.00	0.00	300.41	748.31	1030.98	926.83	0.68	0.01	0.00	0.00	3.64
53.81	82677.55	0.00	31.69	0.00	110.00	0.00	300.34	748.57	1030.96	926.91	0.69	0.01	0.00	0.00	3.61
54.08	56649.18	0.00	32.43	0.00	110.11	0.00	299.94	749.54	1029.15	927.02	0.76	0.01	0.00	0.00	3.68
53.87	82984.67	0.10	32.27	0.00	110.80	0.00	299.59	749.29	1028.40	926.67	0.70	0.01	0.00	0.00	3.66
54.13	84897.51	0.69	33.58	0.00	110.80	0.00	299.35	748.32	1030.07	926.63	0.64	0.01	0.00	0.00	3.87
53.97	66852.16	0.00	30.64	0.00	110.77	0.00	298.91	747.74	1028.71	926.26	0.74	0.01	0.00	0.00	3.46
53.99	68348.84	0.00	32.49	0.00	110.60	0.00	298.60	747.54	1028.16	925.69	0.75	0.01	0.00	0.00	3.67
53.86	54864.12	0.08	32.14	0.00	110.60	0.00	298.68	747.42	1028.55	926.04	0.77	0.01	0.00	0.00	3.63
53.91	59101.56	0.54	32.80	0.00	110.60	0.00	298.76	747.27	1027.77	925.66	0.78	0.01	0.00	0.00	3.75
54.20	60924.42	0.00	30.43	0.00	110.60	0.00	297.89	746.59	1028.74	926.36	0.73	0.01	0.00	0.00	3.45
54.00	65981.67	0.00	32.95	0.00	110.60	0.00	298.63	747.06	1032.73	926.87	0.82	0.01	0.00	0.00	3.70
54.00	56927.34	0.06	31.95	0.00	110.52	0.00	298.99	747.66	1029.48	926.73	0.74	0.01	0.00	0.00	3.62
53.73	84228.09	0.51	32.59	0.00	110.00	0.00	299.10	747.05	1023.76	926.21	0.68	0.01	0.00	0.00	3.77
54.02	73524.94	0.00	31.42	0.00	110.00	0.00	299.37	746.29	1025.94	926.51	0.69	0.01	0.00	0.00	3.58
54.19	92031.74	0.00	33.47	0.00	109.81	0.00	300.17	746.25	1028.66	927.10	0.64	0.01	0.00	0.00	3.82

Operational Data

79FC0040	79FI0252	79FC0662	79FC0665	79FI0668	79FI0526	79FI0712	79TC0791	79TI0770	79TI0718	79TI0684	79AC0695	79AI0780A	79AI0780B	79AI0813	ADC
CCR Feed Total Flow KBPD	Regen Vent Gas Flow SCFH	Air to Regen Gas - O2 Analyzer controlled MSCFH	Air to Regen Cooling Zone Flow Controller MSCFH	Regen N2 to Drying Air MSCFH	Avg Cat Flow Rate %	Oxy-Chlorination Zone Chloride Flow GPM	Regen Vent Gas Temp Controller DEGF	Regen Vent Gas to E7981A DEGF	Regenerator Bed Temp DEGF	Regen Blwr K7981 Suc Temp DEGF	Regen O2 Analyzer Controller %	CCR N2 Header H2 content Mol %	CCR N2 Heater HC Content Mol %	CCR N2 Header O2 Content Mol %	Coke By Air Demand wt%
54.27	95457.63	0.04	32.62	0.00	108.60	0.00	300.81	747.24	1028.08	926.42	0.74	0.01	0.00	0.00	3.75
53.98	79001.73	0.36	32.79	0.00	108.60	0.00	300.90	748.86	1025.97	926.58	0.68	0.01	0.00	0.00	3.82
53.82	65331.59	0.00	30.90	0.00	108.65	0.00	301.36	747.56	1027.23	926.64	0.70	0.01	0.00	0.00	3.56
53.73	65973.91	0.00	32.71	0.00	108.90	0.00	302.12	747.11	1029.76	926.53	0.77	0.01	0.00	0.00	3.74
53.80	62677.34	0.06	32.29	0.00	109.04	0.00	302.09	746.47	1030.47	926.88	0.69	0.01	0.00	0.00	3.71
54.25	60371.46	0.43	32.98	0.00	109.80	0.00	302.35	746.64	1031.55	926.71	0.64	0.01	0.00	0.00	3.81
54.21	58485.13	0.00	31.11	0.00	109.80	0.00	302.63	749.57	1031.78	926.85	0.68	0.01	0.00	0.00	3.55
53.80	81946.48	0.00	32.63	0.00	109.62	0.00	302.58	749.95	1031.59	926.75	0.66	0.01	0.00	0.00	3.73
54.20	61589.65	0.03	32.13	0.00	108.60	0.00	302.23	749.28	1030.82	926.23	0.67	0.01	0.00	0.00	3.71
54.04	84910.02	0.23	33.61	0.00	108.60	0.00	302.38	748.96	1029.60	926.04	0.65	0.01	0.00	0.00	3.90
53.67	57564.85	0.00	30.85	0.00	108.78	0.00	302.12	748.67	1026.05	925.57	0.72	0.01	0.00	0.00	3.55
54.03	79384.23	0.00	33.13	0.00	109.80	0.00	301.85	747.84	1027.34	925.46	0.69	0.01	0.00	0.00	3.77
54.03	76636.90	0.06	31.98	0.00	109.80	0.00	301.94	747.98	1028.69	925.76	0.74	0.01	0.00	0.00	3.65
54.10	62454.59	0.41	32.17	0.00	109.86	0.00	301.58	747.52	1028.00	926.13	0.72	0.01	0.00	0.00	3.71
54.11	56715.95	0.00	31.01	0.00	110.20	0.00	301.44	747.81	1029.76	926.11	0.80	0.01	0.00	0.00	3.51
53.65	50095.04	0.00	32.48	0.00	110.20	0.00	301.38	748.27	1030.85	926.37	0.73	0.01	0.00	0.00	3.68
53.96	59573.27	0.13	31.56	0.00	110.22	0.00	301.06	747.73	1031.08	926.41	0.79	0.01	0.00	0.00	3.59
53.78	75253.49	0.79	32.63	0.00	110.30	0.00	300.67	747.87	1031.78	926.65	0.65	0.01	0.00	0.00	3.80
53.71	65088.68	0.00	31.34	0.00	110.30	0.00	300.63	748.97	1031.50	926.79	0.70	0.01	0.00	0.00	3.56
54.00	68605.83	0.00	32.46	0.00	110.46	0.00	300.48	749.21	1031.27	926.69	0.70	0.01	0.00	0.00	3.68
53.98	**71038.79**	**0.16**	**32.35**	**0.00**	**109.98**	**0.00**	**301.38**	**748.52**	**1029.27**	**926.55**	**0.71**	**0.01**	**0.00**	**0.00**	**3.70**

APPENDIX F:
TRC DATALOG FILES

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	8:26:44 AM	-0.06	0.11	0.00	0.01	0.30
181714	Chevron	CCR Outlet		3/8/2011	8:27:35 AM	-0.47	0.11	0.00	0.01	0.30
181714	Chevron	CCR Outlet		3/8/2011	8:27:35 AM	-0.46	0.11	-0.01	0.00	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:27:35 AM	-0.06	0.11	-0.01	0.01	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:30:44 AM	-0.47	0.11	-0.02	0.00	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:31:44 AM	-0.46	0.11	-0.02	0.01	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:32:44 AM	-0.47	0.11	-0.02	0.00	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:33:44 AM	-0.06	0.14	-0.02	0.01	0.20
181714	Chevron	CCR Outlet		3/8/2011	8:34:44 AM	-0.46	0.11	-0.02	0.01	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:35:44 AM	-0.47	0.11	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:36:44 AM	-0.46	0.11	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:37:44 AM	-0.46	0.14	-0.03	0.01	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:38:44 AM	-0.47	0.11	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:39:44 AM	-0.05	0.08	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:40:44 AM	-0.05	0.11	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:41:44 AM	-0.05	0.11	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:42:44 AM	-0.46	0.01	-0.03	0.00	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	-0.53	0.60	-0.03	0.01	0.10
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	50.71	49.61	20.95	4.41	905.50
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	53.52	49.63	20.96	4.41	890.30
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	54.26	49.72	20.97	4.41	889.30
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	55.00	49.74	20.99	4.42	445.70
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	55.00	49.69	20.98	4.42	267.30
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	52.23	49.63	20.99	4.41	267.10
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	50.26	49.72	20.99	4.42	267.50
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	34.30	27.36	4.51	20.60	445.50
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	24.30	24.54	4.50	20.64	445.30
181714	Chevron	CCR Outlet		3/8/2011	8:43:04 AM	24.11	21.06	5.46	17.00	336.30
181714	Chevron	CCR Outlet		3/8/2011	8:54:45 AM	0.64	0.59	9.99	9.95	309.00
181714	Chevron	CCR Outlet		3/8/2011	8:55:45 AM	-0.05	0.62	13.33	6.29	316.50
181714	Chevron	CCR Outlet		3/8/2011	8:56:45 AM	0.23	0.59	13.47	6.20	206.20
181714	Chevron	CCR Outlet		3/8/2011	8:57:45 AM	-0.22	0.63	13.51	6.11	330.00
181714	Chevron	CCR Outlet		3/8/2011	8:58:45 AM	-0.24	0.57	13.28	6.19	326.60
181714	Chevron	CCR Outlet		3/8/2011	8:59:45 AM	0.13	0.57	13.22	6.36	290.30
181714	Chevron	CCR Outlet		3/8/2011	9:00:45 AM	-0.30	0.60	13.41	6.18	305.30
181714	Chevron	CCR Outlet		3/8/2011	9:01:45 AM	-0.33	0.58	13.45	6.18	293.00
181714	Chevron	CCR Outlet		3/8/2011	9:02:45 AM	-0.32	0.57	12.90	6.46	293.40
181714	Chevron	CCR Outlet		3/8/2011	9:03:45 AM	0.05	0.51	13.48	6.13	344.70
181714	Chevron	CCR Outlet		3/8/2011	9:04:45 AM	-0.35	0.62	13.10	6.38	260.40
181714	Chevron	CCR Outlet		3/8/2011	9:05:45 AM	-0.35	0.57	14.08	5.56	214.80
181714	Chevron	CCR Outlet		3/8/2011	9:06:45 AM	-0.34	0.51	13.57	6.00	241.30
181714	Chevron	CCR Outlet		3/8/2011	9:07:45 AM	-0.39	0.54	13.52	6.09	301.30
181714	Chevron	CCR Outlet		3/8/2011	9:08:45 AM	-0.38	0.54	13.96	5.71	332.40
181714	Chevron	CCR Outlet		3/8/2011	9:09:45 AM	-0.38	0.60	13.44	6.10	377.40
181714	Chevron	CCR Outlet		3/8/2011	9:10:45 AM	-0.39	0.49	13.76	5.80	311.20
181714	Chevron	CCR Outlet		3/8/2011	9:11:45 AM	-0.38	0.43	14.21	5.59	248.10
181714	Chevron	CCR Outlet		3/8/2011	9:12:45 AM	-0.38	0.54	13.97	5.66	302.80
181714	Chevron	CCR Outlet		3/8/2011	9:13:45 AM	0.02	0.54	13.96	5.65	281.50
181714	Chevron	CCR Outlet		3/8/2011	9:14:45 AM	-0.38	0.57	14.16	5.45	203.80
181714	Chevron	CCR Outlet		3/8/2011	9:15:45 AM	-0.39	0.54	14.36	5.26	240.70
181714	Chevron	CCR Outlet		3/8/2011	9:16:45 AM	0.02	0.49	14.09	5.49	286.80
181714	Chevron	CCR Outlet		3/8/2011	9:17:45 AM	-0.38	0.49	14.17	5.52	254.20

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	9:18:45 AM	-0.40	0.49	14.57	5.12	183.60
181714	Chevron	CCR Outlet		3/8/2011	9:19:45 AM	0.02	0.52	14.28	5.33	242.70
181714	Chevron	CCR Outlet		3/8/2011	9:20:45 AM	-0.41	0.49	13.99	5.70	257.80
181714	Chevron	CCR Outlet		3/8/2011	9:21:45 AM	-0.39	0.54	14.24	5.54	273.60
181714	Chevron	CCR Outlet		3/8/2011	9:22:45 AM	-0.41	0.49	14.32	5.39	179.20
181714	Chevron	CCR Outlet		3/8/2011	9:23:45 AM	-0.41	0.49	14.75	4.98	230.90
181714	Chevron	CCR Outlet		3/8/2011	9:24:45 AM	0.00	0.49	14.72	4.98	162.20
181714	Chevron	CCR Outlet		3/8/2011	9:25:45 AM	-0.38	0.54	14.49	5.20	285.20
181714	Chevron	CCR Outlet		3/8/2011	9:26:45 AM	-0.42	0.49	14.44	5.27	192.90
181714	Chevron	CCR Outlet		3/8/2011	9:27:45 AM	-0.41	0.49	14.28	5.41	242.30
181714	Chevron	CCR Outlet		3/8/2011	9:28:45 AM	-0.41	0.52	14.44	5.34	239.60
181714	Chevron	CCR Outlet		3/8/2011	9:29:45 AM	-0.40	0.54	14.65	5.09	297.90
181714	Chevron	CCR Outlet		3/8/2011	9:30:45 AM	-0.41	0.57	13.98	5.59	234.10
181714	Chevron	CCR Outlet		3/8/2011	9:31:45 AM	-0.41	0.49	14.95	4.82	230.70
181714	Chevron	CCR Outlet		3/8/2011	9:32:45 AM	-0.41	0.52	14.62	5.19	232.40
181714	Chevron	CCR Outlet		3/8/2011	9:33:45 AM	-0.28	0.53	14.64	5.12	307.20
181714	Chevron	CCR Outlet		3/8/2011	9:34:45 AM	-0.40	0.52	14.31	5.40	216.80
181714	Chevron	CCR Outlet		3/8/2011	9:35:45 AM	0.00	0.49	14.33	5.34	211.50
181714	Chevron	CCR Outlet		3/8/2011	9:36:45 AM	-0.40	0.49	14.86	4.93	270.50
181714	Chevron	CCR Outlet		3/8/2011	9:37:45 AM	-0.40	0.57	14.08	5.61	281.00
181714	Chevron	CCR Outlet		3/8/2011	9:38:45 AM	-0.38	0.52	14.26	5.43	314.60
181714	Chevron	CCR Outlet		3/8/2011	9:39:45 AM	0.00	0.60	14.48	5.28	197.70
181714	Chevron	CCR Outlet		3/8/2011	9:40:45 AM	-0.38	0.54	14.21	5.51	274.60
181714	Chevron	CCR Outlet		3/8/2011	9:41:45 AM	-0.38	0.49	14.41	5.27	255.70
181714	Chevron	CCR Outlet		3/8/2011	9:42:45 AM	0.00	0.52	14.29	5.33	237.10
181714	Chevron	CCR Outlet		3/8/2011	9:43:45 AM	-0.40	0.49	14.00	5.67	231.00
181714	Chevron	CCR Outlet		3/8/2011	9:44:45 AM	0.00	0.54	13.98	5.72	291.60
181714	Chevron	CCR Outlet		3/8/2011	9:45:45 AM	-0.41	0.54	14.17	5.49	247.50
181714	Chevron	CCR Outlet		3/8/2011	9:46:45 AM	0.00	0.51	13.80	5.85	284.00
181714	Chevron	CCR Outlet		3/8/2011	9:47:45 AM	-0.40	0.49	13.89	5.74	274.20
181714	Chevron	CCR Outlet		3/8/2011	9:48:45 AM	-0.41	0.52	13.95	5.73	307.10
181714	Chevron	CCR Outlet		3/8/2011	9:49:45 AM	0.00	0.52	13.90	5.78	263.20
181714	Chevron	CCR Outlet		3/8/2011	9:50:45 AM	-0.41	0.53	13.83	6.06	258.70
181714	Chevron	CCR Outlet		3/8/2011	9:51:45 AM	0.00	0.57	13.78	5.87	321.40
181714	Chevron	CCR Outlet		3/8/2011	9:52:45 AM	-0.41	0.54	14.17	5.52	304.30
181714	Chevron	CCR Outlet		3/8/2011	9:53:45 AM	-0.41	0.54	14.05	5.65	201.20
181714	Chevron	CCR Outlet		3/8/2011	9:54:45 AM	-0.43	0.52	14.24	5.41	298.70
181714	Chevron	CCR Outlet		3/8/2011	9:55:45 AM	0.00	0.52	13.94	5.76	252.60
181714	Chevron	CCR Outlet		3/8/2011	9:56:45 AM	-0.41	0.52	13.84	5.92	213.40
181714	Chevron	CCR Outlet		3/8/2011	9:57:45 AM	-0.41	0.57	13.74	5.86	220.90
181714	Chevron	CCR Outlet	Run 1	3/8/2011	9:58:00 AM	-0.40	0.57	14.02	5.50	387.60
181714	Chevron	CCR Outlet	Run 1	3/8/2011	9:59:00 AM	0.02	0.52	13.53	6.06	317.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:00:00 AM	0.02	0.54	14.03	5.57	268.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:01:00 AM	0.02	0.57	14.11	5.58	194.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:02:00 AM	-0.38	0.60	14.35	5.30	299.60
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:03:00 AM	-0.38	0.60	13.91	5.74	271.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:04:00 AM	-0.38	0.54	13.85	5.90	263.00
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:05:00 AM	-0.38	0.54	14.86	4.89	282.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:06:00 AM	-0.38	0.57	14.02	5.64	273.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:07:00 AM	-0.38	0.54	14.10	5.61	301.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:08:00 AM	-0.39	0.52	14.30	5.45	290.50
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:09:00 AM	0.02	0.54	14.80	4.89	305.10

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:10:00 AM	-0.38	0.60	13.75	5.78	265.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:11:00 AM	-0.38	0.46	14.37	5.24	232.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:12:00 AM	0.02	0.43	14.19	5.68	278.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:13:00 AM	-0.38	0.51	14.47	5.14	289.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:14:00 AM	0.02	0.54	14.24	5.41	297.00
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:15:00 AM	-0.37	0.57	14.14	5.50	251.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:16:00 AM	0.02	0.52	14.12	5.52	249.60
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:17:00 AM	-0.37	0.52	14.63	5.06	241.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:18:00 AM	-0.37	0.49	14.56	5.22	380.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:19:00 AM	-0.38	0.54	13.93	5.74	373.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:20:00 AM	-0.37	0.49	14.27	5.56	207.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:21:00 AM	-0.37	0.46	14.82	4.96	233.90
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:22:00 AM	0.03	0.54	14.26	5.45	314.10
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:23:00 AM	-0.38	0.57	13.86	5.78	278.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:24:00 AM	-0.37	0.49	14.33	5.34	217.50
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:25:00 AM	0.02	0.46	15.15	4.71	286.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:26:00 AM	-0.38	0.57	14.06	5.64	372.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:27:00 AM	-0.37	0.57	14.23	5.42	197.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:28:00 AM	-0.38	0.46	14.73	5.02	358.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:29:00 AM	0.02	0.57	14.28	5.42	297.00
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:30:00 AM	-0.38	0.52	14.84	4.85	210.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:31:00 AM	-0.37	0.54	14.53	5.21	264.50
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:32:00 AM	-0.37	0.54	14.35	5.39	184.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:33:00 AM	0.02	0.57	14.50	5.19	236.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:34:00 AM	0.02	0.54	14.35	5.35	267.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:35:00 AM	-0.12	0.57	14.32	5.38	268.10
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:36:00 AM	0.02	0.57	14.31	5.50	193.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:37:00 AM	0.02	0.57	14.63	5.03	237.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:38:00 AM	0.02	0.54	14.11	5.56	284.10
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:39:00 AM	0.02	0.54	14.02	5.65	216.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:40:00 AM	-0.36	0.60	14.15	5.58	299.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:41:00 AM	-0.37	0.59	14.80	4.95	220.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:42:00 AM	-0.37	0.62	14.21	5.48	226.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:43:00 AM	-0.37	0.60	14.41	5.26	240.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:44:00 AM	-0.38	0.57	14.38	5.34	237.10
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:45:00 AM	0.02	0.62	14.40	5.25	251.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:46:00 AM	0.03	0.65	14.10	5.51	255.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:47:00 AM	0.02	0.52	14.25	5.39	228.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:48:00 AM	0.02	0.49	14.38	5.37	213.40
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:49:00 AM	0.03	0.59	13.69	5.96	273.30
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:50:00 AM	-0.37	0.51	14.43	5.23	268.00
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:51:00 AM	-0.37	0.57	13.89	5.75	175.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:52:00 AM	-0.37	0.57	13.98	5.71	254.20
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:53:00 AM	-0.37	0.52	14.14	5.44	225.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:54:00 AM	0.02	0.54	14.30	5.37	272.10
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:55:00 AM	-0.38	0.60	13.55	5.95	305.70
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:56:00 AM	-0.37	0.49	13.85	5.75	272.80
181714	Chevron	CCR Outlet	Run 1	3/8/2011	10:57:00 AM	-0.37	0.51	14.19	5.42	258.90
181714	Chevron	CCR Outlet		3/8/2011	10:58:00 AM	-0.38	0.60	14.21	5.43	261.00
181714	Chevron	CCR Outlet		3/8/2011	10:59:00 AM	-0.36	0.54	14.04	5.54	19.90
181714	Chevron	CCR Outlet		3/8/2011	11:00:00 AM	3.15	8.36	6.42	1.86	30.00
181714	Chevron	CCR Outlet		3/8/2011	11:01:00 AM	19.12	20.74	1.42	0.46	28.60

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	11:02:00 AM	22.87	23.47	0.35	0.15	27.90
181714	Chevron	CCR Outlet		3/8/2011	11:03:01 AM	23.58	24.07	0.11	0.07	27.50
181714	Chevron	CCR Outlet		3/8/2011	11:04:01 AM	23.71	24.27	0.05	0.05	27.30
181714	Chevron	CCR Outlet		3/8/2011	11:05:01 AM	24.84	24.32	0.03	0.03	443.90
181714	Chevron	CCR Outlet		3/8/2011	11:06:01 AM	22.17	16.31	6.55	6.57	447.10
181714	Chevron	CCR Outlet		3/8/2011	11:07:01 AM	2.88	1.53	9.57	9.55	0.30
181714	Chevron	CCR Outlet		3/8/2011	11:08:01 AM	0.15	-0.25	9.90	9.89	0.20
181714	Chevron	CCR Outlet		3/8/2011	11:09:01 AM	-0.04	-0.46	9.94	9.95	0.10
181714	Chevron	CCR Outlet		3/8/2011	11:10:01 AM	0.01	-0.46	9.95	9.96	0.10
181714	Chevron	CCR Outlet		3/8/2011	11:11:01 AM	0.09	-0.49	9.95	9.98	0.10
181714	Chevron	CCR Outlet		3/8/2011	11:12:01 AM	0.10	-0.52	9.95	9.98	0.10
181714	Chevron	CCR Outlet		3/8/2011	11:13:01 AM	0.46	-0.49	9.96	9.99	0.10
181714	Chevron	CCR Outlet		3/8/2011	11:14:01 AM	0.04	-0.49	9.95	9.89	1.20
181714	Chevron	CCR Outlet		3/8/2011	11:15:01 AM	0.02	-0.38	12.28	7.27	276.10
181714	Chevron	CCR Outlet		3/8/2011	11:16:01 AM	0.00	0.19	14.40	5.41	182.80
181714	Chevron	CCR Outlet		3/8/2011	11:17:01 AM	-0.07	0.43	14.33	5.36	290.10
181714	Chevron	CCR Outlet		3/8/2011	11:18:01 AM	-0.14	0.52	14.38	5.31	239.30
181714	Chevron	CCR Outlet		3/8/2011	11:19:00 AM	0.16	0.52	14.69	4.98	221.10
181714	Chevron	CCR Outlet		3/8/2011	11:20:00 AM	-0.28	0.43	14.38	5.42	253.30
181714	Chevron	CCR Outlet		3/8/2011	11:21:00 AM	0.08	0.49	14.20	5.47	276.30
181714	Chevron	CCR Outlet		3/8/2011	11:22:00 AM	-0.33	0.52	14.24	5.39	272.50
181714	Chevron	CCR Outlet		3/8/2011	11:23:00 AM	-0.33	0.49	14.01	5.47	280.80
181714	Chevron	CCR Outlet		3/8/2011	11:24:00 AM	-0.33	0.43	14.02	5.65	260.50
181714	Chevron	CCR Outlet		3/8/2011	11:25:00 AM	-0.33	0.43	14.33	5.25	265.40
181714	Chevron	CCR Outlet		3/8/2011	11:26:00 AM	-0.36	0.49	14.35	5.33	224.70
181714	Chevron	CCR Outlet		3/8/2011	11:27:00 AM	-0.37	0.49	14.06	5.57	200.00
181714	Chevron	CCR Outlet		3/8/2011	11:28:00 AM	0.03	0.40	14.31	5.35	260.40
181714	Chevron	CCR Outlet		3/8/2011	11:29:00 AM	0.02	0.49	14.32	5.27	261.30
181714	Chevron	CCR Outlet		3/8/2011	11:30:00 AM	-0.35	0.54	14.41	5.16	244.30
181714	Chevron	CCR Outlet		3/8/2011	11:31:00 AM	-0.36	0.43	14.20	5.37	291.00
181714	Chevron	CCR Outlet		3/8/2011	11:32:00 AM	-0.36	0.43	14.12	5.51	279.40
181714	Chevron	CCR Outlet		3/8/2011	11:33:00 AM	-0.36	0.43	14.41	5.16	308.30
181714	Chevron	CCR Outlet		3/8/2011	11:34:00 AM	-0.36	0.49	13.82	5.77	232.30
181714	Chevron	CCR Outlet		3/8/2011	11:35:00 AM	-0.36	0.49	14.24	5.36	249.60
181714	Chevron	CCR Outlet		3/8/2011	11:36:00 AM	-0.36	0.49	14.15	5.50	261.40
181714	Chevron	CCR Outlet		3/8/2011	11:37:00 AM	-0.37	0.52	14.59	5.06	258.20
181714	Chevron	CCR Outlet		3/8/2011	11:38:00 AM	-0.36	0.54	13.74	5.83	296.00
181714	Chevron	CCR Outlet		3/8/2011	11:39:00 AM	-0.36	0.43	13.97	5.42	226.80
181714	Chevron	CCR Outlet		3/8/2011	11:40:00 AM	-0.36	0.41	13.94	5.80	286.60
181714	Chevron	CCR Outlet		3/8/2011	11:41:00 AM	0.03	0.43	14.04	5.49	270.30
181714	Chevron	CCR Outlet		3/8/2011	11:42:00 AM	-0.35	0.40	13.91	5.68	190.20
181714	Chevron	CCR Outlet		3/8/2011	11:43:00 AM	-0.36	0.46	13.89	5.78	252.50
181714	Chevron	CCR Outlet		3/8/2011	11:44:00 AM	-0.36	0.46	14.21	5.48	272.30
181714	Chevron	CCR Outlet		3/8/2011	11:45:00 AM	-0.35	0.43	14.27	5.50	312.20
181714	Chevron	CCR Outlet		3/8/2011	11:46:00 AM	-0.35	0.52	14.02	5.49	305.50
181714	Chevron	CCR Outlet		3/8/2011	11:47:00 AM	0.03	0.43	13.73	5.78	233.40
181714	Chevron	CCR Outlet		3/8/2011	11:48:00 AM	-0.35	0.35	14.37	5.41	284.30
181714	Chevron	CCR Outlet		3/8/2011	11:49:00 AM	-0.35	0.41	14.04	5.55	305.20
181714	Chevron	CCR Outlet		3/8/2011	11:50:00 AM	-0.36	0.38	14.60	5.08	227.20
181714	Chevron	CCR Outlet		3/8/2011	11:51:00 AM	-0.36	0.40	14.16	5.48	218.80
181714	Chevron	CCR Outlet		3/8/2011	11:52:00 AM	-0.36	0.38	14.12	5.59	281.40
181714	Chevron	CCR Outlet		3/8/2011	11:53:00 AM	-0.36	0.43	14.55	5.08	332.50

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	11:54:00 AM	-0.39	0.49	13.84	5.81	258.00
181714	Chevron	CCR Outlet		3/8/2011	11:55:00 AM	-0.36	0.43	14.12	5.46	308.50
181714	Chevron	CCR Outlet		3/8/2011	11:56:00 AM	-0.39	0.35	13.81	5.87	202.70
181714	Chevron	CCR Outlet		3/8/2011	11:57:00 AM	-0.05	0.40	14.10	5.53	216.10
181714	Chevron	CCR Outlet		3/8/2011	11:58:00 AM	0.00	0.46	14.24	5.44	327.30
181714	Chevron	CCR Outlet		3/8/2011	11:59:00 AM	0.00	0.43	14.35	5.15	281.40
181714	Chevron	CCR Outlet		3/8/2011	12:00:00 PM	0.00	0.46	14.07	5.59	190.00
181714	Chevron	CCR Outlet		3/8/2011	12:01:00 PM	0.00	0.40	14.49	5.18	212.30
181714	Chevron	CCR Outlet		3/8/2011	12:02:00 PM	-0.38	0.49	14.25	5.45	318.20
181714	Chevron	CCR Outlet		3/8/2011	12:03:00 PM	-0.36	0.46	13.76	5.73	277.80
181714	Chevron	CCR Outlet		3/8/2011	12:04:00 PM	-0.39	0.38	14.25	5.46	290.50
181714	Chevron	CCR Outlet		3/8/2011	12:05:00 PM	-0.36	0.40	14.08	5.56	207.50
181714	Chevron	CCR Outlet		3/8/2011	12:06:00 PM	0.00	0.43	14.44	5.32	285.00
181714	Chevron	CCR Outlet		3/8/2011	12:07:00 PM	-0.38	0.49	14.17	5.44	253.90
181714	Chevron	CCR Outlet		3/8/2011	12:08:00 PM	-0.39	0.40	14.30	5.38	287.40
181714	Chevron	CCR Outlet		3/8/2011	12:09:00 PM	-0.35	0.46	14.05	5.56	210.30
181714	Chevron	CCR Outlet		3/8/2011	12:10:00 PM	-0.36	0.43	14.35	5.34	201.90
181714	Chevron	CCR Outlet		3/8/2011	12:11:00 PM	-0.35	0.40	13.82	5.75	229.30
181714	Chevron	CCR Outlet		3/8/2011	12:12:00 PM	-0.38	0.38	14.11	5.59	205.80
181714	Chevron	CCR Outlet		3/8/2011	12:13:00 PM	-0.35	0.43	14.94	4.78	221.20
181714	Chevron	CCR Outlet		3/8/2011	12:14:00 PM	0.03	0.49	14.16	5.50	226.00
181714	Chevron	CCR Outlet		3/8/2011	12:15:00 PM	-0.35	0.38	13.99	5.43	307.80
181714	Chevron	CCR Outlet		3/8/2011	12:16:00 PM	-0.38	0.35	14.11	5.56	194.70
181714	Chevron	CCR Outlet		3/8/2011	12:17:00 PM	-0.14	0.46	14.26	5.38	232.10
181714	Chevron	CCR Outlet		3/8/2011	12:18:00 PM	-0.38	0.43	14.36	5.24	316.30
181714	Chevron	CCR Outlet		3/8/2011	12:19:00 PM	0.03	0.40	13.83	5.75	271.10
181714	Chevron	CCR Outlet		3/8/2011	12:20:00 PM	-0.38	0.35	14.68	5.03	202.40
181714	Chevron	CCR Outlet		3/8/2011	12:21:00 PM	0.03	0.43	14.55	5.10	247.90
181714	Chevron	CCR Outlet		3/8/2011	12:22:00 PM	-0.36	0.46	13.92	5.70	290.00
181714	Chevron	CCR Outlet		3/8/2011	12:23:00 PM	-0.36	0.38	14.27	5.42	301.90
181714	Chevron	CCR Outlet		3/8/2011	12:24:00 PM	-0.40	0.43	14.12	5.53	301.10
181714	Chevron	CCR Outlet		3/8/2011	12:25:00 PM	0.00	0.43	14.31	5.29	243.10
181714	Chevron	CCR Outlet		3/8/2011	12:26:00 PM	-0.36	0.41	14.52	5.11	311.10
181714	Chevron	CCR Outlet		3/8/2011	12:27:00 PM	-0.38	0.40	13.85	5.73	189.50
181714	Chevron	CCR Outlet		3/8/2011	12:28:00 PM	-0.39	0.38	14.01	5.67	241.70
181714	Chevron	CCR Outlet		3/8/2011	12:29:00 PM	-0.39	0.43	14.22	5.48	298.40
181714	Chevron	CCR Outlet		3/8/2011	12:30:00 PM	-0.39	0.43	14.06	5.57	294.60
181714	Chevron	CCR Outlet		3/8/2011	12:31:00 PM	-0.39	0.46	13.72	5.91	225.90
181714	Chevron	CCR Outlet		3/8/2011	12:32:00 PM	-0.39	0.46	14.12	5.48	318.90
181714	Chevron	CCR Outlet		3/8/2011	12:33:00 PM	-0.39	0.40	14.61	5.08	247.10
181714	Chevron	CCR Outlet		3/8/2011	12:34:00 PM	0.00	0.46	13.80	5.72	277.40
181714	Chevron	CCR Outlet		3/8/2011	12:35:00 PM	-0.39	0.40	13.92	5.62	234.00
181714	Chevron	CCR Outlet		3/8/2011	12:36:00 PM	-0.39	0.35	14.23	5.40	196.70
181714	Chevron	CCR Outlet		3/8/2011	12:37:00 PM	-0.39	0.40	14.35	5.32	234.30
181714	Chevron	CCR Outlet		3/8/2011	12:38:00 PM	0.00	0.49	14.45	5.24	243.10
181714	Chevron	CCR Outlet		3/8/2011	12:39:00 PM	-0.39	0.43	14.49	4.92	277.70
181714	Chevron	CCR Outlet		3/8/2011	12:40:00 PM	-0.39	0.45	14.09	5.59	318.00
181714	Chevron	CCR Outlet		3/8/2011	12:41:00 PM	0.00	0.49	14.09	5.47	227.10
181714	Chevron	CCR Outlet		3/8/2011	12:42:00 PM	-0.40	0.46	14.90	4.78	229.50
181714	Chevron	CCR Outlet		3/8/2011	12:43:00 PM	-0.39	0.49	13.91	5.64	328.40
181714	Chevron	CCR Outlet		3/8/2011	12:44:00 PM	-0.39	0.41	14.22	5.47	305.80
181714	Chevron	CCR Outlet		3/8/2011	12:45:00 PM	0.00	0.41	14.77	4.98	308.50

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	12:46:00 PM	-0.39	0.54	14.23	5.48	276.10
181714	Chevron	CCR Outlet		3/8/2011	12:46:04 PM	-0.02	0.52	14.04	5.60	317.70
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:47:04 PM	-0.43	0.49	13.86	5.72	258.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:48:04 PM	-0.02	0.40	14.46	5.26	294.90
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:49:04 PM	-0.42	0.49	14.41	5.30	313.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:50:04 PM	-0.02	0.52	14.17	5.42	234.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:51:04 PM	-0.42	0.46	14.03	5.54	219.70
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:52:04 PM	-0.42	0.46	14.44	5.26	233.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:53:04 PM	-0.03	0.57	14.38	5.25	326.90
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:54:04 PM	-0.42	0.52	13.99	5.61	219.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:55:04 PM	-0.43	0.43	13.95	5.69	231.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:56:04 PM	-0.02	0.43	14.17	5.46	249.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:57:04 PM	-0.42	0.46	14.63	5.05	229.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:58:04 PM	-0.43	0.54	14.10	5.58	252.20
181714	Chevron	CCR Outlet	Run 2	3/8/2011	12:59:04 PM	-0.10	0.52	14.07	5.48	288.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:00:04 PM	-0.42	0.43	13.83	5.70	307.90
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:01:04 PM	-0.44	0.43	14.10	5.54	303.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:02:04 PM	-0.42	0.49	14.49	5.20	231.20
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:03:04 PM	-0.44	0.52	13.76	5.79	289.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:04:04 PM	-0.44	0.46	14.05	5.52	253.20
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:05:04 PM	-0.42	0.52	14.31	5.21	248.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:06:04 PM	-0.42	0.49	14.23	5.40	215.20
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:07:04 PM	-0.02	0.49	13.77	5.76	250.50
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:08:04 PM	-0.42	0.52	14.13	5.48	256.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:09:04 PM	-0.02	0.52	14.35	5.26	295.50
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:10:04 PM	-0.42	0.52	14.09	5.43	229.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:11:04 PM	-0.42	0.49	13.85	5.62	238.50
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:12:04 PM	-0.02	0.43	14.11	5.56	256.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:13:04 PM	-0.42	0.46	14.32	5.29	317.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:14:04 PM	-0.42	0.52	13.79	5.78	258.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:15:04 PM	-0.42	0.46	14.02	5.45	287.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:16:04 PM	-0.43	0.46	14.09	5.55	288.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:17:04 PM	-0.42	0.43	14.13	5.44	305.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:18:04 PM	-0.42	0.49	13.84	5.76	309.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:19:04 PM	-0.44	0.46	13.72	5.75	249.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:20:04 PM	-0.42	0.38	14.48	5.12	235.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:21:04 PM	-0.02	0.46	13.92	5.67	247.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:22:04 PM	-0.42	0.46	14.06	5.50	253.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:23:04 PM	-0.02	0.41	13.66	5.81	189.30
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:24:04 PM	-0.42	0.38	13.92	5.72	273.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:25:04 PM	-0.44	0.43	14.19	5.48	280.70
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:26:04 PM	-0.42	0.49	13.90	5.64	211.90
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:27:04 PM	-0.42	0.52	13.93	5.61	192.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:28:04 PM	-0.02	0.43	14.02	5.63	295.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:29:04 PM	-0.42	0.46	14.25	5.34	307.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:30:04 PM	-0.40	0.49	13.91	5.65	375.50
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:31:04 PM	-0.02	0.49	13.99	5.64	279.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:32:04 PM	-0.42	0.46	14.01	5.53	237.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:33:04 PM	-0.41	0.52	14.23	5.36	232.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:34:04 PM	-0.42	0.49	14.23	5.40	237.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:35:04 PM	-0.42	0.46	13.94	5.60	287.70
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:36:04 PM	-0.44	0.46	13.98	5.62	299.10

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:37:04 PM	-0.02	0.49	14.19	5.43	252.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:38:04 PM	-0.43	0.52	14.05	5.52	314.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:39:04 PM	-0.43	0.49	13.89	5.60	211.60
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:40:04 PM	-0.19	0.43	14.17	5.54	248.00
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:41:04 PM	-0.02	0.46	14.47	5.19	252.80
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:42:04 PM	-0.03	0.49	14.54	5.09	234.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:43:04 PM	-0.42	0.51	13.93	5.55	260.10
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:44:04 PM	-0.41	0.40	14.20	5.44	291.50
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:45:04 PM	-0.43	0.46	14.41	5.23	260.40
181714	Chevron	CCR Outlet	Run 2	3/8/2011	1:46:04 PM	-0.42	0.46	13.97	5.62	278.40
181714	Chevron	CCR Outlet		3/8/2011	1:47:05 PM	-0.42	0.43	14.04	5.59	248.60
181714	Chevron	CCR Outlet		3/8/2011	1:48:05 PM	-0.02	0.43	14.30	5.31	228.20
181714	Chevron	CCR Outlet		3/8/2011	1:49:05 PM	-0.42	0.46	14.24	5.31	266.80
181714	Chevron	CCR Outlet		3/8/2011	1:50:05 PM	-0.02	0.54	13.49	5.93	33.40
181714	Chevron	CCR Outlet		3/8/2011	1:51:05 PM	10.04	15.96	3.51	1.66	29.40
181714	Chevron	CCR Outlet		3/8/2011	1:52:05 PM	21.57	22.51	0.79	0.44	28.40
181714	Chevron	CCR Outlet		3/8/2011	1:53:05 PM	24.55	23.99	0.21	0.16	28.10
181714	Chevron	CCR Outlet		3/8/2011	1:54:05 PM	24.46	24.24	0.09	0.09	27.80
181714	Chevron	CCR Outlet		3/8/2011	1:55:05 PM	24.58	24.30	0.10	0.08	0.10
181714	Chevron	CCR Outlet		3/8/2011	1:56:05 PM	18.00	8.27	7.91	7.83	0.10
181714	Chevron	CCR Outlet		3/8/2011	1:57:05 PM	1.81	0.52	9.71	9.67	0.10
181714	Chevron	CCR Outlet		3/8/2011	1:58:05 PM	-0.03	-0.33	9.90	9.79	1.20
181714	Chevron	CCR Outlet		3/8/2011	1:59:05 PM	-0.31	-0.41	9.93	9.83	452.80
181714	Chevron	CCR Outlet		3/8/2011	2:00:05 PM	-0.33	-0.20	12.31	7.19	308.10
181714	Chevron	CCR Outlet		3/8/2011	2:01:05 PM	-0.31	0.38	13.58	5.96	301.10
181714	Chevron	CCR Outlet		3/8/2011	2:02:05 PM	-0.30	0.49	14.00	5.54	234.00
181714	Chevron	CCR Outlet		3/8/2011	2:03:05 PM	-0.33	0.43	13.94	5.56	346.40
181714	Chevron	CCR Outlet		3/8/2011	2:04:05 PM	0.02	0.43	13.93	5.57	240.10
181714	Chevron	CCR Outlet		3/8/2011	2:05:05 PM	-0.37	0.43	14.42	5.11	285.40
181714	Chevron	CCR Outlet		3/8/2011	2:06:05 PM	-0.40	0.43	14.10	5.36	220.00
181714	Chevron	CCR Outlet		3/8/2011	2:07:05 PM	-0.39	0.38	13.66	5.82	263.80
181714	Chevron	CCR Outlet		3/8/2011	2:08:05 PM	-0.39	0.35	14.41	5.22	313.90
181714	Chevron	CCR Outlet		3/8/2011	2:09:05 PM	-0.39	0.41	13.94	5.55	309.20
181714	Chevron	CCR Outlet		3/8/2011	2:10:05 PM	0.00	0.43	14.21	5.40	239.20
181714	Chevron	CCR Outlet		3/8/2011	2:11:05 PM	-0.40	0.38	13.88	5.65	320.80
181714	Chevron	CCR Outlet		3/8/2011	2:12:05 PM	-0.39	0.32	13.94	5.54	229.70
181714	Chevron	CCR Outlet		3/8/2011	2:13:05 PM	0.00	0.35	14.54	5.06	210.10
181714	Chevron	CCR Outlet		3/8/2011	2:14:05 PM	-0.40	0.41	14.15	5.37	255.70
181714	Chevron	CCR Outlet		3/8/2011	2:15:05 PM	-0.42	0.41	14.08	5.45	299.60
181714	Chevron	CCR Outlet		3/8/2011	2:16:05 PM	-0.44	0.38	14.26	5.29	314.80
181714	Chevron	CCR Outlet		3/8/2011	2:17:05 PM	-0.42	0.43	14.10	5.42	317.40
181714	Chevron	CCR Outlet		3/8/2011	2:18:05 PM	-0.42	0.43	14.32	5.23	269.10
181714	Chevron	CCR Outlet		3/8/2011	2:19:05 PM	-0.03	0.41	13.97	5.46	269.10
181714	Chevron	CCR Outlet		3/8/2011	2:20:05 PM	-0.42	0.35	14.49	5.01	289.20
181714	Chevron	CCR Outlet		3/8/2011	2:21:05 PM	-0.02	0.38	14.45	5.21	312.80
181714	Chevron	CCR Outlet		3/8/2011	2:22:05 PM	-0.42	0.43	14.44	5.15	273.60
181714	Chevron	CCR Outlet		3/8/2011	2:23:05 PM	-0.43	0.46	13.93	5.47	313.80
181714	Chevron	CCR Outlet		3/8/2011	2:24:05 PM	-0.02	0.40	14.04	5.53	237.90
181714	Chevron	CCR Outlet		3/8/2011	2:25:05 PM	-0.42	0.41	13.81	5.60	251.50
181714	Chevron	CCR Outlet		3/8/2011	2:26:05 PM	-0.43	0.43	14.13	5.45	357.60
181714	Chevron	CCR Outlet		3/8/2011	2:27:05 PM	-0.42	0.35	13.80	5.77	315.80
181714	Chevron	CCR Outlet		3/8/2011	2:28:05 PM	-0.42	0.38	14.02	5.60	312.40

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	2:29:05 PM	-0.02	0.46	13.93	5.52	316.40
181714	Chevron	CCR Outlet		3/8/2011	2:30:05 PM	-0.42	0.46	14.14	5.31	296.20
181714	Chevron	CCR Outlet		3/8/2011	2:31:05 PM	-0.43	0.43	13.50	5.98	240.30
181714	Chevron	CCR Outlet		3/8/2011	2:32:05 PM	-0.02	0.38	14.02	5.49	286.60
181714	Chevron	CCR Outlet		3/8/2011	2:33:05 PM	-0.42	0.43	14.05	5.50	260.90
181714	Chevron	CCR Outlet		3/8/2011	2:34:05 PM	-0.42	0.40	14.33	5.27	265.40
181714	Chevron	CCR Outlet		3/8/2011	2:35:05 PM	-0.02	0.49	13.72	5.85	323.50
181714	Chevron	CCR Outlet		3/8/2011	2:36:05 PM	-0.42	0.38	14.40	5.19	321.40
181714	Chevron	CCR Outlet		3/8/2011	2:37:05 PM	-0.03	0.43	14.08	5.47	237.30
181714	Chevron	CCR Outlet		3/8/2011	2:38:05 PM	-0.42	0.46	14.36	5.15	257.90
181714	Chevron	CCR Outlet		3/8/2011	2:39:05 PM	-0.43	0.43	13.88	5.46	358.60
181714	Chevron	CCR Outlet		3/8/2011	2:40:05 PM	-0.42	0.38	14.27	5.41	275.90
181714	Chevron	CCR Outlet		3/8/2011	2:41:05 PM	0.00	0.38	14.21	5.33	263.40
181714	Chevron	CCR Outlet		3/8/2011	2:42:05 PM	-0.39	0.43	14.27	5.19	320.40
181714	Chevron	CCR Outlet		3/8/2011	2:43:05 PM	-0.41	0.43	13.87	5.62	239.40
181714	Chevron	CCR Outlet		3/8/2011	2:44:05 PM	-0.42	0.38	14.13	5.38	242.70
181714	Chevron	CCR Outlet		3/8/2011	2:45:05 PM	-0.02	0.46	14.28	5.38	205.60
181714	Chevron	CCR Outlet		3/8/2011	2:46:05 PM	-0.42	0.46	14.48	5.16	342.60
181714	Chevron	CCR Outlet		3/8/2011	2:47:05 PM	-0.41	0.38	13.59	5.79	219.60
181714	Chevron	CCR Outlet		3/8/2011	2:48:05 PM	-0.42	0.35	14.73	4.82	206.50
181714	Chevron	CCR Outlet		3/8/2011	2:49:05 PM	-0.42	0.40	14.13	5.29	252.70
181714	Chevron	CCR Outlet		3/8/2011	2:50:05 PM	-0.02	0.35	14.30	5.10	265.40
181714	Chevron	CCR Outlet		3/8/2011	2:51:05 PM	-0.02	0.35	14.02	5.60	326.10
181714	Chevron	CCR Outlet		3/8/2011	2:52:05 PM	-0.41	0.40	14.16	5.44	250.00
181714	Chevron	CCR Outlet		3/8/2011	2:53:05 PM	-0.41	0.43	14.13	5.42	274.30
181714	Chevron	CCR Outlet		3/8/2011	2:54:05 PM	-0.02	0.43	14.33	5.19	291.00
181714	Chevron	CCR Outlet		3/8/2011	2:55:05 PM	-0.02	0.43	14.02	5.51	309.30
181714	Chevron	CCR Outlet		3/8/2011	2:56:05 PM	-0.43	0.32	14.16	5.35	249.50
181714	Chevron	CCR Outlet		3/8/2011	2:57:05 PM	-0.42	0.35	14.31	5.22	284.10
181714	Chevron	CCR Outlet		3/8/2011	2:58:05 PM	-0.42	0.38	13.72	5.73	283.90
181714	Chevron	CCR Outlet		3/8/2011	2:59:05 PM	-0.02	0.38	13.78	5.72	302.60
181714	Chevron	CCR Outlet		3/8/2011	3:00:05 PM	-0.42	0.38	14.00	5.53	308.30
181714	Chevron	CCR Outlet		3/8/2011	3:01:05 PM	-0.42	0.43	13.77	5.70	301.30
181714	Chevron	CCR Outlet		3/8/2011	3:02:05 PM	-0.02	0.40	13.88	5.66	252.60
181714	Chevron	CCR Outlet		3/8/2011	3:03:05 PM	-0.42	0.40	13.49	6.00	239.10
181714	Chevron	CCR Outlet		3/8/2011	3:04:05 PM	-0.02	0.38	13.88	5.69	279.30
181714	Chevron	CCR Outlet		3/8/2011	3:05:05 PM	-0.42	0.46	13.94	5.51	250.50
181714	Chevron	CCR Outlet		3/8/2011	3:06:05 PM	-0.02	0.41	14.08	5.51	234.40
181714	Chevron	CCR Outlet		3/8/2011	3:07:05 PM	-0.42	0.43	13.66	5.68	306.30
181714	Chevron	CCR Outlet		3/8/2011	3:08:05 PM	-0.42	0.35	14.29	5.29	239.30
181714	Chevron	CCR Outlet		3/8/2011	3:09:05 PM	-0.02	0.38	13.98	5.49	240.50
181714	Chevron	CCR Outlet		3/8/2011	3:10:05 PM	-0.42	0.41	13.90	5.60	315.40
181714	Chevron	CCR Outlet		3/8/2011	3:11:05 PM	-0.43	0.38	13.94	5.57	307.90
181714	Chevron	CCR Outlet		3/8/2011	3:12:05 PM	-0.42	0.35	14.24	5.37	300.00
181714	Chevron	CCR Outlet		3/8/2011	3:13:05 PM	-0.42	0.41	13.93	5.61	287.20
181714	Chevron	CCR Outlet		3/8/2011	3:14:05 PM	-0.02	0.40	14.13	5.37	264.40
181714	Chevron	CCR Outlet		3/8/2011	3:15:05 PM	-0.42	0.38	13.71	5.83	221.00
181714	Chevron	CCR Outlet		3/8/2011	3:16:05 PM	-0.43	0.35	14.13	5.32	225.20
181714	Chevron	CCR Outlet		3/8/2011	3:17:05 PM	-0.42	0.35	13.95	5.65	263.60
181714	Chevron	CCR Outlet		3/8/2011	3:18:05 PM	-0.42	0.40	14.36	5.32	366.00
181714	Chevron	CCR Outlet		3/8/2011	3:19:05 PM	-0.02	0.41	14.09	5.48	220.20
181714	Chevron	CCR Outlet		3/8/2011	3:19:11 PM	-0.44	0.41	13.89	5.71	236.80

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:20:11 PM	-0.42	0.38	14.15	5.39	289.70
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:21:11 PM	-0.42	0.38	14.15	5.36	311.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:22:11 PM	-0.02	0.40	14.05	5.43	281.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:23:11 PM	-0.42	0.35	14.22	5.33	220.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:24:11 PM	-0.42	0.35	13.94	5.64	193.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:25:11 PM	-0.42	0.35	14.73	4.87	262.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:26:11 PM	-0.15	0.43	14.08	5.44	239.20
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:27:11 PM	-0.42	0.41	13.99	5.48	229.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:28:11 PM	-0.42	0.40	14.24	5.39	301.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:29:11 PM	-0.02	0.43	13.99	5.46	335.70
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:30:11 PM	-0.43	0.38	14.25	5.37	272.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:31:11 PM	-0.42	0.32	13.94	5.58	294.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:32:11 PM	-0.41	0.32	13.99	5.61	253.90
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:33:11 PM	-0.42	0.40	14.21	5.30	265.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:34:11 PM	-0.42	0.43	14.32	5.18	364.00
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:35:11 PM	-0.41	0.35	14.07	5.44	264.10
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:36:11 PM	-0.41	0.32	14.08	5.48	231.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:37:11 PM	-0.41	0.35	14.23	5.33	272.00
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:38:11 PM	-0.42	0.41	14.06	5.53	288.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:39:11 PM	-0.42	0.32	13.86	5.58	288.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:40:11 PM	-0.42	0.30	13.95	5.55	235.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:41:11 PM	-0.43	0.32	14.21	5.35	355.70
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:42:11 PM	-0.42	0.35	14.01	5.58	330.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:43:11 PM	-0.42	0.35	14.21	5.41	318.10
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:44:11 PM	-0.42	0.29	13.68	5.86	276.70
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:45:11 PM	-0.02	0.35	13.72	5.73	290.20
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:46:11 PM	-0.42	0.35	14.12	5.47	284.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:47:11 PM	-0.42	0.38	13.87	5.73	272.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:48:11 PM	-0.02	0.35	13.92	5.62	346.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:49:11 PM	-0.42	0.40	14.00	5.47	300.70
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:50:11 PM	-0.42	0.40	14.42	5.15	251.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:51:11 PM	-0.44	0.46	13.76	5.69	237.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:52:11 PM	-0.42	0.35	13.96	5.70	182.20
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:53:11 PM	-0.42	0.35	14.31	5.25	317.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:54:11 PM	-0.02	0.40	13.81	5.76	333.90
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:55:11 PM	-0.42	0.35	13.67	5.81	220.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:56:11 PM	-0.41	0.32	14.17	5.42	220.20
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:57:11 PM	-0.02	0.38	14.26	5.25	265.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:58:11 PM	-0.43	0.41	13.73	5.80	199.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	3:59:11 PM	-0.42	0.33	14.15	5.43	207.10
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:00:11 PM	-0.42	0.30	13.92	5.73	300.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:01:11 PM	-0.41	0.35	14.05	5.51	287.90
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:02:11 PM	-0.41	0.35	14.16	5.43	236.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:03:11 PM	-0.42	0.35	14.12	5.44	218.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:04:11 PM	-0.02	0.32	14.16	5.50	299.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:05:11 PM	-0.41	0.35	14.46	5.17	268.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:06:11 PM	-0.41	0.38	14.18	5.40	275.20
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:07:11 PM	-0.41	0.35	13.86	5.62	187.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:08:11 PM	-0.42	0.32	14.06	5.56	175.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:09:11 PM	-0.41	0.27	14.16	5.48	225.90
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:10:11 PM	-0.41	0.33	13.85	5.74	235.60
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:11:11 PM	0.00	0.32	13.78	5.73	258.40

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:12:11 PM	-0.41	0.25	14.12	5.49	308.40
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:13:11 PM	-0.02	0.35	13.92	5.65	314.00
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:14:11 PM	-0.38	0.35	13.89	5.67	273.80
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:15:11 PM	-0.39	0.30	13.82	5.70	289.90
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:16:11 PM	0.00	0.30	13.83	5.73	274.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:17:11 PM	-0.41	0.30	14.01	5.49	278.30
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:18:11 PM	-0.38	0.35	14.25	5.36	298.50
181714	Chevron	CCR Outlet	Run 3	3/8/2011	4:19:11 PM	-0.39	0.25	13.38	6.08	338.60
181714	Chevron	CCR Outlet		3/8/2011	4:20:11 PM	-0.41	0.30	14.00	5.70	0.50
181714	Chevron	CCR Outlet		3/8/2011	4:21:11 PM	9.07	13.58	2.51	1.23	0.20
181714	Chevron	CCR Outlet		3/8/2011	4:22:11 PM	22.70	22.98	0.33	0.24	0.20
181714	Chevron	CCR Outlet		3/8/2011	4:23:11 PM	24.29	23.99	0.09	0.10	0.10
181714	Chevron	CCR Outlet		3/8/2011	4:24:12 PM	24.42	24.16	0.05	0.07	0.10
181714	Chevron	CCR Outlet		3/8/2011	4:25:12 PM	24.45	24.18	0.04	0.06	0.00
181714	Chevron	CCR Outlet		3/8/2011	4:26:12 PM	24.87	24.16	0.03	0.06	0.00
181714	Chevron	CCR Outlet		3/8/2011	4:27:12 PM	24.47	24.21	0.02	0.05	0.20
181714	Chevron	CCR Outlet		3/8/2011	4:28:12 PM	24.47	24.21	0.02	0.04	451.70
181714	Chevron	CCR Outlet		3/8/2011	4:29:12 PM	11.61	7.08	8.48	8.38	451.10
181714	Chevron	CCR Outlet		3/8/2011	4:30:12 PM	0.99	0.32	9.74	9.63	451.60
181714	Chevron	CCR Outlet		3/8/2011	4:31:12 PM	-0.20	-0.41	9.88	9.72	2.70
181714	Chevron	CCR Outlet		3/8/2011	4:32:12 PM	0.05	-0.43	10.51	8.89	352.60
181714	Chevron	CCR Outlet		3/8/2011	4:33:12 PM	-0.32	0.11	13.04	6.35	323.40
181714	Chevron	CCR Outlet		3/8/2011	4:34:12 PM	-0.34	0.32	13.71	5.78	318.60
181714	Chevron	CCR Outlet		3/8/2011	4:35:12 PM	0.05	0.35	13.56	5.81	373.70
181714	Chevron	CCR Outlet		3/8/2011	4:36:12 PM	-0.37	0.32	13.54	5.90	271.60
181714	Chevron	CCR Outlet		3/8/2011	4:37:12 PM	-0.36	0.30	14.10	5.48	289.30
181714	Chevron	CCR Outlet		3/8/2011	4:38:12 PM	0.00	0.35	13.93	5.57	246.50
181714	Chevron	CCR Outlet		3/8/2011	4:39:12 PM	-0.39	0.38	13.86	5.50	236.50
181714	Chevron	CCR Outlet		3/8/2011	4:40:12 PM	-0.39	0.30	14.11	5.49	276.90
181714	Chevron	CCR Outlet		3/8/2011	4:41:12 PM	-0.41	0.32	14.10	5.48	257.70
181714	Chevron	CCR Outlet		3/8/2011	4:42:12 PM	-0.17	0.38	13.92	5.59	275.10
181714	Chevron	CCR Outlet		3/8/2011	4:43:11 PM	0.00	0.30	13.92	5.43	237.40
181714	Chevron	CCR Outlet		3/8/2011	4:44:11 PM	0.00	0.27	14.08	5.49	230.80
181714	Chevron	CCR Outlet		3/8/2011	4:45:11 PM	0.00	0.30	14.04	5.51	260.70
181714	Chevron	CCR Outlet		3/8/2011	4:46:11 PM	0.00	0.30	13.95	5.63	235.00
181714	Chevron	CCR Outlet		3/8/2011	4:47:11 PM	0.00	0.27	13.96	5.47	297.20
181714	Chevron	CCR Outlet		3/8/2011	4:48:11 PM	0.00	0.22	13.98	5.51	220.40
181714	Chevron	CCR Outlet		3/8/2011	4:49:11 PM	0.00	0.25	14.14	5.35	268.30
181714	Chevron	CCR Outlet		3/8/2011	4:50:11 PM	0.00	0.30	14.04	5.57	252.90
181714	Chevron	CCR Outlet		3/8/2011	4:51:11 PM	0.00	0.30	13.73	5.79	305.30
181714	Chevron	CCR Outlet		3/8/2011	4:52:11 PM	0.00	0.30	13.89	5.57	277.10
181714	Chevron	CCR Outlet		3/8/2011	4:53:11 PM	0.00	0.27	14.02	5.53	255.80
181714	Chevron	CCR Outlet		3/8/2011	4:54:11 PM	0.00	0.30	13.93	5.45	249.90
181714	Chevron	CCR Outlet		3/8/2011	4:55:11 PM	0.00	0.25	13.93	5.62	320.40
181714	Chevron	CCR Outlet		3/8/2011	4:56:11 PM	0.00	0.25	14.02	5.50	293.10
181714	Chevron	CCR Outlet		3/8/2011	4:57:11 PM	0.00	0.27	14.09	5.42	234.70
181714	Chevron	CCR Outlet		3/8/2011	4:58:11 PM	0.00	0.30	13.82	5.74	198.50
181714	Chevron	CCR Outlet		3/8/2011	4:59:11 PM	0.00	0.30	13.88	5.48	361.90
181714	Chevron	CCR Outlet		3/8/2011	5:00:11 PM	0.00	0.22	14.15	5.38	252.60
181714	Chevron	CCR Outlet		3/8/2011	5:01:11 PM	0.00	0.25	13.83	5.66	289.30
181714	Chevron	CCR Outlet		3/8/2011	5:02:11 PM	0.00	0.32	13.85	5.66	327.00
181714	Chevron	CCR Outlet		3/8/2011	5:03:11 PM	0.00	0.32	13.96	5.57	357.10

Project Number	Client	Source	Run Number	Date	Time	NOx (ppm)	CO (ppm)	O2 (%)	CO2 (%)	VOC (ppmv)
181714	Chevron	CCR Outlet		3/8/2011	5:04:11 PM	0.00	0.27	13.76	5.77	292.80
181714	Chevron	CCR Outlet		3/8/2011	5:05:11 PM	0.00	0.25	14.32	5.25	277.20
181714	Chevron	CCR Outlet		3/8/2011	5:06:11 PM	0.00	0.30	13.99	5.51	269.40
181714	Chevron	CCR Outlet		3/8/2011	5:07:11 PM	0.00	0.27	13.98	5.61	259.30
181714	Chevron	CCR Outlet		3/8/2011	5:08:11 PM	0.00	0.30	14.03	5.62	319.60
181714	Chevron	CCR Outlet		3/8/2011	5:09:11 PM	0.00	0.25	13.99	5.66	235.00
181714	Chevron	CCR Outlet		3/8/2011	5:10:11 PM	0.00	0.25	14.52	5.12	248.30
181714	Chevron	CCR Outlet		3/8/2011	5:11:11 PM	0.00	0.30	13.65	5.78	231.30
181714	Chevron	CCR Outlet		3/8/2011	5:12:11 PM	0.00	0.27	14.35	5.19	206.90
181714	Chevron	CCR Outlet		3/8/2011	5:13:11 PM	0.00	0.27	14.16	5.38	251.50
181714	Chevron	CCR Outlet		3/8/2011	5:14:11 PM	0.00	0.30	13.87	5.61	277.90
181714	Chevron	CCR Outlet		3/8/2011	5:15:11 PM	0.00	0.27	13.89	5.54	375.60
181714	Chevron	CCR Outlet		3/8/2011	5:16:11 PM	0.00	0.27	13.98	5.57	258.20
181714	Chevron	CCR Outlet		3/8/2011	5:17:11 PM	0.00	0.32	13.73	5.84	252.50
181714	Chevron	CCR Outlet		3/8/2011	5:18:11 PM	0.00	0.32	13.80	5.76	289.70
181714	Chevron	CCR Outlet		3/8/2011	5:19:11 PM	0.00	0.30	13.96	5.68	327.90
181714	Chevron	CCR Outlet		3/8/2011	5:20:11 PM	0.00	0.30	13.73	5.78	270.80
181714	Chevron	CCR Outlet		3/8/2011	5:21:11 PM	0.00	0.27	13.95	5.61	306.20
181714	Chevron	CCR Outlet		3/8/2011	5:22:11 PM	0.00	0.30	14.18	5.39	262.30
181714	Chevron	CCR Outlet		3/8/2011	5:23:11 PM	0.00	0.30	13.65	5.78	222.80
181714	Chevron	CCR Outlet		3/8/2011	5:24:11 PM	0.00	0.27	13.90	5.74	238.80
181714	Chevron	CCR Outlet		3/8/2011	5:25:11 PM	0.00	0.30	14.31	5.21	239.80
181714	Chevron	CCR Outlet		3/8/2011	5:26:11 PM	0.00	0.32	13.81	5.61	234.70
181714	Chevron	CCR Outlet		3/8/2011	5:27:11 PM	0.00	0.27	13.84	5.51	249.30
181714	Chevron	CCR Outlet		3/8/2011	5:28:11 PM	0.00	0.22	13.94	5.53	233.10
181714	Chevron	CCR Outlet		3/8/2011	5:29:11 PM	0.00	0.25	13.84	5.66	299.30
181714	Chevron	CCR Outlet		3/8/2011	5:30:11 PM	0.00	0.27	13.98	5.59	201.70
181714	Chevron	CCR Outlet		3/8/2011	5:31:11 PM	0.00	0.27	13.75	5.60	229.60

APPENDIX G:
CALIBRATIONS AND CERTIFICATIONS

Spectra Gases Inc.

3434 Route 22 West, Branchburg, New Jersey 08876 USA

ISO 9001:2000

Shipped from: 80 Industrial Drive, Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER:	TRC Air Measurements	**CYLINDER # :**	CC-68298
SGI ORDER # :	0139958	**CYLINDER PRES:**	2000 PSIG
ITEM# :	1	**CGA OUTLET:**	590
P.O.# :	2007513, T9 Jim	**PRODUCT CODE:**	TRC 52

CERTIFICATION DATE: 12/17/2008
EXPIRATION DATE: 12/16/2011

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Dioxide	12/17/2008	4.52 %	4.52 %	+/- 1%
Oxygen	12/16/2008	21.0 %	21.0 %	+/- 1%

BALANCE Nitrogen
PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Dioxide	GMIS-1	CC-117398	10.03 %
Oxygen	NTRM-82659Y	CC-237244	24.52 %

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Dioxide	CAI-300	S03001	NDIR	12/3/2008
Oxygen	CAI-300	S03001	PM	12/4/2008

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Matthew Booth
MATTHEW BOOTH

DATE: 12/17/2008

Tel: +1 908-252-9300 Fax: +1 908-252-0811
www.spectragases.com

Spectra Gases Inc.

3434 Route 22 West, Branchburg, New Jersey 08876 USA

ISO 9001:2000

Shipped from: 80 Industrial Drive, Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: TRC Air Measurements
SGI ORDER # : 0139958
ITEM# : 3
P.O.# : 2007513, T9 Jim

CYLINDER # : CC-109881
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 580
PRODUCT CODE: TRC 52

CERTIFICATION DATE: 12/17/2008
EXPIRATION DATE: 12/17/2011

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Dioxide	12/17/2008	20.8 %	20.8 %	+/- 1%
Oxygen	12/17/2008	4.49 %	4.49 %	+/- 1%

BALANCE Nitrogen
PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Dioxide	NTRM-82745x	CC-79933	20.0 %
Oxygen	GMIS-1	CC-94583	10.00 %

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Dioxide	CAI-300	S03001	NDIR	12/17/2008
Oxygen	CAI-300	S03001	PM	12/11/2008

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Matthew Booth
MATTHEW BOOTH

DATE: 12/17/2008

Tel: +1 908-252-9300 **Fax:** +1 908-252-0811
www.spectragases.com

Airgas

Airgas Specialty Gases
12722 S. Wentworth Avenue
Chicago, IL 60628
(773)-785-3000 Fax: (773)-785-1928
http://www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI80E15AC2K9	Reference Number:	54-124237599-7
Cylinder Number:	SA11209	Cylinder Volume:	151 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 13, 2010	Valve Outlet:	590

Expiration Date: Oct 13, 2013

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 %	9.897 %	G1	+/- 1% NIST Traceable
OXYGEN	10.00 %	10.01 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/O2	06120103	CC195929	9.898% OXYGEN/	Oct 02, 2012
NTRM/CO2	98120809	CC59142	13.78% CARBON DIOXIDE/	Oct 02, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
(CO2-1)HORIBA VIA-510	NDIR	Oct 03, 2010
(O2-1)HORIBA MPA-510	Paramagnetic	Oct 03, 2010

Triad Data Available Upon Request

Permanent Notes:STOCK BY CONCENTRATION

Notes:TRC P.O. 27781
"Stock by Concentration"

Approved for Release

Airgas

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E04NI99E15AC3S3	Reference Number:	83-124198229-1
Cylinder Number:	CC260803@	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 30, 2009	Valve Outlet:	660

Expiration Date: Nov 30, 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 MONOXIDE	85.00 PPM	83.68 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	85.00 PPM	84.99 PPM	G1	+/- 1% NIST Traceable
PROPANE	85.00 PPM	83.92 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		85.00 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	060610	CC206050	49.38PPM NITRIC OXIDE/NITROGEN	Oct 02, 2012
NTRM	08060207	CC255258	51.26PPM CARBON MONOXIDE/NITROGEN	Jan 15, 2012
NTRM	000520	SG9105901BAL	50.5PPM PROPANE/NITROGEN	Apr 03, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2MCO	FTIR	Nov 11, 2009
FTIR2LNO	FTIR	Nov 10, 2009
FTIR2PROPANE (50-500 ppm)	FTIR	Oct 29, 2009

Triad Data Available Upon Request

Notes:TRC PO# 17053
T-16 JEFF

QA Approval

Sx47199

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

Part Number:	E04NI99E15A3528	Reference Number:	83-124238845-8
Cylinder Number:	XC023418B	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 03, 2010	Valve Outlet:	660

Expiration Date: Nov 03, 2012

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
PROPANE	45.00 PPM	45.31 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	50.00 PPM	50.45 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	50.00 PPM	49.59 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		49.61 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	071201	CC239990	48.47PPM NITRIC OXIDE/NITROGEN	May 01, 2011
NTRM	08060226	CC255818	51.26PPM CARBON MONOXIDE/NITROGEN	Jan 15, 2012
NTRM	99060203	CC263030	49.62PPM PROPANE/NITROGEN	Jul 08, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801556 LCO	FTIR	Nov 01, 2010
Nicolet 6700 AHR0801556 LNO	FTIR	Oct 18, 2010
Nicolet 6700 AHR0801556 L2C3H8	FTIR	Sep 30, 2010

Triad Data Available Upon Request

Notes:TRC PO 28073
STOCK BY CONCENTRATION

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

Customer:	TRC		
Part Number:	E04NI99E15A7104	Reference Number:	83-124244061-1
Cylinder Number:	CC123981@	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 15, 2010	Valve Outlet:	660

Expiration Date: Dec 15, 2012

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	24.84 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	25.00 PPM	24.93 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	25.00 PPM	24.37 PPM	G1	+/- 1% NIST Traceable
PROPANE	25.00 PPM	25.05 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	09060704	CC207869	9.90PPM NITRIC OXIDE/NITROGEN	Oct 02, 2011
NTRM	09060704	CC207869NOX	9.90PPM NOx/NITROGEN	Oct 02, 2011
NTRM	99060203	CC263030	49.62PPM PROPANE/NITROGEN	Jul 08, 2012
NTRM	99061210	XC018697B	24.33PPM CARBON MONOXIDE/NITROGEN	Jul 01, 2011
ntrm	09061812	CC273585	24.35PPM CARBON MONOXIDE/NITROGEN	Oct 20. 2013
NTRM	10060309NO	CC280970	20.34PPM NITRIC OXIDE/NITROGEN	Feb 01, 2013
NTRM	10060309NOX	CC280970	20.34PPM NOx/NITROGEN	Feb 01, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801556 LCO	FTIR	Nov 30, 2010
CNOGL	Chemiluminescence	Nov 16, 2010
CNOxGL	Chemiluminescence	Nov 16, 2010
Nicolet 6700 AHR0801556 M1C3H8	FTIR	Dec 07, 2010

Triad Data Available Upon Request

Airgas

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	TRC		
Part Number:	E04NI99E15A41D5	Reference Number:	83-124223982-44A
Cylinder Number:	CC18641	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jul 26, 2010	Valve Outlet:	660

Expiration Date: Jul 26, 2012

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for

Total oxides of nitrogen	809.1 PPM	For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080604	cc255345	1002PPM CARBON MONOXIDE/NITROGEN	Apr 15, 2012
NTRM	08060635	CC255910	1025PPM NITRIC OXIDE/NITROGEN	May 01, 2012
NTRM	01050608	SG9133879BAL	965.9PPM PROPANE/NITROGEN	May 05, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2MCO	FTIR	Jul 09, 2010
FTIR2MNO	FTIR	Jul 22, 2010
AH2SGL	Photometric	Jul 14, 2010

Triad Data Available Upon Request

Notes:SEQUENCE 7
TRC PO 24540
STOCK BY CONCENTRATION

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

Part Number:	E04NI99E15A41D4	Reference Number:	83-124238845-15
Cylinder Number:	CC280478@	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 01, 2010	Valve Outlet:	660

Expiration Date: Nov 01, 2012

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 MONOXIDE	400.0 PPM	401.8 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	400.0 PPM	414.1 PPM	G1	+/- 1% NIST Traceable
PROPANE	450.0 PPM	445.0 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		414.2 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	980608	CC274338	501.3PPM CARBON MONOXIDE/NITROGEN	Feb 01, 2013
NTRM	040602	CC316078	495.6PPM NITRIC OXIDE/NITROGEN	Feb 01, 2016
NTRM	06060918	SG9103755BAL	483.6PPM PROPANE/NITROGEN	Jul 01, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801556 M1CO	FTIR	Oct 04, 2010
Nicolet 6700 AHR0801556 M1NO	FTIR	Oct 05, 2010
Nicolet 6700 AHR0801556 M1C3H8	FTIR	Sep 30, 2010

Triad Data Available Upon Request

Notes:TRC
P.O 28073
"Stock by Concentration"

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0959
www.airgas.com

Customer:	TRC		
Part Number:	E04NI99E15A41H7	Reference Number:	83-124237547-1
Cylinder Number:	CC274733	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 19, 2010	Valve Outlet:	660

Expiration Date: Oct 19, 2012

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 MONOXIDE	200.0 PPM	199.3 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	200.0 PPM	202.0 PPM	G1	+/- 1% NIST Traceable
PROPANE	270.0 PPM	266.1 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		202.4 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08060333	cc255642	250.0PPM CARBON MONOXIDE/NITROGEN	Apr 15, 2012
NTRM	09060921	cc269046	95.74PPM NITRIC OXIDE/NITROGEN	Mar 15, 2011
NTRM	000519	SG9103755BAL	483.6PPM PROPANE/NITROGEN	Jul 01, 2013
NTRM	10060435	CC316078	495.6PPM NITRIC OXIDE/NITROGEN	Feb 01, 2016

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AMP0900119 MCO	FTIR	Oct 04, 2010
Nicolet 6700 AMP0900119 MNO	FTIR	Oct 05, 2010
Nicolet 6700 AMP0900119 PROPANE (50-500 ppm)	FTIR	Sep 30, 2010

Triad Data Available Upon Request

Notes:SEQUENCE 4
TRC PO 27781
STOCK BY CONCENTRATION

Approved for Release

D1 9X

Meter Box: Orifice Full Calibration

Date:	11/4/2010
Prev. Calib. Date:	10/28/2010
Location:	Austin
Technician:	JMH
Meter Serial No:	1011028
TRC Meter Box ID	1011028
Atm. Pressure (corr. in Hg):	uncorrected: 29.72 --> 29.72
Critical Vacuum + 2 in Hg:	16 in. Hg. (required minimum)
Prev. Calib Factor (Y):	1.0018

Reference Orifice Set		**Orifice (#)**	**K' Factor**
Manufacturer:	Apex Instruments	63	0.5881
Model:	SX 40-73	48	0.3451
Tested By:	EW	55	0.4549
		40	0.2353

Orifice Serial #	K' coefficient (see above)	dH (in. H2O)	Time (min)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Initial Temperatures Inlet (deg F)	Initial Temperatures Outlet (deg F)	Final Temperatures Inlet (deg F)	Final Temperatures Outlet (deg F)	Vacuum (in Hg)	Ambient Temperatures Initial (deg F)	Ambient Temperatures Final (deg F)
40	0.2353	0.32	41	176.512	188.956	12.444	71	71	72	72	24	67.0	68.0
48	0.3451	0.67	29	163.458	176.417	12.959	73	73	73	73	23.5	63.0	64.0
55	0.4549	1.20	34	143.418	163.458	20.04	73	73	73	73	22.5	64.0	65.0
63	0.5881	2.00	15	131.963	143.418	11.455	73	73	73	73	21	66.0	66.0

Meter Box Dry Gas Meter: Volume Corrected Vm (std) (cu ft)	Volume Corrected Vm (std) (liters)	Flow Rate (CFM)	Critical Orifice: Volume Corrected Vcr (std) (cu ft)	Volume Corrected Vm (std) (liters)	Dry Gas Meter Calibration Factor (Y): Value (#)	Variation (#)	Orifice Calibration Factor (dH@): Value (in H2O)	Variation (in H2O)
12.28	347.86	0.304	12.48	353.51	1.016	0.001	1.878	0.04
12.77	361.55	0.447	13.00	368.13	1.018	0.003	1.775	-0.07
19.77	559.84	0.589	20.07	568.37	1.015	0.000	1.845	0.00
11.32	320.64	0.764	11.43	323.71	1.010	-0.005	1.863	0.02

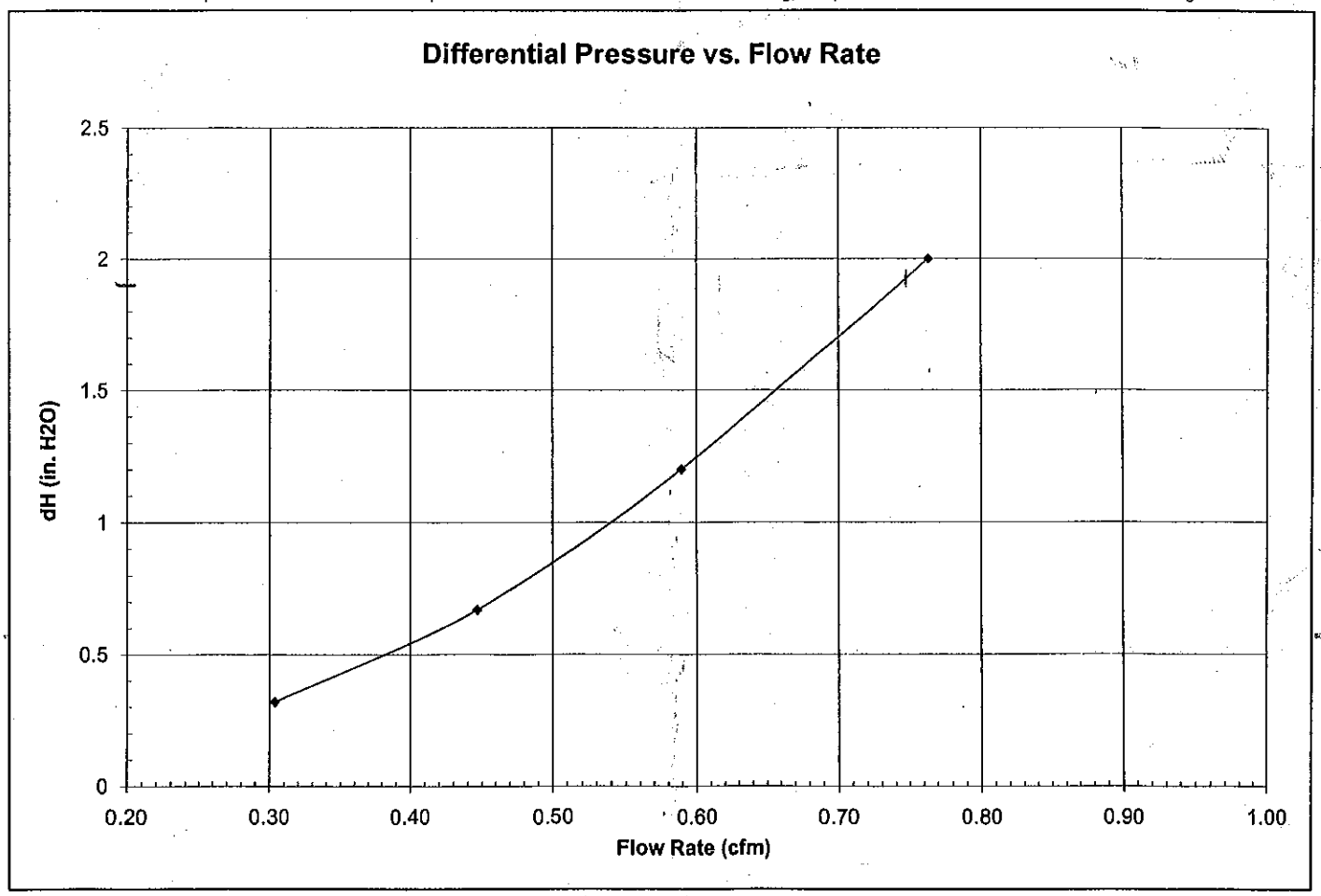
Meter Box

Calibration Test Results		**Pass/Fail**
* Average Y:	1.0148	PASS
Ave. Y w/in 5% of previous value:		YES
0.95 >= Y <= 1.05:		PASS
** Average dH:	1.840	PASS

Criteria:

* Y- ratio of the reading of the calibration meter (critical orifice) to the Meter Box DGM. Acceptable tolerance of individual values from the average is +/- 0.02.

** dH- the orifice differential pressure in inches of H2O that equetes to 0.75 cfm of air flow et 68 F and 29.92 in Hg, acceptable tolerance of individual values from the average is +/- 0.2.



HCL F-8560 F-1102

Meter Box: Orifice Full Calibration

Date:	11/4/2010
Prev. Calib. Date:	11/23/2010
Location:	Austin
Technician:	JMH
Meter Serial No:	1010027
TRC Meter Box ID	1010027
Atm. Pressure (corr. in Hg):	uncorrected: 29.72 --> 29.72
Critical Vacuum + 2 in Hg:	16 in. Hg. (required minimum)
Prev. Calib Factor (Y):	0.9986

Reference Orifice Set		**Orifice (#)**	**K' Factor**
Manufacturer:	Apex Instruments	40	0.2353
Model:	SX 40-73	48	0.3451
Tested By:	EW	55	0.4549
		63	0.5881

Orifice Serial #	K' coefficient (see above)	dH (in. H2O)	Time (min)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Initial Temperatures Inlet (deg F)	Initial Temperatures Outlet (deg F)	Final Temperatures Inlet (deg F)	Final Temperatures Outlet (deg F)	Vacuum (in Hg)	Ambient Temperatures Initial (deg F)	Ambient Temperatures Final (deg F)
40	0.2353	0.32	20	160.739	166.780	6.041	62	62	64	64	24.5	60.0	62.0
48	0.3451	0.68	39	166.780	184.156	17.376	64	64	69	69	23.5	62.0	63.0
55	0.4549	1.1	15	184.156	192.986	8.83	69	69	71	71	22	63.0	64.0
63	0.5881	1.95	34	192.986	219.098	26.112	71	71	76	76	20.5	64.0	64.0

Meter Box Dry Gas Meter: Volume Corrected Vm (std) (cu ft)	Volume Corrected Vm (std) (liters)	Flow Rate (CFM)	Critical Orifice: Volume Corrected Vcr (std) (cu ft)	Volume Corrected Vm (std) (liters)	Dry Gas Meter Calibration Factor (Y): Value (#)	Variation (#)	Orifice Calibration Factor (dH@): Value (in H2O)	Variation (in H2O)
6.06	171.61	0.302	6.13	173.51	1.011	0.001	1.899	0.08
17.33	490.77	0.446	17.50	495.53	1.010	0.000	1.858	0.04
8.76	248.01	0.589	8.86	250.99	1.012	0.002	1.709	-0.10
25.78	730.12	0.768	25.96	735.13	1.007	-0.003	1.790	-0.02

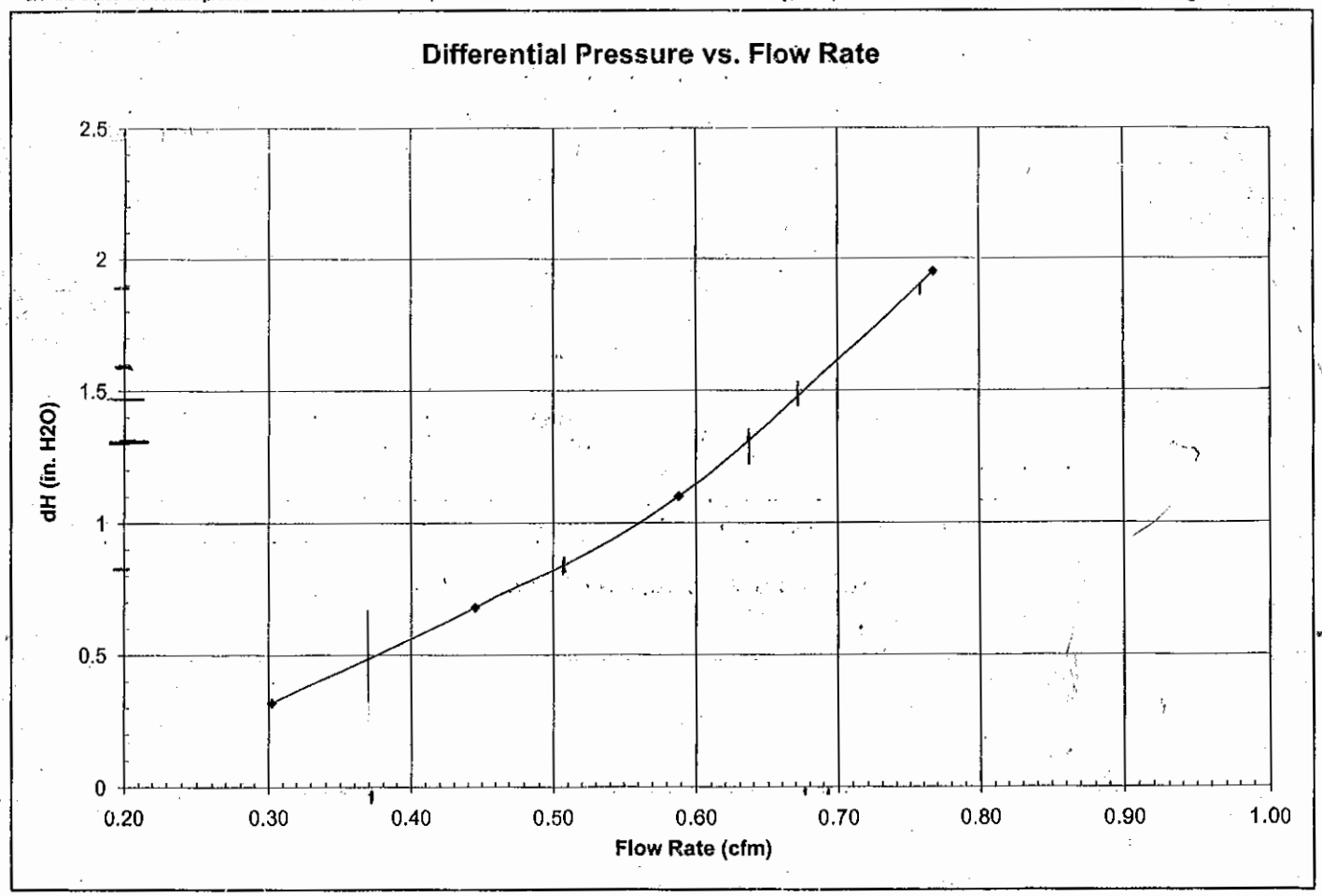
Meter Box

Calibration Test Results		**Pass/Fail**
* Average Y:	1.0099	PASS
Ave. Y w/in 5% of previous value:		YES
0.95 >= Y <= 1.05:		PASS
** Average dH:	1.814	PASS

Criteria:

* Y- ratio of the reading of the calibration meter (critical orifice) to the Meter Box DGM. Acceptable tolerance of individual values from the average is +/- 0.02.

** dH- the orifice differential pressure in inches of H2O that equates to 0.75 cfm of air flow at 68 F and 29.92 in Hg, acceptable tolerance of individual values from the average is +/- 0.2.



Pre/Post-Test Meter Box Calibration Check

WORKING METER

Date:	3/14/2011
Prev. Calib. Date:	11/4/2010
Location:	TRC South Austin, TX
Technician:	NTA
Meter Serial No:	1010027
TRC DGM ID	1010027
Current Calib. Factor (Y):	1.0099

REFERENCE METER

Calibration Date:	9/8/2010
Location:	TRC South
Technician:	KRH
Meter Serial No:	O4E469822
TRC DGM ID:	LAB
Calib. Factor (Y):	0.9920

REFERENCE METER

Calibration Run #	Time (min)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Meter Rate (cu•ft /min)	Corr. Vol @ EPA STP (cu ft)
1	17	73	74	0.000	13.363	13.363	0.7861	13.025
2	15	74	74	0.000	11.778	11.778	0.7852	11.469
3	15	74	74	0.000	11.747	11.747	0.7831	11.439

WORKING METER

Calibration Run #	Time (min)	Ambient Temp (deg F)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Meter Rate (cu•ft /min)	Corr. Vol @ EPA STP (cu ft)	Calculated DGM Factor (Y)
1	17	78	82	85	77.917	91.109	13.192	0.776	12.622	1.0319
2	15	76	85	87	91.109	102.786	11.677	0.778	11.121	1.0313
3	15	77	86	87.0	102.786	114.439	11.653	0.777	11.088	1.0317

Dry Gas Meter
Calibration Check Results

* Average Y:	1.0316
Ave. Y w/in 5% of previous value:	*YES*
Ave. Y between 0.95 and 1.05:	*PASS*
Ind. Y values +/- 0.02 from Ave.:	*PASS*

Signature: Neal Afflerbach

1.9 ΔH

TRC

Pre/Post-Test Meter Box Calibration Check

WORKING METER

Date:	3/14/2011
Prev. Calib. Date:	11/4/2010
Location:	TRC South Austin, TX
Technician:	NTA
Meter Serial No:	1011028
TRC DGM ID	1011028.00
Current Calib. Factor (Y):	1.0148

REFERENCE METER

Calibration Date:	9/8/2010
Location:	TRC South
Technician:	KRH
Meter Serial No:	04E469822
TRC DGM ID:	LAB
Calib. Factor (Y):	0.9920

REFERENCE METER

Calibration Run #	Time (min)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Meter Rate (cu•ft /min)	Corr. Vol @ EPA STP (cu ft)
1	60	68	72	0.000	45.606	45.606	0.7601	44.746
2	15	70	71	0.000	11.589	11.589	0.7726	11.360
3	15	71	71	0.000	11.584	11.584	0.7723	11.344

WORKING METER

Calibration Run #	Time (min)	Ambient Temp (deg F)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Meter Rate (cu•ft /min)	Corr. Vol @ EPA STP (cu ft)	Calculated DGM Factor (Y)
1	60	73	67	81	794.209	838.468	44.259	0.738	43.099	1.0382
2	15	74	81	83	838.468	849.822	11.354	0.757	10.893	1.0428
3	15	75	82	84.0	849.822	861.188	11.366	0.758	10.885	1.0422

Dry Gas Meter
Calibration Check Results

* Average Y:	1.0411
Ave. Y w/in 5% of previous value:	*YES*
Ave. Y between 0.95 and 1.05:	*PASS*
Ind. Y values +/- 0.02 from Ave.:	*PASS*

Signature: Neal Afflebach

Barometer/Altimeter Calibration Check

Date:	1/14/2011
Location:	TRC South Austin, TX
Technician:	NTA
Manufacturer:	Kollsman
Type:	Aneroid
Units:	in Hg & ft
TRC Lab Assign.:	T-9
Serial No.:	2J566

Lab Standard Barometer

Manufacturer:	Princo
Type:	Fortin Type Mercurial
Units:	in. Hg and mm Hg
ID Number:	NOVA 453x

Laboratory Standard Barometer

Uncorrected (Observed) Lab Barometer Reading	29.73	in. Hg
Temperature of Lab Barometer	53	°F
Multiplier for Temperature Correction (+ or -)	-0.002208	unitless
Multiplier for Lattitude Correction (Austin = ~30.5°N) (+ or -)	-0.001327	unitless
Temperature Corrected Laboratory Barometer Reading	29.66	in. Hg
Temperature & Latitude Corrected Laboratory Barometer Reading	**29.62**	in. Hg
Corrected Laboratory Barometer Reading	752	mm Hg
Corrected Laboratory Barometer Reading	1003	mb
Corrected Laboratory Barometer Reading	277	ft

Field Barometer/Altimeter

Field Barometer Reading (temperature compensated)	225	ft
Field Barometer Reading (temperature compensated)	**29.68**	in. Hg

Calibration Test Results

*Difference (in Hg)	**-0.05**
Pass/Fail	*PASS*

Acceptance Criteria

Agreement within 0.1 in. Hg or 2.5 mm Hg, or 100 ft

Neal Afflebach

signature

TRC